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## Determining the cross-channel effects of informational web sites

Teerling, Marije Leonie

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## **2 The Effects of an Informational Web Site on Customer Attitudes and Behavior<sup>3</sup>**

*This study aims to determine the effects of using an informational Web site on offline attitudes and behavior. We are especially interested in how attitudes toward the informational Web site contribute to offline attitudes and behavior. Using structural equation modeling, we test a model that determines the relationships between attitudes toward two channels—the store and the Web site—and actual behavior in those channels. The results provide evidence of synergy effects between the store and the Web site in terms of attitudes, as well as negative effects of site attitude on offline behavior.*

### 2.1 INTRODUCTION

In the context of multichannel environments, the recent evidence of cross-channel effects should come as no surprise. Peterson et al. (1997) were among the first to recognize that the marketing implications of the Internet involve integrated marketing activities. In this sense, integration implies that companies do not develop a specific e-commerce strategy; rather, their use of the Internet becomes part of their overall marketing strategy, which covers multiple informational and transactional channels.

Recent research provides several insights into the multichannel environment from organizational (e.g., Biyalogorsky & Naik 2003) and consumer (e.g., Montoya-Weiss et al. 2003) points of view. Most studies investigating multichannel environments from a consumer point of view find positive attitudinal effects, such as improved customer satisfaction (Shankar, Smith, & Rangaswamy 2003). However, more recent work reports negative effects (e.g., Ansari et al. 2006; Gensler et al. 2007). Gensler et al. (2007) indicate, for example, that given a multichannel environment, the number of nonloyal customers who opt to use none of the firm's channels increases over time.

In response to these contradictory results, the call for generalizable insights into multichannel behavior has rung out (Rangaswamy & Van

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<sup>3</sup> This chapter is based on Teerling, Marije L. and Eelko K.R.E. Huizingh (2003), How about Synergy: The Impact of Online Activities on Store Satisfaction and Loyalty, Working Paper 04F08, SOM, Groningen.

Bruggen 2005). Such generalizability cannot be reached by focusing solely on transactional channels; to understand customer multichannel behavior fully, research also needs to include customer behavior in informational channels, that is, channels that do not allow the customer to buy anything. This realization is emphasized in studies that indicate the difficulties of obtaining such unique but necessary data (Montoya-Weiss et al. 2003; Sullivan & Thomas 2004; Van Baal & Dach 2005). Therefore, this study focuses on the relationships between an informational Web site and an offline store by investigating:

- How site attitudes and behavior influence store attitudes and behavior,
- How these relationships hold up given a longitudinal design, and
- Whether and how these relationships may be moderated.

The key concepts we study are site attitude, store attitude, site behavior (i.e., site visits), and store behavior (i.e., store purchases). Specifically, we investigate how site attitudes influence store attitudes and behavior and how site behavior influences store behavior. We formulate hypotheses about the relationships among these concepts and test them empirically using data from 2,877 customers. For 422 customers, we investigate the relationships given a longitudinal design. Lastly, we perform median splits to determine whether the relationships are moderated by sociodemographics, for example.

This chapter is structured as follows: First, we present our framework and the background for the hypotheses. Second, we discuss methodology, including the data available to test our framework, our measure development, and aspects such as unidimensionality, validity, and reliability. Third, the subsequent section presents the findings. Fourth, we end this chapter with a discussion of the main findings and conclusions.

## 2.2 LITERATURE REVIEW

### 2.2.1 *Multichannel Setting*

The number of studies investigating multiple channels has increased substantially. Some studies focus on the performance of multiple channels from an organizational point of view, and several of these provide frameworks and guidelines for organizations that want to integrate their offline and online activities (e.g., Gulati & Garino 2000;

Otto & Chung 2000; Bahn & Fischer 2003). Geyskens, Gielens, and Dekimpe (2002), for example, demonstrate the benefits of an informational Web site on the overall financial performance of an organization, as measured by stock prices.

Other studies focus on different aspects of consumer behavior in the various channels. For instance, Danaher, Wilson, and Davis (2003) compare loyalty in online and offline environments and show that Internet usage benefits brands with a strong offline presence. Andrews and Currim (2004) investigate the behavioral differences between consumers attracted to online versus offline shopping. Still other researchers consider the reasons consumers prefer and use one channel over another and how this preference influences an overall relationship with the organization (Montoya-Weiss et al. 2003).

On the basis of how consumers use them, channels can be classified as transactional or informational. Consumers use informational channels to search for and retrieve information related to products, brands, and/or services, whereas transactional channels offer them the opportunity to purchase items in addition to information. Similarly, we can group current research into studies that consider (1) the effect of an additional transactional channel on customer behavior and (2) the effect of an additional informational channel on customer behavior. Table 2-1 gives an overview of multichannel studies, based on this classification.

TABLE 2-1 CLASSIFICATION OF CUSTOMER BEHAVIOR STUDIES RELATED TO MULTICHANNEL BEHAVIOR

	Channel Addition	
	<i>Transactional Channel</i>	<i>Informational Channel</i>
<b>Current transactional channel (store, Internet, catalog)</b>	Ansari et al. 2006	
	Bendoly et al. 2005	
	Biyalogorsky & Naik 2003	
	Dholakia et al. 2005	
	Gensler et al. 2007	Current study
	Montoya-Weiss et al. 2003	
	Shankar et al. 2003	
	Thomas & Sullivan 2005	
	Wallace et al. 2004	

Most studies tend to focus on multiple transactional channels (see Table 2-1). Several studies focus on determining the attitudinal effects of adding a transactional channel (e.g., Montoya-Weiss et al. 2003; Shankar et al. 2003; Wallace, Giese & Johnson 2004; Bendoly et al.

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2005). Shankar et al. (2003) and Wallace et al. (2004) show improved firm loyalty as a result from offering customers multiple channels. Montoya-Weiss et al. (2003) show a positive effect on overall satisfaction. However, they show that satisfaction with the service quality in the current (traditional) channel can have a negative influence on the use of the additional (online) channel (Montoya-Weiss et al. 2003). This results might be explained by the preference for the traditional (offline) channel (e.g., Järveläinen & Puhakainen 2004; Keen et al. 2004). Overall, it seems that adding a transactional channel improves customer attitudes towards the firm.

*2.2.2 Proposed Model and Hypotheses*

Figure 2-1 shows the proposed model, which depicts how the effects of an informational Web site can be determined. Specifically, the proposed model determines the effects by focusing on (1) channel attitudes, (2) channel behavior, and (3) moderators that influence the cross-channel effects. With informational Web sites, the firm can only benefit if customers go offline to buy items. Hence, we focus on the effect of the online attitudes and behavior on offline attitudes and behavior. In addition to the main constructs and moderators, the model takes several antecedents into account.

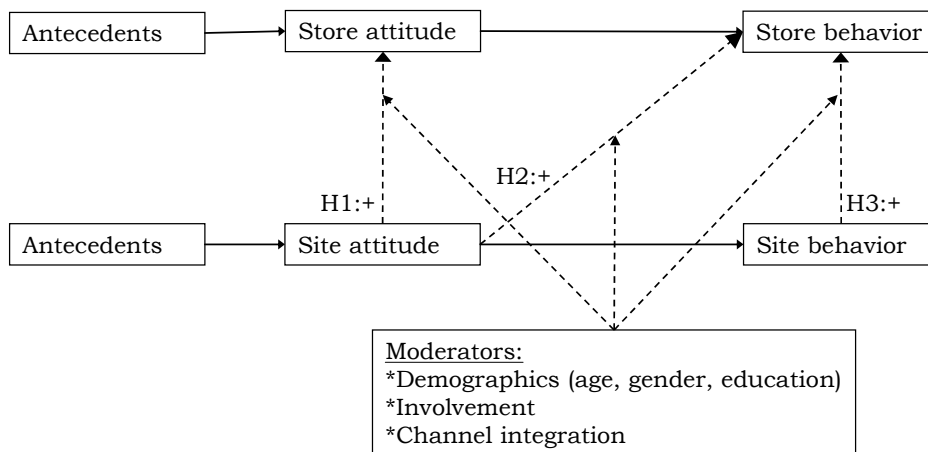


FIGURE 2-1 CONCEPTUAL MODEL: THE INFLUENCE OF AN INFORMATIONAL WEB SITE ON STORE ATTITUDES AND BEHAVIOR

Notes: Dashed lines indicate hypotheses, + indicate an expected positive result.

The first and second hypotheses (H1 and H2) relate site attitude to store attitude and store behavior, respectively. Shankar et al. (2003) argue that customer attitudes toward a service provider differ between its online and offline channels by showing the strengthening effect of an online channel on overall company satisfaction and loyalty. Montoya-Weiss et al. (2003) and Wallace et al. (2004) also indicate positive attitudinal effects of the additional online channel. Finally, Internet search attractiveness positively influences the choice or intention to purchase through the offline channel (Verhoef et al. 2007). Therefore, we expect positive relationships between site attitude and store attitude as well as between site behavior and store behavior. We also expect that customers with a positive site attitude engage more in positive buying behavior; for instance, they may shop more often or buy more products.

The third hypothesis (H3) relates site behavior to store behavior. Insights into this relationship thus far have been mixed. Ansari et al. (2006) and Gensler et al. (2007) both find that online behavior can have a negative effect on offline behavior. Ansari et al. (2006) indicate that customers who use the Internet more report lower purchase quantities, which implies that online behavior may lead to less offline purchase behavior. However, evidence from practice indicates that multichannel customers spend more than single-channel customers (DoubleClick 2004), which would indicate a positive relationship. Kushwaha and Shankar (2005) also report that multichannel customers buy more often, buy more items, and spend more than do single-channel customers. Because a purely informational site requires customers to purchase offline, we hypothesize that site behavior has a positive effect on store behavior.

Table 2-2 provides an overview of the cross-channel relationships found in previous studies, most of which apparently focus on the relationships between attitudes or between behaviors. In the case of attitudes, the findings are consistent, but for behavior, research has found both negative and positive effects. Only a few studies consider the cross-channel relationship between attitudes and behavior; in particular, Verhoef et al. (2007) capture this relationship through search attractiveness and purchase intentions. Our study contributes to this emerging field by capturing the relationship between site attitude and actual offline buying behavior. We formally propose the following hypotheses:

H1. Site attitude has a positive effect on store attitude.

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H2. Site attitude has a positive effect on store behavior.

H3. Site behavior has a positive effect on store behavior.

TABLE 2-2 OVERVIEW RESULTS FROM PREVIOUS STUDIES ON THE MAIN  
THREE HYPOTHESES

	Site Attitude → Store Attitude (H1)	Site Attitude → Store Behavior (H2)	Site Behavior → Store Behavior (H3)
<i>Positive relationship found by:</i>	Burke 2002 Shankar et al. 2003 Montoya-Weiss et al. 2003 Wallace et al. 2004	Verhoef et al. 2007	Kushwaha & Shankar 2005 Verhoef et al. 2007 Dholakia et al. 2005
<i>Negative relationship found by:</i>			Ansari et al. 2006 Van Baal & Dach 2005 Ratchford et al. 2003
<i>Expectation:</i>	+	+	+

Notes: H1 = hypothesis 1, H2 = hypothesis 2, H3 = hypothesis 3.

*2.2.3 Moderating Effects of Customer Traits*

Several studies indicate differences across customer traits in the use and effects of multiple channels (e.g., Burke 2002; Balasubramanian, Raghunathan & Mahajan 2005). We investigate whether the relationships between the channels are moderated in case of an informational channel.

The proposed relationships (H1-H3) can be viewed from two angles. Firstly, we consider the relationships between attitudes (H1) versus those between attitudes and actual behavior (H2). The relationship between attitudes and actual behavior is investigated in studies not related to multichannel behavior (e.g., Mittal & Kamakura 2001 Seiders, Voss, Grewal & Godfrey 2005). Besides this angle, the relationships (H1 and H2) are investigated in multichannel studies (e.g., Burke 2002). To determine any possible moderators, we review previous studies that employ either of these angles.

Mittal and Kamakura (2001) found in a general setting that the relationship between attitudes and behavior is weaker for male, more educated younger adults. Research in a multichannel setting also shows that these subjects are more interested in technology (Burke 2002). On the basis of Burke's (2002) work, we expect the hypothesized relationships to be stronger for male, more educated younger customers. However, their greater interest in technology might make

them more likely to order online. Finally, ordering online is not possible through an informational Web site, a limitation that might weaken the proposed relationships for male, more educated younger customers.

H4. The proposed relationships are weaker for

H4a. males versus females.

H4b. more versus less educated customers

H4c. younger versus older customers.

Highly accessible attitudes likely bias interpretations of relevant information and strengthen the relationship between attitudes and behavior (Olson & Zanna 1993). With stronger involvement, information gets processed more carefully. Seiders et al. (2005) show for instance that more involved customers spend even more when their satisfaction is high. In a multichannel setting, Wallace et al. (2004) show that customers with greater purchase involvement, experience a stronger relationship between multichannel service value and positive disconfirmation than do customers with a less purchase involvement. Therefore, we expect involvement to strengthen the proposed relationships.

H5. The proposed relationships are stronger for highly involved customers than for less involved customers.

With the advent of multiple channels, firms can choose to operate along a spectrum of possibilities varying from completely separate channels to fully integrated channels (Gulati & Garino 2000). With independent channels, customers may not perceive the channels as part of the same organization if the firm tries to provide customers with multiple channels that work together to fulfill their needs (Bendoly et al. 2005). Perceived channel integration, or the extent to which customers perceive integration among channels, such as the ability to order a product online and pick it up offline, may create cross-channel synergies. Further research is needed to investigate this relationship (Verhoef et al. 2007), but Bendoly et al. (2005) indicate that perceived channel integration may be associated with a reduced likelihood of firm switching when the initial channel fails. Perceived channel integration also promotes loyalty and within-firm channel switching. We expect that, especially for informational Web sites, perceived channel integration strengthens the proposed relationships.



H6. The proposed relationships are stronger for customers who perceive higher channel integration than for those who perceive less channel integration.

#### *2.2.4 Store/Site Attitude*

Attitudes are characterized as evaluations of a particular entity with some degree of favor or disfavor, which are represented in memory (Olson & Zanna, 1993). Usually, researchers distinguish among the affective, cognitive, and behavioral antecedents and consequences of attitudes. Engel, Blackwell and Miniard (1993) define attitudes as overall evaluations that result from direct contact with the entity. Furthermore, they indicate that (1) the affective component represents a person's like or dislike of an entity, (2) the cognitive component represents his or her knowledge and beliefs about the entity, and (3) the conative component refers to the person's behavioral tendencies (Engel et al. 1993).

Similarly, in marketing research customer satisfaction is usually defined as the overall evaluation of an entity, after a purchase or consumption experience (e.g., Oliver 1999). Specific to the setting of this dissertation, Macintosh and Lockshin (1997) define store satisfaction as the customer's overall evaluation of the store experience.

Loyalty consists of two dimensions, namely attitudinal and behavioral loyalty (see e.g., Mittal & Kamakura 2001). Attitudinal loyalty relates to the feelings customers have toward a product/service or organization (affective component), whereas behavioral loyalty relates to behavioral intentions to continue buying the same product/service from that organization or store (Srinivasan, Anderson & Ponnnavolu 2002).

Taylor and Hunter (2002) show that the conceptual domains of satisfaction and loyalty in an online setting are similar to those in an offline setting. Therefore, store and site attitude in this study reflect overall evaluations, future intentions and preferences for a channel.

#### *2.2.5 Antecedents of Store/Site Attitude*

Store attitude antecedents range from physical characteristics, such as store interior, price, and merchandise, to softer characteristics, such as personnel, service, employee courtesy, store personality and pleasure (Van Kenhove, De Wulf & Van Waterschoot 1999). Sirgy, Grewal and Mangleburg (2000) and Tang, Bell and Ho (2001) focus on more physical store attributes, whereas others concentrate more on the

softer characteristics (e.g., Kelly & Smith 1983; Donovan, Rossiter, Marcolyn & Nesdale 1994). Baker, Parasuraman and Voss (2002) have developed a model of store choice and patronage intentions that captures both physical and softer characteristics. In this study, we focus on a mix of these antecedents: store interior or design perceptions, monetary price perceptions, merchandise, and personnel or store employee perceptions.

Internet research has proven that several factors related to the content and design (e.g., navigation, graphic style) of a Web site have a positive influence on site satisfaction or usage (e.g., Venkatesh & Davis 2000; Montoya-Weiss et al. 2003; Van der Heijden 2003). With his Technology Acceptance Model (TAM), Davis (1989) predicts the adoption and use of information technologies and shows that perceived usefulness (content) and ease of use (design) relate to the overall acceptance of information systems. Because, e-commerce is highly technology driven, TAM also may be applied in an Internet setting (e.g. Pavlou & Fygenson 2006). In our study, we focus on the two main antecedents of site attitude: content and design.

### 2.3 EMPIRICAL SETTING

To test the proposed model, we collected data among customers of a large, well-known, national retailer in the Netherlands, as discussed in Section 1.6.

The informational Web site is theme oriented, supporting offline activities with the aim to increase the likelihood of purchases in the stores of the retailer. The Web site was introduced in March 2001. To gain access to it, customers registered with the loyalty program identification number that designates their loyalty card, which they use to collect credits when buying products in stores.

#### 2.3.1 Data

Attitudes, store behavior, and site behavior may be linked at the individual customer level by the loyalty card identification number. Customers were asked by e-mail to participate in an online survey and offered a small incentive in return for their participation. The survey, held in May 2001 and May 2002, included rule-based checks and a direct link to the online database to ensure fewer errors in the data collection process. The e-mail message contained the Web address of the survey, which linked to a username- and password-protected Web

site. Both the username and password appeared in the initial e-mail. From the 25,000 customers who visited the Web site, we collected 4,787 rows of data for the May 2002 survey. After careful screening of the data (to eliminate incomplete responses, yea- and nay-saying, erroneous loyalty numbers, and multiple entries), we emerge with a final sample (May 2002) that contains only those 2,877 customers whose channel attitudes and behaviors are available. For 422 customers, data for both surveys and behavior for the period March 2001- May 2002 is available.

#### 2.4 PROPOSED METHODOLOGY

The proposed model includes several antecedents, overall attitudes, and actual behavior. The antecedents with respect to the store are store interior, personnel, merchandise, and price, and those that pertain to the site are content and design. Actual behavior (site visits and store purchases) is observed directly. We acknowledge that the antecedents and attitudes cannot be observed directly but require observable indicators, which suffer from measurement error (Steenkamp & Baumgartner 2000). However, the aim of our proposed model is not to predict actual behavior but to explain the relationships between the channels in terms of customer attitudes and behavior. Because of these characteristics and our aim to gain insight into the observed marketing phenomena, we employ the structural modeling approach.

The proposed model is estimated with structural equation modeling (SEM) using LISREL (version 8.54). Anderson and Gerbing (1988) recommend a two-stage approach with fixed loadings and error variances when

- A tentative theory underlies the constructs (Hair, Anderson, Tatham & Black 1998),
- Measures are less reliable (Hair et al. 1998), and
- The fit of the structural model deteriorates because of a relatively large number of parameters in the measurement model (Steenkamp & Van Trijp 1991).

For both the measurement and structural parts of the model, we use the Chi-square ( $\chi^2$ ) index to assess model fit, along with other fit indices, such as the root mean square error of approximation (RMSEA), non-normed fit index (NNFI), and comparative fit index (CFI) (Byrne 1998). The generally accepted standards — insignificant Chi-square,

Chi-square index ( $\chi^2 / df$ ) between 2 and 5, RMSEA < .08, square root mean residual (SRMR) < .05, NNFI, CFI, and goodness-of-fit index (GFI)  $\geq .90$  — were taken into account to determine the model fit (Jöreskog & Sörbom 1993; Byrne 1998). The standardized coefficients in the structural model indicate the relative importance of the relationships and closely approximate effect sizes comparable to standardized beta coefficients in regression analyses (Hair et al. 1998).

2.4.1 *Specification: Measurement Part of the Model*

The measurement model includes relationships between the latent constructs and their observed items (i.e., a factor-analytical model). The specification generally used in LISREL includes an equation for both exogenous (i.e.,  $X$ -variables) and endogenous (i.e.,  $Y$ -variables) variables (Byrne 1998). For our proposed model, we include six latent exogenous variables that represent the store and site antecedents, measured with 21 items in total. We include two latent endogenous variables, namely, store attitude and site attitude, measured with 6 items. The specification of the measurement model is as follows:

(1)  $X = \Lambda_x \xi + \delta$ , and

(2)  $Y = \Lambda_y \eta + \varepsilon$ ,

where

$X$  = a (21 x 1) vector of observed exogenous items for the store antecedents and site antecedents;

$\Lambda_x$  = the (21 x 6) matrix of loadings, showing which observed exogenous item loads on which latent exogenous variable;

$\xi$  = a (6 x 1) vector of latent exogenous variables, including personnel, store interior, price, merchandise, content, and design;

$\delta$  = a vector of error terms with expectation zero and uncorrelated with  $\xi$ ;

$Y$  = a (6 x 1) vector of observed endogenous items for store attitude and site attitude;

$\Lambda_y$  = the (6 x 2) matrix of loadings, showing which observed endogenous item loads on which latent endogenous variable;

$\eta$  = a (2 x 1) vector of latent endogenous variables, including store

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attitude and site attitude; and

$\varepsilon$  = a vector of error terms with expectation zero and uncorrelated with  $\eta$ .

*2.4.2 Measurement Constructs*

We use scales derived from previous studies (see Table 2-3). All items are measured on a five-point Likert scale ranging from “completely disagree” to “completely agree”.

TABLE 2-3 MEASUREMENT AND ORIGIN OF THE SCALES

	Previous Studies	Sample Scale Item
Store interior (3)	Maddox 1982	The interior of X is attractive.
Personnel (3)		The salespeople at X know their products well.
Merchandise (3)	Van Kenhove et al. 1999	X has different varieties of the same product.
Price (3)		The prices X charges are reasonable.
Store attitude (3)	Reynolds & Beatty 1999	I enjoy shopping at X.
Content (4)	Davis 1989	I find the Web site informative.
Design (5)		The layout of the Web site is attractive.
Site attitude (3)	Van der Heijden 2003	I intend to visit X on a regular basis.

Notes: The number of items used to measure the scale appear in brackets.

With a pre-test, we confirm the proper translation, quality, and applicability of the scales to this study. Scales unrelated to the Web site (i.e., store attitude and its antecedents) were tested using a convenience sample of master’s students and university staff (n=50). The scales measuring online attitudes were not tested among this sample because of the private character of the Web site. With data from the first 100 customers who participated in the study, we tested these latter scales. Descriptive analyses and frequencies were performed to test for normality of the variables. Overall, the scales meet the criterion of normality.

*2.4.3 Construct Validity*

To purify the measures, we use both traditional approaches, such as exploratory factor analyses and Cronbach’s alpha, and LISREL (Steenkamp & Van Trijp 1991).

**Traditional approach.** The exploratory factor analyses performed on both the test and the final sample suggests unidimensionality. With regard to reliability, the Cronbach’s alpha reveals the consistency of the scales. In response to these tests, some of the scales were altered. In the final sample, all Cronbach’s alphas exceed .70 (see Table 2-4).

For the test samples (offline n = 50 and online n = 100), and the final sample, we analyze two other measures of internal consistency: item-to-total, and interitem correlations (e.g., Churchill 1979; Hair et al. 1998). All the correlations for the final sample are significant at a .01 significance level. Most scale items meet the required standards for internal consistency (item-to-total correlations >.50, inter-item correlations > .30). In Appendix II, we provide the inter-item and item-to-total correlations.

**LISREL approach.** LISREL estimated a confirmatory factor model and the fit of this model is within the specified norms ( $\chi^2 / df = 4.39$ ; RMSEA = .049; NNFI = .92 and CFI = .93). Unidimensionality is determined through the model fit in terms of the standardized residuals (Steenkamp & Van Trijp 1991). The results show that the standardized residuals do not exceed the misspecification value of 2.58 (maximum value = 1.08). Table 2-4 depicts various measures that can assess other aspects of construct validity.

Convergent validity is established according to the lambdas of the measurement model. All item loadings are significant, indicating convergent validity (Anderson & Gerbing 1988). For merchandise, one item does not exceed the minimum loading of .70, but we chose not to remove it, because doing so does not improve the scale. The average variance extracted (AVE) exceeds the recommended level of .50 for all constructs, indicating that the variance captured by the constructs is greater than the variance due to errors (Fornell & Larcker 1981).

TABLE 2-4 RELIABILITY MEASURES OF THE MEASUREMENT MODEL

	Construct reliability (>0.70)	Average loading	Lowest loading	Variance extracted (>0.50)	Cronbach’s alpha
<i>Store interior</i>	.89	.85	.74	.72	.84
<i>Price</i>	.90	.87	.78	.75	.85
<i>Personnel</i>	.86	.81	.70	.67	.81
<i>Merchandise</i>	.76	.72	.60	.52	.71
<i>Content</i>	.93	.87	.81	.76	.90
<i>Design</i>	.93	.85	.87	.73	.91
<i>Store attitude</i>	.90	.87	.78	.76	.86
<i>Site attitude</i>	.90	.86	.77	.74	.86

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Discriminant validity is achieved when:

- The correlations between the constructs differ from unity (i.e., the confidence interval for each pairwise correlation does not include the value of 1.0),
- The  $\chi^2$  difference test indicates that two constructs are not perfectly correlated when collapsed into a single construct (e.g., Anderson & Gerbing 1988; Steenkamp & Van Trijp 1991) and,
- The squared correlation between two constructs exceeds the AVE for each of the two constructs (Hair et al. 1998).

Table 2-5 shows the correlations among the latent factors.

TABLE 2-5 CORRELATIONS AMONG LATENT CONSTRUCTS

	1	2	3	4	5	6	7
1. Store Interior	1						
2. Personnel	0.5 (.10)	1					
3. Merchandise	0.64 (.08)	0.56 (.11)	1				
4. Price	0.42 (-.11)	0.46 (.12)	0.59 (.11)	1			
5. Store Attitude	0.51 (.09)	0.55 (.10)	0.74 (.07)	0.57 (.09)	1		
6. Content	0.43 (.09)	0.42 (.10)	0.52 (.09)	0.32 (.12)	0.47 (.09)	1	
7. Design	0.5 (.09)	0.45 (.11)	0.53 (.11)	0.39 (.13)	0.51 (.10)	0.87 (.02)	1
8. Site Attitude	0.43 (.10)	0.42 (.11)	0.53 (.10)	0.33 (.13)	0.53 (-.09)	0.84 (.03)	0.82 (.04)

Notes: Standard errors appear in brackets.

The results show that each of the constructs satisfies the criterion of pairwise correlation, though the correlations between some constructs are reasonably high. Furthermore, the  $\chi^2$  difference test confirms the pairwise tests. All models with a collapsed pair of constructs reveal a worse fit than the original model. The third criterion is not satisfied in two cases. For merchandise, the AVE is .03 lower than the squared correlation with store attitude. For design, the AVE is

.03 lower than the squared correlation with content. For all other constructs, this criterion of discriminant validity is satisfied. Because most of the tests satisfy the conditions of construct validity, we proceed with the structural model.

#### 2.4.4 Specification: Structural Part of the Model

The structural part of the model defines the relationships among the unobserved (or latent) attitudinal variables and observed behavioral variables. It specifies which variable directly or indirectly influences changes in the values of other variables (Byrne 1998). It is generally specified as follows:

$$(3) \eta = \Gamma\xi + B\eta + \zeta,$$

where

- $\eta$  = a  $(m \times 1)$  vector of unobserved endogenous variables,
- $\Gamma$  = an  $(m \times n)$  matrix of coefficients that relates the  $n$  exogenous factors with the  $m$  endogenous factors,
- $\xi$  = a  $(n \times 1)$  vector of latent exogenous variables,
- $B$  = an  $(m \times m)$  matrix of coefficients that relates the  $m$  endogenous factors to one another, and
- $\zeta$  = an  $(m \times 1)$  vector of residuals with zero expectation, and uncorrelated with  $\eta$  and  $\xi$ .

In this study, there are four endogenous variables: store attitude ( $\eta_1$ ), site attitude ( $\eta_2$ ), store behavior ( $\eta_3$ ) and site behavior ( $\eta_4$ ). We include six exogenous variables, namely personnel ( $\xi_1$ ), store interior ( $\xi_2$ ), price ( $\xi_3$ ), merchandise ( $\xi_4$ ), content ( $\xi_5$ ) and design ( $\xi_6$ ). The equations of the structural part of the model are represented as:

$$(4) \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \end{bmatrix} = \begin{bmatrix} \tau_{1,1} & \tau_{1,2} & \tau_{1,3} & \tau_{1,4} & 0 & 0 \\ 0 & 0 & 0 & 0 & \tau_{5,2} & \tau_{6,2} \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix} \begin{bmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \\ \xi_4 \\ \xi_5 \\ \xi_6 \end{bmatrix} + \begin{bmatrix} 0 & \beta_{1,2} & 0 & 0 \\ 0 & 0 & 0 & 0 \\ \beta_{3,1} & \beta_{3,2} & 0 & \beta_{3,4} \\ 0 & \beta_{4,2} & 0 & 0 \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \end{bmatrix} + \begin{bmatrix} \zeta_1 \\ \zeta_2 \\ \zeta_3 \\ \zeta_4 \end{bmatrix}$$



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Because an informational Web site does not provide customers with opportunities to purchase, buying takes place in offline stores. Store behavior reflects total customer buying since the introduction of the Web site, over the period March 2001 to May 2002, measured in total money spent. The same holds for site behavior, though it is measured in total pages viewed online. For the variables measuring store behavior and site behavior, we use the logarithmic transformation.

*2.4.5 Longitudinal Design*

A structural equation model including measurements over time, i.e. a longitudinal design, is estimated to validate whether the relationships between attitudes and behavior hold up in the case of temporal ordering (see Rindfleisch, Malter, Ganesan, & Moorman 2006 on causal inference). For 422 customers, data are available from both surveys (May 2001 and May 2002) with regard to store and site behavior (March 2001 – May 2002). We estimate the relationships (from figure 2-1) with these data for which Figure 2-2 shows the path diagram.

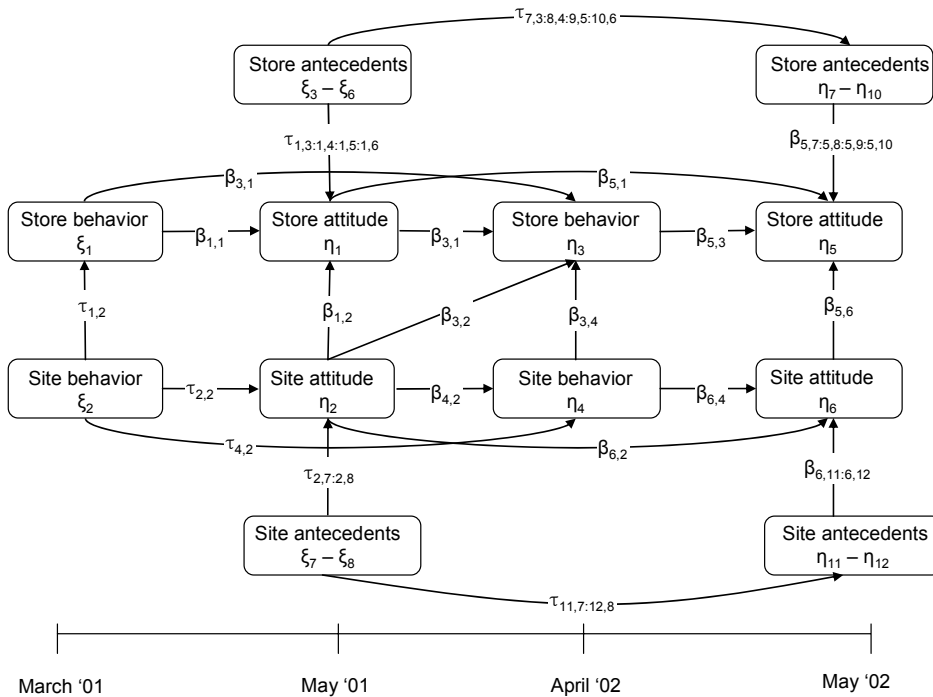


FIGURE 2-2 PATH DIAGRAM FOR THE LONGITUDINAL DESIGN WITH TIMELINE

The model includes the main variables of interest, namely store attitude, site attitude, store behavior and site behavior, each measured for two points in time. The number of endogenous and exogenous variables is different from equation (4), given that the number of variables has changed and the conceptual model is estimated in accordance with the timeline. Nevertheless, the main endogenous variables ( $\eta_1 - \eta_4$ ) from equation (4) are the same in the longitudinal design.

The six antecedents of store and site attitude (personnel, store interior, price, merchandise, content and design), are also measured at two points in time. In Figure 2-2, we specify the structural relationships among the latent variables. We leave out the specification for the measurement model for clarity purposes. As is apparent in Figure 2-2, the antecedents measured in May '01 or May '02 influence site and store attitude at May '01 respectively May '02. Moreover, we estimate the effect from for instance the price perception in May 2001 on the price perception in May 2002. Thus, the antecedents measured in the survey from May '01 also influence the antecedents measured in the survey from May '01, which is common in longitudinal designs for structural equation models (Jöreskog & Sörbom 1993).

Besides the temporal ordering validation, a common method factor could show if common method variance from the surveys affects the estimated coefficients (e.g., Rindfleisch et al. 2006). We attempted to estimate the common method factor, however the model suffered from identification problems due to only two similar items in both surveys for the antecedent 'price'.

### 2.4.6 Measurement Moderators

H4-6 propose that the relationships in the conceptual model are moderated by various factors. We perform a median split to test this moderation. H4 centers on sociodemographics: age, gender, and education. The median age in the panel is 38.59 years, a little more than half (55.4%) of the customers are female, and 46.5% of them have a college education.

The other two moderators (H5 and H6) are measured with multi-item constructs, namely, involvement and channel integration. We define involvement as the extent to which customers have a deep interest in a product or activity, which in our setting refers to the store and its products. Channel integration is the extent to which customers

can use multiple modes of fulfillment during their decision-making process (Bendoly et al. 2005).

We measure involvement as the number of product categories in which the customer indicates an interest. The mean number of product categories in which an interest was indicated is 4.4. Customers can indicate an interest in at most 15 product categories. The median is five product categories, 33.4% of customers indicated no interest in any of the categories.

We measure channel integration through three items, which indicate whether customers use the online information to shop offline. The exploratory factor analysis shows that the three items explain 61% of the variation. The Cronbach's alpha is .69, the interitem correlation ranges from .39 to .43 and the item-to-total correlation ranges from .48 to .52.

### *2.4.7 Moderation and Validation Approach*

For the moderation and validation approaches a similar test is used, namely the Chi-square difference test proposed by Dabholkar and Bagozzi (2002). For the moderation, we compare two groups based on a median split. For the validation, we perform a random split analysis, and a self-selection split analysis.

Before calibrating and estimating the proposed model, we randomly split the data set into an estimation ( $n = 1,433$ ) and a validation ( $n = 1444$ ) sample. To test for any significant differences between them, we follow the rigorous procedure described by Dabholkar and Bagozzi (2002). This procedure uses a Chi-square difference test to determine the presence of significant differences. It is adapted from Jöreskog and Sörbom's (1993) procedure for verifying whether factor loadings are essentially the same or significantly different across two groups. Therefore, this procedure can be used for the random split or the self-selection split, as well as to determine whether moderating variables have a significant effect on the relationships.

We conduct two tests for each split/moderator variable using four models (A–D) for each split (Dabholkar & Bagozzi 2002). In model A, all factor loadings and error variances of the items for endogenous variables are constrained across groups. Model B leaves the factor loadings free but constrains the error variances. Model C frees both the factor loadings and the error variances. Finally, model D constrains the factor loadings but frees the error variances.

The first test compares models A and B (and models D and C). Differences between models A and B are due to factor loadings. The second test compares models A and D (and models B and C), and the differences between models A and D are attributable to error variances in the dependent variables. The difference reflects the  $\chi^2$  difference between the two models, divided by the change in degrees of freedom (i.e.  $X^2$  difference for one degree of freedom,  $\Delta\chi^2 / \Delta df$ ).<sup>4</sup>

## 2.5 FINDINGS

In this section, we report the findings for four analyses. First, we discuss the findings for the proposed model. Second, we report the results for the longitudinal design. Third, we discuss the results for the moderators. Fourth and finally, we validate the proposed model.

### 2.5.1 Estimates for the Proposed Model

Table 2-6 shows the results for the proposed model. The fit measures show a reasonable fit for the model. Although, the Chi-square is significant, this result is expected because the statistic is sensitive to large sample sizes (e.g., Hair et al. 1998). The ratio of the Chi-square to the degrees of freedom ( $\chi^2 / df$ ) is greater than the norm. The RMSEA, SRMR, NNFI, and CFI are all within recommended levels.

All standardized coefficients, except for store interior, are significant. The proposed model explains more than 60% of the variation in site and store attitude. The attitudes explain a small part of the variation in the behavior variables, which is not surprising considering that previous studies show that the relationship between attitudes and actual behavior is extremely hard to capture (e.g., Mittal & Kamakura 2001; Chandon, Morwitz, & Reinartz 2005).

The results show that on an attitudinal level, the relationship between site and store attitude is positive. This relationship, compared to the store antecedents, is also of reasonable magnitude. The relationship between site attitude and behavior is positive when it concerns the site and negative when it concerns the store. Customers with a positive attitude towards the site have less store behavior than customers with a less positive site attitude. The relationship between

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<sup>4</sup> For a more extensive explanation of the test for moderating effects, see Dabholkar and Bagozzi (2002).

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store attitude and store behavior is positive and has the biggest impact. Lastly, site behavior has a positive relationship with store behavior. Hence, customers with more site behavior also have more store behavior.

TABLE 2-6 RESULTS FROM PROPOSED STRUCTURAL EQUATION MODEL  
(N = 1,433)

<i>Explanatory variables</i>	<i>Dependent variables</i>			
	<i>Site Attitude</i>	<i>Store Attitude</i>	<i>Site Behavior</i>	<i>Store Behavior</i>
Store Interior		0.00		
Personnel		<b>0.14</b>		
Price		<b>0.18</b>		
Merchandise		<b>0.47</b>		
Content	<b>0.53</b>			
Design	<b>0.36</b>			
Site Attitude		<b>0.17</b>	<b>0.15</b>	<b>-0.14</b>
Site Behavior				<b>0.08</b>
Store Attitude				<b>0.20</b>
R <sup>2</sup>	0.75	0.61	0.02	0.04
$\chi^2$		2464.12		
Degrees of freedom		399		
$\chi^2 / df$		6.18		
RMSEA		0.06		
SRMR		0.046		
NNFI / CFI		0.93 / 0.93		
GFI		0.89		

Notes: Bold parameter estimates are significant at the 5% level.

*2.5.2 Results Longitudinal Design*

The fit of the longitudinal design model<sup>5</sup> is worse than that of the cross-sectional model<sup>6</sup> and, for some fit indices, falls below the norm

<sup>5</sup> The longitudinal design model determines to what extent the cross-sectional model can be validated given the temporal aggregation of the cross-sectional model. Figure 2-2 shows the path diagram for this model.

<sup>6</sup> The cross-sectional model tests the conceptual model (see Figure 2-1).

( $\chi^2 / df = 3.6$ ; RMSEA = .078; SRMR = .13; NNFI = .74; CFI = .74; GFI = .65). The  $R^2$  for store attitude in both years is .66 and .84 respectively. For site attitude, the  $R^2$  is .87 for 2001 and .96 for 2002. The  $R^2$  of store behavior for both periods is .01 and .07 respectively, for site behavior the  $R^2$  for the second period is .03.

Even though the fit of the model falls below the norm, a review of these coefficients provides additional insights into the reliability of the cross-sectional model. For example, the relationship between site attitude and store attitude holds up across time with standardized coefficients of .10 ( $t$ -value = 2.52) in 2001 and .17 ( $t$ -value = 4.81) in 2002. For the relationship between site attitude and store behavior, which is in temporal order for the longitudinal model, we find a coefficient of -.17 ( $t$ -value = 3.13), which confirms the result found in the cross-sectional model. For the relationship from site behavior to store behavior, we find a coefficient of .09 ( $t$ -value = 1.76) in 2001 and .11 ( $t$ -value = 2.37) in 2002.

The (standardized) carry-over coefficients for the main variables ( $\beta_{3,1}:\beta_{5,1}:\beta_{6,2}:\tau_{4,2}$  from Figure 2-2), i.e. the effect of for instance store attitude in 2001 on store attitude in 2002 are all significant except for the effect of site attitude in 2001 on site attitude in 2002 (coefficient = .03,  $t$ -value = 1.15). This might be caused by the relative newness of the Web site in the survey of 2001 (i.e. only 3 months online). The effect of store behavior in the first period on the second period is .20 ( $t$ -value of 4.17). For store attitude the carry-over coefficient is .20 ( $t$ -value = 4.37). For site behavior the carry-over coefficient is .14 ( $t$ -value = 2.93). The carry-over coefficients for the store antecedents ( $\tau_{7,3:8,4:9,5:10,6}$  from Figure 2-2) are all significant and range from .52 - .64 ( $t$ -value from 11.02 - 13.11). The carry-over coefficients for the site antecedents ( $\tau_{11,7:12,8}$  from Figure 2-2) are all significant and are .52 and .67 ( $t$ -value respectively 11.49 and 16.61). Overall, the results of the longitudinal model confirm the results of the cross-sectional model.

Table 2-7 shows an overview of the expectations and results pertaining to the three main hypotheses. The first hypothesis argues that site attitude relates positively to store attitude, and the results confirm a positive cross-channel relationship, in support of findings from previous studies such as Shankar et al. (2003) and Montoya-Weiss et al. (2003). The second hypothesis states that site attitude relates positively to store behavior, but this hypothesis cannot be confirmed,

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because the results indicate a negative relationship. Verhoef et al. (2007) find a positive effect from Internet search on store purchase. The setting of both studies may explain the difference in results. Verhoef et al. (2007) study these effects in a non-specific setting. When customers are reviewing channels in this more general setting, e.g. before buying a product offline, did you search for information online, the likelihood of a positive relationship is higher. The third hypothesis posits that site behavior relates positively to store behavior and is confirmed by the findings. Ratchford et al. (2003) find a negative effect from the internet on information search behavior, not necessarily on buying behavior, in the traditional channel. Our findings may deviate from Van Baal and Dach (2005) considering that we study aggregate behavior over a year, instead of a single purchase occasion.

TABLE 2-7 OVERVIEW OF RESULTS FOR MAIN HYPOTHESES

	Site Attitude → Store Attitude (H1)	Site Attitude → Store Behavior (H2)	Site Behavior → Store Behavior (H3)
Positive relationship	Burke 2002 Shankar et al. 2003 Montoya-Weiss et al. 2003 Wallace et al. 2004	Verhoef et al. 2007	Kushwaha & Shankar 2005 Verhoef et al. 2007 Dholakia et al. 2005
Negative relationship			Ansari et al. 2006 Van Baal & Dach 2005 Ratchford et al. 2003
Expectation	+	+	+
Result	+	-	+

*2.5.3 Moderating Results of Customer Traits*

Certain variables may moderate the proposed relationships, as we discussed in Section 2.2.3. We test the moderation effects by applying the Dabholkar and Bagozzi (2002) method (see Section 2.4.7), which we also use to validate the proposed model. Table 2-8 shows which of the moderators involves a significant moderation effect due to factor loadings or error variances. For each moderator, we estimate the proposed model on two samples, high versus low (or male versus female in case of gender) (see Section 2.4.7).

TABLE 2-8 CHI-SQUARE DIFFERENCE RESULTS FOR THE MODERATING EFFECTS

	<i>Age</i>	<i>Gender</i>	<i>Education</i>	<i>Involvement</i>	<i>Channel Integration</i>
Difference due to factor loadings	1.73	<b>5.86</b>	<b>4.41</b>	1.39	<b>4.19</b>
Difference due to error variances	<b>4.67</b>	<b>9.43</b>	1.93	<b>5.86</b>	<b>7.46</b>

Notes: Chi-square test values in bold are significant at the .05 level

The test results show that age and involvement do not moderate the relationships of the proposed model (Figure 2-1), because the differences due to the factor loadings are insignificant. Considering Seiders et al. (2005), the result for customer involvement is somewhat surprising. The explanation most likely has to do with the type of measurement. Seiders et al. (2005) measure customer involvement through a number of items directly related to the retail chain. In this study, we measure involvement in the number of product categories, not with the store.

Apparently, the relationships between site and store attitudes and behavior are similar for young (i.e., younger than 38 years) and old (i.e., older than 38 years) customers. In addition, the extent to which customers are interested in different product categories does not affect the strength of the relationships. For the three remaining moderators (gender, education and channel integration), Table 2-9 shows the coefficients of the main relationships for each of the median splits.

TABLE 2-9 SEM COEFFICIENTS FOR MAIN RELATIONSHIPS OF THE PROPOSED MODEL FOR EACH MEDIAN SPLIT

	<i>Gender</i>		<i>Education</i>		<i>Channel Integration</i>	
	<i>M</i>	<i>F</i>	<i>L</i>	<i>H</i>	<i>L</i>	<i>H</i>
SiA → StA	<b>0.15</b>	<b>0.21</b>	<b>0.24</b>	<b>0.15</b>	<b>0.10</b>	<b>0.23</b>
SiA → StB	-0.07	-0.04	-0.03	-0.06	<b>-0.07</b>	0.02
SiB → StB	0.05	0.04	0.03	0.05	-0.03	0.01

Notes: SiA = site attitude, StB = store attitude, SiB = site behavior, StB = store behavior. For gender: *M* = male, *F* = female; for education: *L* = high school education, *H* = at least college education; for channel integration (measured on a scale from 1-5): low (*L*) ≤ 3.33, high (*H*) > 3.33. Bold parameter estimates are significant at the 5% level



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The results show that the moderators mainly affect the relationship between site attitude and store attitude. The relationship between site attitude and store behavior and that between site behavior and store behavior, in most cases, is not significant according to the median split. This somewhat unexpected result could be due to (1) smaller sample sizes and (2) homogenous groups per analysis. Considering the validation results (see section 2.5.4), which show no differences between the estimation and validation samples, the homogeneity of the groups seems to be the more likely reason. Only in the case of low perceived channel integration do we find a significant relationship between site attitude and store behavior. The negative effect falls in line with the results from Table 2-6. We therefore review these results in light of the proposed hypotheses.

H4a thru H4c state that the proposed relationships will be stronger for male, more educated, younger customers. We test for the moderation of three sociodemographic variables and find that age has no moderating effect. Hence, we reject hypothesis H4c. For gender (H4a), we find that the relationship between site attitude and store attitude is weaker for men than for females. With respect to education (H4b), the results indicate a weaker relationship between site attitude and store attitude for customers that are more educated. Therefore, we accept hypotheses H4a en b. Females and less educated customers have a stronger relationship between site attitude and store attitude than do males and customers that are more educated.

Our fifth hypothesis, states that highly involved customers experience the proposed relationships with greater strength. The results show that involvement has no significant moderating effect, and therefore reject H5.

For customers who perceive higher channel integration, H6 suggests the proposed relationships will be stronger than they are for customers with low perceptions of channel integration. Our results support this hypothesis for the relationship between site attitude and store attitude, but channel integration does not moderate the other two proposed relationships. That is, customers with higher perceptions of channel integration show a stronger relationship only between site attitude and store attitude compared with those with lower perceptions of channel integration.

Overall, the moderating effects generally take place at the attitudinal level, that is, the relationship between site attitude and store

attitude. The moderating effects found for the relationships between site attitude and store behavior and between site and store behavior are minor in comparison.

#### *2.5.4 Validation Results*

The validation test, a comparison of the estimation and validation sample, employs the Chi-square difference test described by Dabholkar and Bagozzi (2002) (see Section 2.4.7). The results show no significant difference between the estimation and validation sample according to the factor loadings ( $\Delta\chi^2 / \Delta df = 1.03$ ,  $p$ -value = .31). The test also shows that there are no significant differences based in the error variances. Overall, these results validate the proposed model presented in Figure 2-1.

Besides the validation based on a random sample split, we perform a self-selection split to see if the model relationships are stronger for predisposed loyal customers. More specifically, to test if heavy users show stronger relationships between the channels, as heavy users may be more likely to use all the channels. We use the purchase history, that is, the year before the introduction of the Web site, of customers to determine which customers are the heavy shoppers. We perform a median split based on the basis of store behavior to determine whether the findings are consistent for heavy and light shoppers at the department store. The results of the median split show no significant difference between both groups according to the factor loadings ( $\Delta\chi^2 / \Delta df = 1.54$ ,  $p$ -value = .22).

## 2.6 DISCUSSION

In this chapter, we propose a framework to evaluate the effects of an informational Web site in a multichannel setting. Three hypotheses related to both customer attitudes and behavior are formulated to determine the effects of the informational Web site. Three additional hypotheses function to investigate whether these relationships may be moderated. Two of the three main hypotheses receive support, and two of the three hypotheses pertaining to moderators are supported with regard to the relationship between site attitude and store attitude. We discuss each of these findings in light of existing multichannel literature.

*2.6.1 Site Attitude → Store Attitude*

Montoya-Weiss et al. (2003) show that both competitive and complementary effects can exist among the various channels of a provider. The competitive effect results in channel preference when the perceived service quality of channel *a* is higher than that of channel *b*. In contrast, complementary effects arise when the higher perceived service quality of all channels leads to higher overall customer satisfaction.

We find that customers with a positive site attitude generally also have a positive store attitude. Providing customers with additional online information about products and related background topics, such as the latest fashion trends, improves their satisfaction with shopping at the store. After visiting the site, customers may save time and reduce their cognitive efforts by gathering a better understanding of the products available in the store or their own preferences. In this way, a complementary effect occurs when a positively site attitudes leads to improved store attitude.

This relationship is attenuated for the typical Internet user—male, highly educated customers. Previous research indicates that these customers have more interest in technology and a weaker relationship between attitudes and behavior in general (Mittal & Kamakura 2001; Burke 2002). Our research suggests that typical Internet users also evince a weaker cross-channel relationship between attitudes, because these male, highly educated customers perceive a stronger separation between the channels. For such customers, the informational Web site does not reinforce the cross-channel relationship as strongly as it does for female, less educated customers. The median split based on perceived channel integration provides a similar result: Customers who perceive less channel integration experience a weaker relationship between the channels than do customers who perceive more channel integration.

*2.6.2 Site Attitude → Store Behavior*

Verhoef et al. (2007) show that the search attractiveness of the online channel has a positive impact on choosing to purchase through the offline channel, but our findings indicate a negative relationship in the case of actual behavior. We find that attitude toward the site, or the overall evaluation of and preference for the site, has a negative impact

on actual shopping behavior. The difference between these studies may lie in the setting and the type of data collected.

The study by Verhoef et al. (2007) focuses on the effect of the Internet in general instead of one specific Web site or firm. They investigate whether consumers enjoy searching online, at no particular Web site, and then buying offline, again at no particular store. As the majority of consumers still prefer the offline channel to purchase, but value the Internet as an information search channel, a positive relationship seems logical. In a firm-specific setting, searching in a firm's online channel and buying in its offline channel, a positive relationship is less logical. Factors such as loyalty, free-riding behavior and competition influence the customer in this setting and may lead to the opposite finding.

The other explanation for the difference lies in the data used in the two studies. Verhoef et al. (2007) use survey data, that is, attractiveness and purchase intentions for a particular channel. Our study combines survey data (attitudes) and behavior (offline purchases). Mittal and Kamakura (2001) indicate that the use of intention ratings alone could be misleading.

Our results might indicate that the Web site has become a substitution channel for some customers, for whom it offers increased efficiency. That is, the Web site provides these customers with a tool to determine their consideration set without visiting the store, which might prompt their positive attitudes toward the site (Balasubramanian et al. 2005). The associated decrease in offline buying behavior might be the result of improved efficiency and fewer impulse buying trips.

### 2.6.3 *Site Behavior → Store Behavior*

Various studies show that customers using multiple channels buy more than do single-channel customers (Kushwaha & Shankar 2005). These studies generally refer to multiple transactional channels. However, our study demonstrates that for an offline transactional channel and an online informational channel, customers who view more online pages also spend more offline. In advertising research, Tellis (1988) shows that repeated advertising exposures, i.e. between 1 and 3 exposures have a positive effect on buyers. Even though previous advertising research provides a basis for the interpretation of the results, there is a noticeable difference. A Web site is not a single advertisement, nor are the Web pages equal. A customer is not

repeatedly exposed to the same ad. Hence, informational Web sites can have a different effect than found by Tellis (1988).

Because our data are aggregated over 1½ years, this finding illustrates that customers who use one channel intensively likely use the other intensively as well. The findings do not clarify how this behavior evolves over time and the association we find between site behavior and store behavior is relatively small and insignificant in the case of some of the median splits. Nevertheless, this result is consistent with previous results, such as Verhoef et al.'s (2007) finding of a comparable association between Internet search and store purchases.

## 2.7 CONCLUSIONS

The Internet forms an integral part of our society. The role it plays in information exchange, communication, transaction, and distribution likely will continue to increase. Learning how to apply this “novel” channel effectively is essential for all kinds of businesses, but this study shows that the use of informational Web sites can lead to counterintuitive results. Our results indicate that an informational Web site does not necessarily provide benefits to the organization alone but that customers also benefit by using the information to make their decision-making process more efficient or by free riding on the provided information. Our distinction between attitudes and actual behavior, as well as the inclusion of moderators, provides new insights into how customers react in a multichannel setting. Moreover, we show that these findings are consistent over time.

When trying to reach a different target audience or tune the various channels to different buying situations, managers should focus on creating substitution effects. When they want to establish positive effects between an online and an offline channel, managers should focus on coordinating their channel strategies. Our results regarding the strengthening influence of channel integration seem to confirm the benefits of channel coordination. That is, the channels should have the same look and feel and stimulate cross-channel behavior. Coordination of channel strategies can be achieved by inviting site visitors to test products in the store and reminding store customers of specific, useful features on the Web site. We also emphasize that it is possible to obtain offline benefits by introducing an informational Web site, though these effects vary according to the target group and the level of perceived channel integration. For example, our results show that cross-channel

relationships are not as strong among the Internet-savvy customers. Moreover, organizations should keep in mind that providing an informational Web site, or any type of Web site, likely improves customer efficiency and lower impulse buying.

This study should be viewed as a first step in determining the offline effects of an informational Web site on customer attitudes and behavior. As does any study, it contains several limitations. First, our sample may suffer from a self-selection bias related to both the Web site and the survey. Nevertheless, the split sample according to store behavior prior to the site introduction shows no significant differences in terms of behavioral loyalty. Second, the attitudinal measure may suffer from common method variance, which may have affected the relationship between site attitude and store attitude. Although the knowledge that common method variance (i.e., variance attributable to the measurement method [Podsakoff, Podsakoff & Lee 2003]) does not necessarily lead to biased interpretations (Rindfleisch et al. 2006) offers some relief. The inclusion of actual behavior besides the attitudinal measures also provides additional confidence in the effects of the informational Web site on the offline channel. Further research should ensure that common method bias between the attitudinal measures is minimal. Third, our results for the relationships between site attitude and store behavior and that between site behavior and store behavior do not seem very stable and the variation explained in store behavior is low. These relationships warrant further investigation.

This study also shows how an informational Web site influences both attitudes and behavior in an offline transactional channel. To generalize cross-channel findings pertaining to both transactional and informational channels, more research is needed. Studies might elaborate on the effects of different types of Web sites, such as transactional versus informational sites, differences across branches, or differences due to site design. In addition, an interesting avenue for future research is the extent to which previous advertising research, such as by Tellis (1988), is applicable to informational Web sites.

The generalizability of our model also should be tested for other industries, other channels, or Web sites with different purposes, such as Web communities. Whereas our model testing involves a two-channel situation, it could easily be extended to include more channels, such as catalogs or telemarketing, which might confirm the strength of the model.

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Realizing the value of an informational Web site depends on three criteria. First, value is achieved mostly at the attitudinal level, through improved satisfaction and loyalty toward the store. Second, improved attitude toward the store is achieved mostly from within a particular segment, namely, female, less educated customers. Third, the effect on store attitude can be increased if the customer perceives the channels as highly integrated. However, organizations should be aware that customers likely will spend less offline as a result of an informational Web site, especially if they like it. In conclusion, adding an informational Web site to a traditional channel provides benefits in the form of improved customer attitudes that get manifested offline.