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The Effects of Situational Factors on In-Store Grocery Shopping Behavior: The Role of Store Environment and Time Available for Shopping

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We conducted a field experiment to explore the effects of two situational factors, store knowledge and time available for shopping, on consumers' grocery shopping behavior. The results indicate that these two factors have an impact on such shopping behaviors as failure to make the intended purchases, unplanned buying, brand and product class switching, and purchase volume deliberation. The findings also suggest that the information processing activities that mediate these relationships differ across shopping conditions. Implications for managing the grocery store environment that may advance current practice are offered.

Grocery shopping constitutes an essential and routine type of consumer behavior. Unlike most consumer buying contexts, the grocery shopping experience is characterized by (1) multiple buying goals that must be achieved through the processing of a complex array of in-store stimuli such as products, brands, and point-of-purchase information, and (2) repetition at regular time intervals (e.g., once a week). These conditions create a unique context in which purchase intentions and outcomes often differ depending on a variety of situational factors.

Research on in-store consumer behavior has focused primarily on the effects of in-store display arrangements on such purchase outcomes as sales and brand switching (Harris 1958; McClure and West 1969). A related, yet different, stream of research has

focused on factors that explain unplanned buying, such as shelf configurations (Cox 1964), the type of store and product (West 1951), the amount and frequency of purchase, and consumer demographic characteristics (Kollat and Willett 1967). Recent research has considered the extent of in-store information processing and decision making (Dickson and Sawyer 1986; Hoyer 1984). All three research streams are characterized by considerable across-product variation in the effects of their respective independent variables on the dependent variable of interest.

This study differs from previous research in two fundamental ways. First, it considers the effects of two global situational factors—store knowledge and time available for shopping—on differences between purchase intentions and outcomes (i.e., failure to make intended purchases, unplanned buying, and brand/product class switching) and on the amount of in-store purchase volume deliberation. The two situational variables were selected because consumers frequently encounter them and because there is ample reason to believe that their joint effects influence in-store decision making processes and outcomes. The dependent variables related to differences in purchase intentions and outcomes were chosen to provide a basis for clarifying and extending the findings of research on grocery shopping behavior. Kollat and Willett's (1967) findings indicate that approximately one-half of all grocery purchases are unplanned, and the present study attempts to explain when, why, and

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how such behavior occurs. The dependent variable, purchase volume deliberation, was also included because of its relevance to the two situational variables considered and because this type of decision has received limited attention.

Second, as pointed out by Alba and Hutchinson (1987), a paucity of research exists that has explored the processes underlying differences between purchase intentions and outcomes. Through the use of behavioral and verbal protocol data, this study examines not only the extent of such differences (which have been partially considered in past research), but also attempts to explain the processes that underlie them.

HYPOTHESES DEVELOPMENT

The term "knowledge" may be understood according to its nature (see Anderson 1983, p. 345, for the distinction between declarative and procedural knowledge) and/or its origin (see Park and Lessig 1981 and Brucks 1985 for the distinction between objective and subjective knowledge). In this study, the first situational variable, store knowledge, is operationalized to include these different aspects of knowledge. Store knowledge is defined as the information consumers have about a specific store's layout and floor configurations, including locations of products and brands, based on repetitive shopping experiences in that store.

The second situational variable, time available for shopping, one of the more pervasive factors that affect consumer behavior in general (Belk 1975; Payne, Bettman, and Johnson 1987; Wright 1974), is defined by consumers' perceptions of the time required to perform the intended shopping tasks relative to the actual time available to perform such tasks.

The two situational variables affect in-store decision making in various ways. Store knowledge determines the extent to which product and brand search is guided by internal or external memory (Bettman 1979). When consumers shop in a familiar store, search is guided primarily by internal memory that requires minimal effort and thus facilitates the performance of in-store decision making activities (e.g., making brand or product comparisons) that go beyond product and brand search (Alba and Hutchinson 1987). In contrast, when consumers have little knowledge of a store's layout, search activities must be guided by external memory (e.g., in-store information displays) that requires considerable effort. This in turn reduces a consumer's ability to perform other in-store decision making activities.

The amount of time available for shopping affects in-store decision making in two ways. First, the sheer limitation of time restricts the extent to which consumers can process in-store information. Second, time pressure increases the level of arousal or stress

(Isenberg 1981; Revelle, Amaral, and Turriff 1976), which in turn interferes with the retrieval of memory that is not well rehearsed (Bettman 1979; Eysenck 1976; Swensson 1972). As will be discussed, in-store decision making activities other than those related to product/brand search often require retrieval of not well rehearsed memory (e.g., recall of product inventory levels at home).

In the remainder of this section, we focus on the effects of these two situational factors on in-store information processing and on the following shopping behaviors: the incidence of failure to make the intended purchases, the level of unplanned buying, the level of brand/product class switching, and the extent of purchase volume deliberation. The hypotheses and supporting justifications are summarized in Table 1.

Failure to Make the Intended Purchases

One way for consumers to cope with the stress caused by time pressure is to make a trade-off between speed and accuracy (Isenberg 1981; Swensson 1972). Speedy and insufficient search is in turn expected to lead to inaccurate conclusions about the availability of a product and to thus cause consumers to give up many of their product purchase plans. The adverse effects of time pressure on the retrieval of not well rehearsed memory also is expected to contribute to consumers' failure to make intended purchases. For example, consumers may have more difficulty recalling buying plans for nonstaple items (e.g., vitamins, desserts) that are purchased less frequently than staple items (e.g., bread, milk). This is supported by Kollat and Willett (1976) who found that consumers fail less in reporting their buying plans for staple than for nonstaple items.

The debilitating effects of time pressure on the ability to engage in thorough product/brand search and on the retrieval of not well rehearsed memory should be stronger when consumers shop in an unfamiliar store than in a familiar store. By increasing the time required to locate products and brands, an unfamiliar store configuration heightens time pressure, which in turn further discourages search and hampers retrieval of not well rehearsed memory.

- H1:** Failure to purchase products that the consumer intended to purchase is higher when subjects shop under conditions of low store knowledge and time pressure than when they shop under any other conditions.

Unplanned Buying

Unplanned buying is defined as the purchase of a product that was not planned prior to entering the store. In the context of this study, unplanned buying does not necessarily refer to the purchase of products

TABLE 1
SUMMARY OF HYPOTHESES AND CORRESPONDING SHOPPING CONDITIONS

Shopping behaviors	Situation where it occurs most frequently	Justifications
Hypothesis 1: Failure to purchase the products intended	Unfamiliar store/time pressure	Search based on external memory is hampered by time pressure leading to a trade-off between speed and accuracy. Retrieval of not well rehearsed memory is impeded.
Hypothesis 2: Unplanned buying	Unfamiliar store/no time pressure	Reliance on external memory for product search with no time constraint increases exposure to and processing of in-store stimuli as well as retrieval of memory. This, in turn, increases the likelihood that (1) previously unretrieved needs will be recognized, and (2) unrecognized needs will be made salient.
Hypothesis 3a: Brand/product switching due to difficulty in locating desired brands/products.	Unfamiliar store/time pressure	Brand/product search is guided by external memory which, in turn, increases search efforts. Time pressure does not, however, allow such prolonged search for desired brands/products.
Hypothesis 3b: Brand/product switching due to brand/product comparisons.	Familiar store/no time pressure	Brand/product search is guided by internal memory, thus increase cognitive resources available for brand/product comparisons. Absence of time pressure further facilitates performance of these tasks.
Hypothesis 4: Purchase volume deliberation	Familiar store/no time pressure	Brand/product search is guided by internal memory, thus increasing cognitive resources available for purchases volume deliberation. Absence of time pressure further facilitates performance of these tasks.

to satisfy needs that were recognized but unretrieved at the time the purchase plan was developed. Rather, it extends to the purchase of products to satisfy needs that were unrecognized at the time the purchase plan was developed.

As indicated earlier, absence of knowledge about a store's environment (its layout) generates greater reliance on in-store information and displays to identify product and brand locations than is the case when consumers have knowledge of a store's layout. Increased exposure to in-store stimuli in turn increases the likelihood that previously recognized but unretrieved needs will be cued (exposure effects). Further, reliance on external sources of memory also increases the likelihood that consumers will encounter information that will change the salience of certain unrecognized needs (e.g., when consumers are exposed to sales prices, new package sizes, and so on).

The degree to which knowledge of a store's environment affects unplanned buying, however, is expected to vary depending on the time available for shopping. Specifically, the presence of time pressure is expected to partially offset the positive effect of low store knowledge on unplanned buying for three reasons. First, unplanned buying due to exposure effects will be reduced due to reduced levels of exposure to in-store information. Second, time pressure may limit the time required for consumers to properly process in-store product information (e.g., sales, new product ingredients, new package designs, and so on) that may cause changes in the salience of previously unrecognized

needs. Third, time pressure tends to hinder retrieval of information that is not well rehearsed but that, if retrieved, may cause changes in the salience of previously unrecognized needs (e.g., current inventory levels at home, future family consumption needs, and so on).

Absence of time pressure does not, however, interfere with (1) exposure to and processing of in-store information, and (2) retrieval of not well rehearsed information that may change the salience of previously unrecognized needs. These effects are expected to increase levels of unplanned buying.

H2: The incidence of unplanned purchases is higher when subjects shop under conditions of low store knowledge and no time pressure than when they shop under any other conditions.

Brand/Product Class Switching

In this study, brand/product switching is defined as the in-store decision to select a brand/product that differs from the brand/product initially planned.¹ Two circumstances that promote brand/product

¹Brand and product switching refers to buying other brands and product classes, respectively, that were not initially considered at the time of search in the store. Therefore, product switching automatically involves unplanned purchase. However, not all unplanned purchases are due to product switching.

switching are explored. The likelihood of each of these circumstances arising should depend, in part, on the two situational variables considered in this study.

The first circumstance, when consumers are unable to locate their preferred brands/products, should be prevalent when consumers do not have knowledge of a store's layout and are under time pressure. The unfamiliar store environment is expected to increase the difficulty of locating preferred brands/products, while time pressure is expected to influence the consumer to switch to other brands or product classes rather than engage in extensive search for the preferred brands/products.

The frequency of the second circumstance, when consumers actively engage in specific brand/product comparisons based on salient product information (e.g., price, attributes, package size, and so on), is expected to be high particularly when consumers' cognitive resources are not strained and sufficient processing time is available for comparisons. Such would be the case for consumers shopping under conditions of high store knowledge and no time pressure.

Because the relative frequency of brand/product switching under the two different circumstances is difficult to predict a priori, no prediction is attempted concerning the shopping condition in which consumers will reveal the highest level of brand/product switching. Instead, predictions are made regarding the shopping conditions in which switching would occur most frequently due to each of the aforementioned circumstances.

H3a: Brand/product switching due to difficulty in locating preferred brands/products occurs most frequently when subjects shop in the low store knowledge and time pressure condition; and

H3b: Brand/product switching due to specific brand/product comparisons occurs most frequently when subjects shop in the condition of high store knowledge and no time pressure.

Purchase Volume Deliberation

Consumers often may not make purchase volume decisions prior to entering a store (Spiggle 1986) and so must retrieve and reconstruct relevant internal memory (e.g., levels of inventory of specific products at home, expected future need for a product, storage space available, and so on) to make these decisions while shopping. This type of memory, however, is not expected to be well rehearsed because it is neither constant over time nor repetitively retrieved. Thus, this type of internal memory retrieval is expected to be hampered by time pressure. Further, sheer limita-

tion of time also may discourage consumers from engaging in careful purchase volume deliberation.

Active purchase volume deliberation under the no time pressure condition may be further moderated by the level of store knowledge. The amount of time and effort devoted to locating products and brands by consumers who shop in a familiar store would be considerably lower than by those in an unfamiliar store. The allocation of a lower level of cognitive resources to search activities in turn increases the consumer's ability to perform other in-store decision making tasks such as those related to purchase volume.

H4: Purchase volume deliberation is higher when subjects shop under the high store knowledge and no time pressure condition than under any other conditions.

METHODOLOGY

Design

Data for the present study were gathered through a controlled field experiment. A 2×2 between-subject factorial design was used in which subjects were assigned randomly to the four treatment conditions. Time available for shopping was treated as either no time pressure (no TP) or as time pressure (TP), and knowledge of store layout was treated as either low store knowledge (low SK) or high store knowledge (high SK).

Subjects

The subjects who participated in the experiment were selected from a consumer panel affiliated with a large Eastern urban university. Members of the panel initially were selected based on a random probability sample of the local population. The selection of 68 subjects (53 females and 15 males) from the panel was based primarily on the extent to which each was responsible for grocery shopping in his or her household. Subjects' average age was 40 and their average household income was \$29,000 (in 1982). They were informed that they would be participating in a study on consumer shopping activities. In accordance with an incentive system established by the university that maintains the consumer panel, subjects were awarded approximately \$5 worth of points and \$10 for participating in the study.

Data from seven of the 68 subjects were not included in the analysis due to transcription problems of verbal protocols. The distribution of subjects across the four shopping conditions was 19 for the low SK/no TP condition, 13 for high SK/no TP, 15 for low SK/TP, and 14 for high SK/TP.

Manipulation of Shopping Situations

All subjects who participated in the present study frequented at least one of four major grocery chains.

Subjects were asked to name the grocery store in which they shopped most frequently for replenishment shopping. The low store knowledge condition was created by assigning subjects to stores in which they previously had not shopped. The stores to which low knowledge subjects were assigned, however, belonged to the same chain as their favorite stores. Since stores belonging to each chain maintained the same merchandising policies, this method of manipulation made it possible to control for other factors (e.g., unavailability of store brands, differences in pricing and other sales promotion policies, including coupon redemptions) that might confound subjects' shopping behavior.

However, stores within each chain revealed considerable variation among themselves regarding their layout and product arrangements because of differences in the stores' physical size and space configurations. Based on a pilot study using four subjects (two subjects in each store knowledge condition), these differences, although probably not as drastic as those observed between stores in different chains, were judged to be high enough to shed light on the effect of store layout familiarity on consumers' grocery shopping behavior.

To create the time pressure condition, subjects were asked to provide an estimate of how much time they would require to purchase the intended products. Estimated shopping time was defined as the time that elapsed between entering the store and reaching the checkout line. For subjects under the time pressure condition, the interviewer provided a revised estimate of one-half the required time initially estimated by the subject. This mode of manipulation of time pressure was chosen based on an earlier pilot study of four subjects (two in each time available for shopping condition).

Experimental Procedure

Subjects provided the approximate time of their next regular grocery shopping trip (i.e., a major replenishment trip). The initial shopping time was confirmed early on the day of the experiment and interviewers provided subjects' transportation to the store. Before departing to the store, measures of subjects' purchase plans were obtained following the same procedure as that used by Kollat and Willett (1967).² This information was used to identify the incidence of both unplanned purchasing and failure to purchase intended products. Throughout this procedure, sub-

jects were kept unaware of the experimental manipulations. Only after obtaining subjects' shopping intentions and information necessary for assigning them to experimental conditions were subjects told where they would shop and how much time they would be allowed for shopping.

Subjects were asked to verbalize their thoughts and to describe their actions while they shopped. Their statements were recorded using a microcassette recorder attached to the shopper's cart and a small microphone clipped to the subject's clothing.³ The interviewer accompanied the subject at a discreet distance (approximately three to four feet away) that allowed the subject to talk freely but not feel alone while talking. While subjects shopped, their frequency of back tracking (revisiting an aisle for product/brand search) was also noted. This measure was used to serve the manipulation check for the level of store knowledge.

Interviewers recorded the beginning and ending times of the shopping trip. At the completion of the trip, subjects were asked to respond to a series of scaled questions regarding the amount of time pressure they felt, their level of knowledge about the store layout, and the extent to which they were comfortable verbalizing their thoughts while shopping. Finally, to allow for the identification of unplanned purchases and items that were planned but not purchased, interviewers recorded the items that were in the shopping cart at the conclusion of the trip. When subjects deviated from the shopping plan by purchasing a product from the same class as that which was planned, it was treated as a planned purchase (e.g., lasagna noodles for spaghetti noodles).

After the task was completed, subjects who were under time pressure or low store knowledge conditions were offered extra time to go on their own to make additions to or deletions from the items actually purchased. No record was maintained of these changes because subjects were left alone during this period. Only four subjects exercised this option.

Protocol Coding

The five broad categories and their respective subcategories (see the Appendix) used for protocol coding were developed based on the variables relevant to the present study and considerations that have been discussed in previous information processing studies (e.g., Bettman and Park 1980; Biehal and Chakravarti 1982). Particular attention was devoted to (1) definition of the relevant coding unit, (2) ensuring that the

²This measure did not include brand purchase intentions. Specific brand purchase intentions could not be obtained from subjects for a variety of reasons (e.g., recall difficulty, multiple brand considerations). As will be elaborated in the results section, protocol data were used instead to obtain information about the subjects' brand purchase intentions.

³At the end of the shopping task, subjects were asked to rate the degree to which they felt comfortable executing the task while simultaneously verbalizing their behavior. The mean score on a seven-point scale was 2.39 (where 1 = extremely comfortable), which indicates little discomfort with the task.

coding categories were independent, and (3) the development of rules for multiple coding of particular statements. The following statement provides an illustration of the protocol coding procedure: "Let's see. Here are the chips. I will skip them. Wait a minute. Oh! The Lays potato chips are on sale—I will get a bag." Three coding units were assigned to these statements: one to the in-store processing category (1.1 for "Here are the chips"), one to the unplanned buying category (4.1.1 based on price), and one to the other category (5) to account for a reversal in the buying decision ("I will skip them" to "I will get a bag").

After establishing decision rules for protocol coding based on training sessions using five subjects, two coders (one of whom was blind to both treatment conditions and hypotheses) independently coded the remaining protocols. Overall intercoder reliability was 76 percent with 71 percent of the disagreement observed at the broad category level and 29 percent at the subcategory level.⁴ Disagreements were resolved through discussion and mutual agreement.

RESULTS

Manipulation Checks

As suggested by Belk (1975) and Kakkar and Lutz (1976), the two situational factors were manipulated based on objective and psychological criteria. Specifically, the situations in this study were created using objective features (placing subjects in their usual store versus a store in which they have never shopped, and reducing the time available to shop by one-half of that required to make the purchases intended) that resulted in the desired psychological conditions among subjects (perceptions of high/low store knowledge and the presence/absence of time pressure).

Time Pressure Treatment. The actual time taken for completing the shopping trip was recorded to the nearest minute. The difference in the mean times of the no time pressure and the time pressure group (31.11 minutes and 13.57 minutes, respectively) is significant ($F(1,57) = 55.29; p < 0.001$). After completing the shopping trip, subjects rated on a seven-point scale ranging from "none at all" to "very high" the amount of pressure they felt while shopping. The difference between the two group means of 1.37 and 5.91 on this perceptual measure was significant ($F(1,57) = 250.48; p < 0.001$).

Knowledge of Store Environment. Subjects were asked to estimate, using a 12-point scale (where 1 represented "none" and 12 represented more than 300 times), the number of times they shopped in the store chosen for the experimental task. The high store

knowledge group had a mean score of 8.84, whereas the low store knowledge group had a mean score of zero. After the shopping trip, subjects indicated the amount of store layout knowledge they felt they had at the beginning of the trip using a seven-point "none at all" to "very high" scale. The mean perceived prior knowledge scores for the two groups (1.67 and 6.06, respectively) were significant ($F(1,57) = 179.24; p < 0.001$). Additionally, a behavioral measure, frequency of back tracking, also indicated that store layout knowledge had been successfully manipulated. Subjects in the low store knowledge group engaged in back tracking an average of 6.19 times compared to 3.69 times by subjects in the high store knowledge group ($F(1,57) = 7.56; p < 0.01$).

Hypothesis Testing

Planned comparison tests in which the predicted cell mean was compared to the mean of the remaining three cells were used to test all hypotheses. The dependent variables used in testing Hypotheses 1 and 2 were comprised of behavioral measures (differences between purchase intentions and actual outcomes). Protocol data provided a process explanation for observed variations among the four groups. The dependent variables used in testing Hypotheses 3 and 4 were derived from the protocol data. To control for differences in subjects' verbal abilities, whenever appropriate, variables based on protocol data were standardized by the number of coding units (i.e., coded statements).⁵ Additionally, because the standardized values were often considerably less than 1.0, they were multiplied by a constant (100) to provide information that may be lost in truncation.

Hypothesis 1. This hypothesis predicts the highest frequency of failure to make intended purchases under the condition of low store knowledge and time pressure. The dependent variable used to test this hypothesis consisted of the number of products that were on the subjects' initial shopping plans but were not purchased. The results (see Table 2) show that low SK/TP condition subjects ($\bar{X} = 3.74$) experienced the highest failure rate among the four conditions (mean of the other three conditions: $\bar{X} = 1.98$; $F(1,57) = 7.14; p < 0.01$), thus supporting Hypothesis 1. However, a careful examination of the mean values (see Table 2) reveals that high SK/TP condition subjects also had a relatively high failure rate ($\bar{X} = 3.21$). Thus, time pressure appears to have been the primary cause of failure to buy the products intended.

Due to the debilitating effects of time pressure on product search and on retrieval of the initial shopping

⁴The intercoder reliability was increased to 82 percent when the categories that were not used for the analyses were excluded.

⁵The results for the four hypotheses did not change when standardization was based on the number of products purchased rather than the number of statements.

TABLE 2
RESULTS FOR HYPOTHESIS TESTING

Hypothesis	Four shopping conditions (mean values) ^a				F ^b
	Low SK/No TP	High SK/No TP	Low SK/TP	High SK/TP	
H1: Failure to purchase products intended	1.63	1.15	3.74 ^d	3.21	7.14 ^a
H1-related: Decision not to buy due to search difficulty	1.88	1.63	3.08 ^d	2.22	2.81 ^a
H2: Unplanned Buying	7.68 ^d	3.62	2.13	2.29	12.03 ^a
H2-related: Amount of in-store information processing	12.53 ^d	8.69	9.07	6.50	4.03 ^f
H3a: Brand switching due to search difficulty ^c	0.41	0.42	0.75 ^d	0.44	4.94 ^f
H3b: Brand switching due to brand comparison ^c	0.59	0.58 ^d	0.25	0.56	.95
H4: Purchase volume deliberation	4.15	6.10 ^d	2.46	3.81	4.04 ^f

^a SK = Store Knowledge and TP = Time Pressure.

^b F-value for planned comparisons between the mean value of the hypothesized condition and the overall mean value of the remaining three conditions.

^c There were eight subjects in the four shopping conditions who did not reveal brand (product) switching in their protocol. The degrees of freedom for the error term is thus 49 instead of 57.

^d Mean value for the hypothesized condition.

^e $p < 0.10$.

^f $p < 0.05$.

^g $p < 0.01$.

plans, it was assumed to be the cause of consumers' failing to buy the products they intended to buy. To gain more specific insight into these effects, subjects' decisions to postpone purchases (Category 4.3 in the Appendix) and the extent to which they monitored their shopping plans (Category 2) were examined.

Although there were many reasons why subjects decided not to buy certain products, of particular interest was the frequency of no buying due to search difficulties. This frequency was identified based on protocol statements regarding difficulty in locating brands/products (Category 4.3.1, unavailability of favorite brands). The results (see Table 2, Hypothesis 1-related), although not reaching conventional levels of statistical significance, show directional consistency for the processes assumed to underlie Hypothesis 1. Low SK/TP condition subjects ($\bar{X} = 3.08$) revealed the highest frequency (standardized) of no buying due to unavailability of favorite brands among the four conditions (mean of the other three conditions: $\bar{X} = 1.91$; $F(1,57) = 2.81$; $p < 0.10$). These results suggest that brand/product search difficulty due to time pressure had some effects on failure to make the intended purchases.

Further analysis was performed to examine whether subjects' monitoring of their shopping plans (Category 2 in the Appendix) affected the incidence of failure to make intended purchases. It was thought that such efforts might have reduced purchase failure rates due to forgetting, particularly under the time pressure conditions. Correlations between the fre-

quency of monitoring activities and failure rates under each of the four shopping conditions reveal interesting results.⁶

Under the no time pressure condition (regardless of store knowledge level), the frequency of subjects' monitoring their shopping plans had no effect on purchase failure rates ($r = 0.12$, $p < 0.31$ and $r = 0.01$, $p < 0.58$ for the low and high store knowledge conditions, respectively), suggesting that when subjects had sufficient time for shopping retrieval of internal memory was not hampered and thus did not benefit from monitoring activities.

However, under the time pressure condition, monitoring of shopping plans had different effects on failure rates depending on subjects' store layout knowledge. Under the low SK/TP condition, monitoring was positively associated with failure rate; that is, increased monitoring led to increased purchase failure rates ($r = 0.38$, $p < 0.08$). Under this condition, self-monitoring actually may have reduced further the time available to perform search activities.

⁶ Approximately 44 percent (27/61) of the subjects carried shopping lists during their shopping. Availability of shopping lists did not appear to affect the results. The presence or absence of shopping lists as a covariate in an ANOVA, for example, did not have a significant effect on the major dependent variables in the study ($F(1,56) = 0.06$ for the product purchase failure rate; $F(1,56) = 0.01$ for unplanned purchases; $F(1,56) = 0.13$ for overall level of brand switching; and $F(1,56) = 0.46$ for purchase volume deliberation).

In contrast, self-monitoring appeared to reduce failure rates for the subjects who shopped under time pressure but possessed high knowledge of store layout ($r = -0.39, p < 0.08$). This negative correlation suggests that when subjects shopped in a familiar store, time pressure did not hinder product search while self-monitoring facilitated retrieval of not well rehearsed memory (i.e., reduced levels of forgetting to purchase nonstaple items). This suggests that the debilitating effects of time pressure on memory retrieval (in addition to search difficulty) also may have contributed to the failure to make the intended purchases. Despite the benefits provided by self-monitoring, subjects under the high SK/TP condition did not exhibit greater reliance on such efforts ($\bar{X} = 1.20$, standardized) than did subjects under the other three conditions (mean of the other three conditions: $\bar{X} = 1.32$).

Hypothesis 2. This hypothesis states that consumers in the low store knowledge and no time pressure condition will reveal the highest incidences of unplanned purchases. To test this hypothesis, the incidence of unplanned purchases was measured by enumerating the products that were purchased but were not recorded on subjects' initial shopping plans. As indicated in Table 2, low SK/no TP subjects engaged in a significantly higher rate of unplanned buying ($\bar{X} = 7.68$) than those who shopped in the other three conditions (mean of the other three conditions: $\bar{X} = 2.64$; $F(1,57) = 12.03$; $p < 0.01$).

The processes assumed to underlie Hypothesis 2 are also supported, i.e., low store knowledge and no time pressure would promote greater processing of in-store information, which in turn would lead to greater levels of unplanned buying. As shown in Table 2 (Hypothesis 2-related), low SK/no TP subjects ($\bar{X} = 12.53$) engaged in significantly more in-store information processing (Category 1 in the Appendix, standardized) than did subjects in the other three conditions (mean of the other three conditions: $\bar{X} = 8.10$; $F(1,57) = 4.03$; $p < 0.05$).

There is an alternative explanation for the evidence that supports Hypothesis 2. Specifically, when the number of products consumers actually purchased is large, the likelihood of exposure to in-store product stimuli increases, which may in turn increase the level of unplanned buying (Kollat and Willett 1967). However, analyses based on the number of unplanned items as a proportion of all items purchased (at an individual level) revealed the same pattern of results as those in Table 2. Findings indicate that 47 percent of the purchases were unplanned for subjects in the low knowledge/no time pressure condition, 16 percent were unplanned in the low knowledge/time pressure condition, 20 percent were unplanned in the high knowledge/no time pressure condition, and 13 percent were unplanned in the high knowledge/time

TABLE 3
SUPPLEMENTAL ANALYSES: RESULTS RELATED
TO PROCESSES UNDERLYING IN-STORE
DECISION MAKING

Dependent variables	No time pressure		Time pressure	
	Low store knowledge	High store knowledge	Low store knowledge	High store knowledge
Proportion of unplanned purchases due to needs reminder effect*	0.72	0.80	0.60	0.57
Frequency of brand/product switching	2.53	3.27	1.45	4.41
Frequency of brand-oriented product search	9.39	10.63	8.14	13.02

NOTE: (*) There were 11 subjects whose protocol data did not reveal clearly incidences of unplanned buying.

pressure condition. These variations in the proportion of purchases that are unplanned are in contrast to findings in previous research (Kollat and Willett 1967) that indicate that approximately 50 percent of grocery purchasers are unplanned. Possible reasons for this discrepancy are offered in the discussion section.

As mentioned, unplanned buying may be due to in-store stimuli exposure that facilitates the retrieval of needs that were not retrieved at the time the shopping plan was developed (simple exposure effects). Alternatively, it may result from changes in the salience of unrecognized needs. To the extent that consumers rely on external memory, as would be the case in the low store knowledge condition, the resulting active processing of product information may cause recognition of new needs (as opposed to the mere triggering of already existing but previously unretrieved needs).

To explore the relative role of these two effects, subjects' statements concerning the reasons that underlie their unplanned buying decisions were analyzed. The dependent variable in this analysis was the frequency of unplanned purchases that could be attributed to a reminder of product needs (Category 4.1.2 in the Appendix) as a proportion of all reasons given for unplanned buying (all subcategories in Category 4.1).⁷ According to the results shown in Table 3, no significant differences in this ratio among the four treatment conditions existed. However, approximately 33

⁷The specific items purchased on an unplanned basis were not recorded so it was not possible to identify the reasons for all of the unplanned purchases from the protocol data. Many purchases may have been unplanned but not articulated as such. With respect to the overall sample, approximately 60 percent of the unplanned purchases were accounted for in the protocol data.

percent of all unplanned purchases were due to reasons other than simple exposure effects and involved active processing of product information that may have made subjects aware of previously unrecognized needs.

Hypothesis 3. Hypothesis 3 makes two different predictions regarding the shopping conditions that may lead to brand/product switching. Consumers who shop in the condition of low store knowledge and time pressure are predicted to engage most often in switching due to difficulty in locating their preferred brands/products (Hypothesis 3a). Consumers who shop in the condition of high store knowledge and no time pressure are predicted to engage most often in switching due to specific brand/product comparisons (Hypothesis 3b). Switching either to other brands or to other products was identified from subjects' protocol statements (product switching accounted for less than 12 percent of the total switching frequencies). The dependent variable used to test Hypothesis 3a consisted of the ratio of the frequencies of brand/product switching due to the unavailability of favorite brands/products (Subcategory 4.2.2 in the Appendix) to the total frequency of brand/product switching (Category 4.2). All other reasons for brand/product switching involve some level of brand/product comparisons (see Category 4.2 for different bases of brand/product comparisons). Therefore, one minus this ratio represents the ratio of brand/product switching due to specific brand/product comparisons and was used to test Hypothesis 3b.

Planned comparisons of the mean ratios (see Table 2) indicate that low SK/TP subjects ($\bar{X} = 0.75$) engaged in more brand switching due to difficulty in locating products than did subjects in the other three groups (mean of the other three conditions: $\bar{X} = 0.42$; $F(1,49) = 4.94$; $p < 0.05$), thus supporting Hypothesis 3a. However, high SK/no TP subjects ($\bar{X} = 0.58$) did not engage in more brand switching based on specific brand/product comparisons than did subjects in any of the other three conditions (mean of the other three conditions: $\bar{X} = 0.48$; $F(1,49) = 0.95$; not significant at the 0.10 level). Although Hypothesis 3b is not supported, it is interesting that approximately 50 percent of the switching across the four shopping conditions was based on in-store brand/product comparisons.

The lack of support for Hypothesis 3b partially may be explained by the level of aggregation of different bases for switching. Specifically, in deriving the switching ratio, switching initiated by brand/product comparison (Category 4.2 in the Appendix) included many bases that may have differed in terms of the cognitive resources needed to perform them. For example, brand switching due to curiosity (Subcategory 4.2.3) might have been easier than that due to attribute comparisons (Subcategory 4.2.4). To the extent that different bases for switching due to comparison

required different levels of cognitive resources, the effect of the two situational factors might not have been reflected fully in the switching ratio.

Hypotheses 3a and 3b examined specific circumstances that underlie brand switching. Additional analysis also was conducted to explore differences in absolute levels (standardized) of brand/product switching (all subcategories under Category 4.2 in the Appendix). As illustrated in Table 3, subjects who shopped in the high store knowledge condition engaged in more brand/product switching ($\bar{X} = 3.86$) than did those who shopped in the low knowledge condition ($\bar{X} = 2.06$; $F(1,57) = 5.01$; $p < 0.05$).

One possible explanation for this result may be related to the level of initial brand commitment expressed by subjects in the high store knowledge condition. Specifically, a necessary condition for brand switching is an initial commitment to a specific brand or brands. When shopping under conditions of low store knowledge, subjects' initial search activities are focused on locating product classes rather than specific brands. In contrast, under conditions of high store knowledge, search activities can be readily focused on locating specific brands to the extent that such brand commitments exist. In general, then, the more product search is guided by specific brand commitments, the greater the likelihood of brand switching due to the reasons noted in Category 4.2. Consistent with this expectation, an examination of the incidences (standardized) of specific brand-oriented product search (Category 3 in the Appendix) revealed that subjects in the high store knowledge condition exhibited a higher level of brand search ($\bar{X} = 11.87$) than did those in the low knowledge condition ($\bar{X} = 8.84$; $F(1,57) = 4.92$; $p < 0.05$).⁸ In addition to facilitating product/brand search, high store knowledge also appears to help subjects retrieve some aspects of well-learned memory such as favorite brands.

Hypothesis 4. Purchase volume deliberation was predicted to occur more frequently for consumers who shop under the condition of high store knowledge and no time pressure than under any other conditions. The standardized frequency of statements associated with deliberation about the volume of a product to purchase (Category 4.4) served as the dependent variable for testing this hypothesis. As indicated in Table 2, high SK/no TP subjects revealed the highest level of purchase volume deliberation ($\bar{X} = 6.10$) among subjects in the four conditions (mean of the other three conditions: $\bar{X} = 3.52$; $F(1,57) = 4.04$; $p < 0.05$), thus supporting Hypothesis 4. Al-

⁸Subjects have multiple favorite brands for some products. Because of this multiple brand commitment, they might not reveal any specific brand commitment during their initial search. To the extent that this occurred, the level of brand-oriented search might differ from the results reported in Table 3.

though the protocol data did not offer insight into how subjects made purchase volume decisions without overt deliberation, the protocol data clearly indicate that deliberation is sensitive to the two situational factors considered in this study.

LIMITATIONS

Although the results of this study are informative, several caveats should be mentioned. First, because subjects were not informed of their shopping situations before their initial shopping goals were obtained, our results may not generalize to situations in which consumers know in advance of the shopping trip that they will be under situational constraints. Although the issue of generalizability is not of significant concern as far as the more normal high store knowledge/no time pressure shopping condition is concerned, it may be relevant in the other three conditions in which advance notice may result in changes in shopping goals. However, when consumers unexpectedly encounter conditions that limit the value of existing knowledge of store configuration (e.g., changes in aisle arrangements) or that increase time pressure (e.g., a crowded store), the behaviors reported here can be expected to occur.

The second limitation of the study is that, due to the experimental setting, subjects may have revealed behavior that would not occur otherwise. Specifically, the three shopping conditions (other than the high SK/no TP condition) might have created a level of anxiety or stress in subjects. As a result of being involved in an experiment, subjects may have been more reluctant to give up their shopping plans to alleviate this tension than they would if faced with these situational conditions in reality. If this were the case, the real differences between the high SK/no TP and the other three conditions might have been more dramatic for in-store shopping decisions, such as purchase failure rates and brand switching, and weaker for others, such as unplanned purchases and purchase volume deliberation, than were revealed in the present study.

DISCUSSION AND IMPLICATIONS

This study demonstrates that consumers' store knowledge and the time available for shopping affect many types of in-store shopping decisions. Both factors have an effect on levels of unplanned buying, brand switching due to difficulty in locating preferred brands/products, and the level of purchase volume deliberation. Knowledge of a store's layout, irrespective of time available for shopping, had a positive effect on absolute levels of brand/product switching. Time pressure primarily had an effect on frequency of failure to make intended purchases.

There were three additional findings regarding the processes that underlie in-store decision making. First, one-third of the unplanned buying decisions observed in this study occurred due to the triggering of new needs via the active processing of in-store information. Second, as evidenced by higher levels of brand-oriented search by subjects in the familiar store than by subjects in the unfamiliar store, high store knowledge might facilitate retrieval of certain aspects of well rehearsed memory (i.e., favorite brands). Third, brand/product switching was initiated by active in-store information processing as often as it was from the unavailability of preferred brands/products.

Lower proportions of unplanned purchases were found in this study than has been found in previous research (Kollat and Willett 1967). Two possible factors may account jointly for this discrepancy. First, because this study is based only on major replenishment shopping, the total number of items purchased is greater than that recorded in a previous study, so the fraction of items that are unplanned may shrink. Second, the previous study (Kollat and Willett 1967) did not consider specific shopping conditions in which unplanned shopping occurred. Indeed, such aggregation of shopping occasions (major versus minor shopping trip) and situational conditions may have masked considerable variation in unplanned buying.

The findings of this study have several important implications for grocery store management. Increased levels of unplanned buying, minimization of purchase failure rates, minimization of postponement of purchase, and improvement in the quality of purchase volume decisions (e.g., avoiding purchasing less than the amount actually needed) are important factors that can contribute to increased store revenue. The challenge facing store managers is to develop well planned strategies that facilitate these behaviors. For example, frequent changes in shelf arrangements (i.e., creation of an unfamiliar environment) may, at first glance, be considered a viable approach for increasing unplanned buying. However, such actions are likely to make it difficult for consumers to locate products quickly. Increased time spent on search activities may reduce the time consumers can afford to spend on processing other in-store information, thereby possibly reducing levels of unplanned buying. Such increases in time pressure can be expected to have adverse effects on other types of in-store grocery buying behaviors (e.g., failure to make intended purchases and purchase volume decisions).

To avoid the potential pitfalls of relying on one particular strategy, a coordinated approach to store environment, which considers in-store aisle and display configurations, product display arrangements, and in-store presentation of information, needs to be taken. These strategies may include (1) arrangement of aisles based on consumers' prior knowledge or ex-

pectations of product location, (2) arrangement of product displays for nonstaple items in prominent locations to reduce purchase failure rates, (3) joint display of substitutable products to encourage product-level switching as opposed to purchase postponement when a preferred brand/product is not available, and (4) prominent displays of brand or product information to promote the recognition of previously unrecognized needs that encourages unplanned purchasing.

APPENDIX: PROTOCOL CODING CATEGORIES

Nonbrand-Specific Information Processing

1. In-store information processing: processing product (brand) display information with no specific product (brand) purchasing relevance.
 - 1.1. General processing of package information: "Here's the Ekrich sausage."
 - 1.2. Processing products displayed on shelf: "Here are the dairy products."
2. Monitoring the shopping plan: checking products against plans (lists). "I'd better look at my list to see if I need anything else in this aisle."

Brand-Specific Information Processing and Decision Making

3. Focused product search: product search with specific brands or their characteristics in mind.
 - 3.1. Specific (favorite) brand-oriented search: "I'm looking for Pepperridge Farm rye bread."
 - 3.2. Search for brands with specific characteristics: "I'm trying to find the low sodium soup."
4. Type of in-store purchasing decisions: types of decisions in which consumers engage while shopping.
 - 4.1. Unplanned buying.⁹
 - 4.1.1. Price or sale based: "I'll get some laundry detergent since there is a rebate."
 - 4.1.2. Reminder of product needs: "Oh, I almost forgot, we need some cheese."

- 4.1.3. Attribute based: "Here's the sugar free dressing. Let me try it."
- 4.1.4. Product required for consuming other products: "If we are going to have hot dogs, I'd better get some more ketchup."
- 4.1.5. Curiosity: "This looks interesting, I think I'll try it."
- 4.1.6. Problems with existing product:¹⁰ "I wasn't planning on getting shrimp, but since the chicken doesn't look too good, I think I will."

4.2. Brand/product class switching.

- 4.2.1. Based on price or sales: "I usually get Wisk but Clorox is on sale." "I think I'll get the shrimp instead of chicken since the price isn't too bad."
- 4.2.2. Unavailability of favorite brand: "They don't have Sunlight so I'll get Topco instead." "I see they're all out of Ekrich bacon, so I'll get some sausage instead."
- 4.2.3. Curiosity: "I think I'll get Sara Lee for a change." "I think I'll get Quaker Oats instead of regular cereal for a change."
- 4.2.4. Attribute based: "I'm going to put the Dannon back since the Light and Lively has less fat." "I will take the fish instead of beef for health reasons."

4.3. No buying.

- 4.3.1. Unavailability of favorite brand or a brand with the desired characteristics: "I don't see Hershey's so I guess we'll have to get it someplace else."
- 4.3.2. High price or no sale: "The last time I got these they were four for a dollar. They aren't worth \$1.65."
- 4.3.3. No immediate need: "We have plenty of sugar at home."
- 4.3.4. Unavailability of accompanying product: "I'll take back the cheese since I don't see any Ritz crackers."

⁹Unplanned buying should be understood in the context in which purchasing decisions were made. Statements coded into this category do not, however, fully contain such information.

¹⁰This subcategory of unplanned buying overlaps with the product level switching category that was included in category 4.2. A distinction between the two was made because of their relevance to hypotheses tested.

- 4.3.5. Product attributes problems:
 "They don't look very fresh. We'll pass on them this time."

4.4. Purchase volume decisions:

- 4.4.1. Based on price:
 "These are two for 99¢. I think we'll get four packs for a deal."
- 4.4.2. Based on problems with existing brands:
 "They don't have any caffeine-free Folgers so I'll just get only one pound of Eight O'Clock."
- 4.4.3. Based on multiple usage situations:
 "I'll get some extra mozzarella since I can use it in salads as well as on our pizza."
- 4.4.4. Based on family needs:
 "I always buy a few extra to make sure we never run out."
- 4.4.5. Based on coupon:
 "Let's see, the coupon is for the box of 40, so that's what I'll get."
- 4.4.6. Based on storage availability:
 "This big bottle won't fit in my refrigerator."

5. Others.¹¹

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¹¹ This category included statements that were not used for analyses in the present study.