Innovations in Retail Pricing and Promotions

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Abstract

Retailers confront a seemingly impossible dual competitive challenge: grow the top line while also preserving their bottom line. Innovations in pricing and promotion provide considerable opportunities to target customers effectively both offline and online. Retailers also have gained enhanced abilities to measure and improve the effectiveness of their promotions. This article synthesizes recent advances in pricing and promotions findings as they pertain to enhanced targeting, new price and promotion models, and improved effectiveness. It also highlights the role of new enabling technologies and suggests important avenues for further research.
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In 2008, total U.S. retail sales climbed over $3.9 trillion (U.S. Census Bureau 2008), of which approximately $1.4 trillion came from food, beverage, drug, and department stores and approximately $227 billion from online and mail-order stores. Price promotions are a key marketing instrument that on- and offline retailers use to generate sales and increase their market share. Given their importance and long history, it is not surprising that the marketing literature has accumulated a vast body of knowledge about how promotions work. Quantitative research has often focused on the consumer packaged goods industry, where rich datasets covering long periods and purchases across several product categories are available. Most behavioral research instead uses experimental settings to manipulate various elements of promotional designs and isolate their effects.

Recent reviews, such as those by Ailawadi et al. (2009), Bolton, Shankar, and Montoya (2007), Grewal and Levy (2007, 2009), Grewal, Levy, and Kumar (2009), Grewal et al. (2010), Kopalle et al. (2009a), Levy et al. (2004), Neslin (2002), Puccinelli et al. (2009), and van Heerde and Neslin (2008), summarize the findings of both types of research. Rather than review past research again, we focus our attention on retail price and promotion innovations, many of which have received significant attention in the press, though they have just started to provoke academic interest. As shown in the organizing framework of Fig. 1, we group these innovations based on their relevance to three questions:

- **whom** to target?
- **what** promotions and pricing models to use?
- **how** design elements can increase the effectiveness of these promotions?

This organization around three questions or areas of inquiry guides our review. We wish to note that it is not intended as a framework for analyzing innovations. Within each area, we identify major innovations and their technological enablers, highlight recent research that provides insights on these innovations, and pose questions that should be addressed in future research area.

The first research area involves innovations that are aimed at determining **whom** to target? Two key areas of improved

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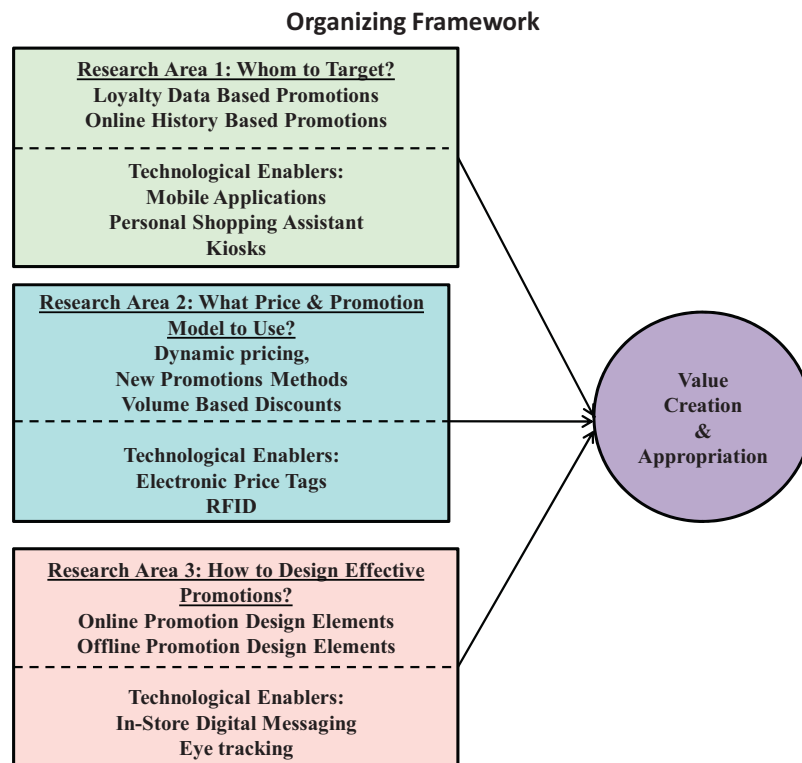
Organizing Framework

Fig. 1. Organizing framework.

targeting activities involve the use of loyalty program data for developing loyalty-based promotions and the use of online history for developing and offering online promotions targeted at individual customers. Technology enablers that are likely to aid these targeting activities include mobile applications, online personal shopping assistants and kiosks. Online personal shopping assistants have access to shoppers' purchase history and, as a consequence, can generate personal shopping lists and display specific prices and promotions.

The second research area that we address involves **what** the emerging models of price and promotions are. These include dynamic pricing models, promotions based on exclusivity, i.e., limited time and limited merchandise (e.g., Gilt), and promotions based on volume discounts (e.g., GroupOn). Technology enablers include electronic price tags and radio frequency identification (RFID).

The third research area pertains to **how** retailers are increasing the effectiveness of online and offline promotions through design elements. Technology enablers include in-store digital messaging and eye-tracking equipment that retailers can use to measure consumer response in greater detail than ever before.

Research area 1: more focused and targeted promotions

Retailers are steadily innovating to address the most central question: who to target with their promotions? They are bringing focused analytics together with the wealth of loyalty program data they have at their disposal to develop targeted promotions. In similar fashion, they are using online analytic tools to increase the usage of targeted online promotions.

Targeted retail promotions using loyalty data

Retailers increasingly target specific promotions to individual customers or customer segments, driven by the availability of loyalty program data and retailers' ability to mine such data. For instance, the drugstore chain CVS offers not only traditional, untargeted promotions through its weekly flyer but also targeted promotions based on its Extra Care loyalty program data. The retailer categorizes its customers into several segments, designs targeted promotions for each segment, and disseminates information about those promotions through personalized e-mail and other communications. It continually evaluates the effectiveness of its promotions by gathering data from matched control groups for each promotional offer and comparing the purchase behavior of the treatment and control groups. Research could generate, on the basis of these controlled field experiments, some empirical generalizations about the types of targeting strategies that work and those that do not. These insights would complement existing work. For example, Feinberg, Krishna, and Zhang (2002) examine conditions in which it is better to target loyal customers versus those likely to switch. Grewal, Hardesty, and Iyer (2004) show, in a scenario-based study that respondents indicate more trust and fairness if customers who buy more frequently receive lower prices, rather than new customers.

The availability of loyalty program data also enables retailers to partner with their manufacturer vendors to offer promotions that encourage store loyalty. Instead of receiving a discount on the brand itself, consumers earn extra loyalty program points to redeem for purchases in the retailer's stores. CVS funds some of its targeted promotions through its vendors and offers "Extra

Bucks" when the customer buys a particular vendor's brands. It is important to evaluate how customers perceive such promotions and how effective they are for the manufacturer and the retailer. If they are effective and can reduce negative reference price (Winer 1986) effects associated with promotions, they may represent a win–win proposition for manufacturers and retailers, who are typically at odds when it comes to promotions. Zhang and Breugelmans (2010) also examine the effectiveness of such promotions for an online retailer.

Finally, promotions can be targeted even in the absence of a loyalty program. Companies such as Catalina now work with retailers to offer targeted coupon promotions, even in the absence of a retailer-specific loyalty program. Research should also evaluate the effectiveness of such targeted promotions. For example, Venkatesan and Farris (2010) quantify the effectiveness of retailer coupon promotions by including not only their redemption effect but also their exposure effect. They find that exposure effects can be more important than redemption effects and overall, such targeted promotions can significantly improve the profitability of customers to a retailer.

Targeted online promotions

Retailers sometimes use past purchase history data to customize promotions for individual consumers, not just for consumer segments. Such customized promotions are growing steadily in all retail channels, though they are most notable online (e.g., Ansari and Mela 2003; Syam, Ruan, and Hess 2005; Zhang and Wedel 2009), probably because the Internet provides the functionality and specific features to cost-effectively target individual customers. For example, e-tailers enjoy great control over their promotions, such that they can initiate an online campaign easily and then end the campaign the moment they achieve their objectives (e.g., a pre-determined number of coupons redeemed). Access to real-time promotional effectiveness data also helps these firms tailor their offers and integrate customer and competitor responses immediately into their promotional campaign designs. However, for multi-channel retailers, integration of real-time promotional effectiveness data is quite challenging (Neslin et al., 2006). Firms need to understand the cost and benefits associated with a single view of their customers (Neslin and Shankar 2009). For a more detailed discussion of multi-channel research, see reviews by Neslin and Shankar (2009) and Neslin et al. (2006).

It is important to examine the extent to which individual targeting is profitable. Extant analytical research has shown the improved profitability of one-to-one and reward promotions targeted at the individual customer level (Chen and Zhang 2009; Fruchter and Zhang 2004; Shaffer and Zhang 2002). Cheng and Dogan (2008) extend this analysis to the Internet and demonstrate that even when consumers actively seek lower prices in the future, dynamic targeted pricing is beneficial and improves profitability. However, empirical evidence is mixed. Rossi, McCulloch, and Allenby (1996) support this result and show the improved profitability of customized promotions. But, Zhang and Wedel (2009) find that, although targeting improves profitability, individually customized promotions do not offer

greater benefits than segment-level customization, especially offline.

There are also potential differences in online and offline promotions which should be examined. Chiou-Wei and Inman (2008) consider online coupons and find that redemption rates increase in response to greater coupon face value, such that online coupons appear more effective for large-ticket items and durables. They further note that greater distance between the retailer and the consumer results in lower coupon redemption, which implies locational relevance, even in an online setting. Yet they find that the coupon expiration date did not have a significant effect on redemption rates. The effectiveness of online promotions also needs to be examined in non-grocery contexts/stores (e.g., Best Buy, Staples, Macy's).

Technological enablers

Mobile Internet users are growing rapidly and are anticipated to number at least 1.4 billion by 2013 (Bucher 2009). As consumers acquire more next-generation smart phones and access the Internet through them, interest in mobile marketing has exploded (e.g., Sultan and Rohm 2005, 2008). Mobile marketing is becoming increasingly important in retailing (see Shankar and Balasubramanian 2009 and Shankar et al., 2010 for a detailed review). These authors define mobile marketing as "the two-way or multi-way communication and promotion of an offer between a firm and its customers using a mobile medium, device or technology." More and more firms have started to integrate mobile marketing into their integrated marketing communications and develop promotional campaigns based on short message services (SMS). In turn, mobile advertising is becoming an increasingly important source of revenue for cellular carriers (Gauntt 2008; Xu, Liao, and Li 2008).

Some retailers have mounted touchscreen tablets onto shopping carts, which then serve as personal shopping assistants (PSA) (Kalyanam, Lal, and Wolfram 2006). Victoria's Secret launched a mobile Web site in 2009 (http://mobile/victoriassecret.com) that acts like a PSA and provides consumers with a means to browse and order by phone, sign up for text alerts, or receive price promotions. Christie's iPhone application (http://www.christies.com/on-the-go/iphone) provides real-time auction results, browsing capabilities, and integration with camera telephones, which represents the famous auction house's attempt to leverage digital technologies. Coupon Sherpa and other firms offer mobile applications that consumers can use to view and redeem coupons through their cellular devices. We refer readers to Shankar et al. (2011) for a more detailed discussion on innovations in digital activities.

Firms like CVS and Staples have visibly embraced the use of interactive, stand-alone kiosks. CVS customers can use a kiosk in the store to print out their loyalty program reward coupons and get other promotional discounts. By connecting customers to the retailer's Web site, the kiosks at Staples stores facilitate purchases of out-of-stock items, as well as products and services not carried in the store. Other retailers (e.g., Metro, CVS, Best Buy, Walmart) have incorporated kiosks to handle service needs

(e.g., printing personalized online coupons). These interactive kiosks clearly enhance the retailer's ability to provide customers targeted promotions that they can access while they are at the store, but research is needed on the profitability (or lack thereof) of these promotions. Further, it would be interesting to study whether kiosks increase the effectiveness of promotions across multiple channels?

Research area 2: price and promotion models

A second important area pertains to what new price and promotions models have emerged as a result of emerging technology. These new models include the expansion of dynamic pricing as well as the development of entirely new types of promotions.

Dynamic pricing models

Traditionally, retailers have taken a one-note approach to pricing, using cost as the primary, and sometimes the only, criterion (Retail Industry Report 2000). But increasingly powerful computers and more sophisticated software, as well as renewed emphasis on training senior managers in quantitative analysis, have fine-tuned pricing strategies in recent years. Some retailers use software to determine optimal markups and discounts (Associated Press 2007) for manufacturers. Symphony-IRI and ACNielsen provide promotional software that builds on proprietary models featuring both price and promotion elasticities to set optimum prices. Estimation and optimization software also supports assessments of tricky details, such as product substitution and complementarity effects, and they often uncover results that might not be clear from a spreadsheet.

Most recently, some retailers have employed sophisticated dynamic pricing models that use data from Internet purchases or company enterprise resource planning systems to set prices. Dynamic pricing models update prices frequently, based on changing supply or demand characteristics (Nagle, Hogan, and Zale 2010). The driving forces behind this trend are threefold. First, much more data are available today. Managers use enterprise data management systems, produced by companies such as Oracle and SAP, to spot purchase patterns and estimate price elasticities in transaction data. Second, price analytic software can be customized to a particular market context or data sources. Dynamic pricing software, which provides data to determine elasticities more reliably, is especially important to companies selling high volume, high frequency products. Third, the use of dynamic pricing models has grown, alongside the Internet's growth as a distribution channel. However, these models are based on historical data, which may not be indicative of future purchase behavior.

In developing an optimal dynamic retail pricing and promotion schedule, retailers should keep several issues in mind (Kopalle 2010): inter- and intra-category optimization, market expansion and contraction effects, modeling frameworks, model performance, the psychological aspects of pricing, objective functions, optimization, parameter estimation, product relationship, and scalability.

Dynamic pricing models allow companies to price discriminate on a small scale, even at a single customer level, which makes them particularly attractive to retailers. New technologies, such as radio frequency identification (RFID), wireless networks, and global positioning (GPS), further enhance the appeal of dynamic pricing in the retail arena. Progressive Casualty Insurance Company, for example, offers different prices to policyholders based in part on data (e.g., speed, distance traveled) uploaded from devices that plug into the diagnostic ports of cars operated by its MyRate customers (McGregor 2009). RFID technology has broader implications and advantages for retailers implementing dynamic pricing and is likely to be beneficial for both EDLP and Hi-Low retailers. In the future, prices in stores might automatically shift up and down based on costs, inventory levels, and consumer spending habits. One New York restaurant already allows its menu prices to fluctuate according to demand (Katz 2010).

Recent pricing research has focused on dynamic pricing in a category based on consumer state-dependent utility. Dube et al. (2008) suggest that dynamic pricing models should consider the evolution of consumer brand loyalty in determining optimal prices over time. In their examination of category pricing, Fox, Postrel, and Semple (2009) note that as future traffic becomes more sensitive to price, retailers increasingly should consider lowering current prices and sacrificing current profits for increased future traffic and profitability.

Hall, Kopalle, and Krishna (2010) present a framework for dynamic pricing and ordering decisions by retailers in a category-management setting. Their multi-brand ordering and pricing model incorporates retailer forward buying and maximizes profitability for the category. The model also considers manufacturer trade deals to retailers, ordering costs that retailers incur, retailer forward-buying behavior, and the own- and cross-price effects of all brands in the category. The research thus derives implications in a dynamic setting about the impact of interdependence among brands on decisions such as pass-through of trade deals and retailer order quantity.

Further, we can infer from emerging literature on loyalty programs that consumers are strategic and forward looking, such that they trade off immediate price discounts offered by competitors against loyalty rewards in the future from the target firm (Kopalle et al., 2009b). Most loyalty programs comprise two components: customer tiers (e.g., Silver, Gold and Platinum) and frequency rewards (e.g., buy n and get $n+1$ free). A more price-oriented customer segment values the frequency reward program more; the service-oriented segment prefers the customer tier program.

However, as retailers and manufacturers adopt such dynamic pricing, they also need to realize that it might increase concerns about price and promotion fairness (for research on price fairness, see Campbell 1999; Grewal, Hardesty, and Iyer, 2004), as well as consumer concerns about the privacy of their shopping history. The perceived fairness of the price (and potentially perceived privacy) is likely depends on factors such as the retailer's

explicit or inferred motives, as well as their reputation (Campbell 1999).

New types of promotions

Several online retailers, such as Gilt, RueLaLa, and HauteLook, offer a limited set of fashion products for limited time periods to select groups of consumers who must subscribe to the site. Some allow subscriptions only after the customer has been invited by another subscriber, which creates a sense of exclusiveness. Recent research suggests consumers value exclusive promotions over inclusive ones (Barone and Roy 2010). Moreover, the sites offer rewards to existing customers if they provide referrals to others (see also Ryu and Feick 2007). Barone and Roy (2010) suggest that exclusive promotions have the greatest appeal to consumers who adopt an independent rather than collectivist self-construal.

These invitation-only promotions also reduce the chance that other consumers will see the offer and form adverse perceptions or begin to expect to find these fashion items at sharp discounts (often 50 percent or more). Yet on the sites, the descriptions virtually always contain a comparison of the regular and sale price (i.e., comparative price format). The offers generally remain available for a limited duration, such as 4 h or until the merchandise sells out. By using reference prices that provide consumers a cue of the quality and value of the merchandise, these online retailers are likely enhancing consumer demand. From a public policy perspective, societies need to ensure that advertised reference prices are genuine, to confirm they are informing rather than deceiving customers.

"Conditional promotions" are another type of promotion where some condition has to be met for the consumer to avail of the discount. Lee and Ariely (2006) examine the effectiveness of conditional promotions where the condition is under the control of the consumer (e.g., consumers receive $1 off on purchases exceeding $6), and find that these promotions are most effective when consumers have less concrete shopping goals. But, there are newer types of conditional promotions where the "condition" is an outside event beyond the control of the consumer. Some recent examples are free coffee offered by Dunkin Donuts or refunds on furniture purchases offered by a New England furniture store if the Boston Red Sox win the World Series (Bortman 2009). Such a promotion illustrates how local brands can tie in with others and free ride on, say, the Red Sox's success. Various factors could form the basis for and influence such conditional promotions, such as the exclusivity of the audience (i.e., invitation only), reference or tie-in to a specific event (e.g., the World Series), and the entertainment value of winning if an uncertain event happens. Research is needed on the viability of such promotions. How successful are these promotions in the short versus the long run—i.e., after the novelty of the promotion has disappeared?

Volume-based pricing

Volume discounts are common; in most grocery stores, the price per ounce is lower for larger packages or greater quantities (e.g., a 12-pack is cheaper than a 6-pack on a per item basis). An innovative adaptation of volume-based pricing on the Web provides a large discount on a given product or services if a predetermined number of consumers agree to purchase it. Group buying sites appear mostly in big cities (Boehret 2010). Both Groupon.com and LivingSocial.com are especially popular in many metropolitan areas, where consumers register online to receive relevant deals and coupons. They can decide whether to take advantage of each deal and must do so within a certain time period. To ensure the minimum number of other users sign on for the deal, users rely on their e-mail contacts and social media to encourage others in their network to participate. Many of the deals involve social events, such as restaurants or sporting events, i.e., encouraging others to participate is a complementary action; they even might meet as a group at the event. According to Groupon's own statistics, it has sold more than a million such deals and saved consumers $42 million. Jing and Xie (2009) note that such group buying sites are also popular in China (e.g., TeamBuy.com.cn) and Japan (rakuten.co.jp/groupbuy). Further research should examine the profitability for retailers using such sites. For example, according to a recent Wall Street Journal article (January 7, 2011) a Groupon offer drew nearly 2800 customers to a retailer but the retailer was lamenting that the program not only did not draw in new customers, but they spent less than their average amount!

Whereas pay-what-you-wish pricing represents a form of volume discount in which the firm hopes to achieve enough volume to cover its marginal costs, group buying Web sites provide the volume discount only after enough people register. Alternatively, sites such as Tippr.com, Woot.com, Gilt.com, and Ideeli.com offer deals regardless of the number of customers, which implies that they compete more directly with discount retailers such as TJMaxx or Marshalls.

We know very little about the effectiveness of these relatively new forms of price promotion models. It would be useful to understand, for instance, how (and how quickly) users diffuse the deals offered by group buying sites. Certain elements of the deals (e.g., product versus service, utilitarian versus hedonic, purchase price, magnitude, reputation) might enhance or inhibit deal acceptance among the group; it would also be useful to determine what percentage of customers are already members compared with new members who have access to the offer through existing members. Another stream of research might determine which forms of social media are more effective for disseminating the deal.

Jing and Xie (2009) suggest that retailers using a group buying model outperform referral reward programs if the cost of sharing the information is low (e.g., through social media) and the offers are fairly mature. These insights may explain why group buying sites have been able to grow rapidly. These users normally rely heavily on social media, and the typical offers tend to be for restaurants, spas, and other entertainment options (i.e., fairly mature categories). These are categories with which consumers are generally familiar with or have some knowledge of the actual regular price and the reputation of the retailer or service provider.

Technology enablers

A number of technological innovations have allowed retailers the ability to create and offer these new business models. With regard to dynamic pricing, newer technologies such as electronic price tags and mobile applications have made it easier to implement marketplace offers.

As retailers become more interested in dynamic price optimization, an obvious question is whether electronic shelf labels are far behind (Supermarket News 2005). Dynamic price optimization and electronic shelf labels (ESL) are a very good match because dynamic pricing involves many rapid price changes, and ESLs make it easier and more cost efficient to execute those changes, especially for retailers who change prices often and thus for whom price changes have become costly. Altierre Corp. (Silicon India 2008) offers ESLs that automate the price-dissemination process in retail stores and present promising solutions to implement truly dynamic pricing solutions. Sears also has been conducting tests of electronic signage solutions, using ESLs in place of traditional printed ones, with price and product information updated using a simple wireless network (Chain Store Age 2008). At the same time, research is needed to understand the consumer implications of dynamic pricing, rapid price changes, and ESLs. Will such ESLs aid consumers in their shopping process or will they add to their confusion? If they are not well accepted by consumers, it is likely to hinder the adoption of such technology in the retail market.

To be successful, such mobile campaigns should personalize the SMS and enhance time and locational relevance. For example, Sears's (http://www.sears.com) mobile application supports barcode scanning for coupons; eBay's mobile Web (http://www.m.ebay.com) informs customers about their bid status and allows payments through PayPal mobile; Ralph Lauren's site (http://m.ralphlauren.com) can be accessed immediately by a customer who uses his or her camera phone to scan a bar code, without ever typing in or clicking into the Web site. Many such mobile application technologies offer the potential for location-based price promotions, in which customers receive coupons and promotions directly on their cell phones when they are near a store that sells items they may be interested in purchasing.

However, the roles of personalization, time relevance, and locational relevance for sales promotion effectiveness remain somewhat unclear and demand further research. In addition, despite the widespread use of fuzzy logic, neural networks, soft computing, and collaborative filtering in other disciplines, their application in the retail domain appears minimal (Vadlamani, Raman, and Mantrala 2006).

If they contain built-in RFID readers, systems can exchange data throughout the store; this technology has the potential to become a common and important element of retailing (Ganesan et al., 2009; Hui, Fader and Bradlow 2009; Sorensen 2003; Webb 2008). Recent advances in RFID technology and its speed could allow for long-range readers that feature simplified payments, dynamic pricing, and greater product history data collections. As consumer items, such as clothing and accessories, become traceable, retailers could install low-cost readers at various store locations to learn more about the shopping habits of their customers. They also could devise improved pricing and promotion campaigns that reflect lessons learned from RFID data with matching customer purchase information.

Research area 3: promotional design elements

Finally, we focus on addressing the question of how retailers have utilized price and promotional design elements to increase the effectiveness of price promotions.

Offline and online promotion design elements

To design their offline and online promotional flyers and offers, retailers must determine whether to use reference and sales prices, the phrasing of the offer, dollar versus percentage off wording, and colors. In weekly flyers, retailers often communicate the benefits of the deal they are offering by indicating the advertised reference prices. Therefore, the price offer communicates both a regular price and a limited time, lower sale price (see Compeau and Grewal 1998). Past research has demonstrated that in offline ads, as the advertised price increases, it conveys greater value (Grewal, Monroe, and Krishnan 1998). However, in an online arena, consumers have the ability to check prices and verify the veracity of the advertised reference price. Thus, increases in advertised reference prices may not enhance value perceptions and may even reduce them.

A related issue involves sequential discounts. Chen and Rao (2007) demonstrate that consumers regard sequential discounts as greater than one big discount, largely due to their own computational errors. On the other hand, when a retailer ends a promotion, the price usually jumps back to the original price. However, Tsiros and Hardesty (2010) reveal that retailers would benefit from slowly increasing the price rather than a larger, one-step price hike. Both sequential elements (decreasing and raising prices) appear to promise benefits to retailers and it would be useful to understand the conditions in which they are most effective.

Consumers process their price savings in a relative fashion (Lindsey-Mullikin and Grewal 2006); they are likely to value $5 off a $10 item more than they do $5 off a $100 item. For smaller-ticket items, they also may prefer savings in percentage terms (e.g., 50 percent off) than in dollar terms (e.g., $5 off a $10 item), whereas for larger purchases, they prefer dollar terms (e.g., $10 off $250 rather than 4 percent savings) (see Chen, Monroe, and Lou 1998). This suggests that presenting the information as percentage off versus dollar off influences future price expectations (DelVecchio, Krishnan, and Smith 2007). Retailers must keep these insights in mind when they design price promotional offers. In particular, the offers for department stores may be more complicated than those for grocery stores, because a single flyer might include both low (e.g., cosmetics) and high (e.g., consumer electronics) price items. Past behavioral research (see Ailawadi et al., 2009 for a recent review) has shown that the framing or design of the deal influences consumer perception about the deal value, search, and purchase intent (see Compeau and Grewal 1998 and Krishna, Briesch, Lehmann, and Yuan 2002 for meta-analytic research in this area). This research suggests

the importance of framing the deal. Going forward, research could empirically investigate the relative effectiveness of multiple ways and channels of communicating different deals but with sale prices of items that are effectively similar, viz., Buy One Get One Free (BOGO), offering mail-in rebates, bundling complementary items versus selling individual items, offering some discounts for online purchases, etc.

In a series of studies, Chandrashekeran et al. (2011) demonstrate that consumers use the color of the prices in marketing communications as a signal. Their findings show that prices in red convey higher savings than do prices in black, though this result applies only to male consumers. Women do not perceive a difference in the savings amount based on color. Yet in certain circumstances, consumers appear to use the color of the price as a heuristic to evaluate the offer value. The multitude of flyers that consumers receive display prices in a vast array of colors, sometimes using many different colors within the same flyer. Research should continue to investigate how consumers react to these cues in settings with different or inconsistent colors.

Technology enablers

Recent research has demonstrated the importance of in-store marketing (see review by Shankar et al., 2011). Inman, Winer, and Ferraro (2009) demonstrate that more than 40 percent of consumer purchase decisions depend on price and promotion elements. Stilley, Inman, and Wakefield (2010a, 2010b) show that consumers maintain a mental budget of what they expect to spend on a given grocery trip and the items they plan to purchase. Therefore, savings on planned purchases (i.e., in-store slack) enhance the quantity of items purchased while savings on unplanned purchases may influence the purchase of more unplanned items.

Although the role of traditional displays on brand choice has been well established (Ainslie and Rossi 1998; Allenby and Ginter 1995; Boatwright, Dhar, and Rossi 2004; Wilkinson, Mason, and Paksoy 1982), the influence of new technologies on in-store shopping behaviors requires additional exploration. These new technologies, such as in-store digital messaging, interactive kiosks, and personal shopping assistants, also may help retailers target their customers better. For example, BJ's and Walmart employ in-store digital advertising displays to communicate offers or describe the use of a promoted product (e.g., new laundry detergent). Kalyanam, Lal, and Wolfram (2006) report on actual in-store signage experiments suggests promising sales lifts for promoted items. In-store digital signage technology can expose consumers to dynamic messaging in the store, adjacent to the merchandise. Consumers buy a great deal of merchandise without planning to do so in advance, so this technology seems likely to attract their attention and increase purchase behaviors. Appropriate comparative and usage messages could encourage brand switching. All these issues warrant additional research.

One recent advance holds particular promise for addressing the measurement issues associated with promotions, namely, eye-tracking software. Advances in eye-tracking technology support its more widespread use in marketing (Pieters, Wedel, and Zhang 2007; Van Der Lans, Pieters, and Wedel 2008). Eye

movements consist of fixations, during which the eye remains relatively still for about 200–300 ms, separated by rapid movements, called saccades, which average three to five degrees in distance (i.e., degrees of visual angle) and last 40–50 ms. Eye-tracking equipment records the duration of each eye fixation and the exact coordinates of the central two degrees of vision, and then maps the coordinates to the location of each area in the picture (e.g., brands on a supermarket shelf).

Recent research has examined the role of in-store shelf facings, using pictures and eye-tracking equipment (Chandon et al., 2009). The number of facings has a strong impact on recall, consideration, and choice; the location of the facing also is critical, in that center facings are more likely to be noticed, reexamined, and chosen, whereas top facings enhance attention and evaluation. These results highlight the importance of item placement in a planogram. Also, whether the price of the item appears to the left or right of the item can influence customers' perceptions of value (Suri and Grewal 2011). This technology therefore documents exactly what shoppers see and miss as they look at different categories. Some shoppers may fail to see certain products, as well as promotional information, which immediately excludes them from the relevant set of purchasers. These unseen products remain unsold, without ever having had a chance to convince shoppers. Eye-tracking software could provide insights into which promotional design elements are the most important and effective for attracting attention.

Research issues

The genesis of this article was in a Thought Leadership Conference organized at Texas A&M University, with the topic "Innovation in Retailing." In our effort to understand innovations in the domains of pricing and promotion, we have limited this endeavor to recent innovations. Across the broad categories of new promotion types and technological advances, we have examined three types, from innovations aimed at targeting customers to those that have evolved out of new price and promotional models to methods for increasing the effectiveness of promotions. The guiding framework in Fig. 1 includes these three types of pricing and promotion innovations and serves as a basis for organizing our discussion. Certainly, other researchers may organize pricing and promotions innovations in a different fashion.

Further, in Fig. 2, for each section, we summarize avenues that should be explored in further research. In the area of Targeting, future research issues include the effectiveness of targeted promotions, comparing better implementation strategies such as providing an immediate discount versus giving out loyalty points. Further, we also need to have a better understanding of how the results generalize to non-grocery settings. Equally important is to study the effectiveness of interactive products such as Kiosks, shopping assistants, and mobile applications.

In the area of price and promotion models, future research opportunities include consideration of inter- and intra-category optimization, incorporating market expansion and contraction effects in dynamic pricing models, a relative comparison of old and new pricing and promotion models on retailer performance,
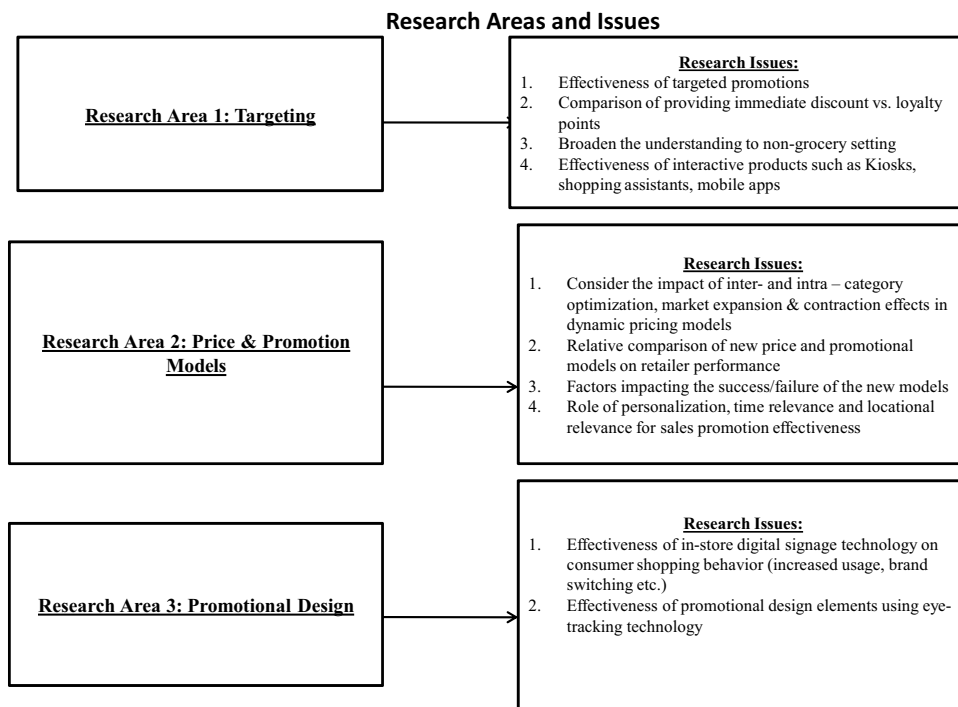
Research Areas and Issues

Fig. 2. Research areas and issues.

the long term impact on reference prices and the factors impacting the success or failure of the newer price and promotion strategies (more details on innovative business models and relevant research issues are available in Sorescu et al., 2011). In this context, one could also study the role of personalization, time and locational relevance on the effectiveness of sales promotion.

With respect to promotional design, we identify two key research issues: (1) Examine the effectiveness of in-store digital signage technology on consumer shopping behavior such as usage rate, brand switching, etc. and (2) Study the effectiveness of promotional design elements using eye-tracking software.

In summary, we have outlined insights gleaned from prior research and practice as it pertains to the above three research areas. Further, we also highlight research issues that could provide foundations for further research. Thus, while work remains to be done, the ideas of better customer targeting, new price and promotion models, and promotional design elements in retail pricing and promotions arena seem viable and worthy of the effort required to more fully understand it. We have also overviewed relevant technological enablers as they pertain to these three domains and the related research that needs to be pursued. We hope that our article outlining recent innovations in price and promotion serves as a catalyst for future research and development on the research issues described throughout the paper and outlined in Fig. 2.

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References

Ailawadi, Kusum, J.P. Beauchamp, Naveen Donthu, Dinesh Gauri and Venkatesh Shankar (2009), "Communication and Promotion Decisions in Retailing: A Review and Directions for Future Research," *Journal of Retailing,* 85 (1), 42–55.

Ainslie, A. and Peter E. Rossi (1998), "Similarities in Choice Behavior Across Product Categories," *Marketing Science,* 17 (2), 91–106.

Allenby, Greg M. and James L. Ginter (1995), "The Effects of In-Store Display and Feature Advertising on Consideration Sets," *International Journal of Research in Marketing,* 12 (1), 67–80.

Ansari, Asim and Carl F. Mela (2003), "E-Customization," *Journal of Marketing Research,* 40 (May), 131–45.

Associated Press (2007), "Inside the World of Price Optimization Software," *Valley News*, April 29, E2.

Barone, Michael and Tirthankar Roy (2010), "Does Exclusivity Always Pay Off? Exclusive Price Promotions and Consumer Response," *Journal of Marketing,* 74 (2), 121–32.

Boatwright, Peter, Sanjay Dhar and Peter Rossi (2004), "The Role of Retail Competition, Demographics and Account Retail Strategy as Drivers of Promotional Sensitivity," *Quantitative Marketing and Economics,* 2, 169–90.

Boehret, Katherine (2010), "A Deal on a Haircut? That's What Friends Are For," *The Wall Street Journal*, March 24, D3.

Bolton, Ruth N., Venkatesh Shankar and Detra Montoya (2007), "Recent Trends and Emerging Practices in Retail Pricing," in *Retailing in the 21st Century: Current and Future Trends*, Kraft M. and Mantrala M., eds (2nd ed.). Germany: Springer Verlag Publishers

Bortman, Eli (2009), "The Jordan's Furniture "Monster Deal": A Legal Gamble?," *Sport Marketing Quarterly,* (December), 218–21.

Bucher, Dan (2009), "Mobile Social Networkers in U.S. to Surpass 56M by 2013," *eMarketer*, November 16, http://www.mobilemarketer.com/cms/news/research/4648.html.

Campbell, Margaret C. (1999), "Perceptions of Price Unfairness: Antecedents and Consequences," *Journal of Marketing Research,* 36 (May), 187–99.

Chain Store Age (2008), "Signage," 84 (2), 91.

Chandon, Pierre, J. Wesley Hutchinson, Stephen J. Heyman, Eric T. Bradlow, ChaoF K.P. and Scott H. Young (2009), "Does In-Store Marketing Work? Effects of the Number and Position of Shelf Facings on Brand Attention

and Evaluation at the Point of Purchase," *Journal of Marketing,* 73 (6), 1–17.

Chandrashekeran, Rajesh, Dhruv Grewal, Rajneesh D. Suri and Nancy M. Puccinelli (2011), "Color of the Price: Gender Differences," unpublished working paper, Babson College.

Chen, Haipeng and Akshay Rao (2007), "When Two Plus Two Is Not Equal to Four: Errors in Processing Multiple Percentage Changes," *Journal of Consumer Research,* 34 (3), 327–40.

Chen, Yuxin and John Z. Zhang (2009), "Dynamic Targeted Pricing with Strategic Consumers," *International Journal of Industrial Organization,* 27 (1), 43–50.

Chen, S.-F., Kent B. Monroe and Y.-C. Lou (1998), "The Effects of Framing Price Promotion Messages on Consumers' Perceptions and Purchase Intentions," *Journal of Retailing,* 74 (3), 353–72.

Cheng, Hsing Kenneth and Kutsal Dogan (2008), "Customer-Centric Marketing with Internet Coupons," *Decision Support Systems,* 44 (3), 606–20.

Chiou-Wei, Song-Zan and J. Jeffrey Inman (2008), "Do Shoppers Like Electronic Coupons? A Panel Data Analysis," *Journal of Retailing,* 84 (September), 297–30.

Compeau, Larry D. and Dhruv Grewal (1998), "Comparative Price Advertising: An Integrative Review," *Journal of Public Policy & Marketing,* 17 (2), 257–73.

DelVecchio, Devon, Shanker Krishnan and Daniel C. Smith (2007), "Cents or Percent? The Effects of Promotion Framing on Price Expectations and Choice," *Journal of Marketing,* 71 (3), 158–70.

Dube, Jean-Pierre, Gunter J. Hitsch, Peter E. Rossi and Maria Ana Vitorino (2008), "Category Pricing with State Dependent Utility," *Marketing Science,* 27 (3), 417–29.

Feinberg, Fred M., Aradhna Krishna and Z.J. Zhang (2002), "Do We Care What Others Get? A Behaviorist Approach to Targeted Promotions," *Journal of Marketing Research,* 39 (3), 277–91.

Fox, E.J., S. Postrel and J.H. Semple (2009), "Optimal Category Pricing with Endogenous Store Traffic," *Marketing Science,* 28 (4), 709–20.

Fruchter, Gila E. and John Z. Zhang (2004), "Dynamic Targeted Promotions: A Customer Retention and Acquisition Perspective," *Journal of Service Research,* 7 (1), 3–19.

Ganesan, Shankar, Morris George, Sandy Jap, Robert W. Palmatier and Barton Weitz (2009), "Supply Chain Management and Retailer Performance: Emerging Trends, Issues, and Implications for Research and Practice," *Journal of Retailing,* 85 (4), 84–9.

Gauntt, John du Pre (2008), "Mobile Advertising: After the Growing Pains," eMarketer http://www.emarketer.com/Reports/All/Emarketer_2000452.aspx.

Grewal, Dhruv, David Hardesty and Gopalkrishnan Iyer (2004), "The Effects of Buyer Identification and Purchase Timing on Consumers' Perceptions of Trust, Price Fairness, and Repurchase Intentions," *Journal of Interactive Marketing,* 18 (4), 87–100.

Grewal, Dhruv, Ram Janakiraman, Kirthi Kalyanam, P.K Kannan, Brian Ratchford, Reo Song and Stephen Tolerico (2010), "Strategic Management of Online and Offline Retail Pricing: A Research Agenda," *Journal of Interactive Marketing,* 24 (May), 138–54.

Grewal, Dhruv and Michael Levy (2007), "Retailing Research: Past, Present and Future," *Journal of Retailing,* 83 (4), 447–64.

————————— and ————————— (2009), "Emerging Issue in Retailing Research," *Journal of Retailing,* 85 (4), 522–6.

Grewal, Dhruv, Michael Levy and V. Kumar (2009), "Customer Experience Management: An Organizing Framework," *Journal of Retailing,* 85 (1), 1–14.

Grewal, Dhruv, Kent B. Monroe and R. Krishnan (1998), "The Effects of Price Comparison Advertising on Buyers' Perceptions of Acquisition Value and Transaction Value," *Journal of Marketing,* 62 (2), 46–60.

Hall, Joseph M., Praveen K. Kopalle and Aradhna Krishna (2010), "Retailer Dynamic Pricing and Ordering Decisions: Category Management versus Brand-by-Brand Approaches," *Journal of Retailing,* 86 (June), 172–83.

Hui, Sam, Peter Fader and Eric Bradlow (2009), "Path Data in Marketing: An Integrative Framework and Prospectus for Model Building," *Marketing Science,* 28 (2), 320–35.

Inman, J. Jeffrey, Russell S. Winer and Rosellina Ferraro (2009), "The Interplay between Category Characteristics, Customer Characteristics, and Customer Activities on In-Store Decision Making," *Journal of Marketing,* 73, 19–2.

Jing, Xiaoqing and Jinhong Xie (2009), "Customers as Sales Agents: Selling through Group Buying," working paper, University of Florida.

Kalyanam, Kirthi, Rajiv Lal and Gerd Wolfram (2006), "Future Store Technologies and Their Impact on Grocery Retailing," in *Retailing in the 21st Century: Current and Future Trends*, Manfred Kraft and Murali Mantrala, eds. New York: Springer Berlin Heidelberg, 95–112.

Katz, Basil (2010), "New York Bar to Set Menu Prices Like Stocks," http://abcnews.go.com/Travel/wireStory?id=10190154, March 24 (accessed April 29, 2010).

Kopalle, Praveen K. (2010), "Modeling Retail Phenomenon: Editorial," *Journal of Retailing,* 86 (June), 117–24.

Kopalle, Praveen, Dipayan Biswas, Pradeep K. Chintagunta, Jia Fan, Koen Pauwels, Brian Ratchford and James Sills (2009a), "Retailer Pricing and Competitive Effects," *Journal of Retailing,* 85 (1), 56–70.

Kopalle, Praveen K., Scott A. Neslin, Baohong Sun, Yacheng Sun and Vanitha Swaminathan (2009b), "The Joint Sales Impact of Frequency Reward and Customer Tier Components of Loyalty Programs," working paper, Tuck School of Business, Dartmouth College.

Krishna, Aradhna, Richard Briesch, Donald R. Lehmann and Hong Yuan (2002), "A Meta-Analysis of the Impact of Price Presentation on Perceived Savings," *Journal of Retailing,* 78 (2), 101–18.

Lee, L. and D. Ariely (2006), "Shopping Goals, Goal Concreteness, and Conditional Coupons," *Journal of Consumer Research,* 33 (1), 60–7.

Levy, Michael, Dhruv Grewal, Praveen K. Kopalle and James Hess (2004), "Emerging Trends in Retail Pricing Practice: Implications for Research," *Journal of Retailing,* 80 (3), 165–1165.

Lindsey-Mullikin, Joan and Dhruv Grewal (2006), "Imperfect Information: The Persistence of Price Dispersion on the Web," *Journal of the Academy of Marketing Science,* 34 (2), 236–43.

McGregor, Jena (2009), "Matching Prices to Demand, in Real Time," *Business Week*, April 7.

Nagle, Thomas T., John E. Hogan and Joseph Zale (2010), *The Strategy and Tactics of Pricing: A Guide to Growing More Profitably,* 5th ed. Upper Saddle River, NJ: Prentice Hall.

Neslin, Scott A. (2002), *Sales Promotion,* Cambridge, MA: Marketing Science Institute.

Neslin, Scott A., Dhruv Grewal, Robert Leghorn, Venkatesh Shankar, Miriji L. Teerling, Jacquelyn S. Thomas and Peter C. Verhoef (2006), "Challenges and Opportunities in Multi-Channel Customer Management," *Journal of Services Research,* 9 (2), 95–112.

Neslin, Scott A. and Venkatesh Shankar (2009), "Key Issues in Multichannel Customer Management: Current Knowledge and Future Directions," *Journal of Interactive Marketing,* 23 (1), 70–81.

Pieters, Rik, Michel Wedel and Jie Zhang (2007), "Optimal Feature Advertising Design Under Competitive Clutter," *Management Science,* 53 (11), 1815–28.

Puccinelli, Nancy M., Ronald C. Goodstein, Dhruv Grewal, Robert Price, Priya Raghubir and David Stewart (2009), "Customer Experience Management in Retailing: Understanding the Buying Process," *Journal of Retailing,* 85 (1), 15–30.

Retail Industry Report (2000) "At What Price? Guidelines for a Customer-Focused Pricing Strategy," Arthur Andersen, Report 1, No. 14.

Rossi, Peter E., Robert E. McCulloch and Greg M. Allenby (1996), "The Value of Purchase History Data Target Marketing," *Marketing Science,* 15 (4), 321–40.

Ryu, Gangseog and Lawrence Feick (2007), "A Penny for Your Thoughts: Referral Reward Programs and Referral Likelihood," *Journal of Marketing,* 71 (1), 84–9.

Shaffer, Greg and John Z. Zhang (2002), "Competitive One-to-One Promotions," *Management Science,* 48 (9), 1143–60.

Shankar, Venkatesh and Sridhar Balasubramanian (2009), "Mobile Marketing: Synthesis and Prognosis," *Journal of Interactive Marketing,* 23 (2), 118–29. Tenth Anniversary Special Issue

Shankar, Venkatesh, Jeffrey Inman, Eileen Kelly, Murali Mantrala and Ross Rizley (2011), "Innovations in Shopper Marketing," *Journal of Retailing,*.

Shankar, Venkatesh, Alladi Venkatesh, Charles Hofacker and Prasad Naik (2010), "Mobile Marketing in the Retailing Environment: Current Insights and Future Research Avenues," *Journal of Interactive Marketing,* 24 (2), 111–20.

Silicon India (2008), "Altierre: Revolutionizing Retail Space," 11 (10), 38.

Sorensen, Herb (2003), "The Science of Shopping," *Marketing Research,* 15 (3), 30–5.

Sorescu, Alina, Ruud Frambach, Jagdip Singh, Arvind Rangaswamy and Cheryl Bridges (2011), "Innovations in Retail Business Models," *Journal of Retailing,*.

Stilley, Karen M., J. Jeffrey Inman and Kirk Wakefield (2010a), "Spending on the Fly: Mental Budgets, Promotions, and Spending Behavior," *Journal of Marketing,* 74 (May), 34–47.

————————, ———————— and ———————— (2010b), "Planning to Make Unplanned Purchases? The Role of In-Store Slack in Budget Deviation," *Journal of Consumer Research,* 37 (August), 264–78.

Sultan, F. and A.J. Rohm (2005), "The Coming Era of 'Brand in the Hand' Marketing," *MIT Sloan Management Review,* 47 (Fall), 83–90.

———————— and ———————— (2008), "How to Market to Generation m(obile)," *MIT Sloan Management Review,* 49 (4), 35–41.

Supermarket News (2005), "The ESL Connection," May 30, 43.

Suri, Rajneesh, D. and Dhruv Grewal (2011), "When Left Is Right and Right Maybe Wrong," working paper, Babson College.

Syam, Niladri B., Ranran Ruan and James D. Hess (2005), "Customized Products: A Competitive Analysis," *Marketing Science,* 24 (4), 569–84.

Tsiros, Michael and David M. Hardesty (2010), "Ending a Price Promotion: Retracting It in One Step or Phasing It Out Gradually," *Journal of Marketing,* 74 (9), 49–64.

U.S. Census Bureau (2008), Annual Retail Trade Report, available at http://www2.census.gov/retail/releases/current/arts/sales.pdf.

Vadlamani, Ravi, Kalyan Raman and Murali K. Mantrala (2006), "Applications of Intelligent Technologies in Retail Marketing," in *Retailing in the 21st Century: Current and Future Trends*, Manfred Krafft and Murali Mantrala, eds. New York: Springer Berlin Heidelberg, 173–88.

Van Der Lans, Raif, Rik Pieters and Michel Wedel (2008), "Eye-Movement Analysis of Search Effectiveness," *Journal of the American Statistical Association,* 103 (482), 452–61.

van Heerde, Harald J. and Scott A. Neslin (2008), "Sales Promotion Models," in *Handbook of Marketing Decision Models*, Wierenga Berend ed. Springer Publishers, 107–62.

Venkatesan, Rajkumar and Paul Farris (2010), "Measuring and Managing the Customer Profitability of Retailer-Targeted Coupon Campaigns," working paper, University of Virginia.

Wall Street Journal (2011), "Groupon 'Flaw' In the Business," January 7, p. B1.

Webb, Warren (2008), "RFID in Embedded Designs," *Electronics Weekly,* 2365 (December 17), 14–7.

Wilkinson, J.B., J. Barry Mason and Christie H. Paksoy (1982), "Assessing the Impact of Short-Term Supermarket Strategy Variables," *Journal of Marketing Research,* 19 (February), 72–86.

Winer, Russell S. (1986), "A Reference Price Model of Demand for Frequently-Purchased Products," *Journal of Consumer Research,* 13 (September), 250–6.

Xu, David Jingjun, Stephen Shaoyi Liao and Qiudan Li (2008), "Combining Empirical Experimentation and Modeling Techniques: A Design Research Approach for Personalized Mobile Advertising Applications," *Decision Support Systems,* 44 (3), 710–24.

Zhang, Jie and Els Breugelmans (2010), "The Impact of an Item-Based Loyalty Program," Unpublished working paper, University of Maryland.

Zhang, Jie and Michel Wedel (2009), "The Effectiveness of Customized Promotions in Online and Offline Stores," *Journal of Marketing Research,* 46 (April), 190–206.