Pergamon

Journal of Retailing 78 (2002) 101–118

Journal of Retailing

A meta-analysis of the impact of price presentation on perceived savings

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Abstract

Pricing is one of the most crucial determinants of sales. Besides the actual price, how the price offering is presented to consumers also affects consumer evaluation of the product offering. Many studies focus on "price framing," i.e., how the offer is communicated to the consumer –is the offered price given along with a reference price, is the reference price plausible, is a price deal communicated in dollar or percentage terms. Other studies focus on "situational effects," e.g., is the evaluation for a national brand or a private brand, is it within a discount store or a specialty store. In this article, a meta-analysis of 20 published articles in marketing examines the effects of price frames and situations on perceived savings. The results reveal many features that significantly influence perceived savings. For instance, while both the *percent of deal* and the *amount of deal* positively influence perceived deal savings, deal percent has more impact. Further, the presence of a *regular price* as an *external reference price* enhances the offer value of large plausible deal and implausible deals, but not of small plausible deals. Thus, high value deals should announce the regular price, but not low value deals. Overall, the results have several useful insights for designing promotions. © 2002 by New York University. All rights reserved.

Keywords: Meta analysis; Behavioral pricing; Reference price; Pricing; Promotions; Consumer behavior

Introduction

Victoria's Secret frequently advertises "Buy two, get one free." Storewide sales in Talbots, The Gap, Benetton and others are often announced by signs proclaiming "20–50% off" or "Up to 70% off." Are price cuts presented in different ways perceived differently by consumers? If the consumer rationally computes his (her) savings, mental effort could be reduced by simply stating the dollar savings to the consumer. Yet, apparently, the presentation of the promotion has an impact on consumer deal evaluation and hence retail sales. In fact, much research in marketing attests to the effect of price presentation on deal perception (Das, 1992; Lichtenstein and Bearden, 1989; Urbany, Bearden and Wielbaker, 1988; Yadav and Monroe, 1993). Nonrational (in the traditional sense) processing of price information is further attested to by Inman, McAlister and Hoyer's (1990) finding that the mere presence of a sale announcement, without a reduced price, increased retail sales. Hence, an understanding of price presentation effects is important for retailers as well as brand managers.

In this research, we use a meta analysis technique to evaluate results from prior literature to determine the relative importance of presentation effects. Understanding presentation effects allows managers and retailers to design promotions for greater effectiveness based on past experience. One caveat is that just because we find that an effect is small, it does not necessarily mean that the method is not cost effective. Rather, a small effect may indicate that more research into the context effect is required.

Our conceptual framework, shown in Fig. 1, examines four broad categories of price presentation factors that prior research has shown affect how consumers perceive promotions. This framework is suggested by research on consumer response to price in the context of information processing (see Jacoby and Olson, 1977; Zeithaml, 1982, 1984; Dickson and Sawyer, 1990). For other frameworks concerned with price perception see Biswas and Blair, 1991; Compeau and Grewal, 1998; Grewal, Monroe and Krishnan, 1998; Krishna, Currim & Shoemaker, 1991.

The first set of factors is situational. *Situational factors* encompass the overall situation for the price promotion, for

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PII: S0022-4359(02)00072-6

example, is the evaluation for a national brand or a private label brand, is it within a discount store or a specialty store, are consumers comparing prices within or between stores, and/or is this kind of promotion distinct (vs. competition) and/or consistent (over time) or not. If situational factors affect consumer perceptions of savings, then a key managerial implication is that a promotion that works for your competitors may not work for your brand or store. The second set of factors, presentation effects, addresses whether it matters how the promotions are communicated, and are some ways of communicating the promotion better than others? For instance, is a tensile claim of "save up to 70%" better than a claim of "save 40%"? The third set of factors is the deal characteristics, for example, how big of a discount is offered to the consumers. The final set of factors relates to the specific studies used in this research and attempt to control for any idiosyncratic effects from a study.

Our conceptual model in Fig. 1 posits that the above four factors may also interact in their effect on the perceived savings. For instance, the type of brand (national or local) may interact with the size of the deal to influence consumers' perceptions of the savings. Per Zeithaml's (1984) conceptual schema, the consumer acquires and encodes the *Objective Price* (stimulus) to form the *Subjective Price.* In Fig. 1, the O*bjective Price* is represented by the *Deal Characteristics* and the *Subjective Price* by *Perceived Savings.* Zeithaml (1984) further suggests, ". . . the consumer. . . may alter the information in the process of encoding it." *Situation* and *Price Presentation* of the information would presumably affect its encoding. Thus, for our meta-analysis, *Perceived Savings* was the dependent variable, and *Deal Characteristics, Situation, Price Presentation,* and *Study Effect* were the independent variables.

This taxonomy is consistent with Farley and Lehmann (1986) which lists four categories of design variables for meta analysis: situation, model specification, measurement, and estimation method; Here we concentrate on situation, specification and measurement (*Deal Characteristics, Price Presentation, Study Effect*). However, as a review article, we were constrained by and concentrated on factors that varied across studies –thus, the taxonomy organizes available variables rather than determining which were examined.

We analyze 20 published research studies to determine the effects of situational factors on *Perceived Savings.* We compare the magnitude of effects for different frames and

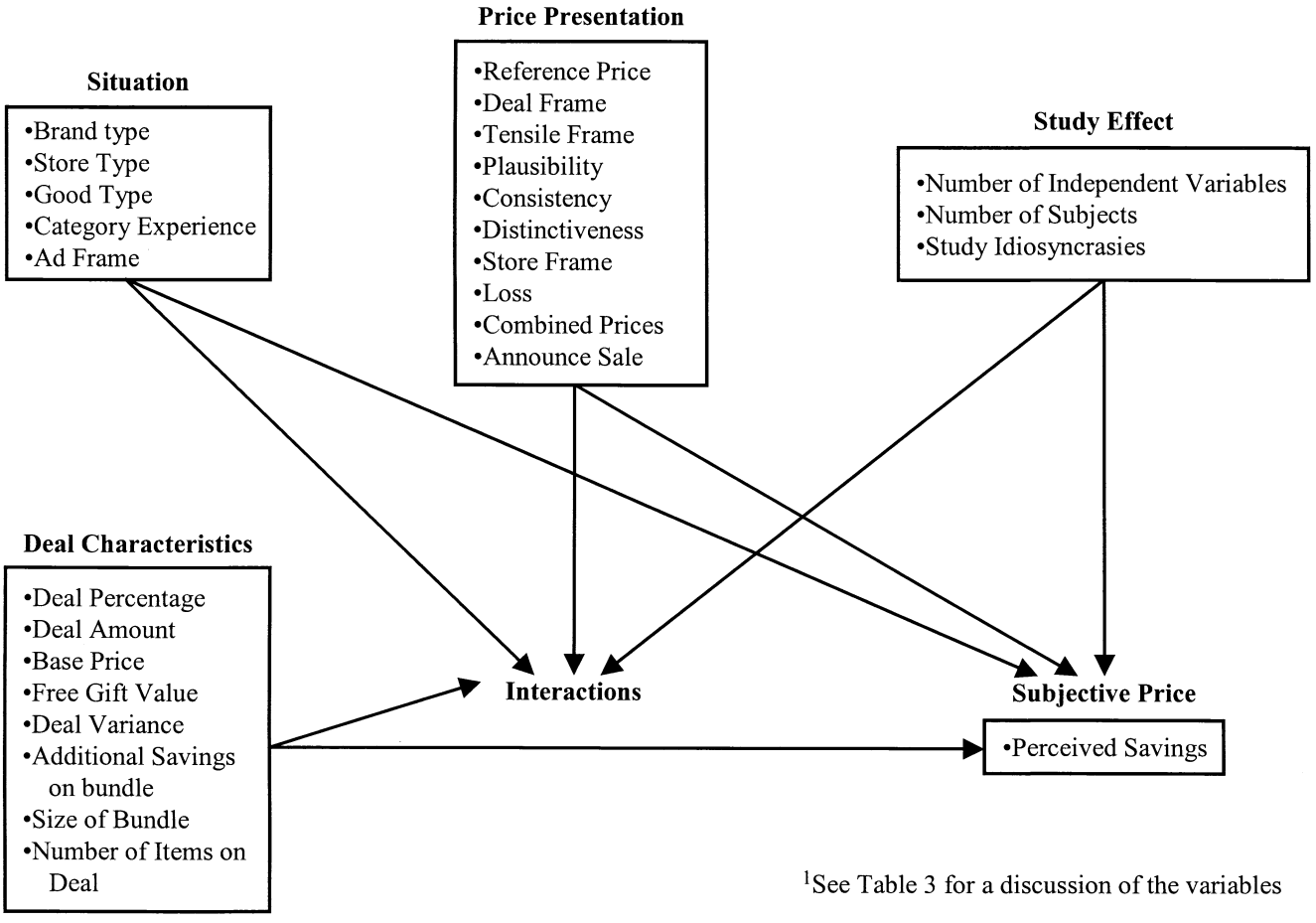


Fig. 1. Conceptual framework.

situation. By generalizing across articles, one can study the effect of larger ranges/number of values for the independent variable. We extend prior research by focusing on the magnitudes of the effects so managers have some guide for the relative impact of the different situational factors.

The rest of the research is organized as follows. In the next section, we describe the prior literature, its findings and how it guided our research. Next we discuss the articles in our analysis. Following a discussion of methodological issues regarding meta-analysis, a conceptual framework including independent and dependent variables is presented. We then present the results of the meta-analysis. We conclude with limitations and possible extensions of our study.

Prior research

Considerable research in marketing has been concerned with the effects of price framing and situation on perceived savings. (See Monroe, 1973; Monroe and Petroshius, 1981; and Winer, 1988). By *price framing,* we broadly mean how the offer price is communicated to the consumer, for example, is the offered price given along with a reference price, is the reference price plausible, is a price deal communicated in dollars or percentage terms. This pertains to what information the consumer gets about the promotion itself.

One particularly relevant reference is a synthesis of reference pricing research by Biswas, Wilson, and Licata (1993). In addition to a narrative review, that article presented an interesting meta-analysis based on 113 observations from 12 studies. A major difference between this earlier study and ours is that the former study concentrates on statistical significance and variance explained, whereas we focus on the magnitude of the effects. Second, the former study does one variable at a time analysis, whereas we analyze the data in a multivariate fashion. This allows us to examine partial and interaction effects[1] as well as to control for the effects of other variables. Further, it permits quantitative predictions of the likely effect under different conditions. Third, we include more studies, which results in a database of 345 observations. This enables us to examine more possible determinants of price presentation effects and to do so with greater power.

A second important reference is an integrative review of comparative advertising studies done by Compeau and Grewal (1998). This review builds upon the meta-analysis done by Biswas, Wilcon, and Licata (1993), has 38 studies, and analyses different dependent variables separately. However, this analysis also focuses on statistical significance and variance explained and does so one variable at a time. A summary of findings from these two articles is provided in Table 1.

We study several of the same variables studied by Compeau and Grewal (1998) (e.g., external reference price) and Biswas et al. (1993) (e.g., external reference price, store type and brand type). In addition, we study other variables as elaborated on later.

In the current research, we meta-analyze 345 observations from 20 articles to determine the effects of price frames and situation on *Perceived Savings.* We compare the magnitude of effects for different frames and situation. In addition, by generalizing across articles, one can study the effect of larger ranges/number of values for the independent variable.

Different approaches to meta-analysis

In order to understand our approach, it is useful to recognize there are different general approaches to meta analysis (i.e., dependent variables). Three distinct ones are evident:

(i) *Statistical significance per se.* This focus has been evident in many classic meta-analyses in social science (e.g., Schmidt, 1992). Here the purpose is to accumulate knowledge to "prove" an effect exists. Since the probability an effect is exactly zero is zero, significance (from zero) is simply a function of sample size and hence not a very interesting or managerially relevant issue (Cohen, 1994).

(ii) *Correlation or variance explained (a.k.a. effect size).* A different focus is the variance explained as measured by some partial-R^2-like measure (e.g., eta squared, omega squared) as in Peterson, Albaum, and Beltramini (1985), Biswas, Wilson, and Licata (1993) and Compeau and Grewal (1998). These measure ability to overshadow (be more influential than) other factors, which might affect the dependent variable (e.g., individual differences or other manipulated or measured variables) and are driven by the consistency of the effect rather than its magnitude per se. This approach tends to be favored by researchers working in the experimental tradition in some areas of psychology and consumer behavior.

(iii) *The magnitude of the effect (a.k.a. size of effect).* Here the focus is on the managerially relevant change in the dependent variable in a model as the independent variable(s) changes. This approach (which often uses standardized measures of the impact of independent variables, such as elasticities) is favored by more econometrically oriented researchers (e.g., Farley and Lehmann, 1986; Farley, Lehmann and Sawyer, 1995; Tellis, 1988).

There is some confusion between the second (effect size) and third (size of effect) approaches. Many measures fall in the category of "effect size" and although the analysis focuses on the percentage of variance explained (e.g., omega squared, R^2). This is different than what is called "size of effect" which refers to the regression coefficient, that is, the magnitude of the effect of an independent variable on a dependent variable (the increase in Y for a 1 unit increase in X). A large "size of effect" may explain little of the variance and/or be insignificant (Imagine a regression

Table 1
Results from previous meta-analysis
Compeau and Grewal (1998)

Independent variables	Effect on dependent variables
Presence of Advertised Reference Price (ARP)	Increases Internal Reference Price (IRP)
	Increases Perceived Value (PV): Consistent with our results
	Decreases Search Intensions (SI)
Increase of Advertised Reference Price (ARP)	Increases IRP
	Increases PV (Consistent with our results if we consider the effect of SP on PV at the same time[a])
	Increases SI
Decrease of Selling Price (SP)	Decreases IRP
	Increases PV (Consistent with our results if we consider the effect of ARP on PV at the same time[a])
	Decreases Perceived Believability (BEL)
	Increases PI
	Decreases SI

[a] An increase of ARP and a decrease of SP results in an increase of ARP-SP (Amount of Deal). Per Compeau and Grewal (1998), an increase of ARP and a decrease of SP results in an increase of PV, which is equivalent to saying that an increase in Deal Amount leads to an increase in Perceived Savings (consistent with our results).

Similarly, per Compeau and Grewal (1998), an increase of ARP and a decrease of SP (which leads to an increase in Deal % = (ARP-SP)/ARP) result in an increase in Perceived Savings (consistent with our results).

Biswas et al. (1993)

Variable studied	Effect on dependent variables
Lab Settings versus Field studies	Studies conducted in lab settings tend to generate larger effects than studies done in the field.
Studies reporting omega square versus studies not reporting	Studies reporting omega yield higher ranking of effect size
MSP versus own Reference Price, Internal Reference Price, Combinations of manipulations	MSP yields higher ranking of effect size
Department Store versus Auto Dealership, Multiple Store, Grocery Store, No Store	Department store yields higher ranking of effect size
National brands versus Unbranded, Store Brand, Fictitious, Multiple	National brands yield higher ranking of effect size

line with a large slope through a cloud of widely dispersed points.).

Similarly a large "effect size" can occur even with a very small "size of effect" (Imagine a regression line which is almost horizontal through a cloud of points which lie almost on the line.) Our focus is on the best guess/estimate of the slope of the line (i.e., the regression coefficient), not the R^2 or t-statistic. Put differently, we (and managers) care primarily about the expected impact of an independent variable – will a "50% off" price framing increase sales of the item more than a "$2 off, regular price $4" sale? Obviously, we also look at whether the "size of the effect" is significant, that is, it is not due to chance.

Thus, this article is in the third tradition. We suggest this to be more appropriate for assessing issues such as the impact of deals since optimal decisions about deals depend on average effects, not whether they are significant or explain a lot of variance in behavior.

Data

We focused on published literature where *Perceived Savings* was the dependent variable. The reason for choosing *Perceived Savings* is that it is the most common method of measuring *Deal Reaction*, and hence offers us the largest number of studies to generalize results. In addition, a supplementary analysis including studies with *Attitude towards the Deal or Product* was also done. We did not include articles where authors used other methods of measuring *Deal Reaction* such as *Is the Product on Sale?* (e.g., Fry & McDougall, 1974), *Relative Happiness* (e.g., Heath, Chatterjee & France, 1995), *Purchase Intention* (e.g., Biswas, 1992; Biswas and Blair, 1991; Inman, Peter & Raghubir, 1997), and *Estimated Discount* (e.g., Dhar, Gonzalez-Vallejo & Soman, 1999). We also did not include articles on price thresholds (e.g., Anderson, 1996), multidimensional prices (e.g., Estelami, 1997) or price search (Grewal and Mormorstein, 1994).

Further, we required that deal evaluation be actually measured as opposed to inferred. Hence, the focus is on experimental and not on scanner-based research. Therefore, we did not include articles where reference prices were inferred or computed based on past prices (e.g., Winer, 1986). We included research on the price-quality relationship if price was the dependent variable (e.g., Dodds, Monroe and Grewal, 1991), but not if quality was the dependent variable (e.g., Lichtenstein and Burton,

1989; Gorn, Tse and Weinberg, 1990; Rao and Monroe, 1989[2]).

We only included articles if the independent variables that the authors manipulated were also manipulated in at least one other article—otherwise the generalization about the effect of an independent variable would be based on a single article, and hence unreliable. Thus, we could not include many articles, for example, Biswas and Sherell, (1993), Lichtenstein, Block and Black, (1988). Some articles did not report the cell means (i.e., means for dependent variables) for all treatments (e.g., Lichtenstein, Burton and O'Hara, 1989; Petroshius and Monroe, 1987; Alba, Mela, Shimp & Urbany, 1999) and so were not included.

The ABI Inform and Psychlit indices from 1980 until 1999 were used to search for articles. In addition, we searched through *Journal of Marketing, Journal of Marketing Research* and *Journal of Consumer Research, American Marketing Association* proceedings, and *Association of Consumer Research* proceedings that had been published before December 1999. Twenty articles passed our screening criteria (see Table 2). Several articles had multiple studies (see Table 2) so that we have thirty studies in all. If an author conducted a 2×2 experiment, we treat this as four observations. Across all 20 articles and 30 studies, we have 345 observations, that is, data points. Two independent coders coded the variables. The few differences in judgments were resolved by discussion between the two coders.

Table 2
Articles used in meta-analysis of price-presentation effects

Authors	Year	# of Studies	# of Observations
Bearden, Lichtenstein & Teel	1984	4	48
Berkowitz and Walton	1980	1	24
Biswas & Burton	1993	2	24
Biswas & Burton	1994	1	6
Blair and Landon	1981	1	12
Burton, Lichtenstein & Herr	1993	1	12
Buyukkurt	1986	1	8
Chen, Monroe & Lou	1998	1	8
Das	1992	1	8
Della Bitta, Monroe and McGinnis	1981	2	30
Dodds, Monroe & Grewal	1991	2	72
Grewal, Marmorstein & Sharma	1996	2	20
Kaicker, Bearden & Manning	1995	1	10
Lichtenstein & Bearden	1989	1	12
Lichtenstein, Burton, Karson	1991	1	10
Low & Lichtenstein	1993	1	9
Mobley, Bearden & Teel	1988	1	4
Suter and Burton	1996	3	9
Urbany, Bearden & Wielbaker	1988	2	10
Yadav & Monroe	1993	1	9
Total	20	30	345

Perceived savings

Across the articles that we included, authors used different measures of *Perceived Savings.* These measures varied on two counts –one was the scale itself (e.g., a four-point scale, a seven-point scale or a nine-point scale), and the other was whether single or multiple scales was used. To make the different scales comparable, we transformed it to a percentage. For example, if the authors of an article used a four-point scale for *Perceived Savings* where 1 = no savings, and 4 = large savings (Blair and Landon, 1981), then we rescaled it as a percentage of possible values on the scale so that 1 was 0% and 4 was 100%. Hence, if mean perceived savings for a cell in the study were 2.19, then this was coded as $(2.19-1)/(4-1) = 0.40$. This transformation makes different scales comparable (e.g., 1 to 4 with 0 to 100) numerically. Among all the 20 articles we examined, 18 articles used seven-point scale, 1 used four-point scale, and one used nine-point scale. Across these 20 articles, perceived savings averaged 0.65 (equivalent to a 3.6 on a 5 point scale) with a standard deviation of 0.10. The actual mean percentage savings was 22% (see Table 5).

To make sure that our results are not sensitive to whether single or multiple scales were used, we employed a dummy variable that was coded 0 if perceived saving was a sum of multiple scale items, and 1 if it was a single scale item. Of all the articles included in our meta analysis, 12 articles used sum of multiple scale items and 8 used single scale item. As illustrated in Table 4, this dummy variable is not statistically significant ($t = 0.25$), and we do not observe any qualitative change in the regression results as a result of adding this dummy variable.

Deal characteristics, situation, price presentation and study effect

Independent variables for the meta-analysis fell under the categories of *Deal Characteristics, Situation, Price Presentation* and *Study Effect* (see Fig. 1). A specific value for a categorical independent variable was included if it constituted more than 1% of the observations (i.e., $n > 3$). Definitions of independent variables and the values of categorical independent variables appear in Table 3. The categorical independent variables are coded using dummy variables. For example, different types of tensile deals are indicated by the use of multiple dummy variables.

We do not propose specific hypotheses for the effect of different independent variables on perceived savings since the nature of this meta-analysis is one of description, that is, to describe the relations between different variables across multiple studies. We do, however, relate our results to those found in individual studies and found in general they are consistent.

Interactions

The meta-analysis also included a subset of interactions between these variables. Interactions included were those hypothesized in previous studies. The reason to include

interactions is because an independent variable may have a different effect for different values of a second independent variable. We expect to find interactions that relate to deal percent and/or amount, plausibility of the deal, reference price and type of brand. For example, while larger deals are perceived more favorably, they are also considered more implausible and consumers may view them with skepticism, lowering the perceived value of the deal (Liefeld and Heslop, 1985). However, the presence of an external reference price may make seemingly implausibly large deals appear less implausible and enhance the perceived deal offer versus implausible deals without external reference prices. While we expect implausible deals to be viewed with skepticism, large deals on national brands may not be considered as noncredible as similar deals on generic or private label brands because of the reputation that national brands enjoy. In addition to these interactions between the independent variables mentioned above, we also examine the other interactions explicitly studied in the 20 articles that we meta-analyze.

Meta-analysis models

Models estimated

In analyzing the results, we concentrated on four models:

Model 1: All (45) main effects of the design variables plus the study average of *Perceived Savings* (to account for idiosyncrasies of each study).

Model 2: Model 1 plus the 24 interactions that had been hypothesized from the articles that provided data for the meta analyses.

Model 3: A reduced version of model 2 that eliminated insignificant (at the 0.10 level) interactions.

Model 4: An expanded version of Model 3 that included studies that had *Attitude towards the Deal or Product* as the dependent variable

At the aggregate level, all four models explain more than 70% of the variance.

While *Model 1* is a main effects model, *Model 2* includes the interactions hypothesized in the 20 articles. A few interactions are not included in the analysis because they empirically were linear combinations of some main effects, which created singularity in the matrix to be inverted. Including the 24 hypothesized interactions increased R^2 by 0.039 from 0.729 (Model 1) to 0.768 (Model 2). A comparison of the variance explained by the two models yields an F of 1.92 that is significant at the 0.05 level. Besides significant increase in R^2, many of the interactions are of interest and provide valuable insights that we discuss later. *Model 3,* which only includes main effects and significant interaction effects, is not significantly different from Model 2 ($F>0.3$). The results for the first and the third model appear in Table 4. *Model 4* had 503 observations, 345 for Perceived Savings and another 158 for Attitude toward the Deal. A dummy variable controlled for the main effect of whether the dependent variable was *Perceived Savings* or *Attitude.* Results obtained were consistent with Model 3. We thus focus our analysis on the more parsimonious Model 3[3].

One-way ANOVAs

In addition to the four models, we also examined the impact of each design variable separately using conditional means and one-way ANOVAs (see Table 5). A comparison of these results[4] and those from the regression models shows that some of the variables (e.g., *Regular Price* vs. *MSP*) that do not have significant F-values in one-way ANOVA analysis yield significant influences on the dependent variable in regression analysis. Similarly, some variables that are significant in the ANOVA analysis (e.g., Number of Subjects in Cell) are not significant in the regression analysis. This result emphasizes the importance of using partial correlations in the heavily confounded conditions found in the natural experiment underlying the meta-analysis.

Results and discussion

We report, in turn, results for the four types of independent variables, namely, *Deal Characteristics, Situation, Price Presentation* and *Study Effect.* The reader is referred to Table 6 to see all the effects. In Table 6, the standardized coefficients are reported. We only standardized the continuous variables, as we want the binary variables to indicate the presence or absence of an effect. Here, we discuss results that we consider more managerially relevant.

Deal characteristics

From an effect size perspective, the three largest influences on Perceived Savings are *Additional Savings on a Bundle* ($b = 1.054$), *Deal percentage* ($b = 0.570$), and Size of the Bundle ($b = -0.219$).

Dollar and percent value of deal. Higher values for both *Deal Percentage* ($b = 0.570$, $t = 6.14$) and *Deal Amount* ($b = 0.122$, $t = 1.66$) raise *Perceived Savings,* albeit *Percentage* does so to greater extent. Utility theory suggests that only the dollar amount should affect deal evaluation. However, even when the dollar amount is accounted for in our equations, the deal percentage still affects deal evaluation (consistent with the hypotheses and findings of Das, 1992 and Della Bitta, Monroe & McGinnis, 1981). This may partly explain why the dollar versus percentage deal frame is not significantly different from just giving the final sale price. Managerially this result means that multiproduct manufacturers and retailers need to keep in mind that the

Table 3
Independent variables

INDEPENDENT VARIABLES AND VARIABLE LEVELS[a]	DEFINITION	ARTICLES WITH VARIANCE ACROSS INDEPENDENT VARIABLES[b]
DEAL CHARACTERISTICS		
Percent of Deal[c]		Most studies
Amount of Deal		Most studies
Additional Savings on Bundle		Low & Lichtenstein (1993); Yadav & Monroe (1993); Das (1992)
Base Price of Item		Between article variation[d]
No. of Items on Deal/No. of Deals Observed	Number of observations provided to subjects	Between article variation
Size of the Bundle	Number of items in the bundle presented to the subjects.	Low & Lichtenstein (1993); Buyukkurt (1986)
Variance of Deals	How deal amount varies over time/Uncertainty in deal price	Buyukkurt (1986)
High		
None/Low		
Free Gift Value		Low & Lichtenstein (1993)
Low	— Value of free gift is small relative to base price of product.	
High or None	— High if there is a free gift and none if there is no free gift.	
SITUATION VARIABLES		
Brand Type		Blair & Landon (1981)
Fictitious		Dodds, Monroe, Grewal (1991)
Generic		Berkowitz & Walton (1980)
National		Bearden, Lichtenstein, Teel (1984)
Private		
None specified		
Store Type		Dodds, Monroe, Grewal (1991)
Department		Berkowitz & Walton (1980)
Discount		Buyukkurt (1986)
Specialty		
Supermarket		
None specified		
Type of Good		Berkowitz & Walton (1980)
Packaged		Das (1992)
Other	— Durable or soft good	
Category Experience	High vs. low consumer knowledge/experience with the category.	Some between article variation
High		
Low		
Not specified		
Ad Frame	Catalogue format versus advertisement format versus shopping simulation.	Blair & Landon (1981)
Advertisement		Grewal, Marmorstein, Sharma (1996) (lots of between study variance)
Catalogue		
Shopping		
PRICE PRESENTATION VARIABLES		
External Reference Price		Blair & Landon (1981); Urbany, Bearden, Weilbaker 1988)
Manufacture suggested price (MSP)		Burton, Lichetenstein, Herr (1993); Das (1992)
Regular price		Bearden, Lichtenstein, Teel (1984); Berkowitz & Walton (1980)
None		Della Bitta, Monroe, McGinnis (1981)
Objective (Non-tensile) Deal Frame	— Deal given as a coupon	Berkowitz & Walton (1980); Della Bitta, Monroe and McGinnis (1981)
Coupon	— e.g., $__ off	Biswas & Burton (1993, 1994); Burton, Lichtenstein & Herr (1993)
Dollar	— e.g., a free premium	Low & Lichtenstein (1993); Das (1992)
Free Gift	— e.g., __% off	Bearden, Lichtenstein & Teel (1984); Chen, Monroe & Low (1998)

(*continued on next page*)

Table 3
(*continued*)

INDEPENDENT VARIABLES AND VARIABLE LEVELS[a]	DEFINITION	ARTICLES WITH VARIANCE ACROSS INDEPENDENT VARIABLES[b]
Percent	— e.g., 2 for the price of 1	
X-For		
None (Final price given)		
Tensile Deal Frame		Biswas & Burton (1993, 1994)
Maximum	— Save up to __	Mobley, Bearden & Teel (1988)
Minimum	— Save __ and more	
Range	— Save __ to __	
Non-tensile (Objective) deal frame	— No tensile deal frame	
Plausibility		Lichtenstein & Bearden (1989); Urbany, Bearden, Weilbaker (1988)
Implausible		
Plausible-Small		Grewal, Marmorstein, Sharma (1996); Suter and Burton (1996)
Plausible-Large		Dodds, Monroe, Grewal (1991); Berkowitz & Walton (1980)
Plausible		Low & Lichtenstein (1993); Lichtenstein, Burton, Karson (1991)
Store Frame		Urbany, Bearden, Weilbaker (1988); Grewal, Marmorstein, Sharma (1996)
Between stores	— e.g., our price, compare with __ at __	
Within store	— e.g., regular price __, sale price __	Berkowitz & Walton (1980); Burton, Lichtenstein, Herr (1993)
Both		Lichtenstein, Burton, Karson (1991)
Consistency	— Of deals over time	Lichtenstein & Bearden (1989) Burton, Lichtenstein, Herr (1993)
High	Three articles specifically discuss manipulating "consistency". Lichtenstein and Bearden (1989) manipulate high and low consistency through high and low deal frequency. Burton, Lichtenstein, Herr (1993) and Lichtenstein, Burton, Karson (1991) depict high consistency by using a within store frame (Was $__, now only $__).	Lichtenstein, Burton, Karson (1991)
Low		
Neither (not applicable)		
Distinctiveness	— Of deal versus other brands	Lichtenstein & Bearden (1989)
High	Three articles specifically discuss manipulating "distinctiveness". Burton, Lichtenstein, Herr (1993) and Lichtenstein, Burton, Karson (1991) manipulate high distinctiveness through a between store frame (Seen elsewhere for $__, our price $__).	Burton, Lichtenstein, Herr (1993)
Low		Lichtenstein, Burton, Karson (1991)
Neither (not applicable)		
Sale Announced?		Yadav, Monroe (1993)
Yes	— Offered price is termed a sale	Burton, Lichtenstein, Herr (1993)
No	— Offered price does not state that it is a Sale	
Free Gift Value		Low & Lichtenstein (1993)
Low	— Value of free gift is small relative to base price of product.	
High or None	— High if there is a free gift and none if there is no free gift.	
Bundle Frame		Kaicker, Bearden, Manning (1995)
Loss		
Mixed (gain and loss)		
Gain		
Combined Prices?		Kaicker, Bearden, Manning (1995); Some between study variation
Yes	Single price for bundle.	
No	Each item has its own price.	

(*continued on next page*)

Table 3
(*continued*)

INDEPENDENT VARIABLES AND VARIABLE LEVELS[a]	DEFINITION	ARTICLES WITH VARIANCE ACROSS INDEPENDENT VARIABLES[b]
STUDY EFFECT		
Number of Variables Manipulated		Between article variation only
Number of Subjects in Cell		Within & between article variation
Study Average		Between article variation only
Multiple scales for DV		Between article variation only
Yes	— DV is measured as a sum of multiple scale items.	
No	— DV is measured as a single scale item.	

[a] Default level is given in italics.
[b] Some independent variables had variation across articles and some had variation both across and within articles. [c] Percent of deal and subsequent variables are continuous variables. [d] Variation in the independent variable occurred across articles not within the same article.

same deal amount will be perceived more positively if the percent is higher.

The effect of *deal percentage* is moderated by whether or not it is done by a *department store* (b = 0.178, t = 1.70) suggesting that larger deals do better in department store than in discount or specialty stores or supermarkets. Deal percentage is also moderated by whether or not regular price is used as an external reference and by tensile claims. These effects are discussed in the sections below on reference and tensile claims.

Savings on the bundle and Size of the Bundle. As expected, the more the savings on the bundle over and above savings on individual items (Yadav and Monroe, 1993), the higher the *Perceived Savings* (b = 1.054, t = 2.80). Interestingly, perceived savings is decreased by the size of the bundle (b = -0.219, t = -2.96). This result suggests that, all else equal, consumers evaluate smaller bundles more favorably than larger bundles. Therefore, when bundling goods, managers should make the bundles as small as possible to maximize perceived savings. Multiple hypotheses to explain this effect (e.g., consumers average the savings by the number of items, or consumers must spend more as the number of items increases to receive the savings) would be fruitful areas for future research.

Number of items on deal. The greater the *Number of Items Offered on Deal* by a store, the higher we expect and find *Perceived Savings* to be (b = 0.197, t = 2.26). This finding may be due to consumers counting the number of deals instead of processing specific price information (Alba et al., 1999).

Table 4
Regression results

Model	Degrees of Freedom	R^2	Adjusted R^2
Main effects	46	0.703	0.657
Main effects and interactions	70	0.768	0.706
Main effects and significant interactions	58	0.759	0.710
Extended model	59	0.765	0.718

Base Price. The higher the *base price* of the item, the more favorably consumers evaluate the deal (b = 0.155, t = 2.56). This result has two implications. First, consumers apparently evaluate deals in higher-priced categories more favorably. Second, this result support findings in the literature for price tiers, as deals on higher priced brands are evaluated more favorably (Blattberg and Wisniewski, 1989).

This effect is moderated by whether the deal is framed as a free gift (b = -0.729, t = 2.12). Apparently consumers discount savings framed as free gifts, and this effect becomes more pronounced as the base price increases. From a managerial standpoint, high-ticket items should avoid offering their discounts as free gifts.

Variance of deals. Higher *Variance of Deals,* manipulated by having a smaller number of larger deal discounts as opposed to a larger number of smaller deal discounts (Buyukkurt, 1986) results in lower *Perceived Savings* as expected (b = -0.105, t = -3.15). The higher the variance in deals, the more likely that consumer's internal reference price becomes lower, and therefore the less the perceived savings (Krishna and Johar, 1996).

Situational effects

In general, situational factors appear to be less important (based on the magnitude of the standardized betas) than the deal characteristics in determining consumers' perceived savings of the deal. However, many of the effects are significant for managers. In this category, the largest impact comes from putting the discount in an advertisement (b = 0.247, t = 2.25). The next group of significant factors includes *type of good* (b = 0.170, t = 1.72), *store type* and *brand type.*

Brand type. Consistent with Bearden, Lichtenstein and

Table 5
Variable-by-variable analysis

Independent Variables						
DEAL CHARAC.						
			Mean of the continuous Variable		F-Value One-Way ANOVA	t-value Main effect plus interaction regression
Percent of Deal			0.22		3.07	6.14**
Amount of Deal			29.98		3.78	1.66*
Additional Savings on Bundle			0.79		3.20	2.80**
Base Price of Item/10000			140.00		5.61	2.56**
No. of Items On Deal/No. of Deals Obs.			1.29		1.49	2.26**
Size of the Bundle			1.40		8.24	−2.96**
			Dependent Variable		F-Value	t-value
	Levels	Frequency	Mean	Std Dev.	One-Way ANOVA	Main effect plus interaction regression
Variance of Deals					8.74	
	High	3	0.74	0.12		−3.15**
	None/Low	342	0.65	0.10		
Free Gift Value					3.78	
	Low	3	0.65	0.10		3.32**
	High or None	342	0.54	0.04		
SITUATIONAL EFFECTS						
Brand Type					1.87	
	Fictitious	25	0.61	0.09		2.01**
	Generic	16	0.66	0.06		−2.02**
	National	155	0.65	0.09		2.14**
	Private	40	0.67	0.09		−1.39
	None	109	0.64	0.07		
Store Type					2.63	
	Department	35	0.68	0.10		−1.25
	Discount	32	0.66	0.11		−2.94**
	Specialty	62	0.66	0.09		−1.67*
	Supermarket	56	0.66	0.10		0.06
	None	160	0.63	0.10		
Type of Good					0.22	
	Other	251	0.65	0.10		
	Packaged	66	0.66	0.10		1.72*
Category Experience					8.20	
	High	9	0.74	0.12		−1.30
	Low/None	336	0	0.10		
Ad Frame					0.37	
	Advertisement	291	0.65	0.10		2.25**
	Catalogue	4	0.63	0.03		−0.53
	Shopping	50	0.43	0.12		
PRICE PRESENTATION EFFECTS						
Reference Price					0.03	
	MSP	10	0.64	0.02		0.86
	Regular Price	189	0.65	0.10		1.78*
	None	146	0.65	0.10		
Tensile					16.91	
	Maximum	11	0.65	0.06		1.21
	Minimum	9	0.45	0.08		−3.52**
	Range	9	0.57	0.05		0.66
	None	316	0.66	0.10		
Deal Frame					6.06	
	Coupon	28	0.65	0.10		−1.06
	Dollar	18	0.62	0.09		0.90
	Free Gift	6	0.53	0.03		−4.23**
	Percent	51	0.60	0.10		1.25
	X-For	4	0.61	0.02		1.09
	None	238	0.68	0.10		

(*continued on next page*)

Table 5
(*continued*)

Plausibility					4.49	
	Plausible-Large	44	0.65	0.08		−4.37**
	Implausible	36	0.63	0.10		−6.50**
	Plausible-Small	48	0.70	0.12		3.67**
	Plausible	217	0.64	0.10		
Store Frame					0.90	
	Between	21	0.65	0.09		2.99**
	Within	307	0.65	005		
	Both	17	0.68	0.212		
Consistency					0.21	
	High	6	0.62	0.05		−3.29**
	Low	11	0.65	0.07		−0.70
	Neither	328	0.42	0.10		
Distinctiveness					0.69	
	High	11	0.67	0.07		−0.84
	Low	6	0.61	0.04		−2.59
	Neither	328	0.42	0.10		
Sale Announced					3.07	
	Yes	253	0.64	0.09		9.23**
	No	92	0.67	0.12		
Loss					3.91	
	Loss	4	0.51	0.14		−3.38**
	Mixed	3	0.63	0.03		−2.91**
	Gain	338	0.65	0.10		
Combined Prices?					11.86	
	No	315	0.66	0.10		
	Yes	30	0.59	0.14		−0.71
STUDY EFFECT						
Multiple scales for dv						
	No	191	0.66	0.10	4.09	0.25
	Yes	154	0.64	0.10		
			Mean of the continuous Variable		F-Value One-way ANOVA	t-value Main effect plus interaction regression
Number of Variables Manipulated			2.84		14.28	0.93
No. of Subjects in Cell			38.00		3.62	−0.60
Study Average			0.65		6.67	11.07**

Teel, (1984), deals on national brands are perceived more positively compared to deals on generic and private brands and when no brand name is used (b = 0.122, t = 2.14). We also find that deals on generic brands do worse than deals on other brands (b = -0.084, t = -2.02). Surprisingly, deals on fictitious brands are perceived positively compared to deals on other brands; perhaps this is a characteristic of the lab settings and student subjects involved, suggesting these may overstate the impact of deals.

Our results offer support for the price tiers found by Blattberg and Wisniewski (1989) and Sivakumar and Raj (1997). Blattberg and Wisniewski (1989) suggested that consumers who typically buy national brands would not buy a lower priced (e.g., generic) brand even if on deal because of a perception of lower quality. However, consumers who typically buy lower priced (e.g., generic) brands would buy national brands on deal, resulting in asymmetric price elasticities between lower and higher priced brands. Sivakumar and Raj (1997)'s empirical findings from four scanner panel data sets showed that with price reduction, high-quality brands gained more than did low-quality brands both in brand choice and category choice decisions. Furthermore, high-quality brands were less vulnerable to losses when prices were increased. Our results suggest that the asymmetry could be due to differing perceptions of deals for national versus generic brands.

Both the plausibility of the deal and whether manufacturer's suggested retail price is used as the external reference price moderate the impact of type of brand. These interactions are discussed in more detail below.

Store type. Prior studies typically had one or two types of stores. Across all 20 articles, we have five *Store Types*. We find that sales offered in discount stores (b = -0.125, t = -2.94) and department stores (b = -0.151, t = -1.25) are perceived to have lower value than deals in specialty stores, supermarkets, and when the type of store is not explicitly mentioned. The discount stores result implies that consumers value deals less in stores that sell based on price, compared to stores perceived to have lower deal frequency; In effect this result mirrors basic psychological research which suggests unexpected rewards are more impactful. The de-

Table 6
Regression results with standardized coefficients

Independent Variables	Levels[a]	Main Effects Model		Main Effects and Significant Interactions Model	
		Coefficient	t-value	Coefficient	t-value
DEAL CHAR.AC.					
Percent of Deal		0.830	9.69**	0.570	6.14**
Amount of Deal		0.109	1.44	0.122	1.66*
Add. Savings on Bundle		0.233	5.19**	1.054	2.80**
Base Price of Item/100		0.172	2.65**	0.155	2.56**
No. of Items On Deal/No. of Deals Observations.		0.079	0.95	0.197	2.26**
Size of Bundle		−0.211	−2.71**	−0.219	−2.96**
Variance of Deals					
	High (3)	−0.106	−2.96**	−0.105	−3.15**
	None/Low	0.000			
Free Gift Value					
	Low (3)	0.127	2.79**	0.207	3.32**
	High or None	0.000			
SITUATIONAL EFFECTS					
Brand Type					
	Fictitious (25)	0.102	1.91*	0.110	2.01**
	Generic (16)	−0.082	−1.85*	−0.084	−2.02**
	National (155)	0.157	2.85**	0.122	2.14**
	Private (40)	−0.059	−1.30	−0.058	−1.39
	None	0.000			
Store Type					
	Department (35)	0.039	0.70	−0.151	−1.25
	Discount (32)	−0.079	−2.03**	−0.125	−2.94**
	Specialty (62)	0.008	0.15	−0.060	1.67*
	Supermarket (56)	−0.044	−0.41	0.007	0.06
	None	0.000			
Type of Good					
	Package (66)	0.183	1.96*	0.170	1.72*
	Other	0.000			
Category. Experience					
	High (9)	−0.061	−0.89	−0.090	−1.30
	Low/None	0.000			
Ad Frame					
	Advertisement (291)	−0.017	−0.29	0.247	2.25**
	Catalogue (4)	−0.035	−0.83	−0.021	−0.53
	Shopping				
PRICE PRESENTATION EFFECTS					
External. Reference Price					
	MSP (10)	−0.003	−0.08	0.038	0.86
	Regular Price (189)	0.013	0.22	0.110	1.78*
	None	0.000			
Tensile					
	Maximum (11)	0.026	0.59	0.058	1.21
	Minimum (9)	−0.071	−1.58*	−0.243	−3.52**
	Range (9)	0.033	0.75	0.030	0.66
	None	0.000			
Deal Frame					
	Coupon (28)	−0.049	−1.14	−0.042	−1.06
	Dollar (18)	0.019	0.44	0.038	0.90
	Free Gift (6)	−0.368	−5.58**	−0.593	−4.23**
	Percent (51)	−0.024	−0.45	0.096	1.25
	X-For (4)	0.083	2.15**	0.043	1.09
	None	0.000			
Plausibility					
	Plausible-Large (44)	−0.128	−2.98**	−0.279	−4.37**
	Implausible (36)	−0.310	−6.83**	−0.350	−6.50**
	Plausible-Small (48)	0.164	3.55**	0.244	3.67**
	Plausible	0.000			

(*continued on next page*)

Table 6
(*continued*)

Independent Variables	Levels[a]	Main Effects Model		Main Effects and Significant Interactions Model	
		Coefficient	t-value	Coefficient	t-value
Store Frame					
	Between	0.000			
	Within (316)	0.016	0.33	0.229	2.99**
Consistency					
	High (6)	−0.123	−3.23**	−0.118	−3.29**
	Low (11)	−0.021	−0.57	−0.025	−0.70
	Neither	0.000			
Distinctiveness					
	High (11)	−0.005	−0.12	−0.036	−0.84
	Low (6)	−0.100	2.65**	−0.089	−2.59**
	Neither	0.000			
Sale Announced					
	Yes	0.000			
	No (92)	0.786	9.76**	0.748	9.23**
Loss					
	Loss (4)	−0.077	−1.68*	−0.151	−3.38**
	Mixed (3)	−0.056	−1.41	−0.111	−2.91**
	Gain	0.000			
Combined Prices?					
	No	0.000			
	Yes (30)	−0.111	−1.67*	−0.181	−0.71
STUDY EFFECT					
No. of Vars Manipulated		−0.045	−0.58	0.077	0.93
No. of Subjects in Cell		0.001	0.32	−0.026	−0.60
Study Average		0.632	10.79**	0.607	11.07**
Multiple scales for dv					
	Yes				
	No (191)	−0.133	−1.26	0.028	0.25
Intercept		0.000	−1.48	0.000	−2.88**
INTERACTIONS					
Regular price (as Ext. Reference Price) times					
Implausible reference price			0.173	2.42**	
Large, but plausible reference price				0.146	2.12**
Small, plausible reference price			−0.202	−2.81**	
National brand times					
Implausible reference price					
Large, but plausible reference price			0.093	2.17**	
Small, plausible reference price			0.050	1.21	
Manuf. Suggested price			0.065	1.67*	
Department Store times					
Percentage value of deal			0.178	1.70*	
Within store frame times					
At home			−0.441	−3.24**	
Percentage value of the deal times					
Discount store			0.042	1.07	
Regular Price as External reference price			−0.087	−1.72*	
Tensile claim with max value			0.155	2.42**	
Base price of item/10000 times					
Deal framed a free gift			−0.729	−2.12**	

[a] Sample size for each level of the discrete variables is included in the parentheses.
Note: The coefficients presented are standardized: * $p<0.10$; ** $p<0.05$

partment store effect, while not significant, is large and less intuitive. Further research in this area may provide interesting insights into this effect.

Type of good. Deals on *Packaged Goods* are considered better value by subjects than deals on other durables or soft goods ($b = 0.170$, $t = 1.72$), perhaps due to greater famil-

iarity with such deals and/or the product's regular prices due to greater purchase frequency.

Price presentation effects

Price presentation effects are generally larger than the *situational effects*, but smaller than *deal characteristic* effects in determining consumers' *Perceived Savings.* The largest effects in the category are whether or not the sale was *announced* (b = 0.748, t = 9.23), *free gift deal frame* (b = -0.593, t = -4.23), *Plausibility* of the deal, tensile claims, within store frame (b = 0.229, t = 2.99), external reference price, and combined prices (b = -0.181, t = -0.71).

Plausibility. *Small and Plausible* deals (b = 0.244, t = 3.67) increase the effect of the deal whereas *Implausible* deals (b = -0.350, t = -6.50) and *Large and Plausible* deals (b = -0.279, t = -4.37) reduce the effect of the deal, ceteris paribus. However, implausible deals (and large and plausible deals) may have a net positive effect on perceived savings because big deals (which are the typical manipulation for implausible deals) have a positive effect on deal evaluation (through deal amount and deal percent). The result for "plausibility" needs to be looked at in combination with the effects of actual deal amount (b = 0.122), and percentage deal amount (b = 0.57). Thus, very large deal amounts, even if implausible, may still have a higher impact on perceived savings than lower deal amounts. For example, if the deal offers an implausible 80% savings through an exaggerated regular price, then perceived savings are higher versus a plausible 20% savings with a believable regular price. It is not the case that implausible deals do not hurt deal evaluation—just that the larger deal percentage helps the deal perception more than the implausibility of the deal hurts it. This shows the importance of considering multiple variables and interactions simultaneously to accurately assess impacts. Plausibility also has significant interactions with the external reference price.

External reference price. Many prior studies have included an external reference price (see Table 3). Most used the *Regular Price* as the reference price while some used *Manufacturer Suggested Price* (e.g., Blair and Landon, 1981). As expected, presence of a *Regular Price* increases *Perceived Savings* (b = 0.110, t = 1.78). However, the presence of a *Manufacturer Suggested Price* (MSP) does not significantly increase perceived deal value, suggesting that consumers are leery of such attempts to set reference prices.

These main effects are moderated by significant interactions. For example, the presence of a *Regular Price as an External Reference Price* has a significant negative interaction with *Deal Percent* (b = -0.0865, t = -1.72). Thus, the effect of Regular price on perceived savings decreases as deal percentage increases. Further, *Regular Price* also interacts with *Plausibility* (see Table 6).

We also find that *National Brand* has an interaction with *Manufacturer Suggested Price* (b = 0.065, t = 1.67), which indicates that MSP may help national brands more than other brands. This suggests that when offering national brands on deals, managers should make external reference prices salient. In addition, National Brands have a significant interaction with *Large Plausible Deals* (b = 0.05, t = 2.12) suggesting that a *Large Plausible Deal* on a *National Brand* results in higher effects of deal than *Large Plausible* deal on other brands, presumably because a large plausible deal on a national brand is more credible than a large plausible deal on other brands.

Deal frame. Across the 20 articles, we found six different *Deal Frames.* Most articles considered 2–3 *Deal Frames* and do not have consistent results. We too do not find any deal frame doing significantly better than the others. However, consistent with Low and Lichtenstein (1993), we find that *Free Gifts* (premiums) hurt the offer value (b = -0.593, t = -4.23).

Tensile claims. We find that tensile claims of the form (savings of __% and more) are perceived to offer significantly lower savings compared to deals framed in terms of nontensile (objective) claims (b = -0.243, t = -3.52). This makes intuitive sense since the low end of the deal is highlighted in the former context. Other tensile frames ("save up to __%, save __% to __%) were not significantly different from nontensile frames ($p > .1$).

Finally, a tensile claim of the type (save up to __%) interacts positively with percentage value of the deal (b = 0.155, t = 2.42), indicating that the higher the actual deal %, the better the tensile claim framed as the maximum possible saving is versus other types of claims.

Consistency. Across all the studies, we found that deals with *High Consistency* result in less favorable deal evaluation (b = -0.118, t = -3.29). This result is in keeping with the literature on consistency effects (e.g., Burton, Lichtenstein, Herr, 1993; Lichtenstein, Burton, Karson ,1991; Lichtenstein and Bearden, 1988, 1989). These articles, have manipulated deal consistency through deal frequency (Lichtenstein and Bearden, 1989) and store frame (Lichtenstein, Burton, Karson, 1991; Lichtenstein and Bearden, 1988, 1989).

Distinctiveness. Consistent with prior studies, we find that *Low Distinctive Deals* decrease consumers' evaluation of *Perceived Savings* (b = -0.089, t = -2.59) (i.e., high distinctive deal frames leads to higher deal reaction.).

Store Frame. Consistent with prior studies, we find that a within store frame (e.g., current price is x, our regular price is y) is more effective (b = 0.229, t = 2.99) than a between store frame (e.g., our price is x, competing store's price is y). However, this effect is lowered when the ad is seen at

home (b = -0.441, t = -3.24). This suggests that between store frames are more effective for free standing inserts and other materials sent to consumers.

Study effect

The *Study Average* (which captures study idiosyncrasies) accounts for a substantial portion of the variation in results, as expected in a situation where each study has few observations. Similar to most meta-analyses, the design variables are potentially confounded with omitted variables unique to each study. We can capture the main effects of these omitted variables by including a dummy variable to represent each study. Unfortunately, this leads to colinearity between design variables and study dummies as well as the need to include 30 additional variables. Therefore, we added a single variable, the *Study Average,* to the analysis. As expected, *Study Average* is statistically significant (b = 0.607, t = 11.07).

Different from some other meta-analyses, in our results the *Number of Independent Variables* and the *Number of Subjects* are not statistically significant.

Conclusion

This section is divided into three sections, managerial contributions, academic contributions and limitations/cautions about this research.

Managerial contributions

Our results show that many features significantly influence price perceptions and hence should be taken into account by managers structuring deals. From a managerial perspective, there are several interesting findings:

- The most important factors influencing consumers' perception of the deal are the deal characteristics and price presentation effects –factors that the manager has the most control over. However, the situational effects are still important, and will affect how consumers' perceive the deal and imply that what works for your competitors may or may not work for you.
- Within deal characteristics, the most important factors are the additional savings on a bundle and the deal percentage. So, one managerial prescription is to create bundles that have additional savings. However, as the size of the bundle increases, consumers perceive the deal less favorably. Thus, small bundles with high percentage discounts are most impactful for their consumers.
- Within price presentation effects, we found several interesting interactions. First, the plausibility of the deal (or size of the deal) interacts with whether or not regular price is given. "Implausibility" of a deal makes it less attractive. However, a large deal amount more than compensates for its lower plausibility, so that deals of large magnitudes are evaluated more favorably than deals of smaller magnitudes. A second interesting interaction is that it appears that within store frames are more effective when the consumer is shopping, but between store frames are more effective when communicating with consumers at home.
- Within situational effects, the most important factors are brand (both store and item). We find that deals on national brands are evaluated more favorably than those on private brands and generics; and that consumers value deals less in stores that have higher deal frequency (discount stores) compared to stores perceived to have lower deal frequency (e.g., specialty stores). This result is consistent with the empirical generalizations of Blattberg et al. (1995) that "The greater the frequency of deals, the lower the height of the deal spike" (p.g124). Since Blattberg et al.'s findings were at the brand-level, whereas these findings are at the store-level, an interesting question for future research is what are the relative magnitudes of the store-versus-brand effects?

Academic contributions

From an academic perspective, we also have several interesting findings:

- Both the dollar and the percentage amount of the deal positively influence perception of deal savings. One implication of this finding is that the marginal rate of substitution between base price and the absolute and relative size of the deal are not constant. Therefore, a dollar deal on a ten-dollar item is evaluated better than a dollar deal on a twenty-dollar item, even when the effect of the increase in the base price is excluded. That impact of a price change in percentage terms is consistent with the Weber-Fechner law of psychophysics and with the price experiments conducted by Monroe (1973) (see Winer, 1988 for details). Our results, however, suggest that *both* percentage and absolute price discounts affect deal evaluation.
- Consumers value savings on bundles less as the bundle size increases. This finding is open to multiple hypotheses as to the cause and would be fruitful area for future research.
- The presence of a regular price as an external reference price increases perceived deal savings. However, when the deal percentage is extremely large, consumers may deflate the external reference price when they observe a sale. Also, the presence of a regular price (external reference price) enhances the offer value of large plausible deals and implausible deals, but not of small plausible deals.
- Presenting manufacturer suggested price is more credible for national brands than for other brands.

Table 7
Important findings from the meta-analysis

Variables Studied	Effect on Dependent Variables
Deal Characteristics	
Amount of Deal, Percent of Deal	Both positively influence Perceived Saving
Variance of Deals	High deal variances lead to lower Perceived Savings
Situational Effects	
Brand Type: National Brands vs. Private Brands and Generics	Deals on National Brands yield higher Perceived Savings
Type of Good: Packaged Goods vs. Other (durable, soft) Goods	Deals on Packaged Goods yield higher Perceived Savings
Store Type: Discount Store vs. Department and Specialty Stores	The deals in Discount Stores lead to lower Perceived Savings.
Price Presentation Effects	
External Reference Price: Regular Price	Presence of Regular Price increases Perceived Savings
Minimum Tensile Claim vs. Non-tensile Claim	Minimum Tensile Claims yield lower Perceived Savings
Plausibility: Small and Plausible Deals vs. Large but Plausible Deals and Implausible Deals	Small and Plausible Deals yield higher Perceived Savings
Consistency	Less consistent deals yield higher Perceived Savings
Distinctiveness	More distinctive deals yield higher Perceived Savings
Interactions[a]	
Regular Price and Deal Percentage	Presenting a Regular Price as an external reference price decreases Perceived Saving when the Deal Percentage is extremely large.
Regular Price and Plausibility	The presence of a Regular Price enhances the Perceived Savings of large, plausible deals and implausible deals but not small plausible deals.
MSP and Brand Type	Presenting MSP increases Perceived Savings more for National Brands than for other brands.
Brand Type and Plausibility	Large but Plausible Deal on a National Brand results in higher Perceived Savings as opposed to a Large Plausible Deal on other brands.
Deal Percentage and Store Type	Large Deals in Department Store yield higher Perceived Savings than those in Discount, Specialty Stores, or Supermarkets.

[a] The Effects of interactions are explained considering the interaction effect and both the main effects.

- Tensile claims of the form (savings of __% and more) are perceived to offer significantly lower savings compared to deals framed in terms of nontensile (objective) claims.
- Deals are more effective if they are less consistent (predictable) and more distinctive.
- Including free gifts in general lowers the perceived value of the deal.

Table 7 summarizes these findings and compares them with findings from prior meta-analyses shown in Table 1.

Limitations and future research

As in many meta-analysis, it would be desirable to have a bigger data set. In studies where the emphasis has been on establishing whether an effect exists (e.g., whether deals lead to perceived savings), one can determine the number of zero effect studies which would have to exist –in "file drawers" –before the impact becomes statistically insignificant. Here there is no real question as to whether deals lead to perceived savings. Rather the focus has been on how the effect systematically varies across several variables. One interesting methodological direction for future research would be to develop such a test.

It would also be desirable to weight studies by their quality, for example, by the inverse of the variance of the estimates. Unfortunately reporting standards are not uniform. Using a weighted least squares procedure thus requires either dropping studies (which are already in short supply) or creating estimates of coefficient standard errors. Since both alternatives have serious problems associated with them, we chose to use an unweighted analysis of the entire set of studies. Hopefully in the future articles will provide sufficient detail to see whether weighting schemes in fact matter.

As mentioned earlier, some variables had little explicit variation within (or across) studies, and there is a need to further investigate the effect of these variables on deal evaluation. For example, the effects of time limits and quantity limits have been explicitly examined by Inman, Peter and Raghubir (1997), and also studied by Biswas & Burton (1993), Burton, Lichtenstein & Herr (1993), Diamond & Campbell (1989), and Kalwani & Yim (1992), but clearly need further research. Similarly, deal frequency (Krishna, 1991; Krishna and Johar, 1996) needs additional research, in particular to disentangle its effect from that of deal consistency[5]. Also, consistency and distinctiveness need to be made orthogonal to store frame – high consistency is often depicted by using a within store frame and high distinctiveness using a between store frame; in fact, only one article in our meta analysis, Lichtenstein and Bearden (1989), manipulates distinctiveness directly by showing subjects within store deals. Further, the impact of variance in the price of the same brand (Krishna and Johar, 1996) and uncertainty in deal price (Mazumdar and Jun, 1993) needs additional research. In addition, the effects of within- versus between-

store framings, and separate versus combined prices for bundles need to be explored further.

From a methodological perspective, our results point to the need to include interactions in meta-analyses, especially if they were specifically hypothesized and tested in the studies included in the meta-analyses. The results from Model 1 (main effects only) when contrasted with those from Models 2 or 3 (main effect and interactions) show that the interpretation of the main effects may be misleading if the interactions are omitted, even when the increase in variance explained by the interactions is moderate (here, 5.5%).

An important direction for future research is to see how price presentations affect "consumer behavior" as opposed to "consumer perceptions." The studies in our meta-analysis were based upon laboratory experiments. Future research should replicate these results in the real world. Results that could be replicated using scanner data (as opposed to consumer perceptions) are the effects of relative and absolute deal amounts, base price, brand type, store type, consistency and distinctiveness of the deal. While Inman, McAlister and Hoyer (1990) have studied the effect of the presence of a sale sign on actual sales, few studies have assessed the effect of different price presentations on consumer behavior (for an exception, see Dhar and Dutta, 1997). Of course, a major reason for this is lack of data. While scanner data records a host of information, price presentation is still not included in the data. From our results, it appears that along with the effect of deal size, price presentation (such as inclusion of a manufacturer suggested price) also exerts significant influence on deal evaluation. Our study indicates the need to include not only reference prices and deal magnitudes in scanner studies, but also situational effects. Still, the results provide a useful reflection of the current state of knowledge in this area and perhaps, more important, highlight areas where future work is needed.

Acknowledgments

We thank L. P. Bucklin and three reviewers for many suggestions in improving this research.

Notes

1. In the analysis we choose to focus on a subset of interactions that were hypothesized in previous articles. We do not examine all possible interactions.
2. For an excellent meta analysis of research on product quality, see Rao and Monroe, 1989.
3. Details on Models 1, 2 and 4 are available from the authors upon request.
4. Available from authors upon request.
5. Deal distinctiveness is the variance in price across brands. Deal consistency should be related to variance in the price of the brand over time, but has typically been related to deal frequency.

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