Asymmetric Decoy Effects on Lower-Quality versus Higher-Quality Brands: Meta-analytic and Experimental Evidence

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Prior research demonstrates that adding decoys to choice sets can increase choice shares of brands similar to decoys while reducing shares of brands dissimilar to decoys. Such effects have been dubbed *attraction effects* and violate the principles of independence of irrelevant alternatives (IIA) and regularity. We report a meta-analysis that, in addition to revealing heretofore unsupported range effects, demonstrates an effect of brand quality. Decoys reduce shares of lower-quality competitors more than they reduce shares of higher-quality competitors. Moreover, whereas IIA is violated throughout, regularity is violated only when higher-quality brands are targeted. Decoys increase shares of higher-quality brands but typically do not increase shares of lower-quality brands. To assess the generalizability of the meta-analytic pattern, we tested decoy effects on two distinct populations in a large experiment. The more traditional population replicated the meta-analytic pattern (standard asymmetry) while the more nontraditional population reversed it. These findings suggest that while the standard asymmetry is replicable, it may not generalize to all market segments.

Adding alternatives to choice sets yields systematic effects. Consider choice sets 1 and 2. Alternatives (i.e., decoys) such as C can reduce A's choice share and increase B's. Brand B apparently benefits relative to A because B, but not A, is now clearly superior to some other alternative (C). Increases in B's share are called *attraction effects* and violate two related assumptions underlying many choice models (Huber, Payne, and Puto 1982): (1) that choices are independent of irrelevant alternatives (IIA), and (2) that adding an alternative cannot increase choice shares of an original alternative (the principle of regularity).

Choice set 1

Brand	*Price ($)*	*Quality*
A	4.95	75
B	4.25	65

Choice set 2

Brand	*Price ($)*	*Quality*
A	4.95	75
B	4.25	65
C	4.25	60

Decoy effects appear to be robust. They occur in product classes ranging from restaurants to light bulbs and occur regardless of whether choice sets are manipulated between subjects (Huber and Puto 1983; Huber et al. 1982; Ratneshwar, Shocker, and Stewart 1987; Simonson 1989; Wedell 1991) or within subjects (Lehmann and Pan 1994; Pan and Lehmann 1993; Wedell 1993). Decoy effects are important for both theory and practice. They implicate various perceptual and decision-making processes, force us to rethink notions of rationality in decision making (see Wernerfelt 1995), and suggest ways in which preferences for a given brand can be improved by new alternatives entering choice sets.

The current study begins with a meta-analysis of existing research on decoy effects. Although prior individual studies report robust effects, analyzing their collective findings reveals systematic limitations. In a large experiment, we then try to replicate these limitations

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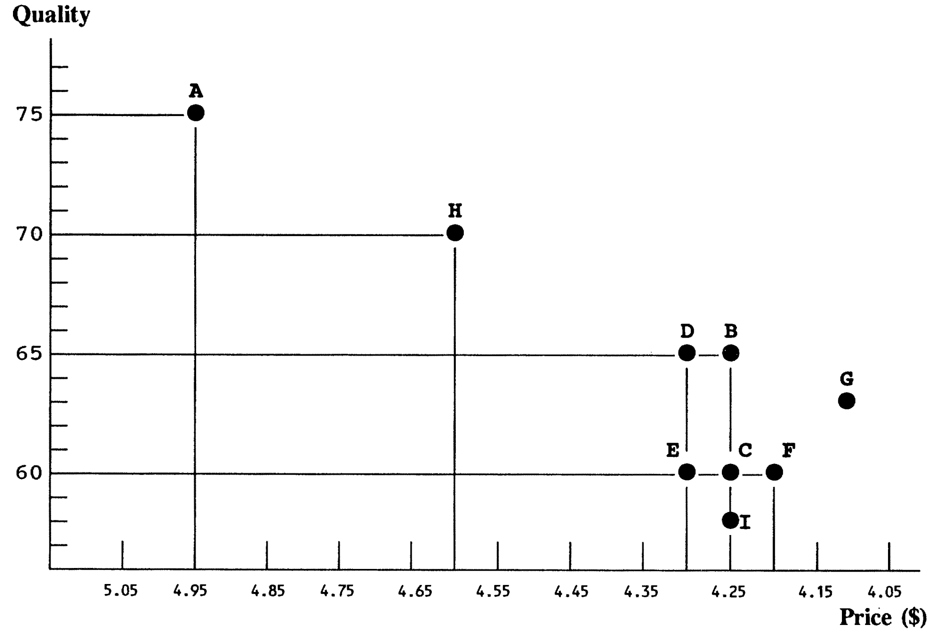
FIGURE 1

EXAMPLE CHOICE SETS



NOTE.—The control condition consists of A and B, while experimental conditions consist of A and B plus one additional brand. Brands C, D, E, and I are asymmetrically dominated, F is relatively inferior, G is on the frontier, and H is a compromise brand.

in a more traditional population while reversing them in another.

META-ANALYSIS

Figure 1 summarizes the types of brands and decoys studied. Brands A and B are in the control choice sets. Brands C–I are decoys added one at a time to create experimental choice sets. The target brand is the brand closest to the decoy, and the competitor brand is the brand farthest from the decoy. When decoy C is added, B is the target and A is the competitor. In this discussion, A will always be the higher-quality alternative and B the lower-quality alternative. We classify decoys into types. Asymmetrically dominated decoys are dominated by one original brand but not the other (decoys C, D, E, and I). Viable decoys are dominated by neither original brand (decoys G and F). Dominated decoys can be safely ignored by decision makers, at least with respect to being the preferred alternative, whereas viable decoys force decision makers to consider trade-offs between them and the competition. Decoys falling in between the original alternatives are discussed below (compromise brands such as decoy H).

Theory and Hypotheses

Various mechanisms and effects have been implicated in research on choice decoys (for reviews see Ratneshwar et al. 1987; Simonson 1989). The meta-analysis tests many of these plus others not tested in individual studies. It tests the effects of a brand's relative quality, range extensions (range effects), product type (nondurables vs. durables), and decoy type (dominated vs. viable). Three related measures are assessed: (1) the competitor's share, (2) the target's share, and (3) the target's share relative to the competitor's share (target/competitor). These measures are partially interdependent and, therefore, risk intercorrelation. When decoys are dominated, the three measures will be correlated perfectly (assuming decoys are not chosen). In the meta-analysis, operationalizations (see below) of the measures were, in fact, correlated perfectly in the context of dominated decoys (r's = 1.00). With viable decoys, however, correlations cannot be predicted because they will depend on rates of substitution from competitor to target, from target to decoy, and from competitor to decoy. Within viable decoys, the correlations are $r = 0.38$ for changes in competitors' shares and changes in targets' shares, $r = 0.90$ for changes in competitors' shares and changes in relative shares, and $r = 0.72$ for changes in targets' shares and changes in relative shares (correlations are weighted by the geometric mean of the n's in control and experimental conditions).[1] Despite these

[1]Combining dominated and viable decoys, overall correlations are $r = 0.49$ for changes in competitors' shares and changes in targets'

dependences, we assess the measures separately because they (1) speak to different theoretic issues and test different normative principles, (2) give rise to different hypotheses, and (3) yield different results.

The Competitor's Share and Resistance to Decoy Effects. Evidence from three research streams suggests that higher-quality competitors are more resistant to attacks from lower-quality brands than lower-quality competitors are resistant to attacks from higher-quality brands. First, in real-world markets, price discounts move consumers from lower-quality to higher-quality brands more than from higher-quality to lower-quality brands (Bemmaor and Mouchoux 1991; Blattberg and Wisniewski 1989; Kamakura and Russell 1989). Second, loss aversion, the tendency for losses to be more unpleasant than equivalent gains are pleasant, appears to be greater for quality than price (Hardie, Johnson, and Fader 1993). Third, in experimental choice sets, compromise brands (e.g., H) draw a larger share from lower-quality than higher-quality brands (Simonson and Tversky 1992). Therefore, we test the possibility that higher-quality competitors are more resistant than lower-quality competitors to decoys intended to help the other brand.

> **H1:** Decoys will reduce shares of lower-quality competitors more than they will reduce shares of higher-quality competitors.

Range effects are common in perceptual judgments and are likely to play a role in choice. Consider decoys C and I. Both are targeting B, but decoy I extends the quality range downward more than does C, an extension that may reduce perceptions of B's quality disadvantage relative to A (see Wedell 1991). If so, decoy I should have a larger effect than decoy C. However, the two studies testing range effects of choice decoys failed to find them (Huber and Puto 1983; Huber et al. 1982). One possibility is that range effects are limited in choice environments where, for example, they are mitigated by lexicographic decision rules (Tversky, Sattath, and Slovic 1988). However, range effects have since been demonstrated on relative judgments not unlike those implicit in choice (Lynch, Chakravarti, and Mitra 1991). Another possible explanation, therefore, is that failures to find range effects with decoys were stimulus specific because the two failures used similar stimuli. To better address range effects, the meta-analysis reassesses them using the greater variety of stimuli found across studies.

> **H2:** Decoys will reduce shares of competitors more as they extend the range of the attribute on which the competitor is superior to the target.

We also assess the effect of product type (nondurables vs. durables). Product type reflects a number of dimensions such as price, interpurchase interval, the amount of product information optimally needed to make a decision, and so on. Most of these dimensions relate to risk. Risk is typically greater with higher-priced, longer-lasting, more complex goods (durables). Two recent findings suggest that perceived risk increases the need for reasons to support a particular choice and, as a result, reliance on heuristics: (1) dominance relationships influence choice more as consumers face greater accountability for their decisions (Simonson 1989), and (2) peripheral cues such as a famous spokesperson affect choice more as products become more differentiated and opportunity costs of choice grow (Heath, McCarthy, and Mothersbaugh 1994). Therefore, perceived risk is expected to magnify decoy effects. Whereas Simonson (1989) tested this possibility by experimentally creating high-accountability conditions, we do so by comparing data across nondurable and durable products. Due to the greater risk involved, we expect decoy effects to be larger in durables than nondurables.[2]

> **H3:** Decoys will reduce shares of competitors more in durables than in nondurables.

Finally, we test the effect of decoy type (dominated vs. viable). This is done on an exploratory basis because of the potential countervailing effects of realism and decoy inferiority. Going from viable to dominated decoys, decoys become less realistic, suggesting weaker effects, but decoys become more inferior to the target, suggesting stronger effects (i.e., the target looks better the more superior it is to the decoy, and hence draws more share from the competitor).

The Target's Share and Violations of Regularity. Because decoys have been found to increase targets' shares and thereby violate regularity, we check for increases in targets' shares across predictors and their combinations. With respect to the study's predictors, when decoys are dominated, decoys are not likely to garner share and the converse of Hypotheses 1 through 3 should hold for the target's share (1 − competitor's share). For example, dominated decoys should benefit higher-quality targets more than they benefit lower-quality targets, where any increase in the target's share violates regularity. However, these effects are not as

shares, $r = 0.91$ for changes in competitors' shares and changes in relative shares, and $r = 0.77$ for changes in targets' shares and changes in relative shares. Correlations among raw changes in shares, as opposed to our log-based operationalizations, were generally lower, although the raw changes probably violate the assumption of linearity underlying the estimates.

[2]This assumes that subjects are fairly involved in the choice tasks and evaluate product information with similar care across nondurables and durables. If subjects examine product information more carefully when facing durables than nondurables, biases from added brands may be less pronounced with durables (see Mishra, Umesh, and Stem 1993).

clear when decoys are viable because, for example, a higher-quality decoy may be more attractive (induce more substitution away from the target) than a lower-quality decoy. Therefore, in the context of viable decoys, effects of brand quality, stimulus ranges, and product type on the target's share are studied on an exploratory basis. However, given that targets' shares are likely to suffer from substitution to viable decoys but not to dominated decoys, we hypothesize the following:

H4: Dominated decoys will increase the target's share more than will viable decoys.

Relative Share and Violations of IIA. IIA holds that decoys will not alter the competitive parity among existing competitors. That is, decoys should affect shares of all existing competitors comparably. We assess decoy effects by testing changes in relative share: target's share divided by competitor's share.[3] Because we cannot predict the net effects of substitution and attraction, we examine changes in relative share (i.e., IIA violations) across predictors and their combinations primarily on an exploratory basis. The exception is the effect of decoy type, because viable decoys should damage the target's share more than should dominated decoys.

H5: Dominated decoys will increase the target's relative share more (or reduce it less) than will viable decoys.

Studies and Data

To reduce bias from sampling only published studies (Rosenthal 1979), unpublished data were sought by contacting researchers of regularity violations. Data were also solicited at a session on the topic at an international conference. Requests were then mailed to all authors identified through these and more informal channels. No additional data surfaced. In four instances, published data lacked the detail needed for analysis (e.g., choice probabilities per condition per product class), though in most cases authors were able to supply the needed information (Burton and Zinkhan 1987; Lehmann and Pan 1994; Pan and Lehmann 1993; Simonson 1989).

The meta-analytic data consist of 92 comparisons between two-brand and three-brand choice sets (see Table 1). To be included, data had to have (1) two-brand choice sets (control conditions) to test the effects of each specific decoy (Wedell [1991] was excluded) and (2) one quality-related attribute to allow tests of target-quality effects. Because the vast majority of data included a quality attribute, this required excluding only the lottery data of Huber et al. (1982) and Wedell (1993), and the investment and paper towel data of Lehmann and Pan (1994). To provide a common ground across data sources, we included Ratneshwar et al.'s (1987) nonelaborated and Simonson's (1989) low-justification conditions. However, we excluded their elaboration and high-justification conditions because they were unique to each study. Elaboration reduced, but did not eliminate, decoy effects, and justification increased decoy effects. Finally, although we retained Huber et al.'s (1982) between-subjects data, we excluded their within-subjects data because they risked contamination from methodological artifact. Unlike the within-subjects studies included in the meta-analysis (e.g., Pan and Lehmann 1993), Huber et al. presented three-brand choice sets prior to two-brand choice sets, such that the reported null effect may have resulted from carryover of perceptual biases.

Method

Predictors. Predictors consisted of the competitor's or target's relative quality (lower vs. higher), decoy type (dominated vs. viable), product type (nondurables vs. durables), and range extension. To create a common metric across studies, range extension was operationalized as the proportional increase in the range of the attribute on which the target was inferior to the competitor. For example, consider brands A and B priced at $550 and $400, respectively. If a decoy targeting A is priced at $625, the proportional range increase is 0.50 (75/150). Proportional range extensions were mean centered to reduce colinearity (Jaccard, Turrisi, and Wan 1990).

Tests within Studies. The effect of each decoy from each study can be tested by recreating the data summarized in the original articles. For example, Huber et al. (1982) report that 43 percent of their 102 control subjects chose the lower-quality beer (brand B), whereas 63 percent of their 39 experimental subjects did so when exposed to one of the decoys targeting that brand. A test of the resulting contingency table shows that the decoy increased the target's share significantly ($\chi^2(1) = 4.52$, $p < .05$).

Condition	*Target brand B*	*Competitor brand A*	*Total*
Control	44	58	102
Experimental	25	14	39
Total	69	72	141

Tests across Studies. Weighted least squares regression (using SAS GLM) was used to test main and interaction effects of brand quality, decoy type, product type, and proportional range extension. Observations were weighted by the geometric mean of the sample sizes in control and experimental conditions. Models were run on (1) the competitor's share, (2) the target's share, and (3) the target's share relative to the compet-

[3]We are grateful to one of the reviewers and the associate editor for suggesting this approach.

TABLE 1

META-ANALYTIC DATA

Study	Target/ competitor[a]	Product class[b]	Proportional range increase[c]	Shares in control condition T, C (*n*)[d]	Shares in experimental condition T, C, D (*n*)[d]	Change in T, C[d]	Change in T/C[e]	χ^2 (ΔT)[e]	χ^2 (ΔC)[e]
Huber et al. 1982	HQ/LQ	Film$_{nd}$	.00	76, 24 (102)	84, 16, . (37)	+8, −8	2.08	1.02	1.02
			1.20	76, 24 (102)	92, 8, . (37)	+16, −16	8.33	4.39*	4.39*
		Restaurant$_{nd}$	.50	70, 30 (102)	91, 9, . (34)	+21, −21	7.78	6.04*	6.04*
			.50	70, 30 (102)	87, 13, . (39)	+17, −17	4.36	4.31*	4.31*
		Beer$_{nd}$	.00	57, 43 (102)	67, 33, . (36)	+10, −10	.70	1.10	1.10
			.50	57, 43 (102)	75, 25, . (38)	+18, −18	1.67	3.80*	3.80
		TV$_d$	.50	25, 75 (102)	32, 68, . (38)	+7, −7	.14	.69	.69
			1.00	25, 75 (102)	62, 38, . (37)	+37, −37	1.30	16.37*	16.37*
		Car$_d$	.00	44, 56 (102)	52, 48, . (33)	+8, −8	.30	.64	.64
			.50	44, 56 (102)	66, 34, . (38)	+22, −22	1.16	5.36*	5.36*
Simonson 1989[f]	HQ/LQ	Beer$_d$	.33	64, 36 (62)	74, 26, . (62)	+10, −10	1.07	1.45	1.45
		Battery$_{nd}$	1.00	43, 57 (63)	61, 39, na (61)	+18, −18	.81	4.02*	4.02*
		Car$_d$	.00	33, 67 (62)	69, 31, . (62)	+36, −36	1.73	16.08*	16.08*
		TV$_d$	3.00	51, 49 (63)	47, 23, 30 (64)	−4, −26	1.00	.20	9.33*
Heath and Chatterjee 1991[g]	HQ/LQ	Beer$_{nd}$	.00	49, 51 (51)	76, 24, . (93)	+27, −27	2.21	10.78*	10.78*
Pan and Lehmann 1993	HQ/LQ	Light bulb$_{nd}$	.50	58, 42 (24)	75, 25, . (23)	+17, −17	1.62	1.52	1.52
			.50	69, 31 (26)	69, 12, 19 (26)	0, −19	3.52	.00	2.78
Huber and Puto 1983	HQ/LQ	Film$_{nd}$	1.00	55, 45 (83)	27, 5, 68 (19)	−28, −40	4.12	4.85*	10.55*
			1.50	55, 45 (83)	55, 18, 27 (22)	0, −27	1.83	.00	5.31*
		Restaurant$_{nd}$	.50	59, 41 (83)	43, 24, 33 (21)	−16, −17	.35	1.74	2.01
			1.50	59, 41 (83)	76, 10, 14 (21)	+17, −31	6.16	2.06	7.10*
		Battery$_{nd}$	.50	33, 67 (82)	43, 28, 29 (21)	+10, −39	1.04	.73	10.52*
			1.00	33, 67 (82)	52, 24, 24 (21)	+19, −43	1.67	2.59	12.71*
		Beer$_{nd}$	.50	67, 33 (83)	67, 14, 19 (21)	0, −19	2.76	.00	2.93
			1.00	67, 33 (83)	90, 0, 10 (21)	+23, −33	. . .	4.36*	9.41*
		Car$_d$	1.00	48, 52 (82)	58, 42, 0 (19)	+10, −10	.46	.67	.62
			1.50	48, 52 (82)	73, 27, 0 (22)	+25, −25	1.78	4.36*	4.36*
Ratneshwar et al. 1987[h]	HQ/LQ	Juice$_{nd}$	.63	65, 35 (37)	60, 17, 23 (35)	−5, −18	1.67	.19	3.01
		TV$_d$	1.00	41, 59 (37)	80, 20, . (36)	+39, −39	3.31	11.59*	11.59*
Simonson and Tversky 1992	HQ/LQ	Gas$_{nd}$	1.86	61, 39 (61)	64, 27, 9 (56)	+3, −12	.81	.11	1.89
		Insurance$_{nd}$	1.00	51, 49 (71)	24, 29, 47 (85)	−27, −20	−.21	12.20*	6.56*
		Computer$_d$	1.29	64, 36 (53)	58, 22, 20 (55)	−6, −14	.86	.41	2.58
Lehmann and Pan 1994	HQ/LQ	Speaker$_d$	.09	43, 57 (14)	54, 26, . (13)	+11, −11	.42	.33	.33
			.33	50, 50 (14)	50, 50, . (14)	0, 0	.00	.00	.00
			.09	57, 43 (14)	50, 36, 14 (14)	−7, −7	.06	.14	.14
			.33	29, 71 (14)	14, 64, 22 (14)	−15, −7	−.19	.93	.16
Huber et al. 1982	LQ/HQ	Film$_{nd}$	.50	24, 76 (102)	20, 80, . (40)	−4, +4	−.07	.26	.26
			.00	24, 76 (102)	19, 81, . (37)	−5, +5	−.08	.39	.39
		Restaurant$_{nd}$	.00	30, 70 (102)	21, 79, . (39)	−9, +9	−.16	1.14	1.14
			.50	30, 70 (102)	43, 57, . (37)	+13, −13	.32	2.06	2.06
		Beer$_{nd}$	.50	43, 57 (102)	63, 37, . (39)	+20, −20	.94	4.52*	4.52*
			.50	43, 57 (102)	35, 65, . (38)	−8, +8	−.22	.73	.73
		TV$_d$	1.00	75, 25 (102)	83, 17, . (35)	+8, −8	1.88	.94	.94
			.00	75, 25 (102)	87, 13, . (38)	+12, −12	3.69	2.34	2.34
		Car$_d$	.00	56, 44 (102)	67, 33, . (40)	+11, −11	.76	1.44	1.44
			.50	56, 44 (102)	67, 33, . (36)	+11, −11	.76	1.33	1.33
Simonson 1989[f]	LQ/HQ	Beer$_{nd}$	.00	36, 64 (62)	43, 57, . (62)	+7, −7	.19	.64	.64
		Battery$_{nd}$	1.00	57, 43 (63)	65, 35, na (63)	+8, −8	.53	.85	.85
		Car$_d$	.30	67, 33 (62)	71, 29, . (62)	+4, −4	.42	.23	.23
		TV$_d$	3.00	49, 51 (63)	54, 38, 8 (64)	+5, −13	.46	.32	2.17
		Apartment$_d$	1.00	52, 48 (64)	66, 34, na (61)	+14, −14	.86	2.53	2.53
Pan and Lehmann 1993	LQ/HQ	Battery$_{nd}$	.44	58, 42 (24)	54, 46, . (25)	−4, +4	−.21	.08	.80
			.44	52, 48 (25)	38, 46, 16 (24)	−14, −2	−.26	.02	.97

TABLE 1 (*Continued*)

Study	Target/ competitor[a]	Product class[b]	Proportional range increase[c]	Shares in control condition T, C (*n*)[d]	Shares in experimental condition T, C, D (*n*)[d]	Change in T, C[d]	Change in T/C[e]	χ^2 (ΔT)[e]	χ^2 (ΔC)[e]
		Car$_{d}$	.50	69, 31 (26)	89, 11, . (24)	+20, −20	5.87	2.97	2.97
			.50	76, 24 (25)	36, 12, 52 (25)	−40, −12	−.17	8.12*	1.22
		TV$_{d}$	.50	54, 46 (26)	69, 31, . (25)	+15, −15	1.05	1.21	1.21
			.50	64, 36 (28)	61, 18, 21 (28)	−3, −18	1.61	.05	2.30
Huber and Puto 1983	LQ/HQ	Films$_{nd}$	1.00	45, 55 (83)	38, 52, 10 (21)	−7, −3	−.09	.33	.06
			1.50	45, 55 (83)	48, 52, 0 (21)	+3, −3	.10	.06	.06
		Restaurant$_{nd}$	.50	41, 59 (83)	64, 36, 0 (22)	+23, −23	1.08	3.71*	3.71
			1.50	41, 59 (83)	26, 74, 0 (19)	−15, +15	−.34	1.47	1.47
		Battery$_{nd}$	.50	67, 33 (82)	42, 47, 11 (22)	−25, +14	−1.14	4.59*	1.47
			1.00	67, 33 (82)	59, 41, 0 (22)	−8, +8	−.59	.49	.49
		Beer$_{nd}$	.50	33, 67 (83)	47, 53, 0 (19)	+14, −14	.39	1.32	1.32
			1.00	33, 67 (83)	46, 54, 0 (22)	+13, −13	.36	1.28	1.28
		Car$_{d}$	1.00	52, 48 (82)	70, 15, 15 (20)	+33, −18	3.58	2.11	7.21*
			1.50	52, 48 (82)	81, 19, 0 (21)	+29, −29	3.18	5.76*	5.76*
Ratneshwar et al. 1987[h]	LQ/HQ	Juice$_{nd}$	1.00	35, 65 (37)	68, 26, 6 (34)	+33, −33	2.08	7.72*	10.84*
		TV$_{d}$	.00	59, 41 (37)	65, 35, . (34)	+6, −6	.42	.27	.27
Simonson and Tversky 1992	LQ/HQ	Gas$_{nd}$	1.00	68, 32 (50)	64, 9, 27 (56)	−4, −23	4.99	.19	8.78*
		Insurance$_{nd}$	1.00	49, 51 (71)	22, 49, 29 (77)	−27, −2	−.51	11.84*	.06
			1.50	54, 56 (54)	58, 20, 22 (55)	+4, −26	1.73	.18	8.35*
Lehmann and Pan 1994	LQ/HQ	Juice$_{nd}$	.10	50, 50 (14)	50, 50, . (14)	0, 0	.00	.00	.00
			.40	40, 60 (15)	43, 57, . (14)	+3, −3	.09	.03	.03
			.10	64, 36 (14)	28, 36, 36 (14)	−36, 0	−1.00	3.65*	.00
			.40	50, 50 (14)	28, 50, 22 (14)	−22, 0	−.44	1.42	.00
		Car$_{d}$	.09	50, 50 (14)	43, 57, . (14)	−7, +7	−.25	.14	.14
			.36	64, 36 (14)	57, 43, . (14)	−7, +7	−.45	.14	.14
			.09	43, 57 (14)	43, 29, 28 (14)	0, −28	.73	.00	2.24
			.36	43, 57 (14)	28, 50, 22 (14)	−15, −7	−.19	.69	.14
		TV$_{d}$	.06	50, 50 (14)	43, 57, . (14)	−7, +7	−.25	.14	.14
			.35	79, 21 (14)	71, 29, . (14)	−8, +8	−1.31	.24	.24
			.06	64, 36 (14)	64, 14, 22 (14)	0, −22	2.79	.00	1.81
			.35	50, 50 (14)	28, 50, 22 (14)	−22, 0	−.44	1.42	.00
		Battery$_{nd}$	.08	50, 50 (14)	50, 50, . (14)	0, 0	.00	.00	.00
			.33	57, 43 (14)	57, 43, . (14)	0, 0	.00	.00	.00
			.08	86, 14 (14)	86, 0, 14 (14)	0, −14	. . .	.00	2.11
			.33	83, 17 (14)	86, 7, 7 (14)	+3, −10	7.40	.04	.63
		Restaurant$_{nd}$	.12	26, 74 (14)	21, 79, . (14)	−5, +5	−.09	.10	.10
			.53	14, 86 (14)	14, 86, . (14)	0, 0	.00	.00	.00
			.12	29, 71 (14)	29, 57, 14 (14)	0, −14	.10	.00	.59
			.53	29, 71 (14)	21, 64, 15 (14)	−8, −7	−.08	.24	.16

[a]LQ, Lower-quality; HQ, higher-quality. The following constitute quality and nonquality attributes of the various products: color fidelity and developing time (films), food quality and driving time or price (restaurants), quality and price (beer), ride quality or acceleration (cars), expected life and price or probability of corrosion (calculator batteries), durability or reliability or picture quality and percent distortion or screen resolution or price (TVs), quality and price (orange juice), octane rating and price (gasoline), memory and price (computers), general conditions and distance (apartments), expected life and lumens (light bulbs), and coverage and annual premium (dental insurance). Recoding the more ambiguous quality cases (e.g., light bulb life vs. lumens) did not alter the results.

[b]nd, Nondurable; d, durable.

[c]To provide a common metric across studies with which to test range effects, range extension was operationalized as the proportional increase in the range of the attribute on which the target was inferior to the competitor. If a decoy is priced at $625 and the original brands were priced at $550 and $400, the proportional range increase is 0.50 (75/150).

[d]C, Competitor's percentage; T, target's percentage; D, decoy's percentage; na, viable decoy not available for choice; 0, unchosen viable decoy; single period (.), dominated decoy.

[e]T/C, or relative share, is the target's share divided by the competitor's share. The statistical significance of changes in relative shares cannot be tested because each consists of a single observation. Changes in competitors' and targets' shares are tested with χ^2 (1). χ^2_C and χ^2_T are the χ^2s associated with changes in the competitor's and target's shares, respectively, across control and experimental conditions.

[f]To match conditions across studies, we included only Simonson's (1989) low-justification conditions.

[g]In Heath and Chatterjee (1991), two similar decoys are combined.

[h]To match conditions across studies, we included only Ratneshwar et al.'s (1987) nonelaborated conditions.

*$p < .05$.

itor's share. Although they are related, each measure reflects different combinations of mechanisms and holds distinct implications for theory and practice. To test the competitor's resistance to decoy effects, we modeled the difference between the $\log_e$ of its odds ratio in the experimental condition (competitor's share/others' shares) and that in the control condition ($\log_e$(experimental odds/control odds)).[4]

Changes in targets' shares reflect the decoy's ability to improve the shares of the target and thereby violate the principle of regularity (net of attraction and substitution). To assess this potential, we modeled the difference between the target's odds ratio in experimental and control conditions as $\log_e$(experimental odds/control odds).

Shifts in the target's relative share were measured as the target's share divided by the competitor's share in the experimental condition minus that same ratio in the control condition. IIA holds that this value should be zero (constant relative share). Values larger than zero reflect an IIA violation favoring the target, whereas values less than zero reflect an IIA violation favoring the competitor. We modeled changes in relative share as $\log_e$(experimental relative share/control relative share).

Results

The Competitor's Share and Resistance to Decoy Effects. Table 1 summarizes the data from each of the 92 control/experimental conditions, and Table 2 summarizes the data from each of the meta-analytic conditions. Hypothesis 1 predicted that decoys would reduce shares of lower-quality competitors more than they would reduce shares of higher-quality competitors. The main effect of competitor quality supports Hypothesis 1 ($F(1,76) = 8.26$, $p = .005$). Decoys reduced shares of lower-quality competitors ($\Delta = -20.32$ percent) more than they reduced shares of higher-quality competitors ($\Delta = -9.22$ percent), although both reductions were statistically significant ($\chi^2(1)$'s = 124.69 and 29.81, respectively; p's < .001). However, the product-type × competitor-quality interaction ($F(1,76) = 4.23$, $p = .04$) and the decoy-type × product-type × competitor-quality interaction also emerged ($F(1,76) = 3.40$, $p = .07$; see Fig. 2). Higher-quality competitors consistently suffered less than lower-quality competitors, except when viable decoys were used with durables. In this case, higher-quality and lower-quality competitors suffered comparably (−16.87 percent and −18.91 percent, respectively).[5]

Hypothesis 2 predicted that increasing the range of the attribute on which the competitor was superior to the target would lead to larger reductions in competitors' shares. The range effect approached statistical significance ($F(1,76) = 3.28$, $p = .07$). When we used a median split to define larger and smaller range extensions, larger range extensions tended to reduce competitors' shares more than did smaller range extensions (Δ's = −17.89 percent and −10.96 percent, respectively), although both reductions were statistically significant ($\chi^2(1)$'s = 97.12 and 48.22, respectively; p's < .001).

Hypothesis 3 predicted that decoys would reduce shares of competitors more in durables than in nondurables. This hypothesis was largely unsupported. The main effect of product type was not significant. As noted above, the product-type × decoy-type × competitor-quality interaction emerged (see Fig. 2), although no obvious explanation is apparent. Product-type effects occurred only within viable decoys, where they varied across higher-quality and lower-quality competitors. Within higher-quality competitors, durables resulted in larger reductions in competitors' shares ($\Delta = -16.87$ percent) than did nondurables ($\Delta = -12.00$ percent; $F(1,76) = 3.61$, $p = .06$), whereas within lower-quality competitors, durables resulted in smaller reductions than nondurables (Δ's = −18.91 percent vs. −22.79 percent; $F(1,76) = 5.03$, $p = .03$).

The Target's Share and Violations of Regularity. In keeping with Hypothesis 4, dominated decoys increased targets' shares ($\Delta = 11.40$ percent) more than did viable decoys ($\Delta = -0.52$ percent; $F(1,76) = 15.34$, $p < .001$). There was also a significant effect of target quality ($F(1,76) = 3.97$, $p = .05$). Decoys increased shares of higher-quality targets more ($\Delta = 9.51$ percent) than they increased shares of lower-quality targets ($\Delta = 1.96$ percent). However, the decoy-type × target-quality interaction approached statistical significance ($F(1,76) = 3.09$, $p < .08$; see Fig. 3). The target-quality effect was significant with dominated ($F(1,76) = 6.31$, $p = .01$) but not with viable decoys ($F(1,76) < 1.00$). Decoys increased targets' shares significantly only when dom-

[4]Two issues merit note. First, in only two cases did a target or competitor suffer from a zero share. Each involved a competitor's share in an experimental condition. To permit estimation, we added one person (chooser) to each brand in the choice set. Second, we report results from models that did not include control-condition shares as covariates. Although we might expect control-condition shares to be related to changes in shares, they were not (i.e., the correlation between competitor's control-condition share and share change was virtually zero; $r = 0.01$). Adding control-condition shares as covariates did not alter the results.

[5]The decoy-type × competitor-quality interaction was significant within durables ($F(1,76) = 4.54$, $p = .036$) but not within nondurables ($F(1,76) < 1$). Decoys reduced shares of lower-quality competitors more than they reduced shares of higher-quality competitors when dominated decoys were used with nondurables (Δ's = −14.82 percent and +2.04 percent; $F(1,76) = 4.12$, $p = .05$) or durables (Δ's = −24.17 percent and −6.79 percent; $F(1,76) = 4.16$, $p = .05$) and when viable decoys were used with nondurables (Δ's = −22.79 percent and −12.00 percent; $F(1,76) = 16.61$, $p < .0001$). However, when viable decoys were used with durables, shares of lower-quality and higher-quality competitors were reduced comparably (Δ's = −18.91 percent and −16.87 percent; $F(1,76) < 1.00$).

TABLE 2

SUMMARY STATISTICS ACROSS META-ANALYTIC CONDITIONS

	Control condition[a]	Experimental condition	Changes	Tests of changes[b]
Higher-quality target/lower-quality competitor:				
Nondurables:				
Asymmetrically dominated decoy:				
Target (%)	64.48	79.30	+14.82	$\chi^2(1) = 22.64^*$
Competitor (%)	35.52	20.70	−14.82	$\chi^2(1) = 22.64^*$
Relative share	2.00	5.40	3.40	$F(1,76) = 29.59^*$
n	443	399		
Viable decoy:				
Target (%)	54.29	52.91	−1.38	$\chi^2(1) = .19$
Competitor (%)	45.71	22.92	−22.79	$\chi^2(1) = 55.97^*$
Relative share	1.31	4.22	2.91	$F(1,76) = 31.51^*$
n	589	430		
Durables:				
Asymmetricaly dominated decoy:				
Target (%)	35.96	60.13	+24.17	$\chi^2(1) = 34.94^*$
Competitor (%)	64.04	39.87	−24.17	$\chi^2(1) = 34.94^*$
Relative share	0.58	1.69	1.11	$F(1,76) = 24.20^*$
n	331	271		
Viable decoy:				
Target (%)	51.97	52.14	+.17	$\chi^2(1) = .00$
Competitor (%)	48.03	29.12	−18.91	$\chi^2(1) = 15.37^*$
Relative share	1.15	2.04	.89	$F(1,76) = 4.26^*$
n	226	188		
Lower-quality target/higher-quality competitor:				
Nondurables:				
Asymmetrically dominated decoy:				
Target (%)	35.38	37.42	+2.04	$\chi^2(1) = .39$
Competitor (%)	64.62	62.58	−2.04	$\chi^2(1) = .39$
Relative share	.59	.68	.10	$F(1,76) = .03$
n	477	401		
Target (%)	50.43	49.04	−1.39	$\chi^2(1) = .24$
Competitor (%)	49.57	37.57	−12.00	$\chi^2(1) = 18.30^*$
Relative share	1.27	2.08	.81	$F(1,76) = 1.94$
n	713	561		
Durables:				
Asymmetrically dominated decoy:				
Target (%)	63.99	70.78	+6.79	$\chi^2(1) = 3.95^*$
Competitor (%)	36.01	29.22	−6.79	$\chi^2(1) = 3.95^*$
Relative share	1.98	3.36	1.37	$F(1,76) = 5.52^*$
n	411	350		
Viable decoy:				
Target (%)	54.00	56.27	+2.27	$\chi^2(1) = .31$
Competitor (%)	46.00	29.13	−16.87	$\chi^2(1) = 17.79^*$
Relative share	1.28	2.67	1.39	$F(1,76) = 9.24^*$
n	318	275		

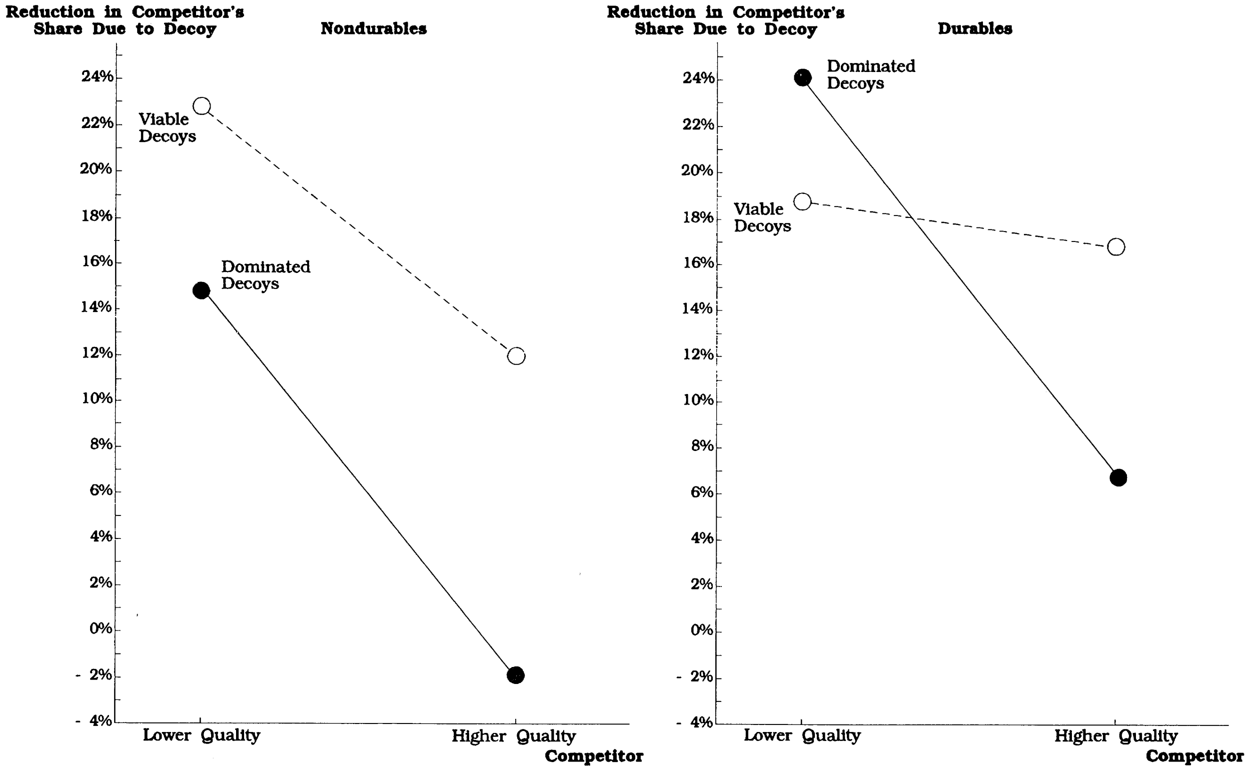
[a]Relative share: the choice share of the target divided by the choice share of the competitor. In this table, however, values of relative share differ slightly from target-competitor ratios. Relative shares were calculated as the weighted mean of the 92 observations in Table 1, whereas weights consisted of the geometric mean of the sample sizes in control and experimental conditions. We report the weighted-mean relative shares because they correspond to the manner in which relative share was modeled (changes in relative share were calculated for each of the 92 observations and then weighted). However, because the choice shares reported here were calculated by summing the number of people across various conditions and studies, they reflect perfectly both control-condition and experimental-condition sample sizes, such that ratios of target to competitor shares differ slightly from the weighted-mean relative shares.

[b]The statistical significance of a given change in relative share across control and experimental conditions was tested with a weighted least-squares model (SAS GLM) treating log (experimental relative share)$_{exp}$ and $\log_e$ (control relative share) as repeated measures. The error term was taken from an overall repeated-measures model that duplicated (perfectly) the inferential statistics of the model of $\log_e$ (experimental relative share$_{exp}$/control relative share).

$^*p < .05$.

FIGURE 2

PRODUCT-TYPE × DECOY-TYPE × TARGET-QUALITY INTERACTION ON COMPETITOR'S SHARE IN THE META-ANALYSIS



inated decoys were combined with higher-quality targets ($\Delta = 19.27$ percent; $\chi^2(1) = 56.12, p < .001$). All other combinations resulted in nonsignificant changes ranging from −1 percent to +4 percent (see Fig. 3). Regularity, therefore, was violated when targets were of higher quality and decoys were dominated.

The only other significant effect on targets' shares was that of range ($F(1,76) = 4.05, p = .05$). Larger range extensions led to slightly smaller increases in targets' shares ($\Delta = 3.83$ percent) than did smaller range extensions ($\Delta = 5.82$ percent), where both increases were statistically significant and violated regularity ($\chi^2(1)$'s = 4.33 and 13.47, respectively; p's < .05).[6]

Relative Share and Violations of IIA. In contrast to Hypothesis 5, dominated decoys did not improve the target's relative share ($\Delta = 1.51$) more than did viable decoys ($\Delta = 1.58$; $F(1,76) = 2.03$, $p = .16$). The only two significant effects were the main effects of target quality and range extension ($F(1,76)$'s = 6.17 and 3.75, p's = .02 and .06, respectively). Higher-quality targets enjoyed larger increases in relative share ($\Delta = 2.40$) than did lower-quality targets ($\Delta = 0.84$), and larger range extensions increased the target's relative share ($\Delta = 2.06$) more than did smaller range extensions ($\Delta = 1.19$). Each of these four increases in relative share was significant and thereby violated IIA ($F(1,76)$'s = 87.34, 10.34, 51.08, and 28.56, respectively; p's < .01).[7] Across all conditions, IIA was violated by a significant improvement in the target's relative share ($\Delta = 1.55$; $F(1,76) = 46.21$, $p < .0001$).

Discussion

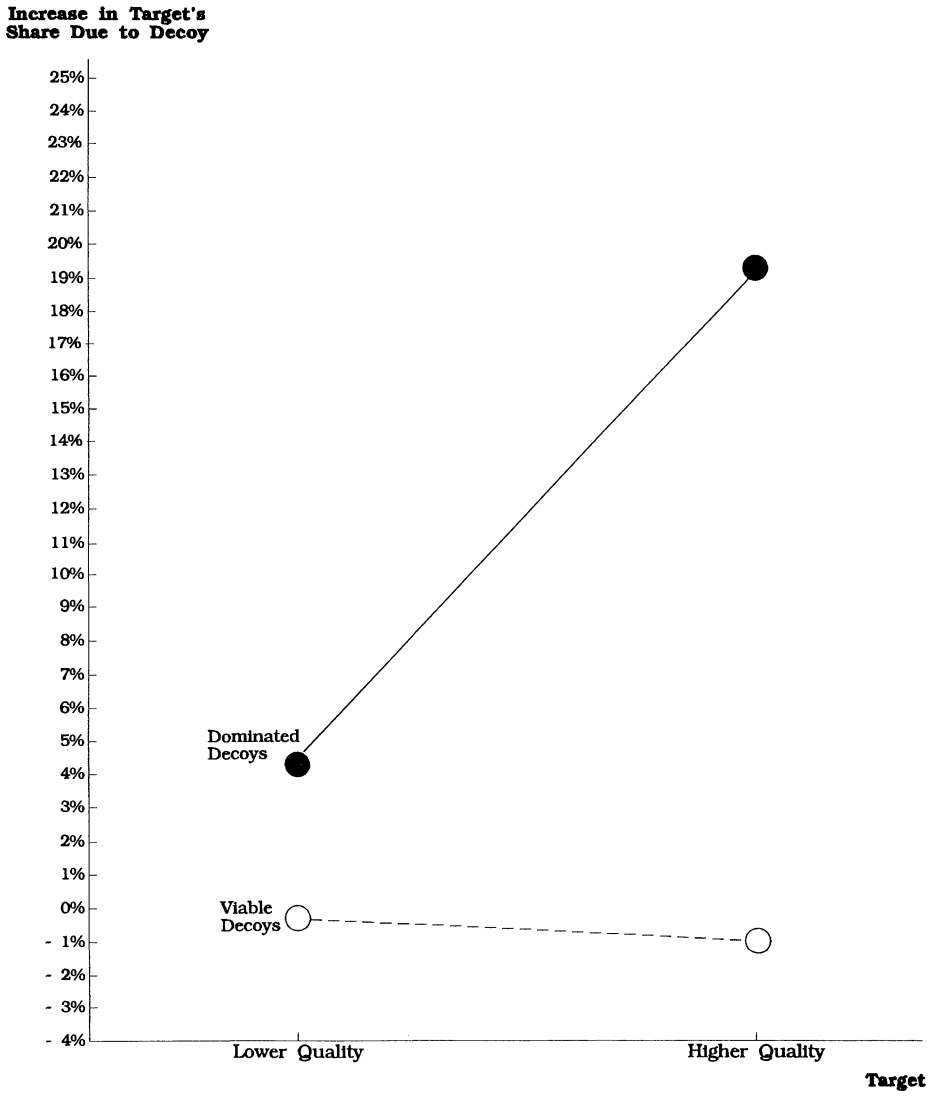
The meta-analysis reveals range effects and brand-quality effects not evidenced in original studies. Larger range extensions produce larger reductions in the competitor's share and larger increases in the target's relative

[6]Readers are cautioned not to infer too much about decoys' shares from these patterns. For example, relative to smaller range extensions, larger range extensions reduced competitors' shares more and increased targets' shares less. Therefore, it is tempting to infer that larger range extensions must have resulted in larger shares for decoys. Although this inference is directionally supported, a model run on decoys' shares revealed no significant main or interaction effects.

[7]The statistical significance of a given change in parity across control and experimental conditions was tested with a weighted least squares model (SAS GLM) treating $\log_e$(experimental parity) and $\log_e$(control parity) as repeated measures. The error term was taken from an overall repeated-measures model that duplicated (perfectly) the inferential statistics of the model of $\log_e$(experimental parity/control parity).

FIGURE 3

DECOY-TYPE × TARGET-QUALITY INTERACTION ON TARGET'S SHARE IN THE META-ANALYSIS



share. Moreover, decoys damage lower-quality competitors more than higher-quality competitors. Across the 92 meta-analytic comparisons (see Table 1), decoys reduced shares of lower-quality competitors 50 percent of the time (18/36) but reduced shares of higher-quality competitors only 11 percent of the time (6/56). Moreover, dominated decoys improved shares of higher-quality but not lower-quality targets. The principle of regularity, therefore, was violated only when dominated decoys were used with higher-quality targets. And although IIA was violated throughout, it was violated more severely in the case of higher-quality targets.

Asymmetric decoy effects across lower-quality and higher-quality brands produce a pattern that parallels three other asymmetries, although the underlying mechanisms may be quite different: (1) Compromise decoys steal a larger share from lower-quality than from higher-quality alternatives (Simonson and Tversky 1992). (2) Loss aversion appears to be more severe for quality than price (Hardie et al. 1993). (3) In real-world markets, discounts move consumers from lower quality to higher quality more than from higher quality to lower quality. Blattberg and Wisniewski (1989) report, for example, that discounts moved consumers up in quality 67 percent of the time, but moved consumers down in quality only 11 percent of the time. If we add the meta-analytic data from the current study, four areas of research converge on the following: It is easier to attract consumers to higher quality than lower quality.

TABLE 3

SURVEY ITEMS AND RESULTS FROM THE EXPERIMENT

Item	Nontraditional subjects	Traditional subjects	$F(1,215)$	ω^2
1. When buying things for myself, I want quality more than I want savings.	3.60	3.63	.10	.00
2. I do not worry about what other people will think about the things I purchase for myself.	3.69	3.25	8.85*	.03
3. I buy less expensive brands rather than more expensive, heavily advertised brands.	2.97	2.71	4.64*	.02
4. After making larger purchases, I generally feel that I bought more quality than I needed.	2.32	2.46	.98	.00
5. I purchase products for their status value.	2.25	2.50	3.35*	.01
6. I believe that store brands such as [local grocery store] products have as much quality as national brands.	3.30	2.87	8.37*	.03
7. I do not check the price of grocery items.	2.06	2.10	.07	.00
8. I believe that more quality is always better.	3.55	3.43	.84	.00
9. I would rather save some money and have moderate quality than spend most of my money and have the best.	3.28	3.17	.68	.00
10. I do not have the money necessary to buy the things I want.	3.43	3.27	.91	.00

NOTE.—Scale was as follows: 5, applies to me all of the time; 4, applies to me most of the time; 3, applies to me about half of the time; 2, does not apply to me most of the time; 1, does not apply to me at all. An overall ANOVA reveals a significant between-group difference (Wilks's $\lambda(10,206) = 0.90$, $p < .05$). Effect size is measured with ω^2 calculated as variance attributed to the consumer-population effect divided by total variance (Keppel 1991, p. 65).

*$p < .05$, except in the case of item 5, where $p = .07$ ($p = .035$ if using a one-tailed t-test).

Although there is growing evidence of a standard asymmetry in responses to price and quality, the evidence arises solely from data that do not distinguish between different types of consumer. They do not consider the possibility that the relative importance of price and quality varies across consumers and market segments. For example, a recent Nielson study found that 17 percent of U.S. consumers account for 42 percent of all private-label purchases, a segment apparently committed to lower prices (Liesse 1994). The implication is that the standard asymmetries in decoy effects and price competition may be segment specific. To explore this possibility, we tested decoy effects on two populations expected to differ in consumption-related beliefs and values.

EXPERIMENT

Subjects

Subjects consisted of 1,261 people drawn from two populations. To replicate the asymmetric decoy effects of the meta-analysis, we tested a more traditional population consisting of graduate students from a nationally ranked M.B.A. program at an urban, semiprivate, research-oriented university (n = 640; average GMAT = 603/800). To assess the generalizability of the meta-analytic pattern to different types of consumers, we additionally tested a more nontraditional population in the spirit of purposive sampling (Lincoln and Guba 1985). This nontraditional population consisted of undergraduates from a rural, teaching-oriented state university that draws students primarily from communities revolving around the steel and/or coal industries (n = 621; average SAT = 797/1,600). We chose this population because we expected its members to be less quality conscious and more price conscious than subjects typically studied at large research universities.

Design and Procedure

Two tasks were administered during student classes. Different subjects were assigned to each task to eliminate carryover effects and minimize required class time. One task was a survey measuring potential value differences between the populations. The survey assessed a wide range of issues including the relative importance of quality and price, image consciousness with respect to purchases, and perceived budget constraints (see Table 3). It was administered to 107 nontraditional and 110 traditional subjects.

The remaining 1,044 subjects took part in the choice task. The experiment varied consumer population (traditional vs. nontraditional), choice set (control vs. experimental), target quality (low vs. high), product class (beer vs. cars), and range extension (coded as proportions) between subjects. Experimental choice sets consisted of a given two-brand choice set plus one dominated decoy. Dominated decoys were used because they provide the strongest tests of regularity. Subjects from each population were randomly assigned to the control and experimental conditions summarized in Table 4. Subjects were asked to imagine being in the market for a six-pack of beer or for a car, and to then choose one of the brands described. Brands were labeled A, B, and C, where C represented the brand added to create experimental conditions.

TABLE 4

EXPERIMENTAL CONDITIONS

Product class	Target	Brand or proportional range extension[a]	Beer price or car mileage	Beer quality or ride quality[b]
Beer	. . .	A	$4.95	75
	. . .	B	$4.25	65
	Higher quality	.14	$5.05	75
		.00	$4.95	72
		.14	$5.05	72
	Lower quality	.30	$4.25	62
		.00	$4.35	65
		.30	$4.35	62
Cars	. . .	A	27	80
	. . .	B	37	60
	Higher quality	.30	24	80
		.00	27	75
		.30	24	75
	Lower quality	.25	37	55
		.00	34	60
		.25	34	55

[a]Proportional range extensions were repeated within some conditions because the experiment was initially designed to follow Huber et al.'s (1982) distinction between range, frequency, and range/frequency dominated decoys. In order of presentation within each trio, the first decoy is a range decoy, the second is a frequency decoy, and the third is a range/frequency decoy.
[b]For beer, subjects were told that 100 represented the best. For cars, subjects were told that 100 represented the ride quality of a Rolls-Royce and that 40 represented the ride quality of a Jeep.

Results

Survey Results. Table 3 summarizes the survey results. As hoped, the two populations demonstrated different consumption-related beliefs and values (Wilks's $\lambda(10,206) = 0.90$, $p < .05$). Of the 10 items, nine are directionally consistent with expectations (the small deviation on item 8 does not affect the significance of λ). Unexpectedly, follow-up ANOVAs on each item revealed no differences on items directly measuring quality and/or price importance (items 1, 8, and 9). However, differences emerged on items 2, 3, 5, and 6. Nontraditional subjects reported being less image conscious (items 2 and 5), more likely to buy less expensive brands (item 3), and more likely to believe that store and national brands have the same quality (item 6). Therefore, any cross-population differences in choice patterns cannot be attributed to differences in attribute weights per se, although differences in image consciousness and/or perceptions of the relative quality of less expensive brands may be involved.

Two concerns might be raised about the survey results. First, despite the significant overall MANOVA, differences are significant on only 4 of 10 items. However, this is not surprising because the survey tested a wide range of issues using fairly general statements (e.g., "I do not have the money necessary to buy the things I want"). Second, the ω^2s are relatively small, ranging from 0.01 to 0.03 on the significant items. However, small effects can be important for reasons of theory, hit rates, and financial returns (Prentice and Miller 1992; Rosenthal and Rubin 1982). Rosenthal and Rubin, for example, found that one study's effect size of 0.04 involved a 20 percent increase in the success rate of the psychotherapy tested. Therefore, the relatively small effects in our experiment's survey may hold important implications for choice patterns.

Experimental Results. We tested the main effects and interactions of population, target quality, proportional range extension, and product class using the weighted least squares approach of the meta-analysis. Range extension was mean centered to reduce colinearity. Because only dominated decoys were used, model results were identical across analyses of the target's share, the competitor's share, and relative share.

Results are summarized in Table 5. As expected, the only significant effect is the target-quality $\times$ population interaction ($F(1,8) = 5.63$, $p = .04$; see Fig. 4). Traditional subjects replicated the meta-analytic pattern, whereas nontraditional subjects reversed it. Within the more traditional population, decoys increased shares of higher-quality targets (13.9 percent; $\chi^2(1) = 6.89$, $p < .01$) but not lower-quality targets (1.2 percent; $\chi^2(1) = 0.04$, NS). Within the more nontraditional population, decoys increased shares of lower-quality targets (14.4 percent; $\chi^2(1) = 6.27$, $p < .01$) but not higher-quality targets (-1.2 percent; $\chi^2(1) = 0.05$, NS). Therefore, regularity and IIA were violated only when (1) traditional subjects were combined with higher-quality targets and (2) nontraditional subjects were combined with lower-quality targets.

Discussion

The experimental decoy effects provide a fairly simple picture: The meta-analytic pattern is replicated with traditional subjects but reversed with nontraditional subjects. Decoys increase shares of higher-quality brands more than they increase shares of lower-quality brands with traditional subjects, but increase shares of lower-quality brands more than they increase shares of higher-quality brands with more nontraditional subjects. Nonetheless, this pattern is confounded slightly by control-condition choice shares in the beer (but not car) data. Subjecting control-condition choices of the higher-quality brand to a logit model with population and product class as predictors produced a population $\times$ product-class interaction ($\chi^2(1) = 4.59$, $p = .032$). Within cars, the difference between the traditional (64.9 percent) and nontraditional (57.9 percent) populations' choices of the higher-quality brand was not significant ($\chi^2(1) = 0.59$). Within beer, however, nontraditional subjects chose the higher-quality brand (77.2 percent) more than the traditional subjects (57.6

TABLE 5

EXPERIMENTAL RESULTS

Product class	Consumer population	Target	Proportional range extension	Target's share in control condition[a] (%)	Target's share in experimental condition (%)	Δ (%)	$\chi^2(1)$
Beer	Traditional	Higher quality	.14	57.6 (59)	68.6 (35)	+11.0	1.11
			.00	57.6 (59)	74.3 (35)	+16.7	2.64
			.14	57.6 (59)	88.2 (34)	+30.6	9.42*
			All	57.6 (59)	76.9 (104)	+19.3	6.67*
		Lower quality	.30	42.4 (59)	38.2 (34)	−4.2	.15
			.00	42.4 (59)	45.5 (33)	+3.1	.08
			.30	42.4 (59)	15.1 (33)	−27.3	7.14*
			All	42.4 (59)	33.0 (100)	−9.4	1.41
	Nontraditional	Higher quality	.14	77.2 (57)	70.6 (34)	−6.6	.49
			.00	77.2 (57)	66.7 (33)	−10.5	1.18
			.14	77.2 (57)	76.5 (34)	−.7	.00
			All	77.2 (57)	71.3 (101)	−5.9	.65
		Lower quality	.30	22.8 (57)	42.4 (33)	+19.6	3.83*
			.00	22.8 (57)	30.3 (33)	+.5	.62
			.30	22.8 (57)	41.2 (34)	+18.4	3.44
			All	22.8 (57)	38.0 (100)	+15.2	3.82*
Cars	Traditional	Higher quality	.30	64.9 (57)	83.3 (36)	+18.4	3.71
			.00	64.9 (57)	74.3 (35)	+9.4	.88
			.30	64.9 (57)	61.8 (34)	−3.1	.09
			All	64.9 (57)	73.3 (105)	+8.4	1.25
		Lower quality	.25	35.1 (57)	38.9 (36)	+3.8	.14
			.00	35.1 (57)	45.7 (35)	+10.6	1.03
			.25	35.1 (57)	55.9 (34)	+20.8	3.76
			All	35.1 (57)	46.7 (105)	+11.6	2.03
	Nontraditional	Higher quality	.30	57.9 (57)	60.6 (33)	+2.7	.06
			.00	57.9 (57)	61.8 (34)	+3.9	.13
			.30	57.9 (57)	61.8 (34)	+3.9	.13
			All	57.9 (57)	61.4 (101)	+3.5	.18
		Lower quality	.25	42.1 (57)	48.5 (33)	+6.4	.34
			.00	42.1 (57)	48.4 (31)	+6.3	.32
			.25	42.1 (57)	70.6 (34)	+28.5	6.93*
			All	42.1 (57)	56.1 (98)	+14.0	2.83

[a]Competitor's share is always 1 − target's share. Values in parentheses are *n*'s. Totaled ("All") *n*'s are less than the sums of the individual *n*'s because one control condition served as a control for multiple experimental conditions.
*$p < .05$.

percent; $\chi^2(1) = 5.03$, $p = .025$). Consider the beer data below:

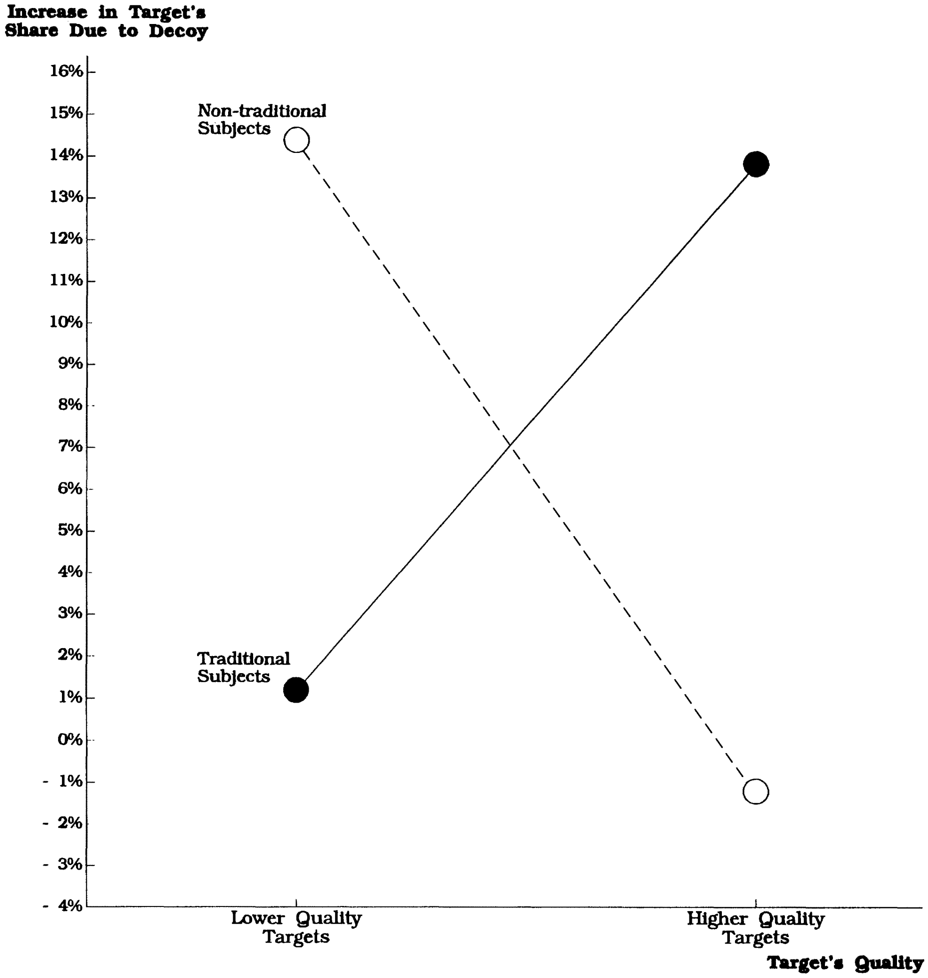
Population	*Percent who chose higher-quality brand under control conditions (%)*	*Percent who chose higher-quality brand under experimental conditions (%)*	Δ *(%)*
Traditional	57.6	76.9	+19.3
Nontraditional	77.2	71.3	−5.9

Because nontraditional subjects chose the higher-quality beer more than traditional subjects in the control condition, it could be argued that nontraditional subjects had a stronger predisposition toward quality. However, a number of results suggest otherwise. Compared with traditional subjects, nontraditional subjects were (1) less susceptible to decoy effects on higher-quality targets, (2) more susceptible to decoy effects on lower-quality targets, and (3) slightly less likely to choose the higher-quality car in the control condition. Nonetheless, the fact that control-condition choice shares failed to indicate that traditional subjects valued quality more than nontraditional subjects is consistent with the survey's failure to find cross-population differences in the importance of quality or price.

Although it is not clear why nontraditional subjects chose the higher-quality beer more often than traditional subjects in the control condition, it is unlikely that a related artifact or bias can account for the data. In control conditions, for example, nontraditional control subjects may have leaned toward the higher-quality beer for purposes of status: status seeking they limit to smaller-ticket items (beer, not cars) because of historical budget constraints. However, this tendency would have existed in experimental conditions as well. It could not

FIGURE 4

TARGET-QUALITY × CONSUMER-POPULATION INTERACTION IN THE EXPERIMENT



then explain the large decoy effects on shares of lower-quality beers, nor the absence of decoy effects on shares of higher-quality beers. Although the higher-quality beer's share (77.2 percent) implicates a potential ceiling on share increases, the remaining 22.8 percent cushion was large enough to accommodate the larger share increases of the relevant comparator conditions (the 15 percent increase in lower-quality beer shares of nontraditional subjects and the 19 percent increase in higher-quality beer shares of traditional subjects). For an artifact to account for the asymmetric decoy effects across targets and populations, it would have to exist only in the nontraditional population, only in the beer data, and only in the control condition—a confluence of circumstances which, while possible, seems unlikely.

The experiment shows that typical asymmetries across lower-quality and higher-quality brands can be replicated, but that they can vary across populations. Although the experiment cannot tease out all underlying dynamics within the beer data, it nonetheless illustrates limitations to the universality of the more typical asymmetry found in the meta-analysis.

GENERAL DISCUSSION

Summary

In contrast to prior tests of decoy effects, range effects emerged in the meta-analysis. Larger range extensions led to larger reductions in the competitor's share and larger increases in the target's relative share. Just as judgment is sensitive to the relative magnitudes of stimuli, choice appears to be sensitive to the relative magnitudes of differences in attributes across alternatives (see Wedell 1991).

Neither IIA nor regularity fared well in this study. IIA was violated throughout the meta-analysis and the experiment. Regularity was violated in the meta-analysis when dominated decoys targeted higher-quality brands, and in the experiment when decoys targeted (1) higher-quality brands within the more traditional population and (2) lower-quality brands within the more nontraditional population. Moreover, in both the meta-analysis and the experiment's traditional population, higher-quality competitors suffered less than lower-quality competitors at the hands of decoys. In general, and relative to lower-quality brands, higher-quality brands benefited more from decoys targeting them and suffered less from decoys targeting others. The exception was the reversal within the experiment's nontraditional population.

Asymmetric Decoy Effects and Theory

The asymmetric decoy effects found in the meta-analysis and the experiment's traditional population yield a pattern that parallels three other asymmetries: (1) asymmetric price competition across lower-quality and higher-quality brands in real-world markets (e.g., Blattberg and Wisniewski 1989), (2) greater loss aversion to quality than price (Hardie et al. 1993), and (3) compromise brands drawing a larger share from lower-quality than from higher-quality competitors (Simonson and Tversky 1992). These disparate research streams converge on the same conclusion: It is generally easier to increase shares of higher-quality brands than lower-quality brands. Nonetheless, there is no guarantee that the parallel patterns arise from similar underlying mechanisms, and the experiment suggests that asymmetric decoy effects vary across populations.

The findings reported here and elsewhere pose a theoretic puzzle that we can only begin to solve. We start with three proposed explanations of asymmetric price competition. First, according to Allenby and Rossi (1991), discounting higher-quality brands results in beneficial substitution and income effects, while discounting lower-quality brands results in a beneficial substitution effect but a detrimental income effect. However, given that there were no discounts in the current study, income effects cannot explain the meta-analytic or experimental findings. Second, relative to gains in quality and money, losing quality may be more aversive than losing money (differential loss aversion; see Hardie et al. 1993). Although differential loss aversion applies readily to brand-switching situations where consumers have a distinct reference state (their usual brand), it does not apply so well to the between-subjects situations of the meta-analysis and experiment where no established reference state existed. Nonetheless, differential loss aversion may apply if consumers imagine choosing one brand and then imagine the gains and losses involved if they switched to another. Third, and more generally, consumers of higher quality may prefer their brands more strongly than consumers of lower quality prefer theirs (Blattberg and Wisniewski 1989).

The foregoing analysis raises the following question: Why are preference strengths and/or loss aversion greater for quality than price?[8] At least two possibilities exist. One is that forgone money is easier to replace than forgone quality. Whereas predispositions toward higher and lower quality may evolve from factors such as budget constraints, differential commitments to those predispositions might result from the differential recoverability of money and quality. The wealth lost by paying a higher price can be recovered through extra income or through savings on other expenditures (e.g., taking your lunch to work). But quality lost cannot be so easily recovered because, strictly speaking, that quality is unique to that product class. Forgone quality is more permanent than forgone money.

Another explanation is that quality is associated with other dimensions such as image and status. Forgone quality would then involve lost status in addition to lost function (i.e., loss aversion on multiple attributes). This explanation is related to the more general principles of embeddedness (Rokeach 1968) and centrality (Scott 1968): The more a given value is linked to other values, beliefs, and attitudes, the more resistant it is to change (see Eagly and Chaiken 1993). One way future researchers might test for image and status effects is to assess asymmetries across different types of products. If image and status are involved, and the effects derive in part from expected reactions of others rather than self-image alone, then more visible products should yield larger asymmetries than less visible products.[9]

Conclusion

The meta-analysis and experiment add evidence to three lines of research suggesting that it is generally easier to increase shares of higher-quality than lower-quality brands. This asymmetry may involve differential preference strengths for higher-quality and lower-quality products (Blattberg and Wisniewski 1989), differential loss aversion to quality and price (Hardie et al. 1993), and/or value embeddedness (Rokeach 1968). Choice patterns in the experiment suggest that the standard asymmetry can vary across market segments differing in consumption-related beliefs and values. The experiment found evidence of cross-population differences in image consciousness regarding purchases and in perceptions of the relative quality of store brands. However, the fact that the populations would have differed on many dimensions makes it difficult to know exactly which factors mediated the effect. One factor

[8]Although we address the concepts jointly here, readers should not confuse differential preference strengths and differential loss aversion. The first refers to different commitments to choices, different attribute weights, or different commitments to weights in general, whereas the latter refers to differences across quality and price in the values placed on losses relative to the values placed on equivalent gains.

[9]We thank the associate editor for suggesting this hypothesis.

that is unlikely to account for the effect is the importance placed on quality versus price, because it unexpectedly failed to vary across populations. However, differences in the importance of quality and price probably exist across other populations and may further moderate asymmetric responses to lower-quality and higher-quality brands. If we consider poverty-stricken societies, it is easy to imagine markets where preferences are stronger for lower-priced than higher-priced products. The implication is that the imperviousness of brands to competitors' attacks depends on the combination of product attributes and consumer values (cf. Hauser and Shugan 1983). Unfortunately, even descriptive theories of judgment and decision making rarely incorporate values beyond risk attitudes (e.g., Kahneman and Tversky 1979), although some more psychologically grounded theories have begun to do so (e.g., Lopes 1987). If we are to understand consumers and their reactions to the marketplace, greater sensitivity to values and their variations across market segments is probably needed.

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