Association for Information Systems
AIS Electronic Library (AISeL)

AMCIS 2008 Proceedings

Americas Conference on Information Systems (AMCIS)

2008

How the Web Influences the Way We Perceive and Evaluate Goods: An Exploratory Study

Yun Wan
University of Houston - Victoria, wany@uhv.edu

Makoto Nakayama
DePaul University, mnakayama@cti.depaul.edu

Norma Sutcliffe
DePaul University, nsutcliffe@cdm.depaul.edu

Follow this and additional works at: http://aisel.aisnet.org/amcis2008

How the Web Influences the Way We Perceive and Evaluate Goods: An Exploratory Study

Yun Wan
University of Houston – Victoria
wany@uhv.edu

Makoto Nakayama
DePaul University
MNakayama@cti.depaul.edu

Norma Sutcliffe
DePaul University
NSutcliffe@cdm.depaul.edu

ABSTRACT

Does the Web affect consumer perceptions on the quality of various products before and after purchase?   To answer questions on quality perceptions in traditional sales channels, researchers use a classification of products proposed by Nelson (1970, 1974) and other researchers on search, experience and credence (SEC) goods. This classification is very useful in evaluating market structures and advertising effectiveness in economics and marketing studies. Since the Web became a popular medium for shopping, how has the availability of Web decision aids changed the perceptions of consumers on the SEC product categories? A pilot study shows that credence and experience products become closer to search products, while search products can exhibit more search attributes for online purchases. In addition, consumers seem to feel less, not more, certain about what they know on products when they use both the Web and non-Web decision aids. Implications and future research plans are discussed.

Keywords

Online Shopping, Perception, Evaluation, Search Goods, Experience Goods, Credence Goods

INTRODUCTION

When a 20 year-old college student Nancy wants to buy a textbook for a course she is going to take in the following semester, she no longer goes to the campus bookstore, which charges full price. Instead, she goes to BestWebBuys.com to find a used copy at a more reasonable price. The Web also included information on shipping time and cost.

Jane recently purchases a pair of shoes from a local shoe store. She knows she could have done comparison shopping and bought shoes online. However, she feels that trying on shoes at a local store is a better way to know the product quality.

John and Mary decide to buy a new family car because they are going to have a new baby. Given the recent surge in gas prices, they decide to buy a hybrid car. They research hybrid cars extensively using a variety of comparison shopping websites to find hybrid cars that meet their needs. They also visit many car dealers. They seek inputs from friends, neighbors and workplace colleagues. After a lengthy investigation, they go to a local car dealer one day and purchase a hybrid car based on the strong recommendation from the sales manager.

The above vignettes illustrate the diversity of ways we use to evaluate products and services.

Numerous online shopping websites and comparison shopping websites (also known as Web decision aids inclusively) offer consumers unparalleled opportunities to search, locate and compare products. This wealth of available information not only alters consumer shopping behaviors but even changes the industry structures. Individual companies have had their competitive position permanently adjusted (Alba, Lynch et al. 1997). Implications of these changes are major topics in information economics, marketing and consumer behaviors (Hoffman and Novak 1996; Brynjolfsson and Smith 2000; Haubl and Trifts 2000).

In contrast, the impact of Web decision aids on consumers' decisions has received little scrutiny. In particular, does the abundance of product information change consumer decisions? For example, before the Web the quality of certain products

was difficult or costly to assess. Has the Web decision aids made our purchase decision process easier? What types of products benefit most from the availability of Web decision aids?

For product categories, this study uses the search, experience and credence (SEC) framework first established in the 1970s (Nelson 1970; Darby and Kami 1973; Nelson 1974). We empirically examine how each classification of the traditional SEC products is perceived differently now with the availability of Web decision aids.

The structure of this paper is as follows. First, we review previous studies. Second, we present hypotheses. Third, research method is described, followed by its preliminary results. Finally, we discuss the implications and conclusions.

LITERATURE REVIEW

The SEC Framework

In the economics literature, we classify goods based on the availability of information and costs associated with researching a good's price and quality. A good which is either a product or service classifies into one of the three categories: search, experience or credence (Nelson 1970; Darby and Kami 1973).

According to Nelson (Nelson 1970; Nelson 1974), evaluating a product or service incurs a cost. If this evaluation cost is minimal compared to the good's value, the consumer always evaluates the quality prior to purchase. Such a good is classified as a *search* good.

In another situation, the cost of evaluation is prohibitive when compared to the value of the good. Perhaps the value of the good itself is minimal, thus the cost of any search is too much. In another situation the value of the good is substantial, but the cost of searching for information on quality before purchase is at least as expensive as the good. In either situation, consumers first purchase the good and then evaluate its quality. Such a good is classified as an *experience* good.

Later, Darby and Kami (1973) differentiate a *credence* good from an experience good. They argue that a consumer can never evaluate the quality of some goods either before or after purchase. Car maintenance and the efficacy of vitamins are two such credence goods where the consumer has to rely on the credibility of the service provider or product vendor in evaluating quality. The major difference between an experience good and a credence good is that a consumer cannot evaluate any credence good for quality after its purchase or its consumption.

Search goods are likely to have more intense price competition than experience and credence goods.   After establishing the basic tenets of the SEC framework in 1970s, it underwent rigorous tests and gradually became the major framework for information economics and marketing research.

Impact of the Web

In the late 1990s when the popularity of the Web surged, the validity of SEC framework for Web environments became an important topic. Of particular interest to us is the possibility that because of the Web, a good can change its SEC category due to the   increased information on the good's quality at either low or no cost.

Let us first look at how a good's SEC classification has traditionally been done. Classifying a good into a specific category of the SEC framework does not depend on a single attribute of that good. Rather, the classification of the good depends on the *dominant attributes* of that good having the characteristics of search, experience, or credence. For example , we regard products as experience goods when "their dominant attributes are either too difficult or too costly to sample prior to purchase" (Klein 1998).

In the traditional environment most consumers used heuristics in making decisions to compensate for the scarcity of information. Now consumers obtain a large amount of product attribute information from the Web at minimal to no cost (Brynjolfsson and Smith 2000). Thus, it seems natural to expect to find changes in perceptions on a good's attributes and evaluations in the Web environment.

Klein gives a systematic analysis of such impact and possible transformation. She posits that experience goods can be divided further into two subcategories (Girard, Silverblatt et al. 2002), using these two criteria (*ibid*., p. 199).

"full information on 'dominant' attributes cannot be known without direct experience"

"information search for 'dominant' attributes is more costly/difficult than direct product experience"

If the first criterion is applicable, we call such an experience good as a Type I experience good. Likewise if the second criterion is applicable, we call such a good as a Type II experience good.

Examples of Type I experience goods include clothing and perfume products; consumers must and can use them to fully evaluate quality. In contrast, Type II experience goods are those goods whose attribute information is always difficult or costly to obtain. For example, consumers can obtain product attribute information on cell phones and television sets without directly using them. However, it is still as challenging and costly to get such information with the Web as it was traditionally.

Finally, examples of credence goods include vitamins, medical services and tax consultations. These goods usually involve professional knowledge and/or have a larger proportion of service attributes (Iacobucci 1992).

The interesting question is whether the abundance of ever-easy-to-use Web decision aids has changed the applicability of these SEC classifications to particular goods. Klein proposed that the Web can change an experience good into a search good through any of three routes: (1) reducing the search cost of a good, (2) altering the weight that consumers give to different attributes of a good, and (3) consumers using a "virtual experience" on the Web to simulate a direct experience of a good. She did not specify which credence goods and which type of experience goods are more prone to shifting to search goods. Remembering that search goods are likely to have more intense price competition than experience and credence goods, the Web can alter a good's market dynamics.

In the next section, we extend Klein's analysis and establish three hypotheses to test empirically such an insight.

HYPOTHESES

The Web provides increased information on a good's dominant attributes at minimal cost. Thus, more goods become search goods because of the now lowered search costs and/or the consumer's "virtual experience" of the good. For example, the automobile was identified as an experience product in 1960s and 70s according to Nelson (1970). It is now a Type II experience good according to Klein (1998) because its attribute information is costly to obtain in the traditional (non-Web) environment. However, as detailed in this paper's vignettes, the Web has dramatically increased the availability of auto-related information including price, product attribute analyses and product reliability statistics. Consumers easily evaluate the performance of a particular model, and the perceived risk of purchase is significantly reduced. Now, an automobile becomes a search product. This is essentially the first route Klein proposed. Thus, our first hypothesis is:

Hypothesis 1: Reduced search costs can transform experience and credence goods into search goods when consumers are equipped with Web information.

The second impact Klein mentioned is that using the Web triggers an adjustment of the attribute weights for a good. We know that the format of good's attribute information influences the weights that a consumer gives these attributes. Therefore the new format can influence a consumer's selection of a good (Russo 1977). Recent research also indicates that the display format of information on the Web can change a consumer's product preference and the consumer's purchase decision (Haubl and Murray 2003).

Therefore, when the Web environment supplies helpful information on experience and credence goods, it is reasonable that consumers now perceive the dominant attributes of these goods differently. Such perception changes exist for Type I experience goods, Type II experience goods and credence goods.

Another aspect to examine is the difference between mass produced and individualized produced goods. Consumers find information about mass produced goods (e.g., DVD players) more easily than they find information about highly individualized goods (perfume). Usually mass produced goods have universal quality evaluation criteria while individualized goods have quality and preference criteria dependent on personal tastes. Thus, we expect to find more Web information for Type II experience goods than for Type I experience goods. Consequently we have our second hypothesis:

Hypothesis 2: Different provisions of attribute information on the Web influence the shift of experience goods to search goods. This shift is more significant for Type II experience goods than for Type I experience goods.

Credence goods are generally services. The key performance indicators for services are generally constant across different environments. Thus, we should expect the second route effect for credence goods is rather minimal.

The impact of the third route or the simulation of direct experience in the Web environment does exist. However, the so-called virtual experience technology for Type I experience goods (e.g., clothing and perfume) is generally not used. One of the few credence goods where we find significant impact from this virtual experience is the software package. This is

because the Web allows the download of a demo or trial version of software. Consumers get the semi-direct experience at little or no cost. Thus, we have our third hypothesis:

Hypothesis 3: Simulated direct experience shifts experience goods to search goods. This shift is more significant for digital experience or credence goods than for the traditional experience or the traditional credence goods.

The next section discusses our empirical testing of the hypotheses.

METHOD

To test the hypotheses, we used the recollection-based survey methodology that Iacobucci (1992) used in her empirical study. Klein (1998) also suggested such an approach.

We created two contrasting scenarios: with and without access to the Web. In the Web-Only scenario, subjects were told they could obtain product or service information only from the Web but not from the "traditional way" (e.g., store visit, information from friends and family, newspaper ads). In the No-Web scenario, subjects were told they could obtain product or service information only from the "traditional" sources but not from the Web. We then added a third scenario to act as a control which we labeled Both. Here subjects can use whatever information sources they choose including "both" the Web and traditional means.

Except for the wording on these three distinct scenarios, all other statements are the same for the three groups.

Each subject was assigned to one of the three scenarios. Following the Iacobucci study, a Likert Scale of 0 to 8 was used to indicate the degree to which a product is a search or credence good.

Subjects were asked to rate whether they could evaluate the quality of the above mentioned ten goods before or after purchase in their assigned scenario. For each good, the subject decides whether it could be evaluated "prior to purchase", "only after some trial", or 'would be difficult to evaluate even after trial." In addition, each general rating is further differentiated into a finer grade: "absolutely," "probably," or "seems so but not sure."

We are still in the preliminary assessment phase of our empirical design. We started data collection in February, 2008. What we report here is based on the preliminary data obtained. After assessing the results of this pilot study, we intend to administer the improved survey more extensively.

Subjects

We used a convenience sample of college students for this pilot study. Graduate and undergraduate students from two universities; one in the Southwest and one in the Midwest participated in this study. About 108 survey invitations were sent and 48 students completed the survey questionnaire. Extra credit for their course assignments was used as an incentive for participation. The profile of the participants is as follows:

Gender: 58% (male), 42% (female).

Age: 8% (18-19 years old), 41% (20-29), 31% (30-39), 17% (40-49), 2% (50 or older)

Goods Selection

A group of 10 products and services are selected for this research (Table 1). We selected all of them from existing SEC literature, and their classifications were either empirically or conceptually verified.

SEC Class		Product/Service (Good)
Search		bestselling book
Experience	Type I	perfume, clothing
	Type II	cell phone, TV, automobile
Credence		vitamins, car maintenance, tax services, office software

Table 1. Products used for this study

The search product we selected is a retail book (Ekelund, Mixon et al. 1995). We use "new bestselling book" as a more explicit item. The Type I experience products we selected are clothing and perfume. The Type II experience products are cell phone and television (Girard, Silverblatt et al. 2002). We also selected automobile as a benchmark experience product (Nelson 1970) which is a Type II experience good according to Klein (Klein 1998). The four credence products and service we selected are car maintenance (Darby and Kami 1973), vitamins (Girard, Silverblatt et al. 2002), tax services (Ekelund, Mixon et al. 1995), and office software (Klein 1998). Of these, office software is a pure digital credence good while tax services are semi-digital credence goods.

RESULTS AND ANALYSIS

Overall results are shown in Figures 1and 2. This is a pilot study with small sample sizes for each treatment group (Web Only N= 18, No Web N = 12, Both N = 18). Thus, we mainly use visual observations on the graphical data representations. However, we did use pair-wise t-tests to assess any statistically significant differences between the three treatment groups over 10 products. The statistically significant differences are shown in Figure 1 as red broken line arrows.
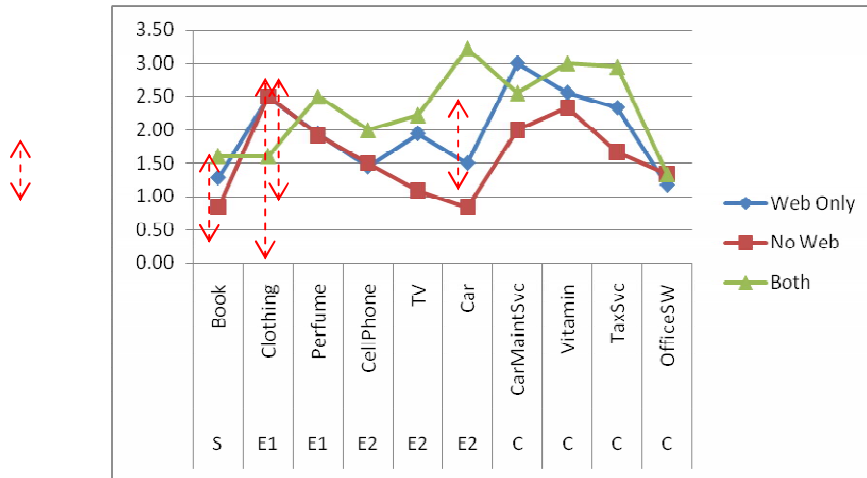

Figure 1. Comparison of consumer certainty on product quality by product*

* In Figures 1 through 4, the vertical axis uses the Likert Scale of 0 to 8 to indicate the degree to which a product is a search or credence good. The statistically significant differences are shown in red broken line arrows.
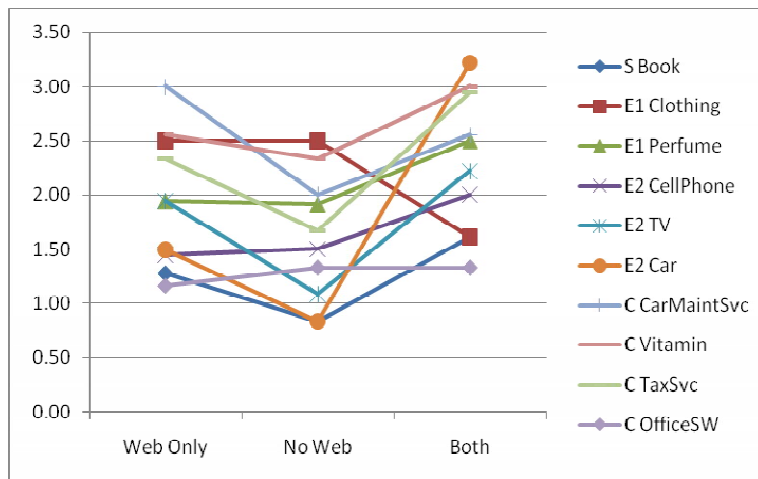

Figure 2. Comparison of consumer certainty on product quality over three different scenarios

General shift towards search goods

The first major finding from this pilot study is the general shift towards search goods for all product and service categories.

In all three scenarios, the participants indicated that all the products are somewhere between search (SEC scale of 0 to 2) and experience products (3 to 5). Vitamins and tax services are traditionally regarded as credence goods. However, participants indicated that they can know the quality of these goods prior to purchase or after a trial. That is, we basically observe the *disappearance* of credence goods. We suspect this is caused by the overall abundance of information nowadays on the Web as well as its dissemination into the traditional environment.

Another issue for further investigation is the presence of a biased sample of participants. Because the participants were all college students, they are Web-savvy and more familiar with all kinds of Web information sources. So we suspect there are some spillover effects on their overall perception of products and goods. Future research will use a participant sample of older adults to test if such effects still exist.

If we disregard any population bias, this trend generally confirmed our first hypothesis. There is an overall shift from credence and experience goods towards search goods because of the impact from Web information.

The shift of experience goods to search goods category

TV and cell phones are traditionally considered type II experience goods. Here participants regarded them as search products, and there is no significant difference between the scenarios.
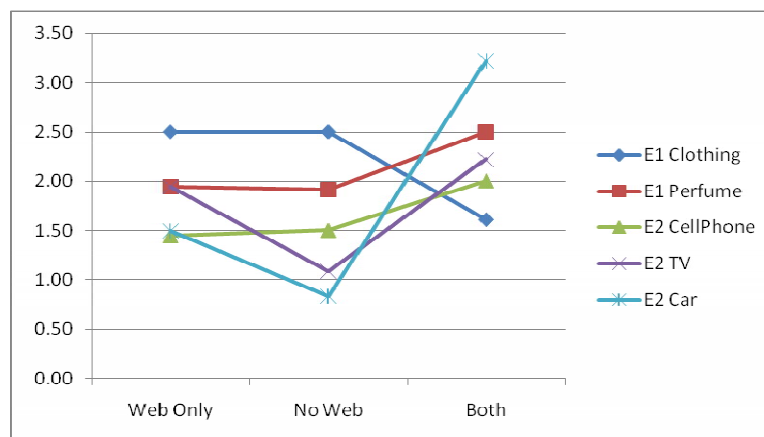

Figure 3. Type I vs. Type II experience goods

Meanwhile, though not significant, the cell phone is regarded more like a search product in the Web-Only scenario compared to the No-Web scenario (1.44 vs. 1.50), while the TV was regarded more as a search product in No-Web scenario compared with Web-Only Scenario (1.94 vs. 1.08). One participant commented that he always has concerns about TV picture quality so he feels more confident going to a store and actually seeing the picture before making any purchase decision.

Perfume and clothing, the two Type I experience products, are regarded as search products and the ratings for perfume and clothing in all scenarios are higher than for TV and cell phone. As mentioned in the hypothesis 2 proposition, because perfume and clothing information are more subjective than TV and cell phone information, online shoppers find evaluation information about TV and cell phone more easily than they find information about perfume and clothing. This is true even though perfume and clothing are search products. Both the first and second parts of our second hypothesis are confirmed with this evidence.

There is an interesting phenomenon for clothing. Under the Both scenario or the No-Restriction scenario, clothing is regarded more significantly as a search good than it is under the other two scenarios. It is obvious that purchasing clothing on Web is not as easy as buying consumer electronics. However, this significant trend indicates the Web provides important complimentary information on clothing that is very helpful under the No-Restriction shopping scenario. The Web provides complimentary information on a garment such as complete measurement information, complete information on the varieties

available (for example, colors and fabrics), complete information on the sizes available, etc. For a shopper wanting an uncommon size or color of a garment, the web tells them if that garment is available for purchase and how quickly the shopper can get it.

CREDENCE GOODS SHIFT TOWARDS SEARCH AND EXPERIENCE

For credence goods, Likert scale range 6 to 8, the trend shifts towards search products, but the shift is not as significant as it is for experience goods. The overall Likert scale rating for credence goods is higher than experience goods, This means it is still more challenging for consumers to obtain evaluation information for credence goods than it is for experience goods.
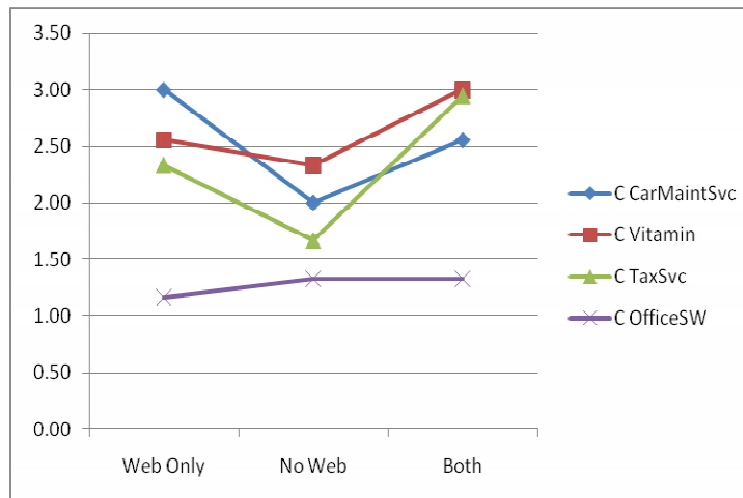

Figure 4. Shift of credence goods

One interesting phenomenon is that, many participants told us that obtaining attribute information from the Web-Only scenario is a greater challenge than in the No-Web scenario. There are a number of potential explanations. One is that there is already little and insufficient evaluation information for credence goods in the No-Web environment which leads to insufficient information in the Web environment. Remember, as we explained in previous section, the Web collects and transmits usage information on experience goods immediately after someone posts their latest experience. However this is not possible for credence goods even after lengthy use.

The only exception is office software, a digital credence good, which actually is more difficult to evaluate without Web access. One explanation is because office software is inherently digital so it can only be evaluated in a digital environment. Finally, because our human subjects are students, who are very experienced and familiar with office software, they have difficulty in imagining how to get comparable information without the Web.

This confirms our third hypothesis. We believe that this is an example of the "simulated direct experience" or "virtual experience" mentioned in Klein (Klein 1998).

The Both or "No-Restriction" scenario leads to more uncertainty?

We anticipated that that the "Both" or "No-Restriction" scenario, which allows subjects to use both Web and traditional information sources, would make it easier to evaluate goods. However, Figure 1 shows the opposite except for clothing, car maintenance service and office software. This was surprising. One possible explanation is that consumers are suffering from information overload. They simply get too much information on quality to process. Another possible explanation is that the Web information does not conform to what consumers already know from traditional sources such as their store experiences.

Clothing is an exception probably because products are relatively simple and because the web information conforms to their information from traditional sources so there is less uncertainty under the "Both" scenario. Uncertainty on quality for office software is the same under all three scenarios.

Know better when Web is not available

In Figure 1, for certain products (clothing, perfume, cell phone, vitamin, and office software) there is little difference between "Web-Only" and "No-Web." In contrast, for other products (book, TV, car, car maintenance service, and tax services), the participants indicated that they know product quality better from traditional means (e.g., store visit, face-to-face discussion with sales reps, hands-on product inspections) than from only the Web.

In Figure 2, products like book, TV, car, car maintenance services and tax services show a shift towards experience product attributes if consumers shop only online. Conversely no such shift is seen for products like clothing, perfume, cell phone and office software. Perhaps, consumers already have enough prior purchase experience and knowledge for these goods.

CONCLUSION AND FUTURE RESEARCH

This is preliminary research on the impact of the Web on the SEC framework. Our research is based on the conceptual work of Klein (Klein 1998). We empirically identified several impacts of the Web on the SEC framework. We also identified the general shift of experience goods to search goods and the general shift of credence goods to search and experience goods within the SEC framework. We also identified the different level of shifts between Type I and Type II experience goods.

There are many limitations of this research. Due to small sample sizes (N = 12 or 18), we only conducted pair-wise t-tests for assessing statistically perceptual differences. Other limitations include the convenient sample we used, the basic design, which did not provide an adequate coverage of other important factors like the complexity of product attributes as well as price factors in decision-making.

However, we do believe our research provides some interesting perspectives for further exploration. For example, a refined empirical design with a larger and more diversified participant sample as well as a larger product selection can definitely reveal more subtle differences in the transformation. Meanwhile, an important topic for further study is the implications that such transformations have on advertising strategies in both traditional and Web environments.

REFERENCES

Alba, J., J. Lynch, et al. (1997). "Interactive home shopping: Consumer, retailer, and manufacturer incentives to participate in electronic marketplaces." <u>Journal of Marketing</u> **61**(3): 38-53.

Brynjolfsson, E. and M. Smith (2000). "Frictionless Commerce? A Comparison of Internet and Conventional Retailers." <u>Management Science</u> **46**(4): 563-585.

Darby, M. R. and E. Kami (1973). "Free Competition and the Optimal Amount of Fraud." <u>Journal of Law and Economics</u> **16**: 66-86.

Ekelund, R. B., F. G. Mixon, et al. (1995). "Advertising and information: an empirical study of search, experience and credence goods." <u>Journal of Economic Studies</u> **22**(2): 11.

Girard, T., R. Silverblatt, et al. (2002). "Influence of Product Class on Preference for Shopping on the Internet." <u>Journal of Computer-Mediated Communication</u> **8**(1).

Haubl, G. and K. B. Murray (2003). "Preference Construction and Persistence in Digital Marketplaces: The Role of Electronic Recommendation Agents." <u>Journal of Consumer Psychology</u> **13**(1&2): 75-91.

Haubl, G. and V. Trifts (2000). "Consumer Decision Making in Online Shopping Environments: The Effects of Interactive Decision Aids." <u>Marketing Science</u> **19**(1): 4-21.

Hoffman, D. L. and T. P. Novak (1996). "Marketing in hypermedia computer-mediated environments: Conceptual foundations." <u>Journal of Marketing</u> **60**(3): 50.

Iacobucci, D. (1992). "An empirical examination of some basic tenets in services: goods-services continua." <u>Advances in Services Marketing and Management</u> **1**: 23-52.

Klein, L. R. (1998). "Evaluating the potential of interactive media through a new lens: Search versus experience goods." <u>Journal of Business Research</u> **41**(3): 195.

Nelson, P. (1970). "Information and consumer behavior." <u>Journal of Political Economy</u> **78**(2): 311-329.

Nelson, P. (1974). "Advertising as Information." <u>Journal of Political Economy</u> **82**(4): 26.

Russo, J. E. (1977). "The value of unit price information." <u>Journal of Marketing Research</u> **14**: 193-201.