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Spontaneous selection: The influence of product and retailing factors on consumer impulse purchases

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ABSTRACT

Our research examines the effect of product characteristics and retailing factors on the likelihood a consumer makes an impulse purchase. We present a framework for understanding the impulse buying process and use it to explain our findings. Our nested logit model uses data from an adult panel of grocery shoppers over three major household grocery shopping trips. The results indicate that product characteristics have a fifty percent greater influence on impulse buying than do retailing factors. Of the three product characteristics investigated, the hedonic nature of the product has the greatest influence on impulse buying. Of the three retail factors, a store environment with a high–low pricing strategy influences impulse buying the most. Our findings suggest that retailers who want to encourage impulse buying behavior utilize promotional activities and merchandising tactics that attract consumers' attention to emotionally appealing products.

1. Introduction

Imagine a consumer walking down a grocery store aisle. While picking up the items on the shopping list, the consumer stops by a cookie display and spontaneously adds a box of cookies to the shopping cart. What prompted this behavior? Was it the hedonic appeal of the product? Was it the special display? What led to the impulsive cookie purchase?

Such questions are not trivial ones. Impulse purchases comprise a substantial portion of retail industry sales. An estimated $4.2 billion in annual store volume is generated by impulse sales of things like candy and magazines (Mogelonsky, 1998). In certain product categories, impulse buying accounts for almost 80% of purchases (Abrahams, 1997; Smith, 1996). Consumer products giant Procter & Gamble Co. spends millions on in-store marketing efforts, believing that the first three to seven seconds when a shopper notices a product on the shelf, what P&G refers to as the "first moment of truth," is critical to the purchase decision (Nelson and Ellison, 2005). There is a growing use among retailers of in-store promotion activities designed to increase short-term sales (see e.g., Blattberg et al., 1995; Blattberg and Neslin, 1990; Narasimhan et al., 1996), and an understanding that some of the sales increase will come from impulse purchases. How and why these activities lead to *impulse* buying behavior is still somewhat vague.

Decisions concerning promotional activities become particularly challenging for retailers during recessions. The availability of money has been shown to drive impulse purchases (Beatty and Ferrell, 1998). Conventional wisdom suggests that shoppers become more price sensitive during difficult economic times, encouraging retailers to increase their promotional activities. Increased planning by shoppers, such as the use of a shopping list, becomes more prevalent, resulting in fewer unplanned purchases (Inman et al., 2009). However, Hampson and McGoldrick (in press) find that while this is true for an important subset of a typical grocery store's clientele, about fifty percent of customers maintain the status quo and do not adapt their shopping behavior during a recession. An overreaction by retailers in the form of increased promotional activity may damage carefully developed store images and customer loyalties. A good understanding of the relative influences of product and store factors on impulse buying can play a crucial role in developing appropriate promotional strategies during economic crises.

Furthermore, even shoppers who, because of economic conditions, carefully plan their purchases can have their minds changed in the store. Research by Information Resources Inc. and other companies indicates that more consumers are preparing shopping lists and sticking to budgets, but also that consumers are switching more often among brands based on deals (Neff, 2009). Such issues motivate the present study. Retailers would benefit from knowing the contribution of in-store merchandising, off-shelf displays, product features and other in-store factors that lead to a consumer's impulsive purchase decision.

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Our research will help marketers better understand how and why consumers buy on impulse. We provide answers to important questions about the role of product and retail factors in consumer impulsive buying behavior. We investigate the relationship between product characteristics and retail characteristics, and ascertain the likelihood that a shopper will make an impulse purchase while grocery shopping. Our model addresses the disparate influence of these factors across three types of purchase outcomes: planned purchases, impulse purchases, and the decision not to buy an item. Our data consists of details on the purchase of 3979 grocery items across three separate shopping trips by a panel of 51 shoppers. The data was assembled from shoppers' survey responses and store receipts. Our study provides a unique opportunity to account for multiple variables that impact consumers concurrently while they are in the store making purchase decisions. In addition, we are able to determine the differential role played by retail factors versus product characteristics in the consumer's impulse purchase decision.

Our study has important implications for retailers, manufacturers, and academics. Our results can inform the following issues:

Retailer product mix design. Many retailers are looking for ways to "fine-tune" their product mix while maintaining variety and differentiation (Progressive Grocer, 2011). Understanding which types of products have a higher likelihood of being bought on impulse can aid retailers in making strategic decisions about which products to add to or remove from store shelves in order to increase sales. Our research provides important information for identifying product characteristics which lead to more impulse buying behavior.

Retailer promotion design. Retailers must decide whether and what type of promotions to run. Are consumers more likely to spontaneously add a product to their carts if the price has been cut or if the product is on special display? Our study provides information on the responsiveness of consumers to specific types of retail promotions within an impulse buying context. This knowledge can guide retailer judgments concerning promotion decisions.

Overall retail performance. Consumers make in-store purchase decisions in a complex environment where a multiplicity of interrelated elements may impel an impulse purchase. Understanding which of the multiple elements that are simultaneously competing for consumers' attention are likely to prompt an impulse purchase can guide retail strategy. Our study assesses the simultaneous influence of a group of variables in order to better reflect the shopping environment as consumers experience it. Our findings inform retailers as to the relative contribution of product-related factors versus store-related factors to an impulse purchase decision, providing them with a better understanding of the impulse-responsiveness of consumers within a multifactorial world. Such knowledge can lead to more optimally designed store environments and aid retailers who want to maximize shopper opportunities for impulse purchases.

Manufacturer product development. Retail space is limited and manufacturers introduce hundreds of new products each year. A growing number of retailers are taking steps to better optimize their product portfolios by weeding out redundant or laggard SKUs (stock-keeping units; Progressive Grocer, 2011). Our study identifies the product characteristics that are most likely to encourage impulse buying. This information provides manufacturers with information that can guide product development decisions and lead to better sales performance for new products.

Understanding consumer buying behavior. Both practitioners and academics are interested in learning more about impulsive buying behavior. While the literature is rich with studies examining individual factors that lead to impulsive buying behavior, few studies attempt a comprehensive approach to understanding the concurrent influences on a consumer's impulse buying decision as it occurs during a shopping experience. Our research framework provides a clear and useful way to understand how in-store stimuli might impact a consumer's buying behavior, and our data provides a unique opportunity to learn about consumers' in-store decision making.

An important theme suggested by these implications is that marketers can gain insights from a more comprehensive exploration of the multiple factors affecting shopper in-store decisions which can lead to more profitable retailing strategies. Previous research has focused on identifying store attributes that influence customer satisfaction and loyalty (see, e.g., Martinez-Ruiz et al., 2010; Wong and Dean, 2009). Other researchers have recognized the relationship between consumers' impulse buying tendencies and store patronage and promotion proneness (Lee, 2007; Martinez and Monaner, 2006; Shamdasani and Yeow, 1995; Skallerud et al., 2009). Our research is unique in that it examines the concurrent influence of product factors and retailing factors on impulsive buying behavior in a grocery store setting and looks at the comparative influence of each of these factors. We model a shopper's purchase outcome as the probability of an impulse purchase, then utilize a nested multinomial logit model (cf. Kamakura et al., 1996) to account for the concomitant presence of a variety of factors impacting an impulsive purchase decision. We focus on purchase outcomes that account for consumers' immediate reactive responses to stimuli *within* the decision environment. As Rook (1987, p. 191) points out, "impulse buying is reactive behavior and often involves an immediate action response to a stimulus." The result is we can better understand how impulse buying behavior varies across the marketing mix variables over which retailers have the most control. From these results, we can provide strategic guidance to retailers as to how to encourage impulsive buying behavior among shoppers, which can lead to an increase in consumer spending and higher retailer profits.

2. Impulse buying behavior

An early field study of grocery shoppers defined an **impulsive purchase** decision as a purchase decision made in the store for which there is no prior recognition of need (Kollat and Willett, 1967). Impulse purchases occur when a consumer sees a product in the store and due to a strong urge to possess the item purchases it with little or no deliberation (see Puri, 1996; Rook and Fisher, 1995). This type of buying behavior consists of "(1) relatively rapid decision-making, and (2) a subjective bias in favor of immediate possession" (Rook and Gardner, 1993, p. 3; see also Rook and Hoch, 1985). It occurs without a lot of reflection (Beatty and Ferrell, 1998). Impulsive buyers typically are emotionally attracted to the impulse object, and desire immediate gratification (Hoch and Loewenstein, 1991).

In this study, we adopt Kollat and Willett's (1967) definition of impulse buying as an in-store decision that occurs without prior recognized need for the item in order to distinguish impulse purchases from unplanned reminder grocery purchases. While the impulse buying literature has often conflated impulsive and unplanned purchasing behaviors, these behaviors are distinct. For example, a shopper may pass the cereal aisle and recall that his home inventory of cereal is low and he needs to restock. This unplanned reminder purchase would be classified as a planned purchase if the shopper had remembered to put the item on his shopping list. A pure impulse purchase has no "reminder" component since there was no prior recognized need. This difference between impulse and unplanned purchases has significant

implications for the marketing strategies of retailers and product manufacturers. The unplanned reminder buy reflects a purchase decision made at a previous point in time (see Stern, 1962). A true impulse purchase reflects an at-the-moment, in-store decision and is therefore subject to greater influence from the store environment, and the consumer's current state at the time of shopping (see Beatty and Ferrell, 1998; Cobb and Hoyer, 1986).

Our reliance on a measure of pure impulse purchases in assessing the effect of product and retail variables on consumers' in-store decisions distinguishes our research from the majority of impulse studies that investigate "unplanned buying" and that rely on scanner data, purchase intentions, or retrospective surveys. As a result, our study provides unique insights into consumer impulse buying behavior. Specifically, our study can help marketers determine the in-store factors that impact purely spontaneous purchases of items that otherwise would not end up in the shopping cart. Our research findings offer important information for benchmarking managerial expectations with regard to product selection and merchandising decisions.

3. Framework and hypotheses

One can describe a shopper's purchase decision as the outcome of a multi-stage process by which the shopper becomes aware of a product, develops an interest in the product, and takes action by purchasing (or deciding not to purchase) the item. The stages of the process are conceptually distinct, though not necessarily observable, and consumers may not consciously be aware of going through the process. More complex models of the consumer decision process are available (e.g., Howard and Sheth, 1969; Rogers, 1962) but the stages of awareness, interest, and decision form the basis of most consumer decision-making models.

This three-stage decision process forms the basis of our theory of impulse buying behavior. An impulse is a reaction to a stimulus (see, e.g., MacInnis and Patrick, 2006; Rook, 1987; Wolman, 1973). The urge a consumer feels to make an impulsive purchase arises when a consumer encounters an object of desire in the retail environment (Beatty and Ferrell, 1998). The desire to acquire the object is elicited on the spot within the store (Strack et al., 2006). Impulsive buying behavior is stimulus-driven and object-focused. An impulse purchase begins with awareness of the impulse object, followed by an immediate desire for the product, and the decision to purchase the product. This process can occur instantaneously.

This three-stage consumer impulse buying process provides the framework for understanding a consumer's attraction to a certain product in a particular retail environment. Factors in the retail environment may facilitate the impulse decision by drawing attention to the product and enhancing its appeal. Further, although any product can be purchased impulsively, previous studies suggest that products with certain attributes are more likely to hold emotional appeal and trigger impulsive desires. We now turn to findings from the impulse literature to identify the key product and retail factors that have been shown to affect consumer impulsive buying behavior.

3.1. Previous research—individual product factors

Impulse buying behavior occurs across a wide range of product categories including food, clothing, and household items (Bellenger et al., 1978; Prasad, 1975; West, 1951; Williams and Dardis, 1972). **Hedonic** products have more emotional appeal than utilitarian products and are bought or consumed primarily for their ability to provide feeling or pleasure rather than utilitarian value (Dhar and Wertenbroch, 2000; Hirschman and Holbrook, 1982). Research by Dittmar et al. (1995) suggests that emotionally appealing products are more likely to be impulsively purchased than non-emotionally appealing products. Given that impulsive buying behavior is an exciting, hedonically-charged experience (see Rook, 1987; Weinberg and Gottwald, 1982) and that impulse buyers often are emotionally attracted to the impulse object, we hypothesize:

H1. Hedonic products are more likely to be impulse purchased than are non-hedonic products.

"**Ready-to-use**" products are those that can satisfy the impulse buyer's desire for immediate gratification (Rook and Gardner, 1993; see also Hoch and Loewenstein, 1991; Rook and Hoch, 1985). The desire for immediate gratification suggests that impulsive buyers choose products that are ready to be used or consumed and that can be enjoyed without delay, therefore we propose that

H2. Ready-to-use products are more likely to be impulse purchased than products that are not ready-to-use.

Previous research demonstrates that consumers make impulsive purchases of both expensive and inexpensive items across a wide range of product categories (Bellenger et al., 1978; Dittmar et al., 1995; Prasad, 1975; Rook, 1987; West, 1951; Williams and Dardis, 1972). Although a study by McGoldrick (1982) indicated that **price** was not a main reason for shoppers' impulsive purchases, Cobb and Hoyer (1986) found that price influenced about nine percent of impulsive buyers. Consistent with utility maximization, a low price is generally preferred to a high price by buyers, all else being equal (Train, 2003), so we expect price to have a negative impact on impulsive buying.

H3. Low-priced products are more likely to be impulse purchased than are high-priced products.

3.2. Previous research—individual retailing factors

Retail environments can stimulate an impulse purchase by attracting attention to impulse items through in-store displays and promotions (Cobb and Hoyer, 1986; Cox, 1964; Dittmar et al., 1995; McGoldrick, 1982; Peck and Childers, 2006). Since impulse purchases are in-store decisions that in some product categories account for the majority of purchases (Abrahams, 1997; Smith, 1996), a retailer's decision to offer an item at a promotional price, or to locate an item on a special display, may play an important role in the shopper's impulsive buying decision. Martinez and Monaner (2006) found that in-store deal proneness was related to buying impulsiveness. Offering an item on sale or at a **promotional price** encouraged slightly more impulse purchases compared to non-promotionally priced goods (Williams and Dardis, 1972). We expect that

H4. Products on sale are more likely to be impulse purchased than are products that are not on sale.

Similarly, end-of-aisle and checkout counter **displays** increased in-store decisions to purchase an item by about three percent compared to when an item was displayed in-aisle (Inman et al., 2009). Therefore, we predict that

H5. Products on special display are more likely to be impulse purchased than are products that are not on special display.

Store atmospherics and the physical aspects of the retail environment also affect a consumer's mood and shopping behavior (Babin and Attaway, 2000; Donovan et al., 1994; Eroglu et al., 2005; Kotler, 1973–74; Martinez-Ruiz et al., 2010; Peck and

Childers, 2006). In general, the more pleasant the environment, the higher the positive affect and the longer the shopper spends in the store. In-store browsing, in turn, leads to more impulsive purchasing behavior (Beatty and Ferrell, 1998). **EDLP** (everyday low price) stores are typically discount retail environments that focus on low prices and limited store atmospherics; HiLo stores are generally grocery environments with more sensory-based atmospherics (e.g., music, lighting) and higher service levels (see Bailey, 2008; Donovan and Rossiter, 1982; Hoch et al., 1994; Kotler, 1973–74).[1] Since more pleasant store atmospherics lead to more in-store browsing and more impulsive buying behavior we hypothesize

H6. Products in a HiLo environment are more likely to be impulse purchased than are products in an EDLP environment.

3.3. Previous research—product vs. retailing variables

Notwithstanding this rich impulse buying literature, impulsive buying behavior remains an elusive phenomenon. One important contribution of our research is our ability to identify the *relative* influence of product and retailer merchandising factors on the impulsive purchase decision. While both types of factors are linked to impulsive buying behavior, the importance of product variables compared to retailing variables remains unknown. As stated previously, the attraction to the stimulus product is at the core of an impulsive purchase (Beatty and Ferrell, 1998; Rook, 1987; Strack et al., 2006; Wolman, 1973). This attraction is aided by the in-store environment that can draw attention to the object and increase its appeal (Cobb and Hoyer, 1986; Cox, 1964; Dittmar et al., 1995; McGoldrick, 1982; Peck and Childers, 2006). Our model allows us to identify the relative influence product characteristics and retailing characteristics have on a consumer's impulsive purchase so that retailers can adjust their marketing strategies accordingly. Because the impulse decision process described in our framework is object-focused and begins with a shopper's awareness of the impulse object, we hypothesize

H7. As a group, product variables have a greater impact on an impulse purchase than do retailing variables.

3.4. Previous research—individual shopper covariates

Our research is focused on the influence of product variables and retailing variables on consumer impulse purchase decisions because, as noted by one researcher, "[impulse] buying may be more a function of situational variables (store-environment, product and trip-specific variables) than of shopper characteristics," (Prasad, 1975, p. 12). We acknowledge that consumer characteristics also influence impulse purchase decisions but our research is directed at factors over which retailers have control. Therefore, based on previous impulse research, we measured consumer characteristics that have been shown to influence impulsive buying behavior and included these variables in our logit model as control variables. The justification and measurement of these characteristics are described in Appendix A.

In summary, the three-stage consumer decision framework and key findings from the impulse literature enable us to generate seven hypotheses that relate product and retail characteristics to the likelihood of an impulse purchase. We describe below our model for testing these hypotheses.

4. Model description

4.1. Impulse purchases

As discussed above, there are several factors associated with the product and the retail environment that might increase the likelihood of a shopper making an impulsive purchase. To determine which group of factors (product or retailing) is more influential to a consumer's impulsive purchase decision, we calibrated the purchase outcome as the probability of an impulse buy (or equivalently, the odds of an impulse buy),[2] then standardized the number and magnitude of the variables describing the two factors.

The aim of our study is to model the relative contribution of product and retailing factors to the impulsive purchase decision. We first model the purchase decision process, in order to explain why some purchase decisions are made impulsively in the store rather than preplanned at home.

For a particular shopping trip, a consumer can make one of three choices about a product that is in the purchase consideration set: (1) preplan to buy the product by including it on a artifactual or mental shopping list in preparation for a shopping trip, (2) attend to the product only when in the store and, if the urge to buy is sufficient to prompt the impulse purchase, buy the product or (3) attend to the product only when in the store but choose not to buy the product at all. Consider a purchase opportunity i with product attributes $\mathbf{x}_i' = (x_{i1}, x_{i2}, \ldots, x_{iK})$, that is retailed as $\mathbf{y}_i' = (y_{i1}, y_{i2}, \ldots, y_{iL})$ to a shopper with characteristics $\mathbf{z}_i' = (z_{i1}, z_{i2}, \ldots, z_{iM})$.[3] The utility associated with a preplanned purchase (putting the product on the shopping list) is $U_{i,\text{plan}} = \mathbf{x}_i'\boldsymbol{\alpha}_{\text{plan}} + \mathbf{y}_i'\boldsymbol{\beta}_{\text{plan}} + \mathbf{z}_i'\boldsymbol{\gamma}_{\text{plan}} + \phi_{\text{plan}} + \varepsilon_{i,\text{plan}}$. The term ϕ_{plan} is the intercept variable and $\varepsilon_{i,\text{plan}}$ captures all unobserved facets of the environment that have not been measured by ($\mathbf{x}_i$, $\mathbf{y}_i$, $\mathbf{z}_i$). Consistent with the long line of work on random utility models (e.g., Train, 2003), the probability that the consumer would plan a purchase rather than make an impulsive purchase or make no purchase can be estimated.

The multinomial logit model assumes that all three alternatives are evaluated simultaneously. However, the two-stage decision process described above is best modeled using a nested multinomial logit model (see Kamakura et al., 1996; Suarez et al., 2004).

4.2. Relative influence of groups of variables

The research objective is to determine whether changes in the vector of variables associated with the product are more influential than the vector of variables associated with the way the product is merchandized. The logarithm of the odds of an impulse buy versus no-buy equals $\lambda \equiv \ln(P_{\text{impulse}}/P_{\text{nobuy}}) = 1/(\mathbf{x}'\mathbf{a}_{\text{nobuy}} + \mathbf{y}'\mathbf{b}_{\text{nobuy}} + \mathbf{z}'\mathbf{g}_{\text{nobuy}} + f_{\text{nobuy}})$, where $\mathbf{a}_{\text{nobuy}}$, $\mathbf{b}_{\text{nobuy}}$, $\mathbf{g}_{\text{nobuy}}$ and f_{nobuy} are the estimators of $\boldsymbol{\alpha}_{\text{nobuy}}$, $\boldsymbol{\beta}_{\text{nobuy}}$, $\boldsymbol{\gamma}_{\text{nobuy}}$ and ϕ_{nobuy}.

[1] A reviewer accurately pointed out that our EDLP/HiLo variable was qualitatively different than our other store variables, since the decision to follow an EDLP or HiLo strategy is a long-term commitment, while sales and displays can be modified in the short-term. In our operationalization, the EDLP variable captures the enhanced store atmospherics typically found in HiLo stores as compared to EDLP stores. Even though the level of store atmospherics may reflect a long term decision, our empirical findings support their hypothesized positive effect on impulse buying. As recommended by the reviewer, we ran our group level analysis separately for the EDLP and HiLo stores. The results are consistent with the group level findings that include the EDLP/HiLo variable.

[2] If events A or B may occur, the odds of A relative to B is the ratio probability(A)/probability(B).

[3] Bold face denotes a column vector and apostrophe denotes transpose.

Critical to our specific research question is the comparison of groups of variables and how changes to the elements of the vector variable influence the odds of an impulsive purchase. Since each of the product and retailing variables is binary, changing the value of each variable from zero to one (the direction that would increase the odds of making an impulse purchase versus not making a purchase) allows us to determine the percentage change in odds due to changes in each group of variables. The log-odds of an impulse purchase versus no-buy therefore change by an amount $-\mathbf{1}'\mathbf{a}_{\text{nobuy}} \times \lambda^2$, where $\mathbf{1}$ is the unit vector of all 1s. The resulting percentage change of the log-odds of an impulse buy versus no-buy with respect to changes in all *product variables* $\mathbf{x}$ is

$$\eta_P = \frac{\%\Delta\lambda}{\Delta\mathbf{x}} = \frac{-\mathbf{1}'\mathbf{a}_{nobuy}/K}{\mathbf{x}'\mathbf{a}_{nobuy} + \mathbf{y}'\mathbf{b}_{nobuy} + \mathbf{z}'\mathbf{g}_{nobuy} + f_{nobuy}} \quad (1)$$

where the number of product variables is K. By similar analysis, the percentage change of the log-odds of an impulse buy with respect to changes in all the *retailing variables* $\mathbf{y}$ is

$$\eta_M = \frac{\%\Delta\lambda}{\Delta\mathbf{y}} = \frac{-\mathbf{1}'\mathbf{b}_{nobuy}/L}{\mathbf{x}'\mathbf{a}_{nobuy} + \mathbf{y}'\mathbf{b}_{nobuy} + \mathbf{z}'\mathbf{g}_{nobuy} + f_{nobuy}} \quad (2)$$

The significance of the differences in these elasticities can be tested using a variant of the method employed by Silber et al. (1995). They compared the ratio of the variances of the contributions of two groups of variables' impact on the log-odds of a choice. Since the changes in Eqs. (1) and (2) have the same denominator, this is equivalent to comparing the ratio of the squares of the percentage changes of the log-odds. The test statistic comparing the influence of product assortment variables $\mathbf{x}$ and retailing variables $\mathbf{y}$ on the log-odds of an impulse buy versus no-buy is

$$\omega^2 = \frac{\mathbf{a}'_{nobuy}\,\mathbf{1}\,\mathbf{1}'\mathbf{a}_{nobuy}}{\mathbf{b}'_{nobuy}\mathbf{1}\,\mathbf{1}'\mathbf{b}_{nobuy}}\frac{L^2}{K^2} \quad (3)$$

(Note, $\mathbf{1}\,\mathbf{1}'$ is a square matrix with 1 in every entry.) If ω^2 equals 1.0, then changes in the typical product and retailing variables contribute the same amount to variation in the log-odds of an impulse purchase versus making no purchase.[4] If ω^2 is larger than 1.0, then changes in the typical product variable contribute more to the likelihood of an impulse purchase. If ω^2 is smaller than 1.0, then changes in the typical retailing variable contribute more to the likelihood of an impulse purchase.

We use the delta method to test the hypotheses concerning ω^2 (Greene, 2003). Assuming asymptotic normality for the vector of parameter estimates, $\tau = \ln(\omega^2)$ is distributed asymptotically normal, with estimated variance $\upsilon = \mathbf{w}'S\mathbf{w}$, where $\mathbf{w}$ is the gradient of τ,

$$\mathbf{w} \equiv 2\begin{bmatrix} \mathbf{1}\,\mathbf{1}'\mathbf{a}_{nobuy}/\mathbf{a}'_{nobuy}\mathbf{1}\,\mathbf{1}'\mathbf{a}_{nobuy} \\ -\mathbf{1}\,\mathbf{1}'\mathbf{b}_{nobuy}/\mathbf{b}'_{nobuy}\,\mathbf{1}\,\mathbf{1}'\mathbf{b}_{nobuy} \end{bmatrix}, \quad (4)$$

and S is the estimated variance–covariance matrix of the parameter vector $\begin{bmatrix} \mathbf{a}_{nobuy} \\ \mathbf{b}_{nobuy} \end{bmatrix}$. Because $\tau/\sqrt{\upsilon}$ is asymptotically standard normal, the hypothesis H_0: $\omega^2 = 1$ can be tested. If this test z-statistic is significantly positive (or equivalently $\omega^2 > 1$), then a change in a typical product assortment factor is a more powerful driver of impulsive purchases relative to planned purchases than a comparable change in a typical retailing factor. Because we are interested in comparing product-related variables and retail merchandising variables, our consumer characteristics are measured and held constant when analyzing the data.

[4] Whether the log-odds are expressed as $\ln(P_{\text{impulse}}/P_{\text{nobuy}})$ or $\ln(P_{\text{nobuy}}/P_{\text{impulse}})$, one observes the same value of ω^2 because squaring eliminates the minus sign that uniquely distinguishes these two variants.

5. Impulse purchase panel data

5.1. Sample and data collection

To determine the relative contribution of product characteristics and retailing variables on impulsive buying behavior, 51 adults living in a large Southern metropolitan area in the United States were recruited to participate in a grocery shopping panel study. Each panelist was observed by a research assistant (cf. Sinha and Uniyal, 2005) and provided information, including their store receipt, for three major household grocery shopping trips over a ten-week period. A major grocery shopping trip was defined for participants as "*the main shopping trip you make to stock up on items needed by the household*" and was distinguished from a quick fill-in trip when only an item or two is purchased. See Table 1 for a detailed description of the panelists. After agreeing to take part in the study, shoppers completed a questionnaire concerning their general grocery shopping behavior, their trait buying impulsiveness (Rook and Fisher, 1995) and demographic items.

Following each shopping trip, panelists completed a questionnaire about the trip. They attached their grocery store receipt to this questionnaire, and circled any items that were impulse purchases. A definition of an impulse purchase was provided: "*an impulse purchase occurs when you make a sudden unexpected decision to buy something while shopping in the store. It is different from planned purchases (for example, a grocery list) and from an unplanned reminder purchase—remembering you need something when you see it in the store. Impulse purchases are spontaneous decisions to buy something with no prior recognized need.*" Across all 51 shoppers for all trips, 3979 items were purchased of which 354 (9%) were impulse buys.

5.2. Measurement of product variables

Two members of the research team independently classified each item purchased as ***hedonic*** or non-hedonic. Initial inter-coder reliability based on Scott's *pi* index was 95 percent (Neuendorf, 2002). Differences in coding were resolved through discussion.

"Ready-to-use" products are those that can satisfy the impulse buyer's desire for immediate gratification (see Hoch and Loewenstein, 1991). A product was classified as ***ready-to-use*** if it could be used or consumed instantly without further preparation or additional items. A bag of cookies was classified as ready-to-use. A carton of eggs was not. Similarly, hair gel is ready-to-use, shampoo is not. Again, two coders independently classified each item in the data set. Inter-coder reliability based on Scott's *pi* index was 96 percent (Neuendorf, 2002). Discrepancies were resolved through discussion.

Product ***price*** was taken directly from the store receipt and coded 0 and 1 based upon a median split (median price = $1.59), with 0 = low price and 1 = high price.

5.3. Measurement of merchandising variables

A ***sale*** dummy variable was created for each item purchased, where 1 = special price, based on information contained on the grocery receipt. A ***display*** dummy variable, where 1 = item on special display, was used to indicate items that were on special display in the store at the time of purchase based on the records of the research assistant who observed the shoppers. A dummy variable captured the distinction in retail shopping environments where 1 = *EDLP* representing an everyday low pricing (*EDLP*)

Table 1
General description of study participants (N=51).

Age (years)	
Mean	41
Range	21–60
Gender	
Male	20%
Female	80%
Income	
Under $25,000	18.5%
$25,000–$49,999	20.4%
$50,000–$74,999	25.9%
$75,000–$99,999	16.7%
$100,000 and above	13.0%
Race/ethnicity	
White/Caucasian	42.6%
Asian	20.4%
Black/African American	13.0%
Hispanic	18.5%
Household size (persons)	
Mean	3.1
Range	1–10

Table 2
Descriptive statistics of product and merchandising variables.

	% Products purchased	Mean	Standard deviation	Range
Product variables				
Hedonic	7%	0.07	0.25	0–1
Ready-to-use (RTU)	21%	0.21	0.41	0–1
Price		2.18	2.51	0.05–36.59
Retailing variables				
Sale	26%	0.26	0.47	0–1
Display	6%	0.06	0.24	0–1
EDLP store	22%	0.22	0.41	0–1

strategy and 0=*HiLo* representing a high–low pricing strategy (see Bailey, 2008; FMI/ACNielsen, 2005). Table 2 provides descriptive statistics for the product and merchandising variables.

5.4. Missing data for non-purchased products

To avoid overestimating the influence of the product and retailing factors on impulsive buying behavior, it was necessary to impute the values of the missing "no-purchase" variables (cf. Yuxing et al., 2007). We assumed that panelists who had bought in a category in one shopping trip always considered buying a product in that category, although on some trips no purchase was made. If no purchase was ever made in a product category by a panelist, then it was assumed that the product category was never considered for purchase.

Second, we imputed the price of the no-buy item.[5] In step one, data sources were weighted for each product category based upon their validity. In step two, a value was drawn from a data source based upon the source's validity as a proxy for the unrecorded variables. This value was then substituted for the unobserved price in a data set. The procedure was replicated to create multiple data sets. Following Little and Rubin (2002), the parameter values were estimated for a small number of datasets[6] and averaged. The resulting variance of the estimator is a combination of the averaged variance estimate within the imputed dataset, $\overline{W}_D$, and the between-dataset variance of the estimates, B_D, namely $\overline{W}_D+(1+1/D)B_D$.

6. Empirical results

The change in the probability of an impulsive purchase with respect to a group of variables was computed by simultaneously switching the value of each component variable in the group – product or retailing – from 0 to 1 (where 1 represents the value that leads to an increase in the likelihood of an impulse purchase being made), and then measuring the percentage response in the impulse log-odds (Eqs. (1) and (2)). For the product variables, changing the values to represent a hedonic, inexpensive, ready-to-use product from values that represent a non-hedonic, expensive product that needs additional preparation before it can be used decreases the log-odds of an impulse buy versus a no-buy by 4.41 and versus a planned buy by 3.55 (a detailed description of all individual variable estimates are found in Table 4). Similarly, changing each of the three retailing variables to values that represent a product that is offered at a promotional price in a special display in a HiLo store results in a decrease in the log-odds by 2.75 versus a no-buy and by 2.38 versus a planned buy. Since a decrease in log-odds indicates an increase in probability, these results indicate product factors (hedonic, ready-to-use, price) have a much greater impact on the likelihood of a shopper making an impulsive purchase than retailing factors (sale, display, EDLP/HiLo store). We next determine whether this ranking is statistically significant.

As described above, the statistic ω^2 given in Eq. (3) is the squared ratio of percentage responses of the log-odds of an impulse purchase with respect to the groups of variables, product and retailing. If ω^2 significantly exceeds 1.0 then changes in numerator variables dominate comparable changes in denominator variables in determining the relative choice probabilities. Two sets of ω^2 calculations and two significance tests appear in Table 3. The first column evaluates the relative changes in log-odds of impulse purchases rather than no-buys. The second column looks at the odds of an impulse purchase versus a planned purchase.

The percentage change in the log-odds of an impulse purchase with respect to the product variables (hedonic, ready-to-use, low price) is significantly greater than the corresponding change with respect to the retailing variables (sale, display, HiLo store). Specifically, the squared ratio of the percentage response of the log-odds of an impulse-buy versus a no-buy with respect to product and retailing variables is 2.56, statistically significantly greater than 1.0. This indicates that changing the product variables in favor of an impulse purchase has a 1.6 ($=\sqrt{2.56}$) times bigger effect on the odds of a shopper making an impulse purchase versus making no purchase than a comparable change in the retailing variables. Similarly, if we look at the odds of impulse versus planned purchases, the product variables have a 1.5 times bigger influence than the retailing variables. These results indicate that the characteristics of the product itself are

[5] Since apples come in several varieties that may have different prices, we could have imputed a price of the not-purchased apple by averaging the prices of all the apples purchased. In fact, there are six potential sources of information from which a proxy for the missing price variable could have been created from our panel data, based on whether it is the same or a different consumer, store, or week. For example, one source for a particular imputation may be from the same consumer and retailer, but in a different week. However, substituting a single number from a particular data source implies precise knowledge of the value of the latent variable for no-buy. We follow the two-step imputation method recommended by Little and Rubin (2002).

[6] Little and Rubin (2002, p. 90) recommend creating a "small set" of datasets. We created 5 datasets.

Table 3
ω^2 Squared relative elasticities of log-odds.

	Log-odds of impulse/nobuy	Log-odds of impulse/plan
Product variables relative to retailing variables	$\omega^2=2.56^{*}$ $z=2.42$	$\omega^2=2.22^{*}$ $z=2.22$

z-statistic calculated from null hypothesis: $\omega^2=1.0$.
* Two-tailed test significance <0.05.

Table 4
Choice parameter estimates for nested multinomial logit.

Variables	Choice comparison			
	Plan—impulse		Nobuy—impulse	
	Coefficient	Standard deviation	Coefficient	Standard deviation
Product variables				
Hedonic	−2.27**	0.50	−2.78**	0.66
Ready-to-Use (RTU)	−0.34	0.25	−0.16	0.28
Price	0.93**	0.31	1.47**	0.36
Retailing variables				
Sale	−0.48**	0.20	−0.56**	0.24
Display	−0.67**	0.27	−0.35	0.35
EDLP	1.23**	0.38	1.84**	0.46
Consumer variables				
Trait buying imp. (TBI)	−0.04**	0.01	−0.03**	0.01
Mood	−0.09**	0.04	−0.08	0.05
Tendency to plan shopping	0.13**	0.06	0.10	0.07
Gender (1=female)	0.34	0.24	0.77**	0.29
Age	−0.03**	0.01	−0.05**	0.01
Income	0.23**	0.06	0.28**	0.07
Constant	3.84**	0.74	2.41**	0.62
Scaling parameter	1.81*	0.44		

Average log-likelihood = −4074.64.
* Two-tailed test significance <0.10.
** Two-tailed test significance <0.05.

the major drivers of consumers' impulse purchases and that retailer merchandising activities like promotional pricing, special displays, and pleasant store atmospherics play a smaller role in the impulse purchase decision. Hypothesis 7 is confirmed.

While our primary research question concerned the influence of a *group* of variables on the likelihood of a shopper making an impulsive purchase, examining the parameter estimates for each of our variables individually is informative and provides a fuller understanding of the overall group variable results. Our tests of hypotheses H1–H6 allow us to confirm that the effects of the individual product and retailing factors are consistent with our framework. Nested multinomial logit regressions for each of the five data sets included in the multiple imputation yielded an average log-likelihood value of −4074.64. The independent variables (product and retailing factors) were the same for each potential choice (planned, impulse or no-buy), so separate parameters were estimated for each choice type. Because we have normalized the baseline decision as an impulse purchase, a positive parameter estimate indicates that the independent variable decreases the probability of an impulse purchase compared to a planned/nobuy decision. Similarly, a negative parameter estimate indicates that the independent variable increases the likelihood of an impulse purchase.

Hypotheses H1, H3, H4 and H6, corresponding to hedonic, price, sale and store atmospherics, respectively, are all confirmed. Consistent with H1, the negative parameter estimate for hedonic in Table 4 is significant indicating that hedonic products are more likely to be impulsively purchased than are non-hedonic products, and this result holds both in comparison to planned purchases and in comparison to items not purchased (no-buy). Hypothesis H2, testing the impact of ready-to-use products, is not confirmed, although the signs of the parameters are in the right direction. H3 predicted that low-priced products were more likely to be impulsively purchased compared to high-priced products. The price parameter estimates in Table 4 are positive and significant supporting H3; higher-priced products are less likely to be bought on impulse than lower-priced products in both planned and no-buy purchase situations. In regard to H4, our results indicate price promotions do encourage impulse buying. We expected that items on sale were more likely to be impulsively purchased than non-sale items and the negative parameter estimates in Table 4 are significant for both the planned and no-buy comparisons.[7] H5, related to special display, is partially confirmed, as indicated by the negative parameter estimates. A product on special display is more likely to be impulsively bought than an item not on display in planned versus impulse purchase situations, but the effect is only significant for planned versus impulse purchase situations. Finally, H6 predicted that HiLo store environments would encourage more impulse buys than EDLP stores. This result holds for both planned vs. impulse and no-buy vs. impulse comparisons. Although no hypotheses were offered for the shopper covariates, the parameter estimates for these variables are consistent with previous research. The parameter estimates for the model are presented in Table 4.

7. Summary and discussion

A summary of the hypotheses and results are presented in Table 5. Overall, as a group, product characteristics have a greater influence on the likelihood of an impulse purchase than do retailing variables. Consider a baseline scenario, with an average shopper in an EDLP store and an item that is not on sale or display, not hedonic or ready-to-use, and above the median price—the probability of an impulsive purchase is 1.9%. Changing the product characteristics to hedonic, ready-to-use and below the median price increases that probability of an impulse purchase to 13.3%. In comparison, changing just the retailing variables in the baseline scenario to on sale and on display in a HiLo store increases the probability of an impulse buy to 7.0%. Product characteristics as a whole are more powerful persuaders than in-store merchandising tactics and atmospherics. But both groups of variables can enhance the probability of an impulse buy.

Our theory of consumer impulse buying described a three-stage process that begins with consumer awareness of the impulse object, followed by the consumer's desire for the product and ultimately, purchase. Our results indicate the second stage – desire for the product – is the more significant contributor to impulsive buying behavior. While retail tactics such as promotional prices and merchandising displays can draw a consumer's attention to a product, it is the characteristics of the product itself that seem to be the impetus for the impulse purchase decision.

Of the product-related variables we investigated, the hedonic nature of a product has the greatest influence on the likelihood of an impulse purchase. Given the 1.9% chance of an impulse

[7] Cross-price effects have been found to favor the discounting of large brands over small brands (see Sethuraman, et al., 1999). We were able to run a test to investigate whether these effects play a role in our context. Our data allow us to evaluate cross-price effects for national vs. store brands by testing to see if the price coefficients are different for the two groups when comparing the likelihood of a planned vs. an impulse buy. We find that the coefficients, in this case, are statistically the same ($p=0.30$).

Table 5
Summary of hypotheses and results.

	Variable	Hypothesized influence on impulse buying	Result
Product variables			
H1	Hedonic	Hedonic > nonhedonic	Supported
H2	Ready-to-use (RTU)	RTU > not RTU	Not supported
H3	Price	Low price > high price	Supported
Retailing variables			
H4	Sale	Sale > not on sale	Supported
H5	Display	Display > not on display	Partially supported
H6	EDLP Store	HiLo > EDLP	Supported
H7	**Group comparison**	Product variables > retail variables	Supported

purchase in the baseline scenario described earlier, making the item a hedonic one increases that probability to 6.5%. The difference in impulsive purchase probabilities between a non-hedonic and a hedonic product is even more dramatic if the item is on sale and on display in a HiLo store, 7.0% versus 24.9%. As discussed previously, the impulse decision is object-focused and stimulus-driven. Our study indicates that an affective desire for the product is at the core of an impulse purchase decision.

The immediate usability of an impulse item was not a significant factor in our shoppers' impulse purchase decisions. An item that is ready-to-use is not more likely to lead to an impulse purchase compared to a product that requires additional preparation. This result may be a consequence of the type of shopping involved (a major grocery shopping trip where meal preparation would be a focus) or it may suggest that immediate *possession* of the object, rather than use, satisfies the impulse urge (see Rook and Gardner, 1993; Rook and Hoch, 1985). More research is needed to clarify this issue.

Our results indicate lower-priced items more readily lend themselves to an impulse purchase compared to higher priced items. The impulsive purchase probability of an item above the median price is 7.0% when the item is on sale and display in a HiLo store, but that probability increases to 11.6% when the item is below the median price, which is to be expected of utility maximizing shoppers. Interestingly, the price parameter estimate is larger in the impulse-no-buy comparison than in the impulse-planned comparison. When deciding whether or not to make an impulse purchase decision in favor of buying the item, a lower price helps to tip the scales in favor of purchase.

Our findings regarding retailer-controlled factors – promotional prices, merchandising displays, and in-store atmospherics (EDLP vs. HiLo stores) – confirm that in-store marketing efforts play a significant role in impulse buying behavior (see also Blattberg et al., 1995; Narasimhan et al., 1996). Consistent with our results for the price variable, products on sale are more likely to be impulsively purchased than non-sale items. The probability of purchasing a hedonic, ready-to-use, inexpensive product is 13.3% when that item is not on sale, but the probability increases to 17.6% when the item is on sale. Promotional prices do motivate impulse behavior, but the parameter estimates are smaller than for other retail factors suggesting price promotions matter—but they are not the major factor in a consumer's impulse buying decision.

Merchandising displays encourage impulse buying behavior primarily in planned versus impulse purchase situations. A hedonic, ready-to-use, inexpensive item has a 13.3% likelihood of being purchased if it is not on display, but a 20.0% likelihood if it is on display. The effect is insignificant in the no-buy vs. impulse condition. One explanation may be that while merchandising displays can draw attention to a product (stage one of the impulse decision framework), displays do not necessarily create desire for the product (stage two). Desire appears to be driven more by product characteristics.

Of the retail factors we examined, store atmospherics had the greatest influence on consumers' impulse buying behavior. Our parameter estimates indicate that a hedonic, ready-to-use, inexpensive product in a HiLo store has a 27.0% chance of being purchased on impulse compared to 13.3% in an EDLP store. Our findings are consistent with the previous research that suggested store atmospherics can lead to more in-store browsing behavior which can lead to more impulse buying (see Beatty and Ferrell, 1998). Another possible explanation for our results is that HiLo stores may encourage greater consumer responsiveness to sales and displays because of the "surprise" factor, i.e., frequently changing product promotions and merchandising displays attract more shopper attention than "consistently" low prices. Additional research designed to test consumer responsiveness to consistent versus varying promotional environments can clarify this issue.

8. Managerial implications

Our study focused on understanding the relative influence of product and retailing variables on shoppers' impulsive purchase decisions. Previous research on sales promotions (Blattberg et al., 1995; Blattberg and Neslin, 1990; Narasimhan et al., 1996) indicated that in-store promotions increase sales volume often because of an increase in impulse purchasing behavior. P&G spent $3.5 billion on trade promotion and shopper marketing in 2008 (Neff, 2009), yet according to one executive, "it's the wild, wild West right now in terms of how you define shopper insights and how you turn those into action" (York, 2010). Given the slim profit margins and limited shelf space facing retailers in the highly competitive grocery industry, retailers need to make sound strategic and tactical decisions – e.g., which products to stock and how to merchandise them – to remain profitable.

To increase impulse buying behavior in their stores, retailers should carefully scrutinize their product inventory with an eye toward increasing the number of SKUs with positive impulse characteristics: emotionally appealing, lower-priced items. Affective desire for a product appears to be the key driver of impulse buying behavior. While both product and retailer variables contribute to the likelihood of a shopper making an impulse purchase, all other things equal, adding more hedonic, low-price items to the retail assortment will generate more impulse buys than will adding more sale items or merchandising displays.

However, retailers can maximize the likelihood of impulse purchasing behavior by designing promotional programs that are based on an understanding of the three-step impulse decision process, and by making strategic use of the *combined* effect of product mix and retailing tactics. For example, retailers can use

promotional activities such as price promotions and special displays to draw shoppers' attention to products that are hedonically attractive. The joint effect of these merchandising tactics can encourage more impulse buying among shoppers. Our study makes it clear that in-store merchandising tactics and promotional activities significantly increase the likelihood of an impulse purchase. Even when consumers plan, minds are changed in the store.

9. Limitations and future research

This comparison of the forces driving consumer impulsive purchasing behavior has limits. First, the data comes from a small panel. More data is always useful, but even given the size of the panel the effects are strong enough that parameter estimates achieve significance. A further interesting area for future research is to examine cross-cultural differences in impulse buying behavior. Previous research indicates cultural influences moderate impulsive buying behavior (e.g., Kacen and Lee, 2002). Is the stimulus-driven nature of impulse buying behavior a universal aspect of consumers across cultures? Is the emotional appeal of the impulse object central to impulse purchases everywhere? Do product factors dominate merchandising factors among shoppers in other cultures? Investigating the behavior of shoppers from different cultural backgrounds and in different cultural contexts is needed to determine which factors are most influential in prompting impulse purchases.

Second, while we have included the major variables shown by earlier researchers to influence impulse buying behavior, there is the possibility that other unmeasured factors (e.g. time of day, whether the shopper was alone or with others, amount of time available) also influence purchase decisions. For example, research by Luo (2005) suggests that the presence of others can increase (in the case of peers) or decrease (in the case of family members) the shopper's urge to make an impulse purchase. We hope future research makes use of our methodology to test a more comprehensive set of product and retailing variables.

A problem faced by this and many other studies is that data is missing for alternatives considered but not chosen. In our case, there are products that were merely considered for purchase but not seen on the sales receipts. We imputed their price and whether they were on display and ready-to-use using established imputation methods (see Little and Rubin, 2002; Yuxing et al., 2007). The relationship between the nested logit results and the corresponding binary logit including only observed choices supports the imputation approach, providing assurance that our method was sound. An area for future inquiry would be to use more advanced research technologies (e.g., eye-tracking software, virtual shopping environments) to identify the items consumers consider but do not purchase.

An additional concern may be our classification of the hedonic nature of each product. While we employed multiple coders, and inter-coder reliability was high, our study might benefit from having additional consumer validation, as the emotional appeal of a particular product may vary from consumer to consumer (any product may have an emotional connection for an *individual* consumer). We coded each product's hedonic nature according to established definitions and examples from the literature and tried to base our classification on what a typical shopper might feel. Additional coding data from typical shoppers would help establish the soundness of our coding.

Future research also might clarify whether an impulse decision is motivated by possession or use of the item. Specifically, future studies might examine impulse purchasing behavior in other types of retail outlets, such as clothing stores or electronics retailers. Do consumers mainly buy things on impulse for immediate use (e.g., a shirt I can wear tonight) or can impulsive purchases satisfy future needs (e.g., ordering a suit to wear later)? With the increased availability of online shopping opportunities, especially mobile apps and one-click buying, this question of immediate ownership versus immediate use becomes more interesting. We hope future research is able to answer this intriguing question.

Future researchers might also look into the degree to which static versus dynamic shopping environments stimulate impulse buying behavior, especially as major retailers such as J.C. Penney attempt to reduce promotional activity (Mattioli, 2012). Our results suggest that promotional activities in HiLo stores create a more varied shopping environment compared to everyday low pricing (EDLP) stores, and that environment may encourage greater attention to price promotions and merchandising displays, leading to more impulse buying behavior. Experiments could be designed to determine whether this is in fact true, and what is the optimal level of environmental stimulation that will prompt impulse buying.

The purpose of this research was to develop and test a theory of consumer impulsive buying behavior that would provide retailers with more strategic insights into buyer behavior, and would lead to more actionable results. Our research makes two important contributions to the impulse literature. First, our framework describing the three-step impulse decision process provides a clear and straightforward depiction of what has been described as a complex behavior. We hope our approach to explaining the impulse buying process provides both practitioners and academics with a better understanding of consumer buying behavior. Secondly, we hope our findings offer retailers a more strategic way to think about how they implement current and new promotional activities.

In sum, this study is valuable for its framework of the impulse decision process, its comprehensive model of in-store decision influences, and its insights about consumer impulse buying. It is also valuable for its unique impulse purchase data. Obtaining data on pure impulse purchases – purchases for which the shopper has no prior recognized need – is difficult because such items cannot be determined from scanner data or store receipts; a pure impulse purchase can only be identified by the shopper. Our findings offer hard-to-obtain insights into the consumer's impulsive purchase decision process and provide a clearer picture of how and why consumers buy.

Appendix A. Consumer variables in the model

Our research is focused on the influence of product variables and retailing variables on consumer impulse purchase decisions. We acknowledge that consumer characteristics also influence impulse purchase decisions but our research is directed at factors over which retailers have control. Therefore, based on previous impulse research, we obtained measures of consumer characteristics that have been shown to influence impulsive buying behavior and included these variables in our logit model as control variables. Two key consumer variables measured in our study were trait buying impulsiveness and the consumer's mood at the time of purchase. Trait buying impulsiveness refers to an enduring consumer tendency "to buy spontaneously, unreflectively, immediately and kinetically" (Rook and Fisher, 1995, p. 306).We also included a tendency-to-plan-shopping variable that measured the amount of planning consumers' generally engaged in when shopping for household groceries. The consumer's gender, age, and household income were also measured. Details concerning all six consumer variables appear in Table A1.

Table A1
Details concerning consumer variables.

Variables	Influence on impulse buying (previous research)	Scale or measure	Scale reliability (α)
Trait Buying Impulsiveness (TBI)	Positive (e.g. Rook and Fisher, 1995)	Rook and Fisher (1995) (scale)	0.88
Mood	Positive (e.g. Rook and Gardner, 1993)	Russell et al. (1989) (Affect grid)	na
Tendency to plan shopping	Negative (e.g. Inman et al., 2009)	New scale[a]	0.64
Gender	Mixed (e.g. Cobb and Hoyer, 1986; Rook and Hoch, 1985)	Female=1	na
Age	Mixed (e.g. Prasad, 1975)	In years	na
Income	Mixed (e.g. Beatty and Ferrell, 1998; Williams and Dardis, 1972)	Six income categories	na

[a] Summed responses to four questions measured on a 4-point scale where 1=never and 4=always:
1) whether they clipped coupons,
2) whether they read store sale flyers prior to shopping,
3) whether they read store sale flyers while in the store,
4) whether they prepared a written shopping list before going to the store.

References

Abrahams, B., 1997. It's all in the mind. Marketing, March 27, 1997, pp. 31–33.
Babin, B.J., Attaway, J.S., 2000. Atmospheric affect as a tool for creating value and gaining share of customer. Journal of Business Research 49 (August), 91–99.
Bailey, A.A., 2008. Evaluating consumer response to EDLPs. Journal of Retailing and Consumer Services 15 (3), 211–223.
Beatty, S.E., Ferrell, M.E., 1998. Impulse buying: modeling its precursors. Journal of Retailing 74 (2), 169–191.
Bellenger, D.N., Robertson, D.H., Hirschman, E.C., 1978. Impulse buying varies by product. Journal of Advertising Research 18, 15–18.
Blattberg, R.C., Briesch, R., Fox, E.J., 1995. How promotions work. Marketing Science 14 (3), G122–G132.
Blattberg, R.C., Neslin, S.A., 1990. Sales Promotion: Concepts, Methods, and Strategies. Prentice Hall, Englewood Cliffs, NJ.
Cobb, C.J., Hoyer, W.D., 1986. Planned versus impulse purchase behavior. Journal of Retailing 4 (Winter), 384–409.
Cox, K., 1964. The responsiveness of food sales to shelf space changes in supermarkets. Journal of Marketing Research 1 (May), 63–67.
Dhar, R., Wertenbroch, K., 2000. Consumer choice between hedonic and utilitarian goods. Journal of Marketing Research 37 (February), 60–71.
Dittmar, H., Beattie, J., Friese, S., 1995. Gender identity and material symbols: objects and decision considerations in impulse purchases. Journal of Economic Psychology 16, 491–511.
Donovan, R.J., Rossiter, J.R., 1982. Store atmosphere: an environmental psychology approach. Journal of Retailing 58 (Spring), 34–57.
Donovan, R.J., Rossiter, J.R., Marcoolyn, G., Nesdale, A., 1994. Store atmosphere and purchasing behavior. Journal of Retailing 70 (Fall), 283–294.
Eroglu, S.A., Machleit, K.A., Chedat, J.C., 2005. The interaction of retail density and music tempo: effects on shopper responses. Psychology & Marketing 22 (July), 577–589.
FMI/ACNielsen, 2005. FMI/ACNielsen Study: Shopping for Food in 2004. AC Nielsen, New York, NY.
Greene, W.H., 2003. Econometric Analysis, 5th ed. Pearson Education, Upper Saddle River, NJ.
Hampson, D.P., McGoldrick, P.J. A typology of adaptive shopping patterns in recession. Journal of Business Research, http://dx.doi.org/10.1016/j.jbusres.2011.06.008, in press.
Hirschman, E.C., Holbrook, M.B., 1982. Hedonic consumption: emerging concepts, methods, and propositions. Journal of Marketing 46 (Summer), 92–101.
Hoch, S.J., Loewenstein, G.F., 1991. Time-inconsistent preferences and consumer self control. Journal of Consumer Research 17 (March), 492–507.
Hoch, S., Dreze, X., Purk, M.E., 1994. EDLP, Hi-Lo, and margin arithmetic. Journal of Marketing 58 (October), 16–27.
Howard, J.A., Sheth, J.N., 1969. The Theory of Buyer Behavior. Wiley, New York, NY.
Inman, J.J., Winer, R.S., Ferraro, R., 2009. The interplay among category characteristics, customer characteristics, and customer activities on in-store decision making. Journal of Marketing 73 (September), 19–29.
Kacen, J.J., Lee, J.A., 2002. The influence of culture on consumer impulsive buying behavior. Journal of Consumer Psychology 12 (2), 163–176.
Kamakura, W.A., Kim, B.D., Lee, J., 1996. Modeling preference and structural heterogeneity in consumer choice. Marketing Science 15 (2), 152–172.
Kollat, D.T., Willett, R.P., 1967. Customer impulse purchasing behavior. Journal of Marketing Research 4 (February), 21–31.
Kotler, P., 1973-74. Atmospherics as a marketing tool. Journal of Retailing 49 (Winter), 48–64.
Lee, B.C.Y., 2007. Consumer attitude toward virtual stores and its correlates. Journal of Retailing and Consumer Services 14 (3), 182–191.
Little, R.J.A., Rubin, D.B., 2002. Statistical Analysis with Missing Data, 2nd ed. Wiley, Hoboken, NJ.
Luo, X., 2005. How does shopping with others influence impulsive purchasing? Journal of Consumer Psychology 15 (4), 288–294.
MacInnis, D.J., Patrick, V.M., 2006. Spotlight on affect: affect and affective forecasting in impulse control. Journal of Consumer Psychology 16 (3), 224–231.
Martinez, E., Monaner, T., 2006. The effect of consumer's psychographic variables upon deal-proneness. Journal of Retailing and Consumer Services 13 (3), 157–168.
Martinez-Ruiz, M.P., Jimenez-Zarco, A.I., Izquierdo-Yusta, A., 2010. Customer satisfaction's key factors in Spanish grocery stores: evidence from hypermarkets and supermarkets. Journal of Retailing and Consumer Services 17 (4), 278–285.
Mattioli, D., 2012. J.C. Penney chief thinks different. The Wall Street Journal, B1, January 26.
McGoldrick, P.J., 1982. How unplanned are impulse purchases? Retail and Distribution Management 10 (January/February), 27–32.
Mogelonsky, M., 1998. Keep candy in the aisles. American Demographics 20, 32.
Narasimhan, C., Neslin, S.A., Sen, S.K., 1996. Promotional elasticities and category characteristics. Journal of Marketing 60 (April), 17–30.
Neff, J., 2009. P&G Taking its Marketing Back to the Store. Advertising Age September 21.
Nelson, E., Ellison, S., 2005. In a shift, marketers beef up ad spending inside stores. The Wall Street Journal, A1. (September 21).
Neuendorf, K.A., 2002. The Content Analysis Guidebook. Sage, Thousand Oaks, CA.
Peck, J., Childers, T.L., 2006. If I touch it I have to have it: individual and environmental influences on impulse purchasing. Journal of Business Research 59 (6), 765–769.
Prasad, V.K., 1975. Unplanned buying in two retail settings. Journal of Retailing 51 (Fall), 3–12.
Progressive Grocer, 2011. Annual Report of the Grocery Industry, April, pp. 32–54.
Puri, R., 1996. Measuring and modifying consumer impulsiveness: a cost-benefit accessibility framework. Journal of Consumer Psychology 5 (2), 87–113.
Rogers, E., 1962. Diffusion of Innovations. Free Press, New York, NY.
Rook, D.W., 1987. The buying impulse. Journal of Consumer Research 14 (September), 189–199.
Rook, D.W., Hoch, S.J., 1985. In: Holbrook, M., Hirschman, E. (Eds.), Consuming Impulses, vol. 12. Association for Consumer Research, Provo, UT, pp. 23–27.
Rook, D.W., Gardner, M., 1993. In the mood: impulse buying's affective antecedents. In: Research in Consumer Behavior, vol. 6(1). JAI Press, Greenwich, CT, pp. 1–28.
Rook, D.W., Fisher, R.J., 1995. Normative influences on impulsive buying behavior. Journal of Consumer Research 22 (December), 305–313.
Russell, J.A., Weiss, A., Mendelsohn, G.A., 1989. Affect grid: a single-item scale of pleasure and arousal. Journal of Personality and Social Psychology 57 (September), 493–502.
Sethuraman, R., Srinivasan, V., Kim, D., 1999. Asymmetric and neighborhood cross-price effects: some empirical generalizations. Marketing Science 18 (1), 23–41.
Shamdasani, P.N., Yeow, O.G., 1995. An exploratory study of in-home shoppers in a concentrated retail market: the case of Singapore. Journal of Retailing and Consumer Services 2 (1), 15–23.
Silber, J.H., Rosenbaum, P.R., Ross, R.N., 1995. Comparing the contributions of groups of predictors: which outcomes vary with hospital rather than patient characteristics? Journal of the American Statistical Association 90 (429), 7–18.
Sinha, P.K., Uniyal, D.P., 2005. Using observational research for behavioural segmentation for shoppers. Journal of Retailing and Consumer Services 12 (1), 35–48.
Skallerud, K., Korneliussen, T., Olsen, S.O., 2009. An examination of consumers' cross-shopping behavior. Journal of Retailing and Consumer Services 16 (3), 181–189.
Smith, D., 1996. The joy of candy. National Petroleum News Supplement February, S2.
Stern, H., 1962. The significance of impulse buying today. Journal of Marketing 26 (April), 59–62.

Strack, F., Werth, L., Deutsch, R., 2006. Reflective and impulsive determinants of consumer behavior. Journal of Consumer Psychology 16 (3), 205–216.
Suarez, A., del Bosque, I.R., Rodriguez-Poo, J.M., Moral, I., 2004. Accounting for heterogeneity in shopping centre choice models. Journal of Retailing and Consumer Services 11 (2), 119–129.
Train, K., 2003. Discrete Choice Methods with Simulation. Cambridge University Press, Cambridge, UK.
Weinberg, P., Gottwald, W., 1982. Impulsive consumer buying as a result of emotions. Journal of Business Research 10, 43–57.
West, J.C., 1951. Results of two years of study into impulse buying. Journal of Marketing 15 (January), 362.
Williams, J., Dardis, R., 1972. Shopping behavior for soft goods and marketing strategies. Journal of Retailing 48 (Fall), 32–41.
Wolman, B., 1973. Dictionary of Behavioral Science. Wan Nostrand Reinhold, New York, NY.
Wong, A., Dean, A., 2009. Enhancing value for Chinese shoppers: the contribution of store and customer characteristics. Journal of Retailing and Consumer Services 16 (2), 123–134.
York, E.B., 2010. Shopping Aisles at Cutting Edge of Consumer Research and Technology. Advertising Age March 15.
Yuxing, R., Kamakura, W.A., Mela, C.F., 2007. Size and share of customer wallet. Journal of Marketing 71 (April), 94–113.