J. Jeffrey Inman, Russell S. Winer, & Rosellina Ferraro

The Interplay Among Category Characteristics, Customer Characteristics, and Customer Activities on In-Store Decision Making

The authors explore product category and customer characteristics that affect consumers' likelihood of engaging in unplanned purchases. In addition, they examine consumer activities that can exacerbate or limit these effects. The authors employ a hierarchical modeling approach to test their hypotheses using a data set of in-store intercept interviews conducted with 2300 consumers across 28 stores. The results show that category characteristics, such as purchase frequency and displays, and customer characteristics, such as household size and gender, affect in-store decision making. Moreover, although the analysis reveals that the baseline probability of an unplanned purchase is 46%, the contextual factors can drive this probability as high as 93%. The results support the predictions that list use, more frequent trips, limiting the aisles visited, limiting time spent in the store, and paying by cash are effective strategies for decreasing the likelihood of making unplanned purchases.

Keywords: in-store decision making, shopper insights, first moment of truth, shopper marketing, unplanned purchases

The grocery store is a place of sensory stimuli. Consumers are met with colorful product displays of fruits and flowers, perfectly aligned packages of snacks on end-cap displays, and even advertisements covering the floor. Some consumers use these in-store stimuli as cues to remind them of what groceries they need. Other consumers enter the store with an intention to buy only a certain set of goods, but this quickly changes as these in-store stimuli lead to purchases of unintended items. In either case, in-store stimuli trigger unrecognized needs and desires or trigger memories for forgotten needs, leading to in-store decision making, or unplanned purchasing.

Bucklin and Lattin (1991) define planned purchases as decisions that are entirely determined before entering the store. In contrast, unplanned purchases are those that were not specifically planned before the shopping event. Any given item in a shopper's grocery basket may have been planned to the level of the brand (i.e., "specifically planned"), to the level of the category (i.e., "generally planned"), or not at all planned (i.e., "unplanned"). According to the Point of Purchase Advertising Institute (POPAI) (1995), more than two-thirds of purchase decisions involve some sort of in-store decision making (i.e., generally planned or unplanned). Although overall marketing spending is relatively flat, manufacturers' shopper-marketing budgets have grown at more than 20% per year since 2004, and this growth is expected to continue through 2010 (Deloitte/Grocery Manufacturers Association 2007). In addition, there has been a significant increase in in-store stimuli, such as advertisements on floors and dedicated television channels, such as those used by Wal-Mart and Target. Such efforts are assumed to be effective because they have their influence at the last stage of the choice process—namely, at the point of purchase. Procter & Gamble's emphasis on "FMOT"—the first moment of truth—(Nelson and Ellison 2005) and Nielsen's recent in-store marketing measurement initiative (*Progressive Grocer* 2007) also indicate the criticality of this topic to marketing practitioners.

Given the importance of marketing efforts at the point of purchase, it is critical to understand the factors driving the extent to which consumers engage in in-store decision making. While prior research has examined a few factors influencing in-store decision making, we present a more comprehensive framework that incorporates the role of product category characteristics, customer characteristics,

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and customer activities. Our approach is similar to that of Seiders and colleagues (2005), who examine groups of factors that influence the relationship between satisfaction and repurchase. We propose a two-step process. First, in-store stimuli require the shopper's attention to have any impact. Therefore, factors that increase or decrease exposure to stimuli affect the level of in-store decision making. Second, after customers have been exposed to a stimulus, they appraise it (Yeung and Wyer 2004), which may result in an affective or cognitive response. The stimulus may then serve as a recognition cue, helping consumers recall that they need that product. The stimulus may also trigger an affective reaction. A positive affective reaction to an in-store stimulus further increases the likelihood of an unplanned purchase.

We examine several product and customer characteristics that we expect to increase exposure and to lead to positive affective responses. These factors may be stable (i.e., relatively invariable over time) or transitory (i.e., variable across trips). Transitory factors at the product-category level (i.e., coupon, store display) can be directly influenced by the retailer or manufacturer. Transitory customer characteristics (i.e., shopping alone versus with others, store familiarity) can also be influenced, though indirectly, by marketing activities.

In addition to product and customer characteristics, we examine the effects of customer activities that limit in-store decision making (e.g., use of a list, restricting the number of aisles visited). Some consumers use the shopping environment to their advantage, relying on in-store stimuli to trigger unrecognized or forgotten needs. However, unplanned purchases may result in negative outcomes (e.g., buying unhealthful foods, overspending), so some consumers have an incentive to limit the extent of unplanned purchases. In such a situation, a consumer may want to take steps to limit the impact of the store environment on purchase decisions. Using a self-control perspective, we examine several strategies that involve limiting exposure (e.g., limiting oneself to certain aisles of the store) or limiting the possibility of an affective response (e.g., purchasing only what is on the list). For ease of exposition, we refer to these strategies as customer activities because they are initiated by the customer and can vary across shopping trips.

The main contributions of this research are twofold. First, we develop predictions for the impact of product category characteristics, customer characteristics, and customer activities on in-store decision making. Second, we test these predictions in a large-scale field study. We are fortunate to have access to a data set that enables us to assess the effects of the focal variables on in-store decision making. We begin by discussing the stable and transitory category and customer characteristics that influence in-store decision making. Subsequently, we examine activities that customers can initiate to limit the extent of in-store decision making. Then, we describe the data set of more than 34,000 items purchased by more than 2300 consumers across 28 stores in 14 cities on which we estimate the model, discuss the statistical methodology, and present the results. We conclude with a discussion of the implications of our findings for research and practice, along with directions for further research.

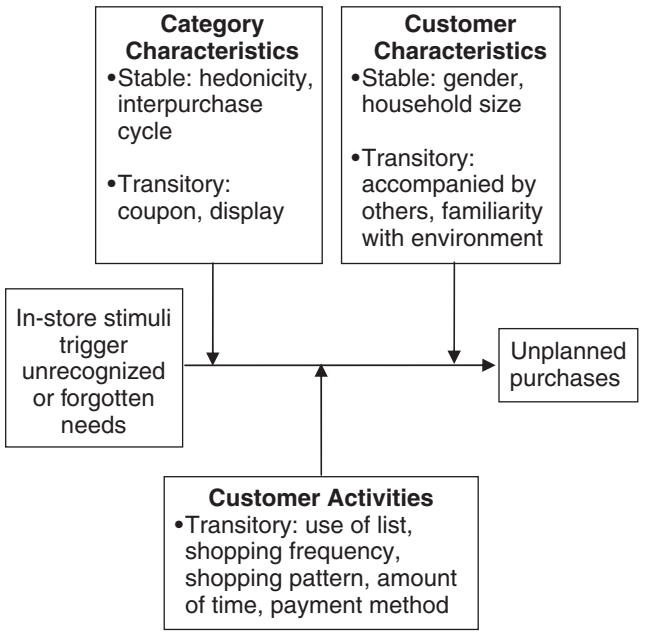
Theoretical Development

In-store decisions occur because stimuli encountered during the trip (e.g., point-of-purchase advertising, the physical product) lead consumers to believe or recall that they have a need for the product category. Factors that enhance a stimulus's ability to trigger unrecognized or forgotten needs will lead to an increase in in-store decision making. We posit that these are factors that increase exposure to stimulus cues and factors that trigger positive affective appraisal (Yeung and Wyer 2004). We also argue that though product and customer characteristics can increase in-store decision making, consumers can initiate activities to limit their impact. Consistent with the factors that increase unplanned purchasing, these customer activities operate through limiting exposure and affective responses. We describe specific predictions for each factor in detail subsequently. Figure 1 summarizes our in-store decision-making framework.

Category Characteristics

Prior research has examined the impact of contextual factors on sales, brand choice, and promotional elasticities (Karande and Kumar 1995; Kumar, Karande, and Reinartz 1998; Narasimhan, Neslin, and Sen 1996). In a similar vein, we examine the role of four category characteristics on in-store decision making: coupon usage, in-store displays, category purchase frequency, and the hedonic nature of the category. Two of these characteristics are relatively stable for the particular product category (i.e., purchase frequency and hedonic nature of the category). Because they are reflective of the functional versus hedonic nature of the product, they should influence affective response. The other two characteristics are transitory (i.e., coupon usage and

FIGURE 1
Factors Influencing the Extent to Which In-Store Stimuli Trigger In-Store Decision Making



in-store display), and their influence should operate through the degree to which they encourage exposure to in-store stimuli.

Coupon usage. Intent to use a manufacturer's coupon is typically determined before entering the store (Kahn and Schmittlein 1992), thus triggering need recognition before the shopping trip. Because coupon usage requires effort and time (Shimp and Kavas 1984), it should lead to an increase in the likelihood that the coupon will be used if taken into the store. Thus, having a coupon for an item should result in greater likelihood of a planned decision.

In-store displays. The positive effect of displays on in-store decision making is well documented (e.g., McClure and West 1969; McKenna 1966). For example, Wilkinson, Mason, and Paksoy (1982) report that across the four brands studied, sales increased between 19% and 39% with expanded shelf space but between 77% and 243% when the brand was displayed in a secondary location. Displays draw more attention and thus increase the likelihood of unplanned purchases.

Interpurchase cycle. More frequently purchased products must be replenished more often. We expect that consumers have greater recognized needs for frequently purchased products, and each time the consumer shops, he or she is likely to purchase the items that are used up quickly. These items are likely more salient and therefore are more accessible in memory (Posavac, Sanbonmatsu, and Fazio 1997). Furthermore, consumers are likely to have scripts in place for the shopping experience, and the habitual purchase of an item is likely to become part of that script. Before each shopping experience, the consumer invokes the script, making the frequently purchased item more accessible. Therefore, consumers should be more likely to plan the purchase of items they buy more frequently and may specifically build a trip to the supermarket around buying these items. We predict that unplanned purchases are less likely for products that are purchased more frequently and thus have a shorter interpurchase cycle.[1]

Category hedonicity. Hedonic goods, such as chocolate cake, elicit more positive affect than functional goods (Shiv and Fedorikhan 1999) and thus are more likely to trigger a positive appraisal (Yeung and Wyer 2004) of that item. These goods are also more likely to be purchased on impulse than functional products. Impulse buying occurs when a consumer experiences a powerful and persistent urge to buy something immediately (Rook 1987). Likewise, vice products (e.g., beer, high-fat foods) are more likely to be consumed on impulse than virtue products (Wertenbroch 1998). This leads to our prediction that hedonic products are more susceptible to in-store decision making than functional products.

Display interactions. Empirical research using consumer choice models has shown that display effects are significant factors in predicting brand choice and have differential effects on category brand purchasing (Erdem and Sun 2002). Lemon and Nowlis (2002) show that when used alone as a promotional device, in-store displays have a greater effect on the purchasing of high-quality brands versus low-quality brands. This implies that in addition to the direct effect of display on unplanned purchasing mentioned previously, displays may interact with category purchase frequency and hedonicity. That is, being on display may have a differential effect because of the display's ability to increase the likelihood of exposure across these types of products. Specifically, we argue that displays benefit categories that are purchased more often (i.e., those with a shorter interpurchase cycle).

All else being equal, the probability of unplanned purchases increases for categories that are consumed quickly when they are on display than for categories that are consumed less quickly. Therefore, we expect a negative interaction between display and interpurchase cycle. Conversely, hedonic products should arguably benefit more from displays than functional products, because the purchase of hedonic items, such as cookies and ice cream, tends to be more intrinsically motivated than the purchase of functional items, such as cleaning supplies. We expect a positive interaction between display and category hedonicity, such that hedonic items on display should experience a greater increase in unplanned purchases than utilitarian items.

Customer Characteristics

Aspects of the customers themselves may also increase or inhibit in-store need recognition. We examine the role of four customer characteristics: gender, household size, store familiarity, and shopping alone versus with others.[2] These characteristics are related to the extent to which they affect exposure to store stimuli and influence the affective response thereto. Two of these characteristics are relatively stable for a given customer (i.e., gender and household size), while the other two characteristics are transitory (i.e., store familiarity and shopping alone versus with others) and can vary across shopping trips.

Gender. Kollat and Willett (1967) find that after controlling for number of purchases, gender does not affect in-store decision making. Despite this finding, we hypothesize that if there are any gender effects, female shoppers will engage in more in-store decision making because they tend to do the household shopping more frequently (Starrels 1994) and thus should be more likely to recognize a household need when exposed to categories in the store.

Household size. We expect that the larger the household, the more in-store decision making will occur. Planning becomes more difficult as identifying and remembering the needs and desires of each family member become more

[1]The reverse effect could be argued. Because infrequently purchased products are used over a longer period, unplanned purchase of these items is riskier because the consumer may underestimate the existing inventory, thus making the carrying costs greater. This would suggest that the longer the interpurchase cycle, the lower is the likelihood that the purchase will be unplanned.

[2]We do not argue that this set of characteristics is exhaustive. Rather, it is partly dictated by available measures in our data set.

complex. This should lead to a greater chance of in-store cues triggering need recall.

Store familiarity. After a consumer shops at a given store repeatedly, he or she learns its general layout. Two opposing forces may operate with regard to in-store decision making. On the one hand, in an unfamiliar store, consumers must direct their attention to the environment as a means of learning where particular items are, thus increasing their exposure to in-store stimuli. Knowledge of the store layout enables the consumer to focus on the task of shopping and to routinize behavior, limiting the extent to which store cues will be noticed. Iyer (1989) and Park, Iyer, and Smith (1989) report that more unplanned purchases occur when the shopper is less familiar with the shopping environment. On the other hand, greater familiarity may lead to more fluency (Schwarz 2004) with shopping in that store environment. This fluency enables the customer to rely on the store to cue him or her for shopping needs. Thus, familiarity might lead to greater in-store decision making. Therefore, we make no specific prediction for store familiarity.

Shopping with others. Research on shopping party size suggests that shoppers accompanied by others shop longer and spend more (Kahn and McAlister 1997). Having additional shoppers present, particularly members of the same household, leads to a higher incidence of need recognition. Thus, we expect that people shopping with others will engage in more in-store decision making than those shopping alone.

Customer Activities

As we mentioned previously, while some consumers may use the in-store environment for memory cues, others may be motivated to limit the extent to which they engage in unplanned purchases. The shopping event is one that is regularly and repeatedly experienced, so shoppers may recognize their tendencies to engage in unplanned purchases and may want to initiate protective behaviors to limit the extent to which they engage in such in-store decision making. We turn to the self-control literature to predict how customer activities may influence in-store decision making.

The self-control literature suggests that, in general, behavior is goal directed toward a certain performance or outcome (Gollwitzer 1999). People tend to act in a goal-directed manner but often are affected by temporary needs or desires that may interfere with longer-term goals. In a shopping context, the trade-off between immediate and long-term goals can lead to the purchase of items that are desired or needed in the short run but harmful or undesirable in the long run. Yet consumers may recognize that they succumb to immediate short-term needs and thus enact strategies to help regulate current behavior in the service of their longer-term goals (Hoch and Loewenstein 1991; Wertenbroch 1998), which may include limiting spending, leaving the store as quickly as possible, or selecting products that are nutritionally healthful. Hoch and Loewenstein (1991) argue that these strategies can be classified into those that reduce desire, such as avoiding situations that are likely to increase desire (i.e., limiting exposure), and those that increase willpower, such as precommitting to a course of action by self-imposing constraints on behavior (i.e., planning ahead). This is aligned with our thesis that exposure and affective responding are at the heart of in-store decision making. The specific strategies we examine are use of a shopping list, number of aisles shopped, shopping frequency, time spent in the store, and method of payment (e.g., cash versus credit card).

Use of a shopping list. An activity that is clearly associated with *ex ante* planning is the use of a shopping list (Spiggle 1987). Block and Morwitz (1999) examine the use of shopping lists as a memory aid for grocery shopping and report that lists are useful tools for helping consumers make planned purchases but do not help them avoid unplanned purchases. This implies that without the memory aid, consumers may default to even more in-store decision making. Thomas and Garland (1993) find that shoppers with lists bought fewer items and spent less money than shoppers without lists. Thus, we expect that consumers with shopping lists will be less likely to make in-store decisions than consumers without a shopping list.

Number of aisles shopped. Our argument is that in-store stimuli increase people's likelihood of making unplanned purchases by cuing needs. As consumers shop the store more completely, they become exposed to a greater number of product categories and in-store displays. Thus, we expect that the probability of in-store decisions will increase with the number of aisles shopped.

Shopping frequency. Consumers also vary in terms of how frequently they shop. Shopping more frequently decreases the number of items needed on a given trip and is likely to put the customer in a mind-set to buy only the items he or she needs. Thus, we expect that unplanned purchasing will be less likely for more frequent shoppers.

Time spent shopping. By limiting the amount of time in the store, the shopper is more likely to move quickly through the store and focus on the products he or she had planned to purchase. This limits exposure to in-store stimuli and also limits the extent to which in-store stimuli can generate an affective response. As a result, we expect that unplanned purchases will be greater as shoppers spend more time in the store.

Method of payment. Consumers have multiple means available to pay for products (e.g., cash, checks, credit cards). Credit card payments allow for a delay between acquiring a product and actual payment. This lessens the "pain of paying" (Prelec and Loewenstein 1998) and enables shoppers to use credit as a short-term financing medium (Lee and Kwon 2002). Using data from actual shoppers, Soman (2003) finds that shoppers spend more when they pay with a credit card than when they pay with cash, and this is primarily driven by purchases of unnecessary items. Hirschman (1979) finds that consumers perceive greater control over spending when paying with cash than with credit cards. Likewise, checks provide more assistance in budgeting and spending control. Thus, we expect that compared with cash, credit card use will increase the likelihood of unplanned purchases.

Empirical Test

The POPAI, an association for the point-of-purchase advertising industry, periodically conducts an extensive field study of consumers' purchasing behavior. This widely cited study is used by business managers and academic researchers (e.g., Inman and Winer 1998) to examine the extent of in-store decision making by consumers. The POPAI fielded its last study in the spring of 1995 at a cost of approximately $400,000. In-store intercept interviews were conducted with 2300 consumers at 28 grocery stores across 14 geographically dispersed U.S. cities.

Consumers were intercepted randomly as they entered the store and were offered a $10 coupon as incentive to participate in the study.[3] Respondents were prompted with each major department. Importantly, the interviewer probed for specific brand purchase intentions. Following this, coupons the respondents held were recorded, and respondents were sent into the store. After each customer was finished shopping, including payment, the interviewer met him or her at the cash register, took the register receipt, and asked several additional questions (e.g., demographics, study sponsor–specific questions). Table 1 summarizes the sample composition. The procedure is essentially identical to that used by Kollat and Willett (1967), with the important addition of the in-store display activity.[4] The POPAI generously provided the resultant data (more than 34,000 purchases) to us for analysis. For succinctness, details on the measures used to operationalize the constructs in our model as well as the expected effects appear in Table 2 (e.g., Kumar, Venkatesan, and Reinartz 2008).

Model

The data set provides the type of decision for each purchase. For each item, we know the category purchased and whether the decision was specifically planned (brand and category), generally planned (category only), a brand switch, or unplanned.[5] This categorical variable is the dependent measure in all subsequent analyses.

In our data, purchases are nested in baskets, which in turn are nested in stores. The category characteristics (e.g., coupon, hedonicity) vary across purchases, and the shopper characteristics (e.g., gender) and activities (aisles shopped) vary across baskets. This represents a multilevel data structure (Goldstein 1995; Raudenbush and Bryk 2002). Furthermore, our dependent variable is categorical. Putting the two together, we use a hierarchical model that Raudenbush and Bryk (2002) describe, with product category characteristics as predictors of decision type (planned, generally planned, completely unplanned) in the first level and aspects of the shopper and their activities (e.g., method of payment) explaining variation in the second level.

[3]The coupon was mailed to respondents to prevent a windfall effect (e.g., Heilman, Nakamoto, and Rao 2002).

[4]Kollat and Willett (1967) test for the presence of demand effects when inquiring about respondents' purchase intentions may have influenced their subsequent purchasing behavior. They find no such effects.

[5]Brand switches constituted less than 4% of the purchases, so we dropped them from the analysis.

TABLE 1
Summary Sample Statistics

	Frequency
Decisions	
Unplanned	60.9%
Generally planned	6.6%
Specifically planned	32.5%
Coupon	6.9%
Display	9.2%
List use	53.9%
Shopping Pattern	
All aisles	20.9%
Most aisles	37.5%
Only aisles in which something was needed	41.6%
Payment Method	
Check	41.2%
Credit	9.5%
Cash	49.3%
Gender (% female)	82.5%
Familiarity (% visit the store most or all the time)	75.4%
Shopping with others	34.0%

	M	SD
Interpurchase cycle	47.4 days	22.8
Category hedonicity	3.8/7	1.1
Shopping frequency	2.6 times per week	1.2
Time spent	42.5 minutes	18.6
Household size	2.7 members	1.2

We use the notation that Raudenbush and Bryk (2002) describe (see also Goldstein 1987; Hedeker and Gibbons 1994). In our case, we have three possible categories: unplanned, generally planned, and specifically planned. Denoting these, respectively, as m = 1, 2, and 3, we introduce response variable R, which assumes a specific value of m with probability φ_{mijk}, where

$$\varphi_{mijk} = \Pr(R_{ijk} = m), \tag{1}$$

which leads to the logit link function for m = 1, 2:

$$\eta_{mijk} = \ln\left(\frac{\varphi_{mijk}}{\varphi_{Mijk}}\right) = \ln\left[\frac{\Pr(R_{ijk} = m)}{\Pr(R_{ijk} = M)}\right], \tag{2}$$

where M indicates that the purchase was specifically planned for product category i in basket j in store k. We then specify the Level 1 model as follows:

$$\eta_{mijk} = \beta_{ojk(m)} + \sum_{q=1}^{Q_m} \beta_{qjk(m)} X_{qijk}, \tag{3}$$

where $\beta_{qjk(m)}$ are the coefficients to be estimated for m = 1 (unplanned) and 2 (generally planned) and X_{qijk} is a Level 1 independent variable q for product category i in basket j in store k, q = 1, …, Q.

In other words, a separate set of parameters is estimated for both unplanned (versus specifically planned) and gener-

TABLE 2
Detailed Descriptions of Measures for the Variables of Interest

Dependent Variable

Purchase type: Indicates whether the item purchased was specifically planned (brand and category), generally planned (category only), a brand switch, or unplanned.

Category Characteristics

Stable Factors

Interpurchase cycle: Taken from the 1998 *Marketing Factbook* (Information Resources Inc 1998), which contains information on the interpurchase cycle at the category level. A larger number indicates a longer interpurchase cycle, meaning that the item is purchased less frequently. (PURCYCLE [+])

Category hedonicity: Assessed with a survey by Wakefield and Inman (2003). Respondents rated product categories in terms of their hedonicity on a seven-point scale. A larger number indicates greater hedonicity. (HEDONIC [+])

Transitory Factors

Coupon: After completing their purchases, shoppers were asked whether they had used any coupons and, if so, which ones. It indicates whether the shopper had a coupon for each item purchased. (COUPON [–])

Display: The field interviewer recorded each in-store display. These data were merged with the purchase data so that each purchase shows the corresponding in-store display activity. (DISPLAY [+])

Customer Characteristics

Stable Factors

Gender: The field interviewer coded the shopper's gender as 1 if female and 0 if male. (GENDER [+])

Household size: Respondents were asked to indicate how many people, including themselves, were currently living in the household. This is a continuous variable. (HHSIZE [+])

Transitory Factors

Shopping with others: The field interviewer noted whether the shopper was accompanied by others. (OTHERS [+])

Store familiarity: Respondents were asked to indicate how often they visit the particular grocery store in which the survey was conducted when doing grocery shopping. Replies were "all of the time," "most of the time," "about half of the time," "less than half of the time," and "rarely." For the purposes of the current analysis, "all of the time" and "most of the time" were combined into one category and compared with all other responses. (FAMILIAR)

Customer Activities

Use of a list: Indicates whether the respondent had a shopping list on that particular trip. (LIST [–])

Shopping frequency: Shoppers were asked the following open-ended question: "In total, about how many grocery shopping trips do you make in a typical week?" Respondents who reported that they make five or more trips per week were pooled. (SHOPFREQ [–])

Number of aisles shopped: This question was asked in the exit interview after the respondents had completed their shopping trip. Respondents were asked how they went through the store and whether they visited each aisle or section of the store, visited most aisles or sections of the store, or visited only those aisles and sections where they planned to buy something. (PATTALL [+], PATTMOST [+])

Time spent shopping: The field interviewer recorded the exact time the shopper began the shopping trip and the exact time the respondent began the exit interview. This difference is used as the measure of time spent shopping. (TIME [+])

Payment method: The interviewer recorded whether the shopper paid by cash, check, or credit card. (CHECK [+], CREDIT [+])

Notes: Sign indicates predicted effect on unplanned purchasing.

ally planned (versus specifically planned) purchases.[6] Unfortunately, our data set does not include any store-level descriptive variables, so we could only estimate a random-effects model at the store level. Because no store-level parameters are estimated, we suppress the k subscript from this point onward in the interest of descriptive parsimony.

The Level 1 specification (i.e., each item in the basket) in our case is as follows:

$$\eta_{mij} = \beta_{0j(m)} + \beta_{1j(m)}\text{COUPON}_{ij} + \beta_{2j(m)}\text{DISPLAY}_{ij} + \beta_{3j(m)}\text{PURCYCLE}_i + \beta_{4j(m)}\text{HEDONIC}_i + \beta_{5j(m)}\text{DISPLAY}_{ij} \times \text{PURCYCLE}_i + \beta_{6j(m)}\text{DISPLAY}_{ij} \times \text{HEDONIC}_i, \quad (4)$$

where

COUPON_{ij} = an indicator variable that is 1 if product category i in basket j was purchased with a coupon and is 0 if otherwise,

DISPLAY_{ij} = an indicator variable that is 1 if product category i in basket j was purchased on display and is 0 if otherwise,

PURCYCLE_i = the average interpurchase cycle for product category i (grand mean centered), and

[6]We also estimated an ordinal logit model with specifically planned as most completely planned and unplanned as least completely planned. In terms of the consistent Akaike information criterion (119,512.3 versus 127,112.6), the multinomial logit specification outperformed the ordinal logit specification, even though it had 36 parameters compared with the ordinal logit's 19 parameters. The two models performed almost the same in terms of predictive validity on a holdout sample of 200 purchases: The ordinal logit had a hit rate of 68.0%, while the multinomial logit had a hit rate of 67.5%. The substantive implications of the two sets of estimates were identical. The estimates for the ordinal logit are available on request. We thank an anonymous reviewer for suggesting this model comparison.

$HEDONIC_i$ = the hedonic rating of product category i (grand mean centered).

With a hierarchical specification, the slopes in Level 1 can be specified as a function of Level 2 variables and identified as either random or fixed (e.g., Hedeker and Gibbons 1994). This "slopes-as-outcomes" model (Burstein, Linn, and Capell 1978) is specified as follows:

$$\beta_{qj(m)} = \nu_{q0(m)} + \sum_{s=1}^{S_q} \nu_{qs(m)} W_{sj} + u_{qj(m)}, \quad (5)$$

where

$\beta_{qj(m)}$ = the Level 1 coefficients;
$\nu_{qs(m)}$ = the Level 2 coefficients (fixed effects);
W_{sj} = a Level 2 independent variable s, s = 1, …, S; and
$u_{qj(m)}$ = the random component.

The Level 2 specification (i.e., across-basket) in our case is as follows:

$$\begin{aligned}\beta_{qj(m)} = {} & \nu_{q0(m)} + \nu_{q1(m)}LIST_j + \nu_{q2(m)}SHOPFREQ_j \\ & + \nu_{q3(m)}PATTALL_j + \nu_{q4(m)}PATTMOST_j \\ & + \nu_{q5(m)}CHECK_j + \nu_{q6(m)}CREDIT_j \\ & + \nu_{q7(m)}TIME_j + \nu_{q8(m)}GENDER_j + \nu_{q9(m)}HHSIZE_j \\ & + \nu_{q10(m)}FAMILIAR_j + \nu_{q11(m)}OTHERS_j + u_{qj(m)},\end{aligned} \quad (6)$$

where

$LIST_j$ = an indicator variable that is 1 if the consumer used a shopping list and is 0 if otherwise,
$SHOPFREQ_j$ = the number of shopping trips per week (grand mean centered),
$PATTALL_j$ = an indicator variable that is 1 if the consumer visited all the aisles and is 0 if otherwise,
$PATTMOST_j$ = an indicator variable that is 1 if the consumer visited most of the aisles and is 0 if otherwise,
$CHECK_j$ = an indicator variable that is 1 if the shopper paid with a check and is 0 if otherwise,
$CREDIT_j$ = an indicator variable that is 1 if the shopper paid with a credit card and is 0 if otherwise,
$TIME_j$ = the number of minutes elapsed between the time the shopper completed the entry survey and completed paying,[7]
$GENDER_j$ = an indicator variable that is 1 if the shopper is a woman and is 0 if otherwise,
$HHSIZE_j$ = the number of individuals in the household including the respondent,
$FAMILIAR_j$ = an indicator variable that is 1 if the response on store familiarity is greater than or equal to "most of the time" and is 0 if otherwise, and
$OTHERS_j$ = an indicator variable that is 1 if the shopper is accompanied by others and is 0 if otherwise.

[7]We recognize the possibility that time is an endogenous variable, such that time spent shopping is determined by the number of aisles shopped. However, the correlation between time spent shopping and number of aisles shopped is low (r = .27 and r = .06 for time spent shopping versus "shopped all aisles" indicator variable and "shopped most aisles" indicator variable, respectively), suggesting that this measure is not endogenously determined.

Results

Table 3 displays the results of the hierarchical linear modeling analyses. As mentioned previously, we used planned purchase as the baseline category. As Table 3 shows, most of the parameters contrasting specifically planned with generally planned purchase are insignificant, so we focus on the results contrasting unplanned purchase with specifically planned purchase. Our analysis revealed that a store model with random effects for only PATTMOST and PURCYCLE produced an equivalent fit to a model with random effects for all store-level intercepts, $\chi^2_{28} = 20.92$, not significiant (n.s.). Thus, we report the results for the more parsimonious model.

Category characteristics. As we expected, coupon use is associated with a lower probability of unplanned purchase ($\beta = -.661$, $p < .001$), while the effect of display on unplanned purchase is positive ($\beta = .735$, $p < .01$). The fixed effects for category interpurchase cycle and category hedonicity are both positive, at .023 ($p < .001$) and .288 ($p < .001$), respectively. This indicates that unplanned purchases are more likely for infrequently purchased categories and for more hedonic categories. The only coefficients that are significant for generally planned purchases are the effects of coupon ($\beta = -.679$, $p < .001$), interpurchase cycle ($\beta = .009$, $p < .001$), and category hedonicity ($\beta = .073$, $p < .01$). Note that these results are directionally consistent with those for unplanned purchases.

As we expected, the display × interpurchase cycle interaction is negative ($\beta = -.006$, $p < .05$). This suggests that displays are more impactful in generating unplanned purchases for product categories that are purchased relatively often. The display × category hedonicity effect is negative as well ($\beta = -.104$, $p < .05$), though we predicted that it would be positive. This implies that displays are more beneficial in terms of generating unplanned purchases for less hedonic categories. We speculate about this finding in the "Discussion" section.

Customer characteristics. As we predicted, in-store decision making is affected by all the customer characteristics we examined, except for shopping with others. The coefficient for gender was positive, as predicted, indicating that women tend to make more unplanned purchases than men ($\beta = .139$, $p < .05$). As household size increased, so did the likelihood of making unplanned purchases ($\beta = .108$, $p < .001$). Surprisingly, shoppers who were accompanied by others were not significantly more likely to make unplanned

TABLE 3
Results of Multinomial Logit Analysis for Unplanned and Generally Planned Purchases

	Unplanned Purchases		Generally Planned Purchases	
	Parameter Estimate	***p*-Value**	**Parameter Estimate**	***p*-Value**
Category Characteristics				
Coupon	–.661	.000	–.679	.000
Display	.735	.009	–.113	n.s.
Interpurchase cycle	.023	.000	.009	.000
Hedonicity	.288	.000	.073	.004
Display × interpurchase cycle	–.006	.036	.004	n.s.
Display × hedonicity	–.104	.013	–.036	n.s.
Customer Characteristics				
Gender	.139	.013	–.046	n.s.
Household size	.108	.000	–.014	n.s.
Familiarity	.099	.042	–.112	n.s.
Shopping with others	.067	n.s.	–.121	n.s.
Customer Activities				
Used a list	–.234	.000	–.178	.012
Shopping frequency	–.095	.000	–.043	n.s.
Shopping pattern				
All aisles	.412	.000	–.170	n.s.
Most aisles	.275	.007	–.036	n.s.
Time spent shopping	.013	.000	.001	n.s.
Payment type				
Paid by check	.173	.000	.117	n.s.
Paid by credit card	.231	.002	.196	n.s.
Variance Components				
Level 1 intercept	.526		.955	
Level 2				
Most aisles	.176		.114	
Interpurchase cycle	.001		.011	

Notes: "Specifically planned" is the baseline category; n.s. = not significant.

purchases (β = .067, n.s.), though the direction is consistent with our prediction. We made no specific prediction regarding store familiarity, but the results indicate that greater familiarity with the store has a positive effect on unplanned purchases (β = .099, $p < .05$). This may be because consumers who are most familiar with the store are more willing to let the store guide their need recognition. Familiarity may increase their comfort with the environment and enable them to focus more on category cues for unrecognized needs. None of the customer characteristic coefficients were significant for generally planned purchases.

Customer activities. We expected that customer-initiated activities would lead to a decreased likelihood of making unplanned purchases. The results are as expected. Both using a list (β = –.234, $p < .001$) and shopping more frequently (β = –.095, $p < .001$) reduce the likelihood of making unplanned purchases. Shopping more aisles in the store increases the likelihood of unplanned purchases. Specifically, the effect of visiting all aisles is .412 ($p < .001$) and visiting "most aisles" is .275 ($p < .01$). The relative size of the coefficients also provides support for our predictions. The amount of time spent in the store is positively related to unplanned purchases (β = .013, $p < .001$), indicating that the likelihood of in-store decision making increases as time spent in the store increases. Finally, both paying by check (β = .173, $p < .001$) and paying by credit card (β = .231, $p < .01$) increase the probability of unplanned purchases compared with paying in cash. The probability of generally planned purchases decreases with list use (β = –.178, $p < .05$).

Interactions. We also examined the possibility of moderating effects for the key variables of time and list use on the other factors in the model. We added interaction terms with time and then with list into the model as a set. Within the sets, there were few significant interactions, and a comparison of goodness-of-fit measures for the augmented and nonaugmented models indicated no significant increase in fit from adding the sets of interactions.

Discussion

Consumer Welfare Implications

To our knowledge, this is one of only a few studies that attempt to examine self-control strategies in the domain of unplanned purchases and, more specifically, in a nonlaboratory context. We argued that people may want to limit the extent to which they make unplanned purchases by limiting

exposure and committing to a course of action. Our findings offer useful, easy-to-enact strategies for consumers who are interested in curtailing unplanned purchases. First, consumers should use a list because it commits the shopper to a set of purchases. Second, they should try to make more frequent, fewer-item trips. This helps focus the shopper on getting in, getting only the items he or she came for, and getting out. Third, consumers should limit browsing because visiting all aisles increases exposure to stimuli and, thus, unplanned purchasing. Fourth, consumers should limit the amount of time spent in the store. Limiting time forces the consumer to focus on the task at hand. Finally, consumers should make the decision before entering the store to pay by cash. Paying by credit (and, to a lesser extent, by check) decouples the "pain of paying" from the purchase and makes it easier to engage in unplanned purchasing.

To expand on the welfare implications, we conducted a "what-if" analysis that examines the relative impact of each variable or group of variables on the likelihood of engaging in in-store decision making. Table 4 shows the probability of generally planned and specifically planned purchase for each category factor, customer characteristic, and customer activity, calculated with Equations 4 and 6. To examine the individual impact of any given variable, an indicator variable was set to one and a continuous variable was increased by one standard deviation above its grand mean, while the other variables were held fixed at their baseline level (i.e., zero for indicator variables and grand mean for continuous variables). After we controlled for the product category and customer variables, the baseline probability of unplanned purchase was .46. Notably, the contextual factors can drive the probability of unplanned purchase as high as .93.

Among category characteristics, display exhibits the greatest effect, increasing unplanned purchasing to .64, almost a 40% jump from the baseline level. The customer characteristics demonstrate roughly equivalent effects, with each factor increasing the probability of unplanned purchase by approximately 10%. Shopping all aisles is the most impactful shopper activity, boosting the probability of unplanned purchase by more than 24% to .57. The effects of payment by check and credit are important because payment by credit and debit cards has become the preferred method of payment for grocery purchases. While these methods are more convenient, they also increase the likelihood of unplanned purchases. As Table 4 shows, paying with a credit card increases the probability of unplanned purchasing by approximately 9% for every item in the basket. This poses a risk for consumers who tend to succumb to immediate temptations and for those with an income constraint because the ease of paying by credit may result in unwanted purchases. Spending an extra 18.6 minutes (one standard deviation) shopping over the grand mean of approximately 42.5 minutes increases the unplanned purchasing propensity by 13% (to .52). Again, this affects each item in the shopper's basket.

What should a shopper who wants to curtail unplanned purchases do? For example, a female shopper for a five-person household has a probability of .53 of making unplanned purchases for each item. Our estimates suggest that she can reduce this probability to .45 by using a list and shopping more frequently (four times per week in this example). However, if she does not use a list, shops infrequently (e.g., twice per week), visits all aisles, and pays by credit card, her unplanned purchasing propensity inflates to .69. This example evinces the impact of shopper activities on unplanned purchasing.

Recall that we partitioned the product category and customer characteristics into stable and transitory factors. We assess the relative effect of each set of factors on unplanned and generally planned purchase probabilities by calculating the range in the probabilities as (1) the indicator variables are first set at their largest and then their smallest level and

TABLE 4
Shifts in Probability of Unplanned and Generally Planned Purchases as a Function of Category Characteristics, Customer Characteristics, and Customer Activities

Variable (SD if Continuous)	Unplanned Purchase Probability	Generally Planned Purchase Probability
Baseline: intercept only	.46	.11
Product Category Characteristics		
Stable Factors Combined (*Range*)	.64–.25	.09–.11
Interpurchase cycle (SD = 22.8)	.57	.10
Hedonic (SD = 1.1)	.53	.10
Transitory Factors Combined (*Range*)	.64–.31	.07–.07
Coupon	.32	.07
Display	.64	.07
Customer Characteristics		
Stable Factors Combined (*Range*)	.53–.42	.09–.11
Gender	.49	.10
Household Size (SD = 1.2)	.49	.10
Transitory Factors Combined (*Range*)	.51–.46	.08–.11
Others	.48	.09
Familiarity	.48	.10
Customer Activities (Range)	.69–.33	.06–.11
List	.41	.10
Shopping frequency (SD = 1.2)	.43	.11
Shopping pattern		
All aisles	.57	.07
Most aisles	.52	.09
Payment method		
Check	.49	.11
Credit	.50	.11
Time spent (SD = 18.6)	.52	.09

Notes: The probability of specifically planned is one less the sum of the probabilities of unplanned and generally planned. "Range" indicates variation in the probability of unplanned purchase when the specific factors are increased or decreased.

(2) the continuous variables are set at one standard deviation above or below their grand mean (see Table 4). The stable category characteristics of interpurchase cycle and hedonicity exert their largest influence when interpurchase cycle is longer (estimated at one standard deviation [22.8 days] above the grand mean of 47.4 days) and when hedonicity is higher (estimated at one standard deviation [1.1 point on the seven-point scale] above the grand mean of 3.8). At this level, the unplanned purchase propensity is .64, or 39% above the baseline level (when both are at their grand mean). Conversely, when both characteristics are one standard deviation below their grand mean, the probability is reduced to .25. Neither the stable nor the transitory customer characteristics exert much influence on the probability range relative to the baseline. However, the customer self-control activities exhibit the greatest range in their effect, from a high of .69 to a low of .33. In contrast to the category characteristic effects, this applies to each item in the basket. Consumers can control their in-store purchase propensity by undertaking a few simple activities.

Managerial Implications

The managerial implications are the flip side of the welfare implications. Consumers should be encouraged to shop as many aisles as possible (in general) and be exposed to as many product categories and in-store displays as possible (in particular). Two ways to achieve this are through innovative aisle layout and shelf design. For example, products that are frequently purchased or "destination" items" (e.g., milk) should be placed in locations that will lead consumers past as many other categories as possible or displayed next to less frequently purchased products. This is particularly useful when categories with longer interpurchase cycles are usage complements to products with shorter interpurchase cycles (e.g., canned tuna and mayonnaise).

Frequent-shopper programs can be leveraged as a tool to increase store familiarity, and geodemographics can be used to target consumers with the greatest probability of making unplanned purchases. Making the shopping experience as pleasant as possible will increase time spent in the store. Finally, manufacturers and retailers need to move beyond category management and consider "aisle management" to think more strategically about driving in-store need recognition.

Limitations and Further Research

Our examination of in-store decision making incorporates variables in terms of the intervening constructs, which should drive their effect on in-store purchasing. Unfortunately, we were limited to measures that were available in the POPAI data set. Further research that uses field-based experiments is needed to extend our findings (e.g., Heilman, Nakamoto, and Rao 2002). Furthermore, we focused on in-store decision making with respect to category choice, but we did not explicitly consider brand choice in our analysis. Our model could be extended to the area of brand choice and the impact of customer activities and characteristics on brand choice. It would also be useful to consider regimes for the effects of interpurchase time and category hedonicity, but this endeavor is most likely to bear fruit only if consumer-level measures of these category characteristics are collected. In addition, in some cases, it would be useful to look for segment differences in parameters using latent class analysis or something similar. However, it is difficult to pick which of many variables to analyze for segments, and some variables, such as interpurchase time, were unavailable in our data because we did not have individual-level longitudinal purchasing data but only category-level at one point in time.

A finding that runs contrary to our predictions was the negative interaction between display and category hedonicity. This suggests that the likelihood of unplanned purchases is affected more by display for products low on hedonicity than for products high on hedonicity. This may be because hedonic products can cause an emotional response in consumers (Yeung and Wyer 2004) regardless of placement, while the increased exposure of being on display is more important for functional products. Because most functional products fail to trigger an affective reaction, the likelihood of their being purchased as a result of in-store decision making requires that a need be recalled. Recall is likely to be boosted by additional exposure that comes from being on display. Further research is needed to better understand this relationship.

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