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How do consumers decide how many units to buy? Whereas prior research on individual consumers' purchases has focused primarily on purchase incidence and brand choice, the authors focus on the psychological process behind the purchase quantity decision. The authors propose that a simple anchoring and adjustment model describes how consumers make purchase quantity decisions and suggests how point-of-purchase promotions can increase sales. Two field experiments and two lab studies show that anchor-based promotions—presented as multiple-unit prices, purchase quantity limits, and suggestive selling—can increase purchase quantities. The final study shows that consumers who retrieve internal anchors can counter these anchor-based promotions effectively. Firms might receive net benefits from anchor-based promotions depending on whether increases in unit sales reflect increased category consumption, brand switching, variety switching, store switching, or stockpiling.

An Anchoring and Adjustment Model of Purchase Quantity Decisions

Most behavioral and quantitative research investigating consumers' purchase behavior has focused on purchase incidence ("when") and brand choice ("what"). Less effort has been directed toward understanding the psychology of the purchase quantity decision—the "how much" question (Gupta 1988). For managers of mature brands, focusing on brand choice may be self-limiting; some marketing dollars should be allocated toward encouraging current users to purchase more of the brand and use it more frequently (Wansink 1994). In this article, we present a simple psychological model that focuses directly on how current users of brands decide how much to purchase.

Why is the quantity decision important? The average consumer regularly shops at multiple stores and makes many unplanned, discretionary purchases (Drèze and Hoch 1998; Drèze, Hoch, and Purk 1994). Most retailers and manufacturers prefer guaranteed sales from a customer today to

probabilistic future sales. For retailers, the more units sold on any shopping trip, the greater the share of short-term grocery dollars. For manufacturers, the same logic holds; the more units sold (witness multiple-unit coupons and packaging), the less likely a consumer will run out of stock and purchase a competing product. We suspect that managers prefer selling large quantities if doing so (1) takes buyers out of the market, (2) facilitates repeated consumption that leads to habit formation (pseudo loyalty through linear learning), (3) encourages promotion-driven stockpilers to switch stores or brands (Jeuland and Narasimhan 1985), (4) passes inventory holding costs on to consumers (Blattberg, Eppen, and Lieberman 1981), or (5) enables accelerated consumption in new situations or in place of other product categories (Wansink and Ray 1996).

Although increased purchase quantities can influence consumer stockpiling, we do not wish to overstate the economic significance of higher purchase quantities. A complete analysis of the benefits and costs of stockpiling requires a dynamic approach that considers multiperiod consequences and competitive responses. Our intent is to illuminate the psychology that governs how consumers make quantity decisions and to suggest how marketers can influence these decisions.

We take as given that stockpiling can be beneficial to manufacturers in some circumstances. For example, stockpiling can discourage the trial of potentially damaging new brands and reduce consumer stockouts during usage-related advertising campaigns. Still, stockpiling is less valuable when not accompanied by an increase in consumption. Con-

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sider an equilibrium in which competitive manufacturers fully responded to the promotional efforts of other manufacturers. Under such circumstances, retaliation could nullify any short-term gains from taking consumers out of the market. If the marketer simply wants to stimulate trial and repeated consumption does not increase preference, it may be more profitable for retailers to minimize promotional purchases to ensure that consumers pay full price on later purchases.

The rest of the article is organized as follows: First, we review previous research on the purchase quantity decision and propose that a simple anchoring and adjustment judgment process adequately describes how consumers make these decisions. This anchoring model also suggests ways that marketers can influence quantity decisions through anchors provided at the point of purchase (POP). Second, we report a series of two field and two laboratory studies that document and explain the effect of various POP anchors on quantity decisions (see Figure 1). In Study 1, we manipulate the anchor through multiple-unit pricing (e.g., "2 for," "3 for") in 13 field experiments in an 86-store supermarket chain. Multiple-unit promotion pricing led to a 32% increase in sales compared with single-unit pricing. Study 2 manipulates the anchor through supermarket quantity limits (e.g., "Limit 12 per customer") and reveals a monotonically increasing impact on sales. In a lab setting, Study 3 shows that suggestive selling anchors (e.g., "Buy 18 for your freezer") can influence intended purchase quantities even without a discount. Finally, Study 4 provides more direct evidence about the psychological processes that occur during purchase quantity decisions. It shows how internally-generated anchors—*default anchors* ("How many units do you usually buy?") and *expansion anchors* ("Think of all the different ways you could consume this product over the next two weeks")—influence purchase intentions and effectively nullify any impact of contemporaneously presented external POP anchors.

WHEN, WHAT, AND HOW MANY?

Several articles suggest that purchase behavior results from the consumer considering three questions: "Should I buy the category on this shopping trip?" "Which brand should I buy?" and "How much should I buy?" (Bucklin and Lattin 1991; Chintagunta 1993; Gupta 1988; Hardie and Barwise 1996; Krishna 1994; Krishnamurthi and Raj 1988;

Neslin, Henderson, and Quelch 1985). The central empirical finding is that most of the action occurs in the brand choice component followed by incidence and then quantity. Although these articles propose a variety of modeling and estimation solutions, they all focus on the simultaneity (or lack thereof) of the asking and answering of these three questions (cf. Gupta et al. 1996). Researchers agree that the questions asked and the resultant answers are not independent. The issue is one of degree. Most of the articles explicitly recognize that the brand choice (what) and the purchase incidence (when) questions are inextricably linked. For example, it is easy to imagine purchase situations in which the consumer notices an attractively priced brand and then makes the "when," "what," and "how many" decisions simultaneously. Alternatively, consumers sometimes come to the store already planning to buy the category; incidence is ensured and only "what" and "how many" are in question.

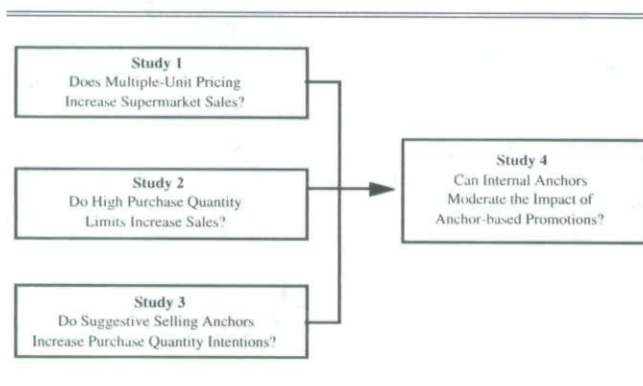
Chiang (1991) forcefully argues that the answers to all three questions are governed by the same underlying force—namely, a utility maximization process that is driven by the difference between the price-adjusted quality of each of the brands and the consumer's threshold reservation price. The bigger this difference, the greater the probability of purchase incidence and brand choice and the greater the quantity purchased. Although Chiang's structural approach is appealing, we believe that the answers to the first two questions are linked more closely to each other than either of them is to the quantity decision. Our reasoning is driven by a simple conjecture that most quantity decisions are not considered actively because the answer already is known. And our best guess is that the answer is usually a low number consistent with routine purchases. This may be one reason why quantity elasticities typically are smaller than those for brand choice and incidence.

An Anchoring and Adjustment Judgment Process

We propose a simple behavioral model to explain purchase quantity decisions. When consumers see a product whose price-adjusted utility rises sufficiently above a threshold, they might decide to buy it (brand choice) on the spot (purchase incidence). The question then becomes, how many units to buy? Because of the frequent nature of most packaged goods purchases, the default value should be low. We contend that consumers often adopt low default anchors (such as one or two) and then adjust upward depending on price attractiveness, stockpiling constraints, substitution opportunities, purchase timing, perceptions of deal frequency, and budget constraints.

If this model reasonably characterizes the basic quantity decision process, then consumers might not adjust much from their initial anchor. There are at least two reasons for this. First, anchoring and adjustment judgment processes are characterized by excess reliance on the starting point and insufficient adjustment for subsequently considered information (Wilson et al. 1996). Second, because food shopping is generally a mundane, low-stakes activity, most consumers will not be motivated to engage in extensive adjustment activity that requires thinking about the dynamic costs and benefits associated with stockpiling (Blattberg, Eppen, and Lieberman 1981; Meyer and Assuncao 1990). Assuming consumers naturally anchor on a small quantity and then insufficiently adjust upward (depending on the price), they

Figure 1
SUMMARY OF ANCHORING STUDIES



might purchase more of the product if they anchor on a larger quantity—such as one noted in a POP display—and then adjust downward (again depending on the price).

Anchoring is observed in many natural contexts and appears to be “extremely robust” even with experts and important decisions (Plous 1993, p. 151). Potential anchoring values can be difficult to ignore. As with other heuristics, people often are unaware of an anchor’s influence. Even random and irrelevant values that are converted to a response scale can act as anchors and influence quantity judgments (cf. Tversky and Kahneman 1974). These findings suggest that retail promotions that explicitly provide product-unit values can have an important impact on how much a consumer buys.

Current merchandising practice suggests that retailers might have the same intuition. Product quantity values that can serve as anchors are found in multiple-unit prices (e.g., prices that are presented as “4 cans for \$2” instead of “50¢ per can”), purchase quantity limits (“Limit of 6 per customer”), and suggestive selling (e.g., “Buy 12 for your freezer”). We hypothesize that though purchase anchors can be presented in several ways, they will have similar impacts on consumers.

STUDY 1: DOES MULTIPLE-UNIT PRICING INCREASE SUPERMARKET SALES?

Supermarket consumers are exposed to potential quantity anchors whenever multiple-unit prices are presented instead of single-unit prices (e.g., “On sale—6 cans for \$3” versus “On sale—50¢”). When involvement is low, an anchoring perspective suggests that a multiple-unit price promotion could stimulate more sales by making salient a higher than normal purchase quantity. Although each promotion offers the same discount, the number of product units presented at the POP is likely to serve as an anchor when consumers make their quantity decisions. Conventional wisdom in the retail trade suggests that multiple pricing does work, but we know of only one study documenting the effect (cf. Blatberg and Neslin 1990, p. 351). Using an econometric approach to control for baseline sales and marketing variables, “n for” pricing increased sales 12% across seven brands in three categories. We use field experiments to

examine the impact of multiple-unit pricing across a larger set of categories.

Method and Procedure

For the 13 products listed in Table 1, we conducted a one-week field experiment comparing multiple- with single-unit promotional pricing. Each study used a simple two-group pre/post design. Half of the 86 stores were assigned randomly to either a single- or multiple-unit pricing condition separately for each category. Baseline sales were computed for each test item using the procedure outlined in Dhar and Hoch (1996)—the average weekly sales over the previous six months during all weeks in which the item was not promoted. The dependent variable was calculated as a percentage change in unit sales compared with the baseline. During the week of each experiment, the test item was sold with a temporary price reduction ranging from 9% to 44% signaled at the POP with a 3.5 × 2.5-inch “bonus buy” shelf tag. The tag indicated the regular price (e.g., 99¢) but expressed the deal price in single-unit (e.g., 75¢) or in multiple-unit (e.g., 2 for \$1.50) form.

Results and Discussion

The results are summarized in Table 1. As can be seen, multiple-unit prices resulted in a 32% increase in sales over the single-unit control. This was calculated as a weighted average across the 86 stores. For 12 of 13 products, sales were higher with multiple-unit pricing, and for 9 products the difference was statistically significant. A meta-analysis of all 13 tests indicates that the multiple-unit pricing effect is highly reliable ($p < .0001$). Multiple-unit pricing produced substantial increases in promotional lift.

Before moving on to the rest of the studies, it is important to be clear about what this experiment does and does not tell us about anchoring and quantity decisions. One possibility is that some consumers might have been confused and believed that they needed to buy multiple units to get the deal price. Given the completely unobtrusive nature of the field study, we have no self-report data on the frequency of such confusion. Regardless, the retailer does not care whether consumer confusion caused the sales increase as long as there is no loss of goodwill that later might affect store pa-

Table 1
THE IMPACT OF MULTIPLE-UNIT PRICING ON SUPERMARKET SALES

Product	Level of Discount	Form of Price Expression	Percentage Change in Unit Sales		p-Value
			Single unit	Multiple unit	
Bathroom Tissue	15%	1/50¢ versus 4/\$2.00	+57	+97	.02
Candy	9%	1/50¢ versus 2/\$1.00	+24	+25	n.s.
Cereal (Breakfast)	33%	1/\$1.99 versus 2/\$3.98	+133	+137	n.s.
Cookies	44%	1/\$1.67 versus 2/\$3.34	+306	+372	.01
Frozen Dinners	12%	1/\$2.49 versus 2/\$5.00	+33	+70	.003
Frozen Dinners	20%	1/\$2.50 versus 2/\$5.00	+133	+195	.0001
Frozen Entrees	26%	1/\$1.25 versus 2/\$2.50	+133	+156	.02
Paper Towels	31%	1/75¢ versus 2/\$1.50	+403	+565	.001
Soap (3-Bar Packs)	15%	1/\$1.99 versus 2/\$3.98	+48	+30	n.s.
Soft Drinks (2 Liters)	17%	1/\$1.49 versus 2/\$3.00	+33	+66	.01
Soup (Canned)	20%	1/\$1.33 versus 3/\$4.00	+200	+248	.01
Soup (Canned)	17%	1/50¢ versus 2/\$1.00	+108	+112	n.s.
Tuna (Canned)	18%	1/65¢ versus 2/\$1.30	+36	+66	.004
	21%		+125%	+165%	.0001

tronage. We cannot rule out confusion categorically, though it seems implausible that confusion consistently could have produced a 32% (165%/125%) improvement in promotional lift (Hoch, Drèze, and Purk 1994). Also, because we are dealing with store-level data, it is unclear whether individual consumers bought more units than normal or whether more consumers bought their normal quantities of the item instead.

Clearly, there are natural limits to the sales impact of multiple-unit prices. Some items are not amenable to multiple-unit pricing (e.g., two 50-pound dog food bags for \$30), and the sales impact of using multiple-unit pricing on everything in the store would be negligible or possibly harmful because of confusion and increased consumer vigilance. Even though some sales impact of multiple-unit pricing might be due to its novelty and uniqueness, we believe there is more to it than that.

Whereas managers are interested in whether multiple-unit prices increase sales, researchers are interested in why they increase sales. To test more directly the impact of anchoring, we searched for a natural and managerially relevant way to present monotonically increasing anchor points. A common promotional method that fits these criteria is purchase quantity limits (e.g., "Limit 12 per customer").

STUDY 2: DO HIGH PURCHASE QUANTITY LIMITS INCREASE SALES?

In Study 2, consumers are presented with anchor values in the form of high purchase quantity limits. This enables us to generalize the external anchor effect from Study 1 and examine the purchase behavior of individuals. Retailers frequently limit the quantity of aggressively priced items used to increase store traffic. These limits restrict sales of loss leaders and reduce the probability of out-of-stocks. Despite the widespread use of purchase quantity limits, only two studies have examined them, and each used low limits (four units or less). Several critical questions about the impact of purchase limits on sales remain unanswered.

For example, different psychological processes have been proposed to explain why relatively low purchase limits might influence sales. Lessne and Notarantonio (1988) suggest that low purchase limits can increase purchase incidence. This is because consumers react to the loss of freedom to buy more price-promoted units. However, consistent with the scarcity literature (cf. Lynn 1992; Verhallen and Robben 1994), it has been found that single-unit purchase limits can increase purchase incidence by signaling that the deal is good (Inman, Peter, and Raghuram 1997). Indeed, single-unit limits can have particularly strong effects on deal evaluations. No previous studies, however, have examined how higher purchase limits influence sales. It might be expected that a higher limit (12 versus 4) reduces reactance and weakens deal signals. Yet if progressively higher purchase limits begin to influence the quantity decision through anchoring, they still could yield sales increases.

Study 2 uses unobtrusive observation to investigate how various purchase limits influence supermarket sales of a familiar, sale-priced consumer packaged good. If anchoring drives purchase quantity decisions, a high anchor should encourage greater purchase amounts than a lower anchor.

Method and Procedure

A field study was designed using end-aisle displays to advertise a variety of Campbell's soups for 79¢ per can. The regular price was 89¢, which implied a modest 12% discount. A sign was mounted behind each display announcing "Campbell's soup sale—79¢/can" and presenting one of three limit conditions ("No limit per person," "Limit of 4 per person," or "Limit of 12 per person").

Three supermarkets in Sioux City, Iowa participated in the study on three consecutive evenings. Each night from 8:00 to 9:00 P.M., a rear-aisle display was set up at each store announcing the sale under one of the purchase limits. The purchase limits were rotated each evening, so that each store offered the sale under each limit condition. Rotating the different purchase limits across the supermarkets and across days minimized any store-related or day-related confounds. Other efforts were made to ensure that the three stores served as replications of one another. The three supermarkets were selected because they had similar sales volumes and a similar demographic mix of shoppers. Moreover, Monday, Tuesday, and Wednesday were selected because these are the three consecutive evenings that have the most similar shopping volumes for these three stores.

Shoppers were observed unobtrusively at the end-aisle display. For each of the 914 shoppers who passed the displays, observers noted whether each customer purchased soup and how many cans were purchased. Because the stores would not allow signage in the interior aisles, direct observation was used to isolate purchases made from the end aisles. Data for 8 consumers who bought more items than the limits allowed were excluded from the analyses (6 of these shoppers bought from displays with a four-can limit), leaving 906 subjects.

Results and Discussion

An ANOVA was conducted to test whether we could aggregate the data across the three stores. Although mean-level sales varied between the stores, no two- or three-way interactions (store \times purchase limit \times day) were significant, and the data were aggregated. The results are displayed in Table 2.

The results show that purchase limits can increase sales even with a relatively small (10¢) discount ($F_{2,77} = 23.3$; $p < .01$). Shoppers who bought soup from the displays with no limit purchased 3.3 cans of soup, whereas buyers with limits of 4 and 12 purchased an average of 3.5 and 7.0 cans, respectively. The buyers in the limit 12 condition purchased significantly more cans than consumers in either the no-

Table 2
THE IMPACT OF PURCHASE QUANTITY LIMITS ON
SUPERMARKET SALES

Measure	Quantity Limit Level		
	No Limit	Limit 4	Limit 12
Purchase Quantity per Buyer	3.3 ^a	3.5 ^a	7.0 ^b
Purchase Incidence	7%	10%	9%
Total Units Sold	73 ^a	106 ^a	188 ^b

Note: Means with different superscripts are reliably different from others in that row at the $p < .05$ level according to the Duncan multiple comparisons procedure.

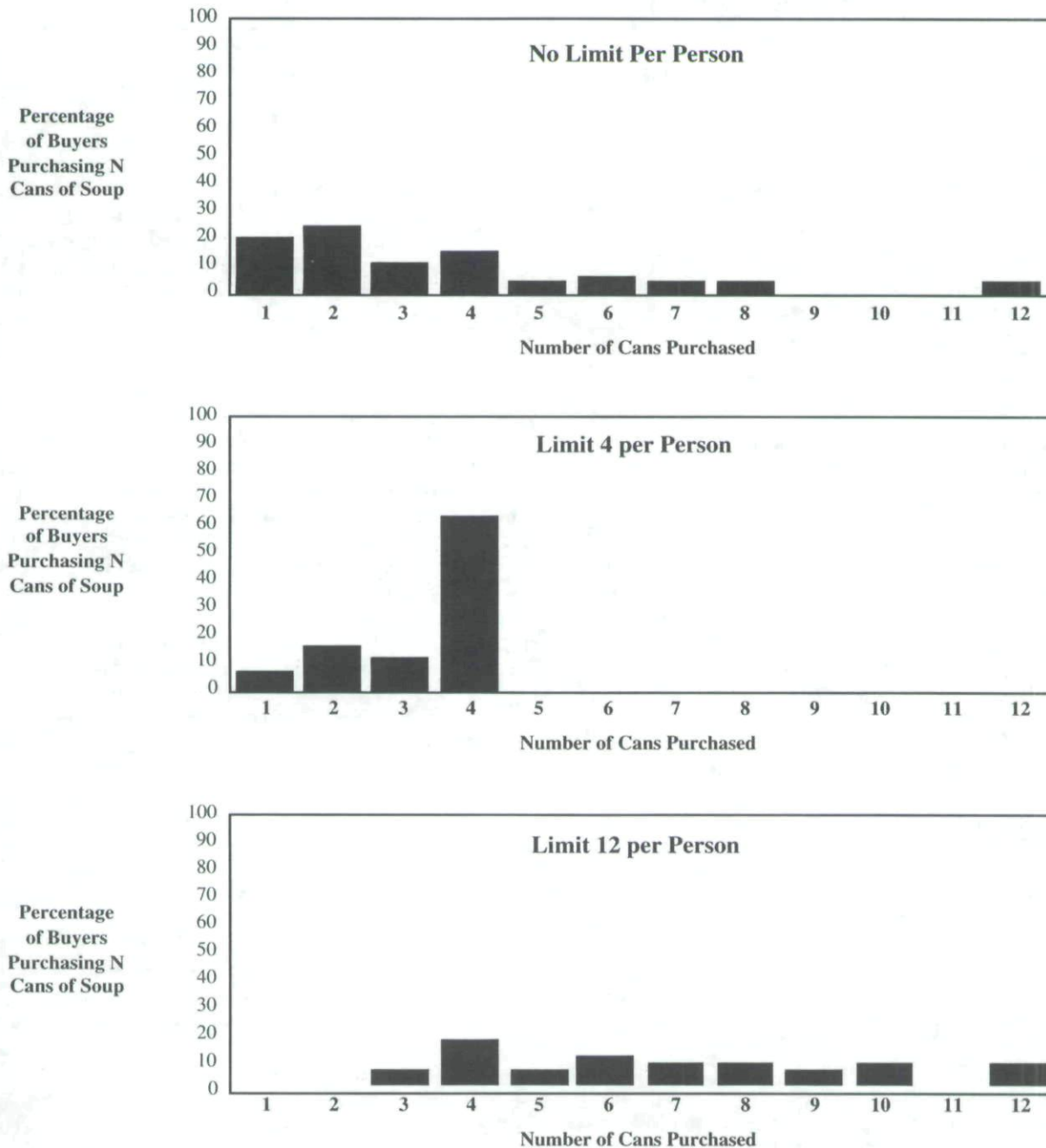
limit condition ($t_{77} = 16.2; p < .01$) or the limit 4 condition ($t_{77} = 6.0; p < .01$). The magnitude of the effect is large—limit 12 signage increased sales per buyer by 112%.

Consistent with the work of Inman, Peter, and Raghbir (1997), purchase quantity limits encouraged directionally higher purchase incidence than the no-limit condition (10% and 9% versus 7%). It is important to note that when these seemingly small variations in purchase incidence are multiplied by the respective purchase quantities, differences in total sales between the no-limit condition (73 cans) and the

limit 4 condition (106 cans) and the limit 12 condition (188 cans) are magnified ($F_{2,902} = 5.0; p < .01$). For every person walking by the display, this translates into .25, .34, and .63 cans, respectively. Total sales from the limit 12 condition were reliably higher than sales from the control condition ($t_{77} = 14.4; p < .01$) and the limit 4 condition ($t_{77} = 5.8; p < .01$).

Figure 2 displays the discrete density functions for each of the three conditions. The overall pattern of data appears to result from a combination of two separate influences,

Figure 2
HOW PURCHASE QUANTITY LIMITS INFLUENCE CANNED SOUP PURCHASES



both brought about by the presence of a particular limit level—one due to anchoring and the other to truncation. Anchoring is evident from the mass point that appears at each limit level (note limit 4) and from a stretching out of the response scale (compare “no limit” with “limit 12”). The data also suggest that a reasonable number of consumers bumped into the limit level in the limit 4 condition and would have bought more if they had been allowed.

The findings in Study 2 are consistent with the idea that high purchase quantity limits provide consumers with an anchor from which they insufficiently adjust downward. At the same time, quantity limits have other properties—truncation and a potential scarcity signal—whose influence is difficult to gauge. Given our hypothesis about the underlying judgment process, other promotions that present product-quantity values also could induce anchoring in the quantity decision.¹

STUDY 3: WILL SUGGESTIVE SELLING ANCHORS BE EFFECTIVE WITHOUT DISCOUNTS?

Thus far, we have shown sales increases when product quantity anchors are presented in multiple-unit prices and purchase limits. If anchoring influences the quantity decision as we suggest, then other POP anchors (e.g., “Buy 18 Snickers bars for your freezer”) also could affect purchase quantity intentions. In Study 3, we investigate such anchor-based suggestive usage slogans. We also examine whether these anchors can influence purchase intentions when accompanied with no price discount.

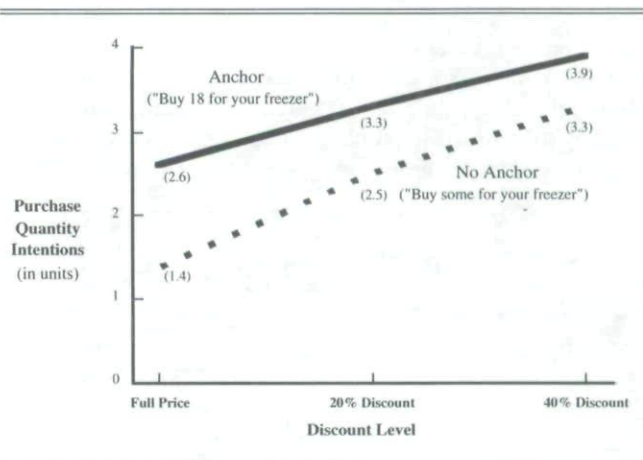
Method and Procedure

One hundred twenty undergraduates from a large university participated in a shopping scenario being conducted for “managers of local convenience stores.” Each subject was offered six well-known products at one of three price levels: an actual convenience store price (no discount), a 20% discount, and a 40% discount. All subjects were given suggestive selling claims that included either no product quantity anchor (“Snickers bars—buy them for your freezer”) or an explicit product quantity anchor (“Snickers bars—buy 18 for your freezer”).² The design was a 2 (anchor versus no anchor) \times 3 (no discount versus 20% discount versus 40% discount) within-subjects design using six counterbalanced product replicates with randomized presentation order. Subjects were given no indication whether the price was a discount and were asked to provide purchase quantity intentions for all products.

¹The anchoring literature suggests that consumers might be influenced even by irrelevant anchors (cf. Plous 1993; Tversky and Kahneman 1974). This was confirmed in a lab study, in which 98 students were given a shopping scenario and shown promotional signs for five price-promoted products (25% discount) that were “shipped to stores” in boxes of a specified number of units (7, 14, 28, or 56 units). Even though a sign that read “shipped to stores in boxes of *n*” arguably provided an irrelevant anchor, subjects in the 7, 14, 28, and 56 conditions indicated they would purchase an average of 3.9, 5.6, 10.5, and 6.5 units, respectively. This main effect of the shipping carton anchor size was significant ($p < .01$). The higher the anchor, the more they intended to buy, except at the highest anchor (56), which appeared to backfire (see Study 3 in Wansink, Kent, and Hoch 1997).

²Other anchoring operationalizations included “Quaker Oats granola bars—buy 18 for your backpack,” “Wrigley’s gum—buy 18 for class,” “Certs—buy 18 for studying,” “Minute Maid orange juice boxes—buy 18 for your room,” and “Yoplait yogurt—buy 18 for dessert.”

Figure 3
THE IMPACT OF SUGGESTIVE SELLING ANCHORS AND DISCOUNTS



Results and Discussion

A MANOVA of purchase quantity intentions indicated a main effect of product type but no interactions with the other variables. Therefore, to control for the main effect of product type, we mean-centered the data separately by product. The untransformed means are shown in Figure 3. Both the anchor ($F_{1,114} = 4.1$; $p < .05$) and discount level ($F_{2,114} = 5.3$; $p < .01$) increased purchase quantity intentions. There was no interaction between anchor type and discount level ($F_{2,114} = 1.2$; n.s). Simple main effect tests indicated a positive trend for discount level in both anchor conditions.

Of particular interest is that the external anchor increased intended purchase quantities even *without* a discount. Although this finding is reminiscent of work on mindless behavior (Inman, McAlister, and Hoyer 1990; Langer, Blank, and Chanowitz 1978), it also provides further testimony to the power of usage-related claims. Such claims have been shown to increase usage frequency and volume of inventoried products such as Campbell’s soup, Ocean Spray cranberry sauce, and Jell-O gelatin (Wansink and Ray 1996). Given this impact on usage, it is not necessarily surprising to find a corresponding impact on purchase quantity intentions, even in the presence of no discount.

The first three studies are consistent with previous findings on external anchors. However, we believe that supermarket shoppers might be able to resist POP (external) anchors by using self-generated (internal) anchors. We examine this in Study 4, thereby providing additional evidence that anchoring is the psychological mechanism driving the results of the previous experiments.

STUDY 4: CAN INTERNAL ANCHORS MODERATE THE IMPACT OF ANCHOR-BASED PROMOTIONS?

The first three studies show that external anchors can have a pronounced impact on purchase quantity decisions. This held across different types of promotions (multiple-unit pricing, quantity limits, and suggestive selling anchors) and in both field studies and controlled laboratory conditions. Yet we have provided no direct evidence that the psychological mechanism driving the results is actually an anchoring and adjustment process. Obtaining process-level evi-

dence about judgmental heuristics through retrospective or concurrent verbal protocols is not easy. And so Study 4 relies on analysis of judgmental output but does so in the context of experimentally manipulated internal anchors.

We assume that the judgment process underlying the quantity decision is as described at the outset of the article; that is, when consumers decide whether and what to buy, they anchor on a small purchase quantity and make upward adjustments depending on deal attractiveness. Our logic for understanding the psychological mechanism underlying the quantity decision is as follows: If respondents implicitly generate low anchors on their own, then their judgments should not be altered when they explicitly generate similar internal anchors before making quantity decisions. Alternatively, if we ask them to explicitly generate an anchor they usually would not retrieve (such as a large anchor prompted by considering an expanded set of usage occasions), we should observe a divergence in their quantity decisions.

We examine the effect of two internally generated anchors on purchase intentions. These anchors are in the form of a default anchor ("How many units do you usually buy?") and an expansion anchor ("Think of all the different ways you could consume this product over the next two weeks"). Given their personal nature, we believe that salient internally generated anchors will influence quantity intentions and override any effect of a contemporaneously presented external POP anchor.

Method and Procedure

One hundred thirty-nine undergraduate students from a large university participated in Study 4 in partial fulfillment of a course requirement. The experimental setup was similar to Study 3. Each subject was told that he or she was involved in a shopping study for a local grocery store and was given a shopping scenario involving 25–30% discounts on single servings of well-known products (e.g., Coca-Cola, Oreo cookies, Snickers candy bars, Sunkist oranges, Wrigley's five-pack gum).

The experiment used a 4×3 mixed design involving a four-level external anchor and a three-level internal anchor. The external anchor was manipulated within subjects, and the internal anchor was manipulated between subjects. For the external anchor, we used four purchase quantity limits: a no-limit control, limit 14, limit 28, and limit 56. The internal anchor had three levels: a no internal anchor control, a default internal anchor, and an expansion anchor. Instructions for the default anchor were as follows: After seeing the details of the promotional deal (i.e., product description, regular and discounted prices, and quantity limits if any), subjects immediately were instructed to answer the question "How many [units of this product (e.g., packs of gum)] do you usually buy at a time?" After writing down a number, each student indicated his or her intended purchase quantity for the item. Instructions for the expansion anchor were similar to those used by Wansink and Deshpandè (1994). After seeing the deal, subjects were asked, "On each of the lines below, please write down a different situation in which you might imagine yourself [consuming this product (e.g., chewing some gum)]." After listing different usage occasions, they were asked, "How many [units of this product (e.g., packs of gum)] do you think you might [use (e.g., chew)] in the next month?" Finally, subjects provided their intended purchase quantities.

We had only three firm expectations about the data. First, in the absence of external anchors, the default internal anchor should produce results similar to the no internal anchor control condition. Second, we expected that the expansion internal anchor treatment would increase quantity decisions substantially. (Considering new uses of a product might produce an atypical anchor that supplants the smaller default anchor.) Third, we expected the external anchors to function in a manner similar to that found in Studies 2 and 3. It was not clear to us, however, what would happen when subjects were exposed concurrently to both internal and external anchors. For example, it is possible that internally generated anchors would be more powerful, both for motivational ("it's my anchor") and informational (retrieval of relevant idiosyncratic information) reasons. Alternatively, the two anchors might interact.

Results and Discussion

As was expected, there were differences in mean purchase intentions across products. Because the independent variables did not interact with product types, we mean-centered the data by product. The pattern for the untransformed purchase quantity intentions data is relatively straightforward, as displayed graphically in Figure 4. In the no-limit control condition, the default anchor led to purchase intentions close to those produced when no internal anchor was elicited (4.2 versus 5.0; $F_{1,136} = .22$). The expansion anchor, in contrast, increased intended purchase quantities substantially, an increase of 150% (10.7 versus 4.2; $F_{1,136} = 14.6$; $p < .01$).

A MANOVA of the full design reveals a significant main effect of internal anchor ($F_{2,136} = 3.3$; $p < .05$). As is indicated in Table 3, purchase intentions in the default anchor condition averaged 5.2 versus 10.3 in the expansion anchor condition and 7.1 in the no internal control condition. There was a significant effect of external anchors ($F_{3,136} = 2.9$; $p < .05$), which ranged from a low of 6.6 in the no-limit control to 8.9 in the limit 56 condition. These two main effects, however, were qualified by a significant internal-by-external anchor interaction ($F_{6,136} = 2.5$; $p < .05$). Simple main

Figure 4
DO SELF-GENERATED ANCHORS NULLIFY EXTERNAL ANCHOR EFFECTS?

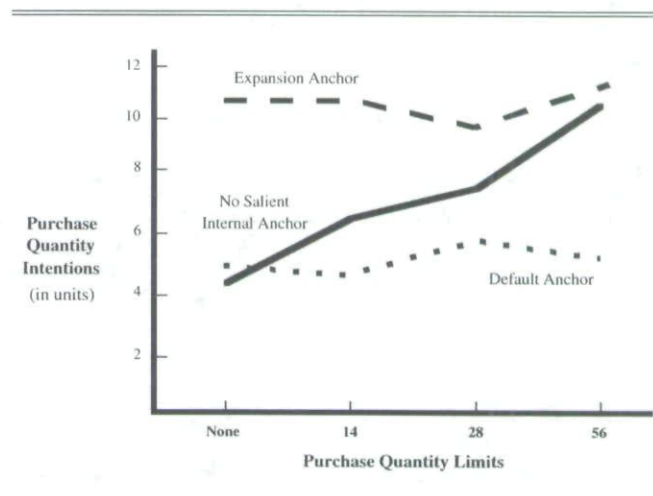


Table 3
HOW INTERNAL ANCHORS MODERATE THE IMPACT OF EXTERNAL ANCHORS

Internal Anchor		External Anchor				Mean
		No Limit	Limit 14	Limit 28	Limit 56	
No Internal Anchor	Quantity	4.2	6.4	7.7	10.4	7.1
	Incidence	77%	80%	88%	81%	82%
	Internal Anchor	n.a.	n.a.	n.a.	n.a.	n.a.
Default Anchor	Quantity	5.0	4.5	6.1	5.2	5.2
	Incidence	89%	89%	87%	85%	87%
	Internal Anchor	2.9	2.8	2.6	2.0	2.6
Expansion Anchor	Quantity	10.7	10.6	8.6	11.2	10.3
	Incidence	87%	89%	96%	89%	90%
	Internal Anchor	10.3	10.2	5.6	10.2	9.1

effects tests in each of the internal anchor conditions revealed that the external anchor had an influence on judgment only in the no internal control condition ($F_{3,134} = 4.9$; $p < .01$). This effect emerged because of a significant positive trend in the data ($F_{1,136} = 14.3$; $p < .01$). When subjects generated either a default or an expansion anchor, the external anchor had no influence on quantity intentions. This suggests that salient internal anchors can nullify any impact of external anchors, enabling consumers to counter POP anchors effectively.³

We also computed correlations between the internal anchors and intended purchase quantities. Collapsing across the eight cells with an internal anchor, the correlation was .61 in the default anchor conditions and .71 in the expansion anchor conditions. Examination of the within-cell correlations indicates a strong relationship between the internal anchor and quantity intentions in both the absence (no limit; $r = .84$; $p < .01$) and presence (limit 14, 28, 56; $r = .62$; $p < .01$) of an external anchor.

The notable average impact of the expansion anchor compared with the default anchor (10.3 versus 5.2) is intriguing for both the manufacturer and the retailer. The challenge is one of in-store implementation. To use expansion anchors, marketers must motivate the consumer to rethink his or her default purchase quantity under noisy and rushed conditions. Because this is difficult to achieve in low-involvement shopping, a coordinated effort between manufacturers and retailers might be most effective. For example, expansion advertising could be combined with POP retrieval cues (cf. Keller 1991) to emphasize a product's usage flexibility (e.g., Chex cereal, A.I. steak sauce, and WD-40), thus encouraging consumers to generate expansion anchors.

SUMMARY AND DISCUSSION

This research explores the psychological process underlying the purchase quantity decision. Everyday shopping is a low-stakes, uninvolved chore for most consumers. Casual and controlled observation of supermarket shoppers suggest

that they are expedient and, within reason, more interested in minimizing shopping costs than in maximizing shopping returns. This is not to say that consumers are irrational; they simply have adapted to the decision task at hand (Payne, Bettman, and Johnson 1992). Most of the time they act reasonably, but every so often they become inattentive and can be influenced unduly by various merchandising methods. Given this low level of motivation and involvement, it makes sense that consumers' quantity decisions could be influenced by "suggestions." Such suggestions can disrupt the normal tendency to anchor on and purchase a small number of units.

If the price justifies stockpiling, a consumer will make an upward adjustment from the small anchor; this adjustment, however, will not eliminate the impact of the starting anchor value. Because of this, retailers might be able to increase sales by using anchor-based promotions to present consumers with a larger than normal purchase quantity. In effect, these large anchors supplant the smaller ones. When considering how many units to buy, a consumer will make an insufficient downward adjustment from this large anchor. This leads to larger purchase quantities.

The results of both field and lab studies show that POP anchors can reliably affect quantity decisions. Study 1 examined how multiple-unit prices affect sales across 13 product categories in 86 supermarkets. Consistent with an anchoring explanation, multiple-unit pricing generated a 32% higher increase in baseline sales than did single-unit pricing. Study 2 examined the impact of high supermarket purchase quantity limits. The results of this field study show that purchase limits can increase the number of units a buyer purchases. A key insight from this study is that purchase limits must be set high enough not to truncate the number of units that otherwise would be purchased. Using low values in other anchor-based promotions (such as suggestive selling or multiple-unit pricing) also could backfire by reducing the purchase quantities of would-be heavy buyers.

To understand more clearly how anchoring can influence purchase quantity decisions, Studies 3 and 4 were conducted in a controlled lab environment. Study 3 shows that anchors embedded in a suggestive selling slogan can increase intended purchase quantities even when the price is not discounted. Finally, Study 4 examined whether internal anchors counteract the influence of external POP anchors. The results support our anchoring model by showing that both low

³We analyzed subjects' first responses and found the same Z-shaped pattern shown in Figure 4, but the interaction was not significant because of the larger between-subjects error term ($F_{6,127} = 1.3$; $p = .27$).

(past purchase quantities) and high (future usage quantities) internal anchors overpower the effects of external anchors.

Implications for Managers, Researchers, and Consumers

Consider a manufacturer or retailer that is given the option of selling four units today or trying to sell one unit in each of the next four weeks. Many manufacturers and retailers probably believe that four units in hand are worth more than "four in the bush." Anchor-based promotions could be considered by these managers. It is important to note, however, that any increases in unit sales may or may not generate incremental revenues and profits for retailers. Further research should investigate whether unit sales increases from anchor-based promotions reflect increased category consumption, brand switching, variety switching, store switching, or stockpiling. These possible sources of sales increases could influence differentially retailer and manufacturer profits. For example, though increased category consumption can benefit both the manufacturer and retailer, the effect of brand switching on retailer profits depends on profit margins.

A consistent finding in these studies is that consumers purchase more units when they see high anchors in POP promotions. For example, our field results indicate that purchase limits and multiple-unit pricing can increase purchase quantities when discounts are low (12%). Even if retailers pass no discounts through to consumers, our lab findings indicate that suggestive selling anchors at the POP (and perhaps in advertisements or on packages) still can increase quantity decisions. These findings can be combined with those of Inman, Peter, and Raghurir (1997) to generate potential strategic applications for low and high purchase limits. Whereas very low or single-unit limits may increase the number of buyers through deal signaling, higher limits may increase the number of units each buyer purchases through anchoring. Therefore, some managers might use low limits

to stimulate trial of new or low-share brands and higher limits to stimulate stockpiling of established brands in usage-variant categories. Table 4 offers additional suggestions on how anchor-based promotions can be executed, improved, and better understood.

Our studies focus on how anchor-based promotions influence purchase quantity, not on how they might influence consumption. Yet there is evidence that some suggestive selling and expansion anchors can increase consumption frequency by expanding the set of situations in which product use is considered. Just as advertisements suggesting alternative usage situations and substitution opportunities can increase the usage frequency of packaged goods (Wansink and Ray 1996), so can suggestive selling and expansion anchors increase usage frequency norms.

Moreover, evidence is emerging that promotional stockpiling sometimes can accelerate consumption. Such effects, however, appear to be highly category-specific. Consumer stockpiling has been shown to generate temporary consumption increases for cookies and fruit juice (Chandon and Wansink 1997), but significant increases have not been found for detergent or ketchup (Ailawadi and Neslin 1996). In general, consumption acceleration can be influenced by package size and perceived unit costs (Wansink 1996) and appears most notable among products that are substitutable, salient, familiar, and convenient. More work must be done on this topic. For example, products that are most prone to usage acceleration could be strong candidates for anchor-based promotions.

Consumers also can benefit from an improved understanding of anchoring. We have shown that internal anchors based on potential uses or on past purchases can overwhelm POP anchors and increase or decrease purchase intentions. We suspect that purchase quantities will increase whenever consumers retrieve or generate an internal anchor that exceeds their usual purchase quantity (see the last column of

Table 4
EXECUTING AND IMPROVING ANCHOR-BASED PROMOTIONS

	<i>Anchor-Based Promotions</i>			
	<i>Multiple-Unit Pricing</i>	<i>Purchase Quantity Limits</i>	<i>Suggestive Selling</i>	<i>Expansion Anchors</i>
Executions	<ul style="list-style-type: none"> •3 for \$1.97. •12 for the price of 10. •Baker's dozen for \$2.99. 	<ul style="list-style-type: none"> •Limit of 12 per person. •Limit of 1 per visit. •4 per person per day. 	<ul style="list-style-type: none"> •Grab 6 for studying. •Buy 8 and save a trip. •Buy 12 for your freezer. 	<ul style="list-style-type: none"> •101 uses! •Buy a month's worth. •Buy for all your friends.
Implementation Considerations	<ul style="list-style-type: none"> •Discounts of 10%–20% can increase sales while protecting margins. •The larger and more expensive the product, the lower the suggested number should be. 	<ul style="list-style-type: none"> •Very low limits increase purchase incidence; high limits increase purchase quantities. •To avoid truncating sales, set limits at least two times higher than the typical quantity bought on deal. 	<ul style="list-style-type: none"> •Anchor-based sales suggestions may work without a corresponding sales promotion. •Suggestive selling can be most effective with familiar, inexpensive items, such as snacks and drinks. 	<ul style="list-style-type: none"> •Advertisements, packages, and POP materials can increase purchase quantities by stimulating thoughts of new uses. •Expansion anchors can be used in advertising campaigns and without a sales promotion.
Research Opportunities	<ul style="list-style-type: none"> •When does confusion moderate anchor effectiveness and when does it enhance it? •When will total price counteract the effect of multiple-unit pricing? 	<ul style="list-style-type: none"> •What determines the ideal quantity limit? •What joint impact do purchase quantity limits have on purchase incidence and purchase quantity? 	<ul style="list-style-type: none"> •Do suggestive selling appeals influence perceived social norms? •Does suggestive selling influence purchase incidence? 	<ul style="list-style-type: none"> •How can involvement be increased so that consumers generate internal anchors? •Do usage-based expansion anchors accelerate consumption?

Table 4).⁴ Yet it might be risky for marketers to encourage reflection on prior product-related behavior. For many consumers, the most salient prior behavior might be a purchase episode rather than a consumption episode. And as we have shown, a focus on prior purchases can lead to a low initial anchor. Although low anchors are not beneficial to managers, they might be beneficial to consumers who wish to limit their purchases and maintain self-control (Hoch and Loewenstein 1991). To generate low anchors, consumers deliberately could recall past purchase quantities or modify their shopping lists to include purchase quantities.

Conclusion

We have examined a question of emerging importance to researchers, retailers, manufacturers, and consumers: How do shoppers decide "how many" units of a product they will buy? Consider the findings on how anchoring at the POP alters purchase quantity decisions. In addition to contributing to a better understanding of consumer behavior, these results also show retailers and manufacturers how inexpensive marketing efforts can increase purchase quantities. At the same time, these results provide consumers with a simple strategy they can use to help counter the effects of these promotional efforts. The findings extend the relevance of anchoring by suggesting how it can be used by managers to increase purchase quantities and by informed consumers to resist such attempts.

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⁴Advertising campaigns have humorously portrayed the dire consequences of running out of Pepsi or milk ("Got Milk?") and have shown how the party disintegrates when the supply of Budweiser beer is depleted. Although these advertisements do not explicitly provide a purchase quantity anchor, they encourage consumers to generate their own anchors by having them recount prior consumption quantities and then add a safety stock to their next purchase.

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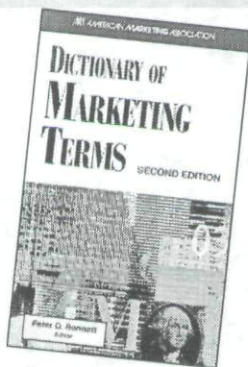
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