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Unplanned Buying on Shopping Trips

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Report Summary

Motivated by the common wisdom that up to 70% of consumers' purchases are decided upon in the store, marketers have expended considerable research energy on what in-store factors influence shoppers' purchase decisions. But out-of-store factors influence unplanned purchases too, and if retailers understand those factors, they may be able to leverage them.

Here, David Bell, Daniel Corsten, and George Knox examine diary panel data from 441 households in a Western European country to uncover how several out-of-store factors influence unplanned purchases.

One major factor is the nature of the shopping goal: Is the consumer shopping to take advantage of a particular promotion or to buy a particular item—both concrete goals—or is the consumer shopping to take care of weekly needs, which is a more abstract goal? Reasons for choosing a particular store are also important. Did the shopper choose the store for its prices? Its selection? Its service? To avoid crowds? Convenience is a third factor: Is the consumer aiming to do one-stop shopping, or is he or she visiting a given store as part of a multiple-store shopping trip? The researchers also looked at the interaction between out-of-store and in-store advertising.

For each shopping trip participating households made during the two-week observation period, the shoppers recorded their reasons for the shopping trip and picked why they had chosen the stores they did from a list of possible reasons relating to the factors under investigation. They also completed a questionnaire in which they noted which of their purchases were planned and which were unplanned.

The researchers found that as shoppers' overall shopping goals became more abstract, the shoppers made more unplanned purchases. Similarly, unplanned buying increased when shoppers chose a store for its low prices or its attractive promotions. A store's assortment and service had no effect on unplanned purchases, however. When shoppers chose a store for the convenience of one-stop shopping, unplanned buying went up; when a store was one in a series of stores to be visited, by contrast, unplanned buying decreased. Finally, although out-of-store marketing had no significant direct effect on trip-level unplanned buying, there was an interaction between out-of-store marketing and in-store marketing that did boost unplanned buying.

These findings have immediate relevance for retailers. They show that ad campaigns such as Wal-Mart's "Save Money. Live Better," which focus on abstract shopping benefits, are likely to generate increased unplanned spending. In the current study, when shoppers' goals were at their most abstract, their unplanned purchases went up 60%. Similarly, the fact that there is an interaction between out-of-store and in-store marketing that boosts unplanned spending suggests that retailers should reevaluate the importance of out-of-store advertising. The current study also validates focusing on the characteristics of the shopping trip rather than the shopper. That is, rather than focusing only on attracting particular types of customer, marketers and retailers may also fruitfully work on promoting a certain type of shopping trip (one with abstract goals, for example).

The research confirms that shopping trips to hard discounters, which offer low prices, a large selection, and the convenience of one-stop shopping, are more likely to have the most abstract goals (in the case of the two big-box discounters in the study, 53% and 44% of the visits were motivated by the most abstract goals). Interestingly, however, when shoppers visit supermarkets with an abstract goal in mind, there is an interaction between the supermarket format and the shopping goal that results in a boost in sales over and above what can be attributed to the abstract goal alone. The bottom line is that all retail formats benefit when the shoppers' goals are abstract.

The current study was conducted in a single European country, and the researchers urge further research in other parts of the world to see how generalizable the results are and how well they apply to countries at other stages in the evolution of retail markets.

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"Supermarkets are places of high impulse buying … – fully 60 to 70 percent of purchases there were unplanned, grocery industry studies have shown us."

Paco Underhill[1]

Managers, acting in accordance with this widespread belief, invest considerable resources inside the store to influence shoppers. Recently, the Grocery Marketing Association forecasted a compound annual growth rate of over 20 percent for in-store marketing budgets; furthermore, *Advertising Age* reported "… the oft-quoted statistic that consumers make 70% of brand decisions in the store boosted shopper marketing and made other advertising seem almost pointless." Unplanned buying clearly results from exposure to in-store stimuli; we argue that it also depends on conditions established *before* the shopper enters the store, some of which are under the retailer's control. We take the retailer's perspective and focus on these largely ignored *out-of-store* factors, including the overall trip goal and other shopping trip antecedents, while controlling for known in-store drivers. Retailers can benefit by generating additional unplanned buying from their existing shopper base.

Unplanned buying is essential to retailers yet academic research is sparse and what constitutes "unplanned buying" differs by study. We examine unplanned *category* purchases, since a majority of items on shopping lists are at the category, rather than brand or stock-keeping-unit, level (Block and Morwitz 1999); our dependent variable, the total number of unplanned category purchases per trip, allows us to assess the basket-level impact of our out-of-store factors. Classic (e.g., Kollat and Willett 1967) and recent (e.g., Inman, Winer, and Ferraro 2009) articles study category characteristics and shopper activities inside the store that have implications for consumer welfare, e.g., ways in which consumers can safeguard themselves from "too much" unplanned buying. In contrast, we explore the role of consumer pre-shopping strategies and show how a retailer can use this “shopping trip antecedent” perspective to stimulate unplanned buying.[2] In sum, we study how what a shopper “brings to the store” affects how she behaves once “inside the store.” We focus on actionable trip-level drivers, such as the abstractness of the overall shopping goal (Lee and Ariely 2006) and specific goals associated with store choice (e.g., those related to anticipated prices and assortments, as in Bell and Lattin 1998 and Briesch, Chintagunta, and Fox 2009). Controlling for the main effects of in-store stimuli, we examine the interaction between out-of-store and in-store promotions (Kahn and Schmittlein 1989; 1992). We build on studies linking shopping trip antecedents to in-store choices (e.g., Briesch et al. 2009; Hansen and Singh 2009; Kahn and Schmittlein 1989; 1992), and show how they affect unplanned buying.

In contrast to most published research, we use diary *panel* data to investigate unplanned buying. Panel data are critical to our substantive objective; a positive relationship between, for example, shopping goal abstractness and unplanned buying in cross-sectional data cannot distinguish two rival explanations: (1) “abstract-goal shoppers (a specific shopper segment) do more unplanned buying”, and (2) “the *same* shopper does more unplanned buying on trips when her shopping goal is abstract”. If (1) is true, retailers may only be able to augment unplanned buying by attracting certain types of shopper; if (2) is true, more unplanned buying can be generated from the *existing* customer base. This distinction is crucial, since it will be more costly for the retailer to pursue (1) than (2).[3]

We contribute three new findings to the collective knowledge on unplanned buying. (1) Unplanned buying increases monotonically with the abstractness of the overall shopping goal held by the shopper before entering the store. (2) Store-linked goals held prior to shopping produce trip-specific changes in unplanned buying. On trips where the household chooses the store for good pricing and shopping convenience there is more unplanned buying; on trips where the store is chosen as part of a multi-store shopping strategy there is less (more than one store-specific goal can be activated on a trip). (3) Out-of-store marketing has no *direct* effect on unplanned buying; however, exposure to out-of-store marketing reinforces the lift in unplanned buying that is triggered by in-store marketing. We show that the collective revenue impact of these effects is significant and we offer some preliminary evidence that the “abstract goal” effect differs across retail formats for the *same* shopper. While hard discounters see a larger share of shoppers’ abstract trips, a shopper visiting a full service supermarket with an abstract shopping trip goal does even more unplanned buying (*over and above* that due to the abstract goal alone).

The paper is organized as follows. We first summarize prior findings, introduce our shopping trip antecedent perspective, and develop our hypotheses. Next, we describe the unique diary panel data (over 18,000 purchases in 58 categories, from more than 3,000 trips, 400 households, and 23 stores) and measures. We then specify Poisson and Tobit models and report the findings. The final section offers implications for managers and researchers.

Literature Review and Conceptual Development

Our objective is to understand how the goals held by shoppers and the marketing they are exposed to *before they enter a store* shape their unplanned buying decisions *once inside the store*. We begin with a brief summary of previous findings and then introduce our conceptual framework and hypotheses.

Prior research

Kollat and Willett (1967), in a classic and widely cited study, find unplanned buying is positively related to transaction size, and negatively related to shopping lists and the number of years married. By examining the frequency of past customer experience with the chosen unplanned items, they surmise that "in-store stimuli usually reminds shoppers of present or future needs rather than evoking new needs" (p. 30). Granbois (1968) finds that unplanned buying increases with time spent in the store, number of aisles shopped, and the number of people in the shopping party. Park, Iyer, and Smith (1989) find that shoppers do the most unplanned buying when they are in unfamiliar stores and under no time pressure. Beatty and Ferrell (1998) focus on individual differences and find the "propensity for impulsiveness" trait is a significant driver of unplanned buying. Rook and Fisher (1995) study individual differences as well; they show that normative evaluations moderate the acceptability of impulse buying—purchasing a gift on the spur of the moment is a good thing, but splurging on oneself is not. Based on the self-control literature, Inman, Winer, and Ferraro (2009) predict and find that certain category characteristics, like hedonicity, and consumer in-store activities, such as the number of aisles shopped, increase unplanned buying across individuals.

More information on prior findings and methods is summarized in Table 1 (following References). A common theme across these articles is the focus on *in-store* drivers of unplanned buying and the effects of individual difference variables (i.e., demographics and shopping habits). Our study complements these by examining *out-of-store factors* and trip-level antecedents of unplanned buying. Studies that focus on pre-shopping factors from which the motivation and context for a shopping trip emerge are rare ("Marketing actions that influence shopper behaviour" is a focus of MSI's 2010 "Shopper Marketing" research initiative).

This research: Out-of-store factors and hypotheses

We develop our conceptual framework similar to Chandon et al (2009), who study the effectiveness of in-store marketing. As shown in Figure 1 (following References), we isolate out-of-store factors, controlling for in-store factors, and allow for the possibility that time spent shopping is endogenous.[4] In our model, we focus on the pre-shopping process of a household, which includes establishing an overall shopping goal, developing store-specific shopping goals, and possible exposure to out-of-store marketing (e.g., store fliers in the mail, word-of-mouth from family and friends, television advertising). Each of these three shopping trip elements is shown in Figure 1. The overall shopping trip goal ranges from concrete to abstract, whereas store-specific goals cover pricing, assortment, service, location convenience, and crowding (more than one store-specific goal can be activated on any particular trip); out-of-store marketing encompasses a variety of factors. Note that each of these shopping trip elements are (in principle at least) within the sphere of influence of the retailer.

Overall shopping trip goal (H_1). Shoppers may enter a store with an overall goal ranging from the very precise and concrete (e.g., to take advantage of a specific promotion) to the relatively abstract (e.g., to fill up on weekly needs). Construal level and mind-set theories also distinguish between abstract and precise goals (e.g., Gollwitzer 1999; Trope, Liberman and Wakslak 2007); decision makers in "abstract" states are more flexible and receptive to their environments whereas those in more precise states are "closed-off" to their surroundings. More recent applied research also emphasizes the importance of goal abstraction: "The success of marketing actions, such as promotions, depends on the *goals* (emphasis ours) consumers have when they are exposed to such promotions" (Lee and Ariely 2006, p. 60). Related evidence shows that the "type of trip"—a proxy for shopping goal abstractness—affects in-store behaviors, conditional on store choice (e.g., Seetharaman, Ainslie, and Chintagunta 1999; Walters and Jamil 2003).

H_1: Unplanned buying *increases monotonically* with the abstractness of the individual consumer's overall shopping trip goal.

To test H_1 we use a continuum of abstraction ranging from concrete goals ("shopping for special offers and promotions", "shopping for immediate consumption", "shopping for a meal on the same day"), to the relatively abstract ("fill-in trip: daily essentials and top-up shopping") and the most abstract ("major trip: shopping for the whole week or more").[5] We also need to rule out plausible alternative explanations. On trips where shoppers have an abstract goal they peruse more items and visit more aisles; as a result, they make more unplanned purchases. We rule these explanations out by adjusting for the number of planned purchases (a proxy for items perused), and the amount of time spent in store (a proxy for the number of aisles visited).

Store-specific goals (H_2). Store choices depend on price image perceptions (Hansen and Singh 2009), breadth and depth of assortment (Briesch, Chintagunta, and Fox 2009), location convenience (Huff 1964), the ability to do one-stop shopping (Messenger and Narasimhan 1997), and store service—an important element in store positioning (Lal and Rao 1997). Any reason for choosing a store, by definition, affects store choice (positively). What is not known is whether these store-specific goals determined ex ante before the visit, *also affect unplanned buying* in the store.[6] Prior research implies that shoppers will do more unplanned buying in stores with low prices, because they feel more normatively justified (Rook and Fisher 1995). On trips where shoppers take advantage of one promoted product, they will likely be aware of and buy other promoted products (Lichtenstein, Netemeyer, and Burton 1995). Similarly, wider assortments tempt shoppers to deviate from plans and also encourage those with poorly defined preferences to do more unplanned buying. Stores with good service also engender confidence and pleasure in shopping, which is positively related to unplanned buying (Donovan et al 1994; Sherman and Smith 1987). Hence

H_{2A} (Pricing): Unplanned buying *increases* on trips where the shopper chooses the store for low prices and attractive promotions.

H_{2B} (Assortment): Unplanned buying *increases* on trips where the shopper chooses the store because it has a wide assortment.

H_{2C} (Service): Unplanned buying *increases* on trips where the shopper chooses the store because it has good service.

To test H_{2A}-H_{2C} we elicit these store choice goals directly from shoppers. The store choice reasons "Low prices", "Large assortment", and "Good service" are hypothesized to increase unplanned buying on the trip; however, other reasons for store choice need not increase unplanned buying. Location convenience from one-stop shopping in the *chosen store* ("Everything I need in one place"), and one-stop shopping for the *trip in general* should have opposite effects. A store chosen for "one-stop shopping" should see more unplanned buying—by by committing to only one store the shopper may be signaling that she has insufficient time (Zeithaml 1985) or cognitive resources (Bettman 1979) to create a detailed plan on a given trip. Conversely, trips where the shopper plans to visit multiple stores may indicate more complex planning, as she may spread her category purchases across stores. On these trips she may also cherry-pick from co-located stores (Fox and Hoch 2005). These behaviors imply less unplanned buying in individual stores on a multi-store trip.

H_{2D} (Specific Convenience): Unplanned buying *increases* on trips where the shopper chooses the store for "one stop shopping".

H_{2E} (General Convenience): Unplanned buying *decreases* on trips where the shopper chooses the store because "I can visit other stores at the same time".

Finally, on some trips the shopper might choose a store to avoid crowds. One consequence of a less crowded store is less time waiting in line, and less exposure to the product choices of other shoppers. Moreover, according to the self-control literature, exposure to environmental cues like noise and crowding decreases self-control (Evans 1979). Recently, Levav and Zhu (2009) found that shoppers react against confinement by expressing a need for more variety. Therefore, we expect a negative relationship between choosing a store to avoid crowds and unplanned buying.

H_{2F} (Crowding): Unplanned buying *decreases* on trips when the shopper chooses the store to avoid in-store crowding and long queues.

Out-of-store and in-store marketing (H_3). Shopper responsiveness to marketing stimuli is the *sine qua non* of research in retailing. Shoppers redeem coupons when benefits exceed the cost of sorting and clipping (e.g., Chiang 1995; Neslin 1990); they stockpile when savings exceed the storage and holding costs (e.g., Blattberg, Eppen, and Leiberman 1981; Bell and Hilber 2006). They respond to monetary and non-monetary promotions (e.g., Chandon, Wansink, and Laurent 2000), are induced to buy more by signs and displays (Dhar and Hoch 1996; Inman and McAlister 1993; Inman, McAlister, and Hoyer 1990) and their overall responsiveness is predicted by their psychographics (Ailawadi, Neslin, and Gedenk 2001).

It is well known that in-store marketing activities capture a shopper's attention and therefore drive up unplanned buying (Inman, Winer and Ferraro 2009). On trips where the shopper takes note of marketing information outside the store environment, they are likely engaged in planning (Bettman 1979) so this should not affect *unplanned* buying. Prior research suggests, but does not test, the idea that when a shopper is exposed to out-of-store marketing on a trip, in-store stimuli can trigger forgotten needs (Inman, Winer and Ferraro 2009; Kollat and Willett 1967), suggesting a positive interaction between out-of-store and in-store marketing.

H_3: Unplanned buying *increases* on trips when the shopper who has been exposed to out-of-store marketing *also* encounters in-store stimuli.

To test H_3 we measure exposure to marketing stimuli outside the store environment (newspaper inserts, store leaflets in the mail, and other sources, such as television advertising) and interact this with exposure to in-store marketing.

Control variables

We control for the direct effects of in-store marketing and other out-of-store contextual factors that are not of substantive interest per se (see Figure 1, following References). These factors include travel time to the store and whether the store was visited second or later in a multi-store trip; both are proxies for "fixed costs" of shopping (e.g., Tang, Bell, and Ho 2001). We also control for the mode of travel (walking, cycling, or driving) which affects the capacity to transport goods, shopping periodicity (e.g., Helsen and Schmittlein 1993), weekend shopping patterns (Kahn and Schmittlein 1989), and trip-level variation in shopper gender (e.g., Kollat and Willett 1967). The number of *planned* purchases, i.e., those determined prior to the shopping trip, controls for the *ex ante* trip-level basket size.

More time in the store on a trip leads to more unplanned buying (Park, Iyer, and Smith 1989). We have no substantive interest in the effect of time, but we do need to control for it appropriately. One approach is to argue that, conditional upon the other variables, time spent in store can be included as a direct covariate (see Inman, Winer, and Ferraro 2009 for this approach); however, like Inman, Winer, and Ferraro (2009), we are concerned that time in the store is possibly endogenous. In our data there is a relatively small trip-level positive correlation between time in the store and the number of categories bought (r = .24). We use two model-based solutions to address this endogeneity problem—instrumental variables Poisson regression and Tobit regression—and discuss both in the Model and Findings section. Our goal is to show that the estimates of interest, i.e., those that test H_1-H_3, are robust to alternative methods of controlling for the effect of time spent in the store.

Data and Measures

The diary panel contains over 18,000 category purchases from 58 product categories (listed in the Appendix). Participating households were screened to be representative of the market for the country in question and were paid €20 for their cooperation. For each trip, households completed a short questionnaire and checked off whether each category purchase was "planned in advance of the store visit and purchased" or "decided in store and purchased." The questionnaire included several other questions; respondents did not know that we were studying unplanned buying per se. Households filled in a new questionnaire directly after each trip and attached their receipts (we asked this to ensure accurate reporting and subsequently cross-checked receipts with questionnaires). After two weeks, the research firm visited each household to collect the questionnaires.

Recall that a key methodological difference between this study and prior research is that ours uses panel *diary* data, rather than one-shot experiments or shopper intercept data (see Table 1, following References). These data allow us to disentangle whether changes in unplanned buying are truly driven by factors that vary across shopping trips for the *same* customer and not simply by differences across customers (unobserved heterogeneity). This is important because if the retailer can generate more unplanned buying from the *existing* shopper base, it obviates the need to attract a certain type of *shopper* who is especially susceptible to unplanned buying. We estimate panel fixed effects models to ensure that parameters are estimated on *within*-customer, rather than *between*-customer, differences, but this requires at least two observations per household.[7] This leaves 441 households who take 3,014 supermarket trips during the two-week observation period in June-July 2006. Households take between 2 and 23 trips (the mode is 6) and trips occur at 23 distinct retail chains. Sample statistics for the variables in our study are given in Table 2, following References.

"Fill-in trip for daily essentials and top up shopping" is the most prevalent shopping trip goal (43% of all trips), followed by "major trips that occur weekly or less frequently" (26%), "shopping for meals on the same day" (15%), "shopping for immediate consumption" (11%), and "shopping for special offers and promotions" (3%). "Leaflets delivered to the home" are the most commonly observed out-of-store marketing device (seen for 19% of all trips). Shoppers can report multiple goals for choosing a particular store on a trip (the average number of store goals per trip is 1.7), so the percentages sum to more than one. The most common is "able to visit other stores at the same time" (37% of all trips). The average number of unplanned category purchases per trip is 1.39 (the range is 0 to 10) and the average total number of planned categories is 5.00. For both variables, we report the log totals; descriptive statistics are shown in Table 2 (following References).

Models and Findings

We now motivate and estimate several models of unplanned buying to ensure the conclusions we draw are valid. To account for the possibly endogenous relationship between unplanned buying and time spent in store, we use an instrumental variables Poisson model for the count (of unplanned category purchases per trip) and two different Tobit specifications that explicitly model the rate of unplanned buying per unit time spent in store.

A Poisson model of unplanned buying

Consider $h = 1, 2, \ldots H$ households taking $t = 1, 2, \ldots T_h$ shopping trips. The total number of unplanned purchases on each trip t for each household h, is UP_{ht} and we assume that UP_{ht} follows a Poisson distribution. First, the number of unplanned category purchases is an integer with no a priori upper bound.[8] Second, as shown in Ross (1996), the Poisson distribution can be derived as an approximation to the sum of independent Bernoulli random variables ($X_1, X_2, \ldots X_n$) with heterogeneous parameters. To see this, let $X_i = 1$ if an unplanned purchase is made in category $i = 1, 2, \ldots N$, and 0 otherwise. N is the total number of categories. Dropping subscripts, let $UP = \sum_{i=1}^{N} X_i$ and allow unplanned purchase incidence probabilities to vary across categories, $X_i|\theta_i \sim \text{Bernoulli}(\theta_i)$. If we assume that θ_i follows a Beta distribution $B(a, b)$ across categories, the marginal distribution of X_i is Bernoulli with probability $p = \frac{a}{a+b}$.[9] If p is small, then $UP \sim$ Poisson (Np) which leads to equation (1) with $Np = \mu$.

Although a multivariate probit model could be applied to the category-level data,[10] modeling the *total number* of unplanned category purchases is better suited to our trip-level research objectives. The categories themselves (listed in the Appendix) are defined at a level that makes cross-category substitution less relevant; furthermore, we have no information on category-level marketing. The large number of categories (58) would also make this approach tough to implement.

UP_{ht} follows a fixed effects Poisson model (Winkelmann 2008, p. 222):

$$P\left(UP_{ht}\middle|x_{ht},\alpha_h\right)=\frac{\exp\left(-\alpha_h\mu_{ht}\right)\left(\alpha_h\mu_{ht}\right)^{UP_{ht}}}{UP_{ht}!} \quad \text{where } \mu_{ht}=\tau_{ht}\exp\left(x'_{ht}\beta\right). \tag{1}$$

The Poisson-distributed variable is the product of an exponential mean function, μ_{ht}, and a multiplicative household-specific effect, α_h, that is estimated jointly with β. The mean μ_{ht} in equation (1) is a combination of the non-negative rate, $\exp(x'_{ht}\beta)$, adjusted for the length of exposure τ_{ht}, i.e., the amount of time spent in the store. Explanatory variables (x_{ht}) are the out-of-store factors of interest as well as the set of controls and store fixed effects. The expected number of unplanned purchases is:

$$E\left(UP_{ht}\middle|x_{ht},\alpha_h\right)=\alpha_h\,\mu_{ht}. \tag{2}$$

There is a closed-form analytical expression for $\hat{\alpha}_h$ that can be inserted back into the likelihood. Because this obviates the need to estimate H separate household-level fixed effect parameters, the estimates of β are neither biased nor inconsistent (Winkelmann 2008). The first-order condition for β uses only within-shopper variation and is a product of the residuals, scaled by the within-household average ratio of observed unplanned buying ($\overline{UP}_h$) to expected unplanned buying ($\bar{\mu}_h$), and the explanatory variables:

$$\sum_{h=1}^{H}\sum_{t=1}^{T_h}\left(UP_{ht}-\frac{\overline{UP}_h}{\bar{\mu}_h}\mu_{ht}\right)x_{ht}=0 \tag{3}$$

Household effects α_h are estimated non-parametrically; hence we *completely* control for any characteristics that vary *across, but not within, households* (e.g., household size, income, deal-proneness, shopping enjoyment). In contrast, studies without this design can *only control for household characteristics they observe*; they must assume that all the other unobserved characteristics are *randomly distributed* and *independent of the explanatory variables*. The latter assumption is especially hard to justify, considering the large set of characteristics potentially correlated with shopping goals and unobserved in typical datasets. In summary, our fixed-effects model is estimated on *shopping trip-level* (within-household) differences and avoids biased estimates of β that arise from: (1) misspecification of the distribution of random effects, and (2) correlation between the shopper-level baseline α_h and the explanatory variables x_{ht}. A Hausman test comparing our fixed effects model with a random effects model (which assumes that the distribution of α_h is independent of x_{ht}), rejects the random effects specification ($p < .001$). Finally, because the first-order conditions in equation (3) are identical to method of moments estimation, "one does not need to worry about over-dispersion, or other expressions of non-Poisson-ness" (Winkelmann 2008, p. 227).

An additional issue in our application is that exposure time, i.e., time in store, is potentially endogenous (see Figure 1 and the earlier discussion of this point). We account for this by: (1) using instrumental variables for exposure time in the Poisson model described above, and (2) estimating two separate Tobit specifications that directly model the rate of unplanned buying.[11] We use day, hour and location dummy variables as instruments that have significant effects on exposure time (first stage regression R^2 =.47), but not on unplanned buying directly ($\chi^2_{(16)} = 14.09$, $p = .59$), and thereby satisfy the instrumental variables exclusion restriction.

A Tobit model of unplanned buying

To further account for the possibly endogenous relationship between unplanned buying and exposure time (time spent shopping), we model the rate of unplanned buying as the dependent variable, i.e., the total number of unplanned purchases on a trip divided by the time spent in the store, y_{ht}. Since this new variable is continuous and censored at zero, we can use a Tobit model to relate it to explanatory variables,

$$y_{ht} = \frac{UP_{ht}}{\log(\tau_{ht})} = \max\{\alpha_h + x'_{ht}\beta + \varepsilon_{ht},\ 0\}. \tag{4}$$

We estimate two versions of the Tobit model, because, unlike the Poisson, there is no analytical trick that lets us circumvent estimating all *H* household-level fixed effects. The first uses standard maximum likelihood estimation, but it is well-known that this procedure generates inconsistent estimates due to the incidental parameters problem (Baltagi 2008). The second uses a semi-parametric approach, trimmed least absolute deviations (LAD) to estimate the fixed effects, which overcomes this problem (Honoré 1992).

Findings: Hypotheses H_1-H_3

Table 3 (following References) reports the estimates for the fixed effect Poisson IV, Tobit, and Trimmed LAD Tobit models. The signs and levels of significance for the focal variables and the control variables are remarkably consistent across all three specifications and this provides us with some assurance as to the robustness and validity of the estimates. Henceforth, we focus on the Poisson results. Column four shows the marginal effects (from the Poisson IV model); for continuous covariates these are computed at one standard deviation above and below the mean.

Overall shopping trip goal (H_1). As the overall trip goal becomes more abstract (holding the shopper and all else constant), there is more unplanned buying. The relevant coefficients increase from β_1 = -.278 to β_5 = .462 (the same monotonically increasing sequence is seen in the coefficients from the Tobit and trimmed Tobit models). A joint test of a monotonic ordering from the concrete goals to the relatively abstract ("fill-in") to the most abstract ("major") is highly significant ($\chi^2_{(4)}$ = 34.14, p < .001). Pair-wise tests are consistent with H_1: the "major-trip" effect is larger than the "fill-in trip" effect ($\chi^2_{(1)}$ = 8.37, p = .004); fill-in trip effects are about the same as effects for shopping for meals on the same day ($\chi^2_{(1)}$ = 2.39, p = .123). The effect of "same day" is about the same as the effect of shopping for "immediate consumption" ($\chi^2_{(1)}$ = 1.18, p = .277) but the effect of immediate consumption is larger than that for the goal of shopping for specific promotions ($\chi^2_{(1)}$ = 4.89, p < .027). Thus, H_1 is largely supported.

Store-specific goals (H_2). While any goal that leads to store choice on a trip is positive for the retailer concerned (from a traffic perspective), it remains to be seen whether specific reasons translate into incremental (unplanned) category purchases. Our test of H_2 is stringent; the model includes seventeen additional controls and store fixed effects to account for baseline store differences apparent for all customers. On a trip when the shopper chooses a store for its "low prices" (β_6 = .111, t-statistic = 1.82) or "attractive promotions" (β_7 = .120, t-statistic = 2.41) there is a 12-13% increase in unplanned buying; however, assortment and service goals have no effect. Thus, we see modest support for H_{2A} but not for H_{2B} or H_{2C}.

On trips when a store is chosen for *store-specific* convenience ("one stop shopping") there is 12% more unplanned buying (β_{10} = .111, t-statistic = 2.36). On trips when it is chosen for *general* convenience in the context of a larger plan, which may involve cherry picking and basket splitting across stores ("I can visit other stores at the same time"), there is less unplanned buying (β_{11} = -.119, t-statistic = -2.59). Hence, H_{2D} and H_{2E} are supported. The control variable that measures whether a shop was visited second, or later in a multi-store trip, is not significant

(γ_6 = -.022, t-statistic = -.46). Combining this finding with support for H_{2D} and H_{2E} implies that on multi-store trips a shopper does less unplanned buying *overall*, and not just at stores she visits later in the shopping sequence. Finally, on trips where the chosen store is selected because it is "less crowded" the shopper does less unplanned buying (β_{12} = -.119, t-statistic = -1.97). Consistent with H_{2F} store congestion (and more exposure to the category choices of other shoppers) increases unplanned buying for the focal shopper on that trip.

Out-of-store and in-store marketing (H_3). Trip-level exposure to out-of-store marketing activity has no significant *direct* effect on a household's unplanned buying (γ_1 through γ_3 are insignificant in all three model specifications). As predicted, there are however positive interaction effects with in-store marketing. On trips when a household is aware of leaflets prior to shopping and also reads leaflets seen in-store while shopping, there is 36% more unplanned buying (β_{14} = .305, t-statistic = 2.70). Similarly, on trips where a household has prior exposure to store marketing through advertising seen on TV, or delivered through coupons, or friends and family and *also* reads leaflets while shopping, there is 68% more unplanned buying (β_{15} =.518, t-statistic = 2.14). This is strong evidence for the interplay between out-of-store marketing and in-store marketing. Thus, in H_3 we find strong support for the untested conjecture of Kollat and Willett (1967) that in-store marketing can trigger forgotten needs.

Control variables and robustness checks

Control variables. Our model includes an extensive set of trip-level controls, in addition to store and household fixed effects. We have no substantive interest in the signs and significance of the control variables per se; however it is important that they are either consistent with well-established results or plausible (for new variables). The pattern of effects is consistent across all three model specifications—we comment briefly on a few notable effects. Exposure to in-store marketing stimulates unplanned buying. Coefficients on shelf features and displays seen on a trip are highly significant (γ_8 = .345, *t*-statistic = 4.03 and γ_9 = .468, *t*-statistic = 4.65, respectively). This finding has been reported in the literature; however, our panel data models allow us to claim that this is unambiguously a *trip-level* effect for an *individual shopper*. Cross-sectional analysis cannot rule out the following alternative explanation—only promotion sensitive shoppers scan features and displays—and only these kinds of shoppers do unplanned buying.[12] (We also find larger in-store marketing coefficients in a model without fixed effects. This suggests that the findings for in-store marketing effects reported in the literature may be overstated.)

Unplanned buying increases on trips when the shopper travels by bicycle or car (relative to a base case of walking). Trips to more distant stores involve less unplanned buying (γ_1 = -.121, *t*-statistic = -3.65). This suggests that when the fixed travel cost is high, the shopper may be more inclined to plan category purchases. Consistent with Inman, Winer, and Ferraro (2009), unplanned purchasing increases when the shopping trip is taken by a female member of the household (γ_6 = .345, *t*-statistic = 4.16). Kahn and Schmittlein (1989; 1992) speculate that the overall shopping trip goal interacts with response to in-store promotions. We find negative interaction effects (γ_{15} and γ_{17}) only in the Poisson model, because they are artifacts of the log-linear model specification, which defines interactions as proportional to the main effects, rather than a substantive finding per se (there are no significant effects found in the Tobit models).

Robustness checks. The main findings are robust to Poisson and Tobit specifications. The fit of the Poisson model is acceptable—the squared correlation between predicted and actual values is .49. The R^2_{KL} metric for non-linear models proposed by Cameron and Windmeijer (1997) and based on the Kullback-Leibler divergence, is .46. If we replace the number of planned purchases with a set of dummy variables the results are largely unchanged. Since time is possibly endogenous we use an IV estimation strategy; however, qualitatively similar effects for the parameters of interest obtain with non-parametric controls for time, i.e., if we use dummy variables to capture shopping trips occurring in discrete intervals of time. We also quantify the additional variation in unplanned buying explained by a trip-level perspective. The R^2_{KL} is .29 in a household-effects-only model; hence, adding trip-to-trip variation increases R^2_{KL} by over 50%. Thus, our substantive trip-level perspective is also justified on statistical grounds.

Discussion and Conclusion

In contrast to prior literature, we explain trip-level unplanned buying that originates from decisions made by the shopper *before she steps into the store*, while controlling for previously found in-store effects. This is a key point of differentiation; most studies focus on differences across shoppers and categories, and on the effects of stimuli found inside the store. Furthermore, our panel data models allow a true trip-level interpretation of the model coefficients and our findings are not confounded by heterogeneity across shoppers. .

Key findings

Figure 2 (following References) shows the average expected percentage change in unplanned category purchases as a function of the overall shopping trip goal, all other factors held constant. Consistent with H_1 and recent experimental work (e.g., Lee and Ariely 2006) as well as goal-setting (Gollwitzer 1999) and construal level (Trope, Liberman and Wakslak 2007) theories, the more abstract the shopping goal, the more unplanned buying. Major trips have the greatest "scope" for unplanned buying because the shopping mission involves satisfying a range of household needs. One need could relate to a meal (e.g., dinner) but not the precise category (e.g., chicken). These trips show the greatest percentage lift in unplanned buying—almost 60%. Fill-in trips which are used for "daily essentials" and "topping up" follow with a 27% increase in unplanned buying. Using the trip receipt data, we know the average trip is €21.45, with on average 5.0 planned category purchases and 1.4 unplanned category purchases. This means that unplanned purchases contribute about €4.70 to an average receipt and planned purchases contribute about €16.75. Unplanned buying on trips where the shopper activates her most abstract overall trip goal contributes, on average, an *additional* €2.77, a 10% increase in the total amount spent.

Over forty years ago, Kollat and Willett (1967, p. 29) reasoned that: "During major trips … the shopper's needs are not well defined, thus the shopper is more receptive to in-store stimuli." Since we control for trip-level exposure to many other factors, the effect of "concrete versus abstract goals" shown in Figure 2 is *over and above* that due to marketing stimuli seen by the shopper, overall basket size, time spent in store, and the other variables we control for (see Table 3, following References). Our fixed effects models estimate household-level intercepts and therefore also rule out explanations such as "certain types of households are more likely to have abstract goals."

Any store-specific goal that brings a shopper to a store on a trip has a positive effect on traffic; our study, however, shows that these goals also affect unplanned buying on the trip once the shopper is inside the store. On trips where the store is selected for "low prices" and "attractive promotions" there is more unplanned buying because the shopper may feel more normatively justified when she engages in incremental purchases (Rook and Fisher 1995). We find moderate increases in unplanned buying of 12-13%. Again, the overall category and Euro value of this lift is about 2% for the average shopper on the average trip.

Store-specific convenience ("one-stop shopping") leads to 12% more unplanned buying whereas *general* convenience with respect to a larger shopping plan ("I can visit other stores at the same time") reduces unplanned buying by a similar amount. We also show that on multi-store trips, the shopper does *less* unplanned buying overall and not just in stores visited second, third, or later. To the extent that multi-store trips are an increasing reality in the evolving retail landscape (Gijsbrechts, Campo, and Nisol 2008), there may be a corresponding decline in unplanned buying. In summary, we find that the specific goal attached to a specific store not only affects the shopper's initial store choice *but also* her unplanned buying inside the store. Note that our test for incremental buying based on store-specific trip goals is very stringent because the model includes fixed effects for stores and households as well as a large set of controls.

It is well known that exposure to out-of-store marketing activity facilitates *planning* and that exposure to in-store marketing stimuli generates *unplanned* buying. Hence, these marketing instruments appear to work in opposing directions. Nevertheless, we hypothesized (H_3) and found that when it comes to unplanned buying, in-store and out-of-store marketing can be mutually reinforcing. This implies that marketing activities should be assessed from the perspective of their collective, rather than individual, weight.

Implications for managers and researchers

The findings summarized above offer new implications for managers and researchers. We comment on two—the overall value of the trip-based view of shopping behavior and the efficacy of alternative retail formats. Both issues are drawing increasing attention, yet neither has been linked to unplanned buying.

The shopping trip view. Sophisticated retailers, including Walmart, collect detailed data on shopping patterns over time and segment shoppers according to the purpose of their shopping trip (Fox and Sethuraman 2006). In support of this approach, we find that trip-level factors greatly improve our ability to understand unplanned buying (adding trip-to-trip variation increased R^2_{KL} by over 50%). This has implications for retail competition as it provides support for moving beyond the more common practice of targeting customers (share-of-customer competition) to targeting shopping trips (share-of-shopping-trip competition). Many retailers believe that most purchase decisions are made inside the store (*Advertising Age*, July 28, 2008) and allocate funds to in-store marketing to stimulate unplanned buying with in-store displays, promotions, and technological innovations (Albert and Winer 2008). We endorse the importance of these factors, but our results also point to the critical role of largely overlooked out-of-store factors, such as the overall shopping trip goal and idiosyncratic store-specific goals. Convincing shoppers to keep their goals abstract to generate more unplanned buying, can be achieved, for example, by using time-dependent coupons that capitalize on the regularity of shopping patterns (Fox, Metters and Semple, 2003), or by advertising more abstract shopping benefits (Walmart exhorts customers to “Save Money. Live Better.”). More needs to be done to understand the overall trip goal, store-specific goals and prior marketing exposures that shoppers bring with them *before they enter the store.*

A parallel implication for researchers is that the shopping trip goal needs to be construed in detail and that this will require more than receipt data alone can reveal. Moreover, in-store and out-of-store marketing stimuli interact; it is not simply the case that out-of-store facilitates planning and in-store stimulates opportunistic behavior. Finally, trip-level store-specific choice goals affect more than just traffic—they can have positive or negative effects on incremental buying within the store. Individually, the percentage lifts and decrements are modest (10-14%); however, taken over many trips they have an economically meaningful impact.

Unplanned buying across retailers and retail formats. Hard discounters have dramatically altered the retail landscape of Western Europe and North America (Cleeren et al. 2010; Van Heerde, Gijsbrechts and Pauwels 2008). This not only raises the possibility for similar change in other regions of the world, but also raises a need for new research on how shoppers behave in this format. Traditional supermarkets and hard discounters vary in observable and substantial ways on pricing, assortment, location, and store environment, but it is unclear how in-store decisions vary across these formats, and, in particular, how this translates to unplanned buying. Our research, which controls for differences across households, and allows the *same* shopper to visit different stores and formats, is well suited to address this issue.

A key within-person finding in this research is H_1—when the shopper activates an abstract goal before shopping she does more unplanned buying in the store. But are shoppers more likely to choose a particular format when they have abstract goals; moreover, does this phenomenon interact with the *format* of the visited store (controlling for other variables and store-level fixed effects)?[13] First, the data reveal that shoppers are more likely to visit hard discounter formats when the overall trip goal is most abstract ("major trip"). The two hard discounters in our data have 53% and 44% abstract trip visits; the traditional supermarkets only have 10-20%. To address the second issue, we re-estimate our model but add two interaction terms. We find that the coefficient on the interaction between the most abstract overall trip goal ("major trip") and choice of a traditional supermarket format is positive and significant (β_{trad} = .488, *t*-statistic =

2.79); the same coefficient for the hard discounter interaction is negative and not significant. Stores of *all* types benefit when the shopper enters with an abstract goal; the positive interaction implies that traditional supermarkets see an additional lift, *over and above* that from the abstract goal alone. This translates into an *additional* €2.10 per trip for the traditional full service supermarket and again highlights the impact of unplanned buying on store revenues.

Limitations

We investigate the effects of out-of-store factors on unplanned buying in one western European market. Retail markets are in different stages of evolution—a cross-country comparison of how what "shoppers bring to the store" affects unplanned buying is an important area for future research. We use panel data to show how *trip-to-trip* variation drives unplanned buying; however, our observation window is relatively short. (Unplanned buying is measurement intensive so one must also consider possible sample attrition as time windows are lengthened.) Longitudinal analysis of steady-state shopping habits around unplanned buying is another important area for future research.

Appendix

List of Product Categories Used in the Analysis (in alphabetical order)

Baby and toddler food
Baking and dessert products
Bath and shower products
Beer
Books, CD's, CD-roms
Bread (incl. crackers/toast/biscuit rusk) and bread rolls
Butter/margarine
Cake/biscuits/chocolate/ sweets
Cereals (corn flakes, cruesli, etc.)
Cheese
Chilled meals/pizzas
Chilled soup
Cleaning products
Clothes (incl. shoes, jewelry, clocks etc.)
Coffee and tea
Crisps/salted snacks/nuts
Deodorant
Dishwasher/washing up liquid/powder
Dry groceries (/salt/spices/herbs)
Eggs
Fabric conditioner
Fish (incl. crustacean and shellfish)
Flowers and plants
Fresh dairy products (drinks and desserts)
Fresh vegetables/fruit/potatoes
Frozen ice cream
Frozen meals/pizzas/snacks
Frozen vegetables/ potato products/fish/meat
Household goods (dishcloths, brushes, candles, crockery, matches, light bulbs, etc.)
Long-life dairy products
Magazines
Mayonnaise and other cold sauces
Meals in a tin/jar/packet/box (incl. dinner kit)
Meat/chicken (incl. meat products)
Medicine/pills/supplements
Mixes for meals/packet mixes/ cooking sauces
Moisturising cream and body lotion
Nappies/other babyand toddler products
Office articles (incl. Computers/printers)
Olive oil/vinegar
Other articles
Other products in a jar/tin (meat, fish, olives, gherkins, etc.)
Pasta/ rice
Pastries and confectionary
Pet food and? pet care
Sandwich filling (non chilled)
Sanitary products/panty liners
Shampoo and conditioner
Shaving products
Smoking materials
Soft drinks/juices/ice tea/sport drinks/diluting juice
Soups and bouillon (tinned/packet)
Sugar and condensed milk/creamer
Toilet paper/kitchen rolls/tissues
Toothbrushes/toothpaste/ oral care
Vegetables in a tin/jar
Washing powder/liquid
Wine and other alcoholic beverages

Notes

[1] From the popular book, *Why We Buy:The Science of Shopping* by Paco Underhill.
[2] Some major retailers (including Walmart) increasingly target customers according to the purpose of their shopping trip (Fox and Sethuraman 2006); we validate this orientation as an approach to understanding unplanned buying (see Discussion and Conclusion section).
[3] We thank an anonymous reviewer for suggesting this important clarification.
[4] We provide more details in the Model and Findings section and thank an anonymous reviewer for suggesting the approaches we take. See equations (1) to (4) and the related discussion.
[5] Some research (e.g., Kahn and Schmittlein 1989; 1992) distinguishes "major" and "fill-in" trips *ex pos*t from grocery receipts. Our measures, developed from direct consumer self-reports (e.g., Walters and Jamil 2003), are more comprehensive, mutually exclusive and collectively exhaustive, and were pre-tested by a professional marketing research company hired by our data provider, a large multinational CPG company.
[6] We test H_{2A}-H_{2F} after controlling for baseline unplanned purchasing in each store (though store fixed effects); coefficients for the hypotheses are identified on household level *trip-to-trip* variation only.
[7] We also estimate random effects models using *all* the data; however, a Hausman test shows that the key random effects modelling assumption—that the regressors are uncorrelated with the random effect is rejected. We provide more details in the next section.
[8] Technically, the 58 categories in the consumer survey is an upper bound, but this is far greater from the observed maximum number of unplanned category purchase decisions on a single trip (10).
[9] See Knorr-Held and Besag (1998, p. 2050) and Ross (1996). This Poisson approximation also allows unplanned purchase incidence probabilities to be weakly positively correlated across categories. Ross (1996, p. 465) provides the error bound for the Poisson approximation when correlations are present.
[10] We thank an anonymous reviewer for this suggestion.
[11] We are very grateful to an anonymous reviewer for suggesting the Tobit specification.
[12] We thank an anonymous reviewer for drawing our attention to this point. A fixed effects panel data model rules out these kinds of across-shopper differences.
[13] We thank an anonymous reviewer for drawing our attention to this point.

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Table 1
Summary of Selected Literature on Unplanned Buying

Research Study	Variables	Research Methods and Data	Key Finding
Kollat and Willett (1967) "Customer Impulse Purchasing Behavior"	Main dependent variable: Number of different products purchased Independent variables: *Shopper traits*, i.e., demographics, and *Shopping trip factors*, e.g., transaction size, major trip, purchase frequency, use of shopping list	Collection method: Shopper interviews on store entry and exit Amount and type of data: [5]96 shoppers, 64 categories, cross-sectional data	"Most unplanned purchases are a response to forgotten needs and out-of-stock"
Granbois (1968) "Improving the Study of Customer In-Store Behavior"	Main dependent variable: Number of different products purchased Independent variables: *Shopper traits*, e.g., demographics, and *Shopping trip factors*, e.g., time in store, number in shopping party	Collection method: Shopper interviews on store entry and exit, observation of shoppers while shopping Amount and type of data: 388 "shopping parties", 84 categories, cross-sectional data	"Study of unplanned purchasing can be improved by combining survey with observational methods"
Park, Iyer, and Smith (1989) "The Effects of Situational Factors on In-Store Grocery Shopping Behavior: The Role of Store Environment and Time Available for Shopping"	Dependent variable: Purchase of products to satisfy needs that were? unrecognized Independent variables: *Shopping trip factors*, e.g., store knowledge, and time available for shopping	Collection method: Shoppers interviewed as in Kollat and Willett (1967) Amount and type of data: 68 shopping parties in four experimental conditions (high or low knowledge; no time pressure or time pressure), cross-sectional data	"Most unplanned purchasing done in the low store knowledge / no time pressure condition"
Beatty and Ferrell (1989) "Impulse Buying: Modeling Its Precursors"	Main dependent variable: Likelihood of an impulse purchase Independent variables: *Shopper traits*, i.e., demographics, "impulse buying tendency", *Shopping trip factors*, e.g., time, budget, enjoying	Collection method: Shoppers interviewed as in Kollat and Willett (1967) Amount and type of data: 533 shoppers, 153 who made "impulsive" purchases, cross-sectional data	"Individual differences in propensity for impulsiveness is a significant driver of unplanned buying"

Bucklin and Lattin (1991) “A Two-State Model of Purchase Incidence and Brand Choice”	Main dependent variable: Probability of category purchase incidence; latent shopping state (planned or opportunistic) Main independent variables: *Shopper “traits”*, i.e., deal loyalty, *Shopping trip factors*, e.g., inventory, store loyalty, marketing mix variables	Collection method: Purchase data collected from supermarket scanners Amount and type of data: 152 shoppers, 52 weeks of purchases, 2 categories, panel data structure	“Probability of unplanned state is higher in low loyalty stores, and for households who buy on deal”
Rook and Fisher (1995) “Normative Influences on Impulsive Buying Behavior”	Main dependent variable: alternative purchase scenarios that vary in level of “impulsiveness” Main independent variables: *Shopper “traits”*, i.e., buying impulsiveness, normative evaluations of impulsiveness as moderator	Collection method: Respondent evaluation of hypothetical buying scenarios (study 1), actual buying behavior (study 2) Amount and type of data: 212 undergraduate students (study 1), 104 mall shoppers (study 2), cross-sectional data	“Impulsive buyers (trait) do more impulsive buying but this is moderated by normative evaluation of acceptability of impulsive purchase”
Inman, Winer, and Ferraro (2009) “The Interplay Between Category Factors, Customer Characteristics, and Customer Activities on In-Store Decision Making”	Main dependent variable: Decision type classified as planned, generally planned, or completely unplanned, for each product category Main independent variables: *Shopper traits*, i.e., demographics, *Shopping trip factors*, e.g., time, use of shopping list, etc., *Category factors*, e.g., display, coupon availability, category hedonicity	Collection method: Shoppers interviewed as in Kollat and Willett (1967) Amount and type of data: 2,300 shoppers, 14 US cities, over 40,000 purchases, cross-sectional data	“Stable category factors and customer-self control factors exert the most influence on unplanned buying”
Our Study (2010) “Unplanned Buying on Shopping Trips”	Main dependent variable: Number of unplanned category purchases per trip Main independent variables: *Pre-visit, out-store-factors* (overall shopping trip goal, store-specific goals, out-of-store marketing)	Collection method: Shoppers interviews and self-reports Amount and type of data: 441 shoppers, 3,014 shopping trips, 58 product categories, over 18,000 purchases, panel data	“Unplanned buying increases monotonically with the abstractness of the shopping goal held by the shopper before entering the store.”

Table 2
Model Variables and Summary Statistics

Model Variables[1]	Mean Proportion	Standard Deviation	Min	Max
H_1: Shopping Trip Goal				
Shopping for Special Offers and Promotions	.031	.174	0	1
Immediate Consumption; To Use Straight Away	.112	.315	0	1
Same Day; Shopping for Meals on the Same Day	.149	.346	0	1
Fill-in Trip; Daily Essentials, Top-up Shopping	.431	.495	0	1
Major Trip; Weekly or Less Often	.256	.424	0	1
H_2: Store Choice Goals				
A: "Low Prices"	.243	.429	0	1
A: "Attractive Promotions and Special Offers"	.298	.458	0	1
B: "Large Assortment"	.217	.412	0	1
C: "Friendly Store, Good Service"	.149	.356	0	1
D: "Store Offers One Stop Shopping"	.312	.463	0	1
E: "I Can Visit Other Stores at the Same Time"	.365	.482	0	1
F: "No Crowds in the Store"	.116	.320	0	1
H_3: Out-of-Store Marketing				
Special Offers Seen in the Newspaper	.013	.112	0	1
Special Offers Seen in the Leaflet Delivered to Home	.189	.392	0	1
Special Offers Seen on TV, Radio, in Coupons, or Communicated by Friends and Family	.025	.157	0	1
Control Variables				
Travel Time to Store (minutes)	7.874	6.640	0	70
Travel to Store by Bicycle or Scooter	.325	.469	0	1
Travel to Store by Car or Taxi	.479	.500	0	1
Trip on Friday or Saturday (Stores closed Sunday)	.379	.485	0	1
Primary Shopper Female on Current Trip	.814	.389	0	1
Multi-Store Shopping Trip (At Least One Other Store Visited on this Trip Prior to Current Store)	.179	.384	0	1

Notes: Proprietary survey panel data collected from 441 shoppers, taking 3,014 shopping trips at supermarkets in a Western European country. The data were collected in conjunction with a major multinational packaged goods manufacturer who wishes to remain anonymous. The data cover the period June 12 to July 10, 2006.

[1] All variables aside from times and category counts are dummy variables.

Table 2 (Continued)

Variables	Mean Proportion	Standard Deviation	Min	Max
Control Variables (cont'd)				
Total Number of Planned Category Purchases	4.997	4.147	1	28
Special Offers Seen at the Shelf	.271	.446	0	1
Special Offers Seen on Display Away from Shelf	.165	.371	0	1
Stay Informed about Special Offers From Store Leaflet in the Shop	.257	.357	0	1
I Wanted the Shopping Trip to be Fast and Efficient	.679	.467	0	1
Exposure Variable				
Time Spent Shopping (minutes)	17.821	11.484	1	85
Dependent Variable				
Total Number of Unplanned Category Purchases	1.39	1.93	0	10

Table 3

Parameter Estimates from Fixed Effect Poisson and Tobit Models[1]

Dependent Variable: UP_{ht} (Number of Unplanned Category Purchases)	**FE Poisson (IV)**[2]	**FE Tobit**[3]	**FE Trimmed Tobit**[4]	**Marginal Effect (%)**[5]
H_1: Shopping Trip Goal Abstractness				
β_1, Shopping for Special Offers and Promotions	$-.278^{+}$	-.174	-.210	-24%
β_2, Immediate Consumption; To Use Straight Away	.023	-.070	-.072	-
β_3, Same Day; Shopping for Meals on the Same Day	.119	.138	.132	-
β_4, Fill-in Trip; Daily Essentials, Top-up Shopping	$.241^{**}$	$.222^{*}$	$.233^{*}$	27%
β_5, Major Trip; Weekly or Less Often	$.462^{***}$	$.522^{***}$	$.569^{***}$	59%
H_2: Store Choice Goals				
β_6, A: "Low Prices"	$.111^{+}$	$.148^{**}$	$.156^{*}$	12%
β_7, A: "Attractive Promotions and Special Offers"	$.120^{*}$	$.085^{+}$	.075	13%
β_8, B: "Large Assortment"	.064	.064	.074	-
β_9, C: "Friendly Store; Good service	.088	$.112^{+}$	.094	-
β_{10}, D: "Store Offers One Stop Shopping"	$.111^{*}$	$.131^{**}$	$.121^{*}$	12%
β_{11}, E: "I Can Visit Other Stores at the Same Time"	$-.119^{**}$	-.033	-.064	-11%
β_{12}, F: "No Crowds in the Store"	$-.129^{*}$	-.067	$-.119^{+}$	-12%
H_3: Out-of-Store Marketing				
β_{13}, Special Offers Seen in the Newspaper *x* Stay Informed Through Leaflet About Offers	.209	-.095	.360	-
β_{14}, Special Offers Seen in the Leaflet Delivered to Home *x* Stay Informed Through Leaflet About Offers	$.305^{**}$	$.252^{*}$	.210	36%
β_{15}, Special Offers Seen on TV, Radio, in Coupons, or Communicated by Friends and Family *x* Stay Informed Through Leaflet About Offers	$.518^{*}$	$.571^{*}$	$.505^{*}$	68%

Table 3 (Continued)

Dependent Variable: UP_{ht} (Number of Unplanned Category Purchases)	**FE Poisson (IV)[2]**	**FE Tobit[3]**	**FE Trimmed Tobit[4]**
Control Variables			
γ_1, Travel Time to Store (log minutes)	$-.121^{**}$	-.054	-.039
γ_2, Travel to Store by Bicycle or Scooter	$.180^{*}$	$.147^{*}$	$.172^{*}$
γ_3, Travel to Store by Car or Taxi	$.385^{***}$	$.377^{***}$	$.414^{***}$
γ_4,Trip on Friday or Saturday (Stores closed Sunday)	$-.107^{**}$	$-.066^{+}$	-.059
γ_5, Primary Shopper Female on Current Trip	$.345^{***}$	$.332^{**}$	$.279^{**}$
γ_6, Multi-Store Shopping Trip (At Least One Other Store Visited on this Trip Prior to Current Store)	-.022	-.058	-.040
γ_7, Total Number of Planned Category Purchases (log units)	$-.613^{***}$	$-.330^{***}$	$-.326^{***}$
γ_8, Special Offers Seen at the Shelf	$.345^{***}$	$.377^{***}$	$.280^{**}$
γ_9, Special Offers Seen on Display Away from Shelf	$.468^{***}$	$.456^{***}$	$.419^{***}$
γ_{10}, I Wanted the Shopping Trip to be Fast and Efficient	$-.479^{***}$	$-.671^{***}$	$-.597^{***}$
γ_{11}, Special Offers Seen in the Newspaper	-.221	.174	-.028
γ_{12}, Special Offers Seen in the Leaflet Delivered to Home	-.052	-.015	-.015
γ_{13}, Special Offers Seen on TV, radio, in Coupons, or Communicated by Friends and Family	-.046	-.051	-.113
γ_{14}, Special Offers Seen at the Shelf *x* Major Trip	-.074	.046	.044
γ_{15}, Special Offers Seen on Display Away from Shelf *x* Major Trip	$-.259^{*}$	-.084	-.142
γ_{16}, Special Offers Seen at the Shelf *x* Fill-in Trip	-.170	-.047	-.068
γ_{17}, Special Offers Seen on Display Away from Shelf *x* Fill-in Trip	$-.212^{+}$	-.015	-.065
Log Likelihood	-2,985	-2,298	-

Notes: Total number of households = 441; shopping trips = 3,014. $^{***}p < .001$; $^{**}p < .01$; $^{*}p < .05$; $^{+}p < .10$

[1] Household and store fixed effects for all models suppressed to save space (available upon request).

[2] The R^2 in the first stage regression (with instruments for time) is .47.

[3] We also estimated a random effects Tobit model; the fixed effects model is preferred under the Hausman test.

[4] The Trimmed Tobit least absolute deviations (LAD estimator) estimates fixed effects semi-parametrically (Honoré 1992). We estimate this model as a robustness check.

[5] Marginal effects for continuous covariates calculated at one standard deviation above and below the mean.

Figure 1

Conceptual Framework

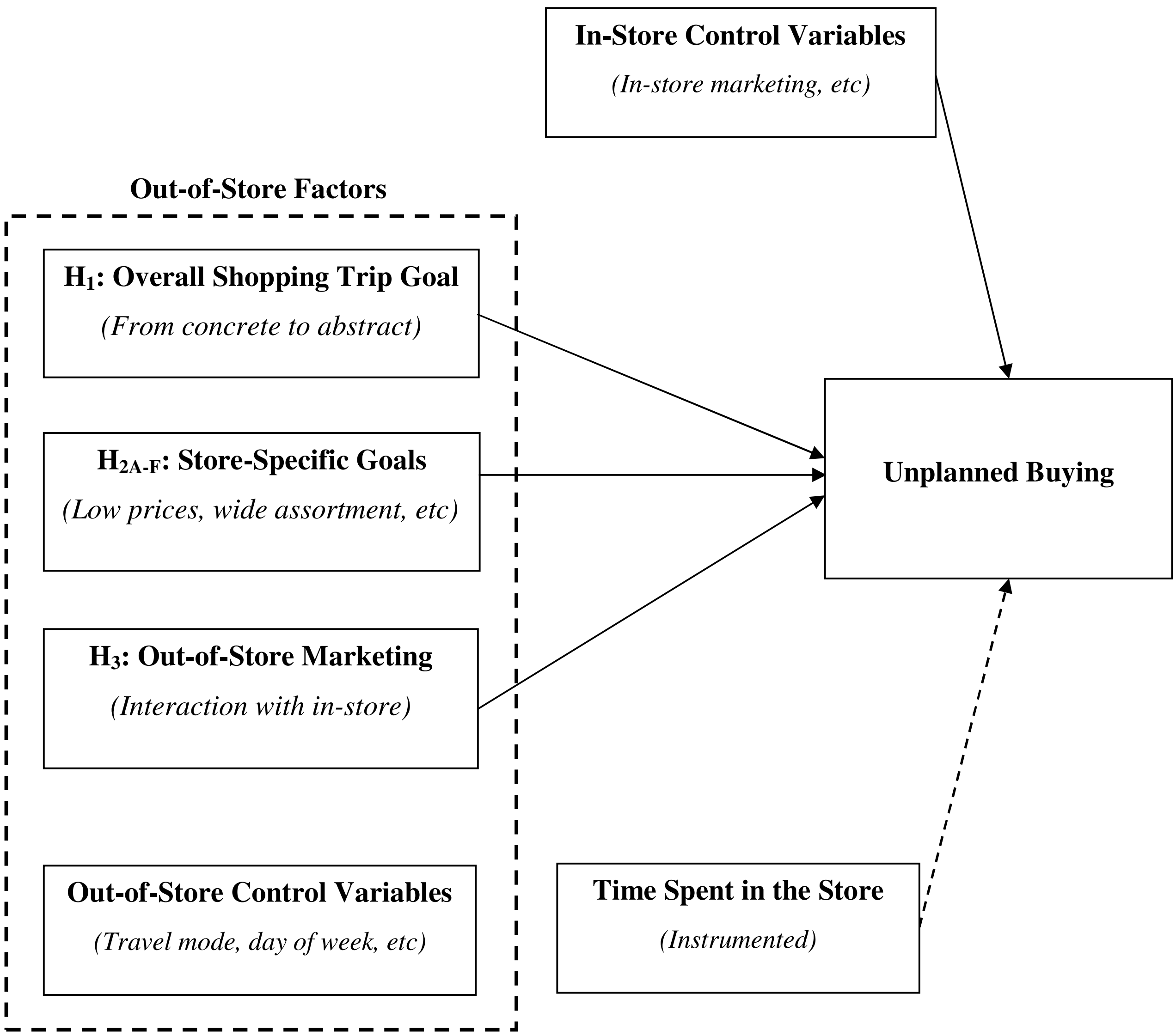

Figure 2

Expected Percentage Change in Unplanned Buying as a Function of the Overall Shopping Trip Goal (All Other Variables Constant)