The Accuracy-Enhancing Effect of Biasing Cues

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Extrinsic cues such as price and irrelevant attributes have been shown to bias consumers' product judgments. Results in this article replicate those findings in pretrial judgments but show that such biasing cues can improve quality judgments at a later point in time. Initially biasing cues can even yield more accurate judgments than cues that do not bias pretrial judgments and can help consumers after a delay (e.g., at the time of repeat purchase) to determine how much they had liked a product when they tried it before. These results suggest that trying to deceive consumers with the use of biasing cues may induce trial in the short term but may come back to haunt the deceiver at the time of repeat purchase.

Consumers sometimes erroneously infer high quality. This may happen, for instance, when low-quality products are priced high and consumers rely on a price-quality heuristic (Broniarczyk and Alba 1994b; Cronley et al. 2005; Dodds, Monroe, and Grewal 1991; Lichtenstein and Burton 1989; Rao and Monroe 1988, 1989) or when irrelevant attributes seem positively related to product quality but in reality are not (Carpenter, Glazer, and Nakamoto 1994). In such cases, a bias may occur in judgments of product performance and, hence, product evaluations and choices. Consumer welfare may be hurt, while the marketer's interest would seem to be well served. This biasing effect is likely to occur for initial quality judgments that determine product trial. However, we propose that the opposite may often occur at the time of repeat purchase. That is, a cue that biases initial quality judgments can increase the accuracy of quality judgments at a later point in time.

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Our goal is, first, to investigate whether initially biasing attribute information can improve quality judgments after the receipt of quality feedback (experiment 1). Second, we probe the generalizability of the accuracy-enhancing effect in a context with an actual consumption experience (experiment 2). Third, we demonstrate that an initially biasing cue can even yield more accurate postfeedback quality judgments than a cue that does not bias pretrial judgments (experiment 3). Finally, we explore the impact of relatively ambiguous product trial experiences and test the hypothesis that inclusion of an initially biasing cue leads to higher consistency between (*a*) consumers' subjective quality experience at the time of product trial and (*b*) their quality judgment after a delay (e.g., at the time of repeat purchase; experiment 4).

THEORETICAL BACKGROUND

Biasing Attributes

Consumers tend to hold naive beliefs regarding relationships between a product's attributes and its benefits. Those naive beliefs have been well documented. For example, many consumers believe that price and quality have a strong positive relationship (e.g., "You get what you pay for"). If such beliefs match the actual relationship, the attribute may serve as a useful heuristic cue to make more accurate decisions. However, we are interested in those cases in which a mismatch exists, such as when the beliefs are wrong or when the true relationship is stochastic (i.e., has exceptions). In virtually every product category, high-priced options exist that provide low or moderate quality (Lichtenstein and Burton 1989). In entire product categories, price-quality correlations are virtually zero or even negative (Tellis and Wer-

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nerfelt 1987). In such cases, relying on a general belief about the relationship between an attribute (e.g., price) and a benefit (e.g., quality) does not help consumers to determine product quality accurately. Instead, the attribute is likely to bias quality judgments for at least some products. We call those attributes "initially biasing attributes" because they lead to biased quality expectations at a point in time when direct quality feedback is not yet available—for example, before product trial.

Predictions

Whereas most research on biasing cues such as price or irrelevant attributes has focused on initial, pretrial quality judgments, we explore the effects of such cues on quality judgments well after quality feedback has been received (e.g., at the time of repeat purchase). Can quality judgments become more accurate in the presence of an attribute that had previously biased such judgments? Although predictions can be generated on the basis of various literatures, the bulk of evidence is more sanguine in predicting a continued bias than an accuracy-enhancing effect.

The literature on consumer inference making indicates that biased perceptions of the attribute-quality relationship often survive the passage of time and even disconfirming evidence (Kardes et al. 2004). For example, Pechmann and Ratneshwar (1992) showed that postexperience perceptions of the association between price and quality continued to be driven by prior beliefs about the price-quality relationship when consumers had difficulty comparing and contrasting taste experiences. Broniarczyk and Alba (1994b) showed that a heuristic cue such as price for quality can sustain its heuristic power even when consumers are presented with a large amount of unambiguous data indicating that price is not a good quality indicator. Lichtenstein and Burton (1989) found no relationship between consumers' product experience or purchase frequency and the accuracy of their price-quality beliefs. Other literatures and paradigms tend to agree. The illusory correlation literature shows that correlations are perceived even when empirical support is missing (Chapman and Chapman 1969). Similarly, the multiple-cue probability learning literature suggests that people do not learn easily from experience (Brehmer 1980). The literature on irrelevant attributes (Broniarczyk and Gershoff 1997; Brown and Carpenter 2000; Carpenter et al. 1994; Simonson, Nowlis, and Simonson 1993) indicates that consumers base quality judgments on attributes that are in reality not positively related to quality even if they have evidence of the irrelevance of those attributes. Together, these literatures show that beliefs about relationships between attributes and quality are often not updated sufficiently. Thus, inaccurate beliefs may persevere, and initially biasing attributes may continue to have a negative effect on the accuracy of consumers' quality judgments after quality feedback has been received.

Despite the predominance of findings suggesting a persevering negative effect, other research suggests that initially biasing cues may actually work to enhance the accuracy of consumers' postfeedback quality judgments. Wright and Murphy (1984) suggested that people are better at detecting the covariation between two variables when they have, or can form, a meaningful theory about the relationship between two variables. This was true even when the theory was inconsistent with the data. Thus, a "wrong" theory may be better than having no theory at all when judging covariation. Investigating the effect of meaningful labels in covariation judgments between price and quality, Baumgartner (1995) showed higher accuracy for meaningful (price and quality) than for arbitrary (X and Y) data labels and suggested that theories can lead to a hypothesis-testing process that facilitates covariation detection even when those theories are wrong.

Translated to our context, the suggestion is that a cue that biases initial quality judgments may enhance learning of the true relationship between the cue and quality. If consumers can then use the learned cue-quality relationship after a delay to judge the quality levels of the products they encountered before, we may find that instead of persevering in its biasing influence, the initially biasing cue may actually help consumers to make more accurate quality judgments after a postfeedback delay (e.g., at the time of repeat purchase). Although such a result would be consistent with the findings by Wright and Murphy (1984) and Baumgartner (1995), it does not directly or necessarily follow from their work. In addition to the findings discussed above that suggest persevering bias, the scenarios of interest to us differ from the situations tested by Wright and Murphy (1984) and Baumgartner (1995) in at least three important ways. First, participants in their experiments were exposed to all the data simultaneously instead of encountering products one by one. Detecting outliers and general patterns may be more difficult if one is exposed to only one data point at a time. Second, their experiments focused on immediate judgments of covariation, with no role for memory. In contrast, we look at consumers' performance after a delay, exposing them to forgetting and postexperience memory distortion. That is, when information about different products is presented sequentially and is followed by a delay, information about the relationship between, for example, price and quality in the data may decay or be distorted in memory. If that happens, consumers may revert to more perseverant prior beliefs about the relationship, leading to biased quality judgments after the delay. Third, in some of our experiments, quality feedback will not be discrete, written information but will consist of the sensory quality feedback provided by actual product experience. The latter type of information is more ambiguous than the discrete feedback used by Wright and Murphy (1984) or Baumgartner (1995), providing more opportunity for biased prior beliefs to bias quality impressions at the time quality feedback is received. Nevertheless, the research by Wright and Murphy (1984) and Baumgartner (1995) does suggest that belief perseverance is not a universal phenomenon and raises the possibility that cues that bias initial quality expectations may lead to more accurate postfeedback quality judgments in the types of contexts of interest to us.

Experiment 1 tests the basic hypothesis that an initially biasing attribute can increase the accuracy of consumers' postfeedback quality judgments.

EXPERIMENT 1

To assess whether quality judgments can be improved by a cue that had previously biased such judgments, we varied the presence of an initially biasing attribute (bottling location) and assessed its influence on judgments of product quality before and after product trial. An accuracy-enhancing effect of bottling information occurs when product profiles that include bottling information yield more accurate quality ratings after a delay and after receiving product quality feedback than product profiles that do not include bottling information. In this experiment, postfeedback quality ratings are considered more accurate if they are correlated more highly with the quality levels given as feedback during trial.

Method and Procedure

Design. The experiment consisted of two phases: a learning phase and a test phase, separated by a 5-minute delay. During the learning phase, participants assessed the expected quality of three fictitious brands of orange juice, one at a time, on the basis of either brand name only or brand name plus bottling location. Quality feedback was provided right after each expected-quality rating and before the next brand name (and bottling location if applicable) was presented. During the test phase, no quality information was provided, but exactly the same products were rated again on quality. The same attributes (brand name only or brand name and bottling location) were presented as during the learning phase.

The experiment had a two-cell, between-participants design. In the bottling location condition, each product carried both a brand name and a bottling location—both during learning and at test. In the no bottling location condition, only a brand name, no bottling information, was provided, again both during learning and at test. As a manipulation check and to establish the initially biasing nature of bottling location, the average quality expectations per bottling location—as measured during the learning phase—were compared in an ANOVA. The main dependent variable is the accuracy of quality assessments at test, as measured by the correlation between quality judgments at test and the quality levels provided as feedback during the learning phase.

Procedure and Stimuli. Participants entered the laboratory in groups of up to 24 people and were randomly assigned to the bottling location or the no bottling location condition. Each participant was seated in front of a computer shielded from other participants. The experiment was entirely computer based, with use of the Authorware software system. Participants were instructed to imagine that they were on a holiday, that they were shopping for orange juice, and that they did not know the local juice brands. The instructions went on to give a truthful representation of the experimental procedure without highlighting the bottling location manipulation. Thus, no deception was used. Next, participants saw the first of three products in the learning phase.

Three bottling locations were used: New Jersey, California, and Florida. We assumed that bottling location would initially have a biasing influence. Bottling locations closer to orange-growing regions should lead to more positive quality predictions before quality feedback is received. Bottling location was irrelevant, however, to the extent that, for each participant separately, bottling locations were assigned to quality levels at random without replacement. Thus, across participants, bottling location was uncorrelated with actual quality during the learning phase.

In the bottling location condition, each orange juice was described by a brand name (Cordoba, Cataluna, or Cartagena; cf. Warlop, Ratneshwar, and van Osselaer 2005) and a bottling location (Florida, California, or New Jersey). Next, participants rated the juice's expected quality level on a scale from 1 (lowest quality) to 3 (highest quality) stars. Finally, feedback about the juice's "actual" quality level was provided using the same scale. The same sequence was followed for the two other juices. Brand names and bottling locations were assigned to quality levels at random for each participant separately, to avoid a systematic relationship between actual quality levels and bottling location across participants. During the 5-minute delay between learning and test phase, participants executed an unrelated task. In the test phase, the product descriptions (i.e., brand name and bottling location but not quality level) for the same three brands were presented on one page. Participants were asked to rate the quality for each product on the same 3-star rating scale, using each quality level once. As noted, the no bottling location condition was identical to the bottling location condition, except that no bottling location information was provided during both the learning and the test phase. Thus, quality judgments in the no bottling location condition could only be based on the brand names.

The assess-feedback-delay-assess procedure was chosen to reflect, in a maximally controlled experimental setting, the real-life repeat-purchase scenario preceded by initial trial: the consumer predicts the quality of a product before deciding to try it, derives feedback from first-time consumption (i.e., trial), and after a delay bases repeat-purchase decisions on perceptions of the quality levels of previously tried products. Seventy-three business undergraduates at the University of Florida participated in the experiment for partial course credit.

Results and Discussion

Because "true" quality levels given as feedback did not systematically depend on bottling locations, evidence for the initial biasing influence of the bottling location attribute is provided when some juices are expected to have a higher quality than others during the learning phase and when this difference is contingent on differences in the bottling variable. The average expected quality on a 3-point scale is

2.54 for juice bottled in Florida, 2.25 for juice bottled in California, and 1.38 for juice bottled in New Jersey. A one-way within-subjects ANOVA on the data from the bottling location condition revealed that participants expected different quality levels based on the bottling location ($F(2, 38) = 31.0$, $p < .001$).

Experiment 1 was designed to test the hypothesis that an initially biasing cue can help, as opposed to hurt, the accuracy of quality judgments after quality feedback has been received. To test for an accuracy-enhancing versus an accuracy-reducing effect of bottling location information over time, the correlation was calculated, for each participant, between quality judgments after the delay and the quality levels we provided as feedback during the learning phase. Contrary to what previous research on the perseverance of prior beliefs might suggest, the average correlation was higher in the bottling location condition ($r = .96$) than in the no bottling location condition ($r = .65$; $t(71) = 3.5$, $p < .01$).

The results in experiment 1 suggest that, in a highly controlled and perhaps stylized setting, an initially biasing cue may improve the accuracy of consumers' quality judgments after quality feedback and a subsequent delay. Thus, adding (irrelevant) attribute information to make an inferior product look better than it is might backfire by helping consumers to correctly judge the product's quality at the time of repeat purchase. Instead of leading to a perseverant bias, which would have pulled down the accuracy correlation toward zero in this experiment, the inclusion of an extrinsic and initially biasing attribute allowed participants to use that attribute as a beneficial quality cue over time.

EXPERIMENT 2

In experiment 2, we assessed the external validity of the accuracy-enhancing effect on several dimensions. First, the artificial star quality feedback as provided in experiment 1 was replaced by actual quality feedback from a true consumption experience: a high- and a low-quality orange juice sample were tasted. Second, real brand names that are available on the market were used. Third, participants did not rate the quality of the orange juices at the time of trial. The latter alteration can be helpful in showing that the accuracy-enhancing effect applies when the information to be recalled is an actual consumption experience rather than the mere memory of the rating on a scale. Fourth, testing occurred 2 weeks, instead of 5 minutes, after trial. Finally, to make the test more forceful, the biasing cue was consistently negatively related (instead of uncorrelated across participants) with quality.

Method

Participants tasted a higher- and a lower-quality orange juice during a learning phase and were asked to rate the quality of the two orange juices after a delay of 2 weeks, without tasting the juices again. As in experiment 1, we manipulated whether the products were presented with or without information about bottling location.

During the learning phase, we listed four brands of orange juice. Participants were told that they would taste two of the listed juices that day. We included the two additional brands to add external validity to the scenario (few stores carry just two brands of orange juice). In the bottling location condition, we listed brand name and bottling location for each of the four juices. In the no bottling location condition, we listed only the brand name. The two juices that were tasted were named Sonera and Sunito. The other two juices were named Sunkist and Solevita. The four brand names used are real brand names available on the European market. We counterbalanced the assignment of brand names to the higher- and lower-quality juices that were tasted. Thus, in each condition, the higher-quality juice was named Sonera and the lower-quality juice was named Sunito for half the participants. The lower-quality juice was named Sonera and the higher-quality juice was named Sunito for the other half. In the bottling location condition, "bottled in Florida" and "bottled in New Jersey" were used for the juices that were tasted because these locations had been shown in experiment 1 to induce expectations of high and low quality, respectively (i.e., they were initially biasing). The New Jersey bottling location was systematically coupled with the higher-quality juice, while Florida was coupled with the lower-quality juice. Thus, the quality of the juices was always inconsistent with the expectations based on the bottling location, which hence biased initial quality expectations away from the actual quality of the juices. The bottling locations for filler brands Sunkist and Solevita (in the bottling location condition only) were Norway and Spain, respectively. Tropicana Original, not from concentrate and without pulp, was used as the higher-quality juice. Winn Dixie frozen orange juice, from concentrate and with calcium, was used as the lower-quality juice. (Recall that the the tasted juices were labeled Sonera and Sunito in the experiment. Participants never saw the Tropicana Original or Winn Dixie brand names.) To make sure that the taste quality of the lower-quality orange juice was indeed worse than the higher-quality orange juice, we used a four-to-one water-to-concentrate ratio (cf. Pechmann and Ratneshwar 1992). This level of concentration is slightly less than recommended but is still commonly used by consumers. Blind tasting pretests confirmed that the higher-quality juice was preferred by significantly more people (90%) than the lower-quality juice (10%, $N = 10$; $\chi^2 = 6.4$, $p < .05$). The order in which the two juices were tasted was counterbalanced. To make sure participants would not merely remember ratings instead of taste experiences, we did not ask them to rate their quality expectations. There was a delay of at least 30 minutes between tasting the first and the second juice.

The test phase took place 2 weeks later. At test, we listed the same four brand names (in the no bottling location condition) or brand names and bottling locations (in the bottling location condition) on a single page and asked participants to select the highest-quality brand. ("Which of the juices you tasted two weeks ago was the high quality juice?" The criterion for quality was "the brand that had the best taste.") Participants did not taste any juices during the test phase. At test, the order in which the juices were listed was different than during the learning phase, to avoid the use of order as a heuristic to determine the highest-quality product. Of the 93 undergraduates at the University of Central Florida who participated in the learning phase, seven participants in the bottling location condition and nine in the no bottling location condition failed to participate in the test phase.

Results

The result of interest pertains to the percentage of participants that, at time of testing, had selected the higher-quality juice. If the bottling location attribute had continued to bias quality judgments after the trial and delay, we should have found that participants in the bottling location condition were less likely to select the higher-quality juice than participants in the no bottling location condition. Hypothesizing a continued biasing influence of the bottling location attribute seems all the more appropriate in this study because real taste evaluation is a subjective matter that can be influenced easily by prior beliefs (Allison and Uhl 1964). However, the results are not in line with this contention. More participants in the bottling location (44%; 18 of 41) than in the no bottling location condition (22%; 8 of 36) selected the juice that the blind pretest had established as the higher-quality juice ($\chi^2 = 4.03$, $p < .05$).

Discussion

The juice that was identified as higher quality in the pretest was identified at test as higher quality more often in the "biasing" attribute condition than in the no attribute condition. In other words, the biasing attribute helped consumers to choose the higher-quality brand after trying the product and after a delay. The result extends our previous findings by using an actual consumption experience instead of artificial quality feedback, a significant delay between the first and the second phase, real brand names, and a consistently biasing cue. Furthermore, the findings indicate that the accuracy-enhancing effect is not limited to situations in which the quality information is a discrete star rating instead of an actual consumption experience, because no discrete star rating feedback was provided during the learning phase. This finding again suggests that attribute information that biases the initial quality expectations that drive trial may help consumers to make better repeat purchase decisions over time. From a marketer's perspective, the results in experiment 2 suggest that touting an attribute such as "bottled in Florida" on an inferior product can bias initial quality expectations upward and presumably stimulate product trial but may backfire by helping consumers avoid the inferior product at the time of repeat purchase.

EXPERIMENT 3

Experiments 1 and 2 show, importantly, that initially biasing cues can enhance the accuracy of postexperience and postdelay quality judgments. However, although those cues have been shown to actually bias pretrial quality judgments, experiments 1 and 2 have not demonstrated that the accuracy-enhancing effect is related to the biasing nature of those cues per se. The results are consistent with several explanations, all relying on the effect of bottling location as a memory cue. That is, the presence of the bottling location information allowed participants in the test phase to better retrieve information about the relationship between bottling location and quality that was stored in memory during the learning phase. This information then helped to determine the quality levels at test. But any cue could yield such a memory cue effect, and it is unclear whether the memory cue effect was inhibited, boosted, or unaffected by the initially biasing nature of the cue. For example, it is possible that there was some perseverance of participants' prior beliefs about the relationship between bottling location and quality but that this belief perseverance effect was smaller than the beneficial memory cue effect. Such an explanation would be consistent with a weaker form of the belief perseverance hypothesis found in the literature (e.g., Broniarczyk and Alba 1994b; Carpenter et al. 1994; Lichtenstein and Burton 1989; Pechmann and Ratneshwar 1992). This would lead to the prediction that when an initially biasing attribute (e.g., price) is compared with an attribute that has a weaker or no biasing effect on initial quality predictions (e.g., package size), quality judgments at test will be more accurate with an initially nonbiasing attribute than with an initially biasing attribute.

In contrast, the research by Baumgartner (1995) and by Wright and Murphy (1984) raises the possibility that the memory cue effect would be enhanced by the initially biasing nature of the added attribute. Consumers' prior beliefs about the relationship between an initially biasing attribute (e.g., bottling location or price) and quality may engender a hypothesis-testing process that helps participants to discover and encode the true relationship between the attribute and quality, making the attribute a more effective memory cue at test. Because participants may be less likely to have or to form a theory about the relationship between quality and an attribute that has less power to bias initial quality expectations (e.g., package size), such a hypothesis-testing process may be less likely for initially nonbiasing attributes. Thus, the research by Baumgartner (1995) and Wright and Murphy (1984) inspires the hypothesis that the initially biasing nature of an attribute enhances rather than diminishes accuracy at test.

Finally, it is also possible that the initially biasing nature of a cue has little or no effect at all. This might be the case, for example, if prior beliefs are set aside as soon as direct quality feedback is received, because the latter is considered more diagnostic than the former as a source of information. In this case, only the basic beneficial effect of having an additional memory cue is at play, and a null effect on accuracy should be expected when contrasting attributes that have a stronger versus weaker biasing effect on initial quality expectations. In experiment 3, we tested the three competing hypotheses discussed above by manipulating the initially biasing nature of an extrinsic attribute (instead of contrasting an initially biasing extrinsic attribute with the absence of an attribute). In addition, we used a different initially biasing attribute—price.

Method

Eighty undergraduates at the University of Florida participated in the study in exchange for partial course credit. Four participants failed to provide data for the test phase and were excluded from the analyses. Experiment 3 had two conditions. The price condition was identical to the bottling location condition in experiment 1, with the exception that we replaced bottling locations with prices. The products were priced at \$1.69, \$2.49, and \$3.99. The size condition was identical to the price condition, except that dollars were replaced by liters (e.g., 1.69 liters).

Results

As a manipulation check, the correlation was calculated for each participant between attribute levels (i.e., levels of price or size) and initial quality predictions. The mean correlation was significantly different from zero in the price ($r = .70$; $t(41) = 8.8$, $p < .001$) but not in the size condition ($r = .06$; $t(33) < 1$). The difference between the two conditions was statistically significant ($t(74) = 4.2$, $p < .001$). Thus, price had a greater capacity than size to bias initial quality judgments.

The crucial question is whether accuracy at the time of test in the price condition was lower than, equal to, or higher than that in the size condition. The data were in line with the latter. The correlation between actual and judged brand quality during the test phase was significantly higher in the price ($r = .92$) than in the size condition ($r = .65$; $t(74) = 3.0$, $p < .01$). Thus, adding an initially more potent biasing cue led to more accurate quality judgments over time than did adding a less potent biasing cue.

Discussion

The suggestion is that the initially biasing nature of biasing cues has a distinct and essential impact on postfeedback quality judgments. An initially biasing cue led to higher accuracy of postfeedback quality judgments than did a cue that never had the power to bias.

Together, experiments 1–3 establish an accuracy-enhancing effect of biasing cues that is enhanced by the initially biasing nature of those biasing cues. The implication is that making a cue biasing (e.g., by setting high prices for low-quality products) or adding it to the marketing mix (e.g., a biasing attribute other than price) may backfire on marketers seeking to mislead consumers. The biasing cue biases initial quality expectations, which form the basis of trial, but helps consumers to more accurately judge product quality later (e.g., at the time of repeat purchase).

EXPERIMENT 4

The previous studies have all shown higher consistency between objective product quality levels (e.g., as provided by us during the learning phase) and consumers' judgments of those quality levels after a delay. However, from a consumer's perspective, the most important consistency may not be that between their postdelay quality judgments and some "objective" quality level as determined by, for example, *Consumer Reports*. For consumers, it is often important to repeat purchase the products they had liked when they previously tried them and to avoid repeat purchasing products they had not liked when they tried them (regardless of whether *Consumer Reports* liked them too). Thus, experiment 4 aims at establishing that a price cue can help consumers to achieve higher consistency between their own subjectively perceived quality experiences at time of trial and their quality judgments after a delay (e.g., when considering repeat purchase).

The important managerial question that arises when subjective quality experience at trial is considered—rather than objective quality provided to the consumer—is whether those subjective experiences are biased by the biasing cue. The answer may determine whether, at time of repeat purchase, an accuracy-enhancing or a continued biasing effect will occur. From previous experiments we know that the pretrial expectations had been biased, but we do not know whether an actual trial experience was or would have been influenced by the biasing cue. The question is probably straightforward when the experience is unambiguous. Past research anticipates little impact, if any, of the biasing cue on the experience (Hoch and Ha 1986). In that case, the cue that biased pretrial quality expectations should help consumers after a postexperience delay to retrieve unbiased trial experiences. Hence, an accuracy-enhancing effect is anticipated. However, when the experience is ambiguous, the answer seems less unequivocal. Hoch and Ha (1986) also demonstrated that ambiguous experiences may be influenced (biased) by prior beliefs. If so, the biasing cue should "help" consumers after a postexperience delay to retrieve biased trial experiences. This process in effect perpetuates or cements the bias. Thus, a continued biasing effect rather an accuracy-enhancing effect should occur. The implication would be that managers' use of initially biasing cues can backfire, but only when the quality experience is unambiguous. In contrast, work by Wright and Murphy (1984) and Baumgartner (1995) strongly suggests that prior beliefs may guide an unbiased hypothesis-testing process instead of a confirmatory hypothesis-testing process. In this case, prior beliefs that biased pretrial quality expectations should not bias quality ratings immediately after trial. If so, the cue should then help consumers after a postexperience delay to retrieve unbiased trial experiences, and an accuracy-enhancing effect should occur. The managerial implication would be that even in a context with relatively ambiguous quality, it is not "safe" for managers to use initially biasing cues.

In addition to manipulating the ambiguity of product experience and measuring the subjectively experienced quality during product trial, we made several other changes in experiment 4. In experiment 2 we used real brand names, but one could argue that the brand names were still relatively similar. This level of similarity is not unrealistic, because the number of associations employed in the orange juice category is extremely limited (e.g., derivations of the words *sun*, *fresh*, and *orange* account for a majority of brand names in the European orange juice market). Nevertheless, in experiment 4 the brand names of the previous studies were replaced by less similar names. This is important because less similar brand names function as more effective memory cues by themselves (Warlop et al. 2005). This makes the role of the initially biasing attribute less critical and might reduce the size of the effect of initially biasing attributes. Thus, it is important to show that our effects obtain with dissimilar brand names. Another change is that we used two new product categories to assess generalization to other categories than orange juice. Furthermore, to show generalization across cultures, we conducted experiment 4 in two western European countries. Finally, as in experiment 3 we used price as a biasing cue to assess whether the effect of price generalizes to situations in which participants assess the physical products directly during the learning phase instead of being told what their quality levels were.

To summarize, experiment 4 wants to take the previous results one step further by (1) establishing that a biasing cue such as price improves the consistency between subjective quality experiences—rather than objective quality information—and postdelay judgments of the experienced products, (2) exploring whether such subjective quality experiences are biased by the biasing cue, in a more ambiguous and in a less ambiguous quality context, and (3) using different product categories and brand names that are less similar to each other.

Method

We manipulated the presence versus absence of price information and the ambiguity of quality feedback. Following Hoch and Ha (1986), we used polo shirts in the ambiguous conditions and paper towels in the unambiguous conditions. During the learning phase, participants physically examined two products (two polo shirts or two paper towels) and were asked to indicate which of the two products had the highest quality level. We did not ask participants in the main experiment to rate their quality expectations before examining the products (to avoid steering participants toward an explicit comparison process between predictions and their experience while examining the products) but conducted a separate test using participants from the same subject pool to test prior beliefs (described at the end of this section). The test phase was similar to that in experiment 2.

Upon entering the lab, participants were randomly assigned to assess the quality of either polo shirts (ambiguous) or paper towels (unambiguous). As in experiment 2, we listed four products and told participants they would try two of the products that day. In the price conditions, we listed each product's brand name and price. In the no price conditions, we listed only brand names. The two products to be experienced were labeled as Kmart and Wal-Mart. The assignment of these two brand names to the experienced products was counterbalanced. (The two other brand names were Sears and Target.) With a high price of \$6.00 and a low price of \$3.99, the prices of the experienced products were set to be in line with current market prices. The assignment of the two prices to the experienced products was counterbalanced. Sears (\$4.79) and Target (\$5.29) products were always priced the same. The polo shirts were both selected to be on the lower end of the quality spectrum (a red shirt was purchased at Zeeman, and a blue shirt was purchased at Wibra; Zeeman and Wibra are two European clothing store chains), while in the paper towel category one brand was intended to be a higher-quality product (the actual product used was sold in Belgium under the Maestro Lotus brand) and the other a lower-quality product (sold in Belgium as Carrefour 1). Thus, participants experienced either two polo shirts (ambiguous condition) or two brands of paper towels (unambiguous condition). In the ambiguous/price condition, the red polo shirt was identified with either the Wal-Mart or the Kmart brand and carried either a high price of \$6.00 or a low price of \$3.99. The blue polo shirt was always presented with the other brand name (e.g., Kmart if the red polo shirt was branded Wal-Mart) and the other price (e.g., \$3.99 if the red polo shirt was priced at \$6.00). The ambiguous/no price condition was the same except that no price information was given either during learning or at test. In the unambiguous/price condition, the higher-quality paper towel was also identified with either the Wal-Mart or Kmart brand and also carried either a high price of \$6.00 or a low price of \$3.99. The lower-quality paper towel was always identified with the other brand name (e.g., Kmart if the higher-quality paper towel was branded Wal-Mart) and the other price (e.g., \$3.99 if the higher-quality paper towel was priced at \$6.00). The unambiguous/no price condition was the same except that no price information was given. Relatively low-priced polo shirts were used to keep the prices constant (at a realistic level) between ambiguous (polo shirts) and unambiguous (paper towels) categories. The order of the products in the learning phase was counterbalanced.

Participants physically examined the first product at the beginning of the experimental session. The second product was examined after a minimum time interval of 10 minutes, during which an unrelated task was completed. Participants in the unambiguous conditions were encouraged to use ketchup to test the quality of the paper towels (cf. Hoch and Ha 1986). After examination of the second product, participants were asked to circle the product they believed was the highest-quality product on their instruction sheet.

The test phase measure was conducted by e-mail 1 week after the learning phase. The e-mail listed the same four brands (and prices in the price condition) and asked participants to indicate the highest-quality product they had tried before. The instructions were the same as during the learning phase. A reminder e-mail message was sent after another week to participants who had not responded to the first e-mail. One hundred and thirty-nine participants at Erasmus University in the Netherlands and Catholic University of Leuven in Belgium participated in the learning phase in return for partial course credit. Eight participants in the unambiguous/no price condition, three in the unambiguous/price condition, five in the ambiguous/no price condition, and zero in the ambiguous/price condition failed to participate in the test phase.

To establish the initially biasing nature of the price cue, we asked an independent sample of participants from the same subject pool to indicate their pretrial quality expectations for higher- and lower-priced polo shirts or paper towels. Participants were presented with the same pretrial information as in the price conditions of the main experiment—a list of four brands (Kmart, Wal-Mart, Sears, and Target) accompanied by prices. Participants were told that two of the four brands (Wal-Mart and Kmart) had drawn their attention and that they should indicate which brand they expected to be the highest-quality brand. As in the main study, one of these two brands had the lowest price ($3.99) and the other the highest ($6.00) of all four brands. We counterbalanced the assignment of the brand names (Kmart and Wal-Mart) to the prices ($3.99 and $6.00). We manipulated the product category between participants. In one condition, the brand names and prices referred to paper towels, in the other condition to polo shirts. Thus, the only difference between this manipulation check experiment and the trial phase of the price conditions in the main experiment was that quality judgments were pretrial expectations instead of judgments made immediately after trying a product. A successful price manipulation required that a majority of participants in the paper towels and polo shirts conditions expected the higher-priced option to have the highest quality.

Results

Manipulation Checks. The manipulation check experiment showed that most participants did hold prior beliefs that the higher-priced product would be of higher quality than the lower-priced product both in the paper towel condition (27 of 32; $\chi^2 = 15.13$, $p < .001$) and in the polo shirt condition (27 of 35; $\chi^2 = 10.13$, $p < .01$). This establishes the initially biasing nature of the price cue.

We used the learning phase responses from the no price conditions in the main experiment as a manipulation check of ambiguity. (Brand names were counterbalanced so that average responses were not influenced by the brand names.) The data confirmed that the quality experience was ambiguous in the polo shirt condition. Each of the two tested products was selected as the "high quality product" by approximately 50% of participants (51% selected the red polo shirt vs. 49% for the blue polo shirt; $\chi^2 < 1$, $p > .5$). The quality experience was unambiguous in the paper towel condition, in which the higher-quality product was selected by 91% of participants ($\chi^2 = 21.13$, $p < .001$).

Hypothesis Testing. Our theory holds that an initially biasing cue helps consumers to retrieve and use the relationship between the cue and product quality as experienced during product trial. Thus, the main hypothesis tested in experiment 4 was that participants in the price conditions show more consistency than in the no price conditions between their judgments during the learning phase and their judgments during the test phase, regardless of whether product experience was ambiguous or unambiguous. This hypothesis was confirmed. Ninety-six percent of the respondents were consistent in the price condition versus 72% in the no price condition ($\chi^2 = 13.31$, $p < .001$). The effect holds in both the ambiguous (91% [32 of 35] vs. 73% [22 of 30]; $\chi^2 = 3.76$, $p = .05$) and the unambiguous condition (100% [34 of 34] vs. 71% [17 of 24]; $\chi^2 = 11.28$, $p < .001$). Because one of the counts (inconsistent responses in the unambiguous/price condition) was zero, we were unable to test for an interaction effect. A logit model in which one observation was added to all counts did not yield a significant interaction ($b = -1.57$, SE $= 1.28$, $p = .22$).

We also explored the impact of an initially biasing cue on consumers' impressions of product quality immediately after trying the products. Results indicated that price did not have a significant effect on quality experienced at trial. Participants were not more likely to choose the higher-priced option than the lower-priced option during the learning phase (32 vs. 40, respectively; $\chi^2 = .89$, $p > .34$), neither in the ambiguous (15 vs. 20; $\chi^2 = .71$, $p > .39$) nor in the unambiguous condition (17 vs. 20; $\chi^2 = .24$, $p > .62$). Thus, price did not significantly affect participants' experiences at trial. This occurred despite the fact that the manipulation check experiment showed that participants did have prior beliefs that biased their initial quality expectations and that could have served as hypotheses for a confirmatory hypothesis-testing process.

Discussion

Confirming our hypothesis, results in experiment 4 showed that adding a price cue helped participants to more accurately indicate what they thought was the highest-quality product in a product test conducted 1–2 weeks before. As expected, this was true regardless of whether that product test experience had been less or more ambiguous. This finding suggests that price information aids consumers at the time of repeat purchase by helping them retrieve their subjective product trial experiences instead of biasing their repeat purchase judgments away from the products they had liked during trial.

Also as expected, we found that consumers' immediate assessments of the quality of their trial experiences were not significantly influenced by price information when the quality differences between the products during product trial were unambiguous. Perhaps more surprisingly, subjective trial experiences in the ambiguous condition were not significantly influenced by price information either. A biasing cue may influence the expectations but does not necessarily influence the actual experience, even in an ambiguous quality context.

Together, the findings in experiment 4 and the accompanying manipulation check experiment illustrate that the effects of biasing cues should be considered at three different points in the consumption process. First, before deciding which products to try, a consumer predicts the quality of products in the consideration set on the basis of extrinsic cues such as brand name, bottling location, or price. To the extent that heuristics about the relationship between these cues and product quality do not reflect the actual relationship, using the extrinsic cues leads to biased predictions. The manipulation check experiment accompanying experiment 4 shows that participants expected higher-priced paper towels and polos to be of higher quality.

Second, while or immediately after consumers try a product, they judge the quality of their trial consumption experience. As outlined in the introduction of this study, these judgments may or may not be influenced by biased pretrial expectations. In experiment 4, we did not find a significant influence of price on quality judgments at trial, not even when trial was ambiguous. This result is unexpected on the basis of the findings by Hoch and Ha (1986) but supports the view that biased prior beliefs do not necessarily lead to a confirmatory hypothesis-testing process (Baumgartner 1995; Wright and Murphy 1984). Of course, we would not want to claim that confirmatory hypothesis testing would never appear. There may be other even more ambiguous situations in which cues such as price do influence consumers' trial experiences. However, our failure to find such a result in the current study does suggest that this influence may be weaker and less widespread than one might have anticipated on the basis of a reading of the literature.

Third, after a delay, consumers may encounter some of the products they have tried before, and they will have to decide which product to repurchase. To make this decision, they will have to judge the quality of the previously tried products again on the basis of extrinsic cues such as brand name, price, or bottling location. The core of our theory is that instead of basing these postdelay quality judgments on, for example, the price-quality heuristic they used for their pretrial expectations, consumers will use the initially biasing cue as a memory cue to retrieve the quality judgments they made at trial. Thus, initially biasing attributes increase the consistency between quality judgments immediately after trial and quality judgments at repeat purchase, regardless of whether the former are unbiased or biased. When those quality judgments at trial are unbiased, the result is an accuracy-enhancing effect, in the sense that quality judgments at repeat purchase better reflect the true quality of the products or the intrinsic preferences of the consumer in the presence (vs. absence) of a cue that biased pretrial quality expectations. When quality judgments at trial are strongly biased, our theory holds that an accuracy-reducing effect should occur, in the sense that quality judgments at repeat purchase would be less reflective of the true quality of the products or the intrinsic preferences of the consumer in the presence (vs. absence) of a cue that biased pretrial quality expectations.

GENERAL DISCUSSION

Summary

Many authors have shown that quality judgments can be biased by extrinsic cues such as price or irrelevant attributes (Broniarczyk and Alba 1994b; Carpenter et al. 1994). Our data confirmed this finding for initial quality judgments made before receiving quality feedback through product trial or from an external source. However, we found that those initially biasing cues can make later quality judgments, made after receiving quality feedback and a subsequent delay, more accurate (experiments 1 and 2). We refer to this phenomenon as the accuracy-enhancing effect of biasing cues. In addition to demonstrating the phenomenon, we documented that the accuracy-enhancing effect can be larger for an initially biasing cue than for a cue that did not significantly bias initial quality expectations (experiment 3), and we explored its robustness in the face of relatively ambiguous consumption experiences (experiment 4). Across experiments, the accuracy-enhancing effect was observed with different types of biasing cues (price and bottling location), with a 5-minute but also a 2-week time interval between trial and repeat purchase, with similar and dissimilar brand names, with different dependent measures, with different product categories, and with products and brands that are available on the market.

Implications

Previous research would lead us to expect that marketers can easily hurt consumers by giving misleading or irrelevant attribute information. For example, adding an irrelevant attribute can make a product look more attractive without changing its intrinsic quality. Putting a high price on an inferior product can do the same. The current experiments suggest that such misleading information would indeed bias consumers' pretrial expectations of quality but demonstrate that the biasing effect may often be short-lived. After trial and a delay, at the time of repeat purchase, the initially biasing information can help consumers to retrieve the quality of their consumption experiences more accurately. Thus, highlighting biasing attributes might actually help consumers to judge the quality of the product more accurately at repeat purchase. Instead of persevering in their reliance on a biased heuristic or rule or instead of learning that the attribute is irrelevant and ignoring it in quality judgment, consumers may use the initially biasing information as a memory hook to retrieve the relationship between the initially biasing cue and quality as experienced during product trial. Thus, even though biasing cues such as irrelevant attributes may help a manager at first, they may backfire later on and instead protect the customer by helping to avoid suboptimal repeat-purchase decisions.

The reported experiments contribute to the literature on the effects of consumers' (prior) beliefs, which deals with consumers' use of extrinsic cues such as price or irrelevant attributes to judge outcomes such as product quality. First, we found that the initially biasing cues became beneficial after a delay by increasing the consistency between post-delay quality judgments and (1) participants' subjective evaluations at trial (experiment 4), (2) externally provided "objective" quality feedback not unlike information provided by consumer organizations and (comparison) shopping Web sites (experiments 1 and 3), and (3) quality as determined by a blind taste test (experiment 2). In addition, the results qualify the idea of prior beliefs as having a strong and perseverant biasing influence on consumers' judgments of product quality (Broniarczyk and Alba 1994b; Carpenter et al. 1994; Pechmann and Ratneshwar 1992). Whereas prefeedback judgments of specific products were indeed strongly biased by participants' prior beliefs about extrinsic cues such as price (experiments 1, 3, and 4), we did not find an effect of those prior beliefs on participants' evaluations of even relatively ambiguous consumption experiences (experiment 4). In addition, because the initially biasing cue in experiment 3 led to higher accuracy than an initially nonbiasing cue after the delay, our findings are not the result of a biasing influence being outweighed by the initially biasing cue's function as an additional memory cue at the time of repeat purchase.

Our findings are consistent with research by Wright and Murphy (1984) and Baumgartner (1995), who showed that covariation detection was not hurt by prior beliefs that were inconsistent with the data. Their research showed a beneficial effect of incorrect prior beliefs on immediate judgments based on unambiguous, discrete, and externally provided data. Our research shows beneficial effects after a delay, uncovering a role for the attribute involved in incorrect prior beliefs as a memory cue. In addition, we find a beneficial effect of initially biasing prior beliefs even when the data are not unambiguous, discrete, or externally provided but are the result of relatively ambiguous experiences of real products (e.g., orange juice, polo shirts). The latter is important because the existing research shows that incorrect prior beliefs can help judgments about large numbers of immutable data points but does not preclude in any way that biases could persist if the data that go into those judgments (e.g., subjectively experienced quality levels instead of discrete X and Y coordinates) could be biased by the prior beliefs in the first place. In sum, our research provides new and important evidence to help redress the imbalance between a view of consumers' prior beliefs as clouding their judgment, making them persevere in bad choices, and a view of consumers' prior beliefs as useful guides that help to interpret, organize, store, and retrieve information, resulting in a beneficial effect on consumers' decisions.

Limitations and Future Research

Whereas results in experiment 4 showed no biasing effect of prior beliefs on participants' evaluations of even relatively ambiguous consumption experiences, other authors did find such effects (Hoch and Ha 1986) with the use of somewhat similar paradigms. Of course, finding such an effect would not threaten our conclusions about the role of initially biasing cues as memory cues as long as an initially biasing cue yields higher consistency between subjective trial experiences at trial and quality judgments after a delay. In addition, finding such an effect would not preclude the substantive importance of our findings as long as there are sufficient numbers of other real-world situations in which trial experiences or externally provided quality information (e.g., through word of mouth) is sufficiently unambiguous to preserve consumers' preference order in the face of incorrect prior beliefs. However, to explore the robustness of the perhaps surprising absence of a biasing effect of prior beliefs on subjective evaluations during product trial, we conducted an additional experiment, replicating experiment 4 with a taste test of orange juices instead of using paper towels and polo shirts. Again, no significant influence was found for prior beliefs on quality judgments at trial, and greater consistency was found between those judgments and judgments after a substantial delay. Thus, we do not dispute that consumption experiences can be biased by prior beliefs in some situations. We also do not dispute that this might lead consumers to repeat purchase objectively inferior or overpriced parity products. However, it does appear that the accuracy-enhancing effect can be robust even in the face of relatively ambiguous experiences. Strong biasing effects of prior beliefs on subjective consumption experiences may be rarer than one would expect on the basis of the literature, and the beneficial power of even incorrect theories to guide perception and cognition may be stronger than one might expect (Baumgartner 1995; Wright and Murphy 1984).

The absence in study 4 of a biasing effect of pretrial beliefs on consumers' evaluations of ambiguous consumption experiences does raise an important question. It is not clear when prior beliefs will actually bias quality judgments versus play a more beneficial role. One factor that might be of importance is the capacity for biased expectations to influence information search and attention (Hoch and Deighton 1989). In our experiments we made sure participants were exposed to hypothesis-disconfirming information in the shape of quality ratings or taste experiences. If, however, consumers engage in confirmatory information search or bias their attention toward expectation-confirming information, prior beliefs may be the basis for continued bias. Another factor that might play a role is the complexity of stimuli. It is possible that stimuli that are ambiguous because of their complexity are more prone to continued bias than the simple orange juices, polo shirts, or paper towels used in our experiments. Finally, consumers may be more impervious even to information that unambiguously disconfirms their hypotheses when products at test are different from the ones during learning. In our experiments, the products rated in the test phase were the same as those experienced in the learning phase. In other research, the products at learning and test were not the same products (Broniarczyk and Alba 1994a, 1994b; Cronley et al. 2005; Kardes et al. 2004; Rao and Monroe 1988, 1989). Thus, the accuracy-enhancing effect may be more likely to occur when the test items are the same products as the learning items.

The latter observation has implications for the process behind the accuracy-enhancing effect. If a requirement for the accuracy-enhancing effect is that the test items are the same products as the learning items, a possibly controversial suggestion is that consumers do not update their original biasing belief during the learning phase. Instead, the biasing cue may help them to remember the specific quality level of an individual product they experienced before. If so, the biasing cue may continue to bias quality judgments for brands consumers have not experienced before while the same cue enhances accuracy for brands consumers have experienced before. Future research is called for to empirically investigate this hypothesis.

Conclusion

Extrinsic attributes such as price or bottling location can be used to bias consumers' initial quality expectations. This can make consumers buy and try suboptimal products. However, instead of continuing to bias consumers' quality judgments, the same extrinsic attributes that biased the initial quality expectations may increase the accuracy of consumers' quality judgments at a later point in time. Thus, trying to deceive consumers with the use of extrinsic attributes may induce trial in the short term but may come back to haunt the deceiver at the time of repeat purchase.

REFERENCES

Allison, Ralph I. and Kenneth P. Uhl (1964), "Influence of Beer Brand Identification on Taste Perception," *Journal of Marketing Research*, 1 (August), 36–39.

Baumgartner, Hans (1995), "On the Utility of Consumers' Theories in Judgments of Covariation," *Journal of Consumer Research*, 21 (March), 634–43.

Brehmer, Berndt (1980), "In One Word: Not from Experience," *Acta Psychologica*, 57, 117–39.

Broniarczyk, Susan M. and Joseph W. Alba (1994a), "The Role of Consumers' Intuitions in Inference Making," *Journal of Consumer Research*, 21 (December), 393–407.

——— (1994b), "Theory versus Data in Prediction and Correlation Tasks," *Organizational Behavior and Human Decision Processes*, 57 (January), 117–39.

Broniarczyk, Susan M. and Andrew Gershoff (1997), "Meaningless Differentiation Revisited," in *Advances in Consumer Research*, Vol. 24, ed. Merrie Brucks and Deborah J. MacInnis, Provo, UT: Association for Consumer Research, 223–28.

Brown, Christina L. and Gregory S. Carpenter (2000), "Why Is the Trivial Important? A Reasons-Based Account for the Effects of Trivial Attributes on Choice," *Journal of Consumer Research*, 26 (March), 372–85.

Carpenter, Gregory S., Rashi Glazer, and Kent Nakamoto (1994), "Meaningful Brands from Meaningless Differentiation: The Dependence on Irrelevant Attributes," *Journal of Marketing Research*, 31 (August), 339–50.

Chapman, Loren J. and Jean P. Chapman (1969), "Illusory Correlation as an Obstacle to the Use of Valid Psychodiagnostic Signs," *Journal of Abnormal Psychology*, 74, 271–80.

Cronley, Maria L., Steven S. Posavac, Tracy Meyer, Frank R. Kardes, and James J. Kellaris (2005), "A Selective Hypothesis Testing Perspective on Price-Quality Inference and Inference-Based Choice," *Journal of Consumer Psychology*, 15 (2), 159–69.

Dodds, William B., Kent B. Monroe, and Dhruv Grewal (1991), "Effects of Price, Brand, and Store Information on Buyers' Product Evaluations," *Journal of Marketing Research*, 28 (August), 307–19.

Hoch, Stephen J. and John Deighton (1989), "Managing What Consumers Learn from Experience," *Journal of Marketing*, 53 (April), 1–20.

Hoch, Stephen J. and Young-Won Ha (1986), "Consumer Learning: Advertising and the Ambiguity of Product Experience," *Journal of Consumer Research*, 13 (September), 221–33.

Kardes, Frank R., Maria L. Cronley, James J. Kellaris, and Steven S. Posavac (2004), "The Role of Selective Information Processing in Price-Quality Inference," *Journal of Consumer Research*, 31 (September), 368–74.

Lichtenstein, Donald R. and Scott Burton (1989), "The Relationship between Perceived and Objective Price-Quality," *Journal of Marketing Research*, 26 (November), 429–43.

Pechmann, Cornelia and S. Ratneshwar (1992), "Consumer Covariation Judgments: Theory or Data Driven?" *Journal of Consumer Research*, 19 (December), 373–86.

Rao, Akshay R. and Kent B. Monroe (1988), "The Moderating Effect of Prior Knowledge on Cue Utilization in Product Evaluations," *Journal of Consumer Research*, 15 (September), 253–64.

——— (1989), "The Effect of Price, Brand Name, and Store Name on Buyers' Perceptions of Product Quality: An Integrative Review," *Journal of Marketing Research*, 26 (August), 351–57.

Simonson, Itamar, Stephen M. Nowlis, and Yael Simonson (1993), "The Effect of Irrelevant Preference Arguments on Consumer Choice," *Journal of Consumer Psychology*, 2 (3), 287–306.

Tellis, Gerard J. and Birger Wernerfelt (1987), "Competitive Price and Quality under Asymmetric Information," *Marketing Science*, 6 (Summer), 240–53.

Warlop, Luk, S. Ratneshwar, and Stijn M. J. van Osselaer (2005), "Distinctive Brand Cues and Memory for Product Consumption Experiences," *International Journal of Research in Marketing*, 22 (1), 27–44.

Wright, Jack C. and Gregory L. Murphy (1984), "The Utility of Theories in Intuitive Statistics: The Robustness of Theory-Based Judgments," *Journal of Experimental Psychology: General*, 113 (June), 301–22.