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The Negative and Positive Consequences of Placing Nonpromoted Products Next to Promoted Products

Christina Kan, Yan (Lucy) Liu, Donald R. Lichtenstein, and Chris Janiszewski

Abstract

This research investigates how a price promotion on a fast-moving consumer good influences the sales of substitute products in a retail shelf or online display. An analysis of supermarket yogurt data finds that when nonpromoted products are strong substitutes for the promoted product, a 1% decrease in the price of the promoted product results in a .25% decrease in the sales of proximal products but no change in the sales of distal products—a negative promotion-proximity effect. However, when nonpromoted products are weak substitutes for the promoted product, a 1% decrease in the price of the promoted product results in a .10% increase in the sales of proximal products but no change in sales for distal products—a positive promotion-proximity effect. Subsequent studies show that these effects occur because a proximal strong substitute is more likely to enter a consideration set with the promoted product (negative promotion-proximity effect) and a proximal weak substitute is more likely to be seen and considered by a consumer who is not interested in the promoted product (positive promotion-proximity effect).

Keywords

product displays, price promotions, consideration sets, substitutes, attention

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The strategic use of price promotions is common in consumer goods. For categories characterized by a large number of competitors, low brand loyalty, and the purchase of multiple brands on a shopping trip, promotions encourage brand switching from nonpromoted to promoted brands (Bell, Chiang, and Padmanabhan 1999; Van Heerde, Gupta, and Wittink 2003). Brand switching is particularly sensitive to substitutability (Blattberg and Neslin 1990; Sethuraman, Srinivasan, and Kim 1999), in that a promotion negatively impacts the sales of strong substitutes more than weak substitutes. The negative influence of a promotion on the sales of nonpromoted products can be offset by category expansion (Sethuraman, Srinivasan, and Kim 1999; Van Heerde, Gupta, and Wittink 2003), in which a promotion attracts new shoppers who increase the sales of all products.

Brand switching and category expansion effects (i.e., main effect of cross-price promotions) and the way switching changes with substitutability (i.e., moderating effect of substitutability) have been well explored in prior research. We extend these findings by investigating how the sales of nonpromoted products are impacted by their proximity to (i.e., moderating effects of proximity), and substitutability for (i.e., moderating effects of proximity and substitutability), a promoted brand. While there is prior research demonstrating that promotions have a stronger impact on non-promoted products that are located proximal to the promoted product (Heilman, Nakamoto, and Rao 2002; Leeflang and Parreno-Selva 2012), it focuses on cross-category effects where the relationship between categories is undefined (i.e., it is unclear whether the categories are unrelated, complements, or substitutes), and more proximal products have an exposure advantage. Our research focuses on within-category effects, defines the relationship between products based on the strength of substitution, and all purchase options have equal exposure.

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We document two promotion-proximity effects. First, when the promoted and nonpromoted brands are strong substitutes, the sales of the proximal nonpromoted brand should decline more than the sales of the distal nonpromoted brand because the target market for these brands finds the promoted brand's price more appealing and the proximal brand suffers more from this unfavorable price comparison (i.e., a negative promotion-proximity effect). Second, when the promoted and nonpromoted brands are weak substitutes, the sales of the proximal nonpromoted brand should increase more than the sales of the distal nonpromoted brand because the target market for the nonpromoted brand is more likely to see and consider the proximal brand (i.e., a positive promotion-proximity effect). Each effect occurs because a promotion encourages a consumer to construct a small, visually localized consideration set from which a purchase decision is made (i.e., "Should I buy?," "What should I buy?," "How much should I buy?"). Consumers find it more efficient to consider brands in subareas of a large shelf display (Drèze, Hoch, and Purk 1994). Thus, a promotion is more likely to have a stronger incremental effect on the sales of proximally located nonpromoted products compared with distally located nonpromoted products.

Our promotion-proximity results provide three insights. First, it is often assumed that price promotions draw attention toward the promoted brand and away from all other brands (Burke and Leykin 2014; Inman, McAlister, and Hoyer 1990). In contrast, our results show that price promotions direct attention to the promoted brand *and* the brands that surround it (i.e., attention spills over). Second, prior research assumes that goal-directed consumers will search a product display so that all appropriate products enter a consideration set before the purchase decision is made (Ratneshwar, Pechmann, and Shocker 1996; Roberts and Lattin 1991). In contrast, our data show that a price promotion can increase (decrease) the likelihood that a proximal (distal) product will enter a consideration set. Third, prior research assumes that multiple purchases come from a single consideration set (Ratner, Kahn, and Kahneman 1999; Simonson 1990; Van der Lans 2018). In contrast, we argue that consumers can search multiple locations in a product display, with each location generating a unique consideration set and purchase opportunity. The implication is that cross-brand elasticities should be sensitive to not only the substitutability of the brands but also the substitutability × physical location interaction. These cross-brand elasticities that are sensitive to substitutability × physical location interactions can be managed by organizing a display to create multiple "visual invitations" to explore, consider, and purchase.

Consideration Set Formation and Choice

A popular conceptualization of decision making assumes that consumers form a consideration set prior to choice (Bettman 1979). A consideration set is formed when a consumer encounters a large number of alternatives and uses screening criteria to isolate a smaller set of options for more careful consideration (Bettman 1979; Chakravarti and Janiszewski 2003; Shocker et al. 1991). In traditional choice models, screening criteria tend to be simple and easy to implement. For example, consumers can use price (Mehta, Rajiv, and Srinivasan 2003) or a product attribute (Chakravarti and Janiszewski 2003) to screen alternatives. Further, the screening process is thought to be linear (i.e., one option at a time) and comprehensive (all options are screened). This approach to screening is viable if screening criteria are simple and effortless to apply. When criteria are difficult to implement (Mehta, Rajiv, and Srinivasan 2003), search costs are high (Liu and Dukes 2013), or time is limited (Punj and Moore 2009), people may fail to screen all alternatives.

An updated conceptualization of stimulus-based consumer choice puts significantly more emphasis on how attention can act as a de facto screening process. In this conceptualization, incidental display factors direct attention to a location in the display and indirectly influence consideration set formation and choice. Consistent with this claim, choice is impacted by attentional processes that are sensitive to product prominence, such as eye-level merchandise (Drèze, Hoch, and Purk 1994), high-contrast packages (Van der Lans, Pieters, and Wedel 2008), large shelf facings (Chandon et al. 2009), large display items (Janiszewski 1998), high visual salience (Milosavljevic et al. 2012), and price promotion signals (Kumar and Leone 1988; Van Heerde, Gupta, and Wittink 2003). In these cases, increased attention to a product provides an opportunity to accumulate more positive information about the product and, consequently, increases the likelihood that the product will be considered and purchased (Orquin and Loose 2013; Shimojo et al. 2003).

When there are many competitors in a product display, and a consumer is not searching for a specific brand, attentional processes can result in a consideration set that has more than one product (see Figure 1). A global attention process (box #1) allows relevance (e.g., a product is familiar) or visual salience (e.g., a price promotion is marked with a visually salient tag) to determine an initial fixation (box #2) in the product display (i.e., which product is attended to first) (Bogomolova et al. 2020; Inman, McAlister, and Hoyer 1990; Nordfält 2011). The awareness of additional products is influenced largely by their proximity to the product that was initially fixated on (Janiszewski 1998; Pieters and Wedel 2004; Wästlund, Shams, and Otterbring 2018). This localized search (box #3) is used to form a consideration set, with more refined screening criteria (e.g., price, product benefits, product attribute) determining which of the proximal products enter the consideration set (box #4). A choice and purchase quantity (box #5) are then determined using the benefits and prices of the products in the consideration set. Subsequently (box #6), the consumer can transition to another product category (exit) or revert to global attention (box #1) so that a different area of the display can be searched.

Hypotheses

The purchase process described in Figure 1 has two implications for how a price promotion could result in a distance ×

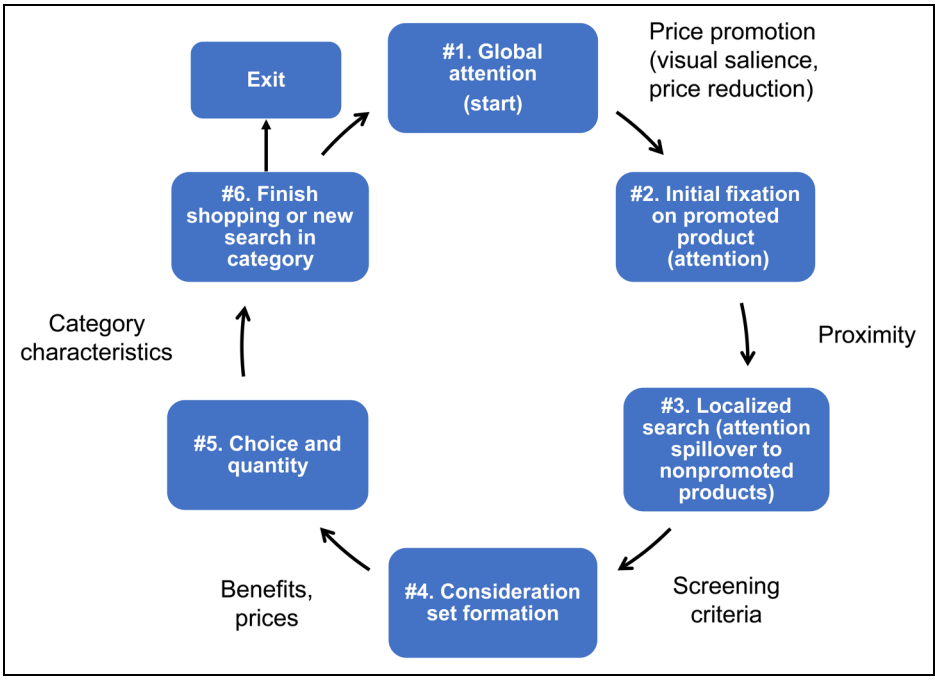

Figure 1. The Influence of Price Promotions on Attention, Consideration Set Formation, and Choice.
Notes: The boxes represent the cognitive processes that occur when a consumer shops. The information outside the boxes moderates the relationship between the boxes. For example, visual salience and a price reduction influence the location of an initial fixation in a product display, proximity influences the subsequent fixations in the display, screening criteria influence the composition of the consideration set, prices and attributes influence choice, and category characteristics determine if more than one search will occur in a product category.

substitutability interaction on the sales of nonpromoted products.[1] First, to the extent that search is localized to areas of the display that have a strong draw on attention, price promotions should have more influence on the sales of products located proximally to the promoted product than on the sales of products located distally to the promoted product (i.e., a cross-price promotion × distance interaction). Second, to the extent that there is heterogeneity in consumer preferences and in product offerings, a price promotion could have a negative or positive impact on the sales of proximal nonpromoted products (i.e., a cross-price promotion × distance × substitutability interaction). When the promoted and nonpromoted products appeal to the same target market (i.e., are strong substitutes), the promoted product should capture sales that would have otherwise gone to the nonpromoted product. When the promoted and nonpromoted products appeal to different target markets (i.e., are weak substitutes), the nonpromoted proximal product sales should increase relative to the distal product because it is more likely to be seen by the target market that is interested in its benefits. Next, we discuss the cross-price promotion × distance interaction and the moderating influence of substitutability.

Negative Promotion-Proximity Effect

Referring to Figure 1, a promoted product has two cues (a visually salient promotion marker and a price reduction) that encourage an initial fixation (i.e., attention) on the promoted product. After the initial fixation, there is increased attention to proximal products during localized search (i.e., more people see the proximal product than if the promotion had not existed—a process labeled "attention spillover"; Janiszewski 1998). If the promoted product and its proximal neighbor are strong substitutes, both are likely to enter the same consideration set for a target market with screening criteria that advantage these products (i.e., the benefits the products share). At the choice stage, the reduced price of the promoted product serves as a reference price for the proximal product, causing an unfavorable price comparison. The negative influence of the promoted product on the sales of strong substitutes should be weaker as nonpromoted products are located farther from the promoted product. Distally located strong substitutes are less likely to enter a consideration set with the promoted product and, thus, are less likely to suffer from an unfavorable price comparison. As a result,

[1] Our hypotheses pertain to the sales of nonpromoted products after controlling for the main effect of the cross-price promotion (i.e., the combined effects of brand switching and category expansion) and the cross-price promotion × substitutability interaction. The incremental effect of the cross-price promotion × distance interaction and the cross-price promotion × distance × substitutability interaction can be captured by comparing proximal product sales with distal product sales for products of equivalent substitutability.

H_{1a}: The sales of a strong substitute product decrease more when located proximally to a promoted product than when located distally to a promoted product.

H_{1b}: The sales decline for the proximal product is due to its having a price disadvantage compared with the promoted product.

Positive Promotion-Proximity Effect

Referring to Figure 1, a promoted product has an attentional cue that encourages an initial fixation on the promoted product and increased attention to proximal products (i.e., more people see the proximal product than if the promotion had not existed). If the promoted product and its proximal neighbor are weak substitutes, they are unlikely to enter the same consideration set. For a target market that appreciates the benefits of the nonpromoted product, the nonpromoted product should enter its consideration set and be more likely to be purchased. Thus, heightened attention to the nonpromoted proximal product increases its consideration and sales. Distally located weak substitutes will not benefit from the increased attention and, hence, are less likely to benefit from the attention spillover from the price promotion. As a result,

H_{2a}: The sales of a weak substitute product increase more when located proximally to a promoted product than when located distally to a promoted product.

H_{2b}: The sales increase for the proximal product is due to its having favorable attributes compared with the promoted product (for particular consumers).

Moderation by Attention Diffusion

The process explanation discussed previously depends on the promoted and proximal products (1) being attended to and (2) entering the consideration set. Evidence for the instrumentality of the attention process can be provided by manipulating the visual appeal of the areas of the display containing a promoted product. Global attention (i.e., fixating on the entire display) is sensitive to a visual area having uniquely salient information, such as signage for a price promotion. This can lead to a pop-out effect, which occurs when uniquely salient information automatically stands out from other information in the display and, as such, is prone to be both the first and most attended information in the display (Milosavljevic et al. 2012; Treisman 1998; Wolfe 1994). A mitigator of the pop-out effect is attention diffusion. As more items in a display have the same salient feature that encourages pop-out (e.g., neon shelf tag), the feature becomes less unique and less likely to encourage attention to any one area containing a product with the salient feature (Wolfe 1994). Thus, the more items in a display that share an otherwise salient feature that would allow a single item to automatically pop out, the less attention each salient product will receive (Wolfe 1994).

Attention diffusion can occur in retail displays that include multiple promotions. As the number of promotions in a retail display increase, a visual feature that signals a promotion (e.g., a "shelf screamer") can become more common, so that a single promotion is less distinctive and less likely to automatically draw differential attention to its area of the display. That is, as the number of promotions in a display increases, the attention garnered by any one promotion decreases. Further, as the amount of attention paid to any particular area containing a promotion decreases, promotion-proximity effects should decrease. As a result,

H_3: An increase in the number of promotions within the same product display decreases the strength of the negative and positive promotion-proximity effects.

Overview of Studies

We conducted eight studies to investigate our hypotheses. Study 1 uses sales data from a retail grocery chain to provide evidence for negative (H_{1a}) and positive (H_{2a}) promotion-proximity effects as well as the influence of multiple promotions on promotion-proximity effects (H_3). Recognizing the correlational nature of the Study 1 data, Studies 2a and 2b replicate the promotion-proximity effects (H_{1a}, H_{2a}) using field studies. Studies 3a and 3b isolate the independent influence of a promotion's attention cue and price discount cue on a negative promotion-proximity effect (both cues are necessary) and a positive promotion-proximity effect (only the attention cue is necessary). Study 4 investigates the role of preference heterogeneity in contributing to the positive and negative promotion-proximity effects. Studies 5a and 5b explore a managerially relevant moderator: how adding attention attractors beyond the promotion itself (e.g., flashing lights) impacts the negative (Study 5a) and positive (Study 5b) proximity effects.

Study 1: Promotion-Proximity Effects in Retail Grocery Sales Data

In Study 1, we analyze yogurt sales data to assess whether a product's sales exhibit positive and negative promotion-proximity effects when its competitor is on promotion, after controlling for the main effect of cross-price promotion (e.g., combined effect of additional shoppers and brand switching) and the interaction of substitution and cross-price promotion. We matched daily sales to a retailer's planogram to explore how the proximity and substitutability of a nonpromoted product influenced its sales response to the promotion. Daily sales data were used because the retailer allowed the prior week and current week promotions to run in tandem (i.e., promotions ran for eight days and overlapped on Wednesdays).

Data and Variables

We obtained the data for this study from three stores of a U.S. grocery retailer. The data set contains slightly over two years of

daily sales in the yogurt category, with sales quantity, selling price, and price promotion status for all 17 brands and 183 stockkeeping units (SKUs) sold at that retailer.

Price promotion. We operationalized the price promotion variable as the percentage discount from the regular price. This allowed for the possibility that a discount on a cheaper item (e.g., $.50 discount on a $1.00 item; 50% discount) could have a greater impact on sales than the same discount on a more expensive item (e.g., $.50 discount on a $1.50 item; 33% discount). Whenever a product was on price promotion, it had a shelf sign displaying both the regular and the reduced price. This sign was a promotional cue that also drew shoppers' attention. Therefore, the price promotion reflects both a price discount effect and an attention-draw effect.

Distance. Each SKU was matched to a specific location within the store's planogram. The planogram was designed for a shelf display of 12 feet wide and 6 feet high. The planogram had six horizontal shelves, with a maximum of 44 possible product facings on each shelf.[2] Shelves varied in height, with the total height of the combined shelves being 20 facings. Product facings were used as the units to calculate distance. Therefore, 1 unit of distance is about .3 feet. We plotted each of the product facings as points on a Cartesian coordinate system. Some products had multiple facings; for these products, we labeled the location of the product as the midpoint of its product facings. We then calculated the Euclidean distance, $Dist_{ij}$, between product i with coordinates (X_i, Y_i) and product j with coordinates (X_j, Y_j):

$$Dist_{ij} = \sqrt{(X_i - X_j)^2 + (Y_i - Y_j)^2}.$$

Substitutability. Similar to Rooderkerk, Van Heerde, and Bijmolt (2013), we measure substitutability as the similarity between two SKUs in the following product attributes: (1) brand; (2) style: traditional, Greek; (3) fat: low fat, full fat; and (4) organic: organic, not organic,[3] with

$$Sub_{ij}^{n} = I(Attr_i^n = Attr_j^n).$$

Sub_{ij}^{n} is the substitutability between SKU i and SKU j in product attribute n. $Attr_i^n$ is the product attribute n of SKU i, including a brand indicator ($Attr_i^1$) and dummy variables of style ($Attr_i^2$, Greek = 1, traditional = 0), fat ($Attr_i^3$, 1 = low fat, 0 = full fat), and organic ($Attr_i^4$, 1 = organic, 0 = not organic). $I(\cdot)$ is an indicator function. Sub_{ij}^{n} equals one if $Attr_i^n = Attr_j^n$, and zero otherwise.[4] We report the descriptive statistics of all variables in Table WA1 of Web Appendix A.

Analysis

Following Rooderkerk, Van Heerde, and Bijmolt (2013), we developed a hierarchical linear model (HLM) that captures both the own and cross effects of price promotion. We allowed the cross effects of price promotion to be a function of product distance, substitutability, and the interaction between distance and substitutability. Moreover, we controlled for the effects of regular price and product attributes, lagged price promotion, store, and seasonality (i.e., quarterly, weekend, and holiday effects). We allow for nonlinear effects of price and promotion on sales by starting with a log-log model, similar to the SCAN*PRO model (Rooderkerk, Van Heerde, and Bijmolt 2013; Van Heerde, Leeflang, and Wittink 2002):

$$\begin{aligned} Ln(S_{ibkt}) = {} & \beta_{1b} Ln(Prom_{ibkt}) + \sum_{j \neq i} \alpha_{ij} Ln(Prom_{jb'kt}) \\ & + \beta_{2b} Ln(Rp_{ibkt}) + \sum_{n=1}^{4} \beta_{3b}^{n} Attr_i^n \\ & + \sum_{\tau} \beta_{4b}^{\tau} Ln(Prom_{ibk\tau}) + \beta_{5b} Store_k \\ & + \beta_{6b} Season_t + \varepsilon_{ibkt}. \end{aligned} \quad (1)$$

In this equation, S_{ibkt} is the sales volume in ounces of SKU i of brand b in store k for day t. $Prom_{ibkt}$ is the percentage of the promotion discount offered for SKU i of brand b in store k for day t. $Prom_{jb'kt}$ is the cross-price promotion of SKU j of brand b′ in store k for day t, where b′ = b if SKU i and j are from the same brand, and b′ ≠ b otherwise. Rp_{ibkt} is the regular price per ounce of SKU i of brand b in store k for day t.[5] $Prom_{ibk\tau}$ is the lagged τ weeks' promotion of SKU i of brand b in store k. We let $\tau \in |1, 2|$, as we do not expect a promotion's impact to last

[2] There are only 183 SKUs because some products had multiple facings.

[3] Other observable attributes, including size and flavor, have no significant impacts on the effects of cross-price promotions. Moreover, including these two attributes decreases the model fit. We thus excluded these two attributes in the final model.

[4] The first level of the hierarchical linear model (HLM), Equation 1, accounts for the direct effect of attributes on sales. The second level of the HLM, Equation 3, accounts for substitution patterns based on the similarity in attributes between the focal SKU and the cross-promoted SKU (Rooderkerk, Van Heerde, and Bijmolt 2013). We chose this approach—rather than including the attributes of both SKUs in Equation 3—because (1) our approach is in line with theory stating that substitutability between items is driven by their similarity and (2) it yields a parsimonious model. Note that we compute substitution from the attribute variables. It is possible to distill more detail regarding which attribute levels were most important in creating that similarity. However, this is not in line with our objective to examine whether substitution based on the similarity of different attributes influences cross-promotion effects. In addition, while substitution is directly a function of attributes, its construction means that it will not be a perfect linear function of the attributes. The empirical correlation between substitution and individual attribute variables was quite small, ranging from .02 to .05.

[5] Following previous literature (e.g., Liu and Balachander 2014), we infer regular price from the data. Specifically, for SKUs on promotion, we assume that the price of the closest previous no-promotion day is the regular price.

more than two weeks.[6] Since yogurt has a short shelf life of one to two weeks, stockpiling beyond this period is unlikely. Further, since yogurt is regularly consumed, consumers are unlikely to change their consumption patterns. $Store_k$ is a vector of store indicators. $Season_t$ is a vector of seasonality variables, including quarterly indicators, a weekend indicator, and a holiday indicator. β_{1b} is the own effect of price promotion.[7] α_{ij} is the parameter of cross-price promotion of SKU j on the sales of SKU i. Because of the log-log transformation, α_{ij} captures the cross-price promotion elasticity. β_{2b}, β_{3b}, β_{4b}, β_{5b} and β_{6b} are parameters of the regular price, product attributes, lagged price promotion, store, and seasonality, respectively. ε_{ibkt} is the error term and is assumed to follow a normal distribution $\varepsilon_{ibkt} \sim N(0, \sigma_\varepsilon^2)$.[8] Own price promotion, regular price product attributes, lagged price promotion, and seasonality may have differential effects on different brands. We define $\beta_b = \{\beta_{1b}, \beta_{2b}, \beta_{3b}, \beta_{4b}, \beta_{5b}, \beta_{6b}\}$ and allow β_b to vary across brands:

$$\beta_b = \bar{\beta} + e_b \text{ and } e_b \sim N(0, \sigma_e^2), \tag{2}$$

where $\bar{\beta}$ is the mean value of β_b and e_b is the random error of brand b. Moreover, we modeled the cross-price promotion effect α_{ij} as a function of distance and substitutability, and the interaction between distance and substitutability between SKU i and SKU j. Thus, we have

$$\begin{aligned}\alpha_{ij} = {} & \gamma_0 + \gamma_1 \ln(Dist_{ij}) + \sum_n \gamma_2^n Sub_{ij}^n \\ & + \sum_n \gamma_3^n Sub_{ij}^n \ln(Dist_{ij}) \\ & + \varepsilon_{ij} \text{ and } \varepsilon_{ij} \sim N(0, \sigma_\varepsilon^2).\end{aligned} \tag{3}$$

In Equation 3, γ_1 and γ_3 capture how distance and the interaction between distance and substitutability moderate the relationship between cross-price promotions and sales and, hence, test H_{1a} and H_{2a}. γ_0 is the main effect of cross-price promotion due to brand switching or category expansion. γ_2 is the moderating effect of substitutability. We log-transform distance to capture possible nonlinear effects of distance on the impact of cross-price promotions.[9,10]

Although the endogeneity of marketing activities—in particular price promotion, regular price, and cross-price promotion—should be less of a concern given that these activities are arranged weeks in advance and we use daily-level data, we additionally address this concern by using the Gaussian copulas approach (Park and Gupta 2012). This approach models the correlation between the endogenous variables and the error term with Gaussian copulas. It allows us to nonparametrically estimate the density of the marginal distribution of the endogenous variables and, thus, requires no instruments. With a normal error term, the Gaussian copulas method requires that the endogenous regressors are not normally distributed for identification purposes. The Shapiro–Wilk test rejects the null hypothesis of a normal distribution with $p < .01$ for price promotion, regular price, and cross-price promotion variables in our data.

We estimated the HLMs with Gibbs sampling (Rooderkerk, Van Heerde, and Bijmolt 2013; Rossi, Allenby, and McCulloch 2005). We ran the Gibbs sampler for 100,000 draws and retained every 10th draw of the last 50,000 draws. Details of the sampling algorithm can be found in Web Appendix A. We estimate three versions of the sales models: (1) Model 1, a model without considering the effect of cross-price promotion (i.e., $\alpha_{ij} = 0$); (2) Model 2, a model based on Model 1 by incorporating the constant effect of cross-price promotion (i.e., without second level equation of α_{ij}); and (3) Model 3, the full model that includes the moderating effect of distance and substitutability on the impact of cross-price promotion.

Results

Model fit. We report the deviance information criterion (DIC; Spiegelhalter et al. 2002), mean absolute error (MAE), and root mean square error (RMSE) in Table 1. We use the DIC to compare the fit of the models, as MAE and RMSE do not penalize the model with increased parameters. A lower value of DIC is preferred. Table 1 displays the resulting model comparison. The full model fits the data best; it is important to model the impacts of distance and substitutability when investigating the effects of cross-price promotion on sales.

Testing for the positive and negative promotion-proximity effects. Table 1 presents the key posterior parameter estimates for the full model. All the parameters of the cross-price promotion effects (i.e., γ_0 to γ_3) are statistically significant except for the parameter for organic substitutability (γ_2^4). These results indicate that another product's price promotion has an impact on the focal product's sales, and this impact is moderated by the substitutability attributes (brand, style, and fat), distance, and the interaction between the substitutability attributes and distance. More importantly, the significant estimates of γ_1 and γ_3^n suggest that there are promotion-proximity effects of cross-price promotion and that the substitutability attributes moderate these effects. To better illustrate the impact of the cross-effect of price promotion, we plot the elasticities of cross-price promotion,[11] given the distance (range from 0 to 3.83) and substitutability

[6] Indeed, a robustness check shows that promotions of three weeks prior have no significant effects on sales.

[7] Following Baltagi (2005), we conduct the Roy–Zellner pooling test to determine whether we can pool response parameters across stores. The F-value is .95, smaller than the critical value 1.36, indicating that the null hypothesis of pooling is not rejected. This is not surprising, given that the stores are located in the same city, and consumers across these stores are likely to have similar purchase behaviors.

[8] We test the serial correlations of error terms with Wooldridge's test (Wooldridge 2010, p. 320). Specifically, we conducted this test separately for all three stores. All three key coefficients (−.484, SE = .012; −.510, SE = .027; −.494, SE = .028) are not significantly different from −.5, indicating no serial correlations in the error terms of the model.

[9] We ran a model without log-transforming the distance variable, and the results are consistent (Table WA5 of the Web Appendix).

[10] There might be an interaction effect between the own promotion and cross-price promotion. However, the multicollinearity becomes a problem according to the variance inflation factor (VIF) test after including such an interaction term. We thus leave this for future research.

Table 1. Estimates of Cross-Price Promotions and Model Comparisons (Study 1).

	Model 1	Model 2	Model 3 (Full Model)
	Mean (SD)	Mean (SD)	Mean (SD)
Constant (γ_0)	**0**	**−.05 (.01)**	**.10 (.01)**
Sub_{ij}^{brand} (γ_2^1)			**−.09 (.01)**
Sub_{ij}^{style} (γ_2^2)			**−.11 (.03)**
Sub_{ij}^{fat} (γ_2^3)			**−.13 (.02)**
$Sub_{ij}^{organic}$ (γ_2^4)			−.02 (.05)
$Dist_{ij}$ (γ_1)			**−.03 (.00)**
$Sub_{ij}^{brand} \times Dist_{ij}$ (γ_3^1)			**.02 (.00)**
$Sub_{ij}^{style} \times Dist_{ij}$ (γ_3^2)			**.02 (.01)**
$Sub_{ij}^{fat} \times Dist_{ij}$ (γ_3^3)			**.01 (.00)**
$Sub_{ij}^{organic} \times Dist_{ij}$ (γ_3^4)			**.03 (.01)**
DIC	493,463.72	451,098.12	424,142.95
MAE (RMSE)	.43 (.62)	.38 (.52)	.33 (.47)

Notes: In bold are shown the parameters for which the 95% highest posterior density intervals exclude zero. For conciseness, we report all other estimates in Table WA2 of Web Appendix A.

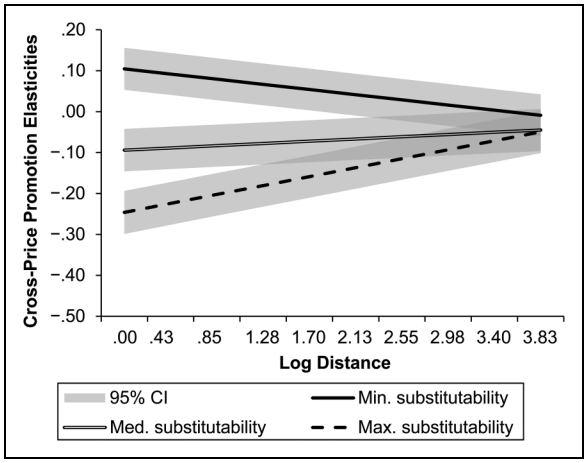

Figure 2. Elasticities of Cross-Price Promotion at Different Distances and Substitutability.

(maximum = substitutable in all four attributes, medium = substitutable in brand and style,[12] minimum = not substitutable in any attribute) between the two products (Figure 2).

Figure 2 shows that cross-price promotion elasticities depend on the substitutability and distance between the promoted and focal products. The slopes of the lines show the difference in sales change for the adjacent versus the distal product, thus reflecting the promotion-proximity effects. When the substitutability was at a maximum level (substitutable in all four product attributes), the slope is significantly positive (.05, CI = [.04, .06]). Given a 1% increase in price promotion, sales of the adjacent focal product ($\ln(Dis_{ij}) = 0$) decreased .25% while sales of the most distal focal product ($\ln(Dis_{ij}) = 3.83$) had no significant change. When substitutability was at a minimum level (not substitutable in any product attribute), the slope is significantly negative (−.03, CI = [−.04, −.02]). Given a 1% increase in price promotion, sales of the adjacent focal product ($\ln(Dis_{ij}) = 0$) increased .10% while sales of the most distal focal product ($\ln(Dis_{ij}) = 3.83$) had no significant change. The significant difference in sales change for the adjacent versus distal product under maximum substitutability provides support for the negative promotion-proximity effect (H_{1a}), while the results under minimum substitutability provide support for the positive promotion-proximity effect (H_{2a}). We included results for medium substitutability for comparison; these results are consistent with the negative promotion-proximity effect with a significant positive slope (.01, CI = [.01, .02]).

Although beyond the specific focus of the present investigation, an issue of managerial relevance relates to the influence of a promotion on the total sales of the proximal product relative to when no promotion is offered. Figure 2 allows us to address this managerial issue. Because of the log-log specification, the elasticities shown in Figure 2 are the estimated total effect of cross-price promotion (i.e., α_{ij}). Given that the cross-price promotion variable has a meaningful zero, indicating no cross-price promotion, the value of the significance tests of α_{ij}, or the elasticities shown in Figure 2, capture the effect of cross-price promotion on sales compared with a no-cross-price promotion baseline. It shows that when substitutability was at a maximum (minimum) level, there was a significant decrease (increase) in sales of a proximal product, compared with the baseline. These changes are not significant for a distal product. We return to this issue in the "General Discussion" section.

Exploring how the number of promotions impacts the positive and negative promotion-proximity effect. To investigate how the number of cross-price promotions moderates the promotion-proximity effects (H_3), we allow the parameters $\gamma = \{\gamma_0, \gamma_1, \gamma_2, \gamma_3,\}$ in Equation 3 to be a function of the number of cross-price promotions. We have

$$\gamma_{ikt} = \omega_0 + \omega_1 M_{ikt} + \mu_{ikt} \text{ and } \mu_{ikt} \sim N(0, \sigma_\mu^2), \quad (4)$$

where M_{ikt} is the number of products on promotion other than SKU i in store k for day t.

ω_1 in Equation 4 captures how promotion-proximity effects differ given the number of cross-price promotions. Because of the high-dimensional interaction terms, multicollinearity becomes a problem according to the variance inflation factors

[11] The estimated cross-price promotion elasticities are comparable to findings from previous literature; a meta-analysis of the cross-price elasticities from 115 publications finds that the mean cross-price elasticity is .26 (Auer and Papies 2020).

[12] We plotted the elasticities with a randomly selected pair of product features for the medium substitutability. The elasticities with all other pairs of product features are reported in Figure WA3 of the Web Appendix. The slopes are between .01 (CI = [.01, .02]) and .02 (CI = [.01, .02]), similar to the results reported in Figure 2.

Table 2. Key Estimation Results: Impact of the Number of Cross-Price Promotions.

	Constant Term (γ_0) Mean (SD)	Coefficient of $Dist_{ij}$ (γ_1) Mean (SD)	Coefficient of Sub_{ij} (γ_2) Mean (SD)	Coefficient of $Sub_{ij} \times Dist_{ij}$ (γ_3) Mean (SD)
Constant (ω_0)	.21 (.03)	−.06 (.01)	**−.19 (.03)**	**.04 (.01)**
M_{ikt} (ω_1)	−.37 (.09)	.10 (.04)	**.32 (.10)**	**−.07 (.03)**

Notes: In bold are shown the parameters for which the 95% highest posterior density intervals exclude zero. M_{ikt} is rescaled by multiplying by .01. For conciseness, we report all other estimates in Table WA3 of Web Appendix A.

(VIF) test (Yu, Jiang, and Land 2015).[13] To address this, we simplified the model specification in Equation 2 and assumed that the substitutability across different product attributes has the same effects on the impact of cross-price promotion (i.e., γ_2^n and γ_3^n are constant across n). After greatly reducing the number of interaction terms, the VIFs of the simplified model indicate no multicollinearity problem.

Table 2 presents the results of the key parameters of Equation 4. The ω_1 coefficients are all significant for all γ equations, indicating moderating effects of the number of cross-price promotions. In Figure 3, we present possible promotion-proximity effects by plotting the elasticities of cross-price promotion under two scenarios, with low ($M_{ikt} = 12$, 95th percentile) and high ($M_{ikt} = 42$, top 5th percentile) numbers of cross-price promotions (see Web Appendix Figure WA4 for a plot at $M_{ikt} = 23$, 50th percentile). It shows that the slope of the solid lines (dotted lines) becomes flatter with increasing M_{ikt}, indicating decreasing negative (positive) promotion-proximity effects as the number of promoted SKUs increases. Moreover, all the changes in slopes are significant at 95% credible interval. Thus, H_3 was supported.

Discussion

Using a secondary data set, we observed that a sales promotion had a stronger detrimental effect on the sales of strong substitute products when they were located closer to the promoted product (i.e., a negative promotion-proximity effect) (H_{1a}). Further, we observed that a sales promotion has a stronger beneficial effect on the sales of weak substitute products when they were located closer to the promoted product (i.e., a positive promotion-proximity effect) (H_{2a}). When the number of promotions increased, the size of the promotion-proximity effects declined (H_3) due to, we posit, the decreased ability of any single promotion to capture attention.

While the pattern of sales observed in this data set is supportive of promotion-proximity effects, there are several limitations. First, the design of the planogram could be endogenous in that the retailer has designed it to maximize profits. Our subsequent studies address this issue via random assignment of the proximity of a nonpromoted to a promoted product. Second, according to our theory, attention and a price discount are both needed for a negative promotion-proximity effect, but only attention is needed for a positive promotion-proximity effect. However, both attention and a price discount are naturally confounded in a real-world price promotion. Studies 3a and 3b address this by orthogonally manipulating attention and discounts.

These limitations noted, we were interested in whether managers would anticipate the results of Study 1. We contracted Qualtrics Research to recruit 100 retail managers from their respondent panel and received 87 usable surveys from respondents with an average of ten years of retail experience. Respondents saw two hypothetical yogurt planograms, with a promoted product having a 25% discount. They then estimated the influence of this promotion on the sales of a strong or weak substitute that was located proximal or distal to the promoted product (four within-subject estimates for each planogram). Full details about the study and results are in Web Appendix B. Managers anticipated that a promotion would reduce the sales of strong substitutes more ($M = -2.44\%$) than weak substitutes ($M = -.74\%$; $F(1, 86) = 7.11$, $p = .01$, $\eta_p^2 = .076$). However, managers did not anticipate that proximity would impact the magnitude of the decrease in sales ($M_{proximal} = -1.62\%$, $M_{distal} = -1.55\%$; $F(1, 86) = .008$, $p = .93$) or that there would be a proximity × degree of substitutability interaction ($F(1, 86) = .005$, $p = .94$). Thus, managers did not anticipate either promotion-proximity effect.

Study 2a: Promotion-Proximity Effects in a Retail Field Study

Study 1 used secondary data to provide evidence for promotion-proximity effects and the moderating role of product substitutability. Due to the correlational nature of the data, we cannot determine causality. Thus, the goal of Study 2a was to explore the causal effect of varying the proximity of a nonpromoted product to a promoted product, and the moderating effect of substitutability, on the sales of the nonpromoted product.

Predictions

We conducted a field study at point-of-checkout displays in a campus bookstore. We selected a commonly purchased category of products, university-branded keepsakes, and used two subcategories: university-branded stuffed animal keychains and university-branded car emblems (see Figure 4). The eight products within a subcategory were considered strong

[13] The VIFs of Models 1–3 are all below 5, a common rule of thumb, indicating no multicollinearity problem for these three models.

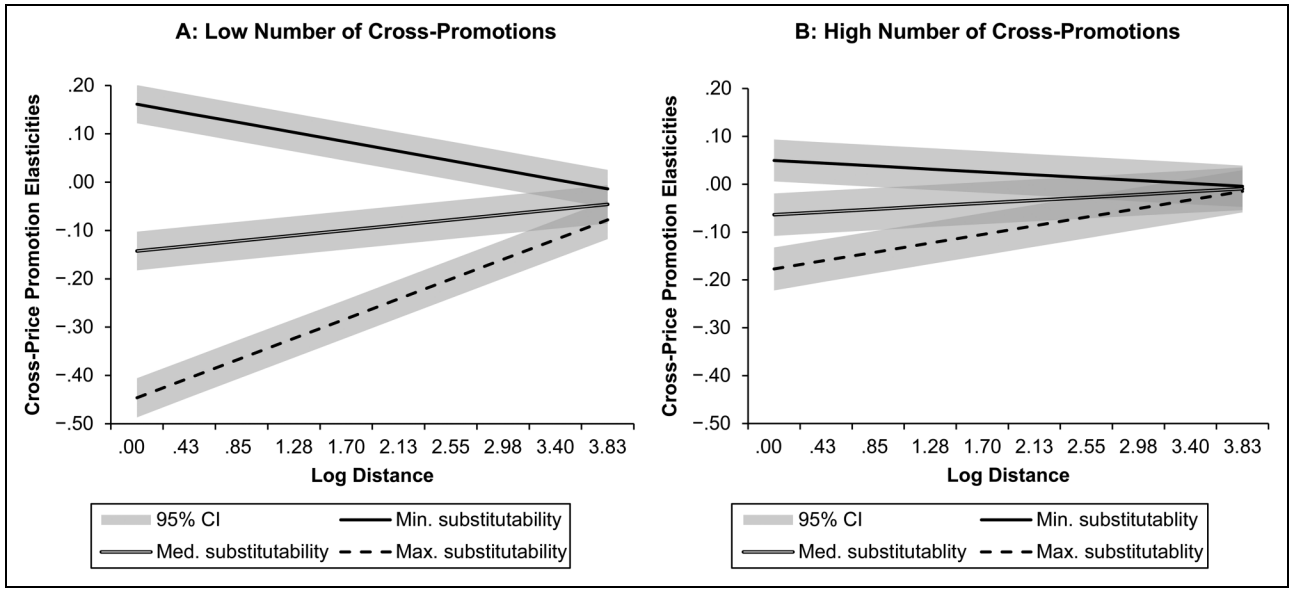

Figure 3. Elasticities of Cross-Price Promotion by Level of Promotional Activity.

substitutes and the eight products across subcategories were considered weak substitutes. These subcategories were chosen because they had high turnover and the products fit into the shelf display. We predicted a negative promotion-proximity effect for proximal products within the product subcategory (i.e., strong substitutes) and a positive promotion-proximity effect for proximal products outside the product subcategory (i.e., weak substitutes).

The tests for negative and positive promotion-proximity effects relied on a within-subject design (Winer, Brown, and Michels 1991). To illustrate, consider the keychains in Figure 4, Panel A. If there is a negative promotion-proximity effect, promoting a keychain (row 1, column 2 in Figure 4, Panel A) should decrease the sales of a proximal keychain (located to the left of the promoted keychain) relative to a distal keychain located in the lower-left corner of the shelf display. If there is a positive promotion-proximity effect, promoting this keychain should increase the sales of a proximal car emblem (located to the right of the promoted keychain) relative to a distal car emblem located in the lower-right corner of the shelf display.[14]

Procedure

The study used a 2 (substitutability: strong vs. weak) × 2 (location of nonpromoted product: proximal vs. distal) within-subject design. The emblem (Figure 4, Panel B) was promoted in weeks 1 and 2, with the proximal and distal products to the left (keychain) and right (emblem) switched between the weeks. The keychain (Figure 4, Panel A) was promoted in weeks 3 and 4, with the proximal and distal products to the left (keychain) and right (emblem) switched between the weeks. Web Appendix C shows a data collection diagram (Figure WC1), data collection schedule (Table WC1), and prices of the products (Table WC2).

There were a total of four displays in each week (all identical), two at each of the two cash registers in the store. The vendor provided the weekly unit sales for the proximal and distal products. Information regarding the number of products sold per transaction was unavailable.

Results

There was no proximal/distal product counterbalance effect, so the data were collapsed. As predicted, there was a significant substitutability × location interaction ($\chi^2 = 36.66$, $p < .01$; see Figure 5). Follow-up tests showed a significant positive promotion-proximity effect on the sales of the weak substitute ($p_{proximal} = .77$, $units_{proximal} = 169$; $p_{distal} = .23$, $units_{distal} = 50$; $z = 8.04$, $p < .01$, where p_{distal} and $p_{proximal}$ refer to the proportion of sales for the distal and proximal products, respectively) for both the emblems ($p_{proximal} = .71$, $units_{proximal} = 67$; $p_{distal} = .29$, $units_{distal} = 28$; $z = 4.00$, $p < .01$) and the keychains ($p_{proximal} = .82$, $units_{proximal} = 102$; $p_{distal} = .18$, $units_{distal} = 22$; $z = 7.18$, $p < .01$). Unexpectedly, there was no negative promotion-proximity effect on the sales of the strong substitute ($p_{proximal} = .49$, $units_{proximal} = 104$; $p_{distal} = .51$, $units_{distal} = 108$; $z = .28$, $p = .78$). The lack of a negative promotion-proximity effect was a result of the emblem subcategory unexpectedly showing a positive promotion-proximity effect ($p_{proximal} = .70$,

[14] Comparing the proximal product sales with the distal product sales controls for the effect of brand switching (since proximal and distal products should be equally influenced by switching) and category expansion (since proximal and distal products should equally benefit from more shoppers). Including strong and weak substitute subcategories in the design controls for the effect of location in the display because each subcategory manipulates location in parallel, but only one subcategory has a product proximal to the promotion. Thus, the experimental design can isolate location effects that depend on the promotion (i.e., promotion-proximity effects).

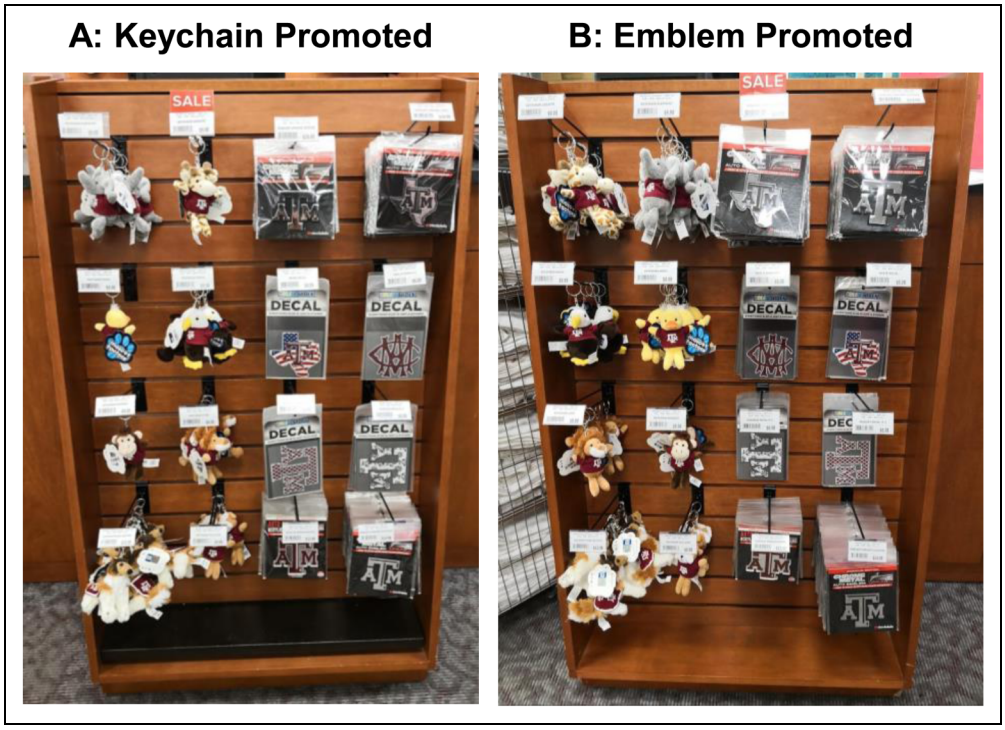

Figure 4. Shelf Displays for Study 2a.

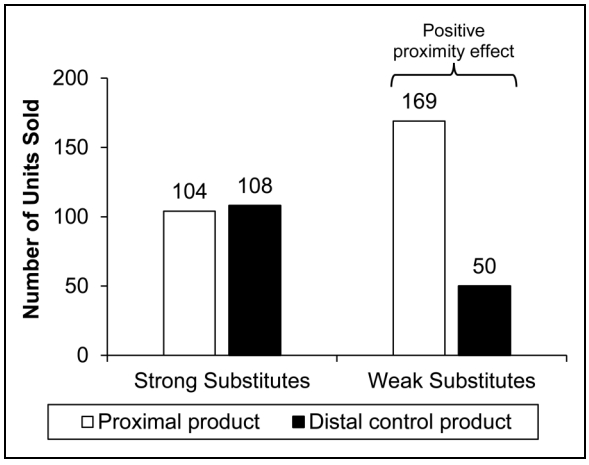

Figure 5. Results of Study 2a: Sales Volume by Substitutability.
Notes: Hereinafter, in-figure labels refer to the "positive promotion-proximity effect" as the "positive proximity effect" and the "negative promotion-proximity effect" as the "negative proximity effect."

$units_{proximal} = 40$; $p_{distal} = .30$, $units_{distal} = 17$; $z = 3.05$, $p < .01$), whereas the keychain subcategory showed the predicted negative promotion-proximity effect ($p_{proximal} = .41$, $units_{proximal} = 64$; $p_{distal} = .59$, $units_{distal} = 91$; $z = 2.17$, $p = .03$). See Web Appendix C, Table WC3 for a table of these results.

Discussion

These results showed a positive promotion-proximity effect for weak substitutes, but no overall negative promotion-proximity effect for strong substitutes. The null effect in the strong substitute condition was a consequence of one replicate product subcategory (emblems) showing a positive, rather than a negative, promotion-proximity effect, while the second replicate showed the hypothesized negative promotion-proximity effect. In hindsight, we suspect that consumers did not consider the proximal/distal emblems as substitutable with the promoted emblem as we anticipated. The promoted emblem had an outline of the state of Texas, whereas the proximal/distal emblems did not; it is possible this attribute was salient to consumers and rendered the proximal/distal stimuli nonsubstitutable. Given this result, our next study aimed to provide additional field evidence for the negative promotion-proximity effect.

Study 2b: Negative Promotion-Proximity Effect in a Retail Field Study

The purpose of Study 2b was to conduct a second field test of the negative promotion-proximity effect. In this study, we chose product categories that were as homogeneous as possible to ensure that products within the category would be perceived as strong substitutes. We also varied the location of the promoted product within the shelf display. This manipulation helped guard against the criticism that promotion-proximity effects are sensitive to the shelf location of the promoted product (e.g., the upper part of a shelf display).

Method

The study was conducted in a campus bookstore. The study used a location of the nonpromoted product (proximal vs.

distal) within-subject design with a manipulation of promoted product location (upper vs. lower part of shelf display) and five product category replicates (energy drinks, keychains, lanyards, socks, and trail mix). There was also a counterbalance factor that switched the proximal and distal product. Each product category was located on a separate shelf (see Figure 6). We did this to isolate and test for the *negative* promotion-proximity effect.

The data were collected over a four-week period to allow for a manipulation of the promoted product location (upper left vs. bottom right) and a counterbalancing of the proximal/distal products.[15] See Web Appendix D for a schedule of the study conditions (Table WD1), along with prices of the products (Table WD2). The vendor provided the weekly unit sales for the proximal and distal products. Transaction-level sales were unavailable.

Results

The data were collapsed across product category. There was no proximal-distal × location of the promoted product interaction ($\chi^2 = 1.63$, $p = .20$), so we collapsed the data across location of the promoted product (Figure 7 shows units sold by location, and Web Appendix D, Table WD3 shows units sold by product and location). A test of proportions showed that the choice share of the proximal product was lower than the choice share of the distal product, providing support for the negative proximity effect (H_{1a}) ($p_{proximal} = .28$, $units_{proximal} = 78$; $p_{distal} = .72$, $units_{distal} = 196$; $z = 7.13$, $p < .01$).

Discussion

The results of Study 2b provide empirical support for the negative promotion-proximity effect. Together with the results of Study 2a, these two field studies offer causal evidence that (1) for strong substitutes, sales are lower if located proximally to a promoted product than if located distally (H_{1a}), and (2) for weak substitutes, sales are higher if located proximally to a promoted product than if located distally (H_{2a}).

Figure 6. Shelf Displays for Study 2b.
Notes: Clockwise from top left: energy drinks in week 1, trail mix in week 2, socks in week 3, lanyards in week 4, keychains in week 1. In the energy drink shelf display, the promoted product was on the far left or the far right. In the remaining categories, the promoted product was placed in the upper-left or lower-right part of the shelf display.

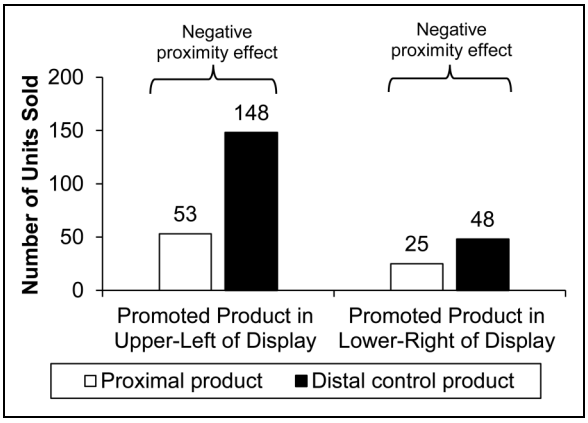

Figure 7. Results of Study 2b: Sales Volume for Strong Substitutes.

Study 3a: Processes Supporting Negative Promotion-Proximity Effects

In Studies 3a and 3b, we provide process evidence for both promotion-proximity effects. Study 3a tests whether, for strong substitutes, the negative proximity effect requires a discounted price on the promoted product and attention spillover from the promoted product to the proximal product. Study 3b tests whether, for weak substitutes, the positive proximity effect requires only attention spillover from the promoted product to the proximal product.

Method

Participants. We recruited 594 workers from Amazon Mechanical Turk (MTurk). People who purchased more than ten of any item (n = 44) were removed from analysis, leaving 550 participants ($M_{age} = 37$ years, 56% male, 44% female).

Experimental design. This experiment employed a 2 (price discount cue: present vs. absent; within-subject) × 2 (attention cue: present vs. absent; within-subject) design with the proximal versus distal control product comparison as the third

[15] Similar to Study 2a, the design and procedure control for the main effects of promotion (brand switching, category expansion). Rotating the location of the promoted products (upper left vs. bottom right) enables us to control for location effects. Thus, the experimental design can isolate the effect of proximity to the promoted product.

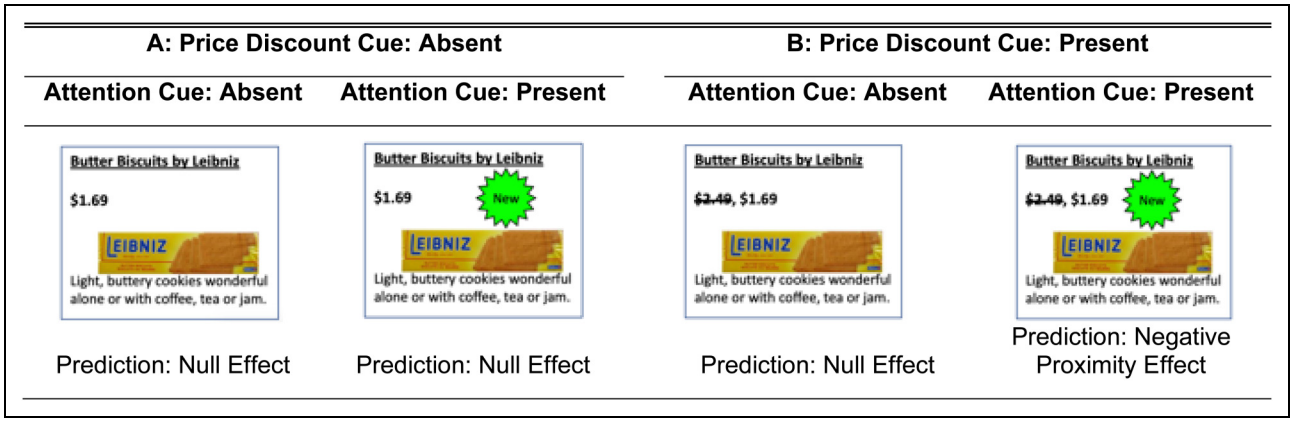

Figure 8. Manipulations and Predictions for Study 3a.

factor.[16] To avoid confounds, there were also counterbalance factors that switched (1) the proximal and distal products and (2) the order of product categories. Details on the design are in Web Appendix E, and all tests involving counterbalancing are in Web Appendix E, Table WE2.

Stimuli. The stimuli were eight product categories (cookies, chocolate candy, savory snacks, candy, jam, chocolate bars, soap, and soda). Each product category was presented using a product display that consisted of eight items arranged in a two-column × four-row grid (see Web Appendix Figures WE1 and WE2). The critical products in each display were the promoted product (upper-left product), the proximal product (upper-right product), and the distal control product (lower-right product). Prices for the stimuli are in Web Appendix E, Table WE3.

To ensure strong substitutability, the promoted, proximal, and distal products were similar (e.g., all three were butter cookies). The discount cue was manipulated by listing only the sale price on the promoted product (discount cue absent) or having an advertised reference price present, crossed out, and accompanied by the sale price on the promoted product (discount cue present) (see Figure 8). The attention cue was manipulated by having no special marking on the promoted product (attention cue absent; Panel A) or having a "new" sticker present on the promoted product (attention cue present; Panel B). As the negative promotion-proximity effect relies on both attention spillover and a discounted price promotion on the promoted product, we predict a significant negative promotion-proximity effect only for this condition.

Procedure. Participants were asked to imagine that they were shopping online and that their shopping list consisted of eight products. For each product category, the instructions were designed to motivate preference for the benefits of the promoted/proximal/distal product (e.g., for the cookie category, "buy butter cookies"). Next, they viewed the product display (e.g., eight types of cookies) and indicated the purchase quantity of each product in the display by typing a number into an adjacent text box. They could buy as many different products as they wished, in the quantity of their choosing. This purchase quantity was the dependent variable (number of units sold per person). This procedure was then repeated for the remaining seven product categories (chocolate candy, savory snacks, candy, jam, chocolate bars, soap, and soda).

Results

We analyzed the number of units sold per person using a mixed analysis of variance (ANOVA). As predicted, when comparing the conditions in which the price discount cue and/or the attention cue were absent with the condition in which both the price discount cue and attention cue were present (contrast code −1, −1, −1, 3), we observed a significant condition × location of the nonpromoted product interaction ($F(1, 542) = 4.54$, $p = .03$, $\eta_p^2 = .008$; see Figure 9). We decomposed this interaction to explore the effect of proximity by condition. When the price discount cue and attention cue were both present, sales of the proximal product were lower than sales of the distal product ($M_{proximal} = .40$, $M_{distal} = .47$; $F(1, 542) = 6.48$, $p = .01$, $\eta_p^2 = .012$). When the price discount cue was present, but the attention cue was absent, sales of the proximal and distal products did not differ ($M_{proximal} = .46$, $M_{distal} = .46$; $F(1, 542) = .04$, $p = .85$). When the price discount cue was absent, sales of the proximal product did not differ from the distal product when the attention cue was present ($M_{proximal} = .44$, $M_{distal} = .45$; $F(1, 542) = .15$, $p = .69$) or absent ($M_{proximal} = .45$, $M_{distal} = .46$; $F(1, 542) = .20$, $p = .65$). Sales of the proximal product were lower when both the price discount and attention cues were present ($M = .40$) than when both were absent ($M = .45$; $F(1, 542) = 4.074$, $p = .044$, $\eta_p^2 = .007$).

[16] The proximal versus distal product comparison controls for the main effects of promotion (brand switching, category expansion). The no-promotion condition enables us to confirm that there is not a location effect. Thus, differences in sales between the proximal and distal product represent the promotion-proximity effect. Study 3b has the same advantages.

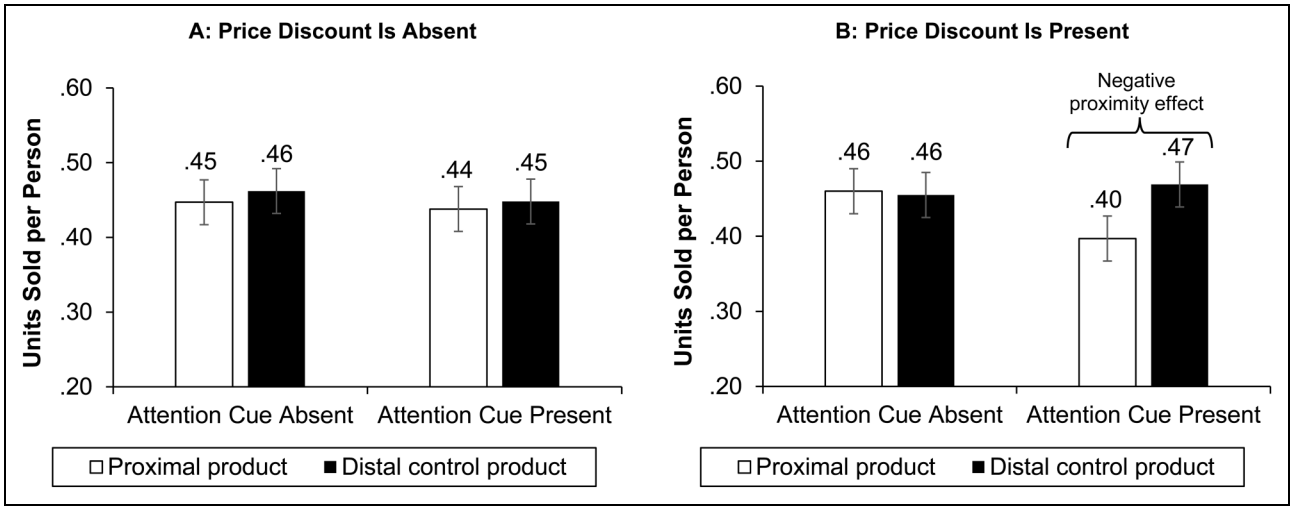

Figure 9. Results of Study 3a: Sales Volume for Strong Substitutes.
Notes: Error bars = ±1 SEs.

Discussion

These findings provide evidence that the negative promotion-proximity effect for strong substitutes requires both a price discount cue and an attention cue. This implies that a price discount alone may not be sufficient to produce a negative promotion-proximity effect, unless the promotion is also highlighted to draw attention.

Study 3b: Processes Supporting Positive Promotion-Proximity Effects

We hypothesize that a positive promotion-proximity effect requires weak substitutability between the promoted and proximal product and attention spillover from the promoted product to the proximal product (H_{2b}).

Method

Participants. We recruited 599 MTurk workers. People who purchased more than ten of any item (n = 20) were removed from analysis, leaving 579 participants (M_{age} = 38 years, 50.4% male, 49.6% female).

Experimental design. The experiment employed the same design as Study 3a. All tests involving counterbalancing are reported in the Web Appendix F, Table WF1.

Stimuli and procedure. The stimuli were the same eight product categories used in Study 3a, but with an adjustment to the promoted products. The substitutability of the proximal and distal products was weakened by making the promoted products (e.g., almond cookies) dissimilar from the proximal/distal products (e.g., butter cookies). The instructions were designed to motivate preference for the benefits of the proximal/distal products (e.g., "buy butter cookies"). Everything else, including prices, was the same as in Study 3a.

Results

We analyzed the number of units sold per person in a mixed ANOVA with all experimental factors. As predicted, there was a significant attention cue × location of the nonpromoted product two-way interaction ($F(1, 571) = 4.51$, $p = .03$, $\eta_p^2 = .008$; see Figure 10). When the attention cue was present, sales of the proximal product were higher ($F(1, 571) = 10.17$, $p < .01$), whether the price discount cue was absent ($M_{proximal} = .71$, $M_{distal} = .65$; $F(1, 571) = 3.78$, $p = .05$, $\eta_p^2 = .007$) or present ($M_{proximal} = .72$, $M_{distal} = .64$; $F(1, 571) = 6.46$, $p = .01$, $\eta_p^2 = .011$). When the attention cue was absent, sales of the proximal and distal products did not differ ($F(1, 571) = .19$, $p = .66$), whether the discount cue was absent ($M_{proximal} = .69$, $M_{distal} = .67$; $F(1, 571) = .15$, $p = .70$) or present ($M_{proximal} = .68$, $M_{distal} = .68$; $F(1, 571) = .04$, $p = .84$). Sales of the proximal product when both the price discount and attention cue were present (M = .72) were directionally but not significantly higher than when both were absent (M = .69; $F(1, 571) = 1.33$, $p = .249$, $\eta_p^2 = .002$).

Discussion

The Study 3b findings provide evidence that the positive promotion-proximity effect for weak substitutes requires only an attention cue that allows attention to spill over to the proximal product. In most cases in the marketplace, this attention cue is created by the formatting of the price discount (e.g., large font, bright colors, sale tags). In this study, we separate the price discount cue from the attention cue and show that it is the attention cue part of the price promotion that is responsible for the positive promotion-proximity effect.

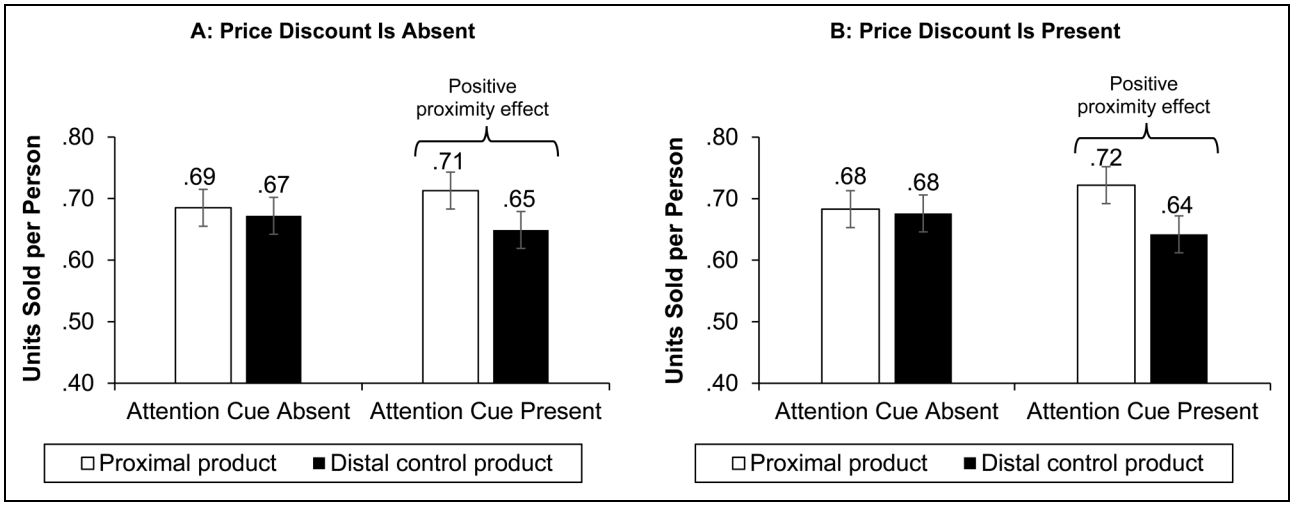

Figure 10. Results of Study 3b: Sales Volume for Weak Substitutes.
Notes: Error bars = ±1 SEs.

Similar to Study 1, the design of Studies 3a and 3b allows us to assess how the net sales of the proximal product change owing to the promotion—a managerially important issue. Relative to the no-promotion baseline, the sales of a strong (weak) substitute are significantly lower (directionally higher) when a promotion is present versus absent. We address this issue further in the "General Discussion" section.

We hypothesized that the negative and positive proximity effects occur because the attention garnered by the promoted product spills over more to proximally located products than to distally located products, which increases the likelihood that proximally located products are attended to and considered. If the promoted and proximal products are strong substitutes, then the promoted product is more likely to be chosen because of its price advantage. If the promoted and proximal products are weak substitutes, and people prefer the attributes of the proximal product, then the proximal product is more likely to be chosen because of its product attributes. This implies three corollary assumptions that we test in the following posttests: (1) proximally located products receive more *attention* than distally located products when a promotion is present than when there is no promotion, (2) proximally located products receive more *consideration* than distally located products when a promotion is present than when there is no promotion, and (3) product attributes play a more influential role in *choice* decisions than price for weak substitutes as compared with strong substitutes.

Attention posttest. The first posttest assessed how much attention participants paid to the proximal versus distal product. We recruited 300 participants from Prolific Academic (M_{age} = 33 years, 45% male, 51.3% female, 2.3% nonbinary/third gender, 1.3% prefer not to answer). Participants were randomly assigned to one of eight conditions in a 2 (promotion: absent vs. present) × 2 (substitutability: strong vs. weak) × 2 (counterbalance) between-subjects design. The promotion present (attention cue and price discount cue) and absent (no cues) conditions were from Study 3. The strong (weak) substitutability stimuli were the soda stimuli from Study 3a (3b).

The procedure was identical to Study 3 except that immediately after the participant indicated the purchase quantity of their first product, a new screen appeared and assessed attention to the proximal versus distal product by asking, "Of the following two sodas, which one did you pay more attention to?" (1 = proximal product, and 7 = distal product; see Web Appendix G for full details). An ANOVA found a significant main effect of promotion such that there was greater attention to the proximal product relative to the distal product when there was a promotion present ($M_{promotion\ present} = 2.71$, $M_{promotion\ absent} = 3.24$; $F(1, 292) = 5.54$, $p = .019$). The interaction with substitutability was not significant ($p = .49$), indicating that this effect was equally strong for both the strong and weak substitutes conditions.

Consideration posttest. The second posttest was designed to assess how much participants considered the proximal versus distal product. We recruited 300 participants from Prolific Academic (M_{age} = 33 years, 54.3% male, 44.3% female, 1.3% nonbinary/third gender). This study used the same stimuli and procedure as the attention posttest. The only difference was that instead of being asked about attention, participants were asked, "Of the following two sodas, which one did you consider more?" (1 = proximal product, and 7 = distal product; see Web Appendix H for full details). An ANOVA found a significant main effect of promotion such that there was more consideration of the proximal product when there was a promotion present ($M_{promotion\ present} = 3.05$, $M_{promotion\ absent} = 3.53$; $F(1, 292) = 4.41$ $p = .037$). The interaction with substitutability was not significant ($p = .87$), indicating that this effect was equally strong for both the strong and weak substitutes conditions.

Choice influences posttest. The third posttest measured the extent to which participants were influenced by price versus product

attributes when making choices between the promoted and proximal product. We recruited 300 participants from MTurk ($M_{age} = 40$ years, 40.3% male, 58.3% female, 1% nonbinary / third gender, .3% prefer not to say). Participants were randomly assigned to one of four conditions in a 2 (substitutability: strong vs. weak) × 2 (counterbalance) between-subjects design. The strong (weak) substitutability stimuli were the soda stimuli from Study 3a (3b).

The procedure was similar to the attention and consideration posttests, except that instead of being asked about the proximal versus distal products, participants were asked about the promoted versus proximal products. Specifically, they read, "Please compare these two products. To what extent did price versus product attributes influence your decision of how much of each product to buy?" (1 = "price was the most important," and 7 = "product attributes were the most important"; see Web Appendix I for full details). An ANOVA found a significant main effect of substitutability such that product attributes were a stronger influence on choice decisions than price for weak substitutes than for strong substitutes ($M_{strong\ substitute} = 4.56$, $M_{weak\ substitute} = 5.93$, $F(1, 296) = 50.90$, $p < .001$).

Together, these three posttests provide evidence for the hypothesized process—when there is a promotion, people pay more attention to, and are more likely to consider, products that are proximally located to the promoted product than products that are distally located. Subsequently, price plays an influential role in deciding between the proximal and promoted products when they are strong substitutes, while product attributes play a more influential role when they are weak substitutes.

Study 4: The Moderating Role of Product Preferences on the Negative and Positive Promotion-Proximity Effects

The purpose of Study 4 was to demonstrate the role of preference heterogeneity in generating the promotion-proximity effects. Suppose that a butter cookie is on price promotion, and there are consumers who prefer butter cookies (i.e., consumers who prefer the benefits offered by the promoted product's subcategory). If the proximal and distal products are also butter cookies (i.e., strong substitutes), the promoted and proximal butter cookies are considered together, but the promoted butter cookies are chosen because of their *price advantage*, resulting in a negative promotion-proximity effect. If the proximal and distal products are almond cookies (i.e., weak substitutes), these consumers purchase the promoted butter cookies, resulting in no difference in sales of the proximal and distal almond cookies.

Now suppose there are consumers who prefer almond cookies, which are not on promotion (i.e., consumers who prefer the benefits offered by a nonpromoted product). When the promoted, proximal, and distal products are all butter cookies (i.e., strong substitutes), the promoted and proximal butter cookies may be considered together, but because these consumers prefer almond cookies, there is no difference in sales of the proximal and distal butter cookies. However, when the promoted product is a butter cookie but the proximal and distal products are almond cookies (i.e., weak substitutes), the promoted and proximal products are considered together, and the proximal product is chosen because these consumers *prefer the attributes* of almond cookies, resulting in a positive promotion-proximity effect. Study 4 tests these predictions.

Method

Participants. We recruited 600 Prolific workers. People who purchased more than ten of any item (n = 4) were removed from analysis, leaving 596 participants ($M_{age} = 38.8$ years, 50.2% male, 48.6% female, 1.2% nonbinary/third gender/prefer not to answer).

Experimental design. This experiment employed a 2 (substitutability: strong vs. weak; between-subject) × 2 (preference: promoted product vs. weak substitute proximal product; between-subject) design with the proximal versus distal control product comparison as the third factor, within-subject.[17] To avoid confounds, there were also counterbalance factors that switched (1) the proximal and distal products and (2) the order of the eight product categories. Details on the design are in Web Appendix J, and all tests involving counterbalancing are in Web Appendix J, Table WJ1.

Stimuli and procedure. The stimulus categories, price discount, and attention cue were the same as in Study 3a. For the strong substitute conditions, the promoted, proximal, and distal products were of the same type (e.g., all butter cookies). For the weak substitute conditions, the proximal/distal products (e.g., almond cookies) were dissimilar from the promoted products (e.g., butter cookies). Preference was manipulated by telling participants that they preferred the benefits of the promoted product (e.g., "buy butter cookies") or the weak substitute proximal product (e.g., "buy almond cookies"). Additional details are in Web Appendix J.

Results

We analyzed the number of units sold per person in a mixed ANOVA. When consumers had a preference for the promoted product's benefits, sales of the proximal product were lower than those of the distal product for strong substitutes ($M_{proximal} = .37$, $M_{distal} = .42$; $F(1, 588) = 3.61$, $p = .058$, $\eta_p^2 = .006$) but did not differ for weak substitutes ($M_{proximal} = .09$, $M_{distal} = .08$; $F(1, 588) = .03$, $p = .87$, $\eta_p^2 = .000$; interaction contrast: $F(1, 588) = 2.13$, $p = .145$, $\eta_p^2 = .004$). When consumers preferred the benefits offered by the weak substitute proximal product (nonpromoted product), sales of the proximal product were higher than those of the distal product in the weak substitutes conditions ($M_{proximal} = .70$, $M_{distal} = .64$; $F(1, 588) = 7.05$,

[17] Similar to Studies 3a and 3b, the proximal versus distal product comparison controls for the main effect of promotion (brand switching, category expansion). The design includes substitute conditions where no proximity effect is expected. This enables us to confirm that there is not a location effect.

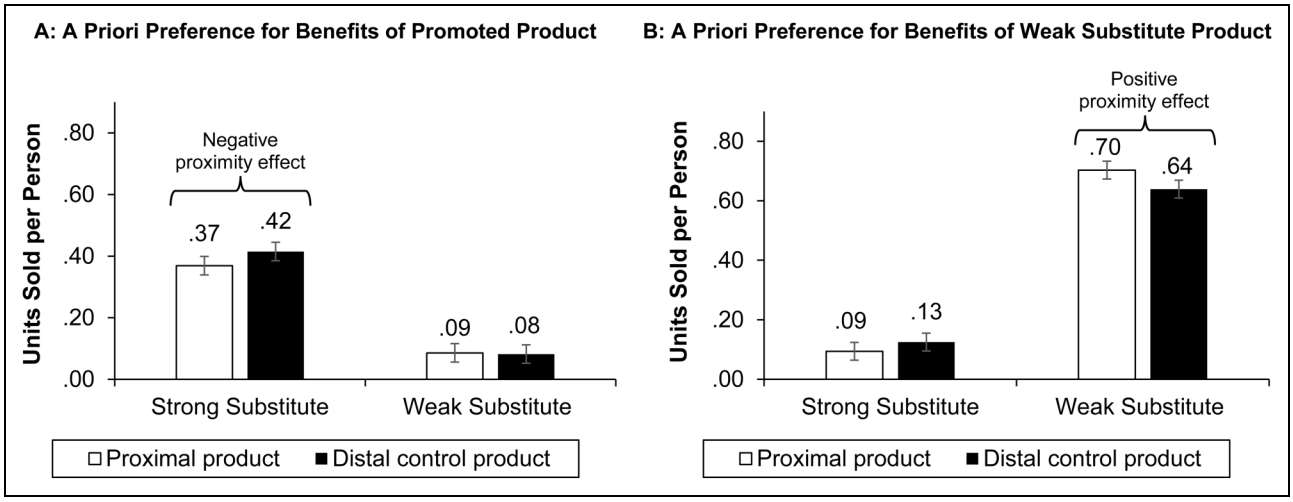

Figure 11. Results of Study 4: Sales Volume for Strong and Weak Substitutes.
Notes: Error bars = ±1 SEs.

$p = .008$, $\eta_p^2 = .012$) but did not differ in the strong substitutes conditions ($M_{proximal} = .09$, $M_{distal} = .13$; $F(1, 588) = 1.71$, $p = .19$, $\eta_p^2 = .003$; interaction contrast: $F(1, 588) = 7.85$, $p = .005$, $\eta_p^2 = .013$; see Figure 11).

Discussion

The goal of Study 4 was to demonstrate the role of preference heterogeneity in contributing to the negative and positive promotion-proximity effects. We observe a negative promotion-proximity effect for strong substitutes when consumers prefer the promoted product's benefits. We observe a positive promotion-proximity effect for weak substitutes when consumers prefer the proximal product's benefits.

Study 5a: The Moderating Role of Heightened Attention to the Promoted Product on the Negative Promotion-Proximity Effect

The prior studies demonstrated that attention paid to a promoted product can spill over to nearby products. In those studies, the attention cues were typical of most stores—eye-catching signage with bright colors and a different font. Given the managerial relevance of these findings, one practical question is how further drawing attention to a promoted product by contrived means (e.g., flashing lights, balloons, moving displays) will influence the sales of nearby products. Two possibilities exist. First, further enhancing the presentation of the promoted product could draw more attention to the promoted product, increase attention spillover to the proximal product, and strengthen the negative and positive proximity effects. Second, further enhancing the presentation of the promoted product could encourage an inference that the promotion is especially appealing, increase likelihood that the promoted product enters consumers' consideration set, increase sales of the promoted product, and steal sales from the proximal product. For strong substitutes, this would strengthen the negative proximity effect. For weak substitutes, this would weaken the positive proximity effect. We could not anticipate which response would occur. Thus, we simply expect that further enhancing the display of a promoted product by contrived means will strengthen the negative proximity effect and will either strengthen or weaken the positive proximity effect.

Method

Participants. We recruited 1,515 MTurk workers. People who purchased more than ten of any item (n = 37) were removed from analysis, leaving 1,478 participants ($M_{age} = 41$ years, 44.6% male, 53.5% female, 1.9% nonbinary/third gender/prefer not to answer).

Experimental design. This experiment used a two-cell design (strength of attention cue: regular vs. super; within-subject) with the proximal versus the distal control product comparison as a second factor. To avoid confounds, there were also counterbalance factors that switched (1) the proximal and distal products and (2) the product categories assigned to contain regular- or super-attention manipulations.[18] There were also two sets of product replicates for robustness. Details are in Web Appendix K, and all tests involving counterbalancing are in Web Appendix K, Table WK1.

[18] The proximal versus distal product comparison controls for the main effect of promotion (brand switching, category expansion). The design does not control for a location effect, but this is not an issue because the prediction is for a change in the negative proximity effect in the super-attention condition—location effects are held constant. Study 5b has the same advantage.

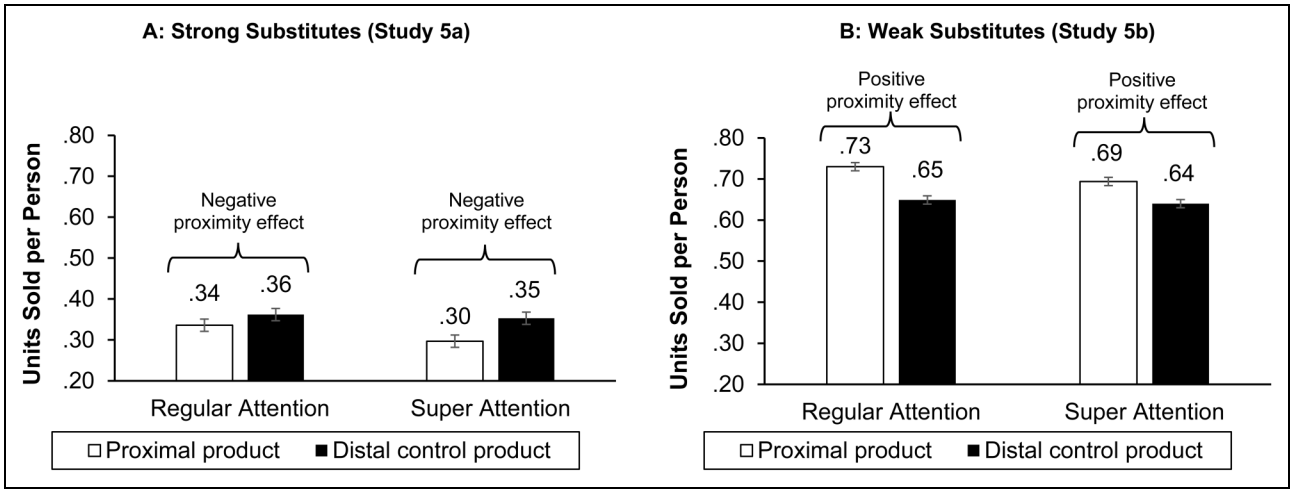

Figure 12. Results of Studies 5a and 5b: Sales Volume for Strong and Weak Substitutes When Price Discount Is Present.
Notes: Error bars = ±1 SEs.

Stimuli and procedure. The stimuli were the same eight product categories used in Study 3a. As in Study 3a, the promoted, proximal, and distal products were similar (e.g., all three were butter cookies). The promoted product always had an advertised reference price present in black font that was crossed out and replaced by a sale price in red font. In the super-attention conditions, there was a flashing red border around the promoted product. In the regular-attention conditions, there was no border around the promoted product. The instructions were the same as in Study 3a.

Results

We analyzed the number of units sold per person in a mixed ANOVA with all experimental factors. As predicted, there was a significant interaction of the attention cue × location of the nonpromoted product ($F(1, 1{,}474) = 3.84$, $p = .050$, $\eta_p^2 = .003$; see Figure 12). Sales of the proximal product relative to the distal product suffered more when the attention cue was super strength ($M_{proximal} = .297$, $M_{distal} = .353$; $\Delta = .056$, $F(1, 1{,}474) = 23.04$, $p < .001$, $\eta_p^2 = .015$) compared with regular strength ($M_{proximal} = .336$, $M_{distal} = .362$; $\Delta = .026$, $F(1, 1{,}474) = 4.94$, $p = .026$, $\eta_p^2 = .003$). These differences were attributable to the sales of the proximal product ($M_{regular} = .336$, $M_{super} = .297$; $\Delta = .039$, $F(1, 1{,}474) = 12.69$, $p < .001$, $\eta_p^2 = .009$). Sales of the distal product did not differ by attention cue strength ($M_{regular} = .362$, $M_{super} = .353$; $\Delta = .009$, $F(1, 1{,}474) = .66$, $p = .415$, $\eta_p^2 = .000$).

Study 5b: The Moderating Role of Heightened Attention to the Promoted Product on the Positive Promotion-Proximity Effect

In Study 5b, we explore the effect of enhancing the presentation of a promoted product on sales of weak substitutes. The positive proximity effect may increase if heightened attention increases spillover or may decrease if heightened attention increases attractiveness of the promotion.

Method

Participants. We recruited 1,511 MTurk workers. People who purchased more than ten of any item (n = 32) were removed from analysis, leaving 1,479 participants ($M_{age} = 41$ years, 43.4% male, 54.9% female, 1.7% nonbinary/third gender/prefer not to answer).

Experimental design. This experiment used the same two-cell design as Study 5a (strength of attention cue: regular vs. super; within-subject) with the proximal versus distal control product comparison as a second factor. Tests involving counterbalancing are in Web Appendix L, Table WL1.

Stimuli and procedure. The stimuli were the same eight product categories used in Study 3b. As in Study 3b, the promoted products (e.g., almond cookies) were dissimilar from the proximal/distal products (e.g., butter cookies). The promoted product always had an advertised reference price present in black font that was crossed out and replaced by a sale price in red font. The super-attention versus regular-attention manipulation was the same as in Study 5a.

Results

We analyzed the number of units sold per person in a mixed ANOVA with all experimental factors. The interaction of the attention cue × location of the nonpromoted product was not significant ($F(1, 1{,}475) = 1.49$, $p = .22$, $\eta_p^2 = .001$; see Figure 12). Sales of the proximal product were higher than sales of the distal product when the attention cue was regular strength ($M_{proximal} = .730$, $M_{distal} = .649$; $\Delta = .081$, $F(1, 1{,}475) = 24.18$, $p < .001$, $\eta_p^2 = .016$) and when the attention cue was super strength ($M_{proximal} = .694$, $M_{distal} = .640$; $\Delta = .054$, $F(1, 1{,}475) = 11.80$, p

$< .001$, $\eta_p^2 = .008$). Sales of the proximal product were higher when the attention cue was regular strength than when it was super strength ($M_{regular} = .730$, $M_{super} = .694$; $\Delta = .036$, $F(1, 1{,}475) = 6.09$, $p = .014$, $\eta_p^2 = .004$). Sales of the distal product did not differ by attention cue strength ($M_{regular} = .649$, $M_{super} = .640$; $\Delta = .009$, $F(1, 1{,}475) = .54$, $p = .462$, $\eta_p^2 = .000$).

Discussion

The goal of Studies 5a and 5b was to explore how heightening attention to the promoted product, using managerially relevant attention cues, impacted the strength of the negative and positive proximity effects. For strong substitutes, we found that adding a blinking red border to a promoted product increased the strength of the negative proximity effect (Study 5a). This is consistent with either increased attention spillover or increased attractiveness of the promoted product. For weak substitutes, we observed a directional weakening of the positive proximity effect (Study 5b). This finding is consistent with the idea that enhancing attention to the promotion may increase attractiveness of the promotion, increasing consideration and sales of the promoted product and stealing sales from the proximal product.

General Discussion

This research explores how a price promotion on one product impacts the sales of a nonpromoted proximal product. For strong (weak) substitutes, the greater the proximity of the nonpromoted product to the promoted product, the more negative (positive) the influence of the promoted product on the sales of the nonpromoted product. This occurs because attention to the promoted product spills over to proximal nonpromoted products. When nonpromoted products are strong (weak) substitutes, their sales are hindered by the comparison to the promoted products (their sales are helped because they are independently considered for purchase).

These results speak to Nedungadi's (1990) two claims about consideration set formation and choice. First, for a product to be chosen, it must be attended to and considered. Given that promotions attract attention (Blattberg and Neslin 1990; Inman, McAlister, and Hoyer 1990) and that attention spills over to proximal products (Pieters and Wedel 2004; Stüttgen, Boatwright, and Monroe 2012), promotions encourage the inclusion of proximal products in a consideration set. This process contributes to negative promotion-proximity effects. Second, for a product to be chosen, a consumer must fail to consider a product that they like better. The promotion literature often assumes that people consider only the promoted product and fail to consider any other product. We show that when the promoted and proximal products are weak substitutes, and the proximal product is considered, some consumers will prefer the proximal product to the promoted product (i.e., a positive proximity effect).

Factors Influencing the Size of Promotion-Proximity Effects

We expect that numerous factors can strengthen or weaken promotion-proximity effects. Factors that should strengthen promotion-proximity effects include the level of product differentiation within the category and the strength of product preferences. First, negative promotion-proximity effects should strengthen in categories characterized by lower product differentiation (all products are strong substitutes; e.g., bottled water, milk) because there is a higher likelihood of having a strong substitute nearby a promoted product. By the same logic, positive promotion-proximity effects should strengthen in categories characterized by higher product differentiation (there are many clear strong and weak substitutes; e.g., cereal, yogurt) because there is a higher likelihood of having a weak substitute near a promoted product. Second, negative promotion-proximity effects should strengthen when consumers have stronger preferences for product subtypes (e.g., the market consists of people who only buy Greek yogurt or only buy low-fat yogurt) because it increases the likelihood that a strong substitute proximal brand will join the consideration set of a promoted brand but not be purchased due to its price disadvantage. Positive promotion-proximity effects should also strengthen when consumers have stronger preferences, as people who prefer the proximal weak substitute will be unlikely to also consider the promoted product.

Factors that should weaken promotion-proximity effects include package characteristics, planned purchases, promoted product value, and attentional breadth. First, promotion-proximity effects should weaken in product categories characterized by salient product packages, as these packages will interfere with the attentional cue from the promotion. Second, promotion-proximity effects should weaken in product categories that have a high percentage of planned purchases, since these consumers should be less sensitive to promotional prices (negative proximity effect) or attention cues (positive proximity effect). Third, negative proximity effects should weaken when the price promotion is insufficient to make the perceived value of the promoted product greater than that of the proximal product. Fourth, positive proximity effects will be weaker for individuals who have high attentional breadth (i.e., are more likely to search an entire display; Streicher, Estes, and Buttner 2021), as they are less prone to localized search.

Factors Influencing Changes in Net Sales of Proximal Product

Our research documents how a promoted product influences the sales of a proximal nonpromoted product after controlling for the main effect of the cross-price promotion and the cross-price promotion × substitution interaction (Promo effect). Yet, managers are interested in the net effect (Net) of a promotion on proximal product sales (i.e., the Promo effect + the promotion-proximity [PP] effect). That is, managers want to know when a promotion leads to a net positive or a net negative cross-brand effect. When combined with our evidence for negative (PP_{neg}) and positive (PP_{pos}) promotional proximity effects, there is a possibility for a $Promo_{neg}$ +

PP_{neg} effect (e.g., all nonpromoted brands lose sales and the proximal brand loses relatively more sales), a $Promo_{pos} + PP_{neg}$ effect, $Promo_{neg} + PP_{pos}$ effect, and $Promo_{pos} + PP_{pos}$ effect.[19] Of course, the Promo effect can also be close to zero, as in our Study 1 yogurt analysis (note that the distal product sales depict the Promo effect), so that PP effects on proximal products represent changes in Net sales for a brand.

$Promo_{neg}$ effects can occur when a promotion does not bring additional shoppers to the product category, so that nonpromoted brands' sales are cannibalized by the promoted brand (Kumar and Leone 1988). This main effect is qualified by a substitutability moderator, in that a promotion encourages more brand switching from strong substitutes than from weak substitutes (Blattberg and Neslin 1990; Sethuraman, Srinivasan, and Kim 1999). Thus, a strong substitute loses sales regardless of its location on the shelf but is especially penalized if it is located proximally to the promotion. We expect that this negative promotion-proximity effect is stronger when the $Promo_{neg}$ effect can be attributed to an aggressive promotional price, since proximal strong substitutes should be differentially cannibalized, but weaker when the $Promo_{neg}$ effect can be attributed to a lower-quality brand, especially if the proximal strong substitute is a higher-quality brand.

$Promo_{pos}$ effects occur when a promotion brings additional shoppers to the product category (e.g., infrequent buyers in the category, store switchers). These additional shoppers are not only price sensitive (hence the appeal of the promotion) but also buy variety (hence the category expansion). We anticipate that the larger the category expansion effect (i.e., more additional shoppers result in $Promo_{pos}$), the stronger the positive promotion-proximity effect (PP_{pos}) because the category expanders buy products from different benefit segments (i.e., variety seeking across benefit segments). The profile of the category expanders may vary by product category, so that the $Promo_{pos} \times PP_{pos}$ interaction is stronger in variety-seeking categories where customers tend to stockpile (e.g., soup, wine) but weaker in variety-seeking categories where stockpiling is less prevalent due to shelf-life concerns (e.g., bakery, produce). Of course, these predictions are irrelevant for categories with limited variety seeking (e.g., sugar, toilet paper).

There may also be situations where $Promo_{pos}$ and $Promo_{neg}$ can exist in the same product category owing to different types of promotions. For example, the promotion of a large- (small-) market-share brand in a differentiated category might create $Promo_{pos}$ ($Promo_{neg}$). When a large-market-share brand creates $Promo_{pos}$, it does so by increasing the sales of weak substitute brands. Given that proximity effects use distal products with the same level of substitutability as a baseline, this would result in lower PP_{pos} effects because baseline sales increase relatively more than proximal brand sales. When a small-market-share brand creates $Promo_{neg}$, it does so by cannibalizing the sales of strong substitute brands. Again, given that proximity effects use distal products with the same level of substitutability as a baseline, this would lower PP_{neg}.

Implications of Promotion-Proximity Effects for Managers

It has long been recognized that price promotions result in attention. An understanding of how attention spills over to proximal products creates several opportunities for managerial action. First, managers may consider product subcategory boundaries as opportunities to exploit positive proximity effects (as done with the two subcategories of university keepsakes shown in Figure 4, positive proximity effects in Figure 5). Consider the cookie category, where butter cookies and chocolate chip cookies may border each other on a shelf. Placing a border brand on price promotion should draw increased attention to a less substitutable proximal item, heightening the probability of a positive proximity effect. Managers can take advantage of this to direct attention to full-priced, higher-margin brands. Taking this logic one step further, positive proximity effects may also occur for nonsubstitutes (e.g., refrigerated yogurt and refrigerated desserts). In fact, Costco implements this strategy by offering unique items, that are not regularly stocked, at a reduced price to train shoppers to enter the store in search of "deals," as if on a treasure hunt (*The Wall Street Journal* 2021). Finding these deals exposes customers to proximal products in another product category, allowing Costco to capture sales from people who are not interested in the deal product.

Another managerial implication relates to loss leaders. Retailers commonly conceive of loss leaders (e.g., milk) as items used to increase exposure to other nonpromoted product categories in the store (e.g., product categories passed on the way to the dairy aisle). Yet, a loss leader can also be used to introduce customers to new products within a product category. For example, imagine price promoting a particular version of an item (e.g., almond milk) and surrounding it with novel flavors/versions of nonpromoted items (e.g., oat milk, soy milk) to induce trial of those new items. In this sense, price promotions not only benefit the promoted brand but also increase exposure to other high-margin items in the product category.

In addition, some products are organized by price levels (e.g., higher- vs. lower-priced wines on the top vs. bottom shelf). For categories in which substitutability is defined by price, such as those with ambiguous attributes, placing any item on sale would have a negative influence on proximal items. As consumers have little expectation of which cabernets should be located next to each other, managers may place lower-margin items proximal to price-promoted items during the promotion.

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[19] Although the norm is $Promo_{neg}$, there are $Promo_{pos}$ situations (Sethuraman, Srinivasan, and Kim 1999; Van Heerde et al. 2003). Consistent with this, for 2 of the 13 categories they examined (ice cream and butter), Van Heerde et al. (2003) found that price promotions led to sales increases not only for the promoted brand but also for the nonpromoted brands generally (i.e., category expansion). Sethuraman, Srinivasan, and Kim (1999) conducted a meta-analysis of 1,060 cross-price elasticity estimates for competing brands and found that a price promotion on a focal brand increased the sales of the competing brand in 10% of the cases.

constructive guidance and encouragement. Supplementary materials are included in the Web Appendix.

Associate Editor

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