



# Multichannel customer management: Understanding the research-shopper phenomenon

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## Abstract

This paper develops and estimates a model for understanding the causes of research shopping, and investigates potential strategies for managing it. The research-shopper phenomenon is the tendency of customers to use one channel for search and another for purchase. We hypothesize three fundamental reasons for research shopping: (1) Attribute-based decision-making, (2) Lack of channel lock-in and (3) Cross-channel synergy. Our findings suggest all three mechanisms are at work in making Internet Search⇒Store Purchase the most popular form of research shopping. We illustrate how our methods could be used to simulate and evaluate various strategies for managing research shopping. © 2007 Elsevier B.V. All rights reserved.

*Keywords:* Multichannel; Internet; Retailing; Consumer behavior; Marketing models

## 1. Introduction

Today's firms are constantly adding new shopping channels, such as the Internet, to better serve their customers (Geyskens, Gielens, & Dekimpe, 2002). In this environment, many consumers have become multichannel users. The presence of the multichannel customer has presented several challenges (Kelly, 2002; Stone, Hobbs, & Khaleeli, 2002). One of these is that the firm may lose the customer in the course of the shopping process (Nunes & Cespedes, 2003). This is referred to as the "research shopper" phenomenon — the propensity of consumers to research the product in one channel (e.g., the Internet), and then purchase it through another channel (e.g., the store). For instance, in the vacation industry, 30% of the consumers use one channel for search and a different channel for purchase (Yellavali, Holt, & Jandial, 2004). Kelly (2002) reports that roughly half of online shoppers research the product on the Internet and then purchase it in a brick-and-mortar store.

Fig. 1 shows the results of a Doubleclick study (Double-Click, 2004) of research shopping. As the figure shows, the most common form of research shopping is Internet⇒Store.

There is also some Catalog⇒Store and Store⇒Internet research shopping. An important question is, *why* are these forms so common, and what can managers do either to increase or decrease research shopping? To answer this, companies clearly need to understand the behavioral mechanisms that encourage research shopping.

Accordingly, the objectives of this paper are: (1) develop a framework for understanding how customers choose which channel to use for search and purchase, (2) use that framework to propose three mechanisms that drive research shopping, (3) measure these mechanisms using survey data, and (4) demonstrate how managerial actions can either enhance or decrease research shopping.

Our framework is based on the well-known theory of reasoned action, applied to multiple behaviors (which channel to use for search *and* purchase). The mechanisms for research shopping which we derive from this framework, we call: (1) Attribute-driven decision-making, (2) Lack of channel lock-in and (3) Cross-channel synergy. In our empirical work, we find evidence for all three mechanisms.

In comparison to previous literature, our work is distinct in its dual emphasis on multiple behaviors (search and purchase) *and* multiple channels. Table 1 summarizes this literature, classified along two dimensions: (1) whether these studies

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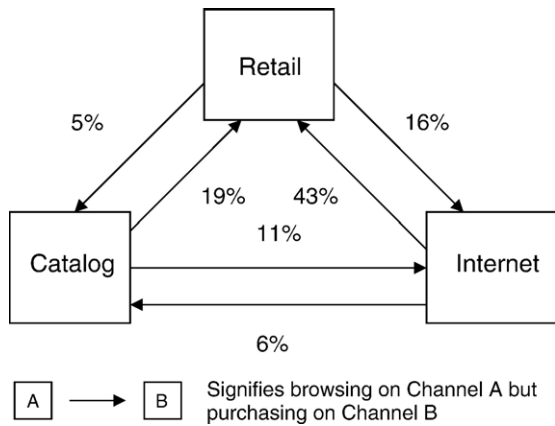


Fig. 1. Previous evidence of research shopping. To be read, for example, 43% of research shoppers gather information on the Internet but make the final purchase at the brick-and-mortar retail store. Source: Adapted from DoubleClick (2004).

considered search, purchase or both, and (2) whether these studies considered only one channel or multiple channels. Some studies have focused on the search decision, either for a single channel (e.g. Vermeir & van Kenhove, 2005) or for multiple channels. For example, Ratchford, Lee, and Talukdar (2003) study the determinants of the consumer’s decision to search for automobile information on the Internet vs. other potential sources. Some studies have focused on the purchase decision, either in a single-channel context (e.g., Baker, Parasuraman, Grewal, & Voss, 2002) or in a multichannel context. For example, Ansari, Mela, and Neslin (2006) study the impact of marketing and learning on customer purchase from either a catalog or the Internet. Kumar and Venkatesan (2005) study the effect of customer characteristics on multichannel purchasing behavior.

Table 1 illustrates a few studies that have examined search and purchase decisions jointly, albeit for a single channel. In particular, Montaya-Weiss, Voss, and Grewal (2003) study the determinants of online use, where “use” appears to include both search and purchase. In a multichannel context, Balasubramanian, Raghunathan, and Mahajan (2005) present a study on

multichannel choice for search and purchase. However, they do not empirically test their model, and they do not focus on research shopping. It can be concluded that research on multichannel customer behavior is still in its early stages (see also Neslin et al., 2006). Rangaswamy and van Bruggen (2005, p. 6), note that research has produced few generalizable insights regarding why customers use multiple channels. Balasubramanian et al. (2005, p. 13) state that research which focuses specifically on consumers’ use of multiple channels in searching for and deciding which products to buy is relatively sparse.

Thus, there is particular need for studies considering channel choice decisions for search and purchase in a multichannel environment, particularly studies that investigate interdependencies between the search and purchase decisions. Our research is positioned to fill this gap in the literature. The key contribution of this study is identifying three mechanisms that drive research shopping: (1) attribute-driven decision-making, (2) lack of channel lock-in and (3) cross-channel synergy. We also empirically analyze antecedents of channel attractiveness and channel choice, and while we do contribute to the growing knowledge base of these antecedents, we do not aim to test specific theories with regard to this literature (e.g. Baker et al., 2002).

We first discuss our conceptual model and derive the mechanisms which we propose drive research shopping. Then, we detail our methodology and our empirical results. Next, we discuss our simulations that illustrate the impact of potential managerial actions. We end with a theoretical discussion, managerial implications, research limitations and issues for further research.

1.1. Conceptual model

The conceptual model is displayed in Fig. 2 for a two-channel case. The objective is to understand why customers choose particular channels for search and purchase. Thus, we distinguish a channel choice decision for search and a channel choice decision for purchase. These behaviors are not mutually

Table 1 Literature review

		Number of channels	
		Single	Multiple
Customer decision	Search	<ul style="list-style-type: none"> <li>• Biswas (2004)</li> <li>• Johnson, Moe, Fader, Bellman, and Lohse (2004)</li> <li>• Vermeir and van Kenhove (2005)</li> </ul>	<ul style="list-style-type: none"> <li>• Ratchford et al. (2003)</li> <li>• Ratchford, Talukdar, and Lee (2001)</li> <li>• Strebel, Erdem, and Swait (2004)</li> <li>• Wendel and Dellaert (2005)</li> </ul>
	Purchase	<ul style="list-style-type: none"> <li>• Baker et al. (2002)</li> <li>• Darian (1987)</li> <li>• Childers, Carr, Peck, and Carson (2001)</li> <li>• Bell and Lattin (1998)</li> </ul>	<ul style="list-style-type: none"> <li>• Ansari et al. (2006)</li> <li>• Gupta, Su, and Walter (2004)</li> <li>• Alba et al. (1997)</li> <li>• Bhatnagar and Ratchford (2004)</li> <li>• Fox, Montgomery, and Lodish (2004)</li> <li>• Inman, Shankar, and Ferraro (2004)</li> <li>• Teerling and Huizingh (2005)</li> <li>• Venkatesan, Kumar, and Ravishanker (2007)</li> </ul>
	Search and purchase	<ul style="list-style-type: none"> <li>• Montaya-Weiss et al. (2003)</li> <li>• Schlosser et al. (2006)</li> </ul>	<ul style="list-style-type: none"> <li>• Balasubramanian et al. (2005)</li> <li>• This paper</li> </ul>

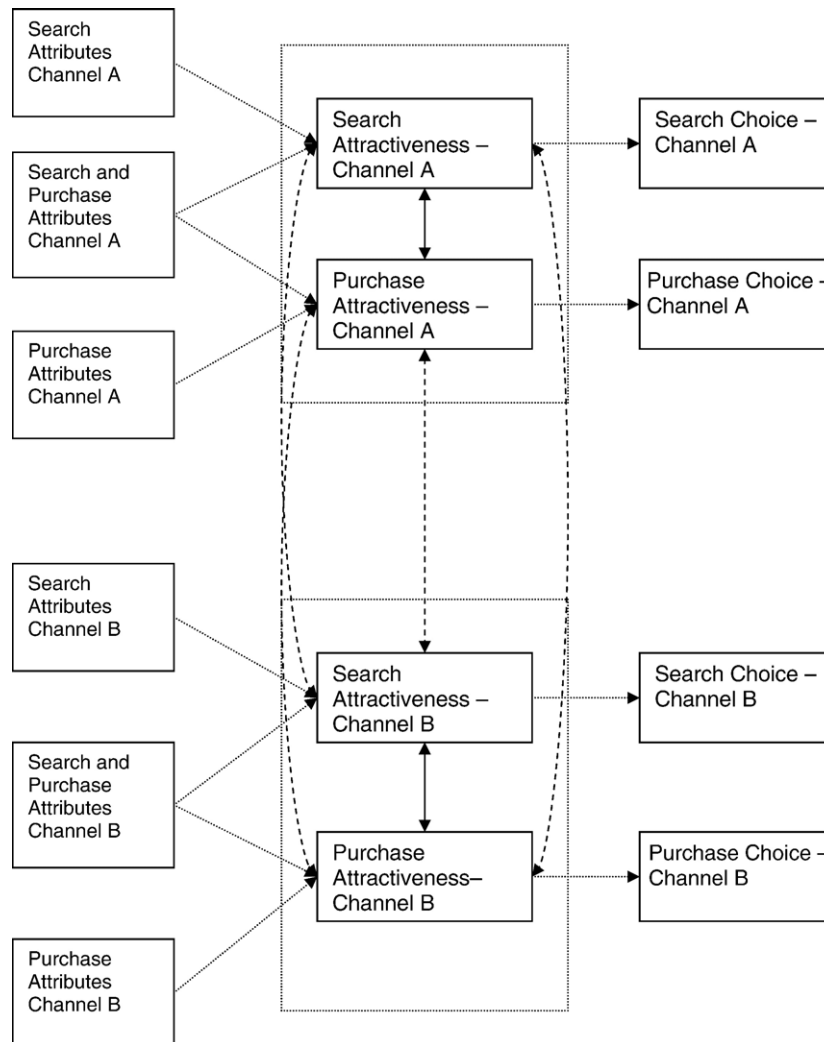


Fig. 2. Theory of reasoned action applied to search and purchase — two channels bold arrows show cross-over effects. Note: The solid lines between channel attractiveness represent channel lock-in. The dashed lines represent cross-channel synergy.

exclusive, in that the consumer could choose a channel for both search and purchase or for one behavior but not the other. Based on the theory of reasoned action (“TRA” (Fishbein & Ajzen, 1975; Sheppard, Hartwick, & Warshaw, 1988)), we assume that consumer perceptions of search and purchase attributes of each channel translate into the search and/or purchase attractiveness of each channel, which in turn affects channel choice for search and purchase. We distinguish between purely search attributes (e.g., ease of gathering information), purely purchase attributes (e.g., speed of obtaining the product), and attributes that apply to both search and purchase (e.g., product assortment).

We do not simply relate attributes directly to purchase for three reasons: First, the central thesis of TRA is that the effect of attribute beliefs on choice is mediated by overall attitudes towards the channel. Second, we are consistent with other channel studies, which show, for instance, that store attributes, such as store atmosphere and assortment, affect consumer perceptions of value, which subsequently affect a channels’ patronage intentions (e.g. Baker et al., 2002; Montoya-Weiss et al., 2003). Third, a choice variable, which is nominally scaled, contains less information than an interval-scaled attitude

variable. This allows us to measure more precisely the impact of attribute beliefs.

As in all TRA models, attribute perceptions drive attitudes, which, in turn, determine behavior. However, we extend this framework in two ways. First, we allow the attitude toward searching on Channel A (the “search attractiveness” of Channel A) to directly affect the attitude toward purchasing on Channel A (the “purchase attractiveness” of Channel A), and *vice versa*. We call this channel “lock-in”. Channel lock-in is represented by the short solid arrows in Fig. 2 — one exists for Channel A, and one for Channel B. Second, we allow for (search or purchase) attitudes toward Channel A to affect (search or purchase) attitudes toward Channel B, and *vice versa*. These we call cross-channel synergy. There are four cross-channel synergy effects depicted in Fig. 2, represented by curved dashed arrows.

Note the terms “channel lock-in” and “cross-channel synergy” are defined with a positive valence. Channel lock-in means that higher attitudes toward searching on Channel A translate into higher attitudes toward purchasing on Channel A. Channel synergy means that higher attitudes toward search or

purchase on Channel A translate into higher attitudes toward search or purchase on Channel B. However, the valence could turn out to be negative, e.g., higher attitudes toward search on Channel A could translate into lower attitudes toward purchase on Channel B. This would be an example of negative cross-channel synergy, and imply that the channels are substitutes.

Channel lock-in and cross-channel synergy play crucial roles in our analysis, and as discussed above, are based on a causal relationship between attitudes toward different behaviors. The theoretical rationale for this relationship is rooted in the attitude literature, where it has been shown that Attitude A can cause Attitude B, if Attitude A essentially assumes the role of an attribute in determining Attitude B. For example, in the literature on attitude toward the ad ( $A_{ad}$ ) and attitude toward the brand ( $A_{bd}$ ), it has been shown that  $A_{ad}$  serves as a factor determining the evaluation of the brand ( $A_{bd}$ ) (Mitchell & Olson, 1981). We apply this reasoning to say that the attitude toward performing one behavior (e.g., searching on Channel A) may influence the attitude toward performing another behavior (e.g., purchasing on Channel A, or searching on Channel B). The degree to which search attractiveness of Channel A determines the purchase attractiveness of Channel A, or vice versa, is what we call channel lock-in. For example, the attractiveness of Channel A as a search channel is one factor that enhances its attractiveness as a purchase channel. In the same vein, to the extent that attitude toward searching on Channel A may influence attitude toward purchasing on Channel B, we have cross-channel synergy. The attractiveness of Channel A as a search channel enhances the attractiveness of purchasing on Channel B. Cross-channel synergy is also referred to as complementarity of channels (Teerling & Huizingh, 2005).

## 1.2. Motives for research shopping

Given the attitude formation model in Fig. 2, we can identify three factors that can explain research shopping: (1) attribute-based decision-making, (2) lack of channel lock-in and (3) cross-channel synergy.

### 1.2.1. Attribute-based decision-making

This mechanism is based on consumer perception that one channel excels on attributes that determine search, while the other channel excels on attitudes that drive purchase. For instance, the Internet is often considered convenient for gathering information, while it is also considered to be risky to purchase because of security factors or the inability to physically touch and test the product (e.g. Alba et al., 1997; McKnight, Choudhury, & Kacmar, 2002). On the other hand, consumers may consider it laborious to search for information in retail stores, but not risky to make the final purchase decision there. This may cause consumers to search on the Internet and purchase in the store.

### 1.2.2. Lack of channel lock-in

As described above, the solid double-arrows in Fig. 2 show that higher attitudes toward searching on Channel A translate into higher attitudes toward purchasing on Channel A, and vice

versa. This is channel lock-in. High channel lock-in would *deter* research shopping because searching and purchasing would become highly correlated. However, if a given channel has low lock-in, that is, high search attitudes do not translate clearly into high purchase attitudes, the result would be research shopping. For example, we would hypothesize that the Internet has relatively low lock-in, because consumers commonly use the Internet as an information source and have come to categorize it in their minds as an “information source,” not a “shopping venue”. The ease of logging off a given website (the equivalent of walking out of a store) may also imbue the consumer with an inclination to move easily from searching on the Internet to purchasing on another channel.

### 1.2.3. Cross-channel synergy

Cross-channel synergy – the dashed double-arrows in Fig. 2 – may cause research shopping, because searching on Channel A enhances the experience of purchasing on Channel B. First, searching in one channel and purchasing in another channel may provide economic benefits. For instance, searching on the Internet may provide consumers with price-information, which allows them to obtain a better deal in the store through negotiation or better informed choices (e.g. Bakos, 1997; Morton, Zettelmeyer, & Silva Russo 2001). Second, from a psychological perspective, research shopping may provide the consumer with smart shopper feelings (Balasubramanian et al., 2005; Chandon, Wansink, & Laurent, 2000) and a higher self-image. These feelings arise because consumers believe that searching in one channel allows them to make better purchase decisions on another channel due to their own “smart” search behavior.

Cross-channel synergy mainly refers to positive synergistic effects between search-and purchase in two different channels. The appearance of negative cross-channel synergy is less obvious, and occurs when searching in one channel makes purchasing in another channel less desirable. For example, the website for an apparel firm might be organized differently (shirts vs. shoes vs. pants) than the firm’s store (men’s vs. women’s clothing), making it confusing for the consumer to search on the firm’s website and buy in the store.

## 2. Data collection and measurement

### 2.1. Data collection and sample

We surveyed the perceptions of 396 Dutch consumers of channel attributes, channel search and purchase attractiveness and intended channel choice for search and purchase. Each respondent evaluated one of six product/service categories: loans, vacations, books, computer, clothing, and electronic appliances. These categories differ in terms of purchase complexity, purchase frequency, and tangibility (Peterson, Balasubramanian, & Bronnenberg, 1997). This should produce substantial variation in the perceptions of the different channels across these six product categories. The selection of multiple categories also enhances the external validity of our research.

A representative consumer research panel of a large research agency in the Netherlands consisting of 40,000 members was used as the sampling frame. We selected from this frame a random sample of 3000 panel members with ages between 20–65 years and having an Internet connection. In May 2004, a short telephone survey determined whether these respondents had purchased anything included in the seven product categories during the three months before May 2004. We included only consumers with recent purchase experiences in these categories, because we believed these consumers were better able to provide meaningful channel perceptions. 2000 panel members indicated that they had purchased one or more of the selected six product categories, and one of the purchase categories was used as the shopping context for each respondent's survey. Of these 2000 panelists, we selected 800 for our survey. These panelists were equally distributed over the 6 product categories (approximately 130 panelists per category). We sent a mail survey to these 800 panel members. This 12-page survey consisted of multiple questions on channel usage and satisfaction, general channel perceptions, specific channel perceptions and intended channel choice for a product category, and psychographics.<sup>1</sup> The included channels were described up-front in the questionnaire. Especially for the store and the catalog, we included broad descriptions because the way in which these channels are implemented may vary between categories. For the store, we described it as a physical outlet. In some categories (i.e. loans), we explicitly described that the store can also be a personal advisor. The catalog was described broadly, as any written documentation (including catalogs as well as direct mail brochures), which can be used for search and/or to buy products or services. A total of 396 panel members responded (response rate 49.5%). Of these 396 responses, 51 were excluded because these respondents did not fully complete the questionnaire. The final analysis sample was 345 (usable response rate 43.1%).

Sample characteristics are reported in Table 2. Income and education levels are relatively high, which can be explained as follows. First, we selected respondents based on recent purchases in product groups, such as loans, which are purchased by wealthy consumers. Second, we only included consumers with Internet connections. Respondents are relatively equally distributed across the 6 product categories. There were 59–61 respondents per category. The only exception was clothing, for which the database only contains 45 respondents.

## 2.2. Definition and measurement of search and purchase attributes

We generated an initial list of attributes by considering: (1) benefits and costs that pertain to search, (2) benefits and costs that pertain to both search-and purchase, and (3) benefits and costs that pertain to purchase. The notion of using benefits

Table 2  
Sample characteristics

Age	Percentage	Income	Percentage
<35 years	19.4	Below median (<30,000 Euro)	13.6
35–50 years	48.7	Median ( $\pm$ 30,000 Euro)	24.1
>50 years	31.9	Above median (>30,000 Euro)	62.2
Education		Family	
University/ Polytechnic	41.7	1–2 person households no children	49.7
High school (high level)	39.7	Family with children <5 years	10.2
High school (low level)	18.0	Family with children 5–14 years	25.3
Low level education	0.6	Family with children >14 years	14.8

and costs to generate frameworks is supported by previous research (Alba et al., 1997; Baker et al., 2002; Bell, Ho, & Tang, 1998; Messinger & Narasimhan, 1997; Stigler, 1961). We note that it is not our objective to test hypotheses on the expected effects of a theoretically derived set of attributes. This type of work has been investigated by previous research. However, it is very important to include these attributes, as this allows us to determine the attribute-based motive for research shopping.

The initial list of attributes, their definitions, literature sources, and specific items are provided in Table 3. We will pursue exploratory factor analysis using the method of principal components to refine this list and come up with a manageable and interpretable set of factors. These factors will be the final attributes we use in our empirical analysis. We use PCA for two reasons. First, as mentioned above, it is not our aim to test a theory on the possible antecedents (with theoretically derived constructs) of channel attractiveness for search and purchase. If that were our aim, confirmatory factor analysis would have been the preferred method. Second, using principal components, we can generate orthogonal factor scores for our subsequent regression analysis, which eliminates multicollinearity. This approach is similar to that used by Rust, Lemon, and Zeithaml (2004) to evaluate multiple brands or suppliers on several characteristics.<sup>2</sup>

## 2.3. Measurement of channel attractiveness and choice

The attractiveness of each channel for search and purchase ( $A_{\text{search}}$  and  $A_{\text{purchase}}$ ) was measured by asking respondents to evaluate two items for each channel on a five-point scale: (absolutely not attractive vs. absolutely very attractive) and (absolutely not appropriate vs. absolutely very appropriate). The coefficient alpha for search attractiveness was 0.83, while it was 0.84 for purchase attractiveness.

<sup>1</sup> Our research was part of a large-scale study of the largest Dutch Marketing Consulting Company and a Dutch market research agency on the Dutch multichannel consumer.

<sup>2</sup> We do not use factor analysis for the after-sales items, because these differ by product category. We computed coefficient alphas per category for the items in each category. These ranged from 0.68 to 0.88, suggesting sufficient reliability. Hence, we summated these items to create an after-sales scale for each category.

Table 3  
List of attributes, definitions, literature sources and measurement items

Attribute	Type	Definition	Sources	Items
Information availability	Search benefit	The perceived quality, quantity, accessibility of information for consumers, and the ability to compare alternatives.	Alba et al. (1997), Hoque and Lohse (1999), Ratchford et al. (2001)	I can get <i>much information</i> on product X in... * The <i>information quality</i> on product X is good in... * I can <i>easily compare options</i> of product X in... I can <i>easily compare prices</i> of product X in... I can <i>get information</i> on product X on <i>each time of the day</i> in... I can quickly get information on product X in...
Search convenience	Search benefit	The perceived ease and speed at which consumers can gather information on products in the specific channel.	Hoque and Lohse (1999), Childers et al. (2001)	I can quickly get information on product X in...
Search effort	Search costs	The perceived required time (time costs) and perceived difficulty for consumers to gather information on the products and services.	Baker et al. (2002), Ratchford et al. (2003), Kang, Herr, and Page (2003)	It <i>costs a lot of time</i> to search for information on product X in... Collecting information on product X <i>costs a lot of effort</i> in... It is <i>difficult to collect</i> information on product X in...*
Service quality	Purchase benefit	The perception on the delivered service in the channel during the purchase.	Baker et al. (2002), Homburg, Hoyer, and Fassnacht (2002), Montoya-Weiss et al. (2003)	I can get <i>good service</i> for products X in... When buying product X I get <i>excellent help</i> in... I get <i>good personal advice</i> about product X in... <i>Delivery</i> is well arranged when buying product X in... (books, computer, electronic appliances, clothing) I can easily <i>trade in</i> product X for money in... (books, computer, electronic appliances, clothing) <i>Returning</i> product X is well arranged in... (books, computer, electronic appliances, clothing) Product X are usually <i>in stock</i> in... (books, computer, electronic appliances, clothing) If <i>I have problems</i> with product X I will get good help in... (all products) When <i>needing repair</i> for product X, that is easily arranged in... (computer, electronic appliances) Having product X <i>installed</i> is easily arranged in... (computer, electronic appliances) I can have a customized product X in... (loans, holiday) I can easily adapt product X in... (loans, holiday) I can easily cancel product X in... (loans, holiday)
After sales service	Purchase benefit	The expected quality of the service that is provided after the purchase (i.e. delivery, assistance when having problems, installation of products).	Van Kenhove, de Wulf, & Van Waterschoot (1999)	I can <i>buy</i> product X <i>each time of the day</i> in...* I can <i>quickly obtain</i> product X when buying in... <i>I can easily negotiate on prices of product X when buying in ...</i>
Purchase convenience	Purchase benefit	The efficiency, ease and speed at which products can be purchased.	Mathwick, Malhotra and Rigdon (2001), Messinger and Narasimhan (1997)	It <i>costs a lot of time</i> to buy product X in ... <i>Buying</i> product X <i>costs a lot of effort</i> in... It is <i>difficult to buy</i> product X in... It <i>costs a lot of time</i> to buy product X in... There is a large probability that <i>I do not get the right</i> product X when buying in... It is <i>difficult to judge the quality</i> of product X in... The probability on <i>wrong payments</i> for product X is large in... <i>Privacy of my personal data is secured</i> when buying product X in...
Negotiation possibilities	Purchase benefit	The perceived ability to negotiate on price and other aspects of the products in a channel.	Morton et al. (2001)	It is <i>fun to search</i> and buy product X in... Searching and buying product X is <i>comfortable</i> in... A <i>large assortment</i> of product X can be found in... You can buy the <i>newest products</i> X in... The <i>popular brands and types</i> of product X can be found in... <i>High-quality</i> products X can I buy in... Here I can find products X <i>fitting my needs</i> *
Purchase effort	Purchase cost	The perceived difficulty and time costs consumers experience when purchasing a product using a specific channel.	Baker et al. (2002); Bhatnagar and Ratchford (2004)	
Purchase risk	Purchase cost	The perceived uncertainty in buying products through a specific channel, due to things such as payment issues, and lack of privacy.	Hoffman, Novak, and Peralta (1999); McKnight et al. (2002), Forsythe and Shi (2003), Park and Jun (2003)	
Enjoyment	Search- and purchase benefit	The perceived shopping experiences that reflect the hedonic value of shopping in a channel.	Babin et al. (1994), Childers et al. (2001), Mathwick et al. (2001)	
Assortment	Search- and purchase benefit	The consumer's perceptions on quality, quantity, and availability of products in a channel.	Kunkel and Berry (1968), Samli, Kelly & Hunt (1998), Yoo, Park, and MacInnes (1998), Baker et al. (2002)	

Table 3 (continued)

Attribute	Type	Definition	Sources	Items
Price level	Search- and purchase costs	The consumers' perceptions of prices in a specific channel.	Dickson and Albaum (1977), Baker et al. (2002), Montaya-Weiss et al. (2003)	The prices of product X are low in... Buying products X in ... provides much value for money*
Promotions	Search- and purchase benefit	The consumers' perceptions on the level and depth of promotions.	Kunkel and Berry (1969), Dickson and Albaum (1977), Lam, Vandenbosch, Hulland, and Pearce (2001), Gijsbrechts, Campo, and Goosens (2003)	There are regularly promotions for product X in... There are attractive offers for product X in ...
Clientele	Search- and purchase benefit	The perceived use of this channel for either search or purchase by relatives and acquaintances (reference groups).	Park and Parker Lessig (1977), Alba et al. (1997), Balasubramanian et al. (2005)	My friends and acquaintances seek for information on product X in ... My friends and acquaintances buy product X usually in...

\* These items did not end up in factor analysis due to low factor loadings or interpretation problems.

To measure intended choice of the channel, we asked which channel respondents would use for search and purchase if they were again to buy the product or service. As consumers can use multiple channels for search, respondents could choose multiple channels for search. For purchase, respondents were forced to choose only one channel.

### 3. Analysis

#### 3.1. Channel attitude formation model

We modeled attitude/attractiveness formation as a six-equation simultaneous model and estimated it using three-stage least squares (3SLS). The exogenous drivers of attitudes are the principal components factors (attributes), which we classify as pertaining to search ( $X$ ), purchase ( $W$ ), or search and purchase ( $Z$ ). The model also includes controls for customer characteristics ( $V$ ), such as age and income, as well as the product category ( $U$ ) that formed the context for which consumers rated each channel. Simultaneity arises because of lock-in and cross-channel synergy, which implies that attitudes serve both as dependent and independent variables. Formally, the attitude formation model for a given channel can be written as:

$$\begin{aligned}
 \text{Search}_{ij'} &= \alpha^{sj'} + \sum_{j \neq j'} \gamma_j^{sj'} \text{Search}_{ij} + \sum_j \omega_j^{sj'} \text{Purchase}_{ij} \\
 &+ \sum_k \beta_k^{sj'} X_{ij'k} + \sum_k \delta_k^{sj'} Z_{ij'k} + \sum_d \phi_d^{sj'} V_{id} \\
 &+ \sum_c \kappa_c^{sj'} U_{ijc} \varepsilon_{ij'}^s \quad (1a)
 \end{aligned}$$

$$\begin{aligned}
 \text{Purchase}_{ij'} &= \alpha^{pj'} + \sum_j \gamma_j^{pj'} \text{Search}_{ij} + \sum_{j \neq j'} \omega_j^{pj'} \text{Purchase}_{ij} \\
 &+ \sum_k \beta_k^{pj'} W_{ij'k} + \sum_k \delta_k^{pj'} Z_{ij'k} \\
 &+ \sum_d \phi_d^{pj'} V_{id} + \sum_c \kappa_c^{pj'} U_{ijc} + \varepsilon_{ij'}^p \quad (1b)
 \end{aligned}$$

where,

$X_{ijk}$  Consumer  $i$ 's perception of channel  $j$  along search attribute  $k$ .

$W_{ijk}$  Consumer  $i$ 's perception of channel  $j$  along purchase attribute  $k$ .

$Z_{ijk}$  Consumer  $i$ 's perception of channel  $j$  along search-and-purchase attribute  $k$ .

$V_{id}$  Consumer  $i$ 's value along customer characteristic  $d$ .

$U_{ijc}$  Dummy variable for product class  $c$ , equal to 1 if consumer  $i$ 's rating of channel  $j$  is for product class  $c$ ; 0 otherwise.

$\text{Search}_{ij}$  Consumer  $i$ 's perceived attractiveness of channel  $j$  for search.

$\text{Purchase}_{ij}$  Consumer  $i$ 's perceived attractiveness of channel  $j$  for purchase.

$\varepsilon_{ij'}^s, \varepsilon_{ij'}^p$  Error terms assumed to follow a multivariate normal distribution. The errors are assumed independent between subjects but correlated between equations.

Eqs. (1a) and (1b) are for one channel,  $j'$ . There are three sets of these equations, one for each channel, for a total of six equations. Parameters are specific to the channel and to the attitude (search or purchase). For example,  $\gamma_j^{sj'}$  depicts the impact of the customer's search attitude toward channel  $j$  on the customer's search attitude toward channel  $j'$ . Note that the sum over search attitudes in Eq. (1a) does not include the impact of search attitude for  $j'$  on search attitude for  $j'$ , and in Eq. (1b) does not include the impact of purchase attitude for  $j'$  on purchase attitude for  $j'$ .

The  $\gamma$ 's and  $\omega$ 's reflect cross-channel synergy and lock-in effects. For example, Eq. (1a) includes the impact of purchase attitude for  $j'$  on the search attitude for  $j'$  ( $\omega_j^{sj'}$ ). This is one form of channel lock-in. The second scenario, more relevant for research shopping, would be the impact of search attitude for  $j'$  on purchase attitude for  $j'$ , captured by  $\gamma_j^{pj'}$ . The other  $\gamma$  and  $\omega$  coefficients, when  $j \neq j'$ , depict various forms of cross-channel synergy. For example,  $\gamma_j^{pj'}$  would reflect the cross-channel synergy of using channel  $j$  for search and  $j'$  for purchase.

Note that the  $X$  attributes appear in the search Eq. (1a) but not in the purchase Eq. (1b), while purchase attributes  $W$  appear in the purchase Eq. (1b) but not the search Eq. (1a). This allows the model to be identified, since several exogenous variables are excluded from each equation. The error terms  $\varepsilon_{ij'}^s$  and  $\varepsilon_{ij'}^p$  are

potentially correlated with each other for a given channel and across channels.<sup>3</sup>

We pool data across the six categories, but we allow for differences in levels by including the category dummy variables. We pool across the categories, as we have, on average, only 50 observations per category. Using 3SLS to estimate six equations with only 50 observations per equation and an average of 15 variables per equation could easily produce over-fitting. By including the category dummies, we address a main problem with pooling, namely difference in levels. Our results, indeed, show some significant category dummies. However, we do, acknowledge that there could be differences in some of the individual slope coefficients.

### 3.2. Search choice model

The search choice model translates search attractiveness into whether the consumer chooses the channel for search. Search choice is modeled as a multivariate probit–multivariate, because the consumer can choose more than one channel for search (Manchanda, Ansari, & Gupta, 1999). Formally, we define  $Y_{ij}^*$  as the latent variable reflecting consumer  $i$ 's overall utility toward choosing channel  $j$  for search, and  $SearchChoice_{ij}$  is given a 1 if consumer  $i$  chooses to search on channel  $j$  and 0 otherwise. The multivariate probit is then:

$$Y_{ij}^* = \psi_{0j} + \psi_{1j}Search_{ij} + \eta_{ij} \quad (j = 1, 2, 3) \tag{2a}$$

$$SearchChoice_{ij} = \begin{cases} 1 & \text{if } Y_{ij}^* > 0 \\ 0 & \text{otherwise} \end{cases} \tag{2b}$$

The error terms ( $\eta_{ij}$ ) are assumed to be multivariate normal, independent between respondents but correlated between equations.

### 3.3. Purchase choice model

The purchase choice model translates purchase attractiveness into whether the consumer chooses that channel for purchase. We use a multinomial logit model–multinomial because the consumer can only choose one channel for purchase. Define  $R_{ij}^*$  as a latent variable, reflecting consumer  $i$ 's utility of choosing channel  $j$  for purchase.  $PurchaseChoice_{ij}$  is defined as 1 if consumer  $i$  chooses channel  $j$  for purchase; 0 otherwise. The multinomial logit is then:

$$R_{ij}^* = \theta_{0j} + \theta_{1j}Purchase_{ij} + \mu_{ij} \tag{3a}$$

$$PurchaseChoice_{ij} = \begin{cases} 1 & \text{if } R_{ij}^* = \text{Max}(R_{im}^*) \\ 0 & \text{otherwise} \end{cases} \tag{3b}$$

<sup>3</sup> Our model is estimated for product categories jointly. We account for possible differences between the considered product categories with the inclusion of product dummies. Another option would have been to estimate models per product category. However, given the limited sample size (approximately 50 per product category) and the large number of explanatory variables, this would lead to unreliable estimates for both the endogenous and the exogenous variables in our model.

The  $\theta_{0j}$  parameters are “channel-specific” constants, reflecting average preference for the channel, while  $\theta_{1j}$  reflects the impact of an individual customer’s purchase attitudes toward that channel on channel choice. Assuming the  $\mu$ 's are independent and follow an extreme value distribution, Eqs. (3a) and (3b) imply:

$$\text{Prob}(PurchaseChoice_{ij}= 1) = \frac{e^{\hat{\theta}_{0j} + \hat{\theta}_{1j}Purchase_{ij}}}{\sum_m e^{\hat{\theta}_{0m} + \hat{\theta}_{1j}Purchase_{im}}} \tag{4}$$

where  $\hat{\theta}$  are the estimated values of  $\theta$ .<sup>4</sup>

## 4. Empirical results

### 4.1. Descriptive statistics of channel choice

Consumers tend to heavily prefer the store in both the search- and the purchase stage: 81% intended to use the store for information search, while 84% intended to purchase in the store. Internet was pretty popular for search (64%), while it was much less chosen as a future purchase channel (13%). Catalogs are chosen for search by 47% of the consumers, while only 3% intended to purchase through this channel. In the search phase, consumers can use multiple channels for search: 27% had only one primary channel for search, 48% intended to use two channels, and 25% intended to use three channels. Research shopping occurs when one of the used search channels is not used for purchase. In our database, approximately 76% of the respondents did research shopping.<sup>5</sup> We will focus on the differences between the various forms of research shopping in our analysis of the reasons for research shopping. By definition, research shopping occurs among consumers indicating use of multiple channels for search. Among consumers choosing one channel for search, 21.7% intended to use another channel for purchase. So research shopping occurs, even among customers using one channel for search.

### 4.2. Principal components analysis of attributes

We used principal components analysis to organize the 36 measurement items in Table 3 into a more manageable and interpretable number of orthogonal factors.<sup>6</sup> The analysis was done across all product categories and channels. Hence, there were 1035 observations (3 channels × 345 respondents). It was important that we could clearly distinguish factors related to search ( $X$ ), purchase and search ( $Z$ ), or purchase ( $W$ ). Therefore, items that had small loadings or caused interpretation problems were excluded. This resulted in 28 remaining items. Table 4

<sup>4</sup> The multivariate probit model is estimated in SAS using Proc QLIM, via simulated maximum likelihood, while the multinomial logit model is estimated in Limdep 8.0 using maximum likelihood.

<sup>5</sup> Note we had 280 customers with non-missing data for intended purchase channel.

<sup>6</sup> Note we do not include the 10 after-sales items in this analysis. See Footnote 2.



shows the varimax rotated component loadings of these items. We retained 14 principal components, because this was the solution with the best interpretation. The minimal Eigenvalue is 0.51.<sup>7</sup> These factors explained 83.9% of the variation in the original 28 items, with the first factor explaining 28.42% of the variance. The factors interpret nicely and were grouped clearly into search, purchase, and search-and-purchase attributes as follows:

Search Attributes (B = benefit; C = cost) ( $X$  in Eq. (1a)):

- “Compare Information”: This relates to how easy it is to compare products and their prices using the channel. (B)
- “Search Convenience”: This relates to ease and convenience in collecting information on the channel. (B)
- “Search Effort”: This relates to the time and effort it takes to search for information on the channel. (C)

Purchase Attributes (B = Benefits; C = Costs) ( $W$  in Eq. (1b)):

- “Service”: The availability of personal advice, excellent assistance during purchase, and excellent service. (B)
- “Negotiation possibilities: Whether one can negotiate price when using the channel. (B)
- “Quick Obtain”: How fast the purchased product can be obtained after the purchase. (B)
- “Purchase Risk”: The difficulty in judging quality and the possibility of not receiving an order placed on the channel, as well as payment hassle. (C)
- “Purchase Effort”: The effort required to purchase the product. (C)
- “Buying Time”: How fast a product can be purchased. (B)
- “Privacy”: The perception that privacy is guaranteed when using the channel. (C)

Search-and-Purchase Attributes (B = Benefits; C = Costs) ( $Z$  in Eqs. (1a)–(1b)):

- “Assortment”: Whether the channel has available popular brands, the newest types of products, large assortment, and good quality products. (B)
- “Price Promotion”: The availability of low prices and attractive offers. (B)

<sup>7</sup> An often-used approach for determining the number of components is the Eigenvalue > 1 cut-off rule. We certainly considered the Eigenvalue cut-off rule, but put more emphasis on interpretation and managerial relevance. Lehmann, Gupta, and Steckel (1998) as well as Gatignon (2004) recommend such considerations in addition to the Eigenvalue cut-off rule. Our approach is also similar to Rust et al. (2004). As these authors note, there are many other criteria for selecting the number of factors, of which one is interpretability or psychological meaningfulness (p. 118) (see also Kaiser, 1960). In addition, use of the Eigenvalue cut-off rule results in only 7 factors, explaining 67% of the variation. These factors are much more difficult to interpret, while multiple variables have relatively high factor loadings on multiple factors. Our 14 factors account for 84% of the total variation, yet are orthogonal, so we have no problems with multicollinearity among the factor scores. Moreover, their interpretability is high, while the variables do not have high factor loadings on multiple factors.

- “Clientele”: Whether friends and acquaintances use the channel for search and/or purchase. (B)
- “Enjoyment”: Whether it is fun and comfortable to shop using this channel. (B)

In summary, the factor analysis is pretty much in line with the ex-ante defined attributes (see Table 3).<sup>8</sup> However, there are some differences. The ex-ante defined purchase convenience factor is split into multiple factors, while price and promotion are grouped together into one factor. Privacy is not grouped into the risk factor, but appears to be a separate factor.

Fig. 3 plots the average scores for each of the three channels along each of the 14 factors, plus after-sales. These scores are computed from the factor score coefficients derived from the principal components analysis (e.g. Lehmann et al., 1998). The results are intuitive. The store channel is particularly strong on Service, Risk, and Privacy, and relatively weak on Search Convenience. The Internet is very strong on Search Convenience and Compare Information, although not strong on Search Effort and very weak on Privacy. Catalogs are particularly weak on Service and Negotiation, but relatively high on Enjoyment. In summary, Fig. 3 suggests that stores are positioned around service and privacy, the Internet is positioned along search convenience and comparing information, Catalogs are positioned as enjoyable and fairly convenient for search.

#### 4.3. Estimation results: 3SLS model

##### 4.3.1. Effect of attributes on attractiveness

Table 5 shows the estimated coefficients and their t-statistics for the included attributes (factor scores) in the channel attractiveness models. The system-weighted  $R^2$  for the model was 0.659. The correlations between the error terms were generally small, with the largest occurring between equations for a given channel. For example, the correlations between the error terms for search and purchase were  $-0.682$  in the store equations and  $-0.462$  in the catalog equations. All other correlations between error terms were less than 0.4 in absolute value. The negative correlations signify that the unobserved factors which we could not measure tended to work in opposite directions, i.e., if they increased search attractiveness, they tended to decrease purchase attractiveness. This could be due to individual difference variables. For example, perhaps being a shopping maven increases the consumer’s utility for searching on all channels, but decreases or has no effect on the consumer’s utility for purchasing on any given channel.

In the search equations, Search Convenience and Compare Information are highly significant, with a positive sign for each channel, as expected. Search Effort has a negative sign in the two equations, as expected, although this attribute is not as strong in absolute value or significance levels.<sup>9</sup> Search-and-

<sup>8</sup> Using the outcome of the PCA, we also ran a confirmatory factor analysis. The fit of this model was adequate and the correlations between the latent constructs were all significantly below 1, indicating discriminant validity.

<sup>9</sup> It is appropriate to compare magnitudes of coefficients, since the variables are factor scores which are standardized across consumers and channels, hence, all these variables have the same standard deviation: 1.



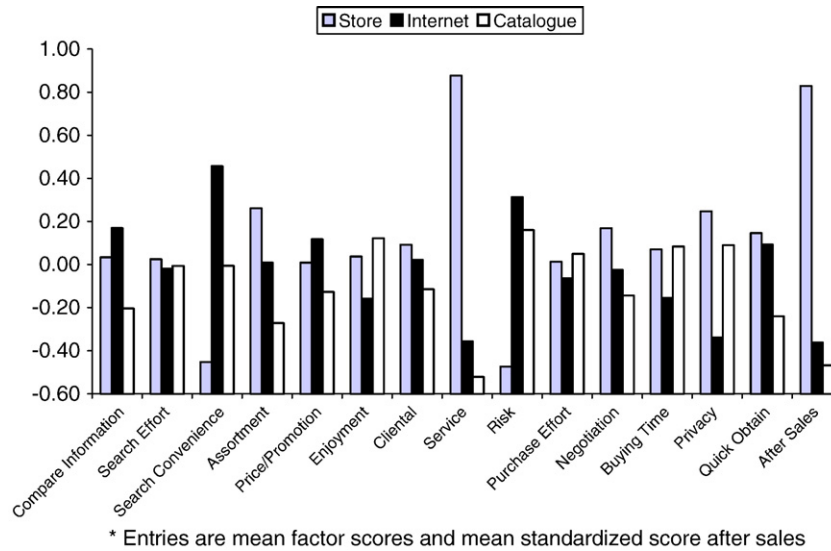


Fig. 3. Customer perceptions of channels along attributes. Entries are mean factor scores and mean standardized score after sales.

Purchase benefits also influence search attractiveness, especially Enjoyment, Assortment, Price Promotion, and Clientele are strongly significant in the Internet and Catalog equations. The relatively strong coefficient for Price Promotion in the Internet equation might signal that consumers use the Internet to search for good deals. Finally, note that there are fewer significant coefficients in the store search equation, while the coefficients are also generally smaller than in the other two equations.

We also found significant effects in the purchase equations having sensible signs. However, surprisingly, we only found one marginally significant coefficient (Price Promotion) in the store equation. In the other two equations, many significant effects were found. For example, Service is significantly positive in both equations, and Purchase Effort is significantly negative in the Internet equation. Risk and Privacy are particularly important deterrents from using the Internet for purchase, as was expected. Risk is also very important for Catalogs. Likewise, with the search equation, we find that Assortment, Clientele, and Enjoyment significantly affect Internet purchase attractiveness.

The finding of few significant effects in the store equations in comparison with the Internet and catalog may be due to lower variation in the attractiveness scores for the store compared to the Internet and catalog. Indeed, an examination of the standard deviations supports this explanation. While the standard deviations of the attractiveness scores for the store are around 0.60, they are around 1.10 for the other two channels. The high average attractiveness scores for the store, coupled with small standard deviations, causes difficulties in finding significant effects for the attributes. Moreover, as the endogenous variables are also included, finding significant effects of the attributes becomes even more difficult.

#### 4.3.2. Lock-in and cross-channel synergy effects

Table 6 provides the estimated coefficients and their  $t$ -statistics for lock-in and cross-channel synergy effects. The coefficients for search on purchase and purchase on search, for a given channel, represent lock-in effects (see Eqs. (1a) and (1b)). There are 6 such coefficients (shaded in gray). They are strongly

positive for the store and catalog (Store: 0.918; 0.738; Catalog: 0.539; 0.731), and weakly positive, but not significant, for the Internet (0.049; 0.086). This suggests that the Internet has poor lock-in.

The cross-channel synergy effects are reflected in the coefficients between search and purchase of different channels (i.e. Internet Search $\Rightarrow$ Store Purchase).<sup>10</sup> There are 12 such coefficients in Table 6. Five of these are statistically significant. Of these, three are positive and two are negative. Positive significant coefficients are found for Internet Search $\Rightarrow$ Store Purchase (0.093), Catalog Search $\Rightarrow$ Internet Purchase (0.309) and Catalog Purchase $\Rightarrow$ Internet Search (0.138). Thus, there is evidence for some cross-channel synergies. The negative significant coefficients are found for Catalog Purchase $\Rightarrow$ Store Search (-0.14), and Store Search $\Rightarrow$ Catalog Purchase (-0.420). Thus, consumers perceiving the catalog to be attractive for purchase believe that the store is less attractive for search and vice versa (negative cross channel synergy).<sup>11</sup>

Our results suggest that the Internet is especially vulnerable to the research shopper. This is because channel lock-in is insignificant for this channel, and there is a marginally significant cross-channel synergy between Internet search and store purchase. Note also that there is a strong cross-channel synergy from catalog search to Internet purchase (0.309,  $t=2.52$ ), suggesting that there may be some research shopping whereby the consumer searches in the catalog and then buys on the Internet.

<sup>10</sup> In interpreting these coefficients, one should keep in mind that we are measuring cross-effects between attitudes. Hence, the coefficients do not have a temporal meaning. For example, we find that there is a positive effect of purchase attractiveness of catalogs on search attractiveness of the Internet. This does not imply that customers will first purchase using a catalog and then search through the Internet.

<sup>11</sup> Our results also reveal five significant cross-channel effects between the same behavior among different channels. Of these, four are negative. These effects are not of direct relevance to the research shopper phenomenon, but the negative results suggest channel substitution for the same behavior.

Table 5  
Attitude formation model results: search and purchase attitudes as function of attributes

	Store				Internet				Catalog			
	Search		Purchase		Search		Purchase		Search		Purchase	
	Coefficient	<i>t</i> -statistics	Coefficient	<i>t</i> -statistics	Coefficient	<i>t</i> -statistics	Coefficient	<i>t</i> -statistics	Coefficient	<i>t</i> -statistics	Coefficient	<i>t</i> -statistics
Search convenience	<b>0.062</b>	<b>2.96</b>			<b>0.379</b>	<b>7.57</b>			<b>0.116</b>	<b>2.94</b>		
Search effort	-0.016	0.85			0.006	0.20			-0.009	0.24		
Compare information	<b>0.073</b>	<b>2.79</b>			<b>0.220</b>	<b>5.92</b>			<b>0.197</b>	<b>5.39</b>		
Service			0.043	0.89			<b>0.262</b>	<b>3.33</b>			<b>0.171</b>	<b>2.53</b>
Risk			-0.013	0.48			<b>-0.288</b>	<b>5.38</b>			<b>-0.195</b>	<b>3.99</b>
Purchase effort			-0.015	0.88			<b>-0.084</b>	<b>1.93</b>			-0.045	1.18
Negotiation			-0.022	1.34			-0.018	0.37			0.028	0.65
Quick obtain			0.002	0.10			<b>0.083</b>	<b>1.80</b>			0.056	1.41
Privacy <sup>a</sup>			0.019	0.83			<b>-0.231</b>	<b>5.19</b>			<b>-0.079</b>	<b>1.92</b>
Buying time <sup>a</sup>			0.019	1.07			<b>0.076</b>	<b>1.97</b>			<b>0.075</b>	<b>1.97</b>
After sales			0.031	0.68			<b>0.348</b>	<b>3.68</b>			<b>0.148</b>	<b>1.85</b>
Assortment	0.033	0.82	0.042	1.15	<b>0.280</b>	<b>7.71</b>	<b>0.253</b>	<b>4.18</b>	<b>0.177</b>	<b>4.26</b>	<b>0.099</b>	<b>2.02</b>
Price promotion	-0.012	0.39	<b>0.051</b>	<b>1.71</b>	<b>0.217</b>	<b>5.53</b>	<b>0.095</b>	<b>1.82</b>	<b>0.119</b>	<b>3.32</b>	0.059	1.52
Clientele	0.002	0.08	0.016	0.72	<b>0.120</b>	<b>3.24</b>	<b>0.191</b>	<b>4.14</b>	<b>0.103</b>	<b>2.39</b>	0.045	0.91
Enjoyment	<b>0.058</b>	<b>1.70</b>	0.016	0.46	<b>0.291</b>	<b>6.27</b>	<b>0.340</b>	<b>5.50</b>	<b>0.178</b>	<b>4.10</b>	0.073	1.39

We do not report the coefficients of the consumer characteristics and the product dummies, in order to save space. These coefficients are available upon request from the authors.

Bold⇒statistically significant at  $p \leq .10$  (two sided tests).

<sup>a</sup> We included negative factor scores in our model for these two variables. Privacy is considered a cost, but the item is stated positively (privacy guaranteed). Buying time is considered a benefit, but the item is stated negatively (a lot of time to buy).

#### 4.4. Multivariate probit and multinomial logit results

Table 7a and b displays the results of the multivariate probit model, linking search attractiveness to search choice, and the multinomial logit model, linking purchase attractiveness to purchase choice. The probit slope coefficients are strongly significant for all three channels. The multinomial logit model results show a significant effect of purchase attractiveness on channel choice for purchase.

### 5. Diagnosing and managing research shopping

The central issues in this paper are to understand (1) why the research shopper phenomenon is prevalent in some channels and (2) how firms can decrease or increase research shopping. We, therefore, first use our survey and model results to identify the degree of research shopping in our data and explain it using our three proposed mechanisms: attribute-based decision making, lock-in, and cross-channel synergy. Next, we use our model to simulate the impact that various changes, motivated by the mechanisms, would have on research shopping.

#### 5.1. Extent of and reasons for research shopping across channels

Among the three mechanisms for research shopping, lack of channel lock-in and the existence of cross-channel synergies are measured by our model coefficients. However, for the attribute-driven motive we need additional calculations. We are interested in the differences in search attractiveness between channels, and the differences in purchase attractiveness between

channels due to channel attributes. To calculate these differences, we first obtained the reduced form estimates of the parameters for Eqs. (1a)–(1b). We then multiplied each respondent's factor score, for each channel, for the attributes connected with search or purchase (see Table 5), times their corresponding reduced form parameters, and summed them. This yielded weighted measures for each customer of each channel's perceived attribute-driven attractiveness for search and purchase. The mean differences between channels appear in Table 8, along with a summary of our other findings. We also calculated the actual percentage of consumers using one channel for search and using the other channel for purchase, as a direct measure of the extent of research shopping between the various channels.

The analysis provides some interesting results. First, the highest research shopping percentage is the Internet Search⇒Store Purchase combination. This corresponds nicely to the independent findings shown in Fig. 1. All three mechanisms appear to be at work in producing Internet Search⇒Store Purchase research shopping. In terms of attributes, the Internet has a search advantage and a purchase disadvantage vs. the store. The Internet also has little lock-in (Table 6). Finally, there is some positive cross-channel synergy (weakly significant but still positive) from Internet search to store purchase (Table 6). These three factors combine to generate significant research shopping from the Internet to the Store.

Table 8 also reveals a high percentage of Catalog⇒Store research shopping. This is clearly attribute-based. The catalog is perceived as significantly less desirable for purchase compared to the store. The high lock-in for the catalog is apparently not able to overcome this large disadvantage in purchase attributes.

Table 6  
Within and between channel cross-over coefficients

		Effect on												
		Store				Internet				Catalog				
		Search		Purchase		Search		Purchase		Search		Purchase		
		Coefficient	T	Coefficient	T	Coefficient	T	Coefficient	T	Coefficient	T	Coefficient	T	
Effect of	Store	Search		<b>0.738</b>	<b>8.14</b>	<b>-0.306</b>	<b>1.83</b>	-0.190	0.84	-0.156	0.87	<b>-0.420</b>	<b>2.13</b>	
		Purchase	<b>0.918</b>	<b>11.23</b>			0.127	0.65	-0.307	1.18	0.016	0.08	0.293	1.30
	Internet	Search	-0.057	1.09	<b>0.093</b>	<b>1.88</b>			<b>0.086</b>	<b>0.77</b>	0.029	0.37	-0.096	1.10
		Purchase	0.077	1.64	<b>-0.109</b>	<b>2.45</b>	<b>0.049</b>	<b>0.70</b>			-0.119	1.64	0.041	0.50
	Catalog	Search	<b>0.143</b>	<b>2.16</b>	-0.017	0.26	<b>-0.171</b>	<b>1.95</b>	<b>0.310</b>	<b>2.52</b>			<b>0.731</b>	<b>7.92</b>
		Purchase	<b>-0.145</b>	<b>2.43</b>	0.029	0.50	<b>0.138</b>	<b>1.70</b>	<b>-0.259</b>	<b>2.29</b>	<b>0.539</b>	<b>8.25</b>		

Bold => Statistically significant at  $p \leq .10$  (two-sided tests).  
Gray shading depicts estimated lock-in effects.

Cross-channel synergy did not play a role here, because it was statistically insignificant.

While less common, Table 8 also reveals some Catalog => Internet research shopping. This is not explained by attributes (the catalog and Internet are roughly equal on purchase attributes), nor is it explained by lack of lock-in, because the catalog has high lock-in (Table 6). However, there is a great deal of cross-channel synergy (the 0.309 coefficient from catalog search to Internet purchase (Table 7a and b)). In short, customers find it natural to peruse the catalog to search for what they want, and then order it on the Internet.

In the rest of the channel pairs, research shopping is curtailed either by high lock-in (for catalog and store), by lack of cross-channel synergy, or by attributes. For example, the prototypical way to produce attribute-driven research shopping would be for both (1) the search difference in Table 8 to be significantly positive and (2) the purchase difference to be significantly negative. This only occurs for Internet => Store research shopping.

In summary, Table 8 demonstrates that the mechanisms for research shopping proposed in this paper – attribute-driven decision making, lack of lock-in, and cross-channel synergy – explain the types of research shopping observed in our data, especially the most common form, Internet => Store. It is noteworthy that Internet => Store research shopping is also

reported as the most common form of research shopping in an independent study (Fig. 1).

### 5.2. Managing research shopping

Research shopping can be viewed either as negative or positive from a company standpoint. Internet => Store research shopping is usually viewed negatively, since companies are afraid they will lose the customer if the customer searches various websites and then buys at another store (Nunes & Cespedes, 2003). Also, a pure-play Internet retailer would certainly view Internet => Store research shopping as a negative. However, Internet => Store research shopping can be viewed positively if the company integrates its Internet and store well-enough so that the Internet essentially acquires customers and funnels them to the store.

We will illustrate how our model can be used to suggest and measure the impact of specific strategies for managing research shopping. The three mechanisms this research has identified as drivers of research shopping suggest three strategies for managing research shopping: (1) change the search and/or purchase attributes of one or both of the channels, (2) create or decrease channel lock-in, and (3) create or reduce cross-channel research synergies. We focus on Internet => Store research shopping, since it is the most common, and assume that the goal is to reduce research shopping.

We use simulations to assess the effect of the three considered strategies. Our basic approach is to change attribute values or coefficients in the 3SLS model and simulate how these changes affect the search- and purchase attractiveness of each consumer. We run a base simulation using the estimated coefficients and values, then simulate with alterations of these numbers based on the particular strategy scenario under consideration, and then

Table 7a  
Multivariate probit model

	Coefficients			
	Constant		Attractiveness coefficient	
	Coefficient	t-statistic	Coefficient	t-statistic
Store	<b>-2.045</b>	<b>3.40</b>	<b>0.707</b>	<b>5.08</b>
Internet	<b>-3.938</b>	<b>7.87</b>	<b>1.069</b>	<b>8.97</b>
Catalog	<b>-3.012</b>	<b>7.84</b>	<b>0.795</b>	<b>8.05</b>

Correlations between equations

	Store	Internet	Catalog
Store	1		
Internet	<b>-0.259</b>	1	
Catalog	-0.062	0.153	1

Bold=>Statistically significant at  $p \leq .10$  (two-sided tests).

Table 7b  
Multinomial logit model

	Coefficient	t-statistic
Constant store	<b>1.494</b>	<b>3.702</b>
Constant Internet	<b>0.959</b>	<b>2.23</b>
Purchase attractiveness	<b>2.867</b>	<b>6.449</b>

Bold=>Statistically significant at  $p \leq .10$  (two-sided tests).

Table 8  
Diagnosing the extent and reasons for research shopping

Research shopping pattern	Mechanisms for research shopping				
	Attribute-driven mean differences <sup>a</sup>		Search channel lock-in	Cross-channel synergy	Actual research shopping <sup>b</sup> (%)
	Search difference	Purchase difference			
Internet→Store	0.2	-0.7	Low	Positive ( $p < .10$ )	50.3
Internet→Catalog	0.37	0.05	Low	n.s.	1.4
Catalog→Store	-0.17	-0.75	High	n.s.	33.7
Catalog→Internet	-0.37	-0.05	High	positive ( $p < .05$ )	6.6
Store→Catalog	0.17	0.75	High	negative ( $p < .05$ )	2.1
Store→Internet	-0.2	0.7	High	n.s.	5.9

<sup>a</sup> Each of these means is significantly different from zero at least at the 1% level, except for the Catalog/Internet difference, which is significant at the 0.12 level ( $z$ -statistic = 1.54).

<sup>b</sup> These numbers represent the percentage of research shopping instances of each form of research shopping. In particular, we identified research shoppers as purchasers in our sample if they either reported searching multiple channels or searched in only one channel but purchased in another. This yielded 214 research shoppers and 288 instances of research shopping (since a respondent could engage in more than one form of research shopping — e.g., the respondent who searched on the Internet and the Catalog yet purchased on the Store would be engaging in Internet⇒Store and Catalog⇒Store research shopping). Our goal was to calculate actual research shopping behaviors to be consistent with the DoubleClick study reported in Fig. 1. We therefore divided the actual instances by 288 so that the percentages in Table 8 would sum to one, as they do in Fig. 1.

subtract the two. The simulation method for a given set of attribute values and coefficients is, as follows:

1. Use the estimated (or altered, depending on the scenario) coefficients and their covariance matrices to draw a set of coefficients (from a multivariate normal distribution) for the attractiveness model (Eqs. (1a)–(1b)), the search model (Eq. (2a)), and the purchase model (Eq. (3a)).
2. For each of the 345 respondents:
  - a. Calculate search and purchase attractiveness using Eqs. (1a)–(1b) and either the original or altered (depending on the strategy scenario) values for the attributes. Note that this entails simulating the error terms ( $\varepsilon$ 's) using their estimated variance/covariance matrix.
  - b. Substitute the calculated search attractiveness variables into Eq. (2a) and simulate the error term ( $\eta$ ) to calculate  $Y^*$  for each channel, and then infer search choice using Eq. (2b).
  - c. Substitute the calculated purchase attractiveness variables into Eq. (4) to directly compute the probability that the respondent will choose each channel for search. Then, set up ranges between zero and one, reflecting these probabilities. For example, if  $P(\text{Store}) = .2$ ,  $P(\text{Internet}) = .5$ , and  $P(\text{Catalog}) = .3$ , the ranges would be 0–0.2, 0.2–0.7, and 0.7–1.0. We then draw a uniform random variable. If that variable equals 0.6, for example, we would determine that the respondent selected the Internet. The ranges, in combination with the uniform random variable, ensure

that the channel has the appropriate probability of being selected.

- d. Keep count of how many times each channel is selected for search or purchase.
3. Repeat steps 1–2 100 times (100 replications). The differences in the averages (strategy scenario minus base case) are reported in Figs. 4–6.

### 5.2.1. Strategy 1

Change search or purchase attributes: Table 8 suggests that a major reason for Internet⇒Store research shopping is that the Internet was deemed unattractive for purchase. Fig. 4 shows that two attributes that particularly hurt the Internet as a purchase channel are its lower average scores on Service and Privacy when compared to the store. Table 5 shows that these attributes are important determinants of Internet purchase attractiveness. Accordingly, we used the model to simulate the impact of increasing the attribute ratings on service and privacy for the Internet. Specifically, for illustration, we changed the service and privacy factor scores by one unit (roughly one standard deviation). In practice, this could be accomplished by adding a real-time shopping assistant to improve service, and adopting and publicizing a transparent and strict privacy policy. Fig. 4 shows the results of this change: Internet purchasing increases by about 10% at the expense of store purchasing, and the percentage of customers searching on the Internet and buying at the store decreases by about seven percentage points.

### 5.2.2. Strategy 2

Increase channel lock-in: Another strategy for decreasing Internet⇒Store research shopping is to increase Internet lock-in. To illustrate, we increase the coefficient relating Internet search to Internet purchase from 0.086 (Table 6) to 0.286. Managerially, this could be done by having the website remember a customer's previous orders, delivery addresses, and credit numbers, as is done by Amazon.com. Fig. 5 shows the impact if we assume the coefficient increases from 0.086 to 0.286 as a result of these changes. (This would increase Internet lock-in to somewhat less than half the level of the other two channels; see Table 6). Fig. 5 shows that if this were to be accomplished, Internet purchasing would increase by 21 percentage points and research shopping would decrease by 13 percentage points.

### 5.2.3. Strategy 3

Decrease cross-channel synergy: The last strategy for decreasing Internet⇒Store research shopping is to decrease cross-channel synergy. To illustrate, we decrease the coefficient relating Internet search to store purchase from 0.093 to 0. This means that we eliminate any cross-channel synergy between searching on the Internet and buying at the store.<sup>12</sup> This could, for example, be done by not providing a store locator on the

<sup>12</sup> For our simulations for strategies 2 and 3 we acknowledge that it is harder to change parameter values than attribute values. It is possible that some of the actions we discuss could change attribute values as well as their importance, reflected in the parameter values.

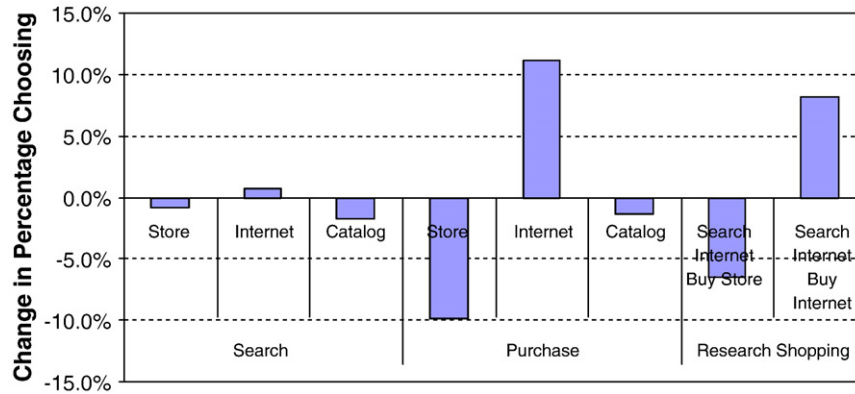


Fig. 4. Decreasing research shopping by improving Internet purchase attributes. Note: The results are based on a change in the Internet’s factor scores for service and privacy by one unit (roughly one standard deviation).

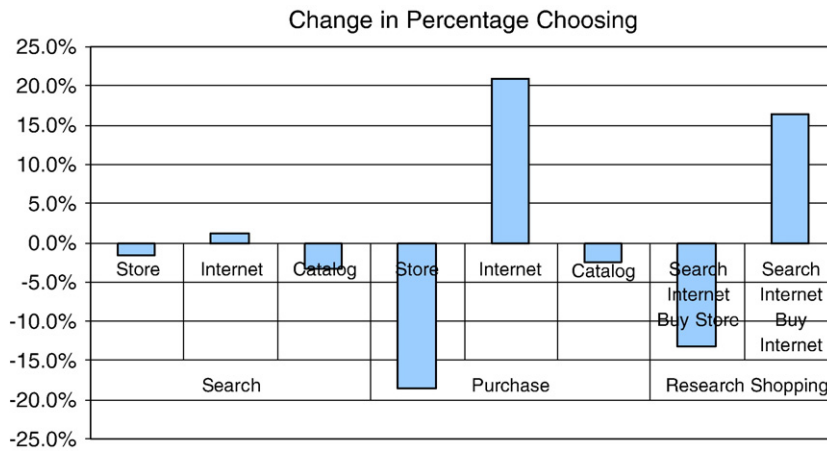


Fig. 5. Decreasing research shopping by increasing Internet lock-in. Note: The results follow from increasing the Search Internet⇒Purchase Store coefficient from 0.086 to 0.286.

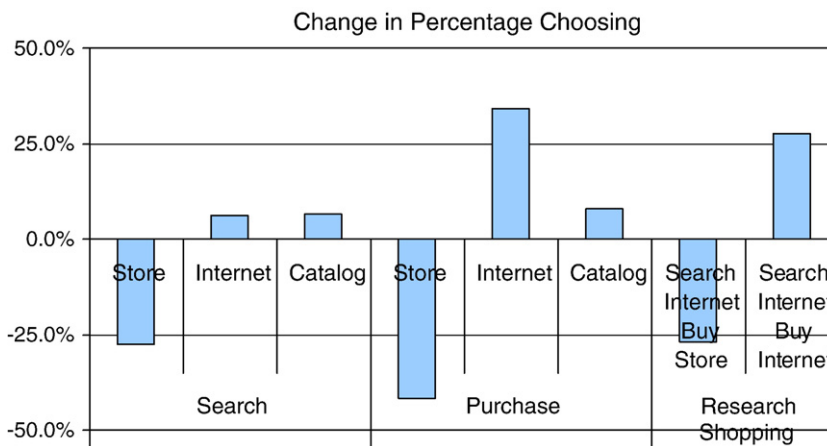


Fig. 6. Decreasing research shopping by decreasing cross-channel synergy between Internet search and store purchase. Note: The results follow from changing the Search Internet⇒Purchase Store cross-channel synergy coefficient from 0.093 to 0.

Internet. Fig. 6 shows the impact of assuming no cross-channel synergy. This impact is large. Research shopping between the Internet and the Store decreases by more than 25%. The reason for this large managerial impact, even though the cross-channel synergy coefficient was only marginally statistically significant ( $p < .10$ ), is the very strong store lock-in coefficients. Decreasing the cross-channel synergy coefficient directly decreases store purchase attractiveness, which subsequently decreases store search attractiveness through the high lock-in parameter. Decreasing search attractiveness subsequently also decreases purchase attractiveness further, which makes purchasing in the store less attractive for Internet searchers.

These examples illustrate how our model could be used to suggest and evaluate different options for changing the extensiveness of research shopping. The model is useful because the three mechanisms that cause research shopping – attribute-based decision-making, lack of lock-in, and cross-channel synergy – are all captured by the model.

One should keep in mind that the above simulations are intended to illustrate our model findings. Moreover, there are two explicit caveats with this exercise. First, under strategy 1, we assume that a change in one attribute (i.e. increasing service) does not affect parameter estimates. Second, we assume that altering some parameters (strategies 2 and 3) will not affect the other parameters. These two assumptions may not hold, which is an important issue in the Lucas critique (see for recent discussions Franses, 2005; Pauwels, 2004; Pauwels et al., 2005; Van Heerde, Dekimpe, & Putsis, 2005).

## 6. Summary and discussion

In this paper, we have attempted to deepen our understanding of an important phenomenon in multichannel customer management — research shopping. We have (1) developed a consumer-level framework that describes how customers choose channels for either search or purchase, (2) used the framework to identify three mechanisms that drive research shopping: attribute-based decision-making, lack of channel lock-in, and cross-channel synergy, (3) showed, using survey data, how the framework can be estimated, providing measures of the three mechanisms, (4) showed how the model results could be used to diagnose why specific forms of research shopping are more prevalent than others, and (5) showed how the model could be used to simulate, and hence, evaluate, the impact of various strategies aimed at mitigating (or enhancing) the mechanisms that induce research shopping.

Our framework is based on the theory of reasoned action, whereby consumer beliefs regarding channel attributes for either search or purchase determine attitudes or search/purchase attractiveness, which, in turn, determine channel choice. Our framework is distinct in its focus on two behaviors — the search decision and the purchase decision. This suggests a mutual relationship between attitudes toward searching on Channel A and purchasing on Channel A. This we refer to as channel lock-in. The *lack* of lock-in for a given channel encourages research shopping. It also suggests a mutual relationship between attitudes toward searching on Channel A and purchasing on

Channel B. We refer to this as cross-channel synergy. A strong positive synergy between search on Channel A and purchasing on Channel B also will encourage research shopping. The theoretical basis for allowing an attitude toward one behavior to affect the attitude of another behavior is rooted in the “attitude-as-an-attribute” notion and the customer’s preference for one-stop shopping (Messinger & Narasimhan, 1997; Mitchell & Olson, 1981).

We expressed our framework empirically in a multiequation model, and estimated it using survey data. The channel lock-in and synergy mechanisms are represented by particular coefficients in that model. Attribute-based decision-making can be measured by examining average attribute perceptions and comparing one channel to another (Fig. 3 and Table 8).

Our findings replicate previous studies, in that we find that Internet $\Rightarrow$ Store research shopping is the most common form of research shopping (Table 8 and Fig. 1). We were able to diagnose that this is due to (1) the strong search attribute advantage of the Internet compared to the store, coupled with the strong purchase attribute advantage of the store compared to the Internet, (2) the lack of statistically significant lock-in for the Internet, in stark contrast to the very strong lock-in enjoyed by the store and catalog, and (3) cross-channel synergy between using the Internet for search and the store for purchase (although the coefficient here was not strongly significant statistically;  $p < 0.10$ ).

Finally, we show, in Figs. 4–6, that by using plausible assumptions for managing the three mechanisms, we can evaluate various policies. In particular, we showed Internet $\Rightarrow$ Store research shopping can be reduced either by an attribute approach (improving service and privacy in purchasing on the Internet), by managing lock-in (increasing lock-in for the Internet from basically zero to somewhat less than half of the other channels), or by managing cross-channel synergy (taking steps to render the cross-channel synergy coefficient between Internet and store equal to zero).

## 7. Implications

Our work has implications both for researchers and practitioners. For researchers, we need to understand better the reasons why certain channels achieve better lock-in than others. For example, the Internet clearly emerges as having poorer lock-in than the other channels, and this is a prime determinant of research shopping. Is this due to the newness of the Internet channel, to the ease in “surfing” across various channels for search, to the mental categorization of the Internet as a search channel rather than a shopping channel, or to the design of websites that do not encourage purchase? We also need to understand what creates cross-channel synergies. Is it the degree of channel “integration” as perceived by the consumer? If so, what influences these perceptions? What are the best ways to design a website so as to create or mitigate cross-channel synergies? More broadly, we need to understand the economic implications of research shopping. Does it increase price competition? Does it potentially allow firms to differentiate in terms of their channel design and degree of



research shopping encouragement or discouragement (see Zettelmeyer, 2000)?

The key implication of our work for management is that there are three underlying mechanisms that drive research shopping – attribute-based decision making, lack of lock-in, and cross-channel synergy – and these mechanisms can be measured. This provides a set of potential levers which a firm can use either to encourage or to discourage research shopping. A retailer could replicate our survey and estimate our model for consumers in its particular product category, using actual competitor evaluations, rather than the generic channel evaluations used in this research. This would allow management to diagnose the extent of research shopping, whether it should be curtailed or encouraged, and to generate strategies – through the three mechanisms – for managing it. For example, companies wishing to discourage research shopping can attempt to improve the purchase attributes of the Internet, such as perceived risk and privacy. In doing so, they will create smaller attribute differences between the Internet and the store. Recently, Schlosser, Barnett-White and Lloyd (2006) show that website investments in consumer trust can convert Web searchers into Web buyers. Second, they can attempt to increase channel lock-in, by devices such as remembering the customer's address and credit card number (as Amazon does), and offering promotions, such as instantly redeemable rebates for customers who immediately decide to buy the product on the Internet. Some firms may also mandate channel lock-in. For example, firms may require a small fee for searching, which is only refunded when the customer purchases through the website. Examples of companies mandating channel lock-in are scarce. In the past, some catalogers (i.e. Bertelsmann subsidiaries) mandated lock-in by using a membership structure. In an Internet-context, consumers expect information to be free and always accessible, which makes it difficult to require fees for search. Companies wishing to encourage research shopping can also work on attributes (improving purchase attributes of the store, while improving search attributes on the Internet). Also, they can try to create cross-channel synergies through store locators, free store pick-up, or coupon promotions distributed on the website that are redeemable at the store.

It is important to note that whether to encourage or discourage research shopping depends on the firm's competitive situation and the particular channels the firm employs. For example, pure-play E-tailers certainly want to curtail research shopping. Companies that employ an information-only website (e.g., Ikea) and a store obviously want to encourage research shopping but route the research shopper from their website to *their* store. Multichannel companies may wish to encourage research shopping from the Internet to the store, if they believe they can cross-sell the customer additional products once he or she is in the store. However, they may wish to curtail research shopping if Internet purchases provide them with higher margins because of lower costs. In any case, the previous paragraph illustrates that the three mechanisms we identified that cause research shopping – attribute-based decision-making, channel lock-in, and cross-channel synergy – provide a framework from which companies can increase or decrease research shopping as their situation dictates.

In summary, an important overall managerial implication of our work is that we reinforce the notion that consumer channel choice is largely determined by channel attributes and, hence, is potentially manageable. For example, the efforts companies make to relieve consumer concerns about privacy will indeed improve attitudes toward buying on the Internet. They can do this through more transparent, highly publicized privacy policies, and through opt-in rather than opt-out agreements with customers as to how their data can be used.

## 8. Research limitations and future research

In conclusion, we believe this study has increased our understanding of the research shopper phenomenon; however, the work is subject to limitations that provide avenues for future research. First, we modeled intended choice instead of actual choice of a channel for either search or purchase. Future research could study consumers' actual channel choices for search and purchase.<sup>13</sup> Note that our model portrays search and purchase behaviors to be functions of search and purchase attitudes. We do not consider direct impacts of search behavior on purchase behavior, or *vice versa*. Our view is that search and purchase behaviors determine attribute perceptions, which in turn determine search and purchase attitudes, and search and purchase attitudes are directly related to each other through Eqs. (1a) and (1b). Therefore, an example which considers a direct effect of search behavior on purchase behavior might be “double counting.” Having said this, it certainly would be interesting to study the behavior through which these behaviors feed back to attributes. Related to this is that our measures of search and purchase behavior are 0–1 choices. We do not measure the *depth* of search (i.e. how long and intensive one searches in a channel), and this could be related, in interesting ways, to research shopping. Moreover, if one considers channel choice for purchase, a subsequent interesting point is the quantity purchased in that channel. Second, although we studied multichannel behavior in six product categories, these categories might still be limited in terms of certain characteristics. Future research might apply our model to other categories. Third, this study is subject to potential sample selection issues. Geographically, we only studied Dutch consumers. Researchers might consider multichannel behavior in other countries, as well as collect international data on multichannel customer behavior, in order to make comparisons between countries. Furthermore, our sample is not representative of the general public, as our sample consists of higher income, more educated consumers. This might be caused by the fact that we study specific categories, and we used selection criteria to ensure that the respondent at least had access to the considered channels. These selection criteria probably created some selection bias.

Fourth, we do not study research shopping from a single firm perspective. Future work could take on this perspective, and gain insights not only on “competition” between channels, but

<sup>13</sup> We also measured actual channel choice in the last purchase occasion. Our results reveal a large association between intended channel choice and actual choice.

between companies as well. The reason we took the perspective of the category level is that our purpose was simply to identify and measure the mechanisms that drive research shopping; a firm-specific study would have required a heavy respondent burden, because respondents would have had to evaluate a particular firm plus competitors on several attributes. However, we would encourage future research at the firm level. This limitation is related to the fact that we ignore competitive responses of channels in our simulations. For example, if a specific store increases its promotion intensity, an E-tailer might respond (e.g. Ailawadi, Kopalle, & Neslin, 2005; Leeflang & Wittink, 1996). Fifth, we considered multichannel choice for search and purchase as a simultaneous process. However, one could argue that this is a sequential process. With our cross-sectional data, we cannot study this. The use of cross-sectional survey data can thus be considered as an important limitation of this study. Future research should collect longitudinal field data that follows a consumer's channel choice within the consumer's shopping process. This would allow researchers to study the impact of prior channel choice on current channel choice, which we have not done, revealing possible channel inertia or variety seeking effects. Sixth, the finding that the Internet has low lock-in is very important, in that it is an important cause of Internet⇒Store research shopping. However, we did not distill the psychological reason for the finding. We speculated above that this could be due to how the consumer mentally categorizes the Internet as a search vehicle, rather than as a shopping vehicle, but this would be a fascinating area of future research. Seventh, our model is estimated on pooled data across six product categories, because the number of observations per category is limited. Future research might study whether the underlying reasons for research shopping differ between product categories, and which underlying product category characteristics explain these differences. For example, level of involvement and task requirements could influence how the mechanisms apply to specific categories for specific purchases. Eighth, our model does not include nonlinear effects of the considered attributes, as this was outside the scope of our study. Future research might focus on possible nonlinearities. Ninth, our research did not consider channels, such as TV-selling and Mobile Commerce. Future research can extend our model by including these channels as well. However, this would make the data collection effort very extensive. Tenth, we did not investigate potential interdependencies among the mechanisms for research shopping. For example, a channel that is strong on search attributes and weak on purchase attributes might also have low lock-in. We believe our empirical model is able to separately measure the three mechanisms, because each one is measured after controlling for the others (see Eqs. (1a)–(1b)). Having said this, the potential inter-relationships among the mechanisms could be explored by allowing for interactions between such things as attribute evaluations and the lock-in and cross-channel synergy variables using Eqs. (1a)–(1b). Given the complexity of the current model, we feel this is beyond the scope of the current research and an area for future research. Finally, our research did not study the potential consequences of research shopping on firm profits. The impact of research

shopping on firm profits may be rather complicated. Research on multichannel customer behavior empirically shows that customers using multiple channels from the same channel spend more (e.g. Kumar & Venkatesan, 2005). However, this work does not take into account research shopping. It may be that research shopping encourages more goal-directed purchasing and hence less responsiveness to cross-selling and other efforts to increase purchases. Indicative of possible negative effects is research by Morton et al. (2001), which suggests that consumers searching on websites for automobiles tend to pay lower prices. There is clearly more research required on this issue.

### Acknowledgment

This research has been financially supported and executed in close cooperation with VODW Marketing Consultants Leusden and Market Response. The second author would like to dedicate this paper to the memory of Gustavo de Mello, who made invaluable suggestions regarding theory, and who tragically died while this paper was being written. The authors also thank Yiorgos Bakamitsos for his contributions to the theory, and Eduard de Wilde and André Doffer for their helpful suggestions in the research design, and Paul Wolfson for invaluable programming support. We thank Gerrit van Bruggen and Benedict Dellaert and seminar participants of the University of Groningen, Tilburg University, Dartmouth College, Arizona State University and Kiel University for helpful comments. We also acknowledge the helpful comments of participants of the special session on multichannel customer management at the Marketing Science Conference 2005 in Atlanta. Finally, we thank three anonymous reviewers and the editor Hubert Gatignon for their supportive comments.

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