THE EFFECTS OF PRICE DISCOUNT AND PRODUCT COMPLEMENTARITY ON CONSUMER EVALUATIONS OF BUNDLE COMPONENTS

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Existing research in bundling has primarily focused on consumer evaluations of a bundle as a whole. Drawing upon reference price theory and mental accounting theory, this paper investigates the effects of price discounts on consumer evaluations of the discounted product in a bundle. It examines how these effects interplay with complementarity of bundle components. The results of three experimental studies indicate that bundle price discounts hurt consumer evaluations of the discounted bundle component, and complementarity of bundle components attenuates these negative effects by altering a consumer's selection of mental accounts in the evaluation process.

Bundling, the sale of two or more separate products or services in one package, has become a widespread sales practice in many production- and service-oriented industries (Guiltinan 1987). Multi-item bundles are available for home electronics, fast-food meals, automobiles, and broadband services, among many others. In the telecommunication industry, bundling wars have even begun, and bundling has become the key focus (e.g., bundles of cable television, DSL, and phone service). For example, at the end of the third quarter of 2003, AT&T served more than 3.5 million subscribers with bundles, and its revenue attributable to consumer bundles soared to $521 million by the end of the quarter, a 77 percent increase. Verizon had also slashed its DSL rates to $29.95 per month when bought as part of a bundled package, from $34.95 when purchased as a stand-alone product (Vittore and Bischoff 2003). The trend of bundling strategy in the telecommunication and Internet service industries corresponds with Bakos and Brynjolfsson's (1999) prediction that bundling large numbers of unrelated information goods might be surprisingly profitable because bundling can create "economies of aggregation" for information goods (Bakos and Brynjolfsson 2000).

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With the widespread use of bundling in marketing practice, most behavioral research has been limited to how consumers evaluate a bundle as a whole. For instance, Johnson, Herrmann, and Bauer (1999) find that consumer evaluations of an offer increase as component price information is bundled. Similarly, Mazumdar and Jun (1993) investigate the effect of aggregation or segregation of price increases, finding that consumers will respond more unfavorably to multiple price increases than to a single price increase of an equal amount. Yadav (1994) proposes a weighted-additive model to formulate the cognitive process in which consumers evaluate a bundle. Some other researchers have studied the price discount framing effects on consumers' bundle price discount (Janiszewski and Cunha 2004; Yadav 1994), and purchase contextual effects in a bundling setting (Suri and Monroe 1995). However, research on bundling has generally ignored the effects of bundling, especially bundle price discounts, on consumer perceptions and evaluations of individual bundle components (Simonin and Ruth 1998).

The pervasive format of bundling is mixed bundling, where all components of a bundle are also available separately (Guiltinan 1987).[1] The question addressed here is, if a consumer exposed to a bundle is not interested in or does not intend to buy it, how does the presence of the bundle influence his or her evaluation of the separate bundle components? Puri (1998) finds that product bundling enhances the perceived value of the ancillary product by changing the direction in which information about this ancillary product is processed. We suggest that, even though bundle price discounts can increase a consumer's perceived transaction value and purchase intention for the bundle, they might also have negative effects on consumer evaluations of

individual bundle components when sold separately. Consumers constantly use extrinsic cues to evaluate a product. The price discount in the bundling setting may serve as a cue to influence consumer perceptions of both price and quality of the discounted product. If the positive effects of bundle price discounts on evaluations of a bundle cannot outperform the potential negative effects on individual bundle components, a bundling practice will hurt the merchant in the long term.

THEORY AND HYPOTHESES

Marketers can employ two forms of bundling—pure bundling and mixed bundling (Guiltinan 1987). In pure bundling, products or services are available only in the bundled form; they cannot be purchased separately. As this case is relatively rare, we will focus on mixed bundling. In mixed bundling, a consumer can purchase the bundle or the products in the bundle separately. Mixed bundling is currently the pervasive form of bundling in the marketplace and can be further classified into *mixed-leader* and *mixed-joint* forms (Guiltinan 1987). For simplicity, we only consider bundles of two products in this paper. In a mixed-leader bundle, the price of one product is discounted while the other is listed at the regular price. That is, given regular prices P_A and P_B of products A and B, consumers can buy the bundle at $(P_A + P_B^*)$ $(P_B^* < P_B$, where P_B^* is the discounted price of product B, and for convenience of discussion, we assume that product B is the discounted product). In a mixed-joint bundle, only a single price P_{A+B} is set for the bundle $[P_{A+B} < (P_A + P_B)]$. Because in a mixed-joint bundle, no product is discounted explicitly, we limit our research effort on mixed-leader bundles, especially how price discounts influence consumers' perception of the discounted product. Using the basic price-value model (Dodds, Monroe, and Grewal 1991; Teas and Agarwal 2000; Zeithaml 1988), we focus on consumers' quality and price perceptions of the discounted product in a bundle. This section draws upon reference price, attribution, and mental accounting theories to develop hypotheses about the effects of price discount on consumer evaluations of the discounted product.

Perceived Price and Quality of the Discounted Product

Perceived price is the price encoded by a consumer (Jacoby and Olson 1977). While consumers rarely act directly on an objective price (i.e., the listed price in a shopping scenario), it does influence price perceptions. Subjectively, perceived

prices may rely on the comparison of a market price to a single, internal reference price. Prices below the reference price are perceived as low or inexpensive, and prices above it are perceived as high or expensive (Kalyanaram and Winer 1995; Monroe 2003; Thaler 1985). Thus, the internal reference price has important implications for purchase evaluations (e.g., perceptions of price, value, and purchase intentions). Given the role of reference price in product evaluations, any effect on the internal reference price should influence price evaluations, and thus purchase intentions. The important question, then, is how internal reference prices are formed and modified in the bundling contexts.

According to adaptation theory (Helson 1964), new prices that an individual faces will move the adaptation level in its own direction, thus changing a consumer's internal reference price. The discounted price of the bundle item will decrease a consumer's internal reference price for this product. Similarly, assimilation-contrast theory (Sherif 1963) suggests that the reference price depends on both product experience and information in the environment. One input into a consumer's decision context is the price discount on the product, which will likely lead to a lower internal reference price (Grewal and Compeau 1992; Lichtenstein and Bearden 1989). Given the decreased internal reference price, a consumer will perceive the regular price of the discounted product as more expensive and less attractive. Therefore, we have the following hypothesis:[2]

> *Hypothesis 1: The greater the bundle price discount, the more expensive is the regular price of the discounted product perceived by consumers.*

Just as objective prices differ from perceived prices, objective quality and perceived quality also have distinct meanings to consumers. Objective quality is defined as the "unbiased measurement of quality based on the characteristics such as a design, durability, performance and safety" (Riesz 1978, p. 19). Although there is a positive association between objective quality and quality perceptions, the latter may be influenced by extrinsic cues (Dawar and Parker 1994) and causal attributions (Blattberg and Neslin 1990). Because many consumers believe that there is a positive relationship between a price and the product quality (Rao and Monroe 1989), greater bundle price discounts should lower the perceived quality of the discounted product. Hence, we have the following hypothesis:

> *Hypothesis 2: The greater the bundle price discount, the lower is the perceived quality of the discounted product.*

Moderating Effects of Complementarity of Bundle Components

Mental accounting suggests the psychological construction of separate budgets for categories of expenditures; a mental account can be described as the "set of cognitive operations used by individuals and households to organize, evaluate, and keep track of financial activities" (Thaler 1999, p. 183). The concept of mental accounting has spawned a considerable amount of conceptual and empirical research, notably in explaining consumer evaluations of bundling offers (Johnson, Herrmann, and Bauer 1999; Mazumdar and Jun 1993).

Tversky and Kahneman (1981) illustrate the notion of mental accounts and their potential for decision bias using the following experimental scenarios:

> Scenario A: Imagine that you are about to purchase a jacket for $125 and a calculator for $15. The calculator salesperson informs you that the calculator you wish to buy is on sale for $10 at the other branch of the store, located a 20-minute drive away. Would you make the trip to the other store? (Yes; 68 percent)

> Scenario B: Imagine that you are about to purchase a jacket for $15 and a calculator for $125. The calculator salesperson informs you that the calculator you wish to buy is on sale for $120 at the other branch of the store, located a 20-minute drive away. Would you make the trip to the other store? (Yes; 29 percent)

In both scenarios, the choice is whether to drive 20 minutes to save $5 on a total expenditure of $140. The responses to the two scenarios were remarkably different. In scenario A, 68 percent of participants were willing to make the trip, compared with only 29 percent in scenario B. Tversky and Kahneman explained this result by hypothesizing the formation of mental accounts; respondents in each condition formed an account that included the price of the calculator and the potential saving of $5. Because of the diminishing sensitivity in the value function (Kahneman and Tversky 1979), respondents value a $5 saving more over a $15 calculator than over a $125 calculator.

Kahneman and Tversky (1984) propose three mental accounts in which outcomes might be framed as minimal, topical, and comprehensive, respectively:

- A minimal mental account includes only the differences between the two options, disregarding their common features. With a minimal mental account, the presentation of the decision problem discussed above would be regarded as a choice between "saving $5 versus saving 20 minutes of driving."
- A topical mental account is constrained to a specific decision situation. In this case, the relevant topic is the purchase of the calculator, and the benefit of the trip is therefore framed as a reduction of the price either from $15 to $10 or from $125 to $120. The price of the jacket is not included in the topical account.
- A comprehensive mental account incorporates all decision-related factors, including current wealth, future earnings, possible outcomes of other probabilistic holdings, and so on. With a comprehensive mental account, the price of the jacket would also be considered. In other words, in both experimental conditions, respondents would compare the $5 discount to the total regular price of $140, the sum of the jacket price and the calculator price. Following this analysis, the preference reversal reported in Tversky and Kahneman (1981) would only appear when a topical mental account is employed.

In sum, the selection of mental accounts can alter a decision maker's choices. Thus, the study of the conditions that activate a specific mental account represents a critical issue in the research of mental accounting. This issue will also influence bundle evaluations and consumer evaluations of the discounted product. Consider a bundle consisting of a TV (regular price $250) and a DVD player (regular price $150), in which the DVD player is discounted to $110 (consumers get a $40 discount if they buy the bundle). If a consumer uses a topical mental account, the price discount would be compared only to the regular price of the DVD player. In other words, the consumer will evaluate the $40 price discount against the $150 regular price. However, if a consumer uses a comprehensive mental account, the price discount would be compared to the sum of the regular prices of the TV and the DVD player. The consumer will evaluate the $40 price discount against $400. With a comprehensive mental account, the same price discount ($40) will loom less significant than with a topical mental account.

The selection of mental accounts will be determined, at least in part, by contextual factors (Bonini and Rumiati 2002). For example, Bonini and Rumiati (2002) find that when two products are strongly related, people will use a comprehensive mental account to evaluate a price reduction. Several researchers have underlined how the strength of association among the elements of a decision problem is a potential factor affecting the use of mental accounts (Joyce and Shapiro 1995; Kahneman and Tversky 1984). In a purchase decision context, Bonini and Rumiati (1996) suggest that people shift from a topical to a comprehensive mental account when the discounted product is specifically linked to other planned purchases. Furthermore, this shift

of mental accounts could influence acceptance of a price discount (Bonini and Rumiati 2002).

Complementarity of bundle components, reflecting functional relatedness and dependence between bundle components, represents one such linkage.[3] Complementary bundles are those in which individual components function as a system or complementarily (e.g., a computer and a printer; a TV and a VCR; airfare, lodging, and a rental car; a razor and a blade). Noncomplementary bundles are those in which bundle components are not functionally related (e.g., a TV and an MP3 player; a ski suit and a fishing rod).

Within a mixed-leader bundle, high complementarity of bundle components will engender the use of a comprehensive rather than a topical account, because functional relatedness between the two products is high. Hence, the price discount assigned to one product is more likely to be evaluated by being compared to the total regular price of bundle components. Thus, part of the price discount of the discounted product will be mentally shifted to the undiscounted product. Then, the perception of the price discount will be relatively low in this situation, mitigating the impact of bundle price discount on the perception of the regular price of the discounted product. In contrast, low complementarity (hence, functional unrelatedness) will be more conducive to the use of a topical account, leading to a more exclusive association of the bundle price discount with the discounted product.[4] Thus, we have the following hypothesis pertaining to the moderating effect of complementarity of bundle components:

Hypothesis 3: For higher (lower) levels of complementarity of bundle components, the effect of bundle price discount on a consumer's perception of the regular price of the discounted product will be weaker (stronger).

As postulated in H2, higher bundle price discounts will lead to lower perceived quality of the discounted product. However, with high levels of product complementarity, a consumer will be more likely to use a comprehensive mental account to evaluate the bundle offer. Consequently, people would relate an offered price reduction to the regular total price, rather than to the regular price of the discounted product. Therefore, a consumer will perceive a less relative price change on the discounted product, weakening the negative effect of bundle price discount on its perceived quality. Thus, we have the following hypothesis pertaining to the moderating effect of complementarity of bundle components:

Hypothesis 4: For higher (lower) levels of complementarity of bundle components, the negative effect of bundle price discount on perceived quality of the discounted product will be weaker (stronger).

STUDY 1

Method

Experimental Design

We employed a 2 (price discount: low/high) × 2 (product complementarity: low/high) between-subjects design. The low price discount was operationalized as 10 percent off the sum of the regular prices of the two bundle components, while the high price discount was 30 percent. Complementarity of bundle components was manipulated through different combinations of products. A clothes washer ($400) and a clothes dryer ($400) comprise the high-complementarity bundle, whereas a grill ($90) and a task chair ($60) comprise the low-complementarity bundle. The regular prices were adapted from real market prices of these products. The clothes dryer or the task chair was discounted, respectively. For example, under low price discount, the washer–dryer bundle was framed as "buy the washer at $400 and the dryer at $320 as a bundle," whereas the grill–task chair bundle was framed as "buy the grill at $90 and the task chair at $45 as a bundle." For high price discount, the prices of the dryer and the task chair were discounted at $160 and $15, respectively. In each experimental condition, both the bundles and separate products were presented to the participants simultaneously. For details of the design and stimuli, see Appendix A.

Procedure

A total of 183 undergraduate students from a state university participated in Study 1 in a paper-and-pencil task. The sample was evenly distributed between females (51.9 percent) and males (48.1 percent), with the majority (98.3 percent) of the respondents being 19 to 24 years old (median = 20). Participants were randomly assigned to one of the four experimental conditions. In the questionnaire, they were instructed to imagine that they were shopping in a store. After being exposed to verbal descriptions of the separate products and the bundle, as well as all the prices, we instructed participants to assume they needed only the discounted product instead of the bundle. Participants were then asked to evaluate the price and quality of the discounted product, if purchased separately. At the end of the study, demographics were obtained, and the participants were briefed about the purpose of the study.

Measures

Perceived Price. The measure of perceived price was adopted from previous studies (Janiszewski and Lichtenstein 1999; Zeithaml 1988) using two seven-point semantic differential scales assessing the degree to which respondents perceived the price as unattractive/attractive and unfair/fair. Scales were reverse coded, with an item correlation of 0.71. All measures are reported in Appendix B.

Perceived Quality. Perceived quality was measured by three seven-point semantic differential scales adopted from previous studies: unreliable/reliable (Grewal, Monroe, and Krishnan 1998), of low quality/high quality (Boulding and Kirmani 1993), and inferior/superior (Keller and Aaker 1992). Cronbach's $\alpha = 0.92$.

Complementarity. As a manipulation check, we measured complementarity by developing three new seven-point Likert scale questions: (1) A and B are highly complementary, (2) A and B are very likely to be used together, and (3) A and B are semantically related. Respondents reported their degree of disagreement/agreement about these statements. Cronbach's $\alpha = 0.98$.

Analyses and Results

Manipulation Check

Consistent with the manipulation, those respondents exposed to complementary bundles reported higher complementarity of bundle components than those exposed to noncomplementary bundles ($M_{low\,complementarity}$ = 2.13, $M_{high\,complementarity}$ = 6.14, t = 17.88, $p < 0.001$).

Main Effects

Table 1 reports the results of two 2 × 2 analyses of variance (ANOVAs) on perceived price and perceived quality of the discounted products. As predicted in H1, the regular price of the discounted product is perceived as more expensive when the price discount of the bundle was high rather than when it was low ($M_{high\,price\,discount}$ = 4.34 versus $M_{low\,price\,discount}$ = 3.76; F = 10.67, p = 0.001, η_p^2 = 0.057). H2 proposes that bundle price discounts hurt quality perceptions of the discounted product. Respondents had lower perceived quality when the bundle price discount was greater ($M_{high\,price\,discount}$ = 4.00 versus $M_{low\,price\,discount}$ = 4.84; F = 29.51, $p < 0.001$, η_p^2 = 0.142), supporting H2.

Moderating Effects of Complementarity

H3 predicts a weaker effect of bundle price discount on consumer perceptions of regular prices of the bundle components when complementarity of bundle components is higher. As shown in Table 1, the bundle price discount × complementarity interaction was not significant (F = 0.76, p = 0.386), and H3 was not supported. When using an experimental design, hypotheses may not be supported for a number of reasons. We employed a student sample in this study, and the student participants might have a relatively low involvement level in the study. In addition, small sample size in this study may lead to low statistical power (0.14, as shown in Table 1), thus failing to support the hypothesis. However, the follow-up contrasts are consistent with our original argument. Under low levels of complementarity, participants perceived the regular price of the discounted product as more expensive in the high price discount condition than in the low price discount condition ($M_{high\,price\,discount}$ = 4.59, $M_{low\,price\,discount}$ = 3.84, p = 0.002). However, this mean comparison was not significant with highly complementary products ($M_{high\,price\,discount}$ = 4.10, $M_{low\,price\,discount}$ = 3.67, p = 0.11). The comparison is shown in Figure 1a.

H4 predicts that bundle price discounts have larger negative effects on perceived quality under low levels of complementarity than under high levels of complementarity. As shown in Table 1, part b, the bundle price discount × complementarity interaction was significant (F = 6.09, p = 0.02, η_p^2 = 0.03, depicted graphically in Figure 1b). Under high complementarity, larger bundle price discounts marginally decreased perceived quality of the discounted product ($M_{high\,price\,discount}$ = 4.55, $M_{low\,price\,discount}$ = 5.01, p = 0.06, η_p^2 = 0.04). However, under low complementarity, a much stronger effect of bundle price discount was observed ($M_{high\,price\,discount}$ = 3.43, $M_{low\,price\,discount}$ = 4.68, $p < 0.001$, η_p^2 = 0.31). H4 was supported.

Discussion

In Study 1, we applied mental accounting theory to understand the moderating effect of complementarity of bundle components. However, we did not directly observe an individual's selection of mental accounts, nor did we articulate the process in which the individuals employed different mental accounts to evaluate bundle price discounts under different levels of complementarity. This lack of articulation of how mental accounts influence consumers' cognitive operations in the bundle evaluation process represents a logic leap, which is addressed in Study 2.

Table 1
ANOVA Results of Study 1

Source	Degrees of Freedom	a. Perceived Price				b. Perceived Quality			
		F	p	η_p^2	Power	F	p	η_p^2	Power
Model	3	4.71	0.003	0.074	0.90	17.85	0.000	0.231	1.00
Error	179								
Price Discount	1	10.67	0.001	0.057	0.90	29.51	0.000	0.142	1.00
Complementarity	1	3.28	0.072	0.018	0.44	20.99	0.000	0.105	1.00
Discount × Complementarity	1	0.76	0.386	0.004	0.14	6.09	0.015	0.033	0.70

Figure 1
Moderating Effects of Complementarity in Study 1

a. Perceived Price — b. Perceived Quality

Bundle Price Discount

◆ High Complementarity   ■ Low Complementarity
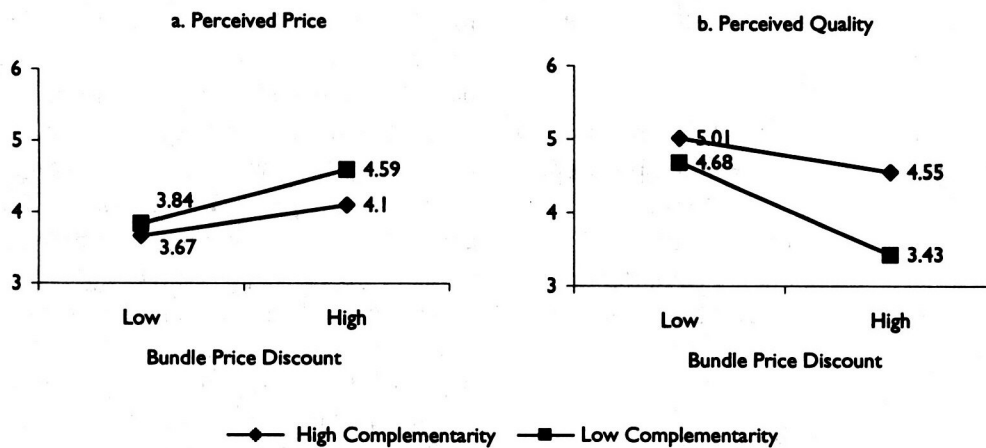
STUDY 2

As advanced in Study 1, mental accounting plays a critical role in determining consumer evaluations of the discounted product in a bundle. Study 2 expands our understanding of how complementarity of bundle components alters consumer evaluations of bundle price discounts through the selection of different mental accounts, thus leading to different transaction values of a bundle.

A distinction between the concepts of acquisition value and transaction value (utility) should be elaborated here (Thaler 1985). Acquisition value represents the perceived economic gain or loss associated with a purchase and is a function of product utility and purchase price, while transaction value concerns the level of satisfaction with the financial terms of the purchase, and may be determined by comparing the selling price to the internal reference price (Grewal, Monroe, and Krishnan 1998; Monroe and Chapman 1987; Thaler 1985). We adopt this conceptualization of transaction value and, being consistent with the value function developed by marketing scholars (Monroe 2003; Winer 1988), we start with the following simple hypothesis:

Hypothesis 5: The greater the bundle price discount, the higher is the transaction value of a bundle.

At this point, it is helpful to consider a bundle comprised of product A (regular price $100) and product B (regular price $100) to illustrate the role of mental accounting. We consider two levels of bundle price discount. In scenario 1, product B's price is reduced to $80, a 10 percent discount of the sum of the regular prices of A and B. In scenario 2, product B's price is reduced to $40, a 30 percent discount.

As suggested by Thaler, "people appear to respond more to perceived changes than to absolute values" (1985, p. 201). In other words, individuals evaluate gains or losses relative to some natural reference points. In the current context, bundle price discounts are likely to be evaluated relative to the regular price(s). If a consumer uses a topical mental account, the price discount will be compared to only the regular price of product B, $100. If such is the case, scenario 1 presents a 20 percent price discount, whereas scenario 2 presents a 60 percent price discount. The difference of price discount rates between scenarios 2 and 1 is 40 percent. However, if a consumer uses a comprehensive mental ac-

count to evaluate the price information in the bundles, the price discount will be compared to the total regular price of A and B, $200. Then, in scenario 1, it is a 10 percent price discount, whereas in scenario 2, it is 30 percent. The difference of price discount rates between scenarios 2 and 1 is 20 percent. This difference of price discounts will be reflected in a difference of transaction value. Of course, this arithmetic may be treated as simply illustrative. Exact computation is not necessary to posit a greater perceived impact of the switch on transaction value from scenario 1 to scenario 2 when using a topical rather than a comprehensive account.

If, as suggested by Study 1, greater complementarity does engender the use of a comprehensive rather than a topical mental account, then the logic above implies that bundle price discounts will have a greater impact on transaction value at low levels of complementarity than at high levels of complementarity of bundle components. Thus, we have the following hypothesis:

Hypothesis 6: Complementarity of bundle components moderates the effects of bundle price discount on transaction value of a bundle offer. Bundle price discounts have a weaker (stronger) effect on transaction value of a bundle under high (low) levels of complementarity of bundle components.

Method

Study 2 employed a 2 (bundle price discount: low/high) × 2 (bundle component complementarity: low/high) between-subjects factorial design. The same stimuli and price discounts were used as in Study 1. However, in Study 2, we focused on subjects' evaluations of transaction value of the bundle, which reflects the pattern of cognitive operations (mental accounts) used by an individual to evaluate financial information (bundle price discount). One hundred and fifty-two undergraduate students at a state university participated in the study in exchange for extra credit in an introductory marketing class. Each participant was randomly assigned to one of the four conditions. Participants were first presented with a bundling offer, and then measures of transaction value and complementarity were obtained.

Scales for the transaction-value measure included both previous (Grewal, Monroe, and Krishnan 1998; Yadav and Monroe 1993) and new items. Participants indicated their agreement/disagreement on five seven-point Likert scales: "If I bought the bundle, the deal I would be getting is very good," "I would be satisfied if I bought the bundle at the reduced price," "Taking advantage of this bundle deal will

give me a sense of joy," "It is worth buying A and B as a set," and "Buying A and B as a set is very economical." This measure showed high internal consistency (Cronbach's $\alpha = 0.95$).

Results

Manipulation Check

Consistent with the manipulation, respondents in the high-complementarity condition reported higher complementarity levels than those in the low-complementarity condition ($M_{low\ complementarity} = 2.30$, $M_{high\ complementarity} = 6.71$, $t = 25.06$, $p < 0.001$).

Main Effect of Bundle Price Discount

As predicted by H5, the effect of bundle price discount on transaction value was significant in the ANOVA ($F = 32.37$, $p < 0.001$, $\eta_p^2 = 0.178$). Respondents exposed to high bundle price discounts reported higher transaction value than those exposed to low price discounts ($M_{low\ price\ discount} = 4.80$ versus $M_{high\ price\ discount} = 5.93$). H5 was supported.

Moderating Effect of Bundle Component Complementarity

As predicted by H6, the interaction between bundle price discount and complementarity of bundle component was significant in the ANOVA ($F = 4.19$, $p = 0.042$, $\eta_p^2 = 0.028$). To better understand the nature of this interaction effect (depicted graphically in Figure 2), we conducted simple main effect tests examining the impact of bundle price discount for low- and high-complementarity conditions. Under high levels of bundle component complementarity, bundle price discount had a significant effect on transaction value of the bundle ($M_{low\ price\ discount} = 5.62$, $M_{high\ price\ discount} = 6.33$, $t = 3.57$, $p < 0.001$, $\eta_p^2 = 0.149$). However, an even stronger effect of bundle price discount was found under low levels of complementarity of bundle components ($M_{low\ price\ discount} = 3.98$, $M_{high\ price\ discount} = 5.52$, $t = 4.46$, $p < 0.001$, $\eta_p^2 = 0.212$). H6 was supported.

STUDY 3

The integrity of the findings in Study 2 was examined through a replication featuring different products in the bundles. The same design and procedure were applied. A car radio tuner (regular price $200) and a car amplifier (regular price $200) comprised the complementary bundle, while an electronic fish finder (regular price $100) and a

Figure 2
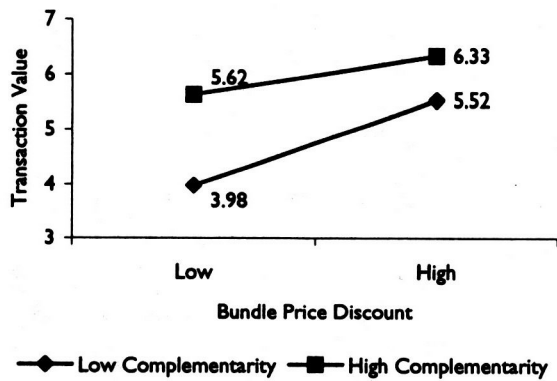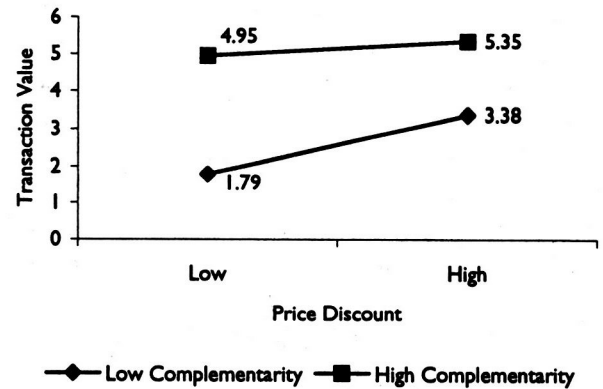**Moderating Effect of Complementarity in Study 2**

Figure 3
Moderating Effect of Complementarity in Study 3

yoga kit (regular price $100) comprised the noncomplementary bundle. The low price discount was operationalized as 10 percent off the sum of the regular prices of the two bundle components, while the high price discount was 30 percent. The car amplifier or the yoga kit was discounted, respectively. One hundred and twenty-two undergraduate students participated in exchange for extra credit.

The results of the ANOVA indicated a significant effect of bundle price discount on transaction value ($F = 23.78$, $p < 0.001$, $\eta_p^2 = 0.168$), again supporting H5. Respondents exposed to high bundle price discounts had higher transaction value than those exposed to low price discounts ($M_{low\ price\ discount} = 3.40$ versus $M_{high\ price\ discount} = 4.35$). The price discount × bundle component complementarity interaction was also significant ($F = 8.38$, $p = 0.005$, $\eta_p^2 = 0.066$; depicted graphically in Figure 3). Under low levels of bundle component complementarity, respondents perceived significantly higher transaction value when the bundle price discount was high rather than when it was low ($M_{low\ price\ discount} = 1.79$, $M_{high\ price\ discount} = 3.38$, $t = 4.66$, $p < 0.001$). However, when bundle component complementarity was high, the effect of bundle price discount on transaction value of the bundle was not significant ($M_{low\ price\ discount} = 4.95$, $M_{high\ price\ discount} = 5.35$, $t = 1.79$, $p = 0.078$). H6 was again supported. Overall, findings in this study were consistent with those in Study 2.

DISCUSSION

Findings and Contributions

Given the prevalence of bundling in marketing practice, how consumers evaluate a bundling offer has received intensive attention from marketing researchers. However, how bundling influences consumer evaluations of individual bundle components is generally ignored. The current research adds value to this growing body of literature by examining how bundle price discounts and complementarity of bundle components influence consumer evaluations of the discounted product in a mixed-leader bundle.

Consistent with our hypotheses, bundle price discounts hurt the discounted product on both fronts, leading to higher perceived regular price and lower perceived quality. Furthermore, these effects are moderated by the complementarity of bundle components. Under high complementarity of bundle components, the negative effects of bundle price discount on the discounted product are attenuated. These findings are well explained by the role of mental accounting, as demonstrated in Studies 2 and 3. The hypotheses and test results are summarized in Table 2.

The current findings, especially those in Studies 2 and 3, also enrich research in mental accounting. Mental accounting theory has already spawned a considerable amount of conceptual and empirical research (see Thaler 1999). While bundling researchers have applied the principles of mental accounting to explain the prevalence of bundling strategies (Johnson, Herrmann, and Bauer 1999; Mazumdar and Jun 1993), little attention has been paid to the conditions that influence an individual's selection of mental accounts. The results of Studies 2 and 3 suggest that individuals use comprehensive instead of topical mental accounts to evaluate a price discount in a high-complementarity bundle, but this is less likely in a low-complementarity bundle. In other words, the functional relatedness between bundle components influences the selection of mental accounts.

MANAGERIAL IMPLICATIONS

Product and service bundles are a strategic option for companies looking to stimulate demand and increase profits, but managers should be very cautious when they select products

Table 2
The Summary of Hypotheses and Results

Hypotheses*	Significance Level	Support or Not
H1: The greater the bundle price discount, the more expensive is the regular price of the discounted product perceived by consumers.	$p = 0.001$	Yes
H2: The greater the bundle price discount, the lower is the perceived quality of the discounted product.	$p < 0.001$	Yes
H3: For higher (lower) levels of complementarity of bundle components, the effect of bundle price discount on a consumer's perception of the regular price of the discounted product will be weaker (stronger).	$p = 0.386$	No
H4: For higher (lower) levels of complementarity of bundle components, the negative effect of bundle price discount on perceived quality of the discounted product will be weaker (stronger).	$p = 0.02$	Yes
H5: The greater the bundle price discount, the higher is the transaction value of a bundle.	$p < 0.001$ (Study 2) $p < 0.001$ (Study 3)	Yes
H6: Complementarity of bundle components moderates the effects of bundle price discount on transaction value of a bundle offer. Bundle price discounts have a weaker (stronger) effect on transaction value of a bundle under high (low) levels of complementarity of bundle components.	$p = 0.042$ (Study 2) $p = 0.005$ (Study 3)	Yes

* H1, H2, H3, and H4 are tested in Study 1; H5 and H6 are tested in Studies 2 and 3.

and set price discounts in a bundle. The conceptualization guiding the present research provides useful findings for managers considering their bundling strategies. The primary objective of a bundle is to increase sales of bundled components. Up to this point, research has primarily focused on how to enhance consumer attitudes or evaluations of the bundle. As demonstrated by previous research (Kaicker, Bearden, and Manning 1995; Yadav 1994; Yadav and Monroe 1993), bundle price discounts lead to favorable consumer evaluations of the bundle, *as a whole*. Therefore, bundle price discounts might increase the sale of a bundle. However, the presence of bundle discounts may also have unintended effects on perceptions of individual bundle components, making the discounted bundle component seem more expensive and of lower quality. If the positive effects of bundle price discount on evaluations of a bundle cannot outperform the negative effects on the evaluations of individual bundle components, then such discounts would actually decrease the total sale of the discounted product. Fortunately, the negative effects of price discount can be attenuated by high levels of product complementarity. Therefore, our findings suggest a complementary bundle is much safer than a noncomplementary bundle in terms of the impact on the discounted product should the provider decide to discount only one product in the bundle (i.e., a mixed-leader bundle).

Moreover, the negative effect of price discount on the discounted product will have a more significant influence when bundling is used as a format of brand alliance (Simonin and Ruth 1998). Retailers may bundle products from two different manufacturers or service providers; for example, a travel plan may include airline tickets, car rental, and a hotel stay. Given the negative impact of bundle price discount, the discounted product may, in fact, suffer from such an alliance in terms of consumer perceptions and total sales. When an unknown brand is discounted in the bundle, the consequence will be more severe, because quality perceptions of an unknown brand are more vulnerable to price discounts. Managers of new or unknown brands should be very cautious when they want to take advantage of the bundling strategy, especially for the discount arrangement. The provider of the unknown brand should avoid discounting their products in the bundle. Another option is to set a mixed-joint bundle; in other words, no specific product is discounted, and the price promotion is set on the bundle as a whole.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

Our study has a few limitations that point to directions for further research in this area. First, this study employed undergraduate students as subjects in a paper-and-pencil task. This may limit the generalizability of findings in this study, because Peterson's (2001) second-order meta-analysis demonstrated that student responses differ from those of the overall population. Therefore, to further explore the validity of the findings of this study, future research efforts should examine whether the results of this investigation extend to nonstudent samples and field bundling offers.

Second, the arbitrary setting of levels of bundle price discount is open to criticism. We arbitrarily set the low price discount as 10 percent off the sum of the regular prices of the two bundle components, and the high price discount as 30 percent. We also assume bundle price discounts have a linear

impact on dependent variables in our model. However, this assumption may not always hold. For instance, consumers may perceive certain levels of price discount as goodwill a merchant attempts to provide to consumers. A slight price discount will not cause negative attributions on quality. However, if the price discount level is too high, it may exaggerate the negative attributions related to poor quality. Therefore, the influence of price discount might be nonlinear.

Third, we focused on bundles including only two products in the situation of the mixed-leader bundle where the price of only one product is discounted while the other is at regular price. However, bundles with more than two components are common in the marketplace. For example, a typical McDonald's meal includes a burger, a drink, and fries. A telecom company may bundle cable television, phone, and Internet services together. So, our two-product setting leads to a limitation of the generalizability of the findings. In addition, customer evaluations of the products depend on whether each item is viewed by the customer as "focal" or "the price leader" (cf. Puri 1998; Yadav 1994). However, in our study, we do not distinguish between the "focal" and "the price leader." In other words, the bundled products are set equally important to consumers. There is no "focal" or "ancillary" product. Correspondingly, in the experiments, we chose two equally important products in the bundle—for example, a washer and a dryer. These limitations also represent an important avenue for future research efforts. For example, is the effect of price discount different when the "ancillary" product is discounted rather than when the "focal" product is discounted? Would the findings still hold if there are three or more products in the bundle? Studies focusing on such issues are needed before the validity of this study can be fully assessed.

Finally, as an artificial experimental condition, the stimuli presented to respondents disguised brand information. However, brand information plays a critical role in consumer evaluations of a marketing offer (Keller 1993). How the bundling affects interplay with brand information may be a promising future research stream. In particular, a strong bundle component brand image might attenuate the negative effects of price discount on the discounted product. We leave these perspectives to future research.

NOTES

1. More recent work on bundling distinguishes between product and price bundling (e.g., Stremersch and Tellis 2002). However, we found that the literature regarding this issue is still controversial, and there is no widely accepted definition. Stremersch and Tellis (2002) use product integration of bundle components to distinguish between price and product bundling.

In this classification, price bundling provides no product integration, whereas product bundling is the integration and sale of two or more separate products or services at any price. Based on this definition, Stremersch and Tellis (2002, p. 57) classify integrated stereo systems, PC systems, one-stop insurance, and telecom calling plans as product bundling. However, these bundles are classified as price bundling in Johnson, Herrmann, and Bauer (1999, p. 129) and Monroe (2003, p. 409). Based on these examinations, we follow Adams and Yellen (1976) and Guiltinan (1987) and use "bundling" without specifically distinguishing between product and price bundling in this paper.

2. As indicated by a reviewer, it is possible that a consumer has an internal reference price lower than the bundle discount price; then, the discounted price might increase their internal reference price and could theoretically lower their perception of expensiveness of the discounted product compared to the situation in which there is no bundle. However, in this paper, we investigate only the phenomena related to the most common situations of internal reference prices being above the discounted prices but not for situations in which the discounted price is still above the original internal reference prices.

3. Complementarity is often defined in terms of negative cross-elasticity. A complementary good exists if an increase in the price of one good causes a decrease in demand for the other good. This is seen as a negative value for the cross-elasticity of demand, or a coefficient of elasticity of $C < 0$. Similarly, a decrease in the price of one product causes an increase in demand of the other product.

4. In order to mathematically demonstrate the effect of complementarity on a consumer's selection of mental reference, we consider a bundle with two products, A and B, with a price discount of D, and original prices P_A and P_B. If the two products are complementary, a consumer may compare the discount D versus $(P_A + P_B)$; when the two products are noncomplementary, a consumer may compare the discount D versus P_B only. The discount in the latter looms larger than that of the former.

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APPENDIX A
Experimental Design and Stimuli of Study 1

Complementarity	Price Discount	Item	Price		Product and Bundle
Low	High	A: Gas grill B: Task chair	$90 $60	or	Buy the grill at $90 and the task chair at $15 as a bundle.
Low	Low	A: Gas grill B: Task chair	$90 $60	or	Buy the grill at $90 and the task chair at $45 as a bundle.
High	High	A: Clothes washer B: Clothes dryer	$400 $400	or	Buy the washer at $400 and the dryer at $160 as a bundle.
High	Low	A: Clothes washer B: Clothes dryer	$400 $400	or	Buy the washer at $400 and the dryer at $320 as a bundle.

APPENDIX B
Measures of Constructs

Perceived Price
  The regular price of (the product) is unattractive/attractive (Janiszewski and Lichtenstein 1999).
  The regular price of (the product) is unfair/fair (new).
Perceived Quality
  This (the product) is unreliable/reliable (Grewal, Monroe, and Krishnan 1998).
  This (the product) is of low quality/high quality (Boulding and Kirmani 1993).
  This (the product) is inferior/superior (Keller and Aaker 1992).
Complementarity
  (Product A) and (product B) are highly complementary (new).
  (Product A) and (product B) are very likely to be used together (new).
  (Product A) and (product B) are semantically related (new).
Transaction Value
  If I bought the bundle, the deal I would be getting is very good (Yadav and Monroe 1993).
  I would be satisfied if I bought the bundle at the reduced price (new).
  Taking advantage of this bundle deal will give me a sense of joy (Grewal, Monroe, and Krishnan 1998).
  It is worth buying (product A) and (product B) as a set (new).
  Buying (product A) and (product B) as a set is very economical (Yadav and Monroe 1993).