

The determinants of consumers' online shopping cart abandonment

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Abstract Despite placing items in virtual shopping carts, online shoppers frequently abandon them—an issue that perplexes online retailers and has yet to be explained by scholars. Here, we identify key drivers to online cart abandonment and suggest cognitive and behavioral reasons for this non-buyer behavior. We show that the factors influencing consumer online search, consideration, and evaluation play a larger role in cart abandonment than factors at the purchase decision stage. In particular, many customers use online carts for entertainment or as a shopping research and organizational tool, which may induce them to buy at a later session or via another channel. Our framework extends theories of online buyer and non-buyer behavior while revealing new inhibitors to buying in the Internet era. The findings offer scholars a broad explanation of consumer motivations for cart abandonment. For retailers, the authors provide suggestions to improve purchase conversion rates and multi-channel management.

Keywords Online shopping cart abandonment · Online buyer behavior theory · E-tail · E-commerce

To more fully understand buyer behavior, it is crucial to also examine consumer “non-buying” behavior. Non-

buying behavior is especially apparent in an online retailing context, where many shoppers place items in their virtual shopping carts yet do not complete the purchase—thereby abandoning their cart. Known as virtual or online shopping cart abandonment, we define this behavior as *consumers' placement of item(s) in their online shopping cart without making a purchase of any item(s) during that online shopping session*.

Industry studies report that 88% of online shoppers have abandoned their electronic cart in the past (Forrester Research 2005). As an ongoing “non-buyer” behavior, online shoppers abandon their carts approximately a quarter of the time. Specifically, Andersen Consulting and Forrester Research each show abandonment rates of 25%, and Jupiter Communications triangulates this finding by documenting a shopping cart abandonment rate of 27% (Tarasofsky 2008). To understand why such frequent abandonment occurs, it is vital to investigate consumers' perceptions of virtual carts and their intentions to complete the purchase online or at a land-based store.

To some extent, consideration of online shopping carts has relied on mirroring traditional carts, which may constrain strategic thinking about e-commerce and multi-channel marketing (Rayport and Sviokla 1995). For instance, mirroring offline channel functionality to an online store may result in overlooking features that could be beneficial online, or implementing features not suited for e-commerce (Weinberg et al. 2007). The current inquiry challenges the notion that virtual carts and the way consumers use them are analogous to using a shopping cart or basket. While such in-store carts are utilitarian (i.e., they store items en route to the cashier), virtual carts may have other, hedonic uses. Hence, it is important to study how and why consumers abandon their shopping carts in an online context. Identifying driving

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forces behind virtual cart use and the inhibitors to making an online purchase will help online retailers better understand their shoppers' product interests and create more consumer-friendly sites.

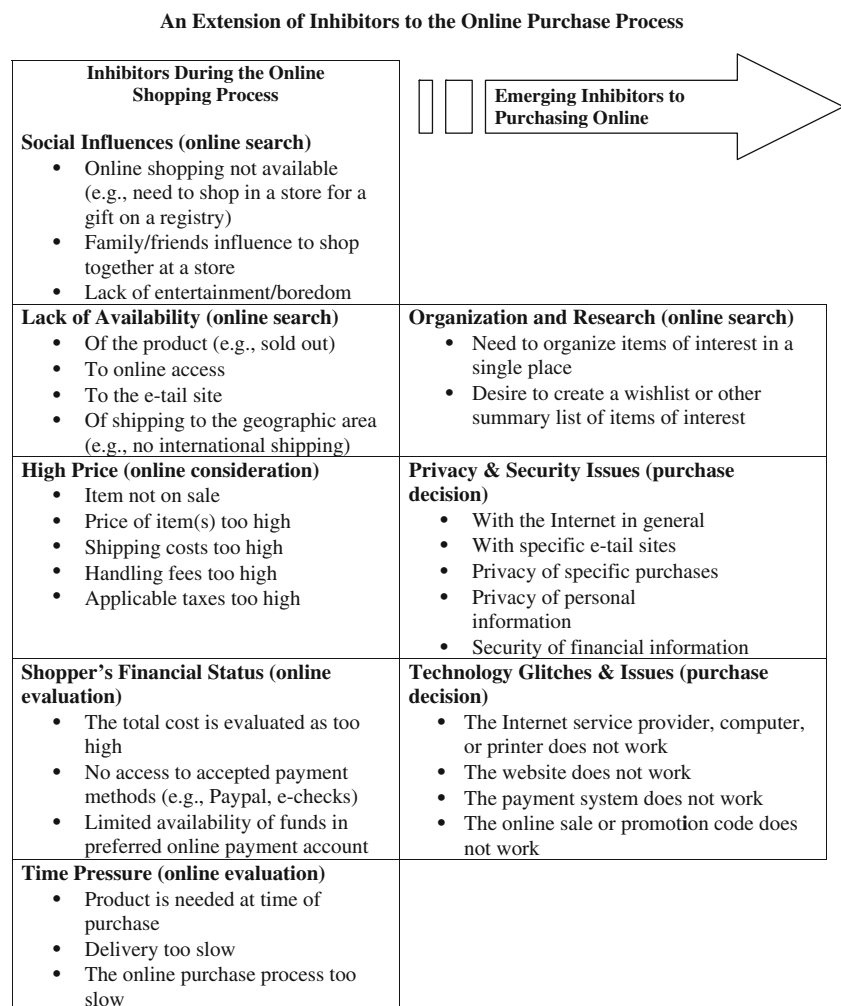
Despite widespread online cart abandonment and popular press touting the behavior, scholars have yet to examine what determines this consumer behavior. Hence, the purpose of the present research is to fill this gap in the literature. Because it is a new topic of scholastic inquiry, we provide a broad examination across product categories. The key theoretical contribution is the development of a framework to identify drivers of electronic cart abandonment and explain why it occurs. We also determine how certain drivers of online cart abandonment help explain an online shoppers' decision to make the purchase at a traditional, land-based retailer. Consequently, the research offers implications for online retailers with respect to increasing conversion rates from online shopping to buying as well as for multi-channel management.

Theoretical background: buyer and non-buyer behavior

Purchase inhibitors

To investigate why consumers abandon their online carts, we first identify key inhibitors at each stage of the purchasing process. While preparing to buy online, consumers encounter a range of inhibitors which may trigger them to abort the process and abandon their cart. Traditionally, inhibitory situations to purchasing include: social influences, lack of availability, high price, financial status, and time pressure (Howard and Sheth 1969). Here, we extend these inhibitors to the online context (Fig. 1, column 1). For example, the high price inhibitor may account for consumers' decision to wait for a lower price and thus leads them to abandon their cart. The financial status inhibitor should be related with a shopper's concern about total costs. We further suggest emerging inhibitors to purchasing online (Fig. 1, column 2). These include organization and research, privacy and security issues, and technology

Figure 1 An extension of inhibitors to the online purchase process.



glitches. In the e-tail era, such new inhibitory situations, not identified in the original Theory of Buyer Behavior, may help to explain online cart abandonment.

Consumer online shopping process

We apply the Howard and Sheth (1969) Theory of Buyer Behavior to online buyer or non-buyer behavior. Similar to bricks-and-mortar shopping, online shoppers form a need or want, they search, consider alternatives, evaluate them, and decide whether or not to buy the item(s) in the cart. After determining a need or want, an online shopper browses through web pages in the online search stage. While some online shoppers search with a motive to buy at that session, for others, the search is part of a purposeful ongoing search (Bloch et al. 1986). To maximize information collection efficiency, and to narrow down information overload, online shoppers may use virtual carts to organize their consideration set. Online shoppers also search and shop online for freedom, control or fun (Wolfenbarger and Gilly 2001).

In the online shopping context, consideration occurs as a shopper places an item(s) of interest into their cart. Some shoppers may place items under consideration in their cart as a wish list, a way to bookmark the product, for entertainment, or to obtain total cost. Hence, shoppers may use their cart to help taper options to a consideration set to be evaluated further. Then, online evaluation occurs when the online shoppers review the cart contents and analyze the items in the evoked set based on their past experience and unique purchase criteria (Nedungadi 1990). Shoppers compare and contrast their choice criteria, focusing on those attributes that are salient in their motives (Howard and Sheth 1969), such as the total cost associated with buying the cart contents. Based on evaluation of the item(s) in the cart, the consumers decide whether or not to proceed to checkout and purchase these items. Ultimately, when consumers begin to enter their personal or financial information online, they demonstrate a commitment to the purchase.

The process described above is not necessarily sequential. Online shoppers may go through stages out of sequence for various reasons (Li and Chatterjee 2006). For instance, consumers may not need product information, and thus skip to purchasing. Shoppers may also change their mind and revert to information search, or abort an intended transaction at any point. Finally, the aborted purchase may be completed in a bricks-and-mortar store, also explored here.

Hypotheses development

As online shoppers move through the purchase process, various factors are likely to impact the extent to which cart

abandonment occurs. Some factors may be explained as inhibitors based on Howard and Sheth (1969), while others are identified as relevant to the online context. Eleven hypotheses positing relationships among these factors as they relate to both virtual cart abandonment and the decision to buy from a land-based store are proposed and depicted in Fig. 2.

Online search: the entertainment value

Consumers may shop online with experiential (e.g., entertainment-seeking) motives as well as goal-oriented (e.g., organizing potential purchases) motives (Novak et al. 2003; Wolfenbarger and Gilly 2001). Experiential motives include searching and shopping for fun and to alleviate boredom (Moe 2003; Wolfenbarger and Gilly 2001) or as a medium for entertainment or escapism (Mathwick et al. 2001). Thus, entertainment-seeking shoppers may place items in a cart for hedonic reasons. Such “experiential shoppers” (Novak et al. 2003; Wolfenbarger and Gilly 2001) view shopping as a fun and experiential activity more so than a means to obtain a product or service (Bellenger and Korgaonkar 1980; Holbrook and Hirschman 1982). Therefore, we define the entertainment use of cart as *the extent to which consumers place items in their online shopping cart for purposes such as to entertain themselves and to alleviate boredom*. Further, we propose that virtual cart abandonment is more likely to occur, the more the shoppers use their cart for entertainment.

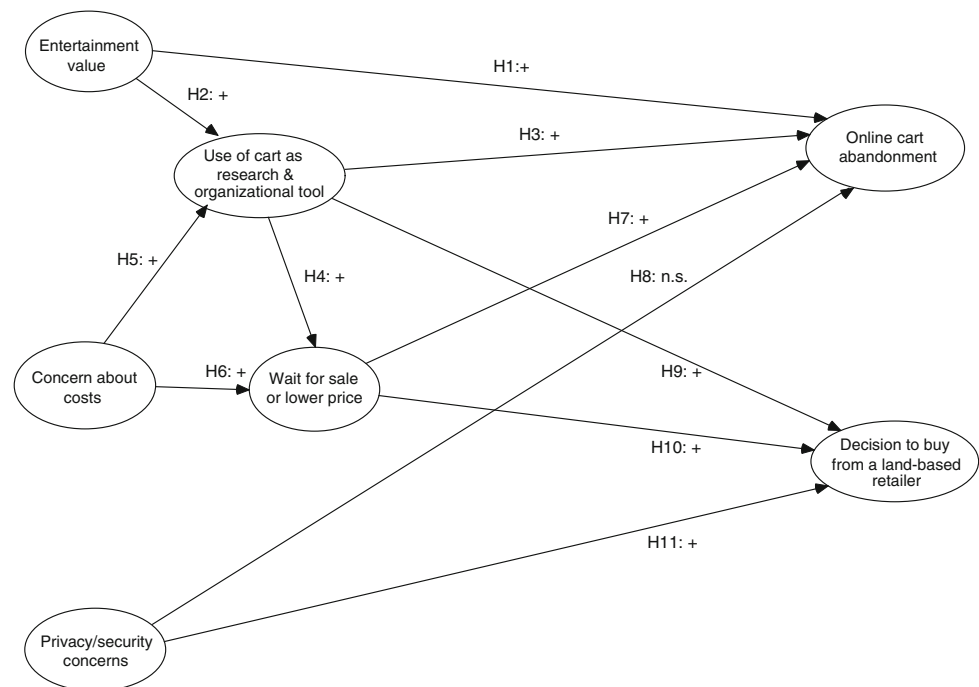
H₁: The more that consumers use their online cart for entertainment (out of boredom or for fun), the more likely they are to abandon it.

While the online cart can be used for entertainment purposes, cart use can also help an online shopper research and organize items of interest as a part of a purposeful search. In the course of purposeful (goal-oriented) ongoing search (Bloch et al. 1986), consumers may use the cart to organize items of interest to narrow down their selections prior to gathering additional information. In a Forrester Research survey, 41% of participants placed items in the online cart for such research purposes (Magill 2005). Virtual carts also allow consumers to easily return to the item after considering other items in their evoked set. We thus define the shopper’s use of online carts for such reasons as *organizational and research cart use*.

A relationship may exist between consumers’ research use and entertainment use of virtual carts. Securing an item in their cart and organizing a consideration set in their virtual space may provide some consumers with a sense of control. Wolfenbarger and Gilly (2001) show that online shopping can increase feelings of control and freedom. Online shoppers who experience more feelings of control in

Figure 2 Determinants of consumer electronic shopping cart abandonment: conceptual model. Note: The direction of the significant effect is shown for each relationship; n.s. = not significant.

Determinants of Consumer Electronic Shopping Cart Abandonment: Conceptual Model



Note: The direction of the significant effect is shown for each relationship; n.s. = not significant.

the online environment are active participants, not merely passive recipients of marketing and commerce (Wolfenbarger and Gilly 2001). Moreover, selecting items and virtually organizing them is a higher involvement entertainment activity as compared with merely browsing webpages, as it requires shoppers to engage in deeper consideration of selected products beyond simply searching through the websites. Therefore, we propose that the more likely consumers are to seek entertainment from their virtual cart, the more likely they will be to use the cart as a shopping research or organizational tool. Specifically,

H₂: The more that consumers seek entertainment from online cart use, the more likely they are to use the cart for shopping research and organizational purposes (such as information gathering, securing items of interest, narrowing the consideration set).

Online consideration: virtual cart as a shopping research and organizational tool and waiting for a lower price of the items in the cart

The contents of an online cart allow consumers to consider prices of items in their organized consideration set. When shoppers use their virtual cart as a research and organizational tool during the consideration stage, some are not in immediate need to purchase the item(s) from that site at that given time, and are consequently more price sensitive

(Tellis 1986). As such, these shoppers should be more willing to wait for a sale or lower price of the item(s) in their cart. Specifically, we propose that the more that consumers use their cart as a shopping research and organizational tool, the more likely it is that they will consider the price of the item(s) in the cart and whether a lower price can be obtained at a different time or through a different channel. Hence, abandonment will more likely occur, the more the shoppers use the cart as a shopping research and organizational tool (H₃). Furthermore, the more likely that consumers are to use the cart for research and organization, the more likely they should be to wait for a sale or lower price (H₄).

H₃: The more that consumers use the online cart as a shopping research and organizational tool, the more likely they are to abandon it.

H₄: The more that consumers use the online cart as a shopping research and organizational tool, the more likely they are to wait for a sale or lower price.

Online evaluation: concern about total costs

While the previous hypothesis (H₄) considers the individual price of items in the cart, online shoppers may be especially sensitive to the aggregate total of all items in the cart, which also includes shipping and handling costs, tax (if applica-

ble), and other fees that raise the overall cost. Many Internet users expect online retailers to offer lower prices on products; yet, the overall cost of the final order may discourage or inhibit shoppers from purchasing (Li and Chatterjee 2006; Magill 2005; Xia and Monroe 2004). As shipping and handling fees often appear at the end of the online transaction, seeing the total cost, consumers may decide to restrict the use of their shopping cart to a research and organizational purpose (H_5), rather than buying the item(s) in the cart immediately. Thus,

H_5 : The more that online shoppers are concerned about the total cost of the order (cost of goods in cart, shipping charges, sales taxes, other fees), the more likely they are to use the online cart for shopping research and organizational purposes.

Consumers' concerns with the total cost of the order may lead to the online shopper's decision to wait until a lower price can be found on at least some item(s) in the cart, whether it be at the same or a different store, through the same or a different channel (H_6). When any of the items exceed their reference price, the consumer may likely anticipate that a lower price is either currently available elsewhere or should become available soon. In an online context, substantial price dispersion and frequent price changes indicate a high likelihood that a lower price may be found at a different store or at a different point in time (Nelson et al. 2007). Therefore, we propose that the greater the consumers' intention to wait for a lower price, the greater their likelihood of abandoning the cart at that session (H_7). Specifically,

H_6 : The more that online shoppers are concerned about the total cost of the order, the more likely they are to wait for a sale or lower price.

H_7 : The more that online shoppers tend to wait for a sale or lower price, the more likely they are to abandon their online cart.

Purchase decision: privacy, security, and decision to buy from a land-based store

Privacy and security of personal and financial information are key concerns of online shoppers (Miyazaki and Fernandez 2001; Zhou et al. 2007) and a reason why some consumers avoid the Web (Laroche et al. 2005; Xie et al. 2006). When websites do not meet consumers' privacy and security expectations, this concern may become especially prevalent during the checkout process, which requires consumers to enter personal and financial information, and may in turn influence consumers to abort purchasing the items in the cart. Therefore, we propose that the extent

of consumers' online privacy and security concerns is positively related with the frequency with which they abandon online shopping carts.

H_8 : The more that online shoppers are concerned about their online privacy and security, the more likely they are to abandon their online cart.

Furthermore, such privacy and security concerns, in addition to immediate gratification seeking and desire to reduce the overall costs may drive some online cart users to decide to purchase their cart item(s) at a land-based store at any point during the purchase process. Some shoppers may search for products and organize the items of interest in an online cart, but decide to actually buy them at a land-based retail outlet (H_9). Such in-store purchases allow consumers an up-close physical examination and an instant acquisition of products. Alternatively, upon consideration of the online price of the product, consumers may decide to buy it from a bricks-and-mortar store (H_{10}), possibly for a lower price or at least a lower overall cost (i.e., avoiding any shipping and handling fees). Lastly, because online shoppers may consider buying at a bricks-and-mortar store as more secure than buying online, we predict that online shoppers who experience higher privacy and security concerns associated with buying online will be more likely to complete the purchase offline (H_{11}). Stated formally, we predict:

H_9 : The more that online shoppers use their cart as a shopping research and organizational tool, the more likely they are to decide to buy the cart contents from a land-based store.

H_{10} : The more that online shoppers intend to wait for a sale or lower price, the more likely they are to decide to buy the cart contents at a land-based store.

H_{11} : The more that online shoppers are concerned about their online privacy and security, the more likely they are to decide to buy the cart contents at a land-based store.

Empirical research

Method and sample characteristics

In order to test the proposed hypotheses, we conducted an online survey. The survey contained questions about various factors hypothesized to be linked to shopping cart abandonment, measures of the frequency of online cart abandonment, frequency of buying items in the cart from a land-based store, general questions about consumer online behaviors and demographic characteristics.

First, we conducted two preliminary studies. The first preliminary study involved a data collection from student online shoppers ($n=183$) at a private east coast university. Building on this, the second preliminary study employed a mixed—student and adult—sample of online shoppers in a metropolitan west coast city ($n=247$). Over the course of these two studies, the construct measures were refined. Both regional pilot studies were used to inform the main data collection ($n=255$), which employs the refined measures and a more representative, national consumer sample of adult online shoppers, and is thus the study of focus here.

For this main study, we recruited a sample from an online national consumer panel from Zoomerang which mirrors the characteristics of the U.S. online population. The sampling frame was specified to be adults (non full-time students) who shop online. The obtained national sample consists of 255 respondents from 44 states. Just over half (53%) are males. There is a relatively dispersed age breakdown; 30% of the sample is older than 40, 28% is 31 to 40 years old, 29% is 21–30 years, and 6% is 20 or younger.

A majority (93%) of respondents reports visiting online stores at least once a month. Almost one-third (29%) shop more frequently—once a week or more. Once visiting an online store, participants report purchasing from it on average 40% of the time (consistent with the 37% purchase in both pilot tests). The sample reports abandoning their online shopping carts 26% of the time, consistent with reports from Andersen Consulting and Forrester Research (25%) as well as Jupiter Communications (27%) (Tarasofsky 2008), and slightly lower than Oliver and Shor's (2003) 32%.

Measures

We adapted some measures for independent variables from the literature. Specifically, we based the entertainment measure on the research by Wolfenbarger and Gilly (2001) and the privacy and security measure on Miyazaki and Fernandez (2001). Due to the emerging nature of the topic, we developed other independent variable measures of using the cart as a research and organizational tool and tendency to wait for a lower price or sale. Using the two preliminary studies, we also generated the key outcome measures of online cart abandonment and decision to buy from a land-based store.

To determine the measurement properties of the scales, a confirmatory factor model including all theoretical constructs was assessed by maximum likelihood estimation in AMOS. The standardized item loadings ranged from .70 to .99 and therefore displayed sufficient item validity and reliability. The constructs exhibited sufficient reliabilities

ranging from .79 to .95. The inter-construct correlations were significantly lower than one, satisfying the test of discriminant validity. The construct and item reliabilities are reported in Table 1, and the inter-construct correlations are in Table 2.

Findings

Evaluation of the structural model

To test the conceptual model, we employed latent variable structural equation modeling (LVSEM) with maximum likelihood estimation in AMOS (see Fig. 2 for the hypothesized conceptual model and Table 3 for the results). LVSEM was chosen because it helps control for measurement error, can improve ways to measure reliability and validity, and can help evaluate more complex inter-relationships simultaneously (MacKenzie 2001). All goodness-of-fit indices ($\chi^2(140) = 374, p < .05$; incremental fit index [IFI] = .94, Tucker-Lewis index [TLI] = .92, confirmatory fit index [CFI] = .94, root mean square error of approximation [RMSEA] = .08) indicate that the model fits the data well. Summary results for the tested model and the standardized structural path parameter estimates are presented in Table 3 and are discussed next.

Hypotheses results

Given that the direction of the hypothesized relationships was predicted in advance, one-sided t-tests are used to test the hypotheses. In preliminary study 1, each hypothesis is supported; H₁, H₂, H₃, H₄, H₆, & H₇ are supported at $p < .01$; H₈ (–) is supported at $p < .05$. Also, in preliminary study 2, each hypothesis is supported; H₂, H₃, & H₆ at $p < .01$; and H₁, H₄, H₇, & H₈ (–) at $p < .05$. In the two pilot studies, H₅, H₉, H₁₀, H₁₁ are not applicable as they were introduced in the main study, of focus here.

For the main study, ten of the eleven hypotheses are supported. Specifically, the findings show that the more the respondents place items in the cart for entertainment purposes, the greater is their extent of online cart abandonment (H1: $\beta = .19, t = 2.65, p < .01$). In addition, the greater the use of the cart for entertainment purposes, the more likely the respondents also use the cart for research and organizational purposes (H2: $\beta = .45, t = 7.32, p < .01$). Thus, H1 and H2 are both supported. Findings also provide support for the prediction that the greater the consumer's extent of using the online cart for organizational purposes, the more likely the consumer will abandon the shopping cart (H3: $\beta = .32, t = 3.74, p < .01$). Further, we proposed that the use of the online cart as a shopping research and organizational tool enhances the

Table 1 Measures

Construct items and scale reliability	Item reliability
Online cart abandonment; $\alpha = .85^b$	
How often do you leave items in your online shopping cart without buying them?	.88
How often do you place an item in the online shopping cart, but do not buy it during the same Internet session?	.79
How often do you close the webpage, or log off the Internet before you buy the item(s) in your online shopping cart?	.70
How often do you abandon your online shopping cart?	.71
Decision to buy from a land-based store^b	
I decide that I would rather purchase the same item from a land-based store (as opposed to online)	N/A
Entertainment value; $\alpha = .95^b$	
I select and place items in the shopping cart for fun.	.99
I select and place items in the shopping cart when I am bored.	.91
Using the cart as a research and organizational tool; $\alpha = .90^b$	
I place items in the shopping cart so I can more easily evaluate a narrowed-down set of options.	.76
I use the shopping cart as a form of information gathering.	.95
I use the shopping cart as a shopping research tool.	.92
Wait for a lower/sale price; $\alpha = .91^b$	
I decide to wait for the item to come on sale before buying it.	.83
I decide that I may be able to find better sales at another online store.	.92
I decide that I may be able to find better sales at a land-based store.	.89
Concern about the costs of the order; $\alpha = .91^b$	
I decide not to buy when I see the shipping charges for my order.	.86
I decide not to buy when I see the amount of sales tax added.	.87
I decide not to buy when I see the total amount at the checkout.	.90
Privacy/security concerns; $\alpha = .79^a$	
I am concerned that someone will steal my identity.	.71
I am concerned that the retailer will share my information with third parties.	.85
Internet privacy is important to me.	.72

^a These items were measured on a scale 1=strongly disagree, 7=strongly agree.

^b These items were measured on a scale 1=never, 7=always.

Table 2 Construct inter-correlations

	Online cart abandonment	Buying from land store	Entertainment value	Research and org. tool	Wait for sale	Concern about costs	Privacy/ security concerns
Online cart abandonment	1						
Buying from land store	.30**	1					
Entertainment value	.43**	.29**	1				
Research and org. tool	.53**	.45**	.55**	1			
Wait for sale	.41**	.71**	.36**	.52**	1		
Concern about costs	.45**	.64**	.28**	.50**	.75**	1	
Privacy/security concerns	-.01	.28**	-.12	.08	.26**	.26**	1

* $p < .05$; ** $p < .01$.

Table 3 Testing the proposed model relationships

Hypothesis sign	Structural path	Stand. estimate	t-value	Hypothesis outcomes ^{1,2}
H ₁ :+	Entertainment value → Cart abandonment	.19**	2.65	✓
H ₂ :+	Entertainment value → Research and org. tool	.45**	7.32	✓
H ₃ :+	Use of cart as research and org. tool → Cart abandonment	.32**	3.74	✓
H ₄ :+	Research and org. tool → Wait for sale	.16**	3.02	✓
H ₅ :+	Concern about costs → Research and org. tool	.38**	6.44	✓
H ₆ :+	Concern about costs → Wait for sale	.75**	12.19	✓
H ₇ :+	Wait for sale → Cart abandonment	.22**	2.91	✓
H ₈ :+	Privacy/security concerns → Cart abandonment	-.11	-1.36	-
H ₉ :+	Research and org. tool → Decision to buy from a land store	.09*	1.70	✓
H ₁₀ :+	Wait for sale → Decision to buy from a land store	.66**	10.50	✓
H ₁₁ :+	Privacy/security concerns → Decision to buy from a land store	.13**	2.53	✓
Goodness-of-Fit Statistics				
	Chi-square (d.f.)	374	(104)	
	IFI	.94		
	TLI	.92		
	CFI	.94		
	RMSEA	.08		

¹ In pilot study 1 (N=183), H₁, H₂, H₃, H₄, H₆, & H₇ were also supported at $p < .01$; H₈ (-) was supported at $p < .05$.

² In pilot study 2 (N=247), H₂, H₃, & H₆, were supported at $p < .01$; H₁, H₄, H₇, & H₈ (-) was supported at $p < .05$.

H₅, H₉, H₁₀, H₁₁ were not tested in pilot studies as they were introduced in the main study, reported above.

* $p < .05$, ** $p < .01$.

likelihood that the online shopper will wait for a sale or a lower price before purchasing the item(s) in the cart (H₄). This hypothesis is likewise supported (H₄: $\beta = .16$, $t = 3.02$, $p < .01$).

We further predicted that the greater the concern about total cost of the order, the more likely consumers would restrict the online cart use to the role of an organizational and research tool (H₅). The data provide support for this hypothesis (H₅: $\beta = .38$, $t = 6.44$, $p < .01$). Furthermore, the greater the consumers' concern about the overall cost, the greater their likelihood to wait for a lower or sale price (H₆: $\beta = .75$, $t = 12.19$, $p < .01$). In turn, the more likely the shoppers are to wait for a lower or sale price, the greater is their likelihood of shopping cart abandonment (H₇: $\beta = .22$, $t = 2.91$, $p < .01$). Therefore, both hypotheses H₆ and H₇ are supported. The next hypothesis predicted that the extent to which online shoppers are concerned about the

online privacy and security should directly impact the rate with which they abandon their online shopping carts (H₈). However, this hypothesis is not supported (H₈: $\beta = -.11$, -1.36 , $p > .10$).

The final set of findings (H₉–H₁₁) indicates that, beyond their influence on consumers' online cart abandonment, some of these factors also directly influence an online shopper's intention to buy from a traditional, land-based retailer. Specifically, the findings show that consumers shop online and place items in their cart as a part of their search and consideration set organization, but instead leave the chosen products behind in their online cart and decide to purchase them at a land-based store. Specifically, use of the online cart as such an organizational tool was found to positively impact an online shopper's decision to buy from a traditional, bricks-and-mortars retailer (H₉: $\beta = .09$, $t = 1.70$, $p < .05$). Moreover, the more likely the shopper is to

Table 4 Total standardized effects

Total standardized effects	Entertainment value	Research and org. tool	Concern about costs	Wait for sale	Privacy/ security concerns
On online shopping cart abandonment	.35	.35	.30	.22	-.09
On decision to buy from a land store	.09	.20	.57	.66	.13

wait for a lower or sale price, the more likely he or she is to choose to buy from a land-based retailer (H_{10} : $\beta = .66$, $t = 10.50$, $p < .01$). Finally, privacy and security concerns positively impact intention to buy from a land-based retailer (H_{11} : $\beta = .13$, $t = 2.53$, $p < .01$). Therefore, all hypotheses regarding an online shopper's decision to buy from a land-based store ($H_9 - H_{11}$) are supported.

In sum, all but one of the hypotheses received support. The exception was the prediction that online privacy and security concerns would be associated with greater extent of online cart abandonment (H_8), as we found no significant effect of privacy and security concerns on cart abandonment in the main study. While this hypothesis was supported in both pilot studies, it may be that advancements in security measures and legal enforcements of privacy laws over the two years elapsed from the pilot studies to the national online study reduced consumer concerns about security, privacy, and shopping online. At the time of the national online main study, many e-tail sites provided advanced security measures, such as encrypted data transmission, and displayed security seals to reassure customers. Moreover, consumers likely place items in the cart predominantly at online retailers whom they trust or are familiar with. Hence, even though their overall level of online privacy and security concerns may impact the extent to which they use the shopping cart to begin with, it does not influence their decision to abandon their cart after having already used it to store the items of interest.

Additional analyses: mediation analysis, total effects tests, and interactions

In addition to testing the proposed hypotheses, we also conducted mediation analysis (Baron and Kenny 1986). Mediation analysis showed that the constructs of using the cart as a research and organizational tool and waiting for a lower price partially mediate the effect of entertainment value on shopping cart abandonment. Further, mediation analysis shows that the effect of concerns about costs on shopping cart abandonment is mediated through use of cart for organizational purpose and through waiting for lower price.

In addition, we determined the most important influencers of cart abandonment by calculating total effects of all variables on online cart abandonment. The three most important factors driving cart abandonment are (see Table 4): using the cart as a shopping research and organizational tool (total standardized effect of .35), entertainment value (.35 as well), and concern about overall costs (.30). These findings support the notion that online shoppers use the cart in their search and consideration stages, but do not necessarily complete the purchase process online. Similarly, the most important drivers of

the decision to buy an item from a land-based store are: waiting for a lower or sale price (total standardized effect of .66), concern about overall costs (.57), and using the cart as a research and organizational tool (.20). Interestingly, the first two drivers to buy from a land-based store are related with item price or the total cost.

We also conducted a post-hoc investigation of possible interaction effects between some of the predictor variables. Specifically, we ran an ANOVA analysis with cart abandonment as the dependent variable, and organizational tool and waiting for a lower price as factors. Both were dichotomized using the median split first. While both factors have significant main positive effects on abandonment as predicted, there is also a significant interaction between using the cart as an organizational tool and waiting for lower price ($F(1,251)=4.50$, $p < .05$). Specifically, when the consumer's motivation to use the cart as an organizational and research tool is high, an intention to wait for a lower price does not have any effect on the consumer's shopping cart abandonment. However, when the organizational use of cart is low, an increased intent to wait for a lower price leads to greater cart abandonment. A possible explanation is that the shoppers who use their cart for research are not as concerned with waiting for a sale in their search and consideration stages. These online shoppers perceive the cart more as a tool to compile information for a later purchase, rather than to store items for an immediate purchase.

Discussion

The present research offers both important theoretical contributions and valuable managerial implications for online-based retailing and multi-channel management.

Theoretical contributions

By explicating and testing a theoretical model of the determinants of online shopping cart abandonment, we work towards an explanation of "non-buyer behavior" in an online shopping context. Using the buyer behavior framework, the findings extend knowledge by identifying consumers' tendencies to place items in the cart for reasons other than immediate purchase, specifically for research and organization and for the entertainment value, as emerging inhibitors to the online purchase decision. As a second area extending the foundation set by Howard and Sheth (1969), we identify inhibitors that the online environment brings to the buying process, extending the framework to include issues such as online privacy and security. Finally, we determine how these inhibitors determine consumers' intent to buy an item from a land store.

Managerial implications for online retailers

Organizational use of cart Conventional wisdom suggests that electronic cart abandonment is a “bad thing” because it lowers shopping transaction conversion rates or may imply a non-consumer friendly site (Hoffman and Novak 2005). Scholars have also used it as a measure of consumer dissatisfaction (Oliver and Shor 2003), making an assumption that the abandoned items represent a lost sale. However, our findings reveal that consumers often leave items in their cart for reasons other than dissatisfaction with the product, the online retailer or the purchase process. We find that online shoppers are accustomed to using their cart as an organized place to hold or store their desired items, a wish list, and as a tool to track prices for a possible later purchase. Online cart abandonment does not necessarily mean that the consumer will never make the purchase; rather, consumers may decide to delay their purchases or purchase decisions (Moe 2003). Thus, even abandoned carts serve as a source of useful information for both consumers and retailers. For example, placing an item in an online cart for shopping research helps document online shoppers’ interests, desires, or purchase intent in an organized way. The specific items in the abandoned carts also provide online retailers with information about their customers’ consideration sets, which they may in turn use to help target the online shoppers with alternative or complementary products.

Entertainment value We find that even without purchasing, merely placing items in a cart is a form of entertainment or boredom release for online shoppers. These shoppers may get the thrill of enacting shopping rituals and satisfying impulses to shop without necessarily buying and spending money. Online retailers should be aware that while their efforts to make their sites interactive and entertaining may increase the likelihood of consumers placing items in the cart, they will not automatically lead to an increase in buying behavior. In fact, using the cart for entertainment is positively related with shopping cart abandonment¹ and negatively with overall frequency of buying online². However, given the derived entertainment value, the consumers who use their cart for fun or to alleviate boredom may still spread positive word of mouth about the online retailer and their experience at its website, even if they choose not to purchase.

Concern about price and overall cost Two other important drivers of cart abandonment are concerns about the total cost of the order and the shopper’s intention to wait for a lower price. These findings further highlight that items left in the cart may not necessarily represent a lost sale, but rather an

opportunity to make the sale in the future by sending a promotional offer to the consumer, providing lower or free shipping on the item(s), or sending a reminder email about the items when the price has been lowered. To better compete with other online retailers, an online store may also decide to offer a flat shipping rate, rather than a variable rate (based on the amount purchased). The flat rate may encourage consumers to buy more without the fear of having to pay excessive shipping fees. Rewards such as discounts or coupons (Xie et al. 2006) may also encourage consumers who are likely to wait or search for a lower price to complete the purchase.

Managerial implications for multi-channel retailing

Intention to wait for a lower price Consumers’ intention to wait for a lower price and its impact on the decision to buy from a land-based store represents both a threat and an opportunity to multi-channel retailers. The threat is that consumers may choose to buy from a different site or land store, who may offer a lower price. To keep their customers from defecting to other retailers, multi-channel retailers should keep the customers informed about any price changes and sales taking place both on- and offline, either through e-mail communications or direct mail pieces. Additional incentives, such as additional discounts for using the retailer’s loyalty card, could also be successful at reducing prices and stimulating purchases through either channel.

Concern about overall costs To take advantage of the relationship between overall cost concerns and consumers’ intention to buy from a bricks-and-mortar store, multi-channel retailers should offer customers options such as buying online but being able to pick up the purchase from the land-based store location. This would allow the consumers to avoid the cost of shipping and handling fees, while permitting them to achieve the same low product prices offered online. Similarly, returns of items at bricks-and-mortar store locations should be accepted to alleviate consumers’ concerns about having to pay return shipping fees.

Organizational use of cart We find that many consumers use their online cart as a tool to help gather information prior to visiting a traditional, land-based store. Thus, consumers have different channel preferences with regards to searching versus buying. Multi-channel retailers should keep in mind that bricks-and-mortar store purchases may in fact be a result of consumers’ online organizational cart use. Hence, they should strive to provide detailed product information online and also alert consumers to the possibility of buying the items of interest offline.

¹ $\rho = .43, p < .01$

² $\rho = -.13, < .05$

Limitations and directions for future research

While the present research offers important contributions to both theory and practice, we recognize some limitations. First, we employed a sample from a diverse population based on online shoppers in the United States. We encourage other scholars to further test the model in a multinational context to determine how to satisfy online shoppers across the world. Since consumers from different countries have varying levels of perceived risk, an interesting follow-up cross-cultural study could examine what role perceived risk plays in cart abandonment and eventual in-store purchases of the abandoned items across different countries.

Second, the findings are based on self-reported survey data. Although the percentage of cart abandonment we obtained is consistent with prior research (industry studies by Andersen Consulting, Forrester Research, and Jupiter Communications; Oliver and Shor 2003; Tarasofsky 2008), other methods, such as click-stream modeling, experiments, and depth interviews could provide a complementary picture of this phenomenon.

Intriguing areas of future research also include studying the process of using the cart as an organization tool in greater depth and investigating different motivations for consumer shopping cart use. A study in which participants indicate cart abandonment for specific types of products or services would also be valuable. We hope that the present research stimulates more work on this relatively common, yet under-studied consumer non-buyer behavior.

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