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Assimilation of advertised reference prices: the moderating role of involvement☆

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Abstract

This study examines the hypothesis that the level of involvement influences the assimilation of advertised reference prices (ARPs) into consumers' existing internal reference prices (IRPs). In addition, it investigates the nature of the relationship between the change in IRP and the perceived discrepancy between the ARP and IRP. Results from two different product categories are consistent with assimilation-contrast theory and reveal a nonlinear relationship between the change in IRP and the perceived ARP–IRP discrepancy. In addition, the results are consistent with involvement theory and with prior research on how involvement influences the extent to which consumers elaborate on and are persuaded by advertised information. Specifically, highly involved consumers assimilate a smaller portion of the ARP into their existing IRPs. Implications for research and practice are highlighted.

Keywords: Advertised reference price; Internal reference price; Involvement; Assimilation

Introduction

The use of comparison prices by retailers to enhance the perceived value of an offer is commonplace. A recent content analysis of over 700 sale announcements of six major national retailers over the Labor Day weekend in 2001, for example, revealed that 72% of the ads contained an advertised reference price (ARP; Chandrashekaran, Viswanathan, & Monroe, 2002).[2] One reason for the popularity of this technique is that the provision of such a point of comparison offers consumers an external anchor upon which to base their internal reference prices and, consequentially, their decision to buy.

Several studies of ARP have found that they are influential in enhancing consumers' evaluations of offers and raising consumers' internal reference prices (see review by Grewal, Monroe, & Krishnan, 1998). However, only a few have closely examined the process consumers use to assimilate information from these external cues into their internal reference prices. For example, Puto (1987) showed that industrial buyers update their internal references in light of new information by measuring both initial and final reference prices. Lichtenstein, Burton, and Karson (1991) shed light on the effects of exaggerated reference prices and two types of semantic cues on consumers' cognitive and evaluative responses. Finally, Urbany, Bearden, and Weilbaker (1988) explained how advertisers' claims affected consumers' price perceptions and used this to propose a framework for studying how plausible and exaggerated ARPs affect consumers' evaluations.

While these studies provide an important background, they do not provide insight on the extent of change that occurs in consumers' internal reference prices because of exposure to advertised regular prices. The literature suggests that the assimilation process may be nonlinear (Lichtenstein et al., 1991). However, no studies have explicitly examined the extent to which consumers change their internal references based on observed discrepancies between their own IRPs and an advertised regular price.

Understanding the nature of the assimilation process has implications for designing pricing (i.e., level of regular price) and price promotions (i.e., depth of discount and appropriate point of comparison). Exaggerated regular prices have the

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[2] Although retailers can use several types of ARPs, for example, list prices, competitors' prices, and so forth, they most commonly use the price of the item before it went on sale. Therefore, this study examines the role of one specific type of ARP, that is, advertised *regular* price.

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potential to enhance consumers' current evaluations (Urbany et al., 1988). However, associated increases in sales may come at the expense of future sales. Another way in which future sales may be hurt is by consumers' skepticism and ultimate rejection of the advertiser's regular price claim that is likely to lower consumers' IRPs for future purchases (i.e., a curvilinear response pattern). Consequently, future prices and promotional activity are likely to be evaluated less positively against lowered reference prices. Clearly, it is crucial to select appropriate levels of advertised reference prices such that they contribute positively to offer evaluations and, at the same time, do not erode consumers' IRPs.

Retailers must also be aware of factors that make consumers' more likely to assimilate a portion of the difference between the ARP and their initial reference prices (IRP_1) to form a revised (new) internal reference price (IRP_2), which is then used to evaluate future sale prices more positively. Prior research has not explored the role that any personal factors, such as involvement play, in determining the influence of advertised reference prices on consumers' IRP. If shoppers differ in the extent to which they scrutinize and assimilate advertised reference prices, different communications may be necessary across market segments to obtain the desired cognitive and behavioral results.

The primary objectives of this study are to investigate two basic issues. First, we investigate the nature of the assimilation process. Specifically, we assess the relationship between assimilation (change in IRP) and the perceived discrepancy between ARP and IRP. Second, we investigate how involvement influences the assimilation process and whether the observed effects are consistent with existing theory and previous research findings.

Review of relevant literature

Extant research suggests that consumers respond positively to advertised comparison prices used in conjunction with temporary price reductions (Grewal et al., 1998). Comparison prices provide consumers with external anchors against which to evaluate current and future prices (Compeau & Grewal, 1998). If consumers pay attention to, and assimilate a significant portion of the advertised reference price, they may subsequently evaluate the current and future prices against higher IRPs, thereby enhancing the effectiveness of future retailer sales.

However, if advertised regular prices are to be effective in raising consumers' IRPs, retailers must understand how consumers' perceive and process information related to advertised, regular prices. As discussed earlier, if consumers encounter and reject an exaggerated regular price and/or encounter a lower sale price frequently, they may reject the regular price all together and assimilate a portion of the lower sale price into their internal reference prices *for the next purchase period* (Lattin & Bucklin, 1989; Monroe & Petroshious, 1981; Winer, 1986). If this happens, then both the regular nonsale price and future sales prices will be evaluated less positively against the new and lower internal reference price.

Extant research shows that consumers respond positively to the difference between the offered sale price and advertised comparison prices (Blair & Landon, 1981; Della Bitta, Monroe, & McGinnis, 1981; Grewal et al., 1998; Liefeld & Heslop, 1985) even if the savings are exaggerated (Urbany et al., 1988) or ambiguous (Mobley, Bearden, & Teel, 1988). These, and similar studies, further suggest that the potential for deception is reduced because consumers generally discount some of the claim and subsequently respond to a discounted, rather than the original claim (Liefeld & Heslop, 1985). Such skepticism of advertised reference prices may protect consumers from false or exaggerated comparisons. The extent to which consumers discount the advertised claim (ARP) may depend on the extent to which they believe the ARP, that is, the extent to which they believe that the ARP is a reasonable substitute for their IRPs (Urbany et al., 1988). But, this remains to be investigated as well.

Hypotheses

Evidence of the ability of comparison prices to mold and alter consumers' internal reference prices may be found in Blair and Landon (1981) who found that ARPs have a positive influence on consumer estimates of normal price. Lichtenstein et al. (1991) also found that ARPs have a positive influence on consumer estimates of fair, normal, lowest and highest prices. Urbany et al. (1988) note that an important factor that influences the assimilation of information from external prices is the difference between the perceived ARP and the initial IRP is significant. Consistent with the conclusions drawn from prior research, we define assimilation as *the change in consumers' IRPs as a function of the difference between the perceived (or discounted) ARP claim and their initial IRP*.

Nature of the assimilation process

While some studies have found linear effects of ARPs on consumers' IRPs, Lichtenstein et al. (1991) discovered that consumer responses to advertised reference prices are consistent with the implications of assimilation-contrast theory. The authors demonstrate that at relatively low levels of external reference price, consumers initially assimilate much of the information. However, if ARPs rise above the initial IRP, consumers begin to view the external price with increased skepticism, which impedes assimilation. These findings imply a nonlinear relationship between the extent of change in consumers' IRPs and the difference between the perceived discounted ARP and their initial IRP. In other words, as an

ARP increases relative to the initial IRP, the extent of the difference absorbed into subsequent IRPs diminishes.

Although Lichtenstein et al. (1991) investigated consumers' final *responses*, that research did not measure the extent to which consumers *changed* their IRPs due to ARP information. Therefore, although the authors offer some conceptual support for a nonlinear relationship, direct evidence demonstrating a nonlinear.

Formally, we propose the following:

H1. The change in consumers' IRPs bears a nonlinear relationship to the difference between the perceived advertised regular price and the initial IRP.

Role of involvement

Consistent with prior research, we define involvement as the *degree of personal relevance, interest and/or subjective feeling of importance of the product category or purchase decision* (Petty, Cacioppo, & Schumann, 1983; Zaichkowsky, 1985). A large number of studies have consistently demonstrated that level of involvement influences the type and extent of information processing (Bloch & Richins, 1983; Cacioppo & Petty, 1979; Celsi & Olson, 1988; Chaiken & Maheswaran, 1994; Mantel & Kardes, 1999; Meyers-Levy & Peracchio, 1996; Petty et al., 1983; Richins & Bloch, 1986; Richins, Bloch, & McQuarrie, 1992).

From this background, we draw conclusions of relevance to this study about how involvement influences consumers' information-processing strategies.

- Individuals with high levels of involvement are motivated to process available information more fully and diligently, whereas the less involved are likely to use simple heuristics (Meyers-Levy & Peracchio, 1996).
- Unmotivated consumers are less likely to engage in significant elaboration. In addition, they generate more positive thoughts (support arguments). The involved are likely to engage in more elaboration and counter-arguments (Petty et al., 1983).
- Involved consumers value the product more, engage in more product-related activities and possess better knowledge of product attributes and prices (Bloch & Richins, 1983; Richins & Bloch, 1986).

Researchers have generally applied the concepts of involvement and elaboration likelihood to consumers' processing of product attribute information (e.g., see Mantel & Kardes, 1999; Petty et al., 1983). However, similar arguments can be made in the context of comparative price advertising, where the ARP is intended to serve as an external anchor for consumers on which to base their internal reference prices. When used in conjunction with the *sale price*, the advertised regular price suggests the amount of money the consumer can save by buying the item at the store now as opposed to later. Therefore, the advertised regular price puts the sale price in context and offers consumers the opportunity to elaborate on additional information.

In this context, consumers must assess whether, and to what extent, the externally supplied reference price is accurate. As discussed above, a consistent finding in the literature is that skepticism increases with elaboration likelihood. Therefore, highly involved individuals are likely to be more skeptical of advertised price claims and are more likely to discount the ARP than those who are less involved. In addition, because high-involvement consumers are more knowledgeable about products and their prices (Bloch & Richins, 1983), they possess the ability to assess the veracity of the ARP. Conceptually, since different consumers (high vs. low involvement) are likely to discount the regular price to different extents, they are likely to differ in their perceptions of advertised regular prices. In turn, consumers use these perceived prices (discounted advertised regular prices, or simply DARP) to evaluate the offer. In this way, consumers (consciously or nonconsciously) protect themselves from being deceived (e.g., see Liefeld & Heslop, 1985).

Involvement and assimilation of advertised regular prices

Available empirical evidence is consistent with assimilation-contrast theory and supports a nonlinear response curve (Lichtenstein et al., 1991). However, the theory implicitly assumes that individuals deliberately scrutinize and evaluate the veracity of an advocated position to make a conscious decision about whether to accept or reject the message. In this context, assimilation-contrast theory describes a typical high-involvement response pattern. Accordingly, we expect that the pattern described by assimilation-contrast theory is likely to be more obvious under high involvement.

As much of the evidence suggests (Grewal et al., 1998), we also expect ARPs to influence uninvolved consumers. However, based on the theory and the robust findings that support it, these consumers are not likely to scrutinize the information thoroughly (Celsi & Olson, 1988; Mantel & Kardes, 1999; Meyers-Levy & Peracchio, 1996; Richins & Bloch, 1986). Rather, they are more likely to use simple heuristics (Meyers-Levy & Peracchio, 1996). Consequently, assimilation (change in IRP) under low-involvement conditions is less likely to be influenced solely by scrutiny of the magnitude of perceived discounted ARP–IRP discrepancy per se. Rather, these consumers are likely to depend on additional heuristics (e.g., the mere presence of a regular price and other semantic and contextual cues), which could induce a change in the IRP, regardless of the magnitude and extremity of the perceived discrepancy.[3]

[3] The present study is primarily interested in investigating the strength of the association between assimilation and the perceived discrepancy. Therefore, it does not explicitly test the mere exposure effect (interested readers are referred to Grewal et al., 1998).

This conjecture is also consistent with prior research (McGinnies, 1973) demonstrating that, especially under low-involvement conditions, a persuasive communication induces a change in mean overall attitude, regardless of the extremity of the claim. In the comparative price-advertising context, while we can expect the magnitude of the perceived discrepancy to play a role in both involvement groups, the influence is likely to be more pronounced in the high-involvement group.

The role of involvement can also be explained in the context of ELM (Petty et al., 1983), which proposes that the two groups of consumers (high and low involvement) use and process different aspects of a message. In the context of comparative price advertising, we may expect that, given an ARP, high- and low-involvement consumers process different aspects of the information. High-involvement consumers are likely to scrutinize the information and process central aspects of the message (extent to which the ARP differs from IRP). In contrast, low-involvement consumers are likely to process the same information less thoroughly and to rely on peripheral aspects of the message (e.g., the mere presence of an ARP and other contextual and semantic cues). For example, under low-involvement conditions, apart from of the size of the discrepancy, the mere presence of an ARP may be processed in a nonconscious way and used as a peripheral cue to alter the IRP.

Consequently, the nonlinear discrepancy model is likely to be *more* descriptive of assimilation in a high-involvement segment than in a low-involvement segment.

H2. A nonlinear assimilation function explains a greater proportion of the variation in assimilation when consumers are highly involved as opposed to when they are not involved.

As argued earlier, we anticipate that low-involvement individuals are more accepting of advertised regular prices and, consequently, assimilate a greater proportion of the advertised regular price.[4] As Alba, Broniarczyk, Shimp, and Urbany (1994, p. 219) note, "The tactics used to influence price perceptions are likely to be most effective when consumers are unmotivated or unable to make precise and comprehensive price comparisons." Prior research has also demonstrated that low-involvement consumers are less confident of their own IRPs (Biswas & Blair, 1991; Biswas & Sherrell, 1991). Consequently, they are likely to be more accepting of larger discrepancies between the advertised regular price and their IRPs.

[4] Biswas and Blair (1991) and Biswas and Sherrell (1991) support that highly involved consumers are likely to be more confident of their price estimates than those who lack knowledge and involvement with the product. In addition, Mazumdar and Monroe (1992, p. 67) indicate that consumers who are less confident in their price estimates are likely to be more susceptible to seller-supplied reference prices than are buyers confident of their price estimates.

Data collection

A total of 342 graduate business students provided data for the empirical part of this study. Two product categories, alkaline batteries ($N = 129$) and cameras ($N = 213$), were selected. These were chosen because students are familiar with these goods, likely to purchase them for personal use, and have been used in previous pricing research (e.g., Grewal et al., 1998 used a camera as one of their products). We collected data in two stages.

Stage 1

At the first meeting, subjects viewed a picture of one of the chosen products (either an 8-pack of Duracell AA batteries or a fully automatic Olympus 105 mm zoom camera). They were then asked to provide information about their perceptions of the relevant product category (alkaline batteries or automatic camera) and the advertised brand (Duracell or Olympus) to gauge their involvement with the product category and with the advertised brand. In addition, they provided information on their internal reference prices for the advertised brand.

Involvement

Involvement, the perceived importance of, and level of interest in a product category was measured using four-scale items corresponding to: (i) subjects' overall interest in the product category, (ii) the perceived importance/relevance of the product, (iii) subjects' overall interest in the advertised brand, and (iv) strength of preference for the advertised brand.[5] We measured each items with a 7-point scale. The scale proved reliable with an alpha of .80 and variance extracted of .63 for the *battery* pack and .88 and .61, respectively, for the camera. We calculated the involvement score for each subject as the sum of the four-scale items. Based on a median split of the distribution of involvement scores, we created low- and high-involvement groups for each category.

Initial internal reference price, IRP_1

Previous research (Lichtenstein et al., 1991) emphasized the need to measure internal reference price on multiple dimensions. In addition, available evidence (Briesch, Krishnamurthi, Mazumdar, & Raj, 1997; Rajendran & Tellis, 1994) suggests that consumers are likely to form and utilize *brand-specific* reference prices. Therefore, subjects were asked to indicate their internal reference prices for the relevant advertised brand on four commonly-used measures corresponding to: Lowest Observed Price, Maximum Price Willing to Pay, Fair Price, and Normal/Average Market

[5] Although there are other scales to measure consumers' involvement, for example, the 20-item scale developed by Zaichkowsky (1985), a four-item measure was used. This decision was made primarily to maintain students' attention on the task.

Price. For similar measures, see Lichtenstein et al. (1991) and Grewal et al. (1998).

The mean of these measures provide our estimate of a subject's initial reference price. The scale was again reliable with an alpha of .88 and variance extracted of .74 for the batteries and .92 and .83 for the camera.

Stage 2

About three to five days after the initial data collection session, we met with the subjects again and gave them a second questionnaire booklet containing a mock retail advertisement announcing a sale for the brand they had previously seen. The advertisement contained the same picture and brand description as the subjects had seen earlier. In addition, the advertisement contained a sale price, the regular price and information (amount off the regular price).

The mock advertisement was created from actual newspaper advertisements for the brands, and the sale prices corresponded to the actual sale prices for the brands at the time of the data collection ($4.99 for the Duracell battery pack, and $199.99 for the Olympus camera). However, the advertised regular price was modified for the purposes of this study. For each product, subjects saw one of two levels of the ARP (either $5.49 or $6.29 for the Duracell battery pack; and either $249.99 or $289.99 for the Olympus camera). Consistent with retail advertisements in this category, each price cue was associated with an appropriate descriptor, "Regularly Sold At" and "Now Only." These price levels were chosen to reflect savings of approximately 10 and 20% for the battery, and 20 and 30% for the camera. After studying the advertisement contained in the booklet, subjects evaluated the offer and answered a set of questions pertaining to their current reference prices.

Perceived credibility of the advertised regular price

Subjects indicated their perceptions of the advertised regular price on a single 7-point scale ranging from 1 = "very unlikely" to 7 = "very likely." Responses to this item were normalized [(score − scale minimum)/scale range] to compute a subjective likelihood (varying between 0 and 1) that the advertised *regular* price represents a reasonable and accurate estimate of the price for the item when the store is not offering a sale.

Discounted regular price and perceived discrepancy scores

Extant literature suggests that consumers are not misled by advertised reference prices because they view such claims with skepticism and discount a portion of the ARP (Liefeld & Heslop, 1985). Thus, a discounted ARP was computed for each subject by multiplying the ARP shown in the advertisement by the subjective belief that the advertised ARP is the price of the item when it is not on sale (i.e., ARP multiplied by the perceived credibility of the ARP). Similar weighting schemes of attribute scores based on subjective confidence/belief are also used when estimating consumers' overall attitudes using compensatory, multi-attribute models of preference formation and change (Bass & Talarzyk, 1972; Lutz & Bettman, 1977).

We derived perceived discrepancy scores, DIFF, by subtracting each subject's IRP from the corresponding, discounted advertised regular price. For each product, the data included both positive and negative discrepancy scores (approximately 65% of 129 observations for the battery and nearly 42% of 213 observations for the camera consisted of negative DIFF values, i.e., DARP < IRP).

Assimilation of advertised regular price into internal reference price, IRP_2

Lastly, we asked subjects to provide estimates again for the four measures for internal reference price, lowest observed price, normal price, maximum price, and fair price. We averaged these to create the consumer's final IRP, IRP_2. We measured assimilation of the regular price into IRP as the change in the internal reference price, that is, difference between IRP_2 and IRP_1.

Table 1
Regression results[a]

	Low involvement						High involvement					
	Unstandardized coefficients			Standardized coefficients		R^2	Unstandardized coefficients			Standardized coefficients		R^2
	Constant	DIFF	$DIFF^2$	DIFF	$DIFF^2$		Constant	DIFF	$DIFF^2$	DIFF	$DIFF^2$	
Batteries ($N = 115$)	($N = 63$)						($N = 52$)					
Linear model	1.01**	0.36***	–	0.51	–	.26	0.89**	0.09**	–	0.36	–	.13
Quadratic model	1.14**	0.21*	−0.08*	0.30	−0.31	.31	1.35**	0.09**	−0.07**	0.35	−0.64	.54
Camera ($N = 213$)	($N = 108$)						($N = 105$)					
Linear model	36.31**	0.03	–	0.05	–	.003	17.32**	0.17	–	0.45	–	.21
Quadratic model	43.90**	0.11	−0.001*	0.20	−0.28	.060	27.65**	0.11**	−0.001**	0.27	−0.40	.33

[a] Dependent variable = change in IRP = $IRP_2 - IRP_1$.
* $p = .01$.
** $p = .05$.
*** $p = .10$.

Analysis and results

Based on the total number of usable surveys, the final analysis was based on $N_{\text{camera}} = 213$ and $N_{\text{battery}} = 115$. To investigate whether the effect of the perceived ARP–IRP discrepancy on assimilation ($\text{IRP}_2 - \text{IRP}_1$) varies according to the level of involvement, we regressed the effects of the discrepancy between the discounted ARP and the IRP on assimilation for the low- and high-involvement groups.

Assimilation of advertised regular price

To test the linear versus nonlinear measures of assimilation across high- and low-involvement groups in each

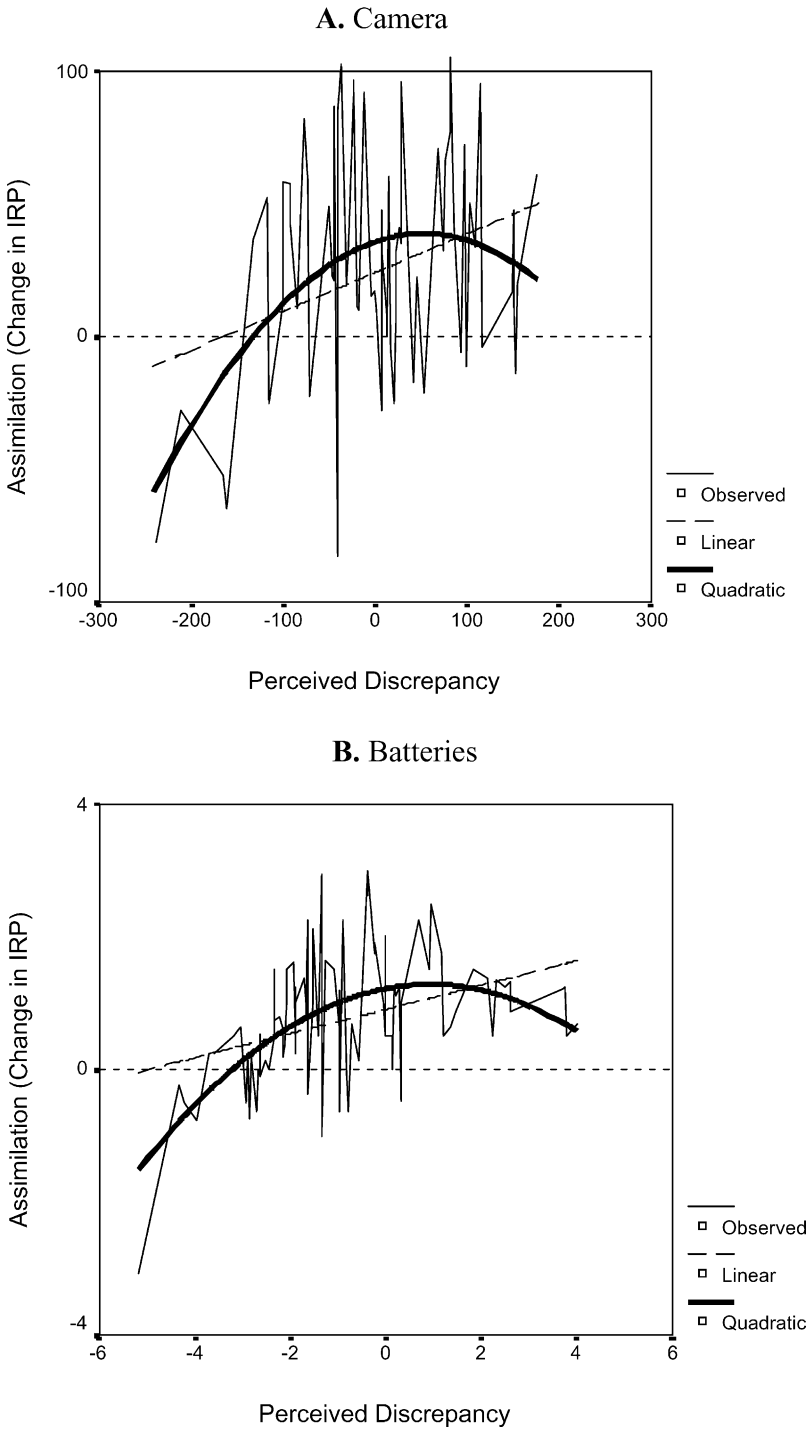

Fig. 1. Estimated assimilation response function.

product category, we contrasted a model incorporating only linear effects against a model containing both linear and nonlinear effects (Table 1). More specifically, we added a quadratic term ($DIFF^2$) to create the nonlinearity and expect a negative coefficient for this measure.[6]

The results from Table 1 support the superiority of the nonlinear model in explaining the change in consumers' IRPs. In all four groups, an improvement in overall model fit (R^2), relative to the change in the degrees of freedom, is obtained by the addition of $DIFF^2$. We computed F-statistics in each group defined by the nested model test (Lehman, Gupta, & Steckel, 1998, pp. 537–538) that show $F(1, 111) = 8.04$ in the low-involvement group and 98.94 in the high-involvement group for the battery, and $F(1, 209) = 12.67$ in the low-involvement group and 36.35 in the high-involvement group for the camera. All values are statistically significant at the .05 level, demonstrating the nonlinear model to be significantly superior to the linear model. As an example, Fig. 1 depicts how the estimated linear and quadratic curves fit the overall data in observed range for the two products.

Checking across all models for multicollinearity, we found the largest VIF indicator to be 1.87, which indicates a low likelihood of undue influence by multicollinearity on any of the parameter estimates is low.[7] Finally, all of the effects in Table 1 are of the expected signs. Specifically both the positive effect for DIFF and the negative effect of $DIFF^2$ are consistent with the hypothesized nonlinear relationship. Therefore, H1 is supported.

Moderating role of involvement

An evaluation of the role of involvement entails testing whether a segmented model describes the impact of the perceived ARP–IRP_1 discrepancy on assimilation better than a more restricted (pooled) model. Our hypothesis (H2) predicts that the effects of DIFF and $DIFF^2$ will differ across involvement groups. If a pooled model is as good as a segmented model, we will accept the null hypothesis that involvement plays no role in the assimilation process.

To assess this, we estimated F-statistics as outlined in the Chow test for both product categories. A comparison of the pooled and segmented models in the two categories yielded $F(3, 112) = 4.0$ for batteries, and $F(3, 207) = 8.8$ for the camera. Both values are larger than the respective tabled, critical values at the .05 level.[8]

Based on these tests, we reject the null hypothesis that the models in the high- and low-involvement groups are equivalent in favor of the alternative hypothesis that the models are significantly different. Therefore, the results support our premise that the models in the two groups (high and low involvement) are structurally different and that involvement influences the assimilation of advertised regular prices.

In the previous section, we established that a nonlinear response curve explains a greater proportion of the variation in assimilation than a linear response function. In addition, we demonstrated that a nonlinear model explains the data better than a pooled model in both categories. Comparing the variances in both products, we find the quadratic curve to explain a higher proportion in the two high-involvement groups ($R^2_{\text{batteries}} = .54$ and $F_{\text{model}} = 28.8$, $p < .001$ in the high-involvement group vs. .31 and 13.6, $p < .001$ in the low-involvement group, and $R^2_{\text{camera}} = .33$ and $F_{\text{model}} = 25.3$, $p < .001$ in the high-involvement group vs. .06 and 3.11, $p < .05$ in the low-involvement group).

An inspection of the relative magnitudes of the linear and quadratic trends (i.e., the standardized parameter estimates) within each group further reveals that the linear and quadratic trends in the two low-involvement groups are comparable, whereas we see a more pronounced quadratic term in the two high-involvement groups. In light of our finding, that assimilation in the two involvement groups is significantly different; these results are consistent with H2.

Discussion

We designed this study to test the premise that when consumers are exposed to advertised regular prices, they evaluate whether, and by how much, to update their internal standards by assimilating a portion of the difference between the perceived regular price and their own IRPs. Previous studies have examined how the size of the claimed savings (i.e., the difference between the comparison price and sale price) affects consumers' evaluations of and final responses to such comparison prices. This study differs fundamentally from previous research by explicitly measuring the change in consumers' IRPs based on the discrepancy between their initial beliefs and the advertised comparison price. In addition, it sheds further light on the nature of the assimilation process by describing how involvement may influence the extent of assimilation and the range of discrepancy values over which positive assimilation occurs.

The results are consistent with assimilation-contrast theory and suggest the presence of a nonlinear assimilation process. That is, credible ARPs are instrumental in raising consumers IRPs, but only up to a point. Beyond this point, the ARP is contrasted. Similar results were obtained in two different product categories.

Consistent with a large body of evidence that offers robust support for the role of involvement in consumer information processing, this study demonstrates that the level of

[6] The presence of negative DIFF values, that is, DARP < IRP, prohibits the investigation of a logarithmic response curve. In addition, prior research (Lichtenstein et al., 1991) suggests that the response curve is likely to quadratic (inverted u shaped).

[7] A maximum VIF in excess of 10 is usually considered an indication of severe multicollinearity (Neter, Wasserman, & Kutner 1985, p. 392).

[8] These statistics are based on the residual sum of squares for the pooled and segmented quadratic models ($RSS_{\text{pooled}} = 70.00$, $RSS_{\text{lowinv}} = 54.27$ and $RSS_{\text{highinv}} = 8.93$ for batteries, and $RSS_{\text{pooled}} = 338{,}438$, $RSS_{\text{lowinv}} = 182{,}091$ and $RSS_{\text{highinv}} = 118{,}130$) for the camera.

involvement helps to determine consumers' perceptions of ARPs and the resulting assimilation (change in IRPs). The results are consistent with ELM—under high-involvement conditions, consumers appear to scrutinize relevant aspects of the information and process it more fully. In contrast, low-involvement consumers appear to process different aspects of the same information. The results are also consistent with the notion that assimilation-contrast theory better describes cognitive responses under high levels of involvement.

Prior research on consumer skepticism of advertised comparison prices has concluded that, generally, consumers discount a certain proportion of the ARP and, consequently, are not misled by advertisers' regular price claims. However, this study suggests that certain sub-populations (market segments) may be more susceptible to the influences of comparison prices that others. In particular, consumers who are less involved are more likely to be gullible to the use of inappropriate advertised reference prices.

Implications

From a retailer's perspective, it is crucial to adopt an optimal price-communication strategy to enhance consumers' assimilation of advertised comparison prices and subsequent evaluations of sale prices against (higher) internal reference prices. The quadratic response curves discovered in this study indicate that retailers must have adequate knowledge of the range of consumers' internal reference prices in the high- and low-involvement segments. This information will assist them in designing pricing and price-communication strategies. More specifically, because the maximum assimilation in each segment is likely to occur at different discrepancy levels (as was the case with batteries), retailers must be careful when choosing comparison price levels (relative to the IRPs of consumers).

One strategy is to use different types of comparison prices in each segment. For example, in the low-involvement group, retailers may use manufacturer suggested retail prices, which are typically higher than other forms of comparison prices, for example, competitor's price, that may be used to communicate with more involved consumers. Such a segmented price-communication strategy might be effective because highly involved consumers are more likely to be aware of competing prices.

Of course, the success of such segmented pricing strategies depends on the ability to identify demographic and other variables linked to involvement. Such information, along with purchase habits will enable marketers to profile and target specific consumers with appropriate price-related communications. Marketers may be able to get valuable information from data supplied by customers (or consumer panels) during various stages of the purchase process, for example, questionnaires filled out when customers request product/price information, satisfaction surveys, information provided on warranty applications, and so forth. Such information may profile shoppers according to several demographic- and purchase-related variables.

As Iyer, Miyazaki, Grewal, and Giordano (2002) elucidate, the growth of the Internet as a shopping medium has made it easier to acquire crucial information about consumers and their shopping habits. The authors discuss several ways in which data may be gathered (e.g., cookies, registrations, opt-in mailings) and analyzed (e.g., collaborative filtering techniques) so that firms can identify, design and track customized promotions for specific segments. For example, such information enables airlines such as Southwest and e-tailers such as Amazon to target current and potential customers with customized promotions based on purchase history and/or sensitivity to previous promotional offers.

Limitations and avenues for future research

Further investigation of this topic may proceed in a number of directions. For example, variables not included in this study can be incorporated. Liefeld and Heslop (1985) found that, compared to females, males are generally more skeptical of advertised discounts and seriously underestimate actual market prices. However, the present study did not address the effects of gender on assimilation of advertised reference prices. Depending on the product, gender could also influence a consumer's level of involvement and their overall knowledge of products and their prices.

This study included only one type of comparison, that is, sale price to regular price. There are many other comparison prices and semantic cues that influence consumers' perceptions and evaluations which have not been considered, for example, manufacturer suggested prices and competitors' prices (Grewal, Marmorstein, & Sharma, 1996; Lichtenstein et al., 1991, see also review by Compeau & Grewal, 1998). Future research may usefully determine whether similar findings appear with other types of comparisons and semantic cues.

Similarly, the effect of competitive pricing and price-communication strategies on consumers' internal reference prices and evaluations remains to be considered. Prices of competing brands have been shown to influence brand evaluations, especially at the point of purchase (Rajendran & Tellis, 1994). Future research needs to investigate whether and how competitors' pricing strategies influence the change in consumers' IRPs.

It will be interesting to compare our results with the process by which consumers lower their IRPs in light of ARP information that is lower than their current IRPs. Urbany et al. (1988) provide some initial evidence that, when initial expectations are above the ARP, consumers' final expectations of the average market price may be lower than their initial IRPs (see footnote in Urbany et al., 1988, p. 337). While the results reported here correspond to the discrep-

ancy between the *discounted* ARP and IRP, they do show that consumers will lower their IRPs in response to perceived ARPs that are lower than their IRPs (Fig. 1a and b).

Although involvement is expected to play a role in the assimilation of positive versus negative discrepancies, constraints due to sample sizes precluded such investigation. Future research can design experiments to specifically examine these issues. Such analysis may also shed some light on the effects of price increases versus decreases on consumers' reference prices and subsequent evaluations. It may also be used to understand the long-term effects (if any) of temporary price reductions. For example, how does a price reduction in a particular time period affect reference prices and evaluations in subsequent time periods (when the price has gone back to the regular nonsale level)?

This study also raises questions from a public policy perspective. Specifically, what types of consumers (market segments) are more susceptible to the influences of advertised reference prices, and is there the possibility of deception? The initial results suggest that low-involvement consumers may be more gullible than involved consumers. Future research can verify our results in other settings and investigate whether similar results are obtained. If so, there may be a need for greater vigilance to prevent retailers from being able to deceive certain sub-populations by using exaggerated claims (Compeau & Grewal, 1998; Grewal & Compeau, 1992).

Finally, Grewal et al. (1996) demonstrated that situational factors could make consumers more (or less) involved, for example, whether exposure to price information occurs inside a store versus at home. In this study, we did not manipulate the situational dimension of involvement. It would be useful to see if similar findings obtain when the experimenter manipulates involvement as opposed to measuring it.

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