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An Empirical Analysis of Shopping Behavior Across Online and Offline Channels for Grocery Products: The Moderating Effects of Household and Product Characteristics

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Abstract

We study the moderating effects of household (e.g., shopping frequency) and product (e.g., sensory nature) characteristics on household brand loyalty, size loyalty and price sensitivity across online and offline channels for grocery products. We analyze the shopping behavior of the same households that shop interchangeably in the online and offline stores of the same grocery chain in 93 categories of food, non-food, sensory and non-sensory products. We find that households are more brand loyal, more size loyal but less price sensitive in the online channel than in the offline channel. Brand loyalty, size loyalty and price sensitivity are closely related to household and product characteristics. Light online shoppers exhibit the highest brand and size loyalties, but the lowest price sensitivity in the online channel. Heavy online shoppers display the lowest brand and size loyalties, but the highest price sensitivity in the online channel. Moderate online shoppers exhibit the highest price sensitivity in the offline channel. The online–offline differences in brand loyalty and price sensitivity are largest for light online shoppers and smallest for heavy online shoppers. The online–offline differences in brand loyalty, size loyalty and price sensitivity are larger for food products and for sensory products.

Keywords: Brand loyalty; Size loyalty; Price sensitivity; E-Commerce; Online grocery

Introduction

Since the early 1990s, many manufacturers and retailers have incorporated the Internet into their multichannel strategy and devoted considerable resources to building the online channel. Meanwhile, an increasing number of consumers consider the Internet to be an important shopping venue. In 2009, U.S. online retail sales grew 11%, while all retail sales only grew 2.5% and about 154 million people or 67% of the online population shopped online, contributing to online retail sales of $155 billion, or 6% of total retail sales (Sehgal 2010a). Forrester Research forecasts that U.S. online sales will keep growing at a 10% compound annual rate through 2014 to $250 billion (Sehgal 2010a). In Western Europe, online retail sales are expected to grow at 11% per year, going from €68 billion in 2009 to €114.5 billion in 2014 (Sehgal 2010b).

The Internet and conventional brick-and-mortar stores each have unique features. The Internet substantially reduces search costs, grants easy access to product and price information and facilitates product comparison. Online shopping involves no travel, product carrying or restrictions on shopping hours, offering greater accessibility, convenience and time saving. But online shopping does not permit physical examination of the products (feel, touch, sample and trial), interpersonal communication or instant gratification, and often incurs shipping and handling costs. In contrast, offline shopping allows physical

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examination of the products, interpersonal communication and instant gratification, but involves high travel costs and search costs, and often has restrictions on shopping hours, especially in countries with strong labor laws (Grewal, Iyer, and Levy 2004). Consumers may use the two channels differently. Some consumers may use physical stores as the primary shopping channel and the Internet as a supplementary channel, whereas others may follow the reverse pattern. Consequently, the same consumers may exhibit different behaviors when shopping across online and offline channels. Therefore, it is important to understand how the same consumers behave at the two channels.

Several researchers have studied consumer behavior across online and offline channels in different contexts (see Table 1 for a comparison and the literature review section for details), but they often use two separate samples for online and offline shopping. As pointed out by Shankar, Smith, and Rangaswamy (2003), such "between-subject" comparisons cannot eliminate the self-selection explanation for the behavioral differences observed across the two channels, and cannot isolate the effect of the shopping medium on behavior differences. In this paper, we use a unique household panel dataset to study how the *same* household's brand loyalty, size loyalty and price sensitivity vary across online and offline channels in grocery shopping, and how these behaviors vary with household and product characteristics. Since we observe the same households that shop across online and offline stores, we are able to conduct a "within-subject" comparison, which allows us to isolate the effect of the Internet on consumer behavior from consumer-specific effects (Shankar, Rangaswamy, and Pusateri 2001; Shankar, Smith, and Rangaswamy 2003). Further, as we observe the entire shopping basket of both packaged goods and perishables, we are able to investigate a large number of vastly different product categories so as to study the effects of product characteristics on channel-specific behavioral differences. As panel households differ substantially in their online shopping frequency, it allows us to examine how online shopping frequency affects online and offline shopping behavior. Additionally, we show how our data enable us to avoid potential endogeneity issues.

Our descriptive study of household shopping behavior involves 93 categories of food, non-food, sensory and non-sensory items (defined below). Consistent with the literature (e.g. Chu, Chintagunta, and Cebollada 2008), we find the same households are more brand loyal, more size loyal, but less price sensitive in the online channel than in the offline channel. Brand loyalty, size loyalty and price sensitivity are related to household and product characteristics. Light online shoppers exhibit the highest brand and size loyalties, but the *lowest* price sensitivity in the online channel. Heavy online shoppers display the lowest brand and size loyalties, but the *highest* price sensitivity in the online channel. Moderate online shoppers exhibit the highest price sensitivity in the *offline* channel. The online–offline differences in brand loyalty and price sensitivity are the largest for light online shoppers and smallest for heavy online shoppers. The online–offline differences in brand and size loyalties and price sensitivity are larger for food products than non-food products, and larger for sensory products than non-sensory products. These findings should help retailers make better decisions on product offerings, pricing and targeted promotions in the online and offline stores.

Categories such as books, CDs, PCs and holiday gifts that are typical of online shopping are more ideally suited to a comparison of consumer behavior across online and offline channels. However, given the infrequent purchases of these categories, it is difficult to collect consumer panel data on the purchases of these categories across the two channels. Although online revenues only account for a small fraction of the supermarket industry, many conventional supermarkets do have online operations (e.g., Safeway's www.safeway.com). In the UK, a report by TNS shows that online grocery sales at Tesco and other main retailers surged 35% in 2008 over the previous year (The Daily Telegraph 2009). The fact that online giant Amazon is now in the grocery business indicates the increasing importance of online grocery shopping. Therefore, using grocery data, while limited to some extent, can still shed light on the channel-specific behavioral differences.

The rest of the paper proceeds as follows. We first review the relevant literature, develop a conceptual framework and derive the various hypotheses. We then describe the data and present the methodology. Next, we report the results and discuss their managerial implications. We conclude the paper with summary of the findings, limitations and directions for future research.

Literature Review

Researchers have studied consumer behavior across online and offline channels in various contexts, either analytically or using experimental, survey or market data. The general conclusion is that consumers are more brand loyal and more size loyal in the online channel, but their price sensitivity seems to depend on product categories (Table 1).

Bakos (1997) theorizes that price sensitivity would be lower online than offline when quality-related attributes are important to consumers. Lal and Sarvary (1999) analyze the online and offline media and find that the Internet may lead to monopoly pricing under some circumstances. Lynch and Ariely (2000) use experiments to study how search costs affect online and offline competition and find that lower search costs for quality information reduce price sensitivity, while lower search costs for price information increase price sensitivity. Brynjolfsson and Smith (2000) find consumers are *more* price sensitive when shopping books and CDs online than offline. Degeratu, Rangaswamy, and Wu (2000) and Andrews and Currim (2004) find online consumers are *less* price sensitive when shopping groceries online than offline. Both studies find households have less brand switching and size switching online than offline, implying higher brand loyalty and size loyalty online. Danaher, Wilson, and Davis (2003) find high market share brands enjoy a loyalty advantage in the online store, while low market share brands enjoy greater brand loyalty in the offline stores.