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# Spillover Effects: How Consumers Respond to Unexpected Changes in Price and Quality

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This article examines how unexpected changes in the marketing mix of one product in a retail setting can influence demand for other, unrelated, items. Results from two laboratory studies show that spillover effects can occur in response to both positive and negative changes in either the price or quality of a product, such that positive changes increase total spending on other items and negative changes reduce it. The results also demonstrate that an attributional process underlies these effects, indicating that consumers experience specific affective responses directed at the retailer that lead them either to reward or punish the retailer accordingly.

Consider a consumer who makes an urgent late-night visit to a local supermarket to purchase a pain reliever. Upon arriving she notices that the store is offering routine discounts on a number of unrelated goods such as milk and paper towels, and she makes a mental note to pick up a few on the way out. But she then encounters an unexpected shock: she sees that the pain reliever is being sold at twice its normal price. Will this negative surprise affect her decision to buy the other, unrelated, items she saw in the store? And what if the situation were reversed; would she be any more likely to buy extra items if the store was offering an unexpectedly large discount on pain relievers?

If she were adhering to the predictions of classical economic theory, the answer, of course, would be “no” in both cases. As long as a basket of goods remains affordable under a consumer’s budget constraint, variations in the price of one item—whether expected or not—should not affect demand for other goods that are not substitutes or comple-

ments. Hence, while the high price charged for pain relievers might cause her to seek a different remedy or to shop for the product elsewhere, it should not rationally affect her decision to purchase goods satisfying fundamental needs, such as milk or paper towels.

But would this really be the case? There is growing evidence that cross-category spillover effects induced by unexpected changes in the marketing mix of products may be more widespread than predicted by rational analyses of demand. Of particular note is recent work by Heilman, Nakamoto, and Rao (2002), who found that giving shoppers an unexpected cents-off coupon for the purchase of one product in a store not only served to increase demand for that one item but also enhanced overall spending. While this finding focused only on the effects of an unexpected in-store promotion, it raises the possibility that surprise-induced spillover effects could be caused by any unexpected changes in the selling features of a product.

The purpose of this article is to explore in detail the range of contexts in which such spillover effects might be observed in the marketplace and to identify the psychological process underlying them. Specifically, using two laboratory studies, we investigate how and why unexpected changes in the attributes of an essential good affect contemporaneous demand for other, more discretionary, items. The studies depart from previous investigations into the effects of unexpected promotions (Heilman et al. 2002) and mental budgets (Heath and Soll 1996) by exploring whether positive spillover effects triggered by unexpected decreases have reciprocal, negative, counterparts in surprise price increases, and whether spillover effects can be triggered by unexpected changes in a product’s quality as well as its price. By manipulating both of these elements, the current article is the

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first to distinguish which of three potential psychological mechanisms (generalized affect, attribution theory, or mental accounting) is primarily responsible for causing spillover effects and to identify the boundary conditions under which they might be observed.

### THE AMBIENT PSYCHOLOGY OF MARKET SHOCKS

The notion that unexpected changes in the selling features of a single product might broadly affect consumer spending is far from a new one. In its heyday, for example, Kmart became famous for trying to exploit this idea with its use of “blue-light specials,” surprise announcements that short-term discounts were being offered on certain products in the store. A presumed—though undocumented—motivation was that these surprises would not only spur demand for the featured items but would also create a festive store atmosphere that would encourage spending on other products. While it is unclear whether blue-light specials actually achieved this goal, there are at least three mechanisms by which they could have done so: (1) by creating general feelings of positive affect (Heilman et al. 2002; Lerner, Small, and Loewenstein 2004); (2) by triggering specific positive affective responses attributed to the retailer (Morales 2005; Weiner 1974, 2000); or (3) by inducing feelings of enhanced wealth through mental accounting (Heath and Soll 1996; Thaler 1985).

*Generalized Affect.* The first of these accounts is perhaps the most straightforward. A pervasive finding of research on the role of emotions in decision making is that affect or moods triggered by one event—such as the receipt of good or bad news—can broadly influence how other, unrelated, decisions are made (Johnson and Tversky 1983; Lerner et al. 2004; Schwarz 1990). Specifically, processing strategies have been found to be linked to affective states, with positive affect facilitating broader and more positive processing and negative affect fostering more narrow and negative processing (Babin and Darden 1996; Cohen and Areni 1991; Donovan et al. 1994; Lerner et al. 2004). For example, consumers primed with good relative to neutral affect have been found to view price promotions as better values (Hsu and Liu 1998), see advertisements as more convincing (Batra and Stayman 1990), and seek more variety in their product selections (Kahn and Isen 1993), while those primed with negative affect engage in more limited search behavior (Maxwell and Kover 2003). Hence, negative affect induced by unexpected price hikes or quality drops might suppress spending by limiting purchase consideration of other goods, while positive affect induced by unexpected price drops or quality upgrades might increase spending by expanding consideration (Millman 1986).

*Attribution Theory.* A limitation of this explanation, however, is that unexpected changes in the marketing mix of a single good during a shopping trip might seem insuf-

ficient to trigger the kinds of holistic changes in affect that have been present in previous studies of mood and emotion on processing (Kahn and Isen 1993). What these changes may do, however, is trigger specific affective responses (such as gratitude or anger) that consumers attribute directly to the retailer. Previous research in attribution theory supports this notion, arguing that consumers naturally search for the causes of events they encounter (Heider 1958; Kelley 1967). Thus, in the case of unexpected surprises in a retail setting, consumers might first engage in an attributional search to determine the cause of the positive or negative change they observed. If the retailer was thought to be responsible for a positive change, consumers would feel grateful and want to reward the retailer; however, if the retailer was deemed responsible for a negative change, consumers would feel angry and want to punish the retailer (Weiner 2000). Thus, it is a process of thinking leading to feelings and feelings leading to actions (Weiner 1995).

While we are not aware of research that has explored the pervasiveness of affective responses related to attribution theory in settings such as the current one, supporting evidence can be found in the recent work by Morales (2005), who offers evidence that implicit feelings of gratitude toward retailers are not only commonplace in retail settings but also can be induced by surprisingly subtle cues, such as displaying merchandise in an orderly rather than a haphazard manner. A decision by a retailer to unexpectedly alter the selling features of a good might thus produce similar feelings of either gratitude or anger, thereby leading consumers to buy more or less in an effort to reward or punish them for their actions.

*Mental Accounting.* For cases where the surprise takes the form of an unexpected change in price, mental accounting, or changes in the perceived affordability of goods, provides a third possible explanation for spillover effects (Heath and Soll 1996; Thaler 1985). Mental accounting hypothesizes that consumers are essentially rational in making purchase decisions but that they constrain spending to mental budgets that reflect the typical amount spent on different kinds of economic activities, such as routine shopping trips (Arkes et al. 1994; Thaler 1999). Hence, an increase or decrease in the amount spent for an essential item on a given shopping trip (e.g., an unexpected increase in the price of milk) would increase or decrease the amount that is perceived to be available to spend on other goods, producing a congruent spillover effect. In addition, such changes in imaginary wealth would be predicted to affect other buying behaviors in a manner consistent with economic theory. Consumers who encounter price hikes, for example, would be predicted to become more price sensitive in decisions about buying other goods and to engage in more extensive price searches. Note that these predictions would be the opposite of those offered by a generalized affect explanation for spillover effects as described above—a fact that will later prove critical in determining which of these processes actually underlies the effects.

In support of this explanation, there have been several

published demonstrations of mental budgeting influencing consumer buying (Cheema and Soman 2004; Heath and Soll 1996; Soman 1999). Cheema and Soman (2004), for example, found that, when consumers received a large price discount off of an item they had planned to purchase, they responded as if they had received a phantom windfall. Consistent with research showing that consumers spend windfall gains more readily (Arkes et al. 1994), the unexpected price discount resulted in higher expressions of willingness to pay for unrelated discretionary items. However, whether this effect would be observed for routine changes in posted prices, and whether the reverse would be observed for unexpected price increases has not been investigated.

*Empirical Differentiation.* While the three proposed processes make similar predictions about how unexpected marketing mix changes alter discretionary spending, each holds different implications for the empirical conditions that would trigger these effects and how each would be manifested in other behaviors. Consider, for example, the hypothesis that spillover effects are the result of general positive or negative affect influencing consumer processing. Since this change in processing is not linked to the source of affect but is instead an application of how people respond to affect in general, it suggests that any stimulus inducing a comparable change in affect will produce the same increase or decrease in overall spending. Attribution theory and mental accounting, on the other hand, predict that changes in discretionary spending would arise only in response to one kind of prime: unexpected changes in the features of a product that either induce feelings of positive or negative affect attributed to the retailer (under attribution theory) or alter perceptions of the affordability of other goods (under mental accounting).

A generalized affect explanation also makes unique predictions about how market shocks should affect consumers' responsiveness to regular (anticipated) in-store promotions on nonfocal products and their interest in browsing. As noted earlier, if unexpected price hikes prime general feelings of negative affect, we should see more skeptical processing of a wide range of store cues, such as decreased responsiveness to in-store promotions and more limited store search (Hsu and Liu 1998; Maxwell and Kover 2003). In contrast, both mental accounting and attribution theory tend to predict the opposite. Under mental accounting, a consumer who feels poorer after incurring an unexpected price hike would be predicted to be more responsive to price promotions offered on other goods and to more actively seek them out through search. The reverse would then hold true for a consumer who feels wealthier after encountering an unexpected discount. Similarly, under attribution theory, a consumer who responds to attribute shocks with feelings of reciprocity would be predicted to adjust their responsiveness to promotions in a way that most clearly signals either gratitude or anger to the retailer. Hence, the clearest signal of gratitude in the face of deal prices would be to purposely buy goods that are off deal (resulting in lower regular-deal sensitivity), while the clearest signals of anger would be to purposely

buy only those goods offered on deal (resulting in higher regular-deal sensitivity).

Finally, while mental accounting and attribution theory make similar predictions about how spillover effects would be manifested in discretionary spending and deal responsiveness, they hold quite different implications for the kinds of attribute surprises that would induce these effects. Under mental accounting, spillover effects should arise only in response to an unexpected change in a product's price or to an attribute that directly affects perceptions of the affordability of other goods. In contrast, attribution theory would allow such effects to be induced by any unexpected surprise in the marketing mix of a product for which the retailer is deemed responsible, such as an unexpected change in quality.

Below we describe two studies designed to tease apart these competing mechanisms and establish the empirical boundaries of spillover effects. Study 1 tests the core hypothesis that positive and negative surprises produce mirror-image effects on discretionary spending and examines whether spillover effects persist in the face of replication and monetary incentives to make decisions as rationally as possible. The study also draws initial insights into the process underlying spillover effects by observing how surprises affect other buying behaviors, such as promotions on discretionary goods and store search. Study 2 investigates the process that produces these effects in more detail by testing whether they can also be the result of changes in product quality and exogenously induced changes in overall affect and by directly measuring the affective responses experienced by consumers after exposure to shocks.

## STUDY 1

### Procedure

One hundred and fifty undergraduates at the University of Pennsylvania participated in study 1, a computerized shopping simulation, where participants managed a home inventory of 12 products, some essential and some less essential. On a weekly basis, participants observed their product inventories and made decisions about going grocery shopping. Participants were instructed to minimize the average cost of stocking their households with these 12 products over the course of 35 wk. To encourage participants to make their shopping decisions as rationally as possible, participants were given their cumulative average costs after each week, and a \$50 prize was awarded to the four participants with the lowest average shopping costs across all 35 wk.

Each week involved the execution of six steps. First, participants reviewed their home inventories. At the start of the simulation, each home was fully stocked with four units of each item. On each subsequent trial, consumption for each item was calculated as a random draw from a discrete uniform (0, 4) distribution. After consumption, participants were asked if they wanted to go shopping, at a cost of \$2 per trip. Shopping was mandatory if the inventory of one or more of the four essential items (milk, paper towels, detergent, and coffee)

was zero. In addition, shopping was also mandatory if the number of out-of-stock items across all categories in a given week was greater than a randomly chosen threshold between three and 10, insuring the occurrence of spillover effects for different levels of home inventory.

To simulate travel to the store, a car moved across the screen with a random wait time of 3–8 sec. Upon entering the store, participants saw a map of the store aisles. After clicking on an aisle, participants saw a display of the items available and their corresponding prices. Regular promotions were flagged by “Special” stickers. After viewing the items, participants made their purchase selections. On each trip, they could buy up to four units of each item, but if a trip was mandatory, they had to buy at least one unit of each out-of-stock item. At any point, participants could click on a “proceed to checkout” button. They were then given the total cost of all current purchases and chose either to continue shopping or to return home.

In order to examine the spillover hypothesis, after 15 wk. of normal shopping designed to develop expectations of regular prices, the inventory of one of the essential items was automatically reduced to zero, thereby inducing a mandatory shopping trip. Upon entering the store, participants discovered that the price of the out-of-stock item was either 80% higher or 80% lower than usual. In both cases, they were required to buy at least one unit of the item, but they could not buy more than four units. This same unexpected price change was then repeated on weeks 20, 25, and 30, with the direction of the change alternating each time. The entire study took 30–40 min., and interviews conducted after indicated participants were unaware of the hypotheses.

## Design

The central experimental manipulation was the type of price change encountered by participants while shopping for an essential item. The four price changes viewed by participants corresponded to the four cells of a 2 (price change: 80% increase vs. 80% discount)  $\times$  2 (base price: \$5 vs. \$2) factorial design. The same item was not sold at both the increase and discount levels. Specifically, the price increase items were coffee (\$5) and paper towels (\$2), and the price discount items were laundry detergent (\$5) and milk (\$2). The four price changes were presented to participants on weeks 15, 20, 25, and 30 of the simulation. The order of presentation was randomized across participants and the same type of price change did not appear consecutively. Price increases were flagged by a prominent “Sorry about the price!” label, and price discounts were flagged by a prominent “WOW!” label.

The cost of shopping (\$2), the regular prices of goods, and the frequency of regular promotions were all held constant throughout the study. During each shopping trip, each of the 12 items had an independent probability (.2) of being on promotion at 20% off the regular price. Items offered on regular promotions were flagged in the grocery aisle with a “Special” label.

## Results

*Spillover Effects.* In order to examine the effects that unexpected price changes on one item had on other purchases (and not on the item itself), we first deleted observations for the four target items in the price change weeks. We then modeled the quantity purchased of each remaining item as a function of the following explanatory variables: (1) 11 product-category-specific effects, (2) whether the item was on regular promotion (20% off), (3) whether there was a price discount (80% off) in another category, (4) whether there was a price increase (+80%) in another category, (5) whether there was any inventory of the item, (6) interaction between inventory and whether the item was on regular promotion, (7) both two-way interactions between inventory and whether there was a price increase or discount in another category, and (8) both two-way interactions between the price change and the target item’s base price (either \$2 or \$5).

Note that in this model the regression coefficients on the price-change variables (variables 3 and 4) are measures of how price changes on each of the target items affect purchase quantities of other items. The coefficients are interpreted with regard to a baseline model of purchase quantity that includes all non-change week purchases for the target items and controls for four potential natural predictors of volume: product category, home inventory, whether it was offered on regular promotion, and all corresponding interactions.

The data offer strong support for our central hypothesis of positive and negative spillover effects. On average, a price discount on one of the target items resulted in a .19 unit increase for each of the other 11 items ( $F(1, 29,530) = 6.9, p < .01$ ), while a price increase resulted in a .5 unit decrease ( $F(1, 29,530) = 21.8, p < .001$ ).

*Effect on Promotion Sensitivity and Search.* Figure 1 shows the interaction effect of unexpected price changes on discretionary good purchases that we predicted to exist under attribution theory and mental accounting but not generalized affect: unexpected price increases enhanced mar-

FIGURE 1

STUDY 1 RESULTS: EFFECT OF PRICE CHANGES ON PROMOTION SENSITIVITY

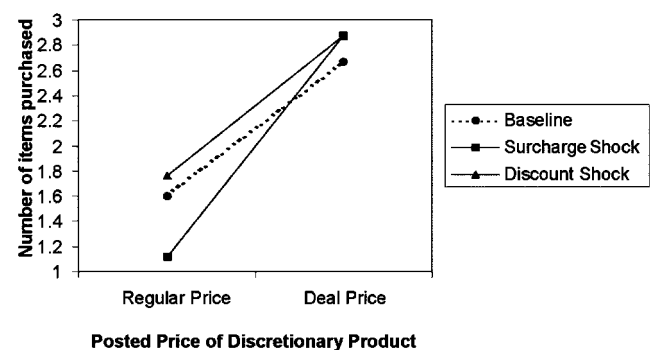
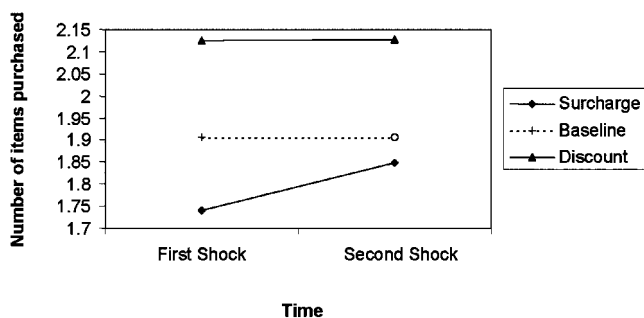


FIGURE 2

STUDY 1 RESULTS: EFFECT OF TIME ON DISCRETIONARY PURCHASES



ginal promotion-price sensitivity, while unexpected price decreases had no effect. When subjected to unexpected price increases, participants reported a lower willingness to buy products at regular prices but a higher willingness to buy products sold on promotion, that is, an increased tendency to engage in cherry-picking. In contrast, when subjected to unexpected price decreases, there was a constant increase in buying at both price points. These results were supported by a significant price increase by promotion interaction ( $F(1, 29,530) = 64.06, p < .0001$ ) and the absence of a price discount by promotion interaction ( $F(1, 29,530) < 1$ ).

An analysis of store search patterns provides further evidence against a general affect explanation for the results. Total search, defined as the number of store aisle visits and revisits during one shopping trip, was modeled as a function of the same explanatory variables used previously to model overall spending. The results indicate that the previous findings on deal sensitivity are mirrored in search patterns: we observe a significant positive interaction between a price increase and regular promotions on total search ( $F(1, 29,530) = 9.21, p < 0.001, \beta = .12$ ) but no significant interaction for price discounts ( $F(1, 29,530) < 1$ ).

At first glance the increased propensity to search in response to a negative price change appears to provide support for a mental accounting explanation for at least this one portion of the data; the increased price could have induced feelings of diminished wealth, which, in turn, would have increased the marginal benefit of seeking out price deals. An analysis of the effect of price decreases on search, however, suggests that this was not fully the case. Participants also searched more when surprised by a price decrease, as evidenced by a significant price discount by base price interaction ( $F(1, 29,530) = 25.4, p < .0001, \beta = .11$ ). This effect was comparable in magnitude and direction to that of the price increase by base price interaction ( $F(1, 29,530) = 15.4, p < .0001, \beta = .12$ ). This suggests that one driver of enhanced search here was a tendency for the unexpected price changes—be they positive or negative—to spark partic-

ipants' curiosity about what other surprises might loom among the various store aisles.

*Learning Effects.* Implicit to all three potential underlying mechanisms for spillover effects is a presumption that the encountered change is truly unexpected—enough so that it induces either strong feelings of affect toward the retailer or unplanned reallocations of mental accounts. As such, one might conjecture that spillover effects are a highly transient phenomenon, occurring only when changes are really a surprise. What is far from clear, however, is how rapidly and across how many repetitions such adaptations will occur.

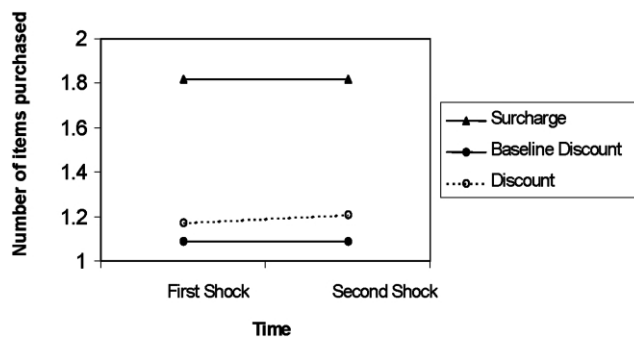
To examine this issue, in figures 2 and 3 we plot two measures of the size of spillover effects when large price changes were repeated over time in the simulation: total buying volumes compared to baseline (fig. 2), and responsiveness to regular price promotions (fig. 3). Perhaps surprisingly, the data show little evidence of wear-out when the same price change was encountered a second time: large price decreases on the target product persisted in inducing net increases in spending while large increases induced net decreases, and large price increases induced a persistent increase in responsiveness to regular price promotions. While figure 2 shows a nominal attenuation for price hikes to induce a decrease in spending over time, the decrease was not statistically significant. When the model of purchase volumes described above was expanded to include a time variable, we could not reject a hypothesis of temporal invariance of effects; the type of price change by time interaction was not significant ( $F < 1$ ), nor was the three-way interaction between type of price change, regular promotion, and time ( $F < 1$ ).

Discussion

Consistent with the primary hypothesis, study 1 shows that an unexpected positive or negative change in the marketing mix of one product can spill over to influence the likelihood of making purchases in other categories. In particular, unexpected increases in the price of one item act to reduce out-of-category purchases, while large drops in

FIGURE 3

STUDY 1 RESULTS: EFFECT OF TIME ON PROMOTION SENSITIVITY



prices increase them. The results also demonstrate that this effect is quite robust, persisting when the same price change is encountered a second time and in a setting where participants had a monetary incentive to make purchases in as rational a manner as possible.

What is somewhat less clear from the study, however, is the primary psychological mechanism that was producing these effects. On one hand, negative price shocks influenced responsiveness to regular promotions and store search in a manner consistent with both mental accounting and attribution theory: search and deal responsiveness both increased, behaviors consistent either with a consumer who felt a sudden decrease in liquidity (mental accounting) or with one who wanted to signal displeasure to the retailer by seeking out only goods offered on price deals (attribution theory). In addition, unexpected price increases induced a larger decrease in total buying than unexpected decreases induced increases, an asymmetry consistent with previous findings of loss aversion in mental accounting (Kahneman and Tversky 1979; Thaler 1999).

On the other hand, we saw no evidence of the predicted reciprocal decrease in promotion sensitivity when participants encountered unexpected discounts, and large discounts also induced an increase in search—something that would not be expected from a consumer who was made less price-sensitive due to feelings of increased wealth (mental accounting). This would, however, be consistent with previous findings on the effect of positive affect on shopping behavior (Donovan et al. 1994). In study 2 we attempt to clarify the psychological mechanisms that appear to explain spillover effects most effectively.

## STUDY 2

### Procedure and Design

Two hundred and ninety-seven undergraduates at the University of Southern California and the University of Arizona participated in a new computer simulation that involved making travel reservations with an online retailer. The study was designed to provide a clearer view of spillover effects by simplifying two of the complicating features of study 1: participants were given common expectations about the normal value of product attributes (rather than allowing them to develop through experience), and out-of-category buying did not involve a search phase. After exposure to a surprise, participants all saw the same set of discretionary items and indicated their purchase intentions for each item.

The cover story asked participants to imagine that they were graduating from college and had been selected to attend a university-sponsored career fair in Portugal. The university arranged for all travel reservations to be made using one agent, Worldwide Travel Services (WTS), an online retailer. Depending on the condition, participants were told to make either airline ticket (price-related manipulation) or hotel (quality-related manipulation) reservations using this agent.

Participants were told that WTS was a discount broker similar to Priceline.com that does not reveal the details of

reservations up-front. Participants making airline reservations were that told other clients had received an airfare of \$450 but that their exact price would not be known until they made a reservation. Participants making hotel reservations were told that the agent would guarantee them a hotel for \$75 a night but that the exact hotel would not be known until they made a reservation. Other clients, however, had been booked at the 3-star Marriott. To balance the two scenarios, participants in the airfare condition were told that they would be guaranteed lodging at the Marriott for \$75 a night, while those in the hotel condition were told that they would be guaranteed an airfare of \$450.

After reading the cover story, participants went to the WTS Web site where they made their own reservation by clicking a button. There was a short delay (simulating a real online search), and their airfare or hotel was revealed. To control for income effects, the instructions purposely did not mention any budget constraints that participants might face for their trip.

After seeing their reservations, participants had the opportunity to buy 10 discretionary items tailored for participants of the career fair program, such as a shuttle ride from the airport and a guidebook for Lisbon. Participants were told that these same items could likely be purchased for the same price in Lisbon but that they might find it more convenient to buy them now through WTS. Participants then gave ratings of their overall intent to buy any of the discretionary items plus their specific intent to buy each individual item.

After seeing all of the discretionary items, participants indicated the degree to which they experienced eight different affective responses (adapted from Andrade 2005) during the shopping simulation by moving a sliding scale that varied from 0 (not at all) to 100 (quite a bit) for each response. Six of the responses measured individuals' general affective state (good, bad, happy, sad, positive, negative), and two responses (thankful and angry) were included to measure more specific affective responses induced by the surprise.

Participants were randomly assigned to one of nine experimental conditions corresponding to a 2 (source of surprise)  $\times$  3 (direction of surprise) + 3 (exogenously induced affect) between-subjects augmented design. The source of the surprise was either the price of the airline ticket or the quality of the hotel. Surprises were negative, positive, or neutral. For the price conditions, participants received airfares that were higher than expected (\$920 = negative), lower than expected (\$190 = positive), or equal to their expectations (\$450 = neutral). Similarly, participants in the quality conditions were booked at hotels with quality ratings below their expectations (1-star = negative), well above their expectations (5-star = positive), or equal to their expectations (3-star = neutral). To insure that participants were aware of the quality differences between hotels, links were provided that gave detailed descriptions of each hotel. Participants were told that they themselves would pay all

expenses relating to the trip, including airfare, hotel, and discretionary purchases.

In the three exogenously induced affect conditions, participants were given an unrelated affect prime before starting the travel simulation. Affect was manipulated based on Andrade (2005) by having participants watch a short video and describe a real-life experience that elicited similar affective responses. In the positive affect condition, participants watched a clip of the television series *Friends*, in the negative affect condition they watched a clip showing the tsunami destruction in Asia, and in the neutral affect condition they watched a clip on artificial clouds in video games. To rule out possible demand effects, participants were told that the purpose of the task was to test recall for ads shown during television shows and a 10 sec. commercial was shown in the middle of the video. In all three affect conditions, participants received the neutral airfare of \$450 for the travel simulation.

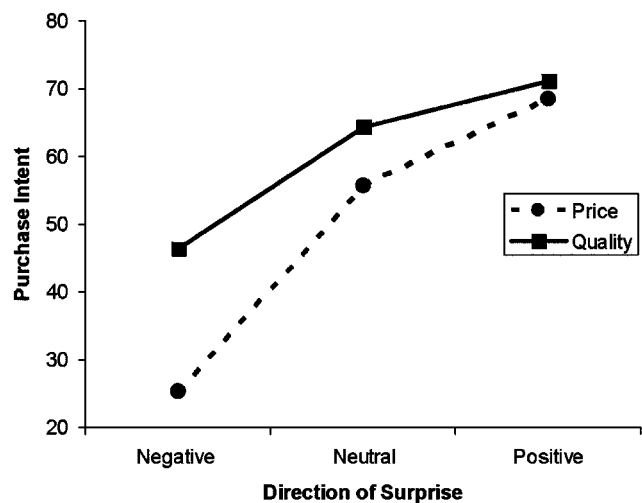
## Results

*Effect of Source and Direction.* An analysis of participants' overall purchase intent for discretionary items supported the hypothesized spillover effect for both positive and negative surprises. Specifically, there was a significant main effect of direction on overall purchase intent ( $F(2, 212) = 32.2, p < .0001$ ), with negative surprises suppressing discretionary purchases relative to neutral purchases ( $M_{\text{neg}} = 35.9, M_{\text{neut}} = 60.0; F(2, 212) = 30.9, p < .0001$ ) and positive surprises enhancing them ( $M_{\text{pos}} = 69.8, M_{\text{neut}} = 60.0; F(2, 212) = 5.07, p = .03$ ).

An initial point of interest is whether this main effect of direction is conditioned by the source of surprise. If spillover effects are caused primarily by mental accounting, we should see little (if any) spillover when the source of surprise is a change in quality that does not affect the amount being spent on a target good. Figure 4 shows mean purchase intent as a function of the direction and source of surprise, revealing two primary findings. First, although participants in the quality conditions expressed a higher purchase intent for the discretionary items than those in the price conditions ( $M_{\text{price}} = 49.8, M_{\text{qual}} = 60.7; F(1, 212) = 9.42, p = .002$ ), the direction by source interaction was not significant ( $F(2, 212) = 2.36; p = .10$ ). Thus, the data could not reject a null hypothesis of homogeneity of spillover effects across price and quality. Second, consistent with study 1, the size of the spillover effects for both price and quality was asymmetric, with negative surprises diminishing interest in discretionary buying more than positive surprises enhanced it.

We might note that, while we could not statistically reject a hypothesis of homogeneity for spillover effects, spillover effects induced by price were nominally larger in means than those observed for quality. Specifically, when the source of surprise was an unexpected change in price, a negative surprise (price increase) significantly suppressed discretionary purchases relative to a neutral condition ( $M_{\text{neg}} = 25.3,$

**FIGURE 4**  
STUDY 2 RESULTS: EFFECT OF SOURCE AND DIRECTION OF SURPRISE ON MEAN DISCRETIONARY PURCHASE INTENTIONS



$M_{\text{neut}} = 55.6; F(2, 212) = 24.7, p < .0001$ ), while a positive surprise (price decrease) significantly enhanced discretionary purchases ( $M_{\text{pos}} = 68.5, M_{\text{neut}} = 55.6; F(2, 212) = 4.47, p = .04$ ). In contrast, when the source of surprise was an unexpected change in quality, a negative surprise (downgrade in quality) suppressed overall discretionary purchases ( $M_{\text{neg}} = 46.5, M_{\text{neut}} = 64.4; F(2, 212) = 8.4, p = .004$ ), but a positive surprise (upgrade in quality) did not result in a significant increase in discretionary purchases ( $M_{\text{pos}} = 71.2, M_{\text{neut}} = 64.4; F(2, 212) = 1.17, p = 0.28$ ).

*Mediating Role of Affect.* To examine the role of affect in inducing spillover effects, we analyzed the eight affective responses measured after exposure to the surprise. A measure of general positive affect was created by averaging the positive, good, and happy scale items, along with reversals of negative, bad, and sad (Cronbach's  $\alpha = .95$ ). Thankful and angry remained individual measures for gratitude and anger because they were not highly correlated empirically ( $r = .63$ ) and are not conceptually located on opposite ends of the same scale.

Analyses modeling the affective responses as functions of the direction, source, and direction by source interaction supported a significant main effect of direction on general positive affect ( $F(2, 212) = 124.1, p < .0001$ ), anger ( $F(2, 212) = 91.4, p < .0001$ ), and gratitude ( $F(2, 212) = 54.9, p < .0001$ ). As expected, participants felt the most positive affect in the positive surprise condition ( $M_{\text{pos}} = 76.4$ ), less in the neutral ( $M_{\text{neut}} = 72.6$ ), and the least in the negative surprise condition ( $M_{\text{neg}} = 36.9$ ). Results followed an opposite pattern for anger with lowest levels in the positive condition and the most in the negative condition ( $M_{\text{pos}} = 15.1, M_{\text{neut}} = 21.4, M_{\text{neg}} = 62.3$ ). For gratitude, participants again felt the most

in the positive condition and the least in the negative condition ( $M_{\text{pos}} = 69.3$ ,  $M_{\text{neut}} = 58.6$ ,  $M_{\text{neg}} = 30.8$ ).

Of critical importance, however, was whether these responses statistically mediate the relationship between price and quality surprises on purchase intentions. Following Baron and Kenny (1986), we found that the direction of surprise was a significant predictor of purchase intent ( $F(2, 212) = 32.2$ ,  $p < .0001$ ), general positive affect (one mediator;  $F(2, 212) = 124.1$ ;  $p < .0001$ ), and gratitude (second mediator;  $F(2, 212) = 54.9$ ,  $p < .0001$ ). In addition, both positive affect and gratitude were significant predictors of purchase intent ( $F(1, 216) = 98.5$ ,  $p < .0001$ ;  $F(1, 216) = 90.5$ ,  $p < .0001$ ). When positive affect, gratitude, and the direction of surprise are all included in a model for purchase intent, however, the effect of direction becomes insignificant ( $F(2, 210) = 2.45$ ;  $p > .08$ ), along with the direction-by-source interaction ( $F(2, 210) = 1.06$ ,  $p > .34$ ). Positive affect and gratitude, however, both remain significant, with gratitude being the stronger of the two predictors ( $F(1, 210) = 4.97$ ,  $p = .03$ ;  $F(1, 210) = 7.26$ ,  $p = .008$ ). Hence, general positive affect and gratitude act as dual mediators of the effect of unexpected marketing mix changes on discretionary purchase intentions. Note that, when the model for purchase intent also included anger as a third possible mediator, it was not significant ( $F < 1$ ), suggesting that if decreased spending in response to price hikes was being driven by negative feelings toward the retailer (as opposed simply to the absence of gratitude), it was not captured by this measure.

*Effect of Exogenously Induced Affect.* Taken together, the emergence of gratitude as a statistical mediator and the finding that spillover effects can be induced by any unexpected marketing mix change (and not just a monetary one) favor attribution theory as the driving mechanism behind spillover effects. Yet, the fact that we also observed mediation by general positive affect still leaves open the possibility that such effects could be induced by any affective prime and not only those initiated by the retailer. To examine this, we tested whether exposure to affective primes before the shopping task also influenced discretionary purchase intentions.

An analysis of affect measures taken after participants watched the video primes supports the effectiveness of the manipulations: there was a significant main effect of the affect manipulation on general positive affect ( $F(2, 76) = 73.2$ ,  $p < .0001$ ). Participants felt the most positive affect after watching the positive affect video ( $M_{\text{pos}} = 85.3$ ), less in the neutral ( $M_{\text{neut}} = 54.2$ ), and the least after watching the negative affect video ( $M_{\text{neg}} = 23.4$ ). In contrast, however, we found no comparable main effect of these moods on subsequent intentions to purchase discretionary items ( $F(2, 76) < 1$ ).

## GENERAL DISCUSSION

The current article contributes to an emerging line of evidence suggesting that surprises encountered in retail set-

tings may indeed induce changes in overall spending levels far more often than previously believed. Using results from two shopping studies, we provide evidence that positive surprises can inflate overall spending levels, and we demonstrate that this effect has a reciprocal counterpart in negative surprises. In addition, the results show that these effects can be quite robust, having been demonstrated even in a gamelike setting where consumers were given an explicit cost minimization goal across replications (study 1).

Together studies 1 and 2 provide convergent evidence that these effects are best explained by an attributional process whereby consumers feel gratitude or anger toward retailers for implementing unexpected changes in the marketing mix of a product and increase or decrease their overall spending to reward or punish them for their actions. Several lines of evidence lead to this conclusion. First, although unexpected changes were found to induce general feelings of positive and negative affect, it was only when these feelings were triggered by specific actions of a retailer that spillover effects were observed. In addition, even stronger evidence against a generalized affect explanation was provided through the dual mediation of general positive affect and gratitude on purchase intentions—with gratitude emerging as the stronger of the two mediators. Finally, we found that spillover effects could be induced as easily by unexpected changes in product quality as price, a finding that argues against attributing the phenomenon to imagined wealth effects under mental accounting.

What remains less clear, of course, is why participants chose to engage in reciprocal behavior based on attributions in contexts where it offered no transparent strategic benefits. One explanation is that the behavior reflected social norms of fair trade, where spending can be an effective means of disciplining/encouraging the actions of sellers. Hence, in the same way that a restaurant patron might express gratitude for a complimentary bottle of wine by ordering more or express anger for a long wait by ordering less, here we observe similar responses to unexpected product price and quality changes, even in settings where such actions would have no disciplining effect. Therefore, a natural extension of the current article is to examine more closely the contexts in which consumers invoke attributional and reciprocal heuristics.

Although the current article offers a body of evidence favoring attribution theory as the primary driver of spillover effects, we acknowledge that this influence may often work in conjunction with the other two hypothesized mechanisms. For example, given the amount of work supporting mental accounting effects in other related contexts (Heath and Soll 1996), it seems plausible that changes in imagined liquidity—however irrational—had at least some influence on the behavior of some participants. Likewise, it is possible that generalized affect, while not inducing changes in total spending alone, might also play a similar complementary role.

Finally, it seems likely that consumers respond to retail surprises not just by altering total spending but also by

changing the nature of the products purchased or the store from which they buy. In our first study, each product category was represented by a single brand and participants could not choose another store. As such, if participants wanted to reward or punish retailers, they could only do so by altering purchase quantities. In natural settings, however, spillover effects could be manifested in switching brands or stores, such that one negative surprise could result in the loss of a customer for a lifetime. If unexpected marketing mix changes indeed result in such broad consequences, it is possible that the spillover effects documented here not only occur in real-world settings but are of a magnitude and frequency significantly greater than we portrayed.

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