

PIERRE CHANDON and BRIAN WANSINK*

When people stockpile products, how do they decide when and how much they will consume? To answer this question, the authors develop a framework that shows how the salience and convenience of products influence postpurchase consumption incidence and quantity. Multiple research methods including scanner data analysis, a field study, and two laboratory studies show that stockpiling increases product salience and triggers consumption incidence among high-convenience products. However, when the decision is made to consume a product, stockpiling increases the consumption quantity for both high- and low-convenience products. In addition to providing new insights on how consumers make postpurchase consumption decisions, these results have implications for the debate on the value of promotions that induce stockpiling.

When Are Stockpiled Products Consumed Faster? A Convenience–Salience Framework of Postpurchase Consumption Incidence and Quantity

In the context of packaged goods, consumer behavior research tends to focus on purchase decisions rather than consumption decisions. Yet consumers' ability to increase consumption is critical for growing mature brands that have already achieved high levels of household penetration and loyalty (Wansink 1994a; Wansink and Ray 1996). Understanding postpurchase consumption behavior is also important in the assessment of the profitability of stockpiling-inducing promotions, such as multiunit packs or "buy one get one free" offers, which may deplete future sales unless consumers increase consumption rates (Blattberg and Neslin 1990).

By drawing on economic (Assunção and Meyer 1993) and mental accounting (Prelec and Loewenstein 1998; Soman and Gourville 2001) frameworks, existing behav-

ioral research has shown that the acquisition and replacement costs of a product influence how much is consumed (Folkes, Martin, and Gupta 1993; Wansink 1996). These studies, however, have only examined consumption volume when the consumption incidence is given. As a result, they have sidestepped the role of two factors that might have triggered consumption incidence in the first place—the salience of a product at the point of consumption and the convenience of its consumption.

Analyses of scanner data have examined variations in household consumption rates across purchases, which is a function of both consumption incidence and consumption quantity. These studies have shown that stockpiling influences the consumption rates of some products but not others (Ailawadi and Neslin 1998; Bell, Chiang, and Padmanabhan 1999; Nijs et al. 2001). The mixed results of these studies and the limitations of scanner data for studying consumption have led some of these authors to call for experimental research that examines the causal relationship between stockpiling and consumption and investigates the variables mediating and moderating the effect of stockpiling on consumption (Ailawadi and Neslin 1998).

To progress in these two directions, we develop and test a framework of postpurchase consumption behavior and apply it to understanding when and how stockpiling increases the short-term rate of product consumption. In the framework, we distinguish between two key consumption decisions: whether a person should consume (consumption incidence)

*Pierre Chandon is Assistant Professor of Marketing, INSEAD (e-mail: pierre.chandon@insead.edu). Brian Wansink is Professor of Business Administration, of Nutritional Science, of Advertising, and of Agricultural and Consumer Economics, University of Illinois at Urbana–Champaign, and Professor of Marketing, Wageningen University (e-mail: wansink@uiuc.edu). This article has benefited from the comments of Gilles Laurent, Bob Meyer, Jim Hess, Steve Hoch, Scott Neslin, Laurence Capron, Vithala Rao, Delphine Manceau, and the three anonymous *JMR* reviewers. The authors thank Alain Quaghebeur from Secodip for generously providing the data for Study 1 and thank the Fondation HEC, the INSEAD Foundation, FNEGE, the Dartmouth College Scholars Fund, and the Food and Brand Lab at the University of Illinois for their financial support.

and how much he or she should consume (consumption quantity given incidence). By doing so, we integrate existing findings with new hypotheses on how product salience and convenience influence consumption incidence. The resulting framework enables us to better explain how stockpiling-inducing promotions increase consumption, why consumption acceleration occurs with some products and not others, and why consumption rates are highest for recently purchased products.

This article is organized as follows: After reviewing existing research, we propose a convenience–salience framework of postpurchase consumption decisions. We then present supporting results from a scanner study, a field study, and two laboratory studies. Study 1 (an exploratory analysis of household scanner data) investigates the effect of stockpiling on the consumption rates of high- and low-convenience products. Study 2 uses an experimental field study to show how product salience and convenience differentially influence consumption incidence and consumption quantity. Study 3 uses a laboratory experiment to show that stockpiling triggers consumption incidence for high-convenience products because it raises their salience at the point of consumption. Study 4 triangulates on the results of the previous studies by focusing on the interplay between salience and convenience in a laboratory experiment. In the last section, we discuss key findings and implications for theory and practice.

POSTPURCHASE CONSUMPTION BEHAVIOR

Consumers typically purchase products to match their expectations of future demand. For example, consumers stockpile products when they are planning to host a party. In these cases (hereafter referred to as endogenous stockpiling), purchase quantity decisions are driven by an expectation of future demand. It is important to realize, however, that consumers do not always make complete consumption decisions at the point of purchase. In other cases (referred to as exogenous stockpiling), consumers may stockpile products because of a compelling promotional offer or simply because they ignore the demand of the end user of the product. After exogenous stockpiling, the end user is faced with deciding whether to consume the products already stockpiled and how many units to consume. Economic and mental accounting theories provide insight as to how the end user makes these consumption decisions.

Existing Research on the Effect of Consumption Costs on Consumption Quantity

According to traditional economic theory, the utility of consuming one unit of a product is exogenous and invariant over the planning horizon. The consumption of a product increases when storage costs increase or when replacement costs decrease. Stockpiling increases storage costs because it uses more pantry space and increases perishability (Walsh 1995). When prices fluctuate, stockpiling also reduces replacement costs by enabling consumers to repurchase only when the product is on promotion (Assunção and Meyer 1993). Although Assunção and Meyer's (1993) analytic model has not been tested empirically, there are indications that people take replacement costs into account when deciding how much to consume for any given consumption occasion (Krishna 1994a, b). For example, Folkes, Martin, and Gupta (1993) find that consumers use less cleaning products

as their supply diminishes in an effort to postpone its replacement.

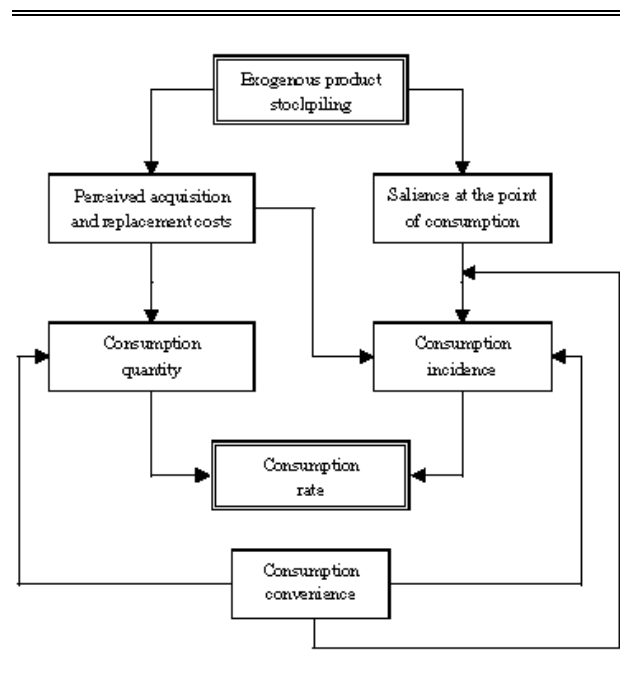
Mental accounting research shows that consumers alter their consumption of a product to mentally recover its acquisition costs (Prelec and Loewenstein 1998; Thaler 1985). For example, reducing perceived acquisition costs makes inventoried products (e.g., snacks, beverages) easier to consume and makes noninventoried products (e.g., nontransferable and nonrefundable theater tickets) easier to forgo (Gourville and Soman 1998; Soman and Gourville 2001). The effects of stockpiling could therefore be explained by consumers' assumptions that stockpiled products were purchased at a lower cost. Consistent with this explanation, Wansink (1996) shows that a larger package size increases consumption volume partially because it is perceived as offering a lower price per unit than a smaller package.

Why Would Stockpiled Products Be Consumed Faster? A Convenience–Salience Framework

Economic and mental accounting studies show that the perceived costs of consumption (acquisition and replacement costs) influence how much people consume. However, these studies do not provide an integrative framework that accounts for observed product category differences or that distinguishes consumption *incidence* decisions (whether to consume a product) from consumption *quantity* or volume decisions (how much to consume given consumption incidence). Yet the many studies showing that purchase incidence and purchase quantity have different antecedents (e.g., Gupta 1988) suggest that consumption incidence and consumption quantity may also have different antecedents.

By integrating key results from economic and mental accounting frameworks, Figure 1 indicates that exogenous

Figure 1
A CONVENIENCE–SALIENCE FRAMEWORK OF HOW EXOGENOUS STOCKPILING INFLUENCES CONSUMPTION



product stockpiling can increase both consumption incidence and consumption quantity by reducing the perceived acquisition and replacement costs of consumption. The framework extends existing research by proposing that stockpiling can also trigger consumption incidence by raising the salience of the product at the point of consumption. This impact is moderated by the product's consumption convenience (which also directly influences consumption quantity and consumption incidence). We now analyze the role of salience and convenience in more detail.

The Mediating Role of Product Salience for Consumption Incidence

Stockpiled products can be more salient at the point of consumption because they take more storage space, can be unusually packaged (e.g., promotional packs), and can be placed in visible locations (on the counter versus in the pantry) until depleted to a more typical level (Raghubir and Krishna 1999; Wansink, Brasel, and Amjab 2000). In addition, consumers spend more money; take more perishability risk; and spend more time loading, carrying, and unloading grocery bags when they stockpile products rather than buy their usual amounts. As a result of this higher cognitive elaboration, stockpiled products are more accessible in memory, especially immediately after their purchase. Wansink and Deshpande (1994) find that stockpiling increases the accessibility of usage-related thoughts, leading a person to increase his or her appraisals of future monthly consumption. Other studies show that making hedonic products salient leads consumers to picture themselves consuming these products, thus triggering consumption desires (Hoch and Loewenstein 1991; Rook 1987) and self-rationing strategies (Wertenbroch 1998).

The convenience–salience framework shown in Figure 1 proposes that raising the salience of a product can trigger consumption incidence irrespective of the perceived acquisition and replacement costs of the product. This is consistent with prior findings that many consumption occasions are not fully anticipated or planned (Nunes 2000). It is also supported by research showing that salience increases the likelihood of consideration even though it may not influence the expected value of consumption (Alba, Hutchinson, and Lynch 1991; Nedungadi 1990). We therefore propose that product salience mediates the impact of stockpiling on consumption incidence. Yet when the decision to consume has been made, the product is very salient, regardless of its previous salience at the point of consumption. The quantity or volume of product consumed therefore should not be influenced by its salience at the point of consumption. Rather, the impact of stockpiling on consumption quantity (given incidence) is more likely to be mediated by the perceived costs of consumption (e.g., Wansink 1996).

The Moderating Role of Consumption Convenience

As is shown in Figure 1, the convenience of consuming the product moderates the impact of stockpiling on consumption rate: Stockpiling is more likely to trigger consumption incidence for high-convenience products than for low-convenience products. Consumption convenience can contribute to as much as 48% of impulsively consumed food (Wansink 1994b). Consumption convenience is a function of the time, comfort, and ease of preparation, depending on the number, complexity, cost, and accessibility of the operations

required before consumption (Gehrt and Yale 1993; Reilly 1982). Consumption convenience can be influenced by packaging (e.g., individually wrapped packs are convenient because they do not force consumers to use, store, or waste the remaining quantity), and it applies to food as well as nonfood products (e.g., prestamped envelopes versus regular unstamped envelopes).

We anticipate that convenience moderates the impact that stockpiling has on consumption incidence but does not influence the impact on consumption quantity (given incidence). Low-convenience products are ingredients or steps in a broader process. They often require the availability of other ingredients and the performance of multiple operations before they can be consumed. For example, consuming iced tea from a mix requires time, water, a container, a spoon, and refrigeration; using detergent requires time, dirty laundry, and a washing machine. All these ingredients need to be available for consumption incidence to occur. However, when all the ingredients are available and the first consumption incidence occurs, low-convenience products can subsequently be consumed in higher quantities relatively easily. Preparing a small pitcher of iced tea from a powdered mix, for example, requires almost as much time and effort as preparing a large pitcher. Stockpiling therefore increases consumption quantity (given incidence) for high- and low-convenience products. However, stockpiling triggers consumption incidence primarily for high-convenience products. As a result, stockpiling increases total consumption (the product of higher incidence and higher quantity given incidence) more for high-convenience products than for low-convenience products.

By extension, we anticipate that a product's salience will mediate the impact of stockpiling on consumption incidence, but only for high-convenience products. Stockpiling can increase salience for both high and low-convenience products, but consumers are more likely to consume a salient product when it is convenient because convenience increases the number of situations in which the product can be consumed. For example, compare prepped and regular popcorn. Both formats are salient when stockpiled. However, consumers will prepare regular popcorn only when they have time to cook and the patience to clean the pan after its use. In contrast, rushed consumers can decide to eat prepped popcorn. As a result, stockpiling should increase consumption incidence more for prepped popcorn than for regular popcorn.

Summary and Research Propositions

The convenience–salience framework offers an integrative model of how stockpiling increases the short-term rate of postpurchase product consumption. The basic propositions reflected in the framework are as follows:

- P₁: Exogenous product stockpiling increases consumption rates, especially when products are convenient to consume.
- P₂: Exogenous product stockpiling increases consumption rates by increasing consumption quantities for both high- and low-convenience products and by increasing consumption incidence only for high-convenience products.
- P₃: Product salience mediates the impact of stockpiling on the consumption incidence of high-convenience products.

We test portions of this framework across four studies using three different methods—scanner data, field studies,

and laboratory studies—to triangulate on the different issues and to provide a clearer understanding of when and how stockpiling influences consumption. We first examine the main proposition of the framework (P_1) with household scanner data (Study 1) and a field experiment that directly measures consumption (Study 2). In addition, in Study 2 we test the effect of stockpiling and convenience on consumption incidence and quantity (P_2). We then directly examine the mediating role of product salience (P_3) in a laboratory experiment (Study 3). Finally, in Study 4 we use a tightly controlled laboratory study to examine all the propositions simultaneously.

*STUDY 1: AN EXPLORATORY SCANNER DATA
ANALYSIS OF POSTSTOCKPILING CONSUMPTION
RATES FOR HIGH- AND LOW-CONVENIENCE
PRODUCTS*

In Study 1, we use household scanner data to explore the impact of stockpiling on the consumption rate of high- and low-convenience products (P_1). Study 1 examines the external validity of the framework and motivates subsequent studies that will distinguish specific factors that mediate and moderate how stockpiling influences consumption. Because scanner data provide information on purchase quantity and timing but not directly on consumption, the results of Study 1 need to be interpreted in the light of their convergence with those of Studies 2, 3, and 4, in which consumption is directly measured.

Study 1: Method and Data

In contrast to existing scanner studies of stockpiling effects (Ailawadi and Neslin 1998; Bell, Chiang, and Padmanabhan 1999; Nijs et al. 2001), in this research we distinguish exogenous stockpiling from endogenous stockpiling. Exogenous stockpiling is caused by the availability of a promotion. Endogenous stockpiling is caused by an anticipated increase in the household demand for the product (such as an upcoming party). Endogenous stockpiling is therefore a consequence rather than an antecedent of consumption. As a result, endogenous stockpiling should be followed by a higher rate of consumption for both low- and high-convenience products (whereas exogenous stockpiling increases consumption rates more for high-convenience products than for low-convenience products).

Consider fruit juices, cookies, and laundry detergents. If a person endogenously stockpiles these products in anticipation of an increase in demand (say, because of children visiting at home for a week), there will be an increase in the weekly consumption rate of these products. However, if the same person stockpiles these products because each is on sale in the form of a multiunit pack, the effect on consumption will depend on the convenience of each product. Assuming that all three products are salient (because they are stockpiled), stockpiling would increase the consumption only of the juices and cookies that are convenient to consume. The boxes of detergent would be used at the same rate because their usage requires planning and is mostly driven by the amount of dirty laundry, not by the salience or the perceived price of the detergent.

We examined this general proposition with household-level scanner data from a panel maintained by Secodip in a market-test zone in France. The data include all purchases of fruit juices, cookies, and liquid and powder laundry deter-

gent made by panel households in all the retail stores in the zone in 1994. We used the first six months of data to compute the modal purchase quantity for each household. We selected a random sample of households among those that had made at least four purchases in each half-year period (respectively, for fruit juices, cookies, and laundry detergent, 272, 393, and 457 households made an average of 9.8, 11.1, and 4.5 shopping trips).

Following Bell, Chiang, and Padmanabhan (1999), we report in Table 1 purchase quantities (Q), interpurchase times until the following purchase (IP), and quantity divided by interpurchase time (Q/IP , an estimate of the rate of consumption) for three types of purchases. However, instead of comparing average consumption rates for promotion and nonpromotion purchases, we use a regression framework to estimate the effects of exogenous and endogenous stockpiling and to account for household heterogeneity in consumption rates.

We distinguish among three types of purchases: regular purchases (no stockpiling), exogenous stockpiling, and endogenous stockpiling. Exogenous stockpiling involves purchases consisting entirely of promotional packs, known from their specific Universal Product Codes (i.e., one or many promotional multiunit packs or bonus packs and no regular packs). Because of the larger sizes of promotional packs, quantities for these purchases are significantly larger than the modal quantity for the household. Endogenous stockpiling purchases are those that include at least one regular pack and that result in the purchase of a larger quantity of products than the modal quantity for the household.¹ We then regress the consumption rate for each purchase and household (Q/IP) on two binary variables that measure exogenous and endogenous stockpiling (coding is reported in Table 2) and on the average consumption for the household computed over the first six months of data.²

Study 1: Results and Discussion

Table 1 shows the average purchase quantity, interpurchase time, and consumption for regular, exogenous stockpiling, and endogenous stockpiling purchases. Table 2 provides the ordinary least squares output of the regression analysis. These results show that fruit juices and cookies are consumed faster when households exogenously stockpile by buying promotional packs than when they do not stockpile (average daily consumption following these purchases

¹Exclusive purchases of promotional packs are a better indicator of the exogenous nature of stockpiling than are purchases of promoted products. Increases in product demand which lead to endogenous stockpiling lead to a higher need for variety (Simonson 1990; Walsh 1995), whereas promotional packs force consumers to purchase a large quantity of the same product. Households anticipating a higher demand are therefore unlikely to purchase promotional packs exclusively, even though they could choose some products among those on promotion.

²This procedure is similar to the one used by Winer (1980) to estimate consumption using panel data. As does Winer, we assume that the amount of inventory remaining at the end of the interpurchase period is independent of the type of purchase, the brand purchased, or the week of the year. We do not assume that the remaining inventory is zero or is the same as the starting inventory but that it is not higher for stockpiling purchases than for regular purchases. In the case of exogenous stockpiling, the remaining inventory is likely to be lower than the starting inventory because many consumers will have purchased before completely depleting their previous inventory to take advantage of the promotion. This procedure therefore provides a conservative test of the effect of exogenous stockpiling.

Table 1
 STUDY 1: PURCHASE QUANTITY, INTERPURCHASE PERIOD, AND DAILY CONSUMPTION RATE
 (MEANS AND STANDARD DEVIATIONS)

		<i>Regular Purchases (No Stockpiling)</i>	<i>Stockpiling</i>	
			<i>Exogenous</i>	<i>Endogenous</i>
Juices	\bar{Q} Purchase quantity (centiliters)	157.24 (109.39)	473.65** (254.66)	344.51** (231.52)
	\bar{IP} Interpurchase period (days)	15.49 (16.85)	21.23 (20.98)	14.95 (15.79)
	\bar{Q}/\bar{IP} Daily consumption rate (centiliters per day)	21.08 (22.93)	44.35** (52.04)	45.80** (60.76)
Cookies	\bar{Q} Purchase quantity (grams)	302.35 (249.80)	626.87** (330.50)	899.01** (672.31)
	\bar{IP} Interpurchase period (days)	12.36 (12.68)	13.50* (13.36)	13.36* (12.82)
	\bar{Q}/\bar{IP} Daily consumption rate (grams per day)	49.98 (60.35)	96.21** (117.39)	127.46** (182.89)
Detergents	\bar{Q} Purchase quantity (laundry loads)	18.00 (8.94)	26.6** (7.55)	37.03** (15.94)
	\bar{IP} Interpurchase period (days)	38.43 (27.50)	43.07* (27.37)	44.90* (29.68)
	\bar{Q}/\bar{IP} Daily consumption rate (laundry loads per day)	.85 (1.64)	1.07 (1.63)	1.59** (2.30)

*Different from regular purchases at $p < .05$.
 **Different from regular purchases at $p < .01$.

Table 2
 STUDY 1: HOW EXOGENOUS AND ENDOGENOUS STOCKPILING INFLUENCE DAILY CONSUMPTION
 (UNSTANDARDIZED REGRESSION COEFFICIENTS AND STANDARD ERRORS)

	<i>Stockpiling</i>		<i>Average Household Consumption</i>	<i>Intercept</i>
	<i>Exogenous</i>	<i>Endogenous</i>		
Juices	23.32** (6.60)	22.0** (1.61)	.71** (.06)	24.8
Cookies	35.21** (5.47)	68.73** (4.66)	.87** (.05)	42.11
Detergents	.03 (.12)	.61** (.15)	1.32** (.13)	.38

* $p < .05$.
 ** $p < .01$.

Notes: Exogenous stockpiling is a binary variable set equal to 2/3 for exogenous stockpiling purchases and to -1/3 for endogenous stockpiling and regular purchases. Endogenous stockpiling is a binary variable set equal to 2/3 for endogenous stockpiling purchases and to -1/3 for exogenous stockpiling and regular purchases. These two binary variables measure the effect of each type of stockpiling compared with regular (no stockpiling) purchases.

increases by 110% for juices and by 92% for cookies). This is because the increase in quantity (201% for juices and 107% for cookies) due to exogenous stockpiling is not compensated for by the increase in the number of days until the following purchase (37% for juices and 9% for cookies). In contrast, detergent is used about as rapidly after exogenous stockpiling (1.07 loads per day) as after a regular purchase (.85 loads per days). For detergents, the increase in quantity

(48%) is compensated for in a larger part by the increase in interpurchase time (12%), which explains why the coefficient for exogenous stockpiling is not statistically different from zero (see Table 2). Finally, Tables 1 and 2 show that, unlike exogenous stockpiling, endogenous stockpiling is accompanied by large and statistically significant increases in consumption rates for all three products (117% for juices, 155% for cookies, and 86% for detergents).

Overall, Study 1 provides important preliminary support for P_1 . It shows that the impact of exogenous stockpiling on consumption rates is strong and that it can be detected with widely available scanner data. The results for detergent also show that the mere existence of an association between consumption rates and purchase quantity does not imply that marketers could exogenously increase consumption by inducing consumers to stockpile. It is important to identify the exogenous or endogenous origin of stockpiling when examining its effect on consumption. In the absence of direct measures of consumption and inventory, however, additional studies are needed to assess the specific causal effect of stockpiling on consumption and to examine the variables mediating and moderating these effects. We consider these issues in the following three experimental studies.

STUDY 2: A FIELD STUDY OF HOW STOCKPILING, SALIENCE, AND CONVENIENCE INFLUENCE CONSUMPTION INCIDENCE AND CONSUMPTION QUANTITY

Study 2 is a longitudinal field experiment in which we manipulate stockpiling and salience and compare direct reports of daily consumption incidence and quantity for three high-convenience products and three low-convenience products. In Study 2, we seek to replicate the exploratory findings of Study 1 that stockpiling increases consumption, especially for high-convenience products (P_1). Study 2 also tests P_2 , that stockpiling increases consumption quantity for all products but triggers consumption incidence only for high-convenience products. Finally, Study 2 provides initial evidence on the effect of salience for high-convenience products (P_3).

Study 2: Design and Procedure

In this study, we used a 2 (low versus high stockpiling) \times 3 (low versus high salience versus distracter task) \times 2 (low-versus high-convenience products) design with two between-subjects factors (stockpiling and salience) and one within-subjects factor (convenience). There were three within-subjects replications consisting of either three high-convenience products or three low-convenience products. The consumers in the study were randomly assigned to the stockpiling and salience conditions as they acquired a basket containing six products (three low-convenience and three high-convenience products). They did not know at the time that they would be asked later to report their daily consumption for each product.

Following a pretest study of product convenience and attractiveness, we selected three products (crackers, granola bars, and fruit juice) that were perceived as more convenient to consume than three others (noodles, oatmeal, and microwave popcorn).³ The unit weights of low- and high-

convenience products were similar (2.1 ounces for low-convenience products versus 2.8 ounces for high-convenience products, $F_{1,4} = .14, p = .73$). A pantry prestudy was conducted to determine what levels of inventory would be necessary to induce perceptions that a product was being stockpiled. On the basis of these findings, we determined that the three products in the high-stockpiling condition would be available in quantities of 12 units of each, and the three products in the low-stockpiling condition would be made available in quantities of 4 units of each.

The goal of the salience manipulation was to manipulate the salience levels for four of the six products in the basket and focus consumers' attention on the two remaining products in order to distract them from the four target products. To accomplish this, we asked the consumers to record their consumption of two of the six products on a daily inventory diary that they taped on the door of their refrigerator. The data pertaining to these two products are excluded from the analysis. We told the consumers that they could keep the other four target products if they wished and provided no further instructions. To manipulate the salience of the remaining products, photographs of two of the four target products were reproduced on the daily inventory diary that they had taped on the refrigerator door. All products were rotated across all conditions.

We recruited 60 households through four PTAs in New Hampshire and Vermont. All respondents were primary meal planners between the ages of 30 and 45, and 15 were employed outside the home. Their educational background was heterogeneous. As compensation for participating in unrelated studies, we gave \$6.50 to their PTA and gave them the choice of either a basket of the six test products or a \$10 bill. Each basket contained 48 packaged units (12 units of three products and 4 units of three other products) and had a market value between \$24 and \$30. Two weeks later, we sent them an unexpected booklet showing the names and packages of all six products and asked them to recall their daily usage (in units) of all products during the previous 14 days. Consistent with Sudman and Wansink (2002), we used these measures of recalled usage in the analysis.⁴ We also asked the consumers nine-point scale questions (1 = "completely disagree," 9 = "completely agree") about their evaluation of these products and the manipulations they experienced. Of the 60 people who began the study, 58 chose the promotional basket and 56 returned the inventory diaries in time to be included in the analysis (for a total of 224 observations).

Study 2: Manipulation Checks and Impact on Total Consumption

We checked the effectiveness of the manipulations using nine-point multi-item scales, where 1 = "completely agree" and 9 = "completely disagree." As expected, consumers agreed with the statement that "products were taking up storage space" more in the high-stockpiling condition than

³This prestudy involved 32 consumers (not the test subjects) who evaluated each product on three seven-point scale items. Their scores were averaged to form a consumption convenience index ("This product is ready to consume as it is without any further preparation," "This product is primarily consumed alone, without any other ingredients or other food," and "It is very easy and convenient to consume this product"), which had a coefficient alpha of .71. All the high-convenience products scored higher than any of the low-convenience products (average rating was 5.9 versus 4.2, $F_{1,52} = 17.0, p < .01$, where 1 = "completely disagree" and 7 = "completely agree").

⁴Following Menon's (1993) work, we asked consumers to recall specific consumption occurrences using a 14-day grid rather than simply recall the frequency of their consumption. We computed the canonical correlation between recalled consumption and diary measures of consumption for the two products in the distracter condition (for which both measures are available). The correlation is .82, attesting to the validity of the memory-based measure of consumption.

in the low-stockpiling condition (3.6 versus 2.7, $F_{1,209} = 9.4$, $p < .01$). The salience manipulation was so subtle that at the end of the 14-day period, it did not influence consumers' agreement with the statement that "products were visible" (5.9 versus 5.8, $F_{1,209} = .21$, $p = .65$). Nevertheless, other measures ostensibly indicated a successful salience manipulation. In particular, in the high-salience condition, consumers believed that stockpiled products were "taking up more storage space" than nonstockpiled products (3.7 versus 2.3, $F_{1,99} = 9.4$, $p < .01$). In the low-salience condition, however, consumers did not realize that stockpiled products were "taking up more storage space" than nonstockpiled products (3.5 versus 3.1, $F_{1,99} = 1.56$, $p = .21$). More important, the convenience, stockpiling, and salience manipulations did not influence the attractiveness of the products, which was measured by averaging the ratings of the product's appeal, quality, likability, and goodness (5.9 versus 6.0 for convenience, $F_{1,222} < .1$, $p = .82$; 6.0 versus 5.6 for stockpiling, $F_{1,215} = 1.00$, $p = .33$; and 6.0 versus 5.6 for salience, $F_{1,215} = 1.00$, $p = .31$).

We first examined the effects of stockpiling, salience, and convenience on total consumption (computed after excluding the partial first and last days). To enable meaningful comparisons across high- and low-convenience products, we converted unit consumption into ounces (one product unit equals .75 ounces for crackers, 3.5 ounces for popcorn, 6.75 ounces for fruit juice, 1.5 ounces for noodles, 1.2 ounces for

oatmeal, and 1.0 ounce for granola bars). Following the procedure used by Neslin, Henderson, and Quelch (1985), we regressed the total number of ounces consumed during the complete 12-day period on binary variables that measured stockpiling, salience, convenience, and their interactions. As described in Table 3, we added covariates that measured product evaluation (as described previously), product-specific effects, education level, and the number of children in the household.

The results show that despite different intrinsic consumption rates between high- and low-convenience products, stockpiling increased total product consumption by 132%, from 5.74 ounces to 13.33 ounces (i.e., from 2.5 units to 4.9 units) over the 12-day period. As is shown in Table 3, the interaction between stockpiling and convenience was statistically significant ($t = 2.88$, $p < .01$). As expected, stockpiling increased total consumption more for high-convenience products (by 11.4 ounces, or 3.15 units) than for low-convenience products (4.0 ounces, or 1.68 units). Along with Study 1, these results support P_1 and provide the first experimental evidence that a product's convenience moderates the impact of stockpiling on consumption. Consistent with our framework, the simple main effect of salience and the interactions in which this factor is included were not statistically significant. This supports the notion that salience influences only one of the components of total consumption: consumption incidence. To examine the effects of salience

Table 3

STUDY 2: THE IMPACT OF STOCKPILING, SALIENCE, AND CONVENIENCE ON TOTAL CONSUMPTION, CONSUMPTION INCIDENCE, AND CONSUMPTION QUANTITY (UNSTANDARDIZED REGRESSION COEFFICIENTS AND STANDARD ERRORS)

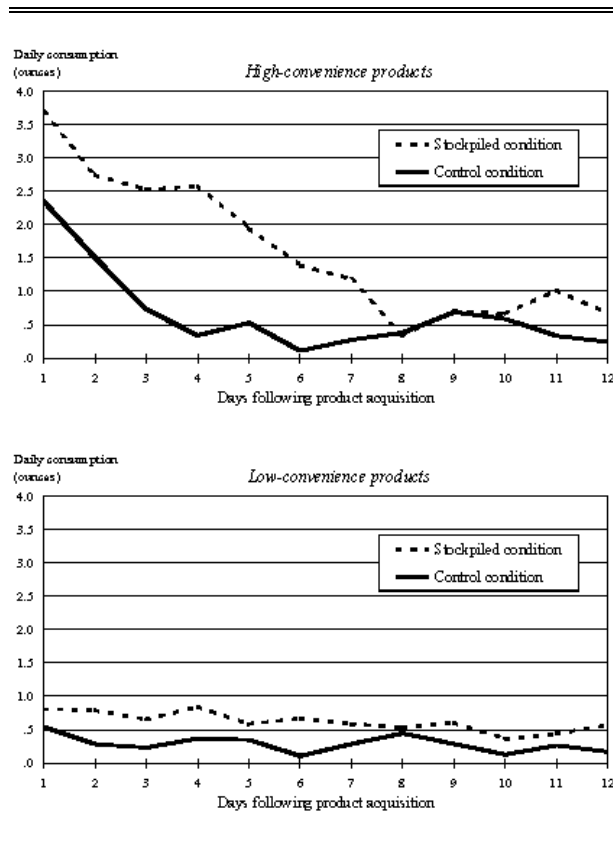
	<i>All Products</i>		<i>Low-Convenience Products</i>				<i>High-Convenience Products</i>							
	<i>Total Consumption</i>		<i>Total Consumption</i>		<i>Consumption Incidence</i>		<i>Consumption Quantity</i>		<i>Total Consumption</i>		<i>Consumption Incidence</i>		<i>Consumption Quantity</i>	
	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>	<i>B</i>	<i>S.E.</i>
Stockpiled	7.68**	1.61	3.42**	1.37	.31	.46	4.53*	2.14	13.05**	2.93	1.11**	.45	11.94**	3.01
Salient	.29	1.62	.92	1.38	.14	.47	2.12	2.09	.14	2.97	.99*	.46	-3.98	3.09
Stockpiled × Salient	-.67	3.23	-.47	2.73	.30	.93	-2.18	4.28	.81	5.90	.52	.90	.03	6.19
Product Evaluation	1.31**	.35	.74**	.27	.38**	.13	.57	.65	2.25**	.71	.24*	.11	2.35**	.86
Education ₂	5.40	3.54	3.70	2.99	1.26	1.00	5.20	4.56	4.47	6.45	.07	.95	-.97	7.10
Education ₃	-5.17	3.90	.86	3.33	-1.66	1.44	4.17	5.50	-12.05	7.03	-1.03	1.03	-10.86	7.89
Education ₄	1.04	3.30	2.26	2.70	.54	.90	3.98	3.99	-1.90	6.13	.03	.89	-4.67	6.71
Number of Children	2.02	1.23	.91	.96	.24	.33	1.35	1.55	4.76	2.51	.85*	.39	2.54	2.71
Oatmeal	-4.68	2.80	-4.47**	1.68	.55	.54	-3.71	2.44						
Noodles	-4.63	2.89	-5.69**	1.76	.18	.64	-5.40	2.88						
Juice	35.49**	3.22							38.95**	4.68	.91	.73	45.46**	5.11
Granola	3.12	2.86							2.75	3.65	-.65	.54	2.78	3.74
Convenient	8.44**	1.62												
Convenient × Stockpiled	9.38**	3.26												
Convenient × Salient	-1.57	3.29												
Convenient × Salient × Stockpiled	.17	6.53												
Intercept	-2.59		-1.10		-4.26		1.44		-8.97		-2.61		-2.21	
R ²	.52		.28		.27		.23		.55		.23		.38	

* $p < .05$.

** $p < .01$.

Notes: The dependent variable for total consumption is the number of ounces consumed during the 12 days: for consumption incidence, a binary variable measuring whether at least one ounce was consumed during the first day, and for consumption quantity, the number of ounces consumed by households that consumed at least one ounce during the 12 days. Simple coding is used for all binary variables. Product Evaluation is the average rating of the product's appeal, quality, likability, and goodness on a nine-point scale. Number of Children is the number of children in the household. Education₂₋₄ captures the impact of, respectively, some college education, college education, and graduate school degree over no college education. Crackers are used as the reference high-convenience product, and microwavable popcorn is used as the reference low-convenience product. For the binary logistic regressions, we report Nagelkerke's R-square. The first day and the last day were not included in the analysis because, in nearly all cases, they were not complete 24-hour periods, and the delivery and pick-up of these products varied slightly across consumers. S.E. = standard error.

Figure 2
STUDY 2: HOW STOCKPILING INFLUENCES THE DAILY CONSUMPTION OF HIGH- AND LOW-CONVENIENCE PRODUCTS



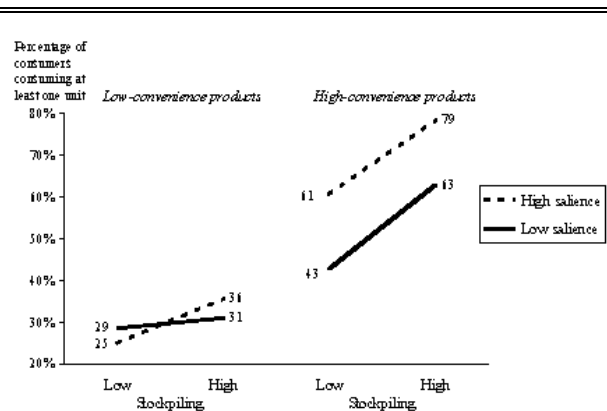
and convenience, we must analyze consumption incidence and consumption quantity separately.

Study 2: Consumption Incidence and Quantity for High- and Low-Convenience Products

The convenience-salience framework proposes that stockpiling increases consumption quantity (given incidence) for both high- and low-convenience products but that stockpiling increases consumption incidence only for high-convenience products (P_2). This argument is supported by the diminishing daily impact of stockpiling on high-convenience products (see Figure 2). For these products, the effect of stockpiling was strongest in the first few days after purchase, when stockpiled products are most salient. For low-convenience products, however, stockpiling increased consumption moderately throughout the period.

We further examined P_2 and P_3 by separately studying the effects of stockpiling and salience on consumption incidence and consumption quantity. As Table 3 shows, for high-convenience products, the effects of both stockpiling and salience on consumption incidence were positive and statistically significant. As is shown in Figure 3, stockpiling increased the percentage of households consuming at least one unit of the high-convenience product on the first day by 19% (from 52% to 71%), and salience increased this per-

Figure 3
STUDY 2: HOW STOCKPILING AND SALIENCE INFLUENCE THE CONSUMPTION INCIDENCE OF HIGH- AND LOW-CONVENIENCE PRODUCTS



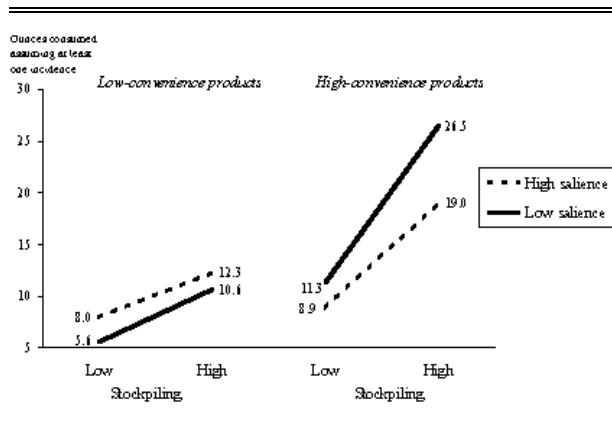
centage by 17% (from 53% to 70%).⁵ In contrast, stockpiling and salience had no effect on consumption incidence for low-convenience products. Stockpiling increased the percentage of households consuming at least one unit of the low-convenience products by only 7%, and salience increased the percentage of households by only 1%.

We then examined the effects of stockpiling and salience on consumption quantity (given incidence) by measuring the quantity (in ounces) consumed among households that consumed at least one unit of the product over the 12-day period. As Table 3 shows, stockpiling was the only statistically significant factor for both high- and low-convenience products. In Figure 4, stockpiling increased consumption quantity by 15.2 ounces (3.30 units) for high-convenience products and by 5.1 ounces (1.70 units) for low-convenience products.

Overall, Study 2 provides experimental evidence that stockpiling influences consumption and shows that the impact of stockpiling on consumption depends on the product's consumption convenience. On the one hand, stockpiling causes people to consume a greater quantity of both high- and low-convenience products if they have already decided to consume. On the other hand, stockpiling triggers and accelerates consumption incidence only for high-convenience products (P_2). This in turn explains why stockpiling increases total consumption more for high-convenience products than for low-convenience products (P_1). Study 2 also provides evidence that salience can trigger consumption incidence for high-convenience products. Laboratory studies are needed, however, to examine the mediating role of salience and test the internal validity of these findings with direct manipulations of convenience and salience.

⁵These results are replicated beyond the first day of consumption. Following Hutchinson, Raman, and Mantrala (1994), we measured consumption incidence latency as the inverse of the number of days until the first consumption incidence (a value of zero indicates no consumption during the period, and a high value indicates that the first consumption occurred quickly). We found that stockpiling and salience decrease consumption incidence latency for high-convenience products but not for low-convenience products (detailed results are available from the authors on request).

Figure 4
STUDY 2: HOW STOCKPILING AND SALIENCE INFLUENCE THE CONSUMPTION QUANTITY FOR HIGH- AND LOW-CONVENIENCE PRODUCTS



STUDY 3: A LABORATORY STUDY OF THE MEDIATING ROLE OF SALIENCE FOR HIGH-CONVENIENCE PRODUCTS

Study 3 examines whether the high salience of stockpiled products drives the consumption incidence of convenient products (P_3). In this study, we test this proposition using a laboratory setting that allows better control of inventory assortment, a different measure of consumption, and a less obtrusive manipulation of salience than the manipulation used in Study 2. Study 3 also extends the results of previous studies by examining how people make consumption decisions among alternatives that belong to the same product category.

Study 3: Design and Procedure

Study 3 used a 2 (low versus high stockpiling) \times 2 (control versus high salience) between-subjects design with eight within-subjects replications. Each replication consisted of two products being assigned to one of the four conditions according to a Latin-square design. At a major U.S. university, 102 undergraduate students participated in the experiment as part of a course requirement. Consumers were presented with a cover story on television programming and chose what they wanted to consume and in what quantity from a photograph of a set of eight different snack food products. What was of interest was how the stockpiling and salience of these products influenced what subjects intended to consume while watching television.

On the basis of three prestudies, the photograph of the two-shelf pantry showed 4 units (either bags or packs) of each of the four products in the low-stockpiling condition and 16 units of each of the four products in the high-stockpiling condition (80 units in total). To manipulate product salience, we placed the products in the high-salience condition on the top shelf (roughly at eye level) of a two-shelf pantry and spread them out on the shelf (thus maximizing product shelf facings). We placed the products in the control salience condition on the lower shelf in stacks. We used only snacks that were convenient to consume: Oreo Cookies, Chips Ahoy!, Quaker Chewy granola bars, M&M’s, Kit Kat, Herr’s Chips, Herr’s Pretzels, and Rice Krispies Treats. In

the pretest of category differences described previously, the mean score of these products was 5.8 of 7 on the convenience index, with little variation. Therefore, we can pool these results across products.

We told consumers that our purpose was to compare the grocery shopping and television watching habits of French and U.S. students. We asked them to imagine that they had given money to a friend to buy snack foods and drinks for a party. We then asked them to examine television listings for seven weekdays and indicate the programs they would like to watch each day. We also told them that they had snacks and drinks left over from the party, so they could consume them while watching television. A separate page included a high-quality color picture of a real pantry stocked with the eight products. After writing down the number of units (if any) of snacks and beverages they would like to eat and drink for each day, consumers sealed the questionnaire and the stimuli in an envelope. We then asked them to recreate a sketch of the pantry they had seen earlier and indicate the position and the number of units of each product at the beginning of the experiment. Finally, consumers answered questions about themselves and about the brands in the study.

Study 3: Manipulation Checks and Impact on Total Consumption

To determine whether the stockpiling and salience manipulation increased salience, we used an index created by averaging consumers’ agreement with two nine-point scale items: “I was always aware of the product during the study” and “This product was very visible on the shelf” (1 = “completely disagree” and 9 = “completely agree”). As expected, we found a statistically significant interaction between stockpiling and salience ($F_{1,397} = 4.4, p < .05$). Stockpiling increased perceived salience only when products were in the control salience condition on the bottom shelf (6.0 versus 4.8, $F_{1,197} = 18.3, p < .01$). When products were in the high-salience condition on the top shelf, they were always salient to the consumers, regardless of whether they were stockpiled (6.1 versus 6.0, $F_{1,198} = 1.7, p = .19$). The stockpiling manipulation was also successful because consumers correctly recalled that more units were available on the shelf for products in the high-stockpiling condition than for products in the low-stockpiling condition (9.2 versus 4.9 units, $F_{1,322} = 93.7, p < .01$). The stockpiling and salience manipulations did not influence the perceived purchase price, the expected replacement price, or the quality evaluations of the products. In summary, the procedure successfully created a setting in which the mediating role of salience could be tested.

We analyzed the data using the same procedure as in Study 2, in which stockpiling and salience were the independent variables and attitude toward the brand and toward dieting were covariates. Table 4 shows how stockpiling and salience influence total consumption, consumption incidence, and consumption quantity (given incidence) for the first decision and over the first three consecutive decisions. Table 5 provides the output of the logistic and ordinary least squares regressions. We did not analyze data for the remaining four decisions because of concerns regarding prediction biases after the first few instances (Kahneman and Snell 1992; Simonson 1990).

Table 4
STUDY 3: THE IMPACT OF STOCKPILING AND SALIENCE ON TOTAL CONSUMPTION, CONSUMPTION INCIDENCE, AND CONSUMPTION QUANTITY
(MEANS AND STANDARD DEVIATIONS)

	First Day			Three Days		
	Total Consumption (in Units)	Consumption Incidence (Percentage of Consumers)	Consumption Quantity (in Units)	Total Consumption (in Units)	Consumption Incidence (Percentage of Consumers)	Consumption Quantity (in Units)
<i>Control</i>						
Low stockpiling	.10 (.39)	.08 (.27)	1.25 (.71)	.46 (.90)	.29 (.46)	1.57 (1.01)
High stockpiling	.24 (.47)	.22 (.41)	1.09 (.29)	.82 (1.22)	.44 (.50)	1.87 (1.20)
<i>High Salience</i>						
Low stockpiling	.23 (.51)	.19 (.39)	1.21 (.42)	.62 (.86)	.42 (.50)	1.47 (.70)
High stockpiling	.27 (.66)	.19 (.39)	1.47 (.77)	.79 (1.10)	.47 (.50)	1.69 (1.03)

Table 5
STUDY 3: HOW STOCKPILING AND SALIENCE INFLUENCE TOTAL CONSUMPTION, CONSUMPTION INCIDENCE, AND CONSUMPTION QUANTITY
(UNSTANDARDIZED REGRESSION COEFFICIENTS AND STANDARD ERRORS)

	Total Consumption		Consumption Incidence		Consumption Quantity	
	B	S.E.	B	S.E.	B	S.E.
Stockpiled	.26**	.10	1.16**	.45	.27	.16
Salient	.07	.10	1.00*	.45	-.15	.16
Stockpiled × Salient	-.18	.20	-1.18*	.58	-.08	.32
Product Evaluation	.47**	.12	1.29**	.43	-.11	.26
Diet	.00	.02	.09	.05	-.03	.03
Intercept	.56	.058	-3.2	.46	1.69	.13
R ²	.06		.09		.03	

* $p < .05$.

** $p < .01$.

Notes: The dependent variable for total consumption is the number of units consumed over the first three days. Consumption incidence is measured by a binary variable indicating whether at least one unit was consumed during the first day. Consumption quantity is measured by the number of units consumed over the first three days among consumers who consumed at least one unit during this period. Simple coding (.5, -.5) is used for all binary variables. Product Evaluation measures the evaluation of the product, and Diet measures whether the subject was on a diet. For incidence, we report Nagelkerke's R-square. S.E.= standard error.

The results about the impact of stockpiling and salience on consumption replicate selected findings from Study 2 under more tightly controlled conditions. As Table 4 shows, stockpiling increased total unit consumption by 50% over the three-day period (from .54 to .81 units). As Table 5 shows, the simple effect of salience was not statistically significant (it increased consumption from .64 to .71 units). The interaction between salience and stockpiling was not significant but was in the expected direction (stockpiling increased consumption by .36 units in the control salience condition and by .18 units only in the high-salience condition). As in Study 2, however, examining only total consumption hides important disparities between consumption incidence and consumption quantity.

Study 3: Impact on Consumption Quantity and Incidence

As Table 4 shows, stockpiling increased the number of units consumed by consumers who had consumed at least one unit during the three-day period by .27 units. Salience

did not significantly increase consumption quantity (-.16 units). As Table 5 shows, none of the regression coefficients was statistically different from zero. Of particular note, the interaction between salience and stockpiling was not significant, indicating that product salience does not mediate the effect of stockpiling on consumption quantity.

In contrast, consumption incidence data showed a significant simple main effect for the stockpiling manipulation, the salience manipulation, and their interaction. As Table 4 shows, stockpiling increased the percentage of consumers who intended to consume at least one unit of the product from 8% to 22% in the control condition ($B = 1.2$, $Wald = 6.9$, $p < .01$). When product salience was kept at a high level, however, consumption incidence remained unchanged at 19% regardless of the quantity of products stockpiled ($B = -.01$, $Wald < .01$, $p = .97$).

We further tested the mediating role of salience by following Baron and Kenny's (1986) procedure. The manipulation checks mentioned previously showed that the salience

and stockpiling manipulations significantly increased perceived product salience. When perceived salience was included in the logistic regression of consumption incidence, its coefficient was statistically significant ($B = .33$, $Wald = 16.4$, $p < .01$), and the coefficients of all the other factors were reduced to only marginal significance levels (stockpiling: $B = .80$, $Wald = 3.0$, $p = .08$; salience: $B = .73$, $Wald = 2.5$, $p = .11$; their interaction: $B = -.94$, $Wald = 2.5$, $p = .11$). These results indicate that the higher salience of stockpiled products mediates, at least in part, the impact of stockpiling on consumption incidence for high-convenience products.

Overall, by manipulating product salience and stockpiling independently, Study 3 provides compelling support for P_3 . It shows that an important reason high-convenience products are more likely to be consumed when stockpiled is that stockpiling increases their salience at the point of consumption. When salience is held constant or perceived salience is accounted for, stockpiling has no effect on consumption incidence. That our manipulation of salience did not influence the perceived costs of consumption shows that these factors do not mediate the effect of stockpiling on consumption incidence. Study 3 also shows that the impact of stockpiling on consumption quantity (given incidence) is not mediated by product salience.

STUDY 4: A LABORATORY STUDY OF THE MODERATING ROLE OF CONVENIENCE

Studies 1 and 2 show that product convenience moderates the effect of stockpiling on consumption incidence. These studies also show that salience mediates the effect of stockpiling on consumption incidence only for high-convenience products. Study 4 reconsiders these issues in a laboratory setting, in which consumption convenience is manipulated rather than measured and salience is manipulated independently of stockpiling. Study 4 also examines how salience and convenience influence product awareness and consideration, which provides insights into how convenience moderates the impact of product salience on consumption.

Study 4: Design and Procedure

Study 4 used a 2 (high- versus low-convenience) \times 2 (high- versus low-salience) between-subjects design replicated across three different products: iced tea, pudding, and orange juice. Consumers were 153 undergraduate students who participated in the experiment for a course credit at University of Illinois. We told consumers that our study aimed to measure the differences in television viewing and snack consumption habits between U.S. and European consumers. After asking them to list their favorite television programs on the first page, the second page showed a high-quality representation of a typical kitchen, with schematic close-ups of a pantry and a refrigerator with four shelves and four products on each shelf. On the following page, we asked consumers to imagine that they had a five-minute commercial break during their favorite television program and that they could use it to choose something to eat and to drink from the products available in their kitchen. The short amount of time available raised the costs of consuming low-convenience products because their preparation would lead consumers to miss part of their favorite television program. Finally, we gave consumers a sketch representing the pantry

and refrigerator shown earlier, but without any products on it, and asked them to recall the placement of as many products as they could. Last, consumers answered various questions regarding their decision, the products, and themselves.

In the high-salience condition, target products were located in the middle of the pantry or refrigerator (depending on the product) and were identified with a black font on a light gray background. In the low-salience condition, these products were located at the bottom of the pantry or refrigerator with black font on a dark gray background. To minimize potential demand effects, four products were always salient in the pantry and refrigerator. These other salient products (vinegar, salad dressing, lettuce, and ketchup), similar to other products in the background, were only moderately appropriate for a student's snack. Stockpiling was kept constant at four units to avoid influencing salience. We manipulated consumption convenience by varying the amount of preparation required before the three products are consumed (iced tea, pudding, and orange juice). In the high-convenience condition, these products were described as "Lipton Refrigerated Ice Tea," "Jell-O Refrigerated Pudding," and "Kool-Aid Bursts Bottle." In the low-convenience condition, they were described as "Lipton Ice Tea Drink Mix," "Jell-O Cook & Serve Pudding Mix," and "Kool-Aid Drink Mix." Computer-generated schematic descriptions of products were used instead of photographs to prevent the two convenience formats from influencing salience.

Study 4: Analyses and Results

To minimize possible contamination of perceived product salience and convenience by consumption decisions, we verified the effectiveness of the salience and convenience manipulations by conducting two separate studies. To check the effectiveness of the salience manipulation, we asked 33 students to look at the stimuli without making consumption decisions. All products were in the high-convenience condition, half in the low-salience and half in the high-salience condition. We measured perceived salience by averaging responses on three nine-point scale items that measured the extent to which products were present, visible, and salient. All products were more salient in the high-salience condition than in the low-salience condition (on average, 4.2 versus 6.4, $F_{1,31} = 12.0$, $p < .01$). To check the effectiveness of the convenience manipulation, we asked 23 students to rate the product described in Study 4 on a convenience index created by averaging two seven-point scale items ("This product is convenient to consume" and "This product requires preparation time"). All products were rated as more convenient in the high-convenience condition than in the low-convenience condition (on average, 6.6 versus 3.2, $t = 6.7$, $p < .01$). Participants also rated high-convenience products as more appealing than low-convenience products (4.9 versus 3.9 on a seven-point scale, $t = 2.26$, $p < .05$).

As in previous studies, we analyzed the effect of salience and convenience on consumption incidence using a binary logistic regression with salience, convenience, and their interaction as independent variables. We also incorporated covariates that captured product differences and individual differences in involvement and product evaluation. As Table 6 shows, convenience increased the percentage of subjects who consumed at least one unit of the product from 29% to

Table 6
STUDY 4: HOW CONVENIENCE AND SALIENCE INFLUENCE CONSUMPTION INCIDENCE, POSTCONSUMPTION RECALL, AND CONSIDERATION AMONG PRODUCTS RECALLED
(MEANS AND STANDARD DEVIATIONS)

	Consumption Incidence (Percentage of Consumers)	Product Recall (Percentage of Consumers)	Consideration Given Recall (1 = "Completely Disagree," 9 = "Completely Agree")
<i>Low-Convenience Products</i>			
Low salience	.36 (.49)	.70 (.47)	7.13 (2.99)
High salience	.22 (.42)	.76 (.43)	6.00 (3.49)
<i>High-Convenience Products</i>			
Low salience	.42 (.50)	.74 (.45)	8.16 (2.10)
High salience	.52 (.51)	.89 (.32)	7.56 (2.69)

Notes: The number of observations per cell varies between 32 and 43 for consumption incidence and product recall and between 23 and 32 for consideration given recall.

47% ($B = 1.07$, $Wald = 6.5$, $p < .01$). Salience did not increase consumption incidence (39% versus 38% of consumers, $B = -.04$, $Wald < .1$, $p = .93$), but its interaction with convenience was statistically significant ($B = 1.62$, $Wald = 4.0$, $p < .05$). As predicted by P_3 , salience increased consumption incidence only in the high-convenience condition (from 42% to 52% of consumers). In the low-convenience condition, increasing salience decreased consumption incidence (from 36% to 22% of consumers).

To better understand why salient and convenient products were more likely to be consumed, we conducted exploratory analyses of the impact of the salience and convenience manipulations on product awareness and consideration. We expect that salience increases the chances that a product is included in the awareness set, whereas convenience increases the chances that a product in the awareness set is included in the consideration set. To measure awareness, we used the data on product recall that we obtained from the memory task. To measure product consideration, we measured consumers' agreement with the statement, "I considered choosing this product, even if only for an instant," on a nine-point scale.

We analyzed product recall data with the same binary logistic regression as for consumption incidence. As Table 6 shows, salience increased the percentage of consumers who recalled the target products from 72% to 82% ($B = .94$, $Wald = 3.96$, $p < .05$). The impact of convenience and its interaction with salience were not statistically significant. The salience manipulation therefore similarly increased awareness for convenient and inconvenient products. To study whether convenience and salience increase the chances that a product in the awareness set is considered, we analyzed consideration among products recalled using an analysis of covariance. Convenience was the only statistically significant variable. As Table 6 shows, the convenience manipulation increased consideration from 7.9 to 6.5 on a nine-point consideration scale, where 1 = "completely disagree" and 9 = "completely agree" ($F_{1,105} = 5.65$, $p < .05$).

Overall, Study 4 provides evidence supporting the internal validity of Study 2. It also confirms the results of Studies 2 and 3 in supporting P_3 . That is, raising salience

increases consumption incidence and the likelihood of consideration more when the product is convenient to consume than when it requires preparation. In addition, Study 4 shows that this interaction occurs because the higher awareness created by the product being salient translates into a higher likelihood of consideration only when the product is convenient to consume.

GENERAL DISCUSSION

In this research, we develop a framework of postpurchase consumption behavior, which we use to examine when and how exogenous product stockpiling increases the short-term rate of consumption. We ask two questions: (1) Are exogenously stockpiled products really consumed at a faster rate? and (2) How does stockpiling increase consumption rates for high-convenience and low-convenience products? We examine the first question with an analysis of household scanner data and by conducting a field experiment. We examine the second question with field and laboratory studies, with families and young adults, with multicategory and single-category choices, with retrospective and prospective measures of consumption, and with a total of 20 different products.

Findings from the field experiment and the scanner data study show that stockpiling indeed causes people to consume products at a faster rate. This suggests that the association between stockpiling and consumption shown in previous scanner data analyses (e.g., Ailawadi and Neslin 1998) is not simply caused by consumers endogenously stockpiling in anticipation of a higher demand for the product. Studies 1 and 2 also reveal that stockpiling increases the consumption rate of high-convenience products more than that of low-convenience products. This is because stockpiling increases consumption incidence only for high-convenience products (though it increases consumption quantity given incidence for both high- and low-convenience products). As is shown in Study 3, salience mediates the impact of stockpiling on consumption incidence. Stockpiling triggers consumption incidence only when it increases the salience of the product at the point of consumption. Finally, Study 4 shows how convenience moderates the effect of salience—

and therefore of stockpiling—on consumption incidence: The higher awareness caused by product stockpiling or point-of-consumption salience is more likely to trigger consideration when the product is convenient to consume than when it requires preparation.

Implications for Consumption Research

Ironically, the amount of research in consumer behavior that examines actual consumption—not purchase—behavior is small, given the name of the parent discipline. This research highlights the value of studying consumption behavior at the point of consumption as opposed to focusing only on purchase behavior at the point of purchase. Consumption decisions are influenced by factors that do not influence purchase decisions. Even the factors that may influence both purchase and consumption decisions (such as inventory level and consumption convenience) can have different weights for each decision because of learning (Simonson 1990), random variations over time (Walsh 1995), or different context effects (Gourville and Soman 1998). Understanding the determinants of consumption behavior helps illuminate some unresolved issues that are difficult to explain in the traditional fixed consumption model. For example, consumption acceleration due to promotional stockpiling can explain the absence of postpromotional “dips” (Neslin and Schneider 1996) and the lower-than-expected gains in sales attributable to everyday low prices (Hoch, Drèze, and Purk 1994).

Further research could study other possible antecedents of postpurchase consumption behavior, such as consumption frequency forecasts (Nunes 2000), social norms (Birch et al. 1987), or compulsion (Faber et al. 1995). These studies could also examine the interplay between the different antecedents of postpurchase consumption. For example, raising the salience of an expensive product could remind consumers how much they paid for it, thus reducing their temptation to consume it. A particularly fruitful area for research would be to study how consumers integrate expectations about future consumption when making purchase decisions. We expect that few consumers are able to optimize both decisions jointly, if only because they are unaware of what influences their consumption behavior. For example, consumers in Study 2 disagreed with the statements that “they were influenced by product inventory levels” ($m = 3.3$ on a nine-point scale, where 1 = “completely disagree” and 9 = “completely agree”), whereas our results indicate that stockpiling did increase consumption.

In this article, we have examined the moderating impact of only one product characteristic, consumption convenience. Certainly, the nature of the product (good versus service, hedonic versus utilitarian) or cultural norms also moderate the generalizability of these results. For example, our finding that stockpiling does not increase the consumption rate of noodles may not hold in Taiwan, where noodles are widely consumed as a snack. To explore the hypothesis that a product’s hedonic appeal may also moderate the impact of stockpiling (Rook 1997), we measured the hedonic value of the high- and low-convenience products used in Studies 2 and 4. We found that the two groups of products in Study 2 were perceived similarly in terms of hedonic value (4.5 versus 4.3 on Dhar and Wertenbroch’s [2000] seven-point scale, $F_{1,52} = .05$, $p = .83$). Similarly, the convenience manipulation did not influence the hedonic value of the products in

Study 4 (3.4 versus 3.7 on Dhar and Wertenbroch’s [2000] scale, $t = .9$, $p = .37$). To examine further the role of hedonic appeal, we asked 23 undergraduate students to evaluate yogurt and ketchup. We chose these products because Ailawadi and Neslin (1998) found a higher stockpiling-induced consumption increase for yogurt than for ketchup. Supporting the importance of product convenience, we found that, compared with ketchup, yogurt was perceived as “more convenient to consume” (6.3 versus 4.4 on the seven-point scale described in n. 5, $F_{1,22} = 40.0$, $p < .01$) but of similar hedonic value (4.8 versus 4.8 on Dhar and Wertenbroch’s [2000] scale, $F_{1,22} < .1$, $p = .9$).

This article examines only the short-term impact of stockpiling. It would also be useful to better understand when stockpiling stimulates long-term consumption and when it instead induces satiation or burnout. On the one hand, studies show that hunger is largely a psychological and sociological construct with few physiological constraints (Schachter and Gross 1968). On the other hand, the homeostasis principle suggests that short-term increases in the consumption of one product should be compensated for by decreases in the consumption of another product or in the future consumption of the same product (Inman 2001). Consistent with this is the finding in Study 2 that the upsurge in consumption due to stockpiling decreases over time.

Finally, more research is needed to examine the validity of the methods currently used for measuring consumption behavior. In this research, we inferred consumption by triangulating from a variety of sources: purchase quantity and timing (Study 1), memory (Study 2), and intentions (Studies 3 and 4). Each method has its benefits and limitations (see Menon 1993). Progress in research on consumption behavior will be further helped by the analysis of data provided by unobtrusive measures, such as in-home videorecording or garbology analysis (Cote, McCullough, and Reilly 1984).

Implications for Marketers

This research suggests that marketers could divert some of their expenditures from the cluttered points of purchase to the relatively uncluttered points of consumption. In particular, marketers should investigate promising ways to increase product salience at the point of consumption and to improve consumption convenience. Marketers can achieve both by using new and distinctive packaging or encouraging consumers to store products or memory cues (such as magnets) where they are visible. Our results also suggest that it might be easier to increase consumption rates by encouraging new consumers to start consuming the product or suggesting new consumption occasions to current consumers (Wansink and Ray 1996) rather than by trying to influence the quantity consumed on each consumption occasion.

Conversely, consumers or public health organizations trying to curb the consumption of harmful products could use opposite strategies to reduce the salience and convenience of these products. To reduce the salience of a product at the point of consumption, products and memory cues can be moved off the counter and stored in the basement. To reduce the convenience of consuming a product, consumers can store the ingredients required for its preparation (e.g., a bottle opener) in an inconvenient location. The most obvious implication—and a basic tenet of weight control plans—is to avoid stockpiling the product in the first place. Manufacturers that want to help consumers resist overconsumption

could do so by increasing the complexity and number of operations required for consumption or by repackaging the product in inconvenient-sized portions.

This research has implications for the current debate on the value of stockpiling-inducing marketing activities, such as sales promotions, multiple-unit pricing, or purchase quantity limits (Wansink, Kent, and Hoch 1998). Our findings that stockpiling can increase the short-term rate of consumption support other studies that show that sales promotions are not always a zero-sum game (Chandon, Wansink, and Laurent 2000). In addition, our findings warrant reconsideration of the traditional characterization of sales promotions as a symmetric prisoner's dilemma: Convenient brands or products will benefit disproportionately more from stockpiling than will less convenient brands.

Finally, the literature on sales promotions suggests that encouraging product stockpiling is a means to reduce storage costs, price discriminate, or impair the launch of competing products (Blattberg, Eppen, and Lieberman 1981; Jeuland and Narasimhan 1985; Robertson, Eliashberg, and Rymon 1995). Our findings suggest that these roles could be revisited and perhaps expanded to account for the effect of stockpiling on postpurchase consumption. For example, manufacturers could use sales promotions to create "visual equity" (incremental brand consideration triggered by visual attention) at the point of consumption as well as at the point of purchase (Chandon, Hutchinson, and Young 2001). These promotional packs or "buy one get one free" offers would be particularly appealing to retailers, because they increase not only the short-term sales of the promoted brands but also total category consumption.

REFERENCES

- Ailawadi, Kusum and Scott A. Neslin (1998), "The Effect of Promotion on Consumption: Buying More and Consuming It Faster," *Journal of Marketing Research*, 35 (August), 390-98.
- Alba, Joseph W., J. Wesley Hutchinson, and John G. Lynch Jr. (1991), "Memory and Decision Making," in *Handbook of Consumer Behavior*, T.S. Robertson and H.H. Kassirjian, eds. Englewood Cliffs, NJ: Prentice-Hall, 1-49.
- Assunção, Joao and Robert J. Meyer (1993), "The Rational Effect of Price Promotions on Sales and Consumption," *Management Science*, 39 (5), 517-35.
- Baron, Reuben M. and David A. Kenny (1986), "The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations," *Journal of Personality & Social Psychology*, 51 (6), 1173-82.
- Bell, David R., Jeongwen Chiang, and V. Padmanabhan (1999), "The Decomposition of Promotional Response: An Empirical Generalization," *Marketing Science*, 18 (4), 504-26.
- Birch, Leann Lipps, Linda McPhee, B.C. Shoba, Lois Steinberg, and Ruth Krehbiel (1987), "'Clean Up Your Plate': Effects of Child Feeding Practices on the Conditioning of Meal Size," *Learning and Motivation*, 18 (3), 301-17.
- Blattberg, Robert C., Gary D. Eppen, and Joshua Lieberman (1981), "A Theoretical and Empirical Evaluation of Price Deals for Consumer Nondurables," *Journal of Marketing*, 45 (Winter), 116-29.
- and Scott A. Neslin (1990), *Sales Promotion: Concepts, Methods, and Strategies*. Englewood Cliffs, NJ: Prentice Hall.
- Chandon, Pierre, J. Wesley Hutchinson, and Scott Young (2001), "Measuring the Value of Point-of-Purchase Marketing with Commercial Eye-Tracking Data," working paper No. 2001/19/MKT, Department of Marketing, INSEAD.
- , Brian Wansink, and Gilles Laurent (2000), "A Benefit Congruency Framework of Sales Promotion Effectiveness," *Journal of Marketing*, 64 (October), 65-81.
- Cote, Joseph A., James McCullough, and Michael Reilly (1984), "Effects of Unexpected Situations on Behavior-Intention Differences: A Garbology Analysis," *Journal of Consumer Research*, 12 (September), 188-94.
- Dhar, Ravi and Klaus Werthenbroch (2000), "Consumer Choice Between Hedonic and Utilitarian Goods," *Journal of Marketing Research*, 37 (February), 60-71.
- Faber, Ronald J., Gary A. Christenson, Martina DeZwaan, and James Mitchell (1995), "Two Forms of Compulsive Consumption: Comorbidity of Compulsive Buying and Binge Eating," *Journal of Consumer Research*, 22 (December), 296-304.
- Folkes, Valerie S., Ingrid M. Martin, and Kamal Gupta (1993), "When to Say When: Effects of Supply on Usage," *Journal of Consumer Research*, 20 (December), 467-77.
- Gehrt, Kenneth C. and Laura J. Yale (1993), "The Dimensionality of the Convenience Phenomenon: A Qualitative Reexamination," *Journal of Business and Psychology*, 20 (Winter), 163-80.
- Gourville, John T. and Dilip Soman (1998), "Payment Depreciation: The Behavioral Effects of Temporally Separating Payments from Consumption," *Journal of Consumer Research*, 25 (2), 160-74.
- Gupta, Sunil (1988), "Impact of Sales Promotions on When, What, and How Much to Buy," *Journal of Marketing Research*, 25 (November), 342-55.
- Hoch, Stephen J., Xavier Drèze, and Mary Purk (1994), "EDLP, Hi-Lo, and Margin Arithmetic," *Journal of Marketing*, 58 (October), 16-27.
- and George F. Loewenstein (1991), "Time-Inconsistent Preferences and Consumer Self-Control," *Journal of Consumer Research*, 17 (4), 492-507.
- Hutchinson, J. Wesley, Kalyan Raman, and Murali K. Mantrala (1994), "Finding Choice Alternatives in Memory: Probability Model of Brand Name Recall," *Journal of Marketing Research*, 31 (November), 441-61.
- Inman, J. Jeffrey (2001), "The Role of Sensory-Specific Satiety in Attribute-Level Variety Seeking," *Journal of Consumer Research*, 28 (1), 105-20.
- Jeuland, Abel P. and Chakravarthi Narasimhan (1985), "Dealing—Temporary Price Cuts—by Seller as a Buyer Discrimination Mechanism," *Journal of Business*, 58 (3), 295-308.
- Kahneman, Daniel and Jackie Snell (1992), "Predicting a Changing Taste: Do People Know What They Will Like?" *Journal of Behavioral Decision Making*, 5 (3), 183-200.
- Krishna, Aradhna (1994a), "The Effect of Deal Knowledge on Consumer Purchase Behavior," *Journal of Marketing Research*, 31 (February), 76-91.
- (1994b), "The Impact of Dealing Patterns on Purchase Behavior," *Marketing Science*, 13 (4), 351-73.
- Menon, Geeta (1993), "The Effects of Accessibility of Information in Memory on Judgments of Behavioral Frequencies," *Journal of Consumer Research*, 20 (December), 431-40.
- Nedungadi, Prakash (1990), "Recall and Consumer Consideration Sets: Influencing Choice Without Altering Brand Evaluations," *Journal of Consumer Research*, 17 (December), 263-76.
- Neslin, Scott A., Caroline Henderson, and John Quelch (1985), "Consumer Promotions and the Acceleration of Product Purchases," *Marketing Science*, 4 (Spring), 147-65.
- and Linda G. Schneider (1996), "Consumer Inventory Sensitivity and the Post-Promotion 'Dip,'" *Marketing Letters*, 7 (January), 77-94.
- Nijs, Vincent R., Marnik G. Dekimpe, Jan-Benedict E.M. Steenkamp, and Dominique Hanssens (2001), "The Category Demand Effects of Price Promotions," *Marketing Science*, 20 (1), 1-22.

- Nunes, Joseph C. (2000), "A Cognitive Model of People's Usage Estimations," *Journal of Marketing Research*, 37 (November), 397–409.
- Prelec, Drazen and George Loewenstein (1998), "The Red and the Black: Mental Accounting of Savings and Debt," *Marketing Science*, 17 (1), 4–28.
- Raghubir, Priya and Aradhna Krishna (1999), "Vital Dimensions in Volume Perception: Can the Eye Fool the Stomach?" *Journal of Marketing Research*, 36 (August), 313–26.
- Reilly, Michael (1982), "Working Wives and Convenience Consumption," *Journal of Consumer Research*, 8 (March), 407–18.
- Robertson, Thomas, Jehoshua Eliashberg, and Talia Rymon (1995), "New Product Announcement Signals and Incumbent Reactions," *Journal of Marketing*, 59 (July), 1–15.
- Rook, Dennis W. (1987), "The Buying Impulse," *Journal of Consumer Research*, 14 (September), 189–99.
- Schachter, Stanley and Louis Gross (1968), "Manipulated Time and Eating Behavior," *Journal of Personality and Social Psychology*, 10, 98–106.
- Simonson, Itamar (1990), "The Effects of Purchase Quantity and Timing on Variety Seeking Behavior," *Journal of Marketing Research*, 27 (May), 150–62.
- Soman, Dilip and John T. Gourville (2001), "Transaction Decoupling: How Price Bundling Affects the Decision to Consume," *Journal of Marketing Research*, 38 (February), 30–45.
- Sudman, Seymour and Brian Wansink (2002), *Consumer Panels*, 2d ed. Chicago: American Marketing Association.
- Thaler, Richard H. (1985), "Mental Accounting and Consumer Choice," *Marketing Science*, 4 (3), 199–214.
- Walsh, John W. (1995), "Flexibility in Consumer Purchasing for Uncertain Future Tastes," *Marketing Science*, 14 (2), 148–65.
- Wansink, Brian (1994a), "Advertising's Impact on Category Substitution," *Journal of Marketing Research*, 31 (November), 95–105.
- (1994b), "Antecedents and Mediators of Eating Bouts," *Family and Consumer Sciences Research Journal*, 23 (2), 166–82.
- (1996), "Does Package Size Accelerate Usage Volume?" *Journal of Marketing*, 60 (July), 1–14.
- , S. Adam Brasel, and Steven J. Amjeb (2000), "The Mystery of the Cabinet Castaways: Why We Buy Products We Never Use," *Journal of Family and Consumer Science*, 91 (1), 93–99.
- and Rohit Deshpande (1994), "Out of Sight, Out of Mind: Pantry Stockpiling and Brand-Usage Frequency," *Marketing Letters*, 5 (1), 91–100.
- , Robert J. Kent, and Stephen J. Hoch (1998), "An Anchoring and Adjustment Model of Purchase Quantity Decisions," *Journal of Marketing Research*, 35 (February), 71–81.
- and Michael L. Ray (1996), "Advertising Strategies to Increase Usage Frequency," *Journal of Marketing*, 60 (January), 31–46.
- Wertenbroch, Klaus (1998), "Consumption Self-Control via Purchase Quantity Rationing," *Marketing Science*, 17 (4), 317–37.
- Winer, Russell S. (1980), "A Longitudinal Model to Decompose the Effects of an Advertising Stimulus on Family Consumption," *Management Science*, 26 (1), 78–85.

