A Range Theory Account of Price Perception

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It is well accepted in the behavioral pricing literature that a consumer’s perception of the attractiveness of a market price depends on a comparison of the market price to an internal reference price. The rationale underlying this dynamic has its roots in Adaptation-Level Theory. However, consistent with Range Theory, we postulate that a consumer’s assessment of the attractiveness of a market price may also depend on a comparison of the market price to the endpoints of the evoked price range. Four experiments provide evidence that variance in the width of the evoked price range affects price-attractiveness judgments in the absence of any variance in the internal reference price. Of theoretical importance, findings from the present article suggest that pricing theory is in need of augmentation in order to account for this effect. Of managerial relevance, these findings suggest that changes in context can bring about changes in the evoked price range and perceptions of the attractiveness of a market price.

I

t is generally accepted that consumers compare a market price to an internal reference price when judging the attractiveness of the market price. For example, Thaler (1985, p. 205) states, “The measure of transaction utility depends on the price an individual pays compared to some reference price.” Kalyanaram and Winer (1995, p. 161) observe that “there is a significant body of literature to support the notion that individuals make judgments and choices based on the comparison of observed phenomena to an internal reference price.” More explicitly, Winer (1988, p. 35) explains, “defining p₀ to be the observed retail price and pᵣ to be the individual’s internal reference price, the underlying assumption of this (behavioral pricing) literature is that positive values of (p₀ – pᵣ) are perceived negatively, . . . while negative values of (p₀ – pᵣ) are viewed positively.”

The assumption that price judgments rely on a comparison of a market price to an internal reference price can be traced to Helson’s Adaptation-Level Theory (1964), a theory of sensory perception that proposes sensory judgments rely on a comparison of current sensation to the adaptation level of recent sensory experiences. Integrating Adaptation-Level Theory into behavioral pricing theory, the internal reference price has been hypothesized to be an adaptation level that depends on recent price experiences (Greenleaf 1995; Kalwani and Yim 1992; Kalwani et al. 1990; Kalyanaram and Winer 1995; Putler 1992; Urbany, Bearden, and Weilbaker 1988; Winer 1986). For example, the internal reference price has been estimated as the most recent price paid, the weighted mean of the logarithms of past prices, and as an exponential smoothing of past prices (cf. Briesch et al. 1997; Kalyanaram and Winer 1995). Considerable effort has been devoted to understanding the stability of the internal reference price and the factors that can alter it (Kalyanaram and Winer 1995; Lichtenstein, Burton, and Karson 1991; Mazumdar and Jun 1992; Urbany et al. 1988).

Adaptation-level theory represents only one view of how people make sensory judgments. Another account of how people make sensory judgments is Range Theory (Volkman 1951), a theory of sensory perception that proposes the range of the values of the stimuli to be judged determines the perceived value of any one stimulus in the range. Applied to behavioral pricing issues, Range Theory suggests that people use the range of remembered price experiences to set a lower and upper bound of price expectations, and that the attractiveness of a market price is a function of its relative location within this range.

Although the range account of scale judgments has received little attention in the pricing literature, there is considerable evidence that the range of stimulus values can influence judgments. For example, Sherif and Hovland begin their book on Assimilation-Contrast Theory...
with a review of the first 40 years of research on judgment scales and conclude that “it is the end values of the series that ordinarily acquire an anchoring function” (Sherif and Hovland 1961, p. 33). Likewise, Nunnally’s graduate text on psychometric theory states, “Subjects tend to anchor their responses in terms of (1) stimuli of the same kind they have experienced in the past and (2) the range of stimuli in the set presented” (Nunnally 1978, p. 45). And Ostrom and Upshaw conclude, “Frame of reference effects, whether they derive from context, residual, or focal stimuli (cf. Helson 1964), operate by affecting the extremity of perspective end anchors. Thus, perspective end anchors are seen as controlling the major properties of the judgment reference scale which the individual adopts in the rating of his attitude” (Ostrom and Upshaw 1968, p. 221).

The objective of this article is to consider the hypothesis that the range of prices a consumer evokes when evaluating a market price can have an independent influence on a judgment about the attractiveness of the market price. Across four studies, the range of evoked prices is manipulated while holding the internal reference price constant. It will be shown that when the upper bound of the range of evoked prices is increased, perceptions of the market price become more favorable. Similarly, when the lower bound of the range of evoked prices is decreased, perceptions of a market price become less favorable. It will be concluded that current pricing theory needs to be updated in order to consider the influence of the range of evoked prices as well as the internal reference price.

**THEORETICAL BACKGROUND**

Internal Reference Price and Price Perception

The prevailing view in the pricing literature is that subjective price judgments rely on a comparison of market prices to a single, internal price standard (Kalyanaram and Winer 1995; Thaler 1985). The reference price is hypothesized to be the norm that serves as a neutral point for comparison, such that prices below it are evaluated as low (relatively inexpensive) and prices above it are evaluated as high (relatively expensive; Kalyanaram and Winer 1995; Monroe 1990; Thaler 1985; Winer 1988).

Behavioral pricing theorists have relied on Helson’s (1964) Adaptation-Level Theory to support the concept of an internal reference price (Kalyanaram and Little 1994, p. 409; Kalyanaram and Winer 1995, p. 162; Monroe 1990). Kalyanaram and Winer (1995) offer a representative explanation of the relationship between Adaptation-Level Theory and the internal reference price construct: “Adaptation-Level Theory is based on the assumption that stimuli are judged with respect to internal norms representing the pooled effects of present and past stimulation. Therefore, all judgments are relative to the prevailing adaptation level. . . . According to Adaptation-Level Theory, the past and present context of experience defines an adaptation level, or reference point, relative to which new stimuli are perceived and compared” (p. 162).

Using the adaptation level as a theoretical foundation for the internal reference price is probably more a metaphor than a description of the underlying process. It must be recognized that Adaptation-Level Theory was proposed to account for visual system adaptation to light and darkness; sensory system adaptation to weight and pain; auditory system adaptation to volume, and so forth (Helson 1964). The theory predicts the change in stimulation required for a person to perceive a change (the just noticeable difference) in the environment is a direct function of the adaptation level (the weighted logarithmic mean of prior sensory experiences). Strictly speaking, price perception is not a physiological response to the sensory stimulation of nerves and receptors. Nonetheless, the adaptation-level metaphor is interesting because it proposes an indifference point and/or region in any scale of judgment. In pricing theory, this indifference point is the internal reference price. Adaptation-Level Theory also proposes an indifference region around the adaptation level, a concept analogous to the region of price insensitivity that some have labeled the latitude of price acceptance (Emory 1970; Kalyanaram and Little 1994; Monroe 1971; Sawyer and Dickson 1984).

Range Theories of Stimulus Judgments

The successful application of Adaptation-Level Theory to issues of price perception suggests that other theories of sensory perception may provide insight into the processes responsible for variability in judgments of price attractiveness. The dual-standard models are a class of models that may be able to explain additional variability in perceptions of the attractiveness of a price. Volkmann summarizes the basic assumption of the dual-standard models by contrasting them to the single-standard model: “It is primarily the end-stimuli that control the oscillations of the absolute scale. The center of the stimulus-range has no special functional significance whatever. It is merely a convenient numerical value: the mean of the two end-stimuli” (1951, p. 283). Psychometric texts continue to present this dual-standard view as a fundamental assumption of how people make scale judgments (e.g., Nunnally 1978).

In addition to concerns about how to anchor a judgment scale, there are also theories about how the density distribution of stimuli used to establish the judgment scale influences the mapping of psychological scale values to stimulus values. Range Theory (Volkmann 1951) postulates a linear relationship between the stimulus range and the psychological scale. For example, Range Theory predicts a 50-gram weight should be judged as heavy when the range of stimuli being judged is from 20 grams to 60 grams, moderately heavy when the range is from 30 grams to 70 grams, and light when the range is from 40 grams to 80 grams (see Volkmann [1951], Sherif and Hovland [1961], and Mellers and Cooke [1994] for reviews of
range effects on scale judgments). Similarly, Range Theory has been shown to be a viable explanation of contrast effects. As shown by Sherif, Taub, and Hovland (1958), adding a heavier weight (e.g., 100 grams) to a set of 30-gram to 70-gram weights will make the 30–70-gram weights seem lighter, a classic contrast effect.

If the endpoints of the range of stimulus values are used as anchors for judgment scales, then one might wonder how the range of stimuli is generated, especially in a judgment context that is not stimulus-based. Norm theory (Kahneman and Miller 1986) proposes that each stimulus generates its own frame of reference by evoking items from memory. Kahneman and Miller hypothesize that each time a person is asked to judge a stimulus (e.g., product X at price Y), s/he selectively evokes a set of stored representations that serve as a frame of reference. These representations are generated in parallel and form a distribution with a mean, mode, and range for each attribute that is relevant (e.g., price, product features). The stimulus is judged within the context of these distributions.

Price-Attractiveness Judgments

The predominance of the Adaptation-Level Theory perspective in the pricing literature can be attributed to three commonalities of price experiences. First, many repeated price experiences have little to no price variability (Sawyer and Dickson 1984). Second, people are often able to recall prices by context, hence they can choose a specific reference price for a specific price judgment (Thaler 1985). Third, in the event a person does evoke a range of prices, the level of the internal reference price and the level of the range of evoked prices is likely to be highly correlated (Lichtenstein and Bearden 1989; Lichtenstein, Bloch, and Black 1988). Thus, Adaptation-Level Theory and the concept of an internal reference price provide an adequate account of how price-attractiveness judgments are made in a variety of situations.

If Range Theory is to be seen as an important addition to pricing theory, it must be shown that the evoked range of prices has an impact on price perception that is independent of the internal reference price. For example, if the range of prices available at the time of judgment can influence perceptions of price attractiveness, then variability in this range that is not accompanied by variability in the internal reference price should result in changes in price perception. Figure 1 illustrates how one might manipulate the range of prices, but not the internal reference price (see Lynch, Chakravarti, and Mitra [1991] for a more detailed discussion of judgment scales). Panel 1 shows a situation in which consumers are exposed to prices that range from $.75 to $1.75 (first scale in panel 1). Encountering a market price of $1.25 (denoted by an “X” in all three scales), the consumer assigns the lower bound (LB in Fig. 1) of the range of prices (e.g., $.75) to be the upper anchor (UA in Fig. 1) of the perceptual scale (second scale in panel 1), the upper bound (UB in Fig. 1) of the range of prices (e.g., $1.75) to be the lower anchor (LA in Fig. 1) of the perceptual scale, and then does a linear mapping of the range of prices to the scale points. In this case, a price of $1.25 would be perceived as neutral, hence, rated as such (third scale in panel 1).

Panel 2 shows a situation in which consumers are asked to evaluate a price of $1.25 in the context of a distribution of prices ranging from $1.00 to $1.75. The consumer assigns the lower bound of the range of prices (e.g., $1.00) to the upper anchor of the perceptual scale, the upper bound of the range of prices (e.g., $1.75) to the lower anchor of the perceptual scale, and then does a linear mapping of the range of prices to the scale points.

In this case, a price of $1.25 would be viewed as positive because it is closer to the lower bound (e.g., $1.00) than the upper bound (e.g., $1.75). Panel 3 shows a situation in which $1.25 is perceived negatively in a range of $1.00 to $1.50, the reason being that the $1.25 is closer to the upper bound than the lower bound.

In contrast, Adaptation-Level Theory would predict no difference in the three situations depicted in Figure 1. Provided consumers experience the entire range of prices at once, the adaptation level should be the mean of the prices ($1.25). Given that the mean does not vary across the three range conditions, a $1.25 market price should be perceived equivalently across the three conditions.

The adaptation-level hypothesis and the range hypothesis of how consumers judge the attractiveness of a market price can be summarized as follows:

**H1**: Adaptation-Level Hypothesis: Price-attractiveness judgments are based on a comparison of market prices to the internal reference price.

**H2**: Range Hypothesis: Price-attractiveness judgments are based on a comparison of market prices to the endpoints of a range of evoked prices.

**EXPERIMENT 1**

The objective of experiment 1 was to assess whether people use the endpoints of a range of prices as scale endpoint anchors when evaluating the attractiveness of a price. The key independent variable was the range of prices available at the time of the judgment. The ranges of available prices were $0.74–$1.74, $0.74–$1.49, or $0.99–$1.74, each range consisting of 10 prices distributed as depicted by the asterisks in the first scale of each of the three panels in...
Figure 1. The key dependent variables were a rating of the attractiveness of a $1.25 market price, a report of the internal reference price, and a report of the range of evoked prices, represented by the most and least that the respondent would be willing to pay for an item.

Two outcomes were possible in experiment 1. If the reference price is the sole standard of comparison in price perception, then there should be no influence of the range manipulation. It was expected that the reference price would be approximately $1.25 in each experimental condition, the mean of each distribution, therefore the $1.25 market price should be rated neutral across the three conditions. However, to the extent the endpoints of the range of evoked prices are used as anchors of the price perception scale, then the $1.25 market price should be judged as attractive when it was nearer to the lower boundary of a set of known prices ($0.74-$1.74), moderately attractive when it was at the midpoint of a set of known prices ($1.25), and unattractive when it was nearer the upper boundary of a set of known prices ($1.74-$1.49).

<table>
<thead>
<tr>
<th>Panel 1: Perception of $1.25 in a range of $0.75 to $1.75</th>
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<th>Panel 2: Perception of $1.25 in a range of $1.00 to $1.75</th>
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<th>Panel 3: Perception of $1.25 in a range of $0.75 to $1.50</th>
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TABLE 1
DEsign of experiment 1

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<th>Judgment 2</th>
<th>Judgment 3</th>
<th>Judgment 4</th>
<th>Judgment 5</th>
<th>Judgment 6</th>
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<td>$.24±$.319 (H)</td>
<td>$.74±$.174 (M)</td>
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<td>3</td>
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<td>$.13±$.214 (L)</td>
<td>$.21±$.319 (M)</td>
<td>$.74±$.149 (L)</td>
<td>$.13±$.239 (M)</td>
<td>$.24±$.319 (H)</td>
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Estimate of internal reference price

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<th>Judgment 3</th>
<th>Judgment 4</th>
<th>Judgment 5</th>
<th>Judgment 6</th>
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<tr>
<td>4</td>
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<td>5</td>
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<td>$.16±$.239 (H)</td>
<td>$.21±$.294 (L)</td>
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<td>6</td>
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Estimate of range of evoked prices

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<th>Condition</th>
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<tr>
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<td>8</td>
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<td>9</td>
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Price-attractiveness rating

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<td>$.16±$.239 (H)</td>
<td>$.21±$.294 (L)</td>
</tr>
<tr>
<td>11</td>
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<td>$.16±$.239 (H)</td>
<td>$.21±$.294 (L)</td>
<td>$.99±$.174 (H)</td>
<td>$.13±$.214 (L)</td>
<td>$.21±$.319 (M)</td>
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<tr>
<td>12</td>
<td>$.99±$.174 (H)</td>
<td>$.13±$.214 (L)</td>
<td>$.21±$.319 (M)</td>
<td>$.74±$.149 (L)</td>
<td>$.13±$.239 (M)</td>
<td>$.24±$.319 (H)</td>
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NOTE.—L = low price level; M = moderate price level; H = high price level.

Design

One of the biggest concerns in the design of the experiment was the carryover effects that could result from successively measuring the attractiveness of a market price, the reference price, and the most and least a person would pay for the product. To control for this bias, each subject’s responses were limited to two of the three dependent measures (an attractiveness measure and a reference price measure or an attractiveness measure and the most/least the person was willing to pay) that were estimated for competing ranges. The primary advantage of this design constraint was the ability to make an independent assessment of the influence of the range manipulation on each of the dependent variables. The primary disadvantage was that mediation tests could not be performed. This disadvantage will be addressed in experiment 2.

The design, shown in Table 1, consisted of a range manipulation (low, $.74–$.149; moderate, $.74–$.174; high, $.99–$.174), a range-level replicate (mean range prices of $1.25, $1.89, and $2.69), and a dependent measure set manipulation (price-attractiveness rating and an estimate of the internal reference price, a price-attractiveness rating, and an estimate of the range of evoked prices) with counterbalancing for the order of the dependent measures and a Greco-Latin square design associated with the range-level replicates. Range-level replicates were created by adding $.65 or $1.45 to each price in the original three conditions. The judged market price was $1.25 for the first replicate, $1.89 (approximately $1.25 + $.65) for the second replicate, and $2.69 (approximately $1.25 + $1.45) for the third replicate.

Referring to Table 1, the influence of the range manipulation on judgments of price attractiveness could be assessed by analyzing the first three judgments of conditions 1–3 and 7–9 and the last three judgments of conditions 4–6 and 10–12. The influence of the range manipulation on the internal reference price could be assessed by analyzing the last three judgments of conditions 1–3 and the first three judgments of conditions 4–6. The influence of the range manipulation on the range of prices evoked during the judgment could be assessed by analyzing the last three judgments of conditions 7–9 and the first three judgments of conditions 10–12.

Procedure

The experimental booklets presented eight lists of 10 prices, one practice set and three experimental sets for each of the two dependent measures. Each list consisted of numerical brand-name identifiers (e.g., 1, 2, 3, . . . 10) and 10 prices. After viewing a price list for 30 seconds, subjects turned to the dependent measure task on the following page. Price-attractiveness ratings were gath-
erred by asking subjects to evaluate the attractiveness of a new product with a market price of $1.25 ($1.89 and $2.69 for replicates) using a one-to-seven scale with unattractive (1) and attractive (7) as scale endpoints. Estimates of the internal reference price were collected using an open-ended question asking subjects to “indicate the price you would expect to pay” for a new product entrant (cf. Jacobson and Obermiller 1990). The range of prices evoked during the judgment was collected with an open-ended question asking people to estimate the “most” and “least” they would be willing to pay for a new product entrant with “least” referring to the price below which they would infer inferior quality (cf. Lichtenstein et al. 1988; Mazumdar and Jun 1992). After each judgment, subjects solved a word puzzle for 40 seconds in order to clear short-term memory.

Results

One hundred twenty subjects enrolled in a principles of marketing class received extra credit for their participation in the experiment. The means for all three dependent variables in each of the three range-level replicate conditions are shown in Figure 2.

Price-Attractiveness Ratings. Price-attractiveness ratings were initially tested for a price range (low, moderate, high) by range-level replication (the $1.25, $1.89, $2.69 judgments) interaction (note that the range-level replication and order of judgments are perfectly confounded). The test was insignificant ($F(4, 342) < 1), thus the analysis combined all three range-level replicates of the price-attractiveness judgment. Next, price-attractiveness ratings were tested for a price range (low, moderate, high) by dependent measure order interaction. The test was insignificant ($F(6, 342) < 1$). Main effect tests of replication ($F(2, 342) < 1$) and dependent measure order ($F(3, 342) = 1.68, p > .05$) were also insignificant.

As predicted by the range hypothesis (Hypothesis 2), the price-range manipulation did have a significant influence on price-attractiveness ratings ($F(2, 342) = 20.64, p < .01, \omega^2 = 0.09$). A test between the high (e.g., $9.99$–$1.74$) and moderate (e.g., $7.49$–$1.74$) range conditions showed that the market price was judged as more attractive in the high price-range condition ($\hat{X}_{\text{high}} = 4.93$, $\hat{X}_{\text{moderate}} = 4.36$; $F(1, 357) = 12.91, p < .01, \omega^2 = 0.03$). A test between the moderate (e.g., $7.49$–$1.74$) and low (e.g., $7.49$–$1.49$) range conditions showed that the market price was judged as more attractive in the moderate-range condition ($\hat{X}_{\text{moderate}} = 4.36$, $\hat{X}_{\text{low}} = 3.89$, $F(1, 357) = 8.50, p < .01, \omega^2 = 0.02$).

Internal Reference Price Estimates. The internal reference price could be responsible for the observed changes in price-attractiveness ratings if it was also sensitive to the range manipulation. Price-attractiveness ratings
were initially tested for a price range (low, moderate, high) by range-level replication interaction. The test was insignificant ($F(4, 167) = 1.00, p > .05$), thus the analysis combined all three range-level replicates of the reference price estimate. Next, internal reference price estimates were tested for a price range (low, moderate, high) by dependent measure order interaction. The test was insignificant ($F(2, 167) < 1$). As would be expected, the main effect test of replication was significant because of the three different price levels of the replicates ($F(2, 167) = 804.98, p < .01$). The main effect test of dependent measure order was also significant ($F(1, 167) = 8.23, p < .01$).

The price range manipulation did not have a significant influence on internal reference prices ($X_{\text{high}} = 1.98, X_{\text{moderate}} = 1.91, X_{\text{low}} = 1.94, F(2, 167) = 1.01, p > .05$). That the price-range manipulation affected price-attractiveness ratings without affecting internal reference price estimates is inconsistent with the adaptation level hypothesis (Hypothesis 1). The adaptation-level hypothesis (Hypothesis 1) predicts that any changes in the attractiveness of a market price should be mediated by changes in the internal reference price.

Range of Prices. Tests for a price range (low, moderate, high) by a range-level replication interaction, a price range by dependent measure order interaction, and a main effect of dependent measure order were insignificant for the measures of the most and least that would be paid (all $p$'s $> .10$), so replicates were combined. The tests confirming that the range manipulations influenced the most that would be paid ($F(2, 162) = 11.97, p < .01$) and the least that would be paid ($F(2, 162) = 12.67, p < .01$) were significant. A test showing that the most that would be paid when exposed to the lower range of prices (e.g., $\$74–\$1.49$) was less than the most that would be paid when exposed to the moderate range of prices (e.g., $\$74–\$1.74$) or high range of prices (e.g., $\$99–\$1.74$) was significant ($X_{\text{low}} = 2.16, X_{\text{moderate}} = 2.39, X_{\text{high}} = 2.33; F(1, 169) = 25.01, p < 0.01, \omega^2 = 0.10$). A test showing that the least that would be paid when exposed to the lower range of prices (e.g., $\$74–\$1.49$) or moderate range of prices (e.g., $\$74–\$1.74$) was less than when exposed to the higher range of prices (e.g., $\$99–\$1.74$) was significant ($X_{\text{low}} = 1.52, X_{\text{moderate}} = 1.54, X_{\text{high}} = 1.65; F(1, 169) = 23.91, p < 0.01, \omega^2 = 0.10$).

Discussion

The results of experiment 1 are consistent with the hypothesis that people use endpoints of the range of evoked prices when evaluating the attractiveness of a market price. As the range of known prices went from low (e.g., $\$74 to $1.49$) to moderate (e.g., $\$74 to $1.74$) to high (e.g., $\$99 to $1.74$), the attractiveness of a market price (e.g., $\$1.25$) increased, even though there was no change in reported reference prices. The implication is that the lower and upper endpoints of a range of evoked prices are used as anchors for price judgments, as predicted by the range hypothesis (Hypothesis 2).

Given the long-standing assumption that the internal reference price is the standard in price perception, it would be advantageous to generate additional evidence that the range of prices may also mediate price-attractiveness judgments. One shortcoming of the results of experiment 1 is that all tests are of differences between aggregate means, hence they may not be capturing the relationship between variables at the individual level. Experiment 2 was a replication of experiment 1 with a slight modification in design to allow for mediation tests of the reference price and the range of evoked prices.

\section*{Experiment 2}

Experiment 2 replicated experiment 1 with two small changes in the experimental design (see Table 1). First, subjects were exposed to the same set of prices when completing the first (judgments 1–3) and second (judgments 4–6) sets of dependent measures (i.e., within each of the 12 conditions, price ranges in judgments 4–6 were manipulated at the same levels as judgments 1–3, respectively). As a result, conditions 1–6 could be used to test for the mediating influence of the internal reference price, and conditions 7–12 could be used to test for the mediating influence of the range of evoked prices. Second, the first (judgments 1–3) and second (judgments 4–6) sets of judgments were separated by a 15-minute filler task to discourage carryover effects.

\section*{Results}

One hundred seventeen subjects from a principles of marketing class received extra credit for their participation in the experiment. Tests for a price range by a range-level replication interaction, a price range by dependent measure order interaction, and a main effect of dependent measure order were insignificant for all of the dependent measures (all $p$'s $> .10$), so the data were pooled across replicates.

The data were analyzed using the mediation analysis procedure recommended by Baron and Kenny (1986). Baron and Kenny recommend that a series of three regression equations be estimated: (1) regress the mediator on the independent variable; (2) regress the dependent variable on the independent variable; (3) regress the dependent variable on both the independent variable and mediating variable. To establish mediation, the independent variable must affect the mediator in the first equation, the independent variable must affect the dependent variable in the second equation, and the mediator must affect the dependent variable in the third equation.

\section*{Test of the Internal Reference Price as a Mediator}

Subjects in conditions 1–6 were used to test the hypothesis that the internal reference price mediates the influence of the manipulated range of prices on ratings of the attrac-
### TABLE 2

MEDIATION TESTS FOR EXPERIMENT 2

<table>
<thead>
<tr>
<th>Equation</th>
<th>( \beta )</th>
<th>t-test</th>
<th>( p )</th>
<th>SS</th>
<th>MSE</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Independent variable on mediator: Manipulated price range on internal reference price</td>
<td>.074</td>
<td>.89</td>
<td>.38</td>
<td>.78</td>
<td>.99</td>
<td>.78</td>
</tr>
<tr>
<td>2. Independent variable on dependent variable: Manipulated price range on rating of price attractiveness</td>
<td>.209</td>
<td>2.55</td>
<td>.01</td>
<td>10.01</td>
<td>1.55</td>
<td>6.48</td>
</tr>
<tr>
<td>3. Independent variable and mediator on dependent variable: Internal reference price and manipulated price range on rating of price attractiveness</td>
<td>.204</td>
<td>2.54</td>
<td>.01</td>
<td>19.59</td>
<td>1.49</td>
<td>6.58</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Equation</th>
<th>( \beta )</th>
<th>t-test</th>
<th>( p )</th>
<th>SS</th>
<th>MSE</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Independent variable on mediator: Manipulated price range on range of evoked prices</td>
<td>-.332</td>
<td>-5.04</td>
<td>.00</td>
<td>1.22</td>
<td>.05</td>
<td>25.38</td>
</tr>
<tr>
<td>2. Independent variable on dependent variable: Manipulated price range on rating of price attractiveness</td>
<td>.238</td>
<td>3.51</td>
<td>.00</td>
<td>17.40</td>
<td>1.41</td>
<td>12.32</td>
</tr>
<tr>
<td>3. Independent variable and mediator on dependent variable: Range of evoked prices and manipulated price range on rating of price attractiveness</td>
<td>-.204</td>
<td>-2.89</td>
<td>.00</td>
<td>28.80</td>
<td>1.36</td>
<td>10.56</td>
</tr>
</tbody>
</table>

**NOTE.**—SS is sum of squares; MSE is mean square error; \( F \) is the value of an \( F \)-test for the entire model.

The reported internal reference price was standardized in each range-level replicate prior to performing the analysis. Equation 1 regressed the internal reference price on the manipulated price-range variable (dummy coded 1, 2, 3) and found a nonsignificant result: \( \beta = 0.074, t(142) = 0.89, p > .05; \) see Table 2. Equation 2 regressed price-attractiveness ratings on the manipulated price-range variable and found a significant result: \( \beta = 0.209, t(142) = 2.55, p = .01. \) Note that this test replicates the manipulated price-range influence found in experiment 1. Equation 3 regressed price-attractiveness ratings on the internal reference price and the manipulated price-range variable and found significant coefficients for each variable: \( \beta = 0.204, t(141) = 2.54, p = .01; \beta = 0.194, t(141) = 2.40, p = .02, \) respectively. For these data, the internal reference price does not mediate price-attractiveness ratings because there is no relationship between the manipulated price range and the internal reference price (Baron and Kenny 1986).

**Test of the Range of Evoked Prices as a Mediator.** Subjects in conditions 7–12 were used to test the hypothesis that the evoked range of prices mediates the influence of the manipulated range of prices on a judgment of the attractiveness of a market price (Hypothesis 2). To do this analysis, we first had to convert the two dependent variable estimates (i.e., most pay, least pay) into a single measure of the evoked range of prices. According to Range Theory, a stimulus judgment should depend on the position of a to-be-judged stimulus relative to the endpoints that define the stimulus range. Thus, the measure was (market price – least pay)/(most pay – least pay). This measure reflects the percentile of a market price within an evoked range of prices, wherein lower scores should reflect more attractive range-induced perceptions of price. For example, if the subject said the least s/he would pay is $1.00 and the most s/he would pay is $1.75, the range measure would equal 0.33 \{($1.25−$1.00)/($1.75−$1.00)\}, indicating that the $1.25 price is relatively attractive given the range of prices evoked.

Equation 1 regressed the evoked price-range percentile measure on the manipulated price range and found a significant result (\( \beta = -0.332, t(205) = -5.04, p < .01; \) see Table 2). Equation 2 regressed the price-attractiveness ratings on the manipulated price-range variable and found a significant result (\( \beta = 0.238, t(205) = 3.51, p < .01 \)). Note that this test again replicates the manipulated price-
range influence found in experiment 1. Equation 3 regressed the price-attractiveness ratings on the evoked price-range percentile measure and manipulated price-range variable and found significant coefficients for each variable: \( \beta = -0.204, r(204) = -2.89, p < .01; \beta = 0.170, r(204) = 2.41, p < .02 \). According to Baron and Kenny, these results support the hypothesis that the range of evoked prices mediates price-attractiveness ratings. Equations 1 and 2 are significant, and the evoked price-range percentile variable influences price-attractiveness ratings in Equation 3. Sobel’s (1982) test of the indirect effect of the manipulated price range on price attractiveness via the evoked price range was significant, \( t(204) = 3.12, p < .01 \).

Discussion

The first two experiments were designed to test if the endpoints of the range of evoked prices are used as anchors for evaluations of market prices, as predicted by Range Theory (Hypothesis 2). Adaptation-Level Theory predicts that price judgments are anchored using a single standard, the internal reference price (Hypothesis 1). Because the adaptation-level account reflects the prevailing perspective among pricing researchers, the experiments were designed to hold the internal reference price constant while varying the range of evoked prices. As such, variance in price-attractiveness perceptions could be uniquely associated with range effects.

The data were fully consistent with the range hypothesis (Hypothesis 2). Manipulations of the range of prices seen prior to judging a market price influenced ratings of the attractiveness of the market price but not the internal reference price. Moreover, the influence of the manipulated range of prices on the judgment of the attractiveness of a market price was mediated by the range of evoked prices but not by the internal reference price. Thus, evidence is provided that the endpoints of the range of evoked prices can serve as anchors for judgments of price attractiveness. However, as the strategy used in these demonstrations was to shift the evoked range of prices while holding the internal reference price constant, our assessment of the results of the manipulation relied not only on a comparison of means, but it also depended on the quality of our measures of the constructs.

Experiments 3 and 4 test the adaptation-level hypothesis (Hypothesis 1) and the range hypothesis (Hypothesis 2) using a strategy that is not dependent on the quality of the measures of the internal reference price and the range of evoked prices. To illustrate, consider a situation in which subjects are given a stimulus set that generates a range of evoked prices, as is the case in panel 1 of Figure 3. Similar to the reasoning used in Figure 1, the lower bound anchors the upper anchor of the perceptual scale and the upper bound of the evoked prices anchors the lower anchor of the perceptual scale. When subjects are asked to judge a market price outside the evoked price range (see \( X_1 \) and \( X_5 \) in panel 2), the endpoint anchors continue to serve as a standard of comparison. Market prices below the lower endpoint of the range (\( X_1 \) in panel 2) should be perceived as lower than market prices equivalent to the lower bound (\( X_2 \) in panel 2), and market prices above the higher endpoint of the range (\( X_5 \) in panel 2) should be perceived as higher than market prices equivalent to the upper bound (\( X_4 \) in panel 2). The range hypothesis predicts these same market prices (\( X_1 \) and \( X_5 \)) should be evaluated as more extreme when the range of evoked prices narrows. As shown in panel 3 of Figure 3, a constriction of the range of evoked prices means that the market price below the lower bound (\( X_1 \) in panel 3) is perceived as lower than when the range of evoked prices was not constricted (e.g., panel 2). Similarly, a constriction of the range of evoked prices means that the market price above the upper bound (\( X_5 \) in panel 3) is perceived as higher than when the range of evoked prices is not constricted (e.g., panel 2).

It is important to recognize how the test illustrated in Figure 3 can be used to differentiate between effects consistent with the adaptation-level hypothesis (Hypothesis 1) and those consistent with the range hypothesis (Hypothesis 2). Recall that the adaptation-level hypothesis predicts that changes in price perception rely on changes in a single standard. Thus, if a context manipulation is shifting the internal reference price, then perception of all market prices should shift in the same direction. For example, if a manipulation designed to constrict a range of evoked prices actually shifts the internal reference price upward, then all market prices (i.e., \( X \) through \( X_5 \) in Fig. 3) should be perceived as lower. In contrast, Range Theory predicts that price perceptions rely on two standards, hence a context manipulation can shift perceptions of prices in different directions. For example, if a context manipulation that constricts the evoked range of prices shifts both endpoint standards (as illustrated in panel 3 of Fig. 3), then low prices will be perceived as lower and high prices will be perceived as higher. Experiment 3 was designed to test for these alternative dynamics predicted by Hypothesis 1 and Hypothesis 2 via a memory-based manipulation of the evoked price range as opposed to the stimulus-based manipulation employed in experiments 1 and 2.

**EXPERIMENT 3**

The objective of experiment 3 was to show that people are sensitive to the endpoints of the range of evoked prices
when perceiving a market price. Similar to the illustration in panels 2 and 3 of Figure 3, the test involved manipulating the endpoints of a memory-based evoked range of prices (scale 1 in all three panels) while holding the mean of the evoked range of prices relatively constant. As shown in panel 3 of Figure 3, a constriction of the range of evoked prices should encourage people to perceive low market prices (X1) as lower and high market prices (X5) as higher while having no impact on prices near the middle of the range (X3). Predictions about the influence of a constriction of the range of evoked prices on perceptions of market prices near the lower bound or upper bound of an evoked price range (X2 and X4) were more difficult to make. Range Theory predicts small changes in the perception of these prices (see panel 3 in Fig. 3). In fact, there is considerable evidence that stimuli near endpoint anchors are assimilated to the anchors (Sherif and Hovland 1961). In this case, there would be no influence of a constriction of the evoked range of prices on the perception of market prices near the lower bound or upper bound of an evoked price range (X2 and X4).

Experiment 3 tested the predictions of Range Theory by manipulating the number of products used to evoke a range of prices. In one condition, people were asked to judge a price for a single item (e.g., sandwich cookies). In a second condition, people were asked to judge the same price for a line of items (e.g., sandwich cookies,
fudge stripes, pecan sandies, peanut butter). Norm theory (Kahneman and Miller 1986) predicted that the single item would evoke a narrower range of prices than the four items, hence prices that were relatively low (X₁) would be perceived as lower and prices that were relatively high (X₅) would be perceived as higher (see Fig. 3).

### Design and Procedure

**Design.** The design was a 2 × 4 between-subjects design with four product category replicates and two control groups. In the main design, the number of items in a product line (one-item, four-item) and the market price (low, low-mid, high-mid, high) were manipulated in four product categories (cereal, cookies, snacks, soup). The number of items in the product line was used to manipulate the width of the evoked range of prices. The price manipulation was meant to mimic the X₁, X₂, X₄, and X₅ market prices illustrated in Figure 3.

**Procedure.** We will use the cookie product category to illustrate the procedure and manipulations. In the one-item conditions, subjects were told “the manufacturer is planning to sell sandwich cookies that will directly compete with Oreo. A one pound package will be sold for _____.” In the four-item conditions, subjects were told “the manufacturer is planning to sell a variety of cookies in the one-item condition, and four-item manipulations resulted in similar deviations of the mid-low and mid-high prices.”

Market prices were rotated across experimental conditions so that people evaluated a different level of market price in each product category. The subscript letters in the price column of Table 3 illustrate this Latin-square design. For example, one group of subjects judged a low price (e.g., $2.09) in the cereal category, a high-mid price ($2.99) in the cookie category, a low-mid price ($1.29) in the snack category, and a high price ($1.59) in the soup category. Members of the control groups were asked to evaluate a price that was expected to be near the internal reference price in all four product categories. These prices are shown in the first column of Table 3 (e.g., for cookies it was $2.49). Subjects in the control group rated only the medium prices. Thus, the only difference between the two control groups was the one-item versus four-item manipulation.

**Pretesting.** Pretests were used to help ensure that the one-item and four-item manipulations resulted in similar reference prices and that the four-item manipulation generated a wider range of evoked prices than the one-item condition. Ninety subjects listed their expected (reference) price, the lowest price they would pay, and the highest price they would pay for the target item (e.g., sandwich cookies) and for an item chosen from the set of four items that would comprise a line (see products in boldface in Table 3) in the cookie, snack, and soup categories.

### Table 3

<table>
<thead>
<tr>
<th>Product category</th>
<th>Product</th>
<th>Price level</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereal</td>
<td>Raisin bran</td>
<td>Low</td>
<td>$2.09</td>
</tr>
<tr>
<td>(Medium = $3.09)</td>
<td>Granola</td>
<td>Low-mid</td>
<td>$2.49</td>
</tr>
<tr>
<td></td>
<td>Multigrain</td>
<td>High-mid</td>
<td>$3.99</td>
</tr>
<tr>
<td></td>
<td>Almond</td>
<td>High</td>
<td>$4.49</td>
</tr>
<tr>
<td>Cookies</td>
<td>Sandwich cookies</td>
<td>Low</td>
<td>$1.49</td>
</tr>
<tr>
<td>(Medium = $2.49)</td>
<td>Fudge stripes</td>
<td>Low-mid</td>
<td>$1.99</td>
</tr>
<tr>
<td></td>
<td>Pecan sandies</td>
<td>High-mid</td>
<td>$2.99</td>
</tr>
<tr>
<td></td>
<td>Peanut butter</td>
<td>High</td>
<td>$3.49</td>
</tr>
<tr>
<td>Snacks</td>
<td>Corn chips</td>
<td>Low</td>
<td>$.99</td>
</tr>
<tr>
<td>(Medium = $1.69)</td>
<td>Multigrain chips</td>
<td>Low-mid</td>
<td>$1.29</td>
</tr>
<tr>
<td></td>
<td>Popped popcorn</td>
<td>High-mid</td>
<td>$2.09</td>
</tr>
<tr>
<td></td>
<td>Cheese curls</td>
<td>High</td>
<td>$2.39</td>
</tr>
<tr>
<td>Soup</td>
<td>Chicken noodle</td>
<td>Low</td>
<td>$.59</td>
</tr>
<tr>
<td>(Medium = $1.09)</td>
<td>Vegetable</td>
<td>Low-mid</td>
<td>$.79</td>
</tr>
<tr>
<td></td>
<td>Tomato</td>
<td>High-mid</td>
<td>$1.39</td>
</tr>
<tr>
<td></td>
<td>Chicken and rice</td>
<td>High</td>
<td>$1.59</td>
</tr>
</tbody>
</table>

Note.—The subscript letters show the four counterbalanced conditions; e.g., subjects in the “a” condition rated a $2.09 cereal, a $2.99 cookie, a $1.29 snack, and a $1.59 soup.

4The cereal category was not included in this pretest. A previous pretest was used to select items and prices in the cereal category.
from the reference prices, hence should have been well outside of the range of evoked prices for either condition.

Results

The first test compared the price perception in the one-item control group to the four-item control group (medium prices). Perception of the price did not differ between the two groups for the four product categories ($\bar{x}_{one-item} = 7.33$, $\bar{x}_{four-item} = 7.22$, $F(4, 78) < 1$). The equivalence of price perceptions in the control groups suggests that the internal reference price was similar in the one-item and four-item conditions.

The second set of tests compared the differences in price perception between the one-item and four-item conditions for the mid-low and mid-high market prices. There were no line size by category interactions for the mid-low ($F(3, 326) < 1$) and mid-high ($F(3, 328) < 1$) market prices, so the data were collapsed across product categories. The mid-low market price was not perceived differently by subjects in the one-item and four-item conditions ($\bar{x}_{one-item} = 5.88$, $\bar{x}_{four-item} = 5.90$, $F(1, 326) < 1$). The mid-high market price was also not perceived differently by subjects in the one-item and four-item conditions ($\bar{x}_{one-item} = 8.68$, $\bar{x}_{four-item} = 8.59$, $F(1, 328) < 1$).

The third set of tests compared the differences in price perception between the one-item and four-item conditions for the low and high market prices. There were no line size by category interactions for the low ($F(3, 328) < 1$) and high ($F(3, 328) < 1$) market prices, so the data were collapsed across product categories. The range hypothesis (Hypothesis 2) predicted that the low market price would be judged lower and the high market price higher in the one-item condition than in the four-item condition because of the narrower range of evoked prices in the one-item condition. The test of this predicted interaction was significant ($F(1, 667) = 12.89$, $p < .001$, $\omega^2 = 0.03$). The low market price was perceived as lower in the one-item condition than in the four-item condition ($\bar{x}_{one-item} = 4.42$, $\bar{x}_{four-item} = 4.82$, $F(1, 328) = 4.21$, $p < .05$, $\omega^2 = 0.011$). The high market price was perceived as higher in the one-item condition than in the four-item condition ($\bar{x}_{one-item} = 10.12$, $\bar{x}_{four-item} = 9.38$, $F(1, 328) = 9.22$, $p < .05$, $\omega^2 = 0.026$).

Discussion

Experiment 3 provides further support for the range hypothesis (Hypothesis 2) of price perception. A market price below/above the lower/upper bound of the evoked range of prices was perceived as lower/higher when the evoked range of prices was constricted on both the low and high ends. In an attempt to hold the internal reference price constant, we purposefully selected the four product items within each price level on the basis of equivalent internal reference prices (see pretest). Because Adaptation-Level Theory rests on the principle that price perceptions are mediated by the internal reference price, to the extent we were successful in holding the internal reference price constant, these results cannot be accounted for by Adaptation-Level Theory. Two pieces of evidence suggest that we were successful in holding the internal reference price constant. First, price perceptions did not differ between the one-item and four-item conditions within the medium (control) price condition. Second, if there had been movement in the internal reference price between the one-item and four-item conditions, then we would have witnessed all prices within the one-item condition being perceived as lower or higher than prices within the four-item condition. That the low price was perceived as lower in the one-item condition and the high price was perceived as higher in the one-item condition is consistent with the range hypothesis, but not Adaptation-Level Theory.

The only possible inconsistency with the range hypothesis is finding that the prices near the lower bound and upper bound of the wider range of evoked prices ($X_2$ and $X_5$) were not perceived differently when the evoked range of prices was constricted. Although the nonsignificant effects for the low-mid and high-mid conditions are inconsistent with Range Theory, it is important to note that there are many demonstrations that internal anchors assimilate to proximate external stimuli, especially when the internal anchors are not firmly established (cf. Lichtenstein and Bearden 1989; Sheriff and Hovland 1961; Urbany et al. 1988). Internal anchors are more malleable when the range of evoked prices used to anchor the scale are based on ad hoc categories (Kahneman and Miller 1986), as was the case in experiment 3.

EXPERIMENT 4

The first three experiments demonstrate that consumers can use the endpoints of the range of evoked prices to anchor the perceptual scale used to judge a market price. A direct implication of these results is that a change in context (e.g., set of prices evoked in memory) can influence the probability the product will be purchased. However, such an implication rests on the premise that the results reported above are representational in nature rather than being based on response language. Lynch et al. (1991) have commented that many context effects observed in the pricing literature may be response language effects, rather than true representational changes in the perception of a price. Response language effects occur when a change in context changes the extremity of the endpoints used to anchor a response scale (labeled “scale rating” in Fig. 3) but not the perceptual scale (labeled “price perception” in Fig. 3). Although not shown in Figure 3, a response language effect occurs when the psychological distance between market prices (e.g., $X_1$ to $X_2$, $X_2$ to $X_3$, $X_3$ to $X_4$, and $X_4$ to $X_5$ in the price perception scale of panels 2 and 3) stays constant for different evoked price ranges. In contrast, a representational effect occurs when the psychological distance be-
between market prices changes for different evoked price ranges, as is illustrated in panels 2 and 3 of Figure 3.

Lynch et al. (1991) argue that true changes in the perception of a price or representational contrast effects are best illustrated by a change in preferences among two or more options. For example, suppose a consumer is indifferent in a choice between (1) a single item (e.g., Oreo cookies or (2) a single item drawn from a set of items (e.g., select one from vanilla wafers, iced oatmeal cookies, graham crackers, sugar cookies, figs, mallomars, grasshoppers, chunk chocolate chip) at a typical market price. The single-item choice can be represented by $X_1$ of panel 3 in Figure 3 and the multi-item choice can be represented by $X_1$ of panel 2 in Figure 3. Note the two items are viewed equivalently on the price perception scale in each panel. Now, suppose the price of each of the two options is substantially reduced to $X_1$. According to the range hypothesis, consumers should be more sensitive to a price discount for the single-item option because the range of evoked prices is narrower. As shown in Figure 3, $X_1$ is perceived as a more favorable price for the single-item option (panel 3) than the multi-item option (panel 2). Thus, preference should shift from the multi-item option to the single-item option when the price is discounted. In contrast, suppose the price of each item is substantially increased. The consumer should be less sensitive to a price increase for the multi-item option because of the wider range of acceptable prices. As shown in Figure 3, $X_1$ is perceived as a more favorable price for the multi-item option (panel 2) than the single-item option (panel 3). Thus, preference should shift from the single-item option to the multi-item option. In summary, a price discount for two competing options should shift preferences to the single-item option, whereas a price increase should shift preferences to the multi-item option. However, if the single-item/multi-item manipulation simply changes the anchors of the rating scale, the relative preference of the two options should be insensitive to either price change.

Procedure

Two hundred twenty-five undergraduate student subjects were asked to make two preference allocation judgments between a single-item option and an eight-item option in each of three product categories. In part one of the questionnaire, subjects were presented with two purchase options in each of three product categories. The first option was a well-known, midpriced item within a category (e.g., Oreo within the cookie category). The second option was a choice from an unbranded, eight-item product line consisting of four items priced lower than the single item option (e.g., vanilla wafers, iced oatmeal cookies, graham crackers, sugar cookies) and four items priced higher than the single item option (e.g., figs, mallomars, grasshoppers, chunky chocolate chip). Each option was priced at the midprice level ($X_1$) used in experiment 3 (e.g., both cookie options were priced $2.49$). Subjects indicated their relative preference for the two options, a single item versus a choice of one of eight items, by allocating 100 points between the options. Subjects made these judgments for the cookie, snack, and soup product categories.

In part two of the questionnaire, the subjects were told that they were visiting a second supermarket that listed a different price for the two options, and that they should perform the preference allocation task a second time. In one condition, the price of both options was dropped to the “low price” ($X_1$) used in experiment 3 (e.g., $1.49$ in the cookie category). In the second condition, the price of both options was increased to the “high price” ($X_1$) used in experiment 3 (e.g., $3.49$ in the cookie category). Thus, the only difference between the low price and high price conditions was the price of the single-item and multi-item options in the second part of the questionnaire.

Results and Discussion

If the results observed in experiment 3 were due only to changes in the response language of the respondents, then the relative preference for the two options should remain constant at time 1 and time 2. On the other hand, if the results observed in experiment 3 were true representational range effects, preference should shift to the single-item option in the low price condition and to the multi-item option in the high price condition. As predicted by the range hypothesis (Hypothesis 2), the preference shifted to the single-item option in the low-priced condition ($X_{time1} = 46.9$, $X_{time2} = 49.9$, $F(3, 116) = 4.11$, $p < .01$, $\omega^2 = 0.03$). Univariate tests were significant for cookies ($X_{time1} = 47.5$, $X_{time2} = 52.3$, $F(1, 118) = 7.80$, $p < .01$, $\omega^2 = 0.05$) and soups ($X_{time1} = 51.8$, $X_{time2} = 54.2$, $F(1, 118) = 4.90$, $p < .05$, $\omega^2 = 0.04$), but not for snacks ($X_{time1} = 41.6$, $X_{time2} = 43.2$, $F(1, 118) = 1.72$, $p = 0.20$). As predicted by Hypothesis 2, the preference shifted away from the single-item option in the high-priced option condition ($X_{time1} = 45.0$, $X_{time2} = 41.3$, $F(3, 113) = 4.15$, $p < .01$, $\omega^2 = 0.03$). Univariate tests were significant for cookies ($X_{time1} = 48.8$, $X_{time2} = 45.0$, $F(1, 115) = 4.32$, $p < .05$, $\omega^2 = 0.03$) and snacks ($X_{time1} = 43.8$, $X_{time2} = 39.1$, $F(1, 115) = 7.36$, $p < 0.05$, $\omega^2 = 0.05$), but not for soup ($X_{time1} = 42.3$, $X_{time2} = 39.8$, $F(1, 115) = 2.70$, $p = 0.10$). Consistent with predictions, the preference ratings suggest the line size manipulation created a representational context effect, as opposed to a response language context effect.

GENERAL DISCUSSION

Price perception research has relied on Adaptation-Level Theory to account for the dynamics by which consumers translate market prices into subjective price perceptions. The adaptation-level hypothesis predicts that prices are evaluated according to their deviation from a single anchor, the internal reference price. The experiments reported in this article were designed to test for
the presence of a different dynamic. The range hypothesis predicts that market prices are evaluated according to their position on a scale defined by the lower bound and upper bound of an evoked range of prices. To date, little attention has been paid to the range hypothesis, an outcome that can be attributed to the fact that the internal reference price and the range of evoked prices often move in tandem (cf. Kalyanaram and Little 1994; Lichtenstein et al. 1988).

This article assesses the veracity of the range hypothesis by investigating subjective price perceptions in situations where the internal reference price and the range of evoked prices are not highly correlated. In experiments 1 and 2, the observed price range was manipulated with subsequent assessment of the attractiveness of a given price within the range, the internal reference price, and the two anchors defining the evoked price range. Experiment 1 showed that judgments of price attractiveness and estimates of the endpoints of the evoked price range were sensitive to shifts in the observed range of prices but that internal reference price estimates were not. Experiment 2 showed that the endpoints of the consumer’s evoked price range mediated changes in perceptions of price attractiveness, whereas the internal reference price did not.

In experiments 3 and 4, both endpoints of the range of evoked prices were shifted concurrently via a memory-based context manipulation. When the range of evoked prices was constricted, prices below the lower bound of the range of evoked prices were perceived as lower and prices above the upper bound of the range of evoked prices were perceived as higher. The adaptation level hypothesis could not account for these findings because any shift in the internal reference price should have had an equivalent directional effect on the perceived attractiveness of both market prices.

Theoretical Implications

To date, there is some evidence that the endpoints of the evoked range of prices may impact price judgments. Biswas and Blair (1991) have shown that consumer purchase intentions are sensitive to their perceptions of the lowest and highest prices in the marketplace. Rajendran and Tellis (1994) have shown that variance in purchase behavior can be explained by the range of prices encountered in the store at the time of purchase (a correlate of the evoked price range—see experiments 1 and 2).

There is also evidence that experienced price variability, a direct antecedent of the width of the evoked range of prices (see experiments 3 and 4), influences price perception. Kalyanaram and Little (1994) have shown that the range of price insensitivity is a direct function of experienced price variability. A range interpretation of this finding would be that an increase in the range of price experience results in a stretching of the psychological scale used to evaluate prices. Thus, the amount of a price change needed to influence consumer demand increases as price experiences become more variable. Mazumdar and Jun (1992) have shown that higher price uncertainty is a source of a larger range of evoked prices.

The influence of price variability and price uncertainty on price judgments may provide insight into the contexts where the evoked range of prices may have a meaningful impact on price judgments. First, there are product categories that have a considerable variety of brands and prices (e.g., wine). Second, there are purchase situations that encourage the formation of goal-derived categories (e.g., gifts). Goal-derived categories often include a variety of products that vary considerably in price. Third, there are purchase situations that are infrequent and uncertain (e.g., durable good purchases). In all three of these contexts, it should be easier to encourage consumers to evoke wider ranges of prices and make them less sensitive to price deviations from their internal reference price. Range Theory could be used to argue this reduced sensitivity is attributable to a larger range of evoked prices.

It is also important to note situations in which the range of evoked prices is likely to have little influence on perceptions of the attractiveness of a market price. The first situation is when there is limited price variability. There is a dominant “going price” for many types of goods; movies usually cost $7.00, daily newspapers cost $.50, and regular candy bars cost $1.00. In these cases, the strongly peaked modal price is likely to be accompanied by a very narrow evoked range of prices. If the consumer does experience a sudden price change for one of these items, the consumer is likely to use the proportion of the change relative to the modal price (i.e., the internal reference price) to assign value to the new market price (Heath, Chatterjee, and France 1995; Thaler 1985). Also, to the extent there is a lack of perceived substitutes in the marketplace for a particular item, this should reduce the variance in an evoked price range. For example, the internal reference price is more likely to be important as a reference point for a specialty good where the consumer is unwilling to accept a substitute such that the decision becomes one of buy/no buy for only a particular brand. In such cases, decisions about whether or not to purchase a single alternative are likely to be framed as cost/benefit tradeoff in which the benefits help define an appropriate cost or internal reference price. A product with a market price at or below the internal reference price is likely to be purchased, whereas a product priced above the internal reference price is not.

Implications for Future Research

Findings from the present study may also provide insight into some commonly studied marketing topics. Our observations on the influence of price variability on judgments about the attractiveness of a market price may have relevance for understanding the different patterns of demand for high-priced and low-priced brands in stores following a “every day low price” (EDLP) pricing strategy and stores following a “high-low” pricing strategy. The price range on a grocery shelf in a high-low store can be
construed as having two sources of variance—variance between brands and variance within brands. In a true EDLP store, only the former source of variance is operative; consequently, the total variance among prices on the shelf should be higher for high-low than for EDLP stores. This is a natural counterpart to our range manipulation. Thus, a high-low pricing strategy should favor higher priced brands in the choice set because of more price variance (i.e., a wider range of evoked prices). In contrast, an EDLP store should favor lower priced brands in the choice set because of less price variance (i.e., a narrower range of evoked prices).

Our evidence on the influence of product line size on the range of evoked prices implies there may be multiple advantages to isolating a product that is on sale. For example, there is much empirical evidence that price cuts on items placed on end-of-aisle display result in increased sales relative to price cuts for in-aisle items (Blattberg, Briesch, and Fox 1995). While some portion of the increased demand is undoubtedly due to the increased attention that an end-of-aisle display attracts, some portion of the increased demand may be a consequence of the isolation of the end-of-aisle product from the product category. The range hypothesis predicts that a price discount assessed in the context of the evoked price range of a specific product is likely to have more impact than a price discount assessed in the context of the evoked price range of a product category. Clearly, these implications need to be empirically assessed before any conclusions can be reached. However, the implications of considering a Range Theory explanation of price perception appear to hold much promise. It is hoped that this research serves as an impetus for future research within this domain.

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