Strengthening the Influence of Advertised Reference Prices through Information Priming

CHRISTINA KAN
DONALD R. LICHTENSTEIN
SUSAN JUNG GRANT
CHRIS JANISZEWSKI

The use of advertised reference price promotions, such as "regularly $119.99, sale price $39.99," is ubiquitous in the marketplace. Thirty years of research supports the conclusion that advertised reference prices (e.g., $119.99) exert an influence on consumers' responses to offer prices (e.g., $39.99) via their assimilative influence on consumers' internal reference prices. The present research provides an enriched account of this assimilation process. Specifically, three studies show that increasing the overlap in information made accessible by the advertised reference price and information made accessible by the offer price increases the influence of the information primed by the advertised reference price on the construction of the internal reference price. Consequently, the offer price is considered more attractive. The identification of this process provides insight into additional variables that moderate the influence of advertised reference prices on downstream deal evaluations. Implications for theory, practice, and public policy are discussed.

Perhaps no sales promotion technique is as commonly employed across merchant types, product categories, and media vehicles as advertised reference prices (ARPs; Grewal, Monroe, and Krishnan 1998; Kaufmann, Smith, and Ortmeyer 1994). Advertised reference price promotions entail the pairing of an advertised reference price (e.g., "regularly $119.99") with an offer price (OP; e.g., "sale price $39.99") in an attempt to make the offer price appear more favorable. Advertised reference prices have been shown to exert a favorable influence across a range of consumer responses, including judgments of a fair price, the normal price, the average market price, the lowest available price in the market, expected savings, purchase value, and purchase intentions (e.g., Grewal et al. 1998; Lichtenstein and Bearden 1989; Lichtenstein, Burton, and Karson 1991; Urbany, Bearden, and Weilbaker 1988) as well as actual marketplace sales (Kaufmann et al. 1994).

The effectiveness of an advertised reference price can be attributed to the decision-making strategy employed by many consumers. Typically, the attractiveness of an offer price is assessed by comparing it to the internal reference price (IRP), defined as a mentally stored or actively constructed reference price. To the extent the offer price is below or above the internal reference price, the offer price is evaluated more or less favorably. Yet this process is not without bias, as an offer price that is lower than an internal reference price can encourage a consumer to reduce the internal reference price and, consequently, reduce the appeal of the offer price. An advertised reference price is beneficial because it can counteract the downward influence of the offer price on the internal reference price. To the extent an advertised reference price is considered valid price informa-

Christina Kan is a PhD student in marketing, Leeds School of Business, University of Colorado, Boulder, CO 80309 (christina.kan@colorado.edu). Donald R. Lichtenstein is a professor of marketing, Leeds School of Business, University of Colorado, Boulder, CO 80309 (donald.lichtenstein@colorado.edu). Susan Jung Grant is a clinical associate professor of marketing, School of Management, Boston University, Boston, MA 02215 (sjgrant@bu.edu). Chris Janiszewski is the Russell Berrie Eminent Scholar Chair and Professor of Marketing, Warrington College of Business Administration, University of Florida, Gainesville, FL 32611 (chris.janiszewski@warrington.ufl.edu). Supplemental materials are included as an attachment in the online-only version of the article. The authors gratefully acknowledge the comments and help of John Lynch, Gary McClelland, Page Moreau, and Karen Schloss.

tion, it can increase the level of the internal reference price and, consequently, make the offer price appear more attractive. Thus, there are significant incentives for understanding how to make the advertised reference price exert a stronger influence on the internal reference price, so as to make the offer price seem more attractive and encourage a purchase.

We propose a novel strategy for increasing the influence of an advertised reference price on an internal reference price. The literature on assimilation effects shows that judgments about an ambiguous target stimulus are more likely to assimilate to a contextual cue when the target stimulus and contextual cue align on relevant dimensions (Higgins 1996; Wyer and Srull 1989). This occurs because information about the contextual cue becomes more diagnostic for disambiguating the target stimulus. As depicted in figure 1, we anticipate that similar assimilation effects might occur for products employing an advertised reference price promotional strategy but by a different process. When a consumer encounters an advertised reference price promotion (e.g., "blue jeans: regularly $119.99, sale $39.99"), the advertised reference price and offering price function as unique memory probes that increase the accessibility of product-related information at each of the two price levels (i.e., jeans at $119.99 and jeans at $39.99). To the extent the information primed by the advertised reference price and the offer price overlap (see the shaded region of fig. 1), the ARP-primed information

becomes more diagnostic to judgments about the product. Consequently, the information primed by the advertised reference price becomes more influential in the construction of the internal reference price (ambiguous target stimulus), leading to more favorable deal evaluations of the product at the offer price. This process account is novel because prior demonstrations of assimilation have shown that cue-target alignability, not the overlap of information primed by two different cues (i.e., advertised reference price, offer price), determines the degree of assimilation (Chapman and Johnson 1999; Higgins 1996; Wyer and Srull 1989).

Three studies are used to illustrate different methods of influencing the overlap of information primed by the advertised reference price and the offer price, and consequently, the influence of the ARP-primed information on the construction of the internal reference price. Study 1 shows that advertised reference price promotions are more effective in influencing consumer internal reference prices, and deal evaluations, in product categories where information associated with a product priced at the advertised reference price and information associated with a product priced at the offer price overlap to a greater degree. Study 2 shows that advertised reference price promotions are more effective when consumers are prompted to adopt a similarity mind-set as opposed to a difference mind-set. The similarity mind-set encourages a person to use the advertised reference price and offer price primes to activate more information that is

FIGURE 1

THE INFLUENCE OF THE ADVERTISED REFERENCE PRICE AND THE OFFER PRICE
ON THE CONSTRUCTION OF THE INTERNAL REFERENCE PRICE
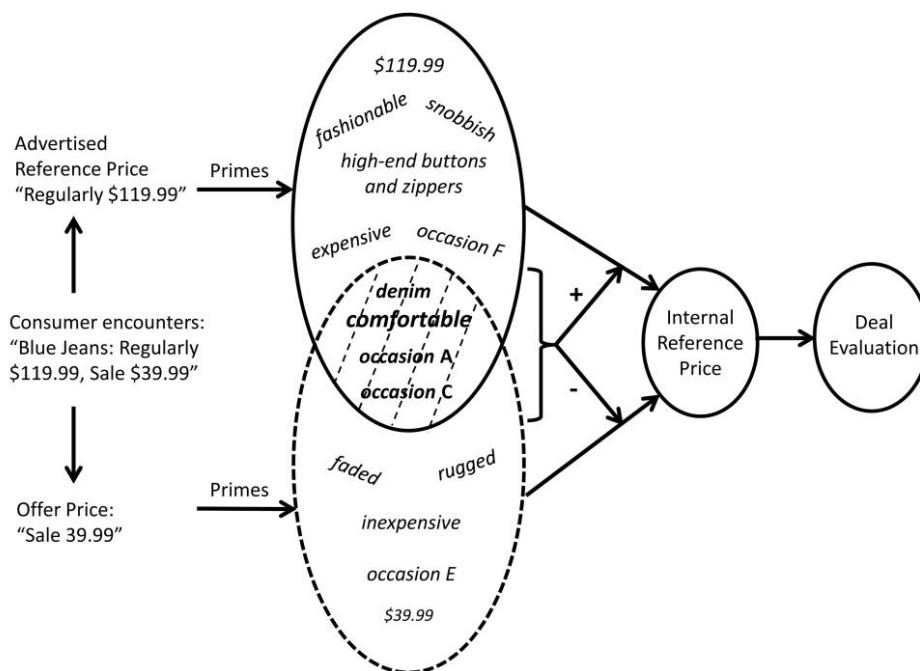
common to the two primes. Study 3 shows that advertised reference price promotions are more effective when contextual products (e.g., complements, substitutes) encourage relational elaboration (Malaviya 2007), thereby leading to an increase in the overlap of information primed by the advertised reference price and the offer price. In all three studies, an increase in the overlap of ARP- and OP-primed information results in a higher internal reference price and a greater desire to purchase the product at the offer price.

THEORY AND HYPOTHESES

Adaptation-level (Helson 1964) and assimilation-contrast (Sherif, Taub, and Hovland 1958) theories have been used to explain how advertised reference prices influence consumer responses to offer prices via changes in internal reference prices (Lichtenstein and Bearden 1988, 1989; Monroe 1979, 1990; Urbany et al. 1988). Adaptation-level theory assumes that an internal reference price is a weighted average of prior product prices. The internal reference price can be retrieved from memory or constructed using retrieved and currently available information. An advertised reference price inflates an internal reference price because it provides new and higher price information that is used to update the internal reference price. Assimilation-contrast theory also assumes that an internal reference price is a remembered or constructed price but relies on a different process for updating the internal reference price. When an advertised reference price is used as an interpretive frame, features associated with the advertised reference price (e.g., "expensive," "premium," "high quality") are used to inform judgments about the internal reference price (Bless and Schwarz 2010). Thus, the theories make parallel predictions concerning the usefulness of an advertised reference price: exposure to an advertised reference price and offer price (e.g., "regularly $119.99, sale price $39.99") results in a higher internal reference price than exposure to an offer price only (e.g., "sale price $39.99"). A higher internal reference price should increase the attractiveness of the deal. Consequently, we offer the oft-supported hypotheses 1 and 2 as a baseline for testing subsequent hypotheses:

H1: Advertised reference prices exert a positive (assimilative) influence on internal reference prices.

H2: Advertised reference prices influence deal evaluations via their influence on internal reference prices.

Strength of Assimilative Processes

A number of process models have been proposed to account for assimilation and/or contrast effects (e.g., Bless and Schwarz 2010; Mussweiler 2003; Wheeler and Petty 2001; Wyer and Srull 1989). A model that is particularly relevant for understanding assimilation effects is the selective accessibility model (Mussweiler 2003; Strack and Mussweiler 1997). The selective accessibility model was developed as an

account of anchoring, a phenomenon defined as "the assimilation of a numeric estimate toward a previously considered standard" (Mussweiler 2002, 67). According to the model, anchoring phenomena are dependent on hypothesis-consistent testing and knowledge accessibility. When people consider an anchor (e.g., an advertised reference price), it is more likely that they will attempt to confirm, rather than disconfirm, the relevance of the anchor (e.g., "Is the price reasonable for the product?"; Jacowitz and Kahneman 1995; Mussweiler and Strack 2001). In so doing, they recruit more anchor-consistent information than anchor-inconsistent information, giving anchor-consistent information an accessibility advantage. The anchor-consistent information influences judgments about the target (Mussweiler and Strack 2001).

At a fundamental level, the selective accessibility model is a priming model. The anchor primes information that then influences the interpretation of the target stimulus. Priming models assume that two conditions must be met before judgments about a target stimulus will assimilate toward the primed information. First, the primed information must align with dimensions informing a judgment about a target (Higgins 1996; Strack and Mussweiler 1997; Wyer and Srull 1989). For example, Strack and Mussweiler (1997) show that assessing the accuracy of a suggested height (width) of the Brandenburg bridge (i.e., an anchor) influences a subsequent height (width) judgment but not width (height) judgment. Similarly, Krishna et al. (2006) show that reference prices for contextual cameras, but not binoculars, influence the price participants are willing to pay for a target camera. Adaval and Wyer (2011) show that reference prices for contextual cameras can exert an influence across product categories, but only when general evaluative information (e.g., "prestige," "quality") is primed by the price information. In each study, the primed information had to be relevant to the latter judgment in order to exert an influence.

Second, the primed information must act as an interpretive frame, not a comparison standard (Bless and Schwarz 2010). When primed information is an interpretive frame, it suggests values for missing information about the target, resulting in assimilation. When primed information is a comparison standard, it anchors the scale used to evaluate the target, resulting in contrast. A large number of factors have been shown to influence whether a prime acts as an interpretive frame or comparison standard (see Bless and Schwarz [2010] for review), including extremity (Herr, Sherman, and Fazio 1983), whether or not the target is classified in the contextual category (Bless and Schwarz 1998), target typicality (Bless and Wanke 2000), and whether people actively search for (dis)similarities between the target and contextual cue (Mussweiler, Ruter, and Epstude 2004).

Increasing Advertised Reference Price Effectiveness

Advertised reference price promotions are naturally structured so that the primed information (i.e., information primed by the advertised reference price) aligns with relevant judg-

ments (i.e., subsequent price judgments). Consequently, a research focus has been on factors that determine whether information primed by an advertised reference price acts as an interpretive frame, resulting in an assimilation effect, or a comparison standard, resulting in a contrast effect. For example, the extremity of an advertised reference price has been investigated with the expectation that a plausibly high advertised reference price would act as an interpretive frame, but an implausibly high advertised reference price would act as a comparison standard. Unexpectedly, there has not been support for this hypothesis. Implausibly high advertised reference prices (i.e., advertised reference prices up to 2.86 times the offer price) have been shown to be more effective than plausibly high advertised reference prices (Urbany et al. 1988, study 2; see also Krishna et al. [2002] for a review of the influence of implausibly high advertised reference prices). It appears that consumers do not use implausibly high advertised reference prices as comparison standards. Moreover, it appears that consumers do not expect implausibly high advertised reference prices to influence price judgments; hence, they do not try to control for their influence (Mussweiler and Strack 2001). The implication is that people are generally unaware of the influence of the advertised reference price.

Extreme advertised reference prices illustrate one way in which the type of primed information (e.g., moderate vs. high reference price information) can influence the effectiveness of the advertised reference price. It has also been suggested that the amount of diagnostic information made accessible by a prime should influence the effectiveness of the prime (Bless and Schwarz 2010; Chapman and Johnson 1999). This expectation is based on research showing that as more judgment relevant information is primed, judgments about an ambiguous target become more extreme (Bless et al. 2000). In a pricing context, Adaval and Wyer (2011) show that elaborating on nonprice information about a contextual camera reduces the influence of the price information (anchor) owing to a dilution of the relative amount of price information. Similarly, Chapman and Johnson (1999) show that elaborating on nonprice information shared by a contextual stimulus and a target stimulus (i.e., similarity information) reduces the influence of contextual price information on target price judgments.

The existing strategies for increasing advertised reference price effectiveness could be described as an information extremity strategy (i.e., increasing the extremity of relevant information increases its influence) and an information density strategy (i.e., increasing the ratio of relevant to irrelevant information increases its influence). We anticipate that there is a third strategy that can influence advertised reference price effectiveness. As noted in our earlier reference to figure 1, this strategy relies on two paradigmatic constraints that are peculiar to advertised reference price promotions: (1) the ambiguous target in advertised reference price promotion is the internal reference price, and (2) both the advertised reference price and the offer price prime information in memory. Regarding the first of these assumptions, although

advertised reference price investigations provide an advertised reference price and an offer price, neither of these prices are ambiguous. Instead, the ambiguous target is the internal reference price. The internal reference price is the construct that is sensitive to contextual information. Regarding the second assumption, an advertised reference price and offer price are not only prices, but they are also memory probes that increase the accessibility of information about a product priced at the advertised reference price as well as information about a product priced at the offer price.

The existence of two memory probes (i.e., dual primes) creates a diagnosticity problem for consumers: which information, the OP-primed information or the ARP-primed information, is more diagnostic to the construction of the internal reference price? The consumer should consider information primed by the offer price most diagnostic for constructing the internal reference price because it represents the current value of the product. Yet information primed by the advertised reference price is also potentially relevant because it represents a recent value as well as information that can be used to assess deal attractiveness. An approach to solving this diagnosticity problem is to assess, albeit not consciously, the extent to which the advertised reference price is representative of the product. This assessment can be made using the overlap in the information made accessible by each probe. As the offer price and advertised reference price prime more information in common, it becomes more likely that the advertised reference price is relevant to judgments about the product (i.e., it becomes more representative). Consequently, the nonoverlapping ARP-primed information (e.g., the advertised reference price itself, other information uniquely associated with the advertised reference price) should exert a stronger influence on the construction of the internal reference price.

Returning to figure 1, imagine a consumer sees a pair of blue jeans advertised as "regularly $119.99, sale price $39.99." The $119.99 advertised reference price will prime product-related information (attributes, benefits, usage situations) that is characteristic of jeans sold at this price point (e.g., denim, high-end buttons and zippers, comfortable, fashionable, snobbish, expensive, dress occasions A, C, and F), as well as the price itself ($119.99). Likewise, the $39.99 offer price will prime product-related information that is characteristic of jeans sold at this price point (e.g., denim, comfortable, faded, rugged, inexpensive, dress occasions A, C, and E) as well as the price itself ($39.99). The greater the overlap (see shaded region of fig. 1), the more (less) the nonoverlapping information associated with the $119.99 ($39.99) price point will influence the construction of the internal reference price.

> **H3**: As the overlap between product-related information primed by the advertised reference price and product-related information primed by the offer price increases, the influence of the advertised reference price on the internal reference price increases.

The "overlap" hypothesis differs from other strategies for facilitating assimilation. First, the overlap hypothesis is not an alignability hypothesis (Gentner and Markman 1997). As price information, the advertised reference price and offer price both align with the internal reference price judgment, regardless of overlap. Thus, overlap is orthogonal to issues concerning alignability. Second, the overlap hypothesis is not an information density hypothesis (Bless et al. 2000). To the extent information primed by the advertised reference price and offer price are stable quantities of information, more overlap between these two sets of information would mean that the nonoverlapping ARP-primed information is less dense, an outcome that would lead to less assimilation (i.e., the opposite prediction of the overlap hypothesis). Third, the overlap hypothesis is not a similarity hypothesis, at least not in the traditional sense (Mussweiler et al. 2004). The advertised reference price and offer price refer to the same product, not two different products, so a similarity judgment must be about the advertised reference price and offer price. Given that a test of an overlap hypothesis requires that the advertised reference price and offer price remain constant, the similarity hypothesis does not apply to a comparison of these prices.

Research Plan

The process illustrated in figure 1 (and articulated in hypothesis 3) highlights that it is the degree of overlap in information primed by the advertised reference price and the offer price that makes the nonoverlapping ARP-primed information more diagnostic to the construction of the internal reference price. We adopted two approaches to testing this hypothesis. First, we sought to identify product categories where an advertised reference price and offer price were naturally more or less likely to prime the same information (study 1). This strategy represents a "moderation-of-process" approach (Spencer, Zanna, and Fong 2005), in which the hypothesized mediator is not directly measured but instead is manipulated using levels of a moderator. Second, we sought to manipulate the extent to which the same information was primed by the advertised reference price and offer price. This strategy relied on manipulating the extent to which the advertised reference price and offer price increased the accessibility of the same information (studies 2 and 3). This strategy represents a "measurement-of-mediation" approach, wherein the hypothesized mediator is manipulated and measured. In all studies, the changes in internal reference price were anticipated to mediate the evaluation of the deal (see hypothesis 2).

EXPERIMENT 1: PILOT STUDY

In order to test hypothesis 3 (in conjunction with hypotheses 1 and 2), it was necessary to find product categories that (1) varied in the degree to which the set of product related associations at a given offer price and advertised reference price overlapped and (2) would be relevant to a student-subject population, such that sufficient product

knowledge would be accessible in memory. We hypothesized that product categories that exhibited (did not exhibit) discernible, tangible, and identifiable differences between product versions typically priced at the advertised reference price versus offer price would also exhibit less (more) overlap in advertised reference price and offer price associations. For example, cordless phones should have differing functionality based on price and thus should possess low overlap in advertised reference price and offer price associations. However, jeans, a wardrobe staple for students, provide similar functionality whether they are high or low priced and thus should possess high overlap in advertised reference price and offer price associations.

Our second screen for selecting categories was the level of the offer price and advertised reference price. The ratio of the advertised reference price to offer price had to be large enough to create variability in the overlap of information primed by the advertised reference price and offer price, but still be representative of promotions in the product category. Based on our review of the literature, the largest advertised reference price to offer price ratio was 2.86 (Urbany et al. 1988). Even at this "implausibly high" level, the advertised reference price was found to influence consumer price perceptions. Considering these factors, we selected 15 product categories (see table 1) and tested them at an offer price of $39.99 and an advertised reference price of $119.99 (i.e., an advertised reference price that exceeded the offer price by a factor of 3).

For each of the 15 product categories, we created a survey that had the following introduction:

> Imagine a (product name inserted here, e.g., "pair of jeans") that normally sells for $39.99. Think of all the features that you might expect (product name inserted here) at this price to have.
>
> Now, imagine a second (product name inserted here) that

TABLE 1

EXPERIMENT 1 PILOT STUDY: PRODUCT CATEGORY SELECTION RESULTS

Product category	Product knowledge mean	Associations overlap ($39.99 vs. $119.99)
Jeans	**4.77**	**5.92**
Men's tie	4.02	5.33
Sunglasses	**4.60**	**5.08**
Men's sports watch	2.85	5.08
Tennis racket	2.94	4.92
Frying pan	3.76	4.92
Hiking boots	3.23	4.75
Camping tent	3.75	4.67
Backpack	**4.71**	**4.42**
Cordless phone	**4.16**	**4.33**
Bookshelf	3.69	4.17
Coffee maker	4.23	4.07
Binoculars	3.60	3.92
Hockey jersey	3.85	3.75
Microwave oven	3.92	3.58

NOTE.—Boldface indicates product categories selected for main study of experiment 1.

sells for $119.99. Think of all the features that you might expect (product name inserted here) at this price to have.

After being prompted to consider these two product/price combinations, participants responded to a question designed to assess the extent to which the advertised reference price and offer price could prime the same information, "How many features would you expect the two (product category) to have in common?" anchored by "very few" and "very many." Next was a 7-point knowledge question: "Compared to other college students you know, how knowledgeable do you think you are about (product category)?" anchored by "less knowledgeable than others" and "more knowledgeable than others."

For ease of survey administration, we split the 15 products into three groups of five products so that each pretest participant responded to only five of the 15 product categories. Pretest participants ($n = 72$) were randomly assigned to one of the sets of five product categories. The results were used to identify the four product categories to be used in experiment 1; two that could be characterized as having low overlap in ARP- and OP-primed information and two that could be characterized as having high overlap in ARP- and OP-primed information. We also wanted to have categories for which the mean level of subject knowledge was high. Finally, to the extent possible, we strove to ensure that associated information overlap would not be confounded with other variables (e.g., the low overlap categories also being more or less technological than the high overlap categories).

Based on the results of this pilot study, we selected backpacks and cordless phones as the low overlap product categories, and sunglasses and jeans as the high overlap categories. As shown in table 1, the measure of overlap is among the highest for sunglasses and jeans, and much lower for backpacks and cordless phones. Further, product knowledge ranks first, second, third, and fifth highest for these four categories. Finally, the two product categories that operationalize the two product overlap conditions do not appear to be obviously confounded with some other salient product category classification with perhaps one exception; the high overlap items are more fashion related. However, there is always the possibility that some other unidentified influence is confounded with product category (e.g., price variability in the product category). This potential limitation is addressed in experiments 2 and 3.

EXPERIMENT 1

Method

Two hundred twenty-eight undergraduates from the University of Colorado–Boulder were randomly assigned to one of eight conditions in a 2 (advertised reference price presence: advertised reference price and offer price vs. offer price only) × 2 (type of product category: low vs. high overlap of ARP-/OP-primed information) between-subjects design with two product category replicates (low overlap: jeans, sunglasses; high overlap: backpack, cordless phone).

Experimental sessions were run in groups of 12–16, and participants were randomly assigned to one of the eight experimental conditions within the experimental session. Participants were told that the experimenters were working with a local retailer "who is interested in gathering information on how consumers perceive prices on products that they may discount in the future, depending on feedback gathered in this survey." The instructions stated that the brand would be referred to as "Brand ABC" and the retailer would be referred to as "Store X" in order to maintain anonymity. Participants were then instructed to turn to the next page where they saw an advertisement for one of the four products. Below the ad image, participants saw either "Regularly $119.99, Store X Sale Price $39.99" or "Store X Sale Price $39.99." In order to allow for variance in associations to the advertised reference price and offer price, no product descriptions were included in the advertisements.

After considering the price advertisement, participants turned to the next page and responded to a range of dependent variables. The first variable assessed average selling price perceptions and was used to operationalize the internal reference price (Grewal et al. 1998; Mazumdar, Raj, and Sinha 2005; Urbany et al. 1988). Specifically, participants in the advertised reference price condition saw the following:

> There are 16 different department and specialty stores in the Denver area that sell the (product category) identical to that shown on the previous page, one of which is Store X. The (product) is offered on sale at Store X for $39.99. According to Store X's advertisement, the regular selling price of brand ABC (product) is $119.99. Suppose you checked prices at the remaining 15 stores that sell this same (product). What would you assume to be the *average selling price* of the (product) at the 15 stores?

For participants in the offer price only condition, the third sentence in this internal reference price measure was deleted.

Then participants responded to a series of four 7-point scales designed to assess the value of the price offer ("I believe the [product] would be a good value at the advertised selling price of $39.99," anchored by "disagree" and "agree"), attitude toward the offer ("My attitude toward the advertised deal is," anchored by "unfavorable" and "favorable"), perceived quality ("The quality of this [product] is," anchored by "poor" and "excellent"), and purchase intentions ("If you were in the market to purchase a [product] in the price range of $40.00 [for yourself or as a gift], how likely would you be to purchase the advertised [product]," anchored by "very unlikely" and "very likely"; Lichtenstein et al. 1991). A principle components analysis showed that these four scales loaded on a single factor (eigenvalue = 2.46) explaining 62% of variance in the data. Thus, we combined the four items into an additive multi-item scale to operationalize evaluations of the deal ($\alpha = .79$).

Results

Prior to analyses, we removed data from 14 participants who responded to the internal reference price measure with

a value of less than \$1 or greater than the advertised reference price of \$119.99, resulting in an effective sample size of 214. An ANOVA indicated that within the high and low overlap product category conditions, the category replicate did not interact with the price manipulation for either of the dependent variables. Thus, in order to formally test hypotheses 1–3, we collapsed across the product category replicates to create high and low overlap conditions. Cell sizes, means, and standard deviations for both dependent variables across the eight experimental cells are shown in table 2.

Internal Reference Price. A two-way ANOVA revealed a significant interaction between overlap and the presence of the advertised reference price on internal reference prices ($F(1, 210) = 3.70$, $p = .056$; see fig. 2A) such that the difference in internal reference prices between the offer price only and ARP/OP conditions was greater for products with high overlap ($M_{OPonly} = 40.79$, $M_{ARP/OP} = 75.44$; $F(1, 210) = 119.46$, $p < .001$) than for products with low overlap ($M_{OP only} = 41.66$, $M_{ARP/OP} = 67.73$; $F(1, 210) = 68.84$, $p < .001$). In addition, the difference between the high and low overlap categories was significant in the ARP/OP condition ($F(1, 210) = 6.09$, $p = .014$) but not in the OP-only condition ($F(1, 210) = .07$, $p = .785$). This suggests that overlap influenced the assimilation of the internal reference price to the advertised reference price and not internal reference prices in general.

Deal Evaluation. A two-way ANOVA on deal evaluations also revealed a significant interaction between overlap and the presence of the advertised reference price ($F(1, 210) = 6.12$, $p = .014$; see fig. 2B) such that the difference in deal evaluations between the offer price only and ARP/OP conditions was greater for products with high overlap ($M_{OP only} = 16.38$, $M_{ARP/OP} = 21.33$; $F(1, 210) = 29.191$, $p < .001$) than for

products with low overlap ($M_{OP only} = 17.08$, $M_{ARP/OP} = 18.84$; $F(1, 210) = 3.76$, $p = .054$). In addition, the difference between the high and low overlap categories was significant in the ARP/OP condition ($F(1, 210) = 7.65$, $p = .006$) but not in the OP-only condition ($F(1, 210) = .56$, $p = .453$), suggesting that overlap only influenced deal evaluations when an advertised reference price was present and not more generally.

Mediation. Next, we tested for mediational evidence. The relationships predicted in hypotheses 1–3 jointly represent mediated moderation, as shown in figure 3. That is, the effect of the advertised reference price manipulation on evaluations of the deal is moderated by type of product category, and this moderation is mediated by the internal reference price. As such, we followed procedures consistent with Hayes (2013) and Preacher and Hayes (2008) for jointly testing these hypotheses. The advertised reference price presence × type of product category interaction positively influenced internal reference prices ($b = 8.59$, $t(210) = 1.92$, $p = .056$), which in turn positively influenced deal evaluations ($b = .10$, $t(209) = 5.07$, $p < .001$; see online app. B for the full set of regression results). The indirect effect of the presence of the advertised reference price × type of product category interaction on deal evaluations through internal reference price was 0.82 (95% CI: .058, 1.901). There was also a significant direct effect of the interaction on deal evaluations ($b = 2.37$, $t(209) = 1.92$, $p = .056$). We conclude that the moderation of the effect of advertised reference price on deal evaluations by type of product category is mediated by the internal reference price.

Alternative Hypothesis. It is possible that the low overlap and high overlap product categories varied in another respect. It may be that participants believed the price discount

TABLE 2

EXPERIMENT 1: DEPENDENT VARIABLE CELL SIZES, MEANS, AND STANDARD DEVIATIONS

Dependent variable	Product category	OP (\$39) only			ARP/OP (\$119/\$39)		
		N	Mean	SD	N	Mean	SD
Internal reference price:							
	Low overlap:						
	Phone	28	43.28	14.91	26	64.50	20.46
	Backpack	25	39.84	9.24	29	70.62	18.38
		53	41.66	12.56	55	67.73	19.46
	High overlap:						
	Jeans	26	42.69	8.97	27	75.52	17.06
	Sunglasses	26	38.88	12.28	27	75.37	22.88
		52	40.79	10.82	54	75.44	19.99
Deal evaluation:							
	Low overlap:						
	Phone	28	16.96	5.41	26	18.42	4.81
	Backpack	25	17.20	4.59	29	19.21	4.20
		53	17.08	4.99	55	18.84	4.48
	High overlap:						
	Jeans	26	17.77	4.27	27	21.78	3.19
	Sunglasses	26	15.00	5.71	27	20.89	4.95
		52	16.38	5.19	54	21.33	4.15

EXPERIMENT 1: THE EFFECT OF PRODUCT FEATURE OVERLAP BY THE PRESENCE OF THE
ADVERTISED REFERENCE PRICE ON INTERNAL REFERENCE PRICE (*A*) AND DEAL EVALUATION (*B*)
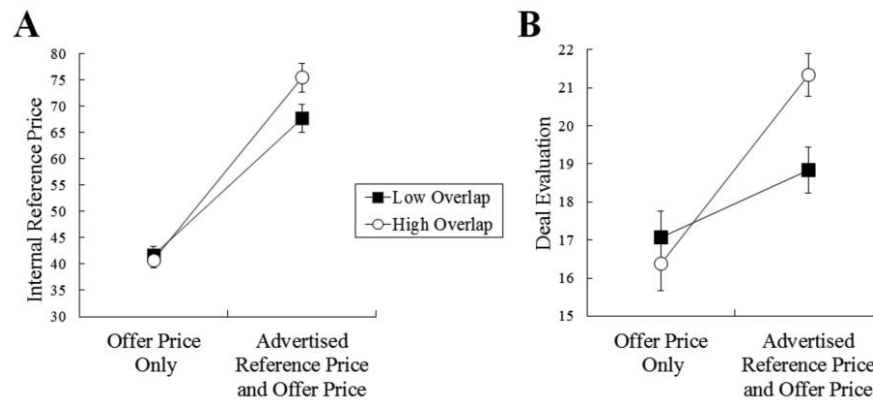
in the low overlap categories, but not the high overlap categories, implied different products. That is, consumers may be less prone to believe that the product offered at $39 is the same product that was previously offered at $119 when the product was backpacks or phones rather than sunglasses or jeans. If so, the high overlap product promotions would be better deals because they represented legitimate discounts (i.e., the discount referred to the same product).

To address this issue, 131 participants from Amazon Mechanical Turk (mTurk) were asked to assess the advertised reference price offers for each of the four products using a within-subject design, so as to maximize our ability to observe differences between categories. The order of products was rotated. Participants were shown each advertisement and asked to assess the extent to which they agreed with the following statement: "In this advertisement, both the sale price of $39.99 and the regular price of $119.99 refer to the same (product), that being the one shown in the photo," on a 7-point scale anchored by "strongly disagree" and "strongly agree." A repeated-measures ANOVA revealed that product replicate did not interact with overlap ($F(1, 130) = .26$, $p = .611$) and that there was no influence of product category on the degree to which people believed that the $39 and $119 price point referred to the same product ($M_{\text{low overlap}} = 5.90$, $M_{\text{high overlap}} = 5.87$; $F(1, 130) = .13$, $p = .721$).

Discussion

Experiment 1 provides evidence suggesting that the degree of influence an advertised reference price exerts on a consumer's response to an offer price is dependent on the degree of overlap in information primed by the advertised reference price and offer price. Consistent with our hypothesis, greater assimilation effects were found for product categories where the information overlap was greater. We note that evidence for the mediating role of the overlap in ARP-

and OP-primed information was provided without direct assessment of the mediator. Rather, we provided evidence of mediation using a "moderation of process" approach.

Spencer et al. (2005, 847) argue that moderation of process designs provide strong evidence of a psychological process if they meet two assumptions. First, there has to be evidence that the moderator does indeed affect the proposed psychological process. Second, the only way that the proposed moderating variable could exert its influence is through the unmeasured mediator. That is, there can be no alternative explanation for the observed moderation. Regarding the first criterion, the hypothesized moderation was obtained. Regarding the second criterion, consideration of several factors suggests that this criterion was also met. First, the product categories were specifically pretested and selected to have high versus low overlap in ARP- and OP-associated product information. Second, the ancillary analysis suggests the results were not a consequence of beliefs about whether the advertised reference price referred to the same product as the offer price. Third, while it is possible that some other variable was also manipulated by our product category operationalization (e.g., high overlap categories being more fashion-oriented and low overlap categories being more functional, high or low overlap categories having more/less price variability within the product categories), the nature of the experiment 1 interaction makes this rival account less likely. Specifically, there were no product category differences in the OP-only condition; product category differences existed only in the ARP/OP condition. Thus, any alternative explanation would have to be able to account for the interaction. That noted, the possibility that an unmeasured causal variable is correlated with product category cannot totally be ruled out and thus is addressed in experiments 2 and 3.
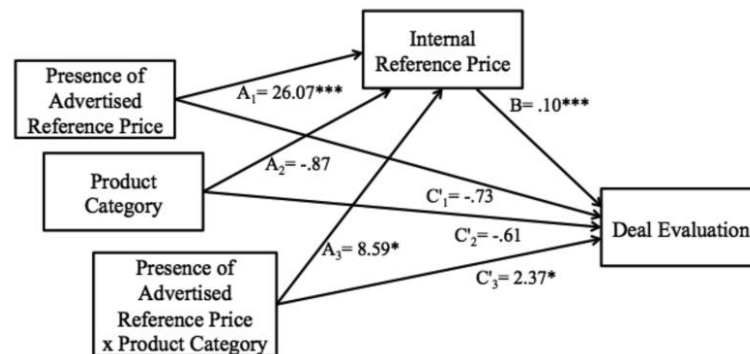
NOTE.—*$p < .10$; **$p < .05$; ***$p < .01$.

EXPERIMENT 2

In experiment 2 we wanted to rule out the possibility that a third variable, correlated with product category, was responsible for the effects found in experiment 1. Our approach to addressing this possibility was to use a single product category, while manipulating executional ad elements designed to encourage or discourage an overlap in information primed by the advertised reference price and offer price. Specifically, we encouraged people to adopt a similarity or dissimilarity mind-set, expecting that this would influence the overlap in ARP- and OP-primed information. A similarity (difference) mind-set should increase the accessibility of ARP- and OP-associated information that is common (unique) to the two price primes. In addition, we measured the amount of ARP/OP information overlap (our indicator of the overlap in primed information), so we could assess mediation using a "measurement of mediation" approach.

Method

One hundred twenty residents of the United States were recruited from mTurk and paid a small amount to participate in this experiment. The experiment was a simple two cell design where two versions of an advertised reference price advertisement were created to encourage either a similarity or difference mind-set. Males viewed an advertisement with a male model, while females viewed an advertisement with a female model. The gender of the model in the advertisement was matched to the gender of the participant to increase the relevance of the ad and involvement in the purchase scenario and thus was not of theoretical interest. The gender main effect and gender by mind-set interaction were not significant, so all reported analyses were conducted collapsing across gender.

On the first screen, participants read the same cover story as in experiment 1. The second screen showed the advertisement containing the manipulation (see app. A for the female similarity mind-set version and the male difference mind-set version of the advertisement). Principles of perceptual organization propose that people are more likely to perceive two objects as a single unit when they are proximally located, share a common region, and are similar in shape and color (Palmer and Rock 1994). Therefore, to promote a similarity mind-set, we designed an advertisement in which the advertised reference price and offer price were displayed in close proximity with a box around them and used the same font style and color. We further encouraged a similarity mind-set by placing the following slogan in the advertisement: "The same classic construction that you've always known. Because good things stay the same." To promote a difference mind-set, the advertised reference price was placed further away from the offer price (the advertised reference price was located above the photo while the offer price was located below the photo), there was no box around the two prices, and the two prices used different font colors and styles. We further encouraged a difference mind-set by placing the following slogan in the advertisement: "A uniquely different construction from what you've known in the past. Because being different is what our jeans are all about."

After viewing this advertisement, participants responded to the dependent variables of interest. First, they responded to the same average price operationalization of the internal reference price used in experiment 1. Participants next provided their evaluations of the deal. This was assessed using the value of the price offer and attitude toward the price offer items from experiment 1, and a new item assessing how long participants believed the sale would last ("Based on your best guess, how long do you think a retailer would offer a sale such as the one above?" anchored by "very

small amount of time" and "very large amount of time"). We included this measure because if participants believe a deal is particularly good, they should believe it is offered for a limited time. This measure is consistent with "time tests" many enforcement agencies (e.g., Massachusetts, Canada) use to assess if an advertised reference price promotional program is legal (Kaufman et al. 1994). That is, if the advertised reference price is offered beyond some specified period of time, it may be legally deceptive, hence not a good deal. These three items were combined to operationalize deal evaluations ($\alpha = .71$). (Recognizing that this operationalization of deal evaluation is partially different from that used in experiment 1, we demonstrate equivalency by employing both scales in experiment 3.)

Following this, we assessed the overlap in information primed by the advertised reference price and offer price. While viewing the "regularly $119.99, sale price $39.99" advertisement, participants were provided with a list of 15 product features and told "A typical $120 pair of jeans has the features listed below." From this list, they were then asked to check off the features of jeans available at the $39.99 offer price. We summed the number of checked features to create a measure of the overlap in information primed by the advertised reference price and offer price. Finally, to address the alternative possibility that the manipulation was influencing the dependent variables via credibility of the advertised reference price, participants were asked "How plausible is it that the jeans being offered for sale at $39.99 regularly sell for $119.99?" on a 7-point scale anchored by "not at all possible" and "very possible."

Results

Prior to analyses, we removed data from eight participants who indicated that they were familiar with or had taken a similar survey previously (we had conducted a similar survey for a study reported in a prior version of this article), four participants who spent less than five seconds on each webpage in the survey, one participant who spent more than 32 minutes (more than 10 SD from the mean) on the page assessing the internal reference price, and one participant who spent more than 16 minutes on the page assessing feature overlap (more than 10 SD from the mean). Thus, 106 participants were used in this analysis. Cell sizes, means, and standard deviations are reported in table 3.

Mediation. We proposed that a similarity mind-set manipulation would lead to more associated information overlap than a difference mind-set manipulation, and that this overlap would in turn influence average price perceptions (the internal reference price) and subsequently deal evaluations. The mediation model (see fig. 4) was tested using the PROCESS macro (model 6; Hayes 2013; Hayes and Preacher 2013). We coded the low overlap condition (difference mind-set) as zero and the high overlap condition (similarity mind-set) as one.

Participants who were exposed to the similarity mind-set perceived marginally more overlap than those who were

TABLE 3

EXPERIMENT 2: DEPENDENT VARIABLE CELL SIZES, MEANS, AND STANDARD DEVIATIONS

| Dependent variable	Difference mind-set			Similarity mind-set		
	N	Mean	SD	N	Mean	SD
Associations overlap	54	5.80	3.81	52	7.00	3.81
Internal reference price	54	60.57	18.16	52	72.94	22.99
Deal evaluation	54	14.28	3.74	52	15.44	3.82

exposed to the difference mind-set ($b = 1.20$, $t(104) = 1.75$, $p = .083$; see online app. C for the full set of regression results), those who perceived more overlap had higher internal reference prices ($b = 1.86$, $t(103) = 3.41$, $p < .001$), and those with higher internal reference prices had more positive evaluations of the deal ($b = .06$, $t(102) = 3.13$, $p = .002$). Although the total effect of mind-set on deal evaluations did not reach conventional levels of statistical significance ($b = 1.16$, $t(104) = 1.59$, $p = .116$), we nonetheless find support for our proposed mediational process (Hayes 2013; Taylor, MacKinnon, and Tein 2008; Zhao, Lynch, and Chen 2010). A bias-corrected bootstrap confidence interval (CI) for the indirect effect of mind-set on deal evaluations through overlap and then internal reference price based on 5,000 bootstrap samples was .12 (95% CI: .0057, .4488). There was no evidence that the similarity versus difference mind-set influenced deal evaluations independent of the effect of overlap and internal reference price ($b = .31$, $t(102) = .43$, $p = .665$). We conclude that relative to those in the difference (low overlap) condition, those in the similarity (high overlap) condition perceived more ARP- and OP-primed information overlap, which in turn encouraged a higher internal reference price. This increase in internal reference price translated into a more favorable deal evaluation.

Alternative Hypotheses. It is possible that the similarity ad and the difference ad also varied in other respects. First, it may be that the similarity ad and the difference ad differentially influenced people's perceptions of advertised reference price credibility. There is evidence that, ceteris paribus, advertised reference prices that are perceived to be more credible have more influence on internal reference prices and subsequent consumer responses (Della Bitta, Monroe, and McGinnis 1981; Lichtenstein and Bearden 1989; Lichtenstein et al. 1991; Monroe 1979; Urbany et al. 1988). It may be that the similarity ad increases advertised reference price credibility to a greater extent than the difference ad, and that the overlap measure either functions as a measure of advertised reference price credibility, or that advertised reference price credibility drives changes in the overlap.

To address this concern, we conducted ancillary analyses using the credibility measure from this study ("How plausible is it that the jeans being offered for sale at $39.99 regularly sell for $119.99?"). There was no influence of the mind-set manipulation on the perceived credibility of the advertised
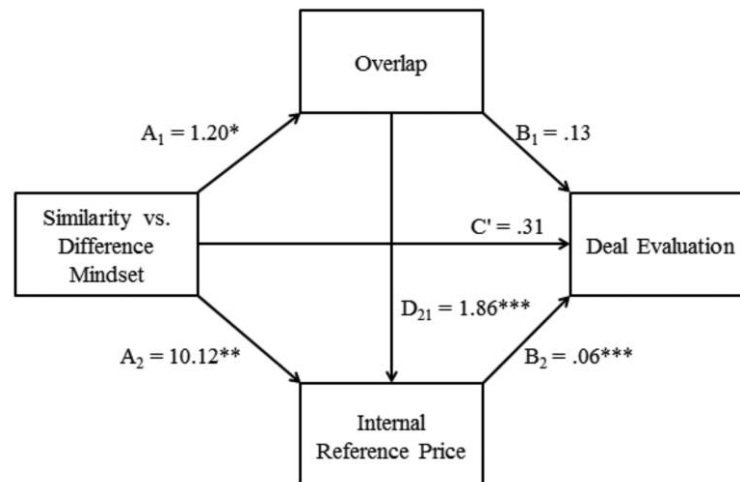
NOTE.—*$p < .10$; **$p < .05$; ***$p < .01$.

reference price claim ($M_{\text{difference}} = 3.20$, $M_{\text{similarity}} = 3.58$; ($F(1, 105) = 1.31$, $p = .255$). Further, when substituting this credibility measure for the overlap measure in the three-step mediational chain, we found that the indirect effect was not significant (indirect effect: .06, 95% CI: $-.0210$, .3128). This suggests that the overlap measure does not function as a measure of advertised reference price credibility. In addition, we found that advertised reference price credibility does not drive changes in overlap (mind-set → credibility → overlap → IRP → deal evaluation, indirect effect: .0079, 95% CI: $-.0022$, .0828). Finally, when controlling for advertised reference price credibility, the indirect effect of the mind-set on deal evaluations through overlap and then internal reference price remains significant (indirect effect: .0982, 95% CI: .0017, .3653). Thus, our results suggest that the proposed overlap construct does have process relevance above and beyond the credibility of the advertised reference price.

A second alternative explanation may be that participants were more prone to believe that the $39 and the $119 price point referred to the same product when viewing the similarity ad than when viewing the difference ad. To address this concern, we conducted a between-subjects post-test in which 121 mTurk participants viewed the similarity ad or the difference ad, and responded to the same question as in the experiment 1 post-test. Females (males) viewed the advertisement with the female (male) model. The gender by condition interaction was not significant ($F(1, 117) = .85$, $p = .358$), so we collapsed across gender. There was no effect of mind-set on the extent to which people believed that the $39 and the $119

price point referred to the same product ($M_{\text{difference}} = 6.25$, $M_{\text{similarity}} = 6.41$; $F(1, 119) = .64$, $p = .426$).

Discussion

The results of experiment 2 support our hypothesis that the advertised reference price exerts a stronger influence on the internal reference price when there is greater overlap in ARP- and OP-primed information, and that this increase in the internal reference price subsequently influences deal evaluations. The procedure manipulated a similarity versus difference mind-set using a constant product category, thereby reducing the possibility that a correlate of category differentiating dimensions was responsible for the results of experiment 1. The procedure also directly measured the overlap in ARP- and OP-primed information, so that the mediational properties of this construct could be confirmed. Thus, results of the first two experiments—the first using a moderation-of-process approach, the second using a measurement-of-mediation approach (Spencer et al. 2005)—provide convergent evidence that the degree of overlap in ARP- and OP-primed information mediates the degree to which internal reference prices are assimilated toward advertised reference prices.

Earlier, we claimed that the overlap in ARP- and OP-primed information is a construct that is conceptually unique to pricing research because advertised reference price promotions present a single product with dual price primes. We also claimed that this made the overlap in ARP- and OP-primed information different from more common concep-

tualizations of similarity. Although our evidence is consistent with this claim, the claim might seem odd given the mind-set manipulation used in experiment 2. Why does a similarity/dissimilarity mind-set manipulation influence the overlap in ARP- and OP-primed information but not the perceived similarity between this information? We argue that accessible information is not a distinct entity, like a category or exemplar. It is cognitively easier to assess the overlap of the information made accessible by the advertised reference price and offer price than to organize, categorize, and compare this information, as would be required to make a similarity judgment. Thus, even though a similarity judgment can be made about any two sets of information, being sensitive to the overlap in the information made accessible by the advertised reference price and offer price is a more efficient way of assessing the usefulness of the ARP-primed information for constructing the internal reference price.

One approach to providing additional support for our claims is to find a context in which an overlap-based process would make a different prediction than a similarity-based process. For instance, consider a situation in which two products are advertised by the same retailer (e.g., circular, webpage). The two products could be substitutes (e.g., two tables), complements (e.g., table, set of chairs), or unrelated (e.g., table, rug). On the one hand, an assessment of the similarity of these product pairs would show that substitutes are more similar than complements or unrelated items (Wisniewski and Bassok 1999). Assuming the relationship between the products can encourage different degrees of similarity processing, an advertised reference price ad for a focal product should be more effective when it is accompanied by an ad for a substitute product, as compared to an ad for a complement or unrelated product. On the other hand, substitutes and complements have been shown to encourage equivalent levels of relational elaboration (Malaviya 2007). Relational elaboration involves relating features of two entities, a conceptual equivalent to information overlap. Assuming the relationship between the products can encourage relational processing, an advertised reference price ad for a focal product should be most effective when it is accompanied by an ad for a substitute or complement product, as compared to an unrelated product.

EXPERIMENT 3

In experiment 3, we manipulated the relationship of a context product (substitute, complement, unrelated) to the focal product of evaluation. This was accomplished in a display that contained ads for two products, with each product having an advertised reference price and an offer price. The focal product was always a table. The context product accompanying the table was a substitute (another table), a complement (a set of chairs) or an unrelated product (a rug). A similarity-based process predicted an accompanying substitute product should most enhance the effectiveness of the advertised reference price promotion for the table, whereas an overlap-based process predicted an accompanying substitute or complement product should most enhance the effectiveness of the advertised reference price promotion for the table.

This experiment used a smaller discount than the previous experiments because there was a concern that participants might find the deep discounts, used in the first two studies, suspicious. Although the ancillary analyses in experiments 1 and 2 showed that participants could not articulate any concerns, these concerns may have been subconscious or difficult to articulate given our measures. Thus, the ARP/OP ratio was changed to 1.27/1 (regularly $699, sale $549), as compared to the 3/1 ratio (regularly $119.99, sale $39.99) used in the first two studies. That is, the discount was changed from implausible (experiments 1 and 2) to plausible (experiment 3; Krishna et al. 2002; Urbany et al. 1988).

Although not of theoretical interest, we felt it important to provide an advertised reference price for the contextual product so as to heighten the realism of the advertisement. Recognizing that any level of contextual product discount might influence the response to the advertised reference price for the focal product, an influence we did not want, we designed a control for this potential bias. We manipulated the discount level of the context product to be less (regularly $699, sale $659) or more (regularly $699, sale $299) than the focal product deal (regularly $699, sale $549). Our expectation was that discount level should not interact with the contextual product manipulation. If we were wrong, and the advertised reference price for the contextual product did exert an influence, we could capture the influence and control for it.

Method

Four hundred twenty-eight residents of the United States were recruited from mTurk and paid a small amount to participate in a 3 (relationship of the context product to the focal product: substitute, complement, unrelated) × 2 (discount level on context product: high [ARP/OP = $699/299], low [ARP /OP = $699/659]) online experiment. Participants were randomly assigned to condition.

At the outset of the survey participants were told that:

> We are working with a Denver area retailer who is interested in how consumers perceive products that are on sale. The retailer wishes to remain anonymous and for that reason the advertisement we are going to ask you to evaluate is very simple and contains no identifying clues about who the retailer might be. We have also substituted the name "Store X" for the actual name of the retailer.
>
> The advertisement shows two products that are on sale. One of the products is the "Santiago Dining Table." That is the product we are going to ask you about and the one we want you to focus on in responding to the questions that follow.
>
> Now please go to the next screen and view the advertisement for the Santiago Dining Table, then answer the questions that follow.

Participants then saw an advertisement for two products, both with an advertised reference price and offer price. The

EXPERIMENT 3: DEPENDENT VARIABLE CELL SIZES, MEANS, AND STANDARD DEVIATIONS

Dependent variable	Discount level	Unrelated			Substitute			Complement		
		N	Mean	SD	N	Mean	SD	N	Mean	SD
Associations overlap:										
	On sale $299	70	3.13	1.54	74	2.99	1.49	74	3.64	1.54
	On sale $659	69	2.94	1.25	75	3.48	1.47	66	3.53	1.54
		139	3.04	1.40	149	3.23	1.49	140	3.59	1.54
Internal reference price:										
	On sale $299	70	533.67	135.66	74	577.03	82.58	74	573.80	72.41
	On sale $659	69	589.30	75.83	75	601.35	72.50	66	606.85	49.27
		139	561.29	113.20	149	589.27	78.36	140	589.38	64.52
Deal evaluation:										
	On sale $299	70	3.57	1.77	74	3.60	1.54	74	3.86	1.42
	On sale $659	69	3.38	1.49	75	4.13	1.67	66	3.91	1.46
		139	3.47	1.64	149	3.87	1.62	140	3.89	1.44

focal product, a dining table with an ARP/OP of $699/$549 was shown at the bottom of the advertisement. This was constant across all conditions. At the top of the advertisement, the context product—a dining table (substitute), chair set (complement), and rug (unrelated)—varied across conditions as did the advertised reference price and offer price for the context product. (See online app. D for the chair set [complement] version of the context product manipulation for the high discount condition.) In the high discount condition, the context product was offered at "regularly $699, sale $299," whereas in the low discount condition the advertised reference price and offer price were $699 and $659. Thus, the discounts across the high and low levels of the context product were much higher or lower than the discount offered on the focal product.

After viewing the advertisement, respondents advanced to the next screen. With both the context and focal products and associated ARPs/OPs still on the screen, participants provided an internal reference price estimate modified to fit the cover story in experiment 3:

> There are three different stores in the Denver area that sell the Santiago Dining Table identical to that shown above, one of which is Store X. As you can see, the table is offered on sale at Store X for $549.00. According to Store X's advertisement, the regular selling price of the Santiago table is $699.00. Suppose you checked prices at the remaining two stores that sell the same Santiago table, knowing that each of these stores can set its own price for the table. What would you assume to be the average selling price of the Santiago table at those two stores? The average price of the Santiago table would be: . . .

Participants also responded to measures of ARP- and OP-primed information overlap and evaluations of the deal. Again, both products remained on the screen while these measures were taken. Regarding overlap, participants responded to the following: "Select the image you feel best represents the similarity in thoughts that come to mind when thinking about the Santiago Table that is being offered for sale at $549.00 and a dinner table that would typically sell

for $699.00." The 7-point scale was a modified version of an item developed to measure the overlap in perceptions of one's self and a target organization (Bergami and Bagozzi 2000). The seven scale positions were accompanied by two circles that were far apart on one end (and labeled as "far apart") and by two circles that were totally on top of each other at the other end (and labeled as "complete overlap"). The five intermediate scale positions showed circles that increasingly overlapped to a greater degree, as in a Venn diagram, with each scale position individually labeled (e.g., "close together but separate," "small overlap," "large overlap"). Participants chose the set of two circles that indicated their perceived overlap in ARP- and OP-primed information.

Given the differing operationalizations of deal evaluations across experiments 1 and 2, in experiment 3 we sought to provide evidence that results would be robust across both operationalizations. Therefore, we assessed the five items used to form the two operationalizations in experiments 1 and 2 (i.e., the four scale items used in experiment 1, and the additional sale length scale item in experiment 2 that was combined with two of the four items from experiment 1). As results were invariant across the experiment 1 and experiment 2 operationalizations, we only report results relevant to the same four-item operationalization used in experiment 1. We provide results for the experiment 2 operationalization in online appendix E.

Results

Initial Analysis. Cell sizes, means, and standard deviations are provided in table 4. ANOVAs revealed no interactions between the discount level of the contextual product and the relationship of the contextual product to the focal product for overlap ($F(2, 422) = 2.31$, $p = .101$), internal reference price ($F(2, 422) = 1.27$, $p = .282$), and deal evaluation ($F(2, 422) = 1.99$, $p = .138$). Therefore, we collapsed across discount level for further analyses.

The similarity-process and overlap-process hypotheses suggested competing planned contrast tests for the relationship of the contextual product to the focal product variable.

The similarity-process planned contrast, comparing the substitute condition to the other two conditions (i.e., substitute = 1, complement = −.5, unrelated = −.5), was not significant for the associations overlap ($M_{substitute}$ = 3.23, $M_{complement}$ = 3.59, $M_{unrelated}$ = 3.04; $F(1, 426)$ = .26, p = .612), internal reference price ($M_{substitute}$ = 589.27, $M_{complement}$ = 589.38, $M_{unrelated}$ = 561.29; $F(1, 426)$ = 2.41, p = .121) or deal evaluation ($M_{substitute}$ = 3.87, $M_{complement}$ = 3.89, $M_{unrelated}$ = 3.47; $F(1, 426)$ = 1.39, p = .240) measures. The overlap process planned contrast, comparing the substitute and complement conditions to the unrelated condition (i.e., substitute = .5, complement = .5, unrelated = −1), was significant for the associations overlap ($M_{substitute}$ = 3.23, $M_{complement}$ = 3.59, $M_{unrelated}$ = 3.04; $F(1, 426)$ = 5.81, p = .016), internal reference price ($M_{substitute}$ = 589.27, $M_{complement}$ = 589.38, $M_{unrelated}$ = 561.29; $F(1, 426)$ = 9.65, p = .002), and deal evaluation ($M_{substitute}$ = 3.87, $M_{complement}$ = 3.89, $M_{unrelated}$ = 3.47; $F(1, 426)$ = 6.19, p = .013) measures. Thus, we find support for the overlap-process hypothesis and not for the similarity-process hypothesis.

Mediation. The overlap process proposes that the influence of context product relatedness (related vs. unrelated) on deal evaluations should be mediated by a sequential process of ARP- and OP-primed information overlap and the updating of the focal product internal reference price. The mediation model (see fig. 5) was tested using the PROCESS macro (model 6; Hayes 2013; Hayes and Preacher 2013). We coded the low overlap condition (unrelated) as zero and the high overlap condition (substitute, complement) as one.

First, participants who were exposed to a related context product perceived more overlap than those who were ex-posed to the unrelated context product (b = .37, $t(426)$ = 2.41, p = .016; see online app. F for the full set of regression results). Second, participants who perceived more overlap had higher internal reference prices (b = 6.63, $t(425)$ = 2.33, p = .020). Third, participants with higher internal reference prices had more positive evaluations of the deal (b = .01, $t(424)$ = 7.62, p < .001). The total effect of the relatedness of the contextual product on deal evaluations was significant (b = .40, $t(426)$ = 2.49, p = .013). A bias-corrected, 5,000 sample bootstrap confidence interval for the indirect effect of relatedness on deal evaluations through overlap and then internal reference price was .014 (95% CI: .0015, .0383). There was no evidence that the relatedness of the context product influenced deal evaluations independent of the effect of overlap and internal reference price (b = .10, $t(424)$ = .68, p = .499). We conclude that, relative to those in the unrelated context product condition, those in the related context product condition perceived more overlap, which in turn was associated with a higher internal reference price. This increase in the internal reference price translated into a more positive deal evaluation.

GENERAL DISCUSSION

The effectiveness of advertised reference prices has been the focus of much pricing research over the past 35 years (see meta-analysis by Krishna et al. 2002). Within this time frame, researchers have adopted a three construct process model (e.g., ARP → assimilation of IRP → deal evaluation) and focused their efforts on identifying moderators of the process. This approach has provided some useful insights.

FIGURE 5

EXPERIMENT 3: MEDIATION MODEL
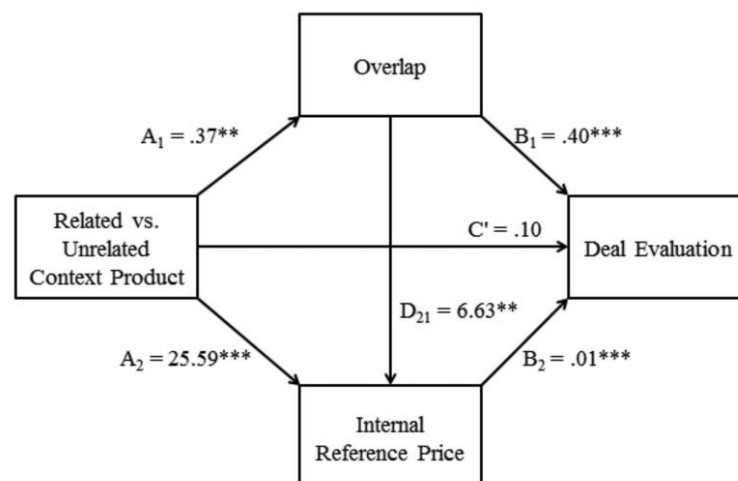
NOTE.—*p < .10; **p < .05; ***p < .01.

For example, semantic cues (Lichtenstein et al. 1991), the history of promotion in a market (Lichtenstein and Bearden 1989), and consumer skepticism (Urbany et al. 1988) have been shown to moderate the advertised reference price's influence on the internal reference price and thus deal evaluations. Importantly, insight into these moderators was a direct consequence of understanding the mediating properties of the internal reference price. Following this logic, the identification of the overlap in ARP- and OP-primed information as a mediator should increase the chances of discovering other yet-to-be-identified moderators.

Three studies support the claim that the overlap in ARP- and OP-primed information mediates the influence of the advertised reference price on deal perception. Specifically, the evidence supports an ARP → overlap in ARP- and OP-primed information → assimilation of IRP → deal evaluations process model. The evidence comes from three studies of very different natures; the first provides a demonstration of "moderation-of-process" and the latter two demonstrate "measurement of mediation" (Spencer et al. 2005). Further, the second two studies used different operationalizations to manipulate primed information overlap, so as to increase confidence about the nature of the underlying process. Study 2 showed that advertised reference prices are more effective when consumers are prompted to adopt a similarity mind-set, as opposed to a difference mind-set. Study 3 showed that advertised reference prices are more effective when contextual products (e.g., complements, substitutes) encourage relational elaboration.

Implications for Theory

Although assimilation-contrast theory is the most cited theory for explaining the influence of advertised reference price promotions, there is a limited understanding of the process mechanisms that determine the effectiveness of the promotional tactic. Standard assimilation processes, such as availability (selective accessibility model), categorization (inclusion/exclusion model), or relative distance (see Herr 1989; Herr et al. 1983) cannot be easily adapted to understand the effectiveness of advertised reference price promotions. The effectiveness of an advertised reference price promotion depends on the weight given to the advertised reference price consistent information. This weight, or emphasis, depends on the overlap in ARP- and OP-primed information for a *single* product (in the present research), as opposed to multiple products or entities (in the assimilation-contrast literature). In effect, this research provides insight into how information associated with the advertised reference price becomes diagnostic. The nonoverlapping ARP-primed information became more diagnostic for the construction of the internal reference price when there was an overlap in the ARP- and OP-primed information. This insight only emerged because the advertised reference price promotional paradigm does not "fit" a standard assimilation paradigm, but reliably produces assimilation-like effects. Explaining these effects required a more nuanced understanding of the process.

If an overlap process can influence the effectiveness of an advertised reference price promotional strategy, one might wonder (1) why the process has not previously been documented and (2) in what other contexts the process might be operating. We expect that the process has not been documented because pricing is a unique context. In most assimilation research, there is a single contextual cue that serves as an interpretive frame (encouraging assimilation) or an endpoint anchor (encouraging contrast) when making judgments about an ambiguous target stimulus. In these studies, assimilation and contrast are a result of two different processes (i.e., interpretation leads to assimilation, comparison lead to contrast). In pricing research, multiple contextual cues contribute to the construction of a comparison standard (e.g., internal reference price). The integration of the information primed by these cues determines the level of the standard. Thus, the initial process is not an interpretation or comparative judgment, but information integration. It is only after information integration produces the internal reference price that a comparison process is used (e.g., the offer price is compared to the internal reference price).

We anticipate that an overlap process may be relevant in other contexts where standards are constructed. Examples of constructed standards include normative behavior (e.g., Araya and Ekehammar 2009), self-concepts (Wheeler, DeMarree, and Petty 2007), adaptation levels (Monroe 1979, 1990), present-state referents (Tversky and Kahneman 1991), and labile single-peaked preferences (Cooke et al. 2004). Each of these domains relies on judgments made relative to a midpoint standard. Primed information can move this midpoint standard up or down, hence influencing the evaluation of a target that is compared to this standard (i.e., creating assimilation or contrast). Processes like this would seem particularly relevant because self-concept and adaptation level models inform investigations into many substantive topics, including self-esteem, motivation, preference formation, satisfaction/dissatisfaction, happiness, and consumption experience. Although none of these literatures refer to an overlap process, they do investigate how one or more pieces of information contribute to the construction of a referent that in turn influences judgments about a target.

Implications for Practice

While generalizing from lab studies to field settings is often a risky endeavor, to the extent our findings do generalize, the implications appear fairly direct. Experiment 1 results suggest that marketers would be well advised to consider the product categories for which they use advertised reference prices. Using advertised reference prices indiscriminately may lessen their credibility, whereas restricting their use to a subset of products, those that generate higher levels of overlap in ARP- and OP-primed information may result in higher levels of consumer responsiveness. Also, the similarity-difference mind-set manipulation in experiment 2 suggests some interesting possibilities. For instance, to the extent marketers can employ tactics to put consumers in a "similarity" mind-set, their advertised reference prices

may be more effective. On the other side of the coin, our results provide evidence that the common marketer practice of differentiating an advertised reference price product with ad slogans that focus on the word "difference," may in fact be having an adverse effect on consumer responses relative to wording that primes a similarity mind-set. Finally, while it is common for marketers to simultaneously promote multiple products, the relationship between promoted products, to our knowledge, has not been extensively investigated (Malaviya 2007; Shocker, Bayus, and Kim 2004). Our results suggest that promoting complement or substitute products in addition to the focal product may encourage higher levels of overlap in ARP- and OP-primed information, leading to a more favorable perception of the deal. However, because the present research was not conducted in a field setting, it is premature to draw firm conclusions regarding the external validity of our findings.

Public Policy Implications

The results are relevant to establishing criteria for a legal finding of advertised reference price deception. In legal proceedings, a common issue is the evidence needed to reliably establish that a retailer has engaged in deceptive advertised reference price behavior. Arguments frequently center on the legal applicability of some "per se" rule, or alternatively, a "rule of reason." Per se rules impose an absolute threshold that retailers must meet to be considered nondeceptive in their advertised reference price practices. For example, Kaufmann et al. (1994) note that Massachusetts enacted advertised reference price regulations in 1990 stipulating that an advertised reference price is legitimate if at least 30% of the sales occurred at that price (i.e., a volume standard) or if the advertised reference price was the selling price for at least 15 days prior to the reduction of price to the offer price and that the item was not "on sale" for more than 45% of a 180-day period (i.e., a time standard). Several other states and countries (e.g., Canada) have similar volume and time tests for per se rules. While these rules establish guidelines for legal behavior, they may not align in the most isomorphic forms of consumer deception. Such "one size fits all" per se rules are insensitive to how advertised reference prices exert a different influence across different product categories (experiment 1) or contextual factors (experiments 2 and 3). Consequently, findings from the present study would support the adoption of a "rule of reason" approach to support a legal finding of deception. Such an approach would require a focus on retailer operations and behavior, consumer perceptions, industry characteristics, characteristics of the product in question, and contextual factors surrounding the pricing behavior in order to make an informed finding regarding consumer deception (Kaufmann et al. 1994). While this approach lacks efficiency from an enforcement perspective, the present results suggest that it may align better with issues related to consumer perception and deception.

DATA COLLECTION INFORMATION

The second and third authors supervised the collection of data for the first study (main study and pilot study) by research assistants at the University of Colorado at Boulder in the autumn of 2009. The first and second authors jointly analyzed these data. The first, second, and fourth authors jointly managed the collection of data for studies 2 and 3 from mTurk in the spring of 2013, and jointly analyzed these data. The first, second, and fourth authors jointly managed the collection of data for the post-tests of studies 1 and 2 from mTurk in the summer of 2013 and jointly analyzed these data.

APPENDIX A

Big Sale at Store X!

Brand ABC Jeans

Always go with the best fit; people notice!

Regularly: $119.99
Sale Price: $39.99

The same classic construction that you've always known. Because good things stay the same.

Big Sale at Store X!

Brand ABC Jeans

Always go with the best fit; people notice!

Regularly: $119.99

Sale Price: $39.99

A uniquely different construction from what you've known in the past. Because being different is what our jeans are all about.

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