

Price-matching guarantees as signals of low store prices: survey and experimental evidence

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Abstract

Many retailers offer a price-matching guarantee that promises to pay consumers the difference if they find a lower price elsewhere. This article proposes that the effectiveness of a price-matching guarantee as a signal of low store prices depends on individuals' beliefs about the degree to which other consumers in the market engage in price search, enforce price-matching guarantees, or both. Consistent with signaling theory, results of a survey and two experimental studies demonstrate that market level factors affect consumer beliefs about the extent to which others engage in price search and thereby the effectiveness of price-matching guarantees in lowering perceptions of store prices. The implications of the findings for retail strategy are discussed along with directions for future research.

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Introduction

Recognizing that price image is an important determinant of shopping decisions, manufacturers and retailers use a number of strategies to convey their price image. A common tactic is to offer a price-matching (or beating) guarantee that promises to match (or beat) competitors' lower prices. For example, the price-matching guarantee of an electronics and appliance store is "If you see a lower price for any model we stock, we will be happy to refund you the difference." Such price guarantees are common in a variety of consumer markets including auto supplies, hardware, books, tires, furniture, and office products. Firms offering price guarantees include Sears, Best Buy, Circuit City, Gateway, Dell, Westin, Sheraton, Tanger Factory Outlet Centers, Sharper Image, Tweeter, Grand Union, and Staples (Arbatskaya, Hviid, & Shaffer 2000). Price-matching guarantees are unique because, unlike typical price promotions, they do not advertise a price reduction. Instead, they promise to match or beat a competitor's lower price. Further, to claim a refund, consumers often have to incur a hassle cost that may entail

engaging in additional price search, providing evidence of lower price, and returning to the store that offered the guarantee (Hviid & Shaffer, 1999).

Much of the research on price-matching guarantees focuses on the strategic aspects of such guarantees from the perspective of the firm (e.g., Salop, 1986). The predominant view in economics is that such guarantees reduce price competition and facilitate monopoly pricing (cf. Jain & Srivastava, 2000; Salop, 1986). However, recent research suggests that consumers associate price-matching guarantees with low store prices and, in fact, are more likely to buy from a store that offers a guarantee (Biswas, Pullig, Yagci, & Dean, 2000; Jain & Srivastava, 2000; Srivastava, 1999; Srivastava & Lurie, 2001).

Note that the presence of a price-matching guarantee does not necessarily guarantee that the store will post the lowest (or even lower than average) price. It only allows consumers to continue searching for a lower price after the purchase and to make the purchase at the lowest price that can be found elsewhere. Given that there is no guarantee that stores with price-matching guarantees post the lowest prices, under what conditions do price-matching guarantees signal and not signal low store prices?

Recent research examines how store-level features, characteristics of the price-matching guarantee itself, and personal characteristics of the buyer, such as differences in

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search cost, influence the effectiveness of the price-matching guarantee (e.g., Biswas et al., 2002; Kukar-Kinney & Walters, 2003; Srivastava, 1999; Srivastava & Lurie, 2001). Existing research shows that the effectiveness of a price-matching guarantee depends on the extent to which other cues indicate high or low prices (Biswas et al., 2002), the financial depth and competitive breadth of the guarantee (Kukar-Kinney & Walters, 2003), and whether the individual consumer's search costs are high or low (Srivastava & Lurie, 2001).

Despite the recent research, it is unclear how consumers view and respond to price-matching guarantees. For example, Biswas et al.'s (2002) findings suggest that a low price guarantee affects perceived value, shopping intentions, or search intentions even when other price cues are indicative of high store prices. This suggests that consumers always consider price-matching guarantees to be signals of store prices. However, Srivastava and Lurie (2001) found that a price-matching guarantee lowers search when the opportunity cost of time is high but actually increases search when the opportunity cost of time is low. This suggests that consumers only consider price-matching guarantees to be signals of low prices when individual search costs are high.

Although existing research has examined the moderating role of individual and situational variables, such as the opportunity cost of time and other price cues, little is known about the extent to which market-level factors, such as the competitive environment in a market (e.g., number of stores in a market or the distance between stores), influence consumer perceptions of price-matching guarantees. From a theoretical perspective, to understand the mechanism through which price-matching guarantees operate, it is important to explicitly recognize that consumer perceptions of store prices are based on observing and interpreting a guarantee within the context of market conditions (Stiglitz, 1989). For example, relatively little research exists that explicitly considers whether individuals view the behavior of other consumers in the marketplace as exerting a disciplinary effect on retail tactics such that it deters retailers from making false claims (cf. Feick & Price, 1987; Wernerfelt, 1988). Individuals' beliefs about the behavior of other consumers in the marketplace may have important implications for the effectiveness of various retail tactics including price-matching guarantees (Bloom, 1989; Ippolito, 1990). From an applied perspective, recommendations as to whether retailers should use price-matching guarantees have generally not considered the competitive environment in which such guarantees are made (e.g., Biswas et al., 2002; cf. Jain & Srivastava, 2000; Kukar-Kinney & Walters, 2003). Finally, from a public policy perspective, recent calls for regulatory action against firms offering price-matching guarantees (Edlin, 1997) may be premature to the extent that consumer behavior serves as a market force that disciplines errant retailers (Bloom, 1989; Feick & Price, 1987).

The primary purpose of this article is to examine how market level factors impact the effectiveness of price-matching

guarantees as a signal of low store prices. Specifically, a price-matching guarantee is examined within the context of a signaling game characterized by information asymmetry between firms and consumers about overall store prices (see Simester, 1995). Signaling theory is based on the premise that marketplace competition is driven by the interaction between sellers and buyers. The effectiveness of a price-matching guarantee as a signal of low store prices thus depends on market conditions (Kirmani & Rao, 2000; Nelson, 1970). Based on the assumption that consumers and firms are rational and capable of interpreting each other's moves, this article uses signaling theory to identify market conditions under which price-matching guarantees are and are not effective signals of low store prices. The predictions are tested empirically in a survey and two experiments.

The rest of the article is organized as follows. In the next section, we use signaling theory to derive the market conditions under which price-matching guarantees are and are not effective signals of low store prices. The predictions are tested in a preliminary survey and two experiments, described in the third and fourth sections, respectively. The final section discusses the implications of the findings and provides directions for future research.

Signaling theory

Signaling theory has been used extensively to describe situations characterized by information asymmetry about an unobservable attribute between firms and consumers (e.g., Nelson, 1970). Assuming that both firms and consumers are rational, signaling theory specifies conditions under which information asymmetry can be resolved and firms can convey information about the unobservable attribute (e.g., product quality) to consumers through some observable trait such as price or advertising level. Depending on market conditions, consumers can then use the observable trait to infer the unobservable attribute (see Boulding & Kirmani, 1993 for a more complete discussion). A few researchers have attempted to understand whether consumers' response to signals under different market conditions is consistent with the assumptions of signaling theory. For example, previous research has found support for the signaling theory assumptions regarding the influence of brand name (e.g., Erdem & Swait, 1998), warranty (Boulding & Kirmani, 1993), and advertising expenditures (e.g., Kirmani, 1990) on consumer perceptions of product quality. In a similar vein, the present study uses signaling theory to specify market conditions under which a price-matching guarantee signal is likely to be effective.

Previous studies on signaling theory focus on product quality as the unobservable attribute because uncertainty with respect to quality cannot be resolved fully prior to purchase. However, the present research examines price-matching guarantee as a signal of a store's overall

price image (Kirmani & Rao, 2000). To the extent that consumers know all the prices, such as with frequently purchased products, there is no need to signal prices. However, for most purchases, consumers do not have full price information and thus rely on the store's overall price image (see Simester, 1995). Price signaling is particularly relevant in markets with intense price competition and related price fluctuations. Retailers can thus use a variety of observable signals to convey overall price image and increase store patronage. In particular, signaling theory has been used to study the role of advertising a subset of prices and sale signs as signals of store price image (see Anderson & Simester, 1998, 2001; Simester, 1995).

Signaling theory suggests that most rational firms are unlikely to send false signals if the signals increase costs in terms of immediate profits, future profits, reputation (store equity), or all (Nelson, 1970). In other words, market mechanisms serve to discipline firms who send false signals (Ippolito, 1990; Kirmani & Rao, 2000). The disciplinary mechanisms are the key in signaling theory because the effectiveness of market signals depends on the prevailing strength of such mechanisms. When disciplinary mechanisms are strong, the cost that a firm is likely to incur or forfeit by sending a false signal is relatively high. However, when the disciplinary mechanisms are weak, firms may have an incentive to send false signals because the cost of sending a false signal is relatively low. In other words, market signals are likely to be truthful and credible when market disciplinary mechanisms are strong but not when the disciplinary mechanisms are weak. For example, if consumers are unable or unwilling to engage in price search, high-price retailers have an incentive to offer a price-matching guarantee knowing that it is unlikely that many consumers will claim refunds.

The market disciplinary mechanisms may be driven by consumer actions as they can exert market power and discipline erring firms by withholding repeat purchases, engaging in negative word-of-mouth, and calling for regulatory action (Rao, Qu, & Ruekert, 1999; Wernerfelt, 1988). Such consumer actions directly affect the intensity of the disciplinary mechanisms and thereby the cost to the firm if the signal is false. To the extent an individual believes that consumers can jointly exert market power, an individual's acceptance of market signals is likely to vary with his/her perceptions of the strength of the disciplinary mechanisms prevalent in the marketplace. For price-matching guarantees, consumers' willingness to engage in price search, claim refunds, or both is also a determinant of the strength of the disciplinary mechanisms because consumers have the option to enforce the guarantee and incur a monetary cost on the retailer if they find a lower price elsewhere. Since the risk of incurring a cost increases with the strength of the disciplinary mechanisms, a price-matching guarantee is likely to be a more effective signal of low store prices as consumers' willingness to engage in price search, enforce such guarantees, or both increases.

It is important to note that it is not sufficient that only consumers themselves or only a few consumers be willing to engage in price search. For a price-matching guarantee to be an effective signal of low store prices, individuals should believe that there are enough other consumers who are willing to engage in price search such that the costs of offering a price-matching guarantee for a high-priced retailer are sufficiently high (Feick & Price, 1987; Wernerfelt, 1988). Specifically, since other consumers' willingness to engage in price search and enforce guarantees adversely affects the potential cost to a high-price retailer, only a low priced retailer would risk offering a price-matching guarantee. For high-priced retailers, the cost of sending a false signal deters them from offering a price-matching guarantee. In other words, in the presence of a price-matching guarantee, individuals' perceptions of store prices should be negatively related to their perceptions of most consumers' willingness to enforce guarantees (if they find a lower price elsewhere). Further, the relationship between perceptions of other consumers' willingness to enforce guarantees and perceptions of store prices is mediated by perceptions of the cost of sending a false signal.

H1. In the presence of a price-matching guarantee, an increase in perceptions of the strength of the market disciplinary mechanisms will lower perceptions of store prices.

H2. In the presence of a price-matching guarantee, perceptions of the potential costs to a high-priced retailer of offering the guarantee will mediate the relationship between perceptions of other consumers' willingness to enforce a guarantee and perceptions of store prices.

Study 1: Survey

The main objective of Study 1 is to provide a preliminary test of the two hypotheses about the relationship between disciplinary mechanisms in the marketplace (i.e., perceptions of most consumers' willingness to enforce guarantees) and perceptions of store prices in the presence of a price-matching guarantee. A second objective of Study 1 is to control for additional factors that may affect store price perceptions. To control for such factors, the survey measures perceptions of the operating cost of the retailer, as well as perceptions of quality and service. Finally, because a price-matching guarantee generally applies to identical models, and it is often difficult to find identical products across retailers, the survey explores the extent to which consumers are aware of the problem of branded variants (Bergen, Dutta, & Shugan, 1996) and whether this affects how they view and interpret price-matching guarantees.

Method

One hundred and ten respondents, ranging in age from 22 to 64 years, were recruited at a major airport to participate

in the survey. The mean age of the respondents was about 42 years and 60% were males. Respondents were told that they were to rate a new Internet service that would provide information about retailers. They were told they would be reading an example of the kind of information they would obtain if they were actual users of the service. They were then provided with a description of an electronics and appliance store—Milo Electronics. They were informed that although an actual store was described, its actual name, address, and phone number were disguised. The description, adapted from an actual store description appearing in the Yellow Pages, included information about the features and the assortment of merchandise at the store. The layout and content of the original ad was retained as much as possible. The store description also included, in fine print, a price-matching guarantee that stated “Our pricing guarantee states that ‘If you buy a product at our store and find the identical product for a lower price elsewhere within 90 days, we will gladly refund the difference.’”

After reading the store description, respondents completed a survey that took about 10 min to complete. To be consistent with the cover story, data on several measures including information content and usefulness of the description were also collected. Perceptions of store prices were measured first followed by perceptions of consumers’ willingness to claim refunds, perceptions of the cost of sending a false signal, perceptions of operating costs, perceptions of product and service quality, and perceived difficulty of finding identical items at different stores. The order in which perceptions of willingness to claim refunds and perceptions of cost were collected was counterbalanced. Because order was insignificant, the data were aggregated across the two order conditions.

Perceptions of store prices were measured by averaging four items (Cronbach’s $\alpha = .88$): “Before taking a refund, the overall prices at Milo are most likely to be” (1 = Lower than average; 7 = Higher than average), “Relative to other electronics stores, the prices at Milo are most likely to be” (1 = Low; 7 = High), “Before taking a refund, my expectations about the overall prices at Milo are” (1 = Very high; 7 = Very low), and “Milo’s prices are likely to be” (1 = Higher than other stores; 7 = Lower than other stores). The last two items were reverse scored.

Respondents’ perceptions of other consumers’ willingness to claim refunds were measured by averaging three items (Cronbach’s $\alpha = .82$). The items were: “It is very likely that most people will claim a refund from Milo if they find a product that they bought at Milo for a lower price elsewhere,” “Most people will not claim a refund if they find a product that they bought at Milo for a lower price at another store” (1 = Strongly disagree; 7 = Strongly agree), and “The likelihood of most consumers claiming a refund if they find a lower price at another store is” (1 = Very low; 7 = Very high). The second item was reverse scored.

Perceptions of the cost that Milo stands to incur if its prices are high were measured by averaging responses to

three items (Cronbach’s $\alpha = .80$). The items were: “Milo is likely to incur substantial monetary costs if its prices are actually high” (1 = Strongly disagree; 7 = Strongly agree), “If Milo has high prices, the monetary costs that it will have to bear are” (1 = Very low; 7 = Very high), and “Milo will incur little or no costs if it has high prices” (1 = Strongly disagree; 7 = Strongly agree). The third item was reverse scored.

Respondents’ perceptions of the operating costs of Milo were measured by averaging their responses to two items ($r = .77$). The items were: “The operating costs for Milo must be substantial” (1 = Strongly disagree; 7 = Strongly agree) and “It is likely that the cost of operating a store like Milo is” (1 = Very low; 7 = Very high).

Two items were averaged to measure respondents’ perceptions of product quality at Milo Electronics ($r = .76$). The items were: “My expectations about the quality of the product at Milo are” (1 = Very bad; 7 = Very good) and “The quality of products that Milo carries is likely to be” (1 = Very low; 7 = Very high). Respondents’ responses to two items were averaged to measure perceptions of service quality ($r = .78$). The items were: “The overall service quality at Milo is most likely” (1 = Lower than average; 7 = Higher than average) and “My expectations about the level of service at Milo are” (1 = Very bad; 7 = Very good).

Perceived difficulty of finding identical models at different stores was measured by a single item: “A product of the same brand and model can be easily found in other stores.” Since a price-matching guarantee only applies to identical models and it is sometimes difficult to find identical products across retailers due to branded variants (Bergen et al., 1996), this item was included to assess whether this affects how consumers view price-matching guarantees.

Results and discussion

Several preliminary regressions indicated that perceptions of operating costs, perceptions of product quality, perceptions of service quality, and the perceived difficulty of finding identical models did not have a significant relationship with perceptions of store prices (all p ’s $> .3$). These variables were thus dropped from the analysis reported here (results do not change when these variables are included as covariates).

Based on signaling theory, H1 predicted that in the presence of a price-matching guarantee, perceptions of store prices would decrease with perceptions of other consumers’ willingness to claim refunds. Consistent with H1 (see Fig. 1, Panel A), a regression shows that perceptions of consumers’ willingness to claim refunds had a significant negative relationship with perceptions of store prices ($\beta = -.17$, $t = -2.98$, $p < .02$, $R^2 = .05$).

Further, H2 predicted that the relationship between perceptions of consumers’ willingness to claim refunds and perceptions of store prices is mediated by perceptions of the cost of sending a false signal. Hypothesis 2 was tested following

Relationship between consumers' willingness to claim refunds and perceptions of store prices

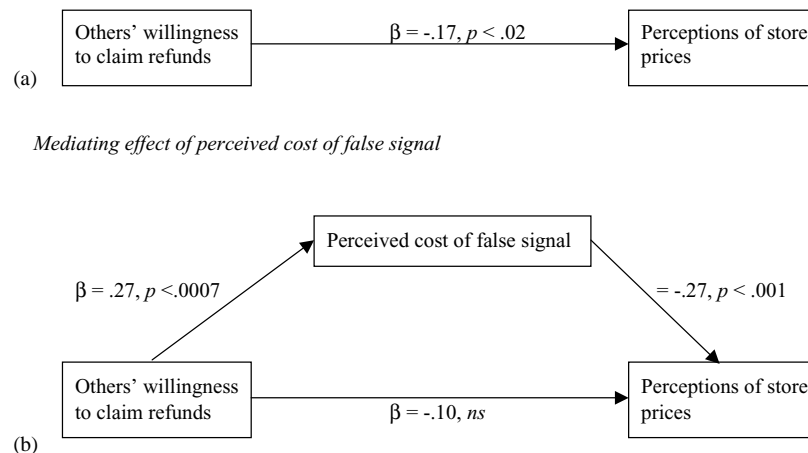


Fig. 1. Results of Study 1.

Baron and Kenny's (1986) procedure. First, Fig. 1 (Panel B) shows that respondents' perceptions of the cost that a store stands to incur increases with their perceptions of other consumers' willingness to claim refunds ($\beta = .27, t = 3.50, p < .0007, R^2 = .10$). This indicates that consumers share the intuition that the cost of offering a price-matching guarantee for a high-priced retailer increases with the strength of the market disciplinary mechanisms. Second, perceptions of store prices decreased with perceptions of the cost of sending a false signal ($\beta = -.27, t = -3.26, p < .001, R^2 = .09$). However, when perceptions of store prices was regressed as a function of perceptions of other consumers' willingness to claim refunds and perceptions of the cost of sending a false signal, consumers' willingness to claim refunds was not significant ($\beta = -.10, t = -1.30, ns$) but perceptions of the cost of sending a false signal remained significant ($\beta = -.23, t = -2.66, p < .008, R^2 = .11$). The analysis shows that, consistent with H2, the relationship between perceptions of other consumers' willingness to claim refunds and perceptions of store prices is mediated by perceptions of cost of false signal.

Consistent with signaling theory, the findings indicate that the effectiveness of a price-matching guarantee as a signal of low store prices is contingent on the perceived strength of disciplinary mechanisms operating in the marketplace. It is important to note that variations in consumer beliefs regarding the operating costs of stores did not affect price perceptions. We cannot, however, rule out the possibility that a price-matching policy affects the operating costs of stores. The findings also suggest that the signaling effect of price-matching guarantees for consumers does not vary with the perceived difficulty of finding identical items at different stores. Although the branded variants problem exists in the marketplace for some product categories (Bergen et al., 1996), consumers are either not aware of the problem or do

not believe that the problem is acute enough to render the price-matching guarantee useless.

Despite the support for signaling theory, the data in Study 1 were collected in a single survey and do not allow for meaningful causal inferences. Further, it is possible that measuring consumers' willingness to claim refunds and perceptions of the cost of sending a false signal may have heightened respondents' attention to the presence of the price-matching guarantee. Moreover, the items used in measuring the constructs may have cued subjects to the signaling rationale. Studies 2 and 3 thus undertake a more stringent test of signaling theory predictions by experimentally manipulating the market conditions that affect perceptions of the strength of market disciplinary mechanisms as well as the presence and absence of a price-matching guarantee. In particular, Studies 2 and 3 examine whether perceptions of other consumers' willingness to engage in price search, as opposed to willingness to claim refunds, are sufficient for the disciplinary mechanisms to operate in the market. The experimental manipulation of the market disciplinary mechanisms and the presence and absence of a price-matching guarantee avoids cuing subjects to the signaling rationale, allowing for more meaningful causal inferences.

Experimental studies

Study 1 found that the effectiveness of a market signal depends on the strength of the disciplinary mechanisms in the marketplace (others' willingness to enforce guarantees) and thereby the cost associated with sending a false signal. Studies 2 and 3 extend the findings of Study 1 by examining whether variability in perceptions of other consumers' willingness to engage in price search influences the effectiveness of a price-matching guarantee signal.

A critical determinant of perceptions of other consumers' willingness to engage in price search is the cost (or effort) associated with searching for a low price (Srivastava & Lurie, 2001). Since consumers' willingness to engage in price search decreases with search cost, the strength of disciplinary mechanisms in the marketplace increases inversely with search cost (or effort required). For a high-priced retailer, the cost of offering a price-matching guarantee is relatively high when consumers can easily engage in price search and compare prices. Low search costs should thus deter high-priced retailers from offering a price-matching guarantee. In contrast, when search costs are high, offering a price-matching guarantee is not as costly because it is not easy for consumers to engage in price search and compare prices and thereby claim a refund. This suggests that a price-matching guarantee is an effective signal of low store prices when search costs are low but not when search costs are high.

H3. Perceptions of store prices will be lower in the presence versus absence of a price-matching guarantee when search costs are low but not when search costs are high.

It is important to note that the signaling theory predictions rest on the assumption that the search costs are common knowledge such that all agents including retailers and consumers in a specific market know search costs, and all agents know that all know it, and so on. The common knowledge assumption about search costs, as opposed to opportunity costs measured at the individual level, allows individuals to infer market level behavior such as the extent to which other consumers are willing to engage in price search (Srivastava & Lurie, 2001; Urbany, 1986). For example, when consumers know that stores are close together or there are many stores in a market, this allows consumers to infer that the costs of price search and comparing prices is relatively low for all consumers. The common knowledge assumption allows consumers to make market level inferences such as extent to which other consumers will engage in price search.

Study 2

Study 2 manipulates search costs through the distance between stores. Unlike other studies, in which search costs are manipulated at the individual level (e.g., Srivastava & Lurie, 2001), this manipulation allows individuals to infer the extent to which other consumers in the market are likely to engage in price search and thereby claim a refund. We expect that perceptions of market disciplinary mechanisms will be higher, and price perceptions lower, when competing stores are close relative to when they are far. Further, given that price competition between competing stores should decrease as the distance between the stores increases, it is expected that price perceptions will be higher when the distance is large relative to when the distance is small. Importantly, signaling theory predicts that a price-matching guarantee is

more likely to be an effective signal of low store prices when the stores are close compared to when they are far apart.

Method

One hundred and six MBA students were recruited from an introductory marketing class and randomly assigned to a 2 (price-matching guarantee: absent and present) \times 2 (search costs: low and high) between-subjects experimental design in which they were asked to evaluate a new Internet directory service. The cover story was that the Direct Marketing Association (DMA), an organization dedicated to bringing together buyers and sellers at the wholesale and retail levels, was launching a new service called E-Yellow Pages. Subjects were told that the E-Yellow Pages would have two distinct advantages over traditional print versions. First, it would provide information about both on-line and off-line retailers in one place. Second, it would provide information about retailers that the print version does not provide (e.g., store location, distance from similar stores, consumer ratings, etc.). Although individual retailers provide most of the information content, the DMA provides additional information that may be of value to consumers. Subjects were told that the purpose of the survey was to solicit reactions to the information content of E-Yellow Pages as well as to assess people's interest in the new service on the basis of a sample web page. They were informed that although the sample web page was for a real electronics store, its name, address, and telephone numbers were disguised.

The store description was adapted from an ad in the Yellow Pages for an electronics store with the layout and information of the ad retained as much as possible (see Fig. 2). The description contained information from two sources: the seller and the DMA as a third party. The information provided by the seller contained the price-matching guarantee manipulation. When a price-matching guarantee was present, the statement "Our pricing guarantee is that if you buy a product at our store and find the identical product for a lower price at another store within 90 days, we will gladly refund you the difference" was inserted in fine print.

The commonly known search cost was manipulated through information provided by the DMA about the distance of the nearest competitor. In the high (low) search cost condition, subjects were told that the store's nearest competitor was 20 miles (1 mile) away. The rationale is that when the nearest competitor is relatively far away, search costs are high. This should lead subjects to believe that the extent to which other consumers are willing to engage in price search is low. Consumer perceptions of store prices, in turn, are expected to be higher in the high search cost condition because consumers may reason that a retailer with relatively little competition is likely to charge "monopoly" prices.

After reading the task scenario and the store description, subjects completed a 15-min questionnaire, were debriefed and dismissed. The debriefing revealed that no one suspected

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Our pricing guarantee is that "If you buy a product at Milo Home Systems and find the identical product for a lower price at another store, we will gladly refund you the difference."

Direct Marketing Association adds the following notes for Milo Home Systems:

- Sells brands such as Sony, Panasonic, JVC, Toshiba, etc.
- Milo's nearest competitor is 20 miles away.
- Customer ratings are being collected and will soon be available.

Fig. 2. Sample store description used in Study 2.

the actual purpose of the study. To be consistent with the cover story, the questionnaire included questions on usage, usefulness of the information, and the relative advantages of the E-Yellow Pages over the print version, and so forth. Subjects then responded to the main dependent measure followed by the manipulation checks on a separate page.

The primary dependent measure, perception of store prices, was measured by averaging three items (Cronbach's $\alpha = .87$). The three items were: "Based on the description, the overall prices at Milo Home Systems are most likely" (1 = Very low; 7 = Very high), "Relative to other stores, the prices at Milo Home Systems are most likely" (1 = Lower than average; 7 = Higher than average), and "Your general expectation about the overall price level at Milo Home Systems is" (1 = Very low; 7 = Very high).

Perceptions of consumer perceptions of market disciplinary mechanisms or willingness to engage in price search were measured by averaging responses to three items (Cronbach's $\alpha = .79$): "How likely is it that most consumers will compare Milo Home System's prices to other stores?" (1 = Very unlikely; 7 = Very likely), "How difficult or easy is it to compare the prices at Milo Home Systems with other stores?" (1 = Very difficult; 7 = Very easy), and "Most consumers at Milo Home Systems would be willing to shop around" (1 = Strongly disagree; 7 = Strongly agree).² To

avoid making the price-matching guarantee salient to subjects, none of the items alluded to a guarantee. The manipulation of distance between stores was assessed through a seven-point scale, "How far is Milo Home System's nearest competitor located?" (1 = Very close; 7 = Very far).

Results and discussion

A 2×2 ANOVA revealed that the store distance manipulation was successful. Milo Home System's nearest competitor was rated significantly farther away in the high cost (20 miles) condition relative to the low cost (1 mile) condition ($M = 5.16$ and 2.23 ; $F(1, 102) = 198.23$, $p < .0001$). No other effects were significant for the manipulation check measure.

Table 1 provides the means and standard deviations of the dependent measures. As expected, perceptions of store prices were significantly higher in the high search cost condition relative to the low search cost condition ($M = 5.11$ and 4.24 ; $F(1, 102) = 20.85$, $p < .0001$). This is because a store that is 20 miles from its nearest competitor (i.e., has relatively little competition) is likely to have higher prices than a store that is only a mile away from its competitor. However, the main effect of search cost was qualified by the significant interaction of the price-matching guarantee and search costs ($F(1, 102) = 4.32$, $p < .02$). Consistent with signaling theory and H3, the presence of a price-matching guarantee had a greater effect on perceptions of store prices when the search cost was low relative to when it was high.

² Strictly speaking, this measure includes ease of shopping and extent of shopping. The manipulation affects each individual measure significantly as well.

Table 1
Experimental studies: means and standard deviations

	Market-level search costs			
	Low		High	
	Absent ^a [1]	Present ^a [2]	Absent ^a [3]	Present ^a [4]
Study 2				
Store price perceptions	4.92 (.66)	3.90 (1.16)	5.24 (.88)	5.22 (.84)
Willingness to search	4.74 (1.23)	4.98 (.98)	4.12 (1.34)	3.78 (.88)
Study 3				
Store price perceptions	4.21 (.85)	3.58 (.94)	5.51 (.74)	5.32 (.73)
Willingness to search	5.44 (1.13)	5.26 (1.09)	4.42 (1.39)	4.10 (.79)
Contrasts for testing hypothesis 3	[1] – [2] > [3] – [4]			

Note: Cell numbers are given in square brackets and standard deviations are in parentheses.

^a Price-matching guarantee.

Planned contrasts reveal that when search costs were low, perceptions of store prices were significantly lower in the presence versus absence of a price-matching guarantee ($M = 3.90$ and 4.92 ; $F(1, 102) = 21.2$, $p < .0001$). In contrast, when search costs were high, the presence of a price-matching guarantee did not affect perceptions of store prices ($M = 5.22$ and 5.24 ; $F(1, 102) = 1.2$, ns). Fig. 3 shows the mean store price perceptions in the four different conditions. These results are consistent with H3.

In support of the signaling argument, the ANOVA results show that consumer perceptions of market disciplinary mechanisms, or other consumers' willingness to engage in price search, were higher when competitive stores were closer relative to when they were far away ($M = 4.86$ and 3.97 ; $F(1, 102) = 7.24$, $p < .002$). Neither the presence of a price-matching guarantee, or its interaction with the distance between stores, was significant. This suggests that consumers' interpretation of a price-matching guarantee signal involves an assessment of market factors such as the likelihood that other consumers will search for lower prices in the market and deter high-priced retailers from offering a price-matching guarantee.

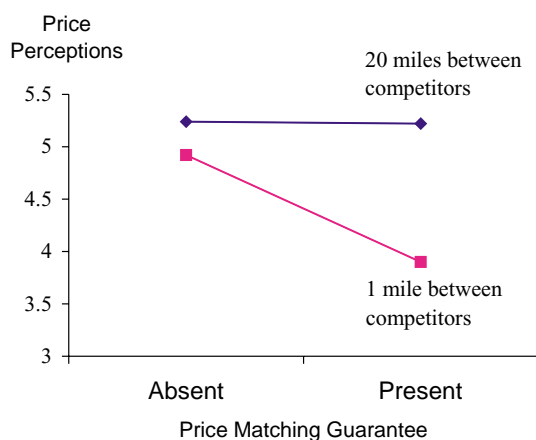


Fig. 3. Store price perceptions in Study 2.

Study 2 shows that the effectiveness of a price-matching guarantee as signal of low store prices is contingent on market-level conditions. As predicted by signaling theory, the effectiveness of a price-matching guarantee as a signal of low store prices depends on consumer beliefs about the strength of market mechanisms; in particular, the extent to which market factors encourage other consumers to engage in price search. Study 3 seeks to replicate the findings of Study 2 by manipulating the cost of shopping through the number of competitors in the market while using a different subject population.

Study 3

In Study 3, the commonly known search cost was manipulated through the number of competitors in the marketplace. We expect that price-matching guarantees will be more effective when there are more competitors in the market because an increase in the number of competitors will increase consumer beliefs that other consumers will engage in more price search. Seventy-seven subjects were randomly assigned to one of four conditions in a 2 (price-matching policy: absent and present) \times 2 (search costs: low and high) between-subjects experimental design. In the low search cost condition, subjects were told that the store had 30 competitors within a 50-mile radius. In the high search cost condition, they were told that the store was the only competitor in a 50-mile radius. Consumer perceptions of store prices (Cronbach's $\alpha = .92$) and of market disciplinary mechanisms, or consumers' willingness to engage in price search (Cronbach's $\alpha = .76$), were measured as in Study 2. To assess the manipulation of store density, subjects were asked, "Milo Home Systems is located in an area where there are many other electronics stores" (1 = Strongly disagree; 7 = Strongly agree).

A 2 \times 2 ANOVA (see Table 1) showed that the extent to which subjects agreed that Milo Home Systems is located in an area where there are many electronics stores was significantly greater in the low versus high search cost condition

($M = 5.22$ and 2.31 ; $F(1, 73) = 65.98, p < .0001$). Subjects' perceptions of store prices were significantly higher in the high search cost condition relative to the low search cost condition ($M = 5.41$ and 3.90 ; $F(1, 73) = 59.79, p < .0001$). This main effect was qualified by the significant interaction of price-matching policy and search costs on perceptions of store prices ($F(1, 73) = 4.22, p < .04$). As in Study 2, the presence of a price-matching policy had a significant effect on perceptions of store prices in the low search cost condition ($M = 3.58$ and 4.21 ; $F(1, 73) = 5.21, p < .02$) but not in the high search cost condition ($M = 5.51$ and 5.32 ; $F(1, 73) = .46, ns$). These data provide additional support for H3 and attest to the robustness of the findings. In addition, the results support the signaling argument that when there are more stores in the marketplace, consumer perceptions of market disciplinary mechanisms are significantly greater, and expectations of price search are higher ($M = 5.35$ and 4.25 ; $F(1, 73) = 15.77, p < .0002$). Only when other consumers are expected to engage in price search is the price-matching guarantee an effective signal of low store prices.

General discussion

The main goal of this paper is to examine price-matching guarantees within the context of signaling theory and identify market conditions under which such guarantees are effective and ineffective market signals. Studies on price-matching guarantees from a consumer perspective have typically ignored the market conditions under which consumers observe and interpret such guarantees (e.g., Biswas et al., 2002; Jain & Srivastava, 2000). Based on the assumption that consumers are often uncertain about overall store prices, this research examines whether the effectiveness of a price-matching guarantee as a signal of low store prices depends on market level factors. In examining the macro factors, this research explicitly considers the market conditions under which consumers are likely to associate price-matching guarantees with low prices and identifies a possible mechanism where consumers' reliance on a price-matching policy as a signal of low price is related to their perceptions of how other consumers are likely to behave.

Signaling theory has been used extensively to describe situations characterized by information asymmetry between firms and consumers about an unobservable attribute (e.g., Kirmani & Rao, 2000; Nelson, 1970). Unlike existing consumer-side examinations of signaling theory, the unknown attribute signaled here is store price image or perceptions of store prices rather than product quality (e.g., Boulding & Kirmani, 1993; Kirmani, 1990). Specifically, signaling theory specifies the market conditions under which information asymmetry can be resolved and firms can convey information about an unobservable attribute (e.g., overall store price image) to consumers through an observable trait such as a price-matching guarantee. Al-

though there is considerable research on the theoretical tenets of signaling theory, relatively little research examines the behavioral outcomes (cf. Boulding & Kirmani, 1993; Urbany, 1986), particularly related to perceptions of market disciplinary mechanisms. Specifically, there is little or no research that examines individual consumers' inferences about the behavior of other consumers and the extent to which individuals believe that the actions of other consumers serve to discipline firms that make false claims. This research attempts to fill this significant gap in the literature.

In explicitly recognizing that signals such as price-matching guarantees are observed and perceived within the context of market conditions, this paper highlights the importance of the common knowledge assumption in signaling theory. Specifically the behavioral predictions, consistent with signaling theory, are driven by consumer perceptions of how other consumers in the market are likely to behave. For signaling theory predictions to hold, it is important for search costs to be commonly known to all consumers.

Three studies show that the effectiveness of price-matching guarantees depends on consumer beliefs about the extent to which disciplinary mechanisms operate in the marketplace. Results support the signaling theory prediction that a price-matching guarantee is likely to be an effective (ineffective) signal of store prices when market disciplinary mechanisms are strong (weak) because market disciplinary mechanisms increase the cost of sending a false signal.

Study 1 demonstrates that the belief that other consumers will enforce guarantees lowers perceptions of store prices in the presence of a guarantee. Importantly, Study 1 also shows that differences in price perceptions are not due to differences in the perceived operating costs of stores or consumer beliefs about the likelihood of finding the same model in a different store—that is, the branded variants problem (Bergen et al., 1996). The finding implies that the price-matching guarantee functions as a signal of low store prices due to lower profit margins rather than lower operating costs. Since the survey did not explicitly test the conditions under which a price-matching guarantee is and is not an effective signal of store prices, two experiments were conducted.

Studies 2 and 3 extend the findings of Study 1 by explicitly manipulating perceptions of market disciplinary mechanisms through perceptions of other consumers' willingness to engage in price search. Based on signaling theory, it was predicted that price-matching guarantees are more likely to be effective when disciplinary mechanisms are perceived to be strong in the marketplace. In order to examine consumer inferences about the disciplinary effect of others' behavior, Studies 2 and 3 manipulated commonly known search costs through the distance between stores and the number of stores in the market. Consistent with signaling theory, both studies show that price-matching guarantees are effective when search costs are low but not when search costs are high.

Besides contributing to the growing body of literature that examines price-matching guarantees from the perspective of

a consumer, this paper also contributes to the literature on signaling theory. First, it identifies a possible market mechanism by which behavioral predictions differ across market conditions. Although signaling theory specifies conditions under which firms can convey information in situations of information asymmetry, it is silent regarding the mechanisms through which different behavioral outcomes are reached.

Although price-matching guarantees are seen as signals of store prices when perceptions of others' willingness to engage in price search, enforce guarantees, or both are high, it is possible that consumers overestimate others' willingness to enforce such guarantees. Consequently, the mechanisms perceived to be disciplining erring retailers might not be fully operational in the marketplace. On the other hand, a vigilante group comprising a sufficient number of market mavens with a high willingness to engage in price search and enforce refunds may be the primary drivers of the disciplinary mechanisms. Given the lack of empirical data regarding the incidence of refund claims, these data are the first indicants of consumer-driven mechanisms that may be operational in the marketplace.

Implications for retail management

Together, the three studies identify market-level conditions under which price-matching guarantees are effective. In general, contextual cues such as price-matching guarantees are effective only when consumers are uncertain of price levels as well as whether a specific price represents a good deal (Biswas et al., 2002). If consumers are uncertain about market prices then they may use price-matching guarantees as signals of low store prices in market conditions where the disciplinary mechanisms are sufficiently strong and where other store and product related cues do not help reduce uncertainty about price levels.

From a managerial perspective, our results suggest that the effectiveness of price-matching policies depend on market conditions. While characteristics of the buyer, such as opportunity costs of time, and characteristics of the store, such as type of retailer, need to be considered in deciding whether or not to offer a price-matching guarantee, our results suggest that retailers also need to consider the competitive environment before assuming that such guarantees will be effective signals of low price.

Although retailers may wish to convey the same (price) image in multiple markets, market conditions may require the use of different tactics to achieve the same results. Although price-matching guarantees may be particularly effective in markets where consumers expect other consumers to engage in extensive price search, they may be ineffective in markets where a limited number of retailers or other factors curtail price search. In particular, the proximity of competitive stores and increased density of stores in the market raise the effectiveness of price-matching guarantees. In markets where consumers believe that other consumers are unlikely (or unable) to check prices, price-matching guarantees may

be much less effective. In such markets, retailers may be advised to look for other ways to convey their price image to consumers such as advertising a subset of prices.

Future research

In this paper, search costs were manipulated in a way that allowed subjects to generalize the cost to other consumers. This ensured that subjects could make market level inferences regarding the strength of the disciplinary mechanisms in the market such as other consumers' willingness to engage in price search, claim refunds, or both and thereby interpret the price-matching signal within the context of these market conditions. This manipulation of search costs is different from that of Srivastava and Lurie (2001) in which subjects were told that a fixed cost, representing cost of time, gas, and so forth would be deducted for each store visited. Under their manipulation, subjects' decision to search may have been dictated by their individual perceptions of the trade-off between the benefit and cost of search rather than perceptions of how other consumers are likely to behave (see Urbany, 1986). Traditional models of search have not generally distinguished between common and individual-level search costs (Urbany, 1986). This paper highlights the notion of common knowledge and its importance in testing economic models in general and signaling theory in particular. Although the common knowledge assumption has not been emphasized in previous tests of signaling theory, this paper shows that behavioral outcomes are sensitive to the assumption. Future research could examine the conditions under which these common and individual search costs lead to similar and distinct outcomes.

Second, although a plethora of research has contributed to developing the theoretical tenets of signaling theory in information economics (e.g., Spence, 1973), relatively little research examines the behavioral outcomes (cf. Boulding & Kirmani, 1993; Erdem & Swait, 1998; Kirmani, 1990; Urbany, 1986), particularly related to perceptions of market disciplinary mechanisms. Specifically, there is little or no research that examines individual consumers' inferences about the behavior of other consumers and the extent to which individuals believe that the actions of other consumers serve to discipline firms that make false claims. Signaling store price image is important as it may be a primary determinant of shopping decisions such as which store to visit, extent of search, and store choice. Another distinct feature is that a price-matching signal, unlike other signaling variables such as price, low introductory price, and advertising expenditures, may be thought of as a nondissipative signal as it does not involve any "money-burning" activities upfront. Instead, low-price retailers can offer price-matching policies with little upfront cost. For price-matching policies, the cost of sending a false signal happens in the future (Kirmani & Rao, 2000; Wernerfelt, 1988) and only occurs if consumers engage in price search and claim the refund. Future research could examine the advantages and disadvantages of upfront

signaling, such as advertising, relative to downstream signaling, such as warranties.

Another important topic for future research is to examine the relative efficiency of different signaling instruments. Other signals such as price beating offers and claims such as “we have the lowest prices” may have important implications for consumer price perceptions and behavior. It may be more efficient for retailers to offer and advertise price-matching guarantees than to advertise specific low prices. The rationale is that a price-matching guarantee generally includes all the merchandise in a store while advertised prices include only a fraction of the stock. A price-matching guarantee thus constitutes an “umbrella pricing” tactic which is indicative of the overall price level of a store. Moreover, consumers may be more skeptical of advertised prices because of the belief that although the “loss leader” advertised products may be low-priced, the nonadvertised products may be high-priced. Another line of inquiry pertains to the effect of multiple signals on consumer perceptions. While analytical models can become intractable when examining multiple signals, it is relatively easier in an experimental setting to examine the effect of multiple signals on behavioral measures.

In addition, given that previous research has examined how micro factors, such as store characteristics and features of the guarantee influence the effectiveness of such guarantees (Biswas et al., 2002; Kukar-Kinney & Walters, 2003), future research could examine how the combination of price and nonprice cues moderates the effectiveness of price-matching guarantees. Fig. 4 summarizes the market level and store-specific conditions under which

price-matching guarantees are likely to be effective in lowering consumer perceptions of store prices. Future research could test these predictions.

In summary, using a signaling framework, this research substantively re-examines price-matching guarantees from the perspective of a consumer. As such, this research identifies and tests conditions under which such guarantees do and do not influence consumers. Theoretically, it makes an advance by highlighting the assumption of common knowledge in testing signaling theories. From an applied perspective, this work ascertains the effectiveness of such policies as a retail tactic that influences store price image.

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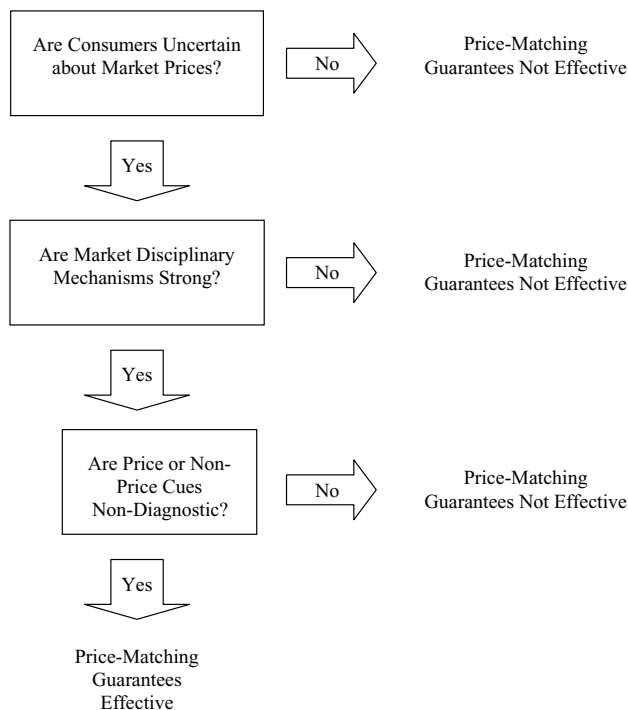


Fig. 4. When are price-matching guarantees likely to be effective?

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