



Consumer Search of Multiple Information Sources and its Impact on Consumer Price Satisfaction☆

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Abstract

When making important purchase decisions, consumers often consult multiple information sources. This paper examines how consumers allocate their search time across offline and Internet sources using survey data from new automobile purchases. Our analysis shows how time spent on Internet sources interrelates with time spent on offline sources, such as car dealerships, and vice versa. Furthermore, we examine whether longer search times imply higher price satisfaction as an outcome of search. A simultaneous equations Tobit model with latent classes is used. Analysis of a decade of survey data reveals two automobile purchaser segments of which the larger one accounts for 91% of observations. Based on this, we find that (1) specific website types can complement or substitute for offline information sources and for each other and (2) longer search times result in increased price satisfaction but only on specific information sources. Our findings provide automobile manufacturers and dealers an insightful way to utilize and manage different sources for product and price information provision.

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Introduction

When consumers search for information to make important purchase decisions, they often use multiple information sources (Ratchford, Lee, and Talukdar 2003; Ratchford, Talukdar, and Lee 2007). For example, when purchasing an automobile, consumers may tap acquaintances for information, read independent reviews, and visit manufacturer and dealer sources on and off the Internet. Because consumers have limited discretionary time to search for information, their search time is allocated across different information sources. For this reason, search time on one source should affect search times on other sources during the search process. Search time should also influence price satisfaction because consumers who search longer may encounter lower prices. Understanding consumers' information search behaviors and search outcomes can help marketers plan advertising

media/contents and pricing programs. However, consumers' search time allocation patterns and the relationship between search time and search outcomes have not been studied in an integrated manner heretofore.

Relatively few papers (e.g., Hauser, Urban, and Weinberg 1993; Ratchford, Lee, and Talukdar 2003; Singh, Ratchford, and Prasad 2014) have studied search behavior across multiple information sources. Hauser, Urban, and Weinberg (1993) proposed an allocation model of search time under a budget constraint. Their laboratory study tested fewer (and pre-Internet) information sources than the present study and omitted interaction effects between different sources. Ratchford, Lee, and Talukdar (2003) considered a utility maximization model in which consumers decide on total search time and allocate it between different sources by factoring the gains and losses from search. These researchers focused on the impact of the Internet on the use of offline sources and treated Internet sources as undifferentiated. Singh, Ratchford, and Prasad (2014) surveyed information sources for used car purchases. In all these papers, search time allocation and outcomes of the search process were not comprehensively considered. In contrast, the present study examines

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a decade of data about how use of an information source is interrelated with all other Internet and offline sources and how it impacts overall price satisfaction.

First, we re-examine the resilience of offline sources, especially the dealership, in this Internet era. 26.4% of automobile buyers in our dataset for 2012 and 25% of new-vehicle buyers surveyed by J.D. Power and Associates in 2008 did not use the Internet for automobile search despite its wide availability (e.g., 92% of respondents in our dataset had access to the Internet). Previous studies found that Internet search substitutes significantly for traditional sources in automobile purchases (Ratchford, Lee, and Talukdar 2003; Ratchford, Talukdar, and Lee 2007). Furthermore, new technologies such as virtual reality can make manufacturer sources substitute for product experiences at dealerships. Nevertheless, for now, traditional offline sources continue to play a necessary role that must be studied.

Second, we propose to differentiate between the types of websites, given that they provide unique as well as overlapping information (e.g., Viswanathan et al. 2007). For example, independent websites allow for comparison of different models, manufacturer websites provide detailed product specifications, and dealer websites give inventory and transaction information. Unlike previous studies that treated the Internet as an undifferentiated medium (e.g., Ratchford, Lee, and Talukdar 2003; Zettelmeyer, Morton, and Silva-Risso 2006), we distinguish between the different types of websites.

Finally, we attempt to relate search time to price satisfaction as an outcome of the search process (Bloch, Sherrell, and Ridgway 1986). Few empirical studies have examined the relationship of search and the outcome of the search process. Exceptions are Ratchford and Srinivasan (1993) and Viswanathan et al. (2007), who examined the effect of search on price. Considering that price-driven satisfaction is one of the antecedents on overall customer satisfaction, and that it has a positive impact (Fornell et al. 1996), it is also meaningful to examine the effect of search on price satisfaction as the final outcome of search. An advantage of studying price satisfaction is that consumers are likely to be able to make accurate judgments about this shortly after the purchase. It might take time for consumers to make accurate judgments about other determinants of satisfaction, such as reliability.

To address these issues together, we use a simultaneous equations Tobit model. This model considers interrelationships between search times on various information sources and allows for censored values. Censoring occurs when a consumer does not use an information source and thus a search time of zero is recorded in the dataset that does not reveal the intensity of negative preference for the source. The proposed model also allows for uncovering consumer heterogeneity by using a latent class approach. The analysis indicates that one segment describes the bulk of consumers (91% of observations forming the segment). From this, we offer several findings:

First, providing a counterpoint to studies that examined the impact of the Internet on offline sources (e.g., Klein and Ford 2003; Ratchford, Lee, and Talukdar 2003), we reveal how offline search time also affects Internet search. For example, we

find that search time at dealerships is positively associated with search time at independent websites but is negatively associated with search time at manufacturer websites. Second, we distinguish the effects of different types of websites. Our new findings show which different types of websites are treated as information complements or information substitutes by consumers. For example, independent websites are the drivers behind reduced search time at dealerships. Third, we find that search times on specific sources are most closely associated with price satisfaction. Notably, search times on independent and dealer sources are strongly related to price satisfaction. These findings provide manufacturers with the insight needed to coordinate with dealers, who continue to be influential sources of information and play an important role in giving consumers the opportunity to physically inspect and experience the product and to negotiate prices. Coordinated delivery of product information should result in improved sales and satisfaction.

In summary, this paper extends the search literature by examining a large set of information sources and their influences on each other and on price satisfaction. The modeling approach reveals consumer segments and new relationships. Unlike previous studies that restricted relationships in terms of the number of sources, directionality of effects, or aggregation of Internet information sources, we consider all available information sources and their interrelated effects and the impact on price satisfaction. Therefore, this study contributes to better understanding consumers' search patterns and outcomes, which is helpful to managers to provide consumers with all relevant information and customized product information via the correct medium.

Relevant Literature

The objective of this paper was to examine the interrelationships in search time on information sources and price satisfaction in an integrated model. In this section, therefore, we discuss the theory behind interrelationships between information sources due to allocation of search time and searcher segments.

Becker (1965) proposed a utility model in which households combine market goods and time to produce commodities (e.g., activities like movie-going) that directly enter their utility functions. In his model, households choose the level of a commodity based on the sum of the prices of the goods and the time used per unit of the commodity, which results in the allocation of time between different activities. In our context, too, searching different information sources may be considered consumer activities where allocating time between the various sources is an important decision. When allocating time to these different sources from a limited total time, interrelationships between search times on the different sources occur. Hirschman (1978) found that information source utilization varies over time such that early (vs. late) adopters use more (vs. fewer) sources and prefer mass media and experiential (vs. interpersonal) sources.

To model the relationship between information sources, Ratchford, Lee, and Talukdar (2003) developed a cost-benefit model. Time is the resource used in producing information that

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