THE INTERPLAY BETWEEN CATEGORY CHARACTERISTICS, CUSTOMER CHARACTERISTICS, AND CUSTOMER ACTIVITIES ON IN-STORE DECISION MAKING

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Abstract

We explore product category and customer characteristics that affect the likelihood of engaging in unplanned purchases. Additionally, we examine consumer activities that can exacerbate or limit these effects. We employ a hierarchical modeling approach to test our hypotheses using a dataset of in-store intercept interviews conducted with 2,300 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, while our 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 our 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, FMOT, 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 endcap 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 memory for forgotten needs leading to in-store decision-making; in other words, 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 prior to 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 (1995), over two-thirds of purchase decisions involve some sort of in-store decision-making (i.e., generally planned or unplanned). While overall marketing spending is relatively flat, manufacturers' shopper marketing budgets are growing at over 20% per year from 2004-2010 (GMA/Deloitte 2007). In addition, there has been a significant increase in in-store stimuli such as advertisements on floors and dedicated TV channels such as those by Wal-Mart and Target. These efforts are assumed to be effective because they have their influence at the last stage of the choice process – at the point of purchase. Procter and 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 incorporating the role of product category characteristics, customer characteristics, and customer activities. Our approach is similar to that of Seiders et al. (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 impact the level of in-store decision-making. Second, once customers have been exposed to the stimulus, they appraise it (Yeung and Wyer 2004) which may result in an affective or cognitive response. The stimulus may 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 vs. with others, store familiarity) can also be influenced, although 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). Clearly, 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 unhealthy foods, overspending), so some consumers have an incentive to limit the extent of unplanned purchases. In such a situation, a consumer may wish 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, these strategies are referred to as customer activities because they are initiated by the customer and may 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 through a large-scale field study. We are fortunate in having access to a dataset that allows us to assess the effects of our 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 dataset of over 34,000 items purchased by over 2,300 consumers across 28 stores in 14 cities on which we estimate the model, discuss the statistical methodology, and then present the results. We conclude with a discussion of the implications of our findings for research and practice, along with interesting directions for future 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 perceive 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 while 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 via limiting exposure and affective responses. Specific predictions for each factor are described in detail below. Figure 1 summarizes our in-store decision-making framework.

---- Insert Figure 1 about here. ----

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). Since 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 in-store display) and their influence should operate via 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), thereby 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 actually 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 increasing 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 goes to shop, s/he is likely to purchase the items that are used up quickly. These items are likely more salient and therefore more accessible in memory (Posavac, Sanbonmatsu, and Fazio 1997). Further, 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. Prior to the start of each shopping experience, the consumer will invoke the script, making the frequently purchased item more accessible. Consumers should therefore 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 therefore predict that unplanned purchases will be less likely for products that are purchased more frequently, and hence have a shorter interpurchase cycle.[1]

Category Hedonicity. Hedonic goods, such as chocolate cake, elicit more positive affect

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

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 are 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 such as ice cream) are more likely to be consumed on impulse as compared to virtue products (Wertenbroch 1998). This leads to our prediction that hedonic products are more susceptible to in-store decision making than are 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 tier brands versus low quality tier brands. This suggests that in addition to the direct effect of display on unplanned purchasing mentioned previously, displays may also interact with category purchase frequency and hedonicity. That is, being on display may have a differential effect due to its 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).

Ceteris paribus, the probability of unplanned purchases increases for categories that are consumed quickly when they are on display compared to categories consumed less quickly. Therefore, we expect a negative interaction between display and interpurchase cycle. On the other hand, hedonic products should arguably benefit more from displays than functional products, because the purchase of hedonic items like cookies and ice cream tends to be more

intrinsically motivated than the purchase of functional items like 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 compared to 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 (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 bigger 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 becomes more complex. This should lead to a greater chance of in-store cues triggering need recall.

Store Familiarity. After a consumer shops a given store repeatedly, s/he learns the general layout of the store. Two opposing forces may operate with regards to in-store decision

making. On the one hand, in an unfamiliar store, consumers must direct attention to the environment as a means of learning where particular items are, thereby increasing their exposure to in-store stimuli. Knowledge of the store layout allows 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 occurred when the shopper was 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 would enable the customer to rely on the store to cue him/her for shopping needs. Thus, familiarity might lead to greater in-store decision making. We therefore 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 those shopping with others will engage in more in-store decision making compared to those shopping alone.

Customer Activities

As mentioned earlier, 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 wish 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

[2] We do not argue that the set of characteristics discussed here is exhaustive. Rather, it is partly dictated by available

decision-making.

The self-control literature suggests that behavior is generally goal-directed towards 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 tradeoff 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 so 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, getting out of the store as quickly as possible, or selecting products that are nutritionally healthy. 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 strategies that increase will power, such as precommitting oneself to a course of action by imposing constraints on behavior (i.e., planning ahead). This aligns with our thesis that exposure and affective responding are at the heart of in-store decision making. The specific strategies we examine are shopping frequency, number of aisles shopped, use of a shopping list, time spent in the store, and method of payment (e.g., cash vs. credit card).

Use of a Shopping List. One 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 shoppers avoid unplanned purchases. This suggests that without the memory aid, consumers may default to even more in-store decision-

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measures in our dataset.

making. Thomas and Garland (1993) find that shoppers with lists bought fewer items and spent less money than did shoppers without lists. Thus, we expect that consumers with shopping lists will be less likely to make in-store decisions compared to 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 will be exposed to a greater number of product categories and in-store displays. Thus, we expect the probability of in-store decisions to 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 mindset to buy only those items that s/he 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 they 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, and 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 allows shoppers to use credit as a short-term financing medium (Lee and Kwon 2002). Using data from actual shoppers, Soman (2003) found that shoppers spent more when they paid by credit card compared to cash, and this was 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 were seen to provide more assistance in budgeting and spending control. Thus we expect that, relative to cash, credit card use will increase the likelihood of unplanned purchases.

EMPIRICAL TEST

The Point of Purchase Advertising Institute (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. POPAI fielded its last study in the spring of 1995 at a cost of approximately $400,000. In-store intercept interviews were conducted with 2,300 consumers at 28 grocery stores across 14 geographically dispersed U.S. cities.

Consumers were intercepted randomly as they entered the store and offered a $10 coupon[3] as an inducement to participate in the study. Respondents were prompted with each major department. Importantly, the interviewer probed for specific brand purchase intentions. Following this, coupons held by the respondent were recorded and the consumer was sent into the store. After the customer was finished shopping, including payment, the interviewer met each respondent at the cash register, took the register receipt, and asked the respondent 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] POPAI generously provided

[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 where inquiring about respondents' purchase intentions may have influenced their subsequent purchasing behavior. They find no such effects.

the resulting data (over 34,000 purchases) to us for our analysis. For succinctness, details on the measures used to operationalize the constructs in our model as well as the expected effects are presented in Table 2 (e.g., Kumar, Venkatesan, and Reinartz 2008).

---- Insert Tables 1 and 2 about here. ----

Model

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

In our data, purchases are nested in baskets, which are in turn nested in stores. The category characteristics (e.g., coupon, hedonicity) vary across purchases, while 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). Further, our dependent variable is categorical. Putting the two together, we use a hierarchical model described by Raudenbush and Bryk (2002), 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.

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

[5] Brand switches comprised less than 4% of the purchases so they were dropped from the analysis.

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

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. The level-1 model is then specified as:

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

where:

$\beta_{qjk(m)}$ are the coefficients to be estimated for m=1 (unplanned), 2 (generally planned),

X_{qijk} is 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 (vs. specifically planned) and generally planned (vs. specifically planned) purchases.[6] Unfortunately, our dataset does not include any store-level descriptive variables, so we could only estimate a random effects model at the store level. Since 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:

$$\begin{aligned}\eta_{mij} = {} & \beta_{oj(m)} + \beta_{1j(m)} COUPON_{ij} + \beta_{2j(m)} DISPLAY_{ij} + \beta_{3j(m)} PURCYCLE_i + \beta_{4j(m)} HEDONIC_i \\ & + \beta_{5j(m)} DISPLAY_{ij} * PURCYCLE_i + \beta_{6j(m)} DISPLAY_{ij} * HEDONIC_i\end{aligned} \tag{4}$$

where:

[6] We also estimated an ordinal logit model with specifically planned as most completely planned and unplanned as least completely planned. In terms of CAIC (119,512.3 versus 127,112.6), the multinomial logit specification outperformed the ordinal logit specification, even though it had 36 parameters compared to 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

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

$DISPLAY_{ij}$ is an indicator variable that is one if product category i in basket j was purchased on display and zero otherwise,

$PURCYCLE_i$ is the average interpurchase cycle for product category i (grand mean centered),

$HEDONIC_i$ is 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:

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

where:

$\beta_{qj(m)}$ are the level-1 coefficients,

$\nu_{qs(m)}$ are the level-2 coefficients (fixed effects),

W_{sj} is level-2 independent variable s, s=1,…,S

$u_{qj(m)}$ is the random component.

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

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

where:

$LIST_j$ is an indicator variable that is one if the consumer used a shopping list and zero otherwise,

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substantive implications of the two sets of estimates were identical. The estimates for the ordinal logit are available from the authors. We thank an anonymous reviewer for suggesting this model comparison.

$SHOPFREQ_j$ is the number of shopping trips per week (grand mean centered),

$PATTALL_j$ is an indicator variable that is one if the consumer visited all the aisles and zero otherwise,

$PATTMOST_j$ is an indicator variable that is one if the consumer visited most of the aisles and zero otherwise,

$CHECK_j$ is an indicator variable that is one if the shopper paid with a check and zero otherwise,

$CREDIT_j$ is an indicator variable that is one if the shopper paid with a credit card and zero otherwise,

$TIME_j$ is the number of minutes elapsed between the time the shopper completed the entry survey and completed paying,[7]

$GENDER_j$ is an indicator variable that is one if the shopper is female and zero otherwise,

$HHSIZE_j$ is the number of individuals in the household including the respondent,

$FAMILIAR_j$ is an indicator variable that is one if the response on store familiarity is greater than or equal to "most of the time" and zero otherwise,

$OTHERS_j$ is an indicator variable that is one if the shopper is accompanied by others and zero otherwise.

Results

Table 3 displays the results of the HLM analyses. Specifically planned purchase was used as the baseline category. As seen in Table 3, most of the parameters contrasting specifically planned with generally planned purchase are insignificant, so we focus on results contrasting unplanned purchase with specifically planned purchase. Our analysis revealed that a store model

[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 ($r = 0.27$ and $r = 0.06$ 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.

with random effects for only PATTMOST and PURCYCLE produced an equivalent fit to a model with random effect for all store-level intercepts, $\chi^2_{28} = 20.92, ns.$ Thus, we report results for the more parsimonious model.

---- Insert Table 3 about here. ----

Category Characteristics. As expected, coupon use is associated with a lower probability of unplanned purchase (β=-0.661, p<.001). The effect of display on unplanned purchase is positive, as expected (β=0.735, p<.01). The fixed effects for category interpurchase cycle and category hedonicity are both positive, at 0.023 (p<.001) and 0.288 (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 (β=-0.679, p<.001), interpurchase cycle (β=0.009, p<.001), and category hedonicity (β=0.073, p<.01). Note that these results are directionally consistent with those for unplanned purchases.

As expected, the display X interpurchase cycle interaction is negative (β=-0.006, p<.05). This suggests that displays are more impactful in generating unplanned purchases for product categories that are purchased relatively often. The display X category hedonicity effect is negative as well (β=-0.104, p<.05), while 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 predicted, in-store decision-making is impacted by all the customer characteristics examined except for shopping with others. First, the coefficient for gender was positive as predicted, indicating that females tend to make more unplanned purchases than do males (β=0.139, p<.05). As household size increased so did the likelihood of making

unplanned purchases (β=0.108, p<.001). Surprisingly, shoppers that were accompanied by others were not significantly more likely to make unplanned purchases (β=0.067, NS), although 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=0.099, p<.05). This may be because those consumers that are most familiar with the store are more willing to let the store guide 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. Using a list (β=-0.234, p<.001) and shopping more frequently (β=-0.095, p<.001) both 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 0.412 (p<.001) and visiting "most aisles" is 0.275 (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=0.013, 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=0.173, p<.001) and paying by credit card (β=0.231, p<.01) increase the probability of unplanned purchases compared to paying in cash. The probability of generally planned purchases decreased with list use (β=-0.178, 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. Interaction terms with time, then with list,

were added into the model as a set. Within the sets, there were very few significant interactions and a comparison of goodness of fit measures for the augmented and non-augmented models indicated no significant increase in fit from adding the sets of interactions.

DISCUSSION

Consumer Welfare Implications

To our knowledge, this is one of the only studies that attempts to examine self-control strategies in the domain of unplanned purchases and more specifically in a non-laboratory situation. We argued that people may wish 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 s/he came for, and getting out. Third, consumers should limit browsing as visiting all aisles increases exposure to stimuli and increases 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 to pay by cash before entering the store. 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 via substitution into 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 controlling for the product category and customer variables, the baseline probability of unplanned purchase is 0.46. Interestingly, the contextual factors can drive the probability of unplanned purchase as high as 0.93.

---- Insert Table 4 about here. ----

Among category characteristics, display exhibits the greatest effect, increasing unplanned purchasing to 0.64, an almost 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 over 24% to 0.57. The effects of payment by check and credit are important, as 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 shown in Table 4, paying with a credit card increases the probability of unplanned purchasing by about 9% for every item in the basket. This poses a risk for consumers who succumb to immediate temptations and 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 about 42.5 minutes increases the unplanned purchasing propensity by 13% (to 0.52). Again, this affects each item in the shopper's basket.

What is a shopper who wishes to curtail unplanned purchases to do? For example, a

female shopper for a five person household has a probability of 0.53 of making unplanned purchases for each item. Our estimates suggest that she can reduce this probability to 0.45 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 0.69! 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 can assess the relative effect of each set of factors on unplanned and generally planned purchase probabilities by examining the range in the probabilities as the set of indicator variables is set at its largest versus smallest level and 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 7-point scale) above the grand mean of 3.8). At this level, the unplanned purchase propensity is 0.64, 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 0.25. Interestingly, 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 0.69 to a low of 0.33. In contrast to the category characteristic effects, this applies to *each item in the basket.* Clearly, consumers can control their in-store purchase propensity by undertaking a few simple activities.

Managerial Implications

The managerial implications are, of course, 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 instance, products which are frequently purchased or "destination" items" (e.g., milk) should be placed in locations which will lead consumers past as many other categories as possible or displayed next to less frequently purchased products. This is particularly useful in cases where categories with longer interpurchase cycles are usage complements to products with shorter interpurchase cycles (e.g., canned tuna and relish).

Frequent buyer 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 would 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 Future 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 dataset. Future research that uses field-based experiments is needed to extend our findings (e.g., Heilman, Nakamoto, and Rao 2002). Further, we focused on in-store decision-making insofar as category choice is concerned, but did not explicitly consider brand choice in our analysis. Our model might be extended to the

area of brand choice and the role of customer activities and characteristics thereon. It would also be useful to consider regimes for the effects of interpurchase time and category hedonicity, but this endeavor will be most likely to bear fruit 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, in addition, some variables like interpurchase time are unavailable in our data as we do not have individual level longitudinal purchasing data but only cross-category at one point in time.

One finding contrary to our predictions was the negative interaction between display and category hedonicity. This suggests that the likelihood of unplanned purchases is impacted more by display for products low on hedonicity than for those high on hedonicity. This may be because hedonic products are able to cause an emotional response in consumers (Yeung and Wyer 2004) irrespective 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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TABLE 1
Summary Sample Statistics

	Frequency
Decisions	
Unplanned	60.9%
Generally planned	6.6%
Coupon	6.9%
Display	9.2%
List use	53.9%
Shopping Pattern	
All aisles	20.9%
Most aisles	37.5%
Payment Method	
Check	41.2%
Credit	9.5%
Gender (% female)	82.5%
Familiarity (% visit the store most or all the time)	75.4%
Shopping w/ Others	34.0%

	Mean	**Standard Deviation**
Interpurchase Cycle	47.4 days	22.8
Category Hedonicity	3.8/7	1.1
Shopping Frequency	2.6 times/week	1.2
Time Spent	42.5 minutes	18.6
HH Size	2.7 members	1.2

TABLE 2
Detailed Descriptions of Measures for the Variables of Interest
[Sign indicates predicted effect on unplanned purchasing]

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 (IRI 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 via 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: Upon completing their purchases, shoppers were asked if 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 him/herself were currently living in the household. This is a continuous variable. (HHSIZE **[+]**)
Transitory Factors
Shopping with Others: The field interviewer noted if 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 to all other responses. (FAMILIAR)
Customer Activities
Use of a list: Indicates whether the respondent had a shopping list on that particular trip or not. (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 said 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 respondent 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 only visited 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 **[+]**)

TABLE 3
Results of Multinomial Logit Analysis for Unplanned and Generally Planned Purchases
(Specifically Planned is the baseline category)

Unplanned Purchases	Parameter Estimate	p value	**Generally Planned Purchases**	Parameter Estimate	p value
Category Characteristics			**Category Characteristics**		
Coupon	-0.661	0.000	Coupon	-0.679	0.000
Display	0.735	0.009	Display	-0.113	NS
Interpurchase cycle	0.023	0.000	Interpurchase cycle	0.009	0.000
Hedonicity	0.288	0.000	Hedonicity	0.073	0.004
Display x Interpurchase cycle	-0.006	0.036	Display x Interpurchase cycle	0.004	NS
Display x Hedonicity	-0.104	0.013	Display x Hedonicity	-0.036	NS
Customer Characteristics			**Customer Characteristics**		
Gender	0.139	0.013	Gender	-0.046	NS
Household size	0.108	0.000	Household size	-0.014	NS
Familiarity	0.099	0.042	Familiarity	-0.112	NS
Shopping with others	0.067	NS	Shopping with others	-0.121	NS
Customer Activities			**Customer Activities**		
Used a List	-0.234	0.000	Used a List	-0.178	0.012
Shopping frequency	-0.095	0.000	Shopping frequency	-0.043	NS
Shopping pattern			Shopping pattern		
All aisles	0.412	0.000	All aisles	-0.170	NS
Most aisles	0.275	0.007	Most aisles	-0.036	NS
Time spent shopping	0.013	0.000	Time spent shopping	0.001	NS
Payment Type			Payment Type		
Paid by check	0.173	0.000	Paid by check	0.117	NS
Paid by credit card	0.231	0.002	Paid by credit card	0.196	NS
Variance Components					
Level-1 Intercept	0.526		Level-1 Intercept	0.955	
Level-2			Level-2		
Most aisles	0.176		Most aisles	0.114	
Interpurchase cycle	0.001		Interpurchase cycle	0.011	

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	0.46	0.11
Product Category Characteristics		
Stable Factors Combined (Range) **	**0.64-0.25**	**0.09-0.11**
Interpurchase Cycle (s.d.=22.8)	0.57	0.10
Hedonic (s.d.=1.1)	0.53	0.10
Transitory Factors Combined (Range)	**0.64-0.31**	**0.07-0.07**
Coupon	0.32	0.07
Display	0.64	0.07
Customer Characteristics		
Stable Factors Combined (Range)	**0.53-0.42**	**0.09-0.11**
Gender	0.49	0.10
HH Size (s.d.=1.2)	0.49	0.10
Transitory Factors Combined (Range)	**0.51-0.46**	**0.08-0.11**
Others	0.48	0.09
Familiarity	0.48	0.10
Customer Activities (Range)	**0.69-0.33**	**0.06-0.11**
List	0.41	0.10
Shopping Frequency (s.d.=1.2)	0.43	0.11
Shopping Pattern		
All aisles	0.57	0.07
Most aisles	0.52	0.09
Payment method		
Check	0.49	0.11
Credit	0.50	0.11
Time Spent (s.d.=18.6)	0.52	0.09

* The probability of specifically planned is one minus the sum of the probabilities of unplanned and generally planned.

** The range indicates the probability as factors are varied to increase or decrease probability of unplanned purchase.

FIGURE 1
Factors Influencing the Extent to which In-store Stimuli Trigger In-store Decision Making