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Yuan Wan

*University of Houston - Victoria*, wany@uhv.edu

Makoto Nakayama

*DePaul University*, mnakayama@cdm.depaul.edu

Norma Sutcliffe

*DePaul University*, nsutcliffe@cdm.depaul.edu

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# Generation Gap and the Impact of the Web on Goods Quality Perceptions

**Yun Wan**

Department of Computer Science  
University of Houston - Victoria  
wany@uhv.edu

**Makoto Nakayama**

Department of Computer Science  
DePaul University  
mnakayama@cdm.depaul.edu

**Norma Sutcliffe**

Department of Computer Science  
DePaul University  
nsutcliffe@cdm.depaul.edu

## ABSTRACT

This study explores how age and general online shopping experience affect consumer perceptions on product quality uncertainty. Using the survey data collected from 549 consumers, we investigated how they perceive the uncertainty of product quality on six search, experience and credence goods. The ANOVA results show that age and the Web shopping experience of consumers are significant factors. A generation gap is indeed seen for all but one experience good. Web shopping experience is not a significant factor for search goods but is for experience and credence goods. There is an interaction effect between age and Web shopping experience for one credence good. Implications of these results are discussed.

## Keywords

Online shopping, generation gap, product quality perceptions, search goods, experience goods, credence goods.

## INTRODUCTION

Conventional wisdom is that teens and young adults shop online the most because they are very familiar with the Internet and mobile equipment. Older generation probably do not shop online as much because they are less familiar with computers and the Internet. Thus, the older generations shy away from online shopping more than the younger generations.

But, several recent surveys indicate that this may not be the case. For example, according to a survey by Pew Research (Jones 2009), though older generations use the Internet less for socializing and entertainment, they do use it more as a tool for information searches, emailing, and buying products. In addition, now both young and old equally pursue video downloads, online travel reservations, and work-related research. Another survey conducted by University of Southern California found that older Americans have equal or even more enthusiasm towards Web 2.0 than their younger, more tech-savvy counterparts (USC 2008). The same survey indicates that while instant messaging and video downloading still remain more popular with the younger generations, older Americans check the Internet more frequently for news. The older generations are logging onto online communities, researching purchases, becoming socially active and playing games in increasing numbers (USC 2008). Also a survey by a UK-based media company in December 2008 found that there were no significant differences between younger and older generations in terms of their general shopping behavior and concerns about online fraud (NWA 2009).

The older generation might be slow in learning new technologies and might be disadvantaged in learning how to use the Web when compared to the younger counterparts. On a second thought, however, most people realize that the older generations do have more shopping experience, even though most of such experiences are rooted in the traditional environment. Yet such experiences may actually give them an edge in evaluating and purchasing products or services on the Web.

Thus the reality of online shopping by different age groups may be more complex than a simple dyad of young and old. It is possible that both groups have their advantages and disadvantages when shopping online. Their behavior and preference in online shopping might also be different because of their accumulated shopping experience in Main Street. The same survey by Pew Research found that, in terms of online shopping, instead of a downward linear trend with age, interest in online shopping is significantly lower among both the youngest and oldest groups – “38% of online teens buy products online, as do 56% of internet users ages 64-72 and 47% of internet users age 73 and older.” – and significantly higher among those in the medium range, with 80% for age 33-44 and 71% for age 18-32 (Jones 2009).

In addition to age, other factors like familiarity with Web and previous purchasing experience also influence an individual's perception of goods. These other factors might interact with age to have a combined influence. This phenomenon calls for more elaborated explanation of age impact in one's evaluation of products and services in online environment as well as its interaction with one's online shopping experience. In this study, we explore this research question in the search, experience, and credence goods or SEC framework.

The remainder of this paper is arranged as follows. First, we give a brief literature review of previous studies on age groups and online shopping as well as SEC framework. Then we explain our survey-based empirical design as well as survey outcomes. Finally, we analyze the results and give our conclusion.

## PREVIOUS STUDIES AND HYPOTHESIS

### Search, experience, and credence goods perception

One major difference between Online and Main Street shopping is how consumers evaluate products and services in these two environments.

Since the birth of market, consumers are used to conducting shopping in an environment where they can inspect the goods directly and converse with the sellers or service providers face to face. And depending on at which point consumers can evaluate the quality of the goods, we can classify goods into three categories: search, experience, and credence (Darby et al. 1973; Nelson 1970, 1974). Search goods are those that consumers can evaluate the quality before the purchase. Experience goods are those consumers can evaluate the quality right after the purchase when such goods being consumed or serviced. Credence goods are those consumers can not evaluate the quality of them even a long time after the purchase. Thus, the SEC framework is based on the classification of goods into these three categories. For each category, we see different advertising and promotion strategies for sellers and shopping behaviors for buyers. The SEC framework is a proven framework for over 30 years. It has been widely adopted in the advertising industry as well as used in consumer behavior research (Ekelund et al. 1995).

With the growing popularity of World Wide Web starting in 1994, a new online shopping environment became part of our daily life (Alba et al. 1997). In this new online environment, no goods can be inspected directly and only limited interactions with service providers are possible. Thus, we expect consumers have to leverage their prior shopping experiences and transform them into useful information for the online environment (Klein 1998). For the younger generations, they have limited shopping experience but using those shopping tools to leverage their existing shopping experience is their advantage. For older generation, while the leveraging adaptation process is longer, their rich shopping experiences give them advantages too. Thus, through the lens of SEC framework, we expect online shoppers may perceive the same product or service with different SEC ratings because of age gap.

### Contributing Factors and Hypothesis

There are many factors that might influence one's perception of a good in the SEC framework. In the online environment, such factors may be *age, gender, Web shopping experiences, Web search experience, and prior purchase experience for the same goods*.

The generation gap seems to exist in the perception of goods for online shopping because of the different level of general shopping experiences accumulated through the years. Several studies on demographics, attitude and behaviors of online shoppers confirm this. One of the earlier studies (Bhatnagar et al. 2000), examining why some consumers become online shoppers while others do not, find out that age, years of using the Web, and gender affect purchase risk perceptions differently. A more recent study that examines the demographic factors like age, gender, income and location on online shopping found these factors influence online purchase frequency and expenditures (Chang et al. 2004). The study does not drill down to purchase frequency and expenditures by products.

Like age, gender is another important factor in explaining many differences in consumers' shopping behaviors and perception of goods. However, it seems this is not the case in online environment. A research study by Stafford et al. (Stafford et al. 2004) examine online shopping behaviors from international and cross-cultural perspectives. They find gender has no significant influence on shopping behavior. They also explore if older consumers are less likely to shop online regardless of country origin and find that the age group 25-34 is the most active online shopping group. The level of online shopping in this age group is statistically different from that of age group 18-24. The other age groups have similar levels of online shopping involvement. Similar findings from mobile commerce research find that younger consumers are more predisposed to use the mobile equipment as a shopping channel (Bigne et al. 2005). Gender and social class are not significant factors for mobile commerce adoption.

As mentioned previously, depending on when a consumer can confidently evaluate the quality of a product or service, that product or service can be categorized as a search, experience, or credence good. However, such rating is mostly depending on an individual's previous purchase and usage experience, especially for experience and credence goods. Compared with the same product or service, an older consumer who has purchased and used a product or service before may regard it less as credence or experience good than a younger consumer who has no prior experience with it. We expect such differences also exist in the online shopping environment. Thus, we have our first hypothesis:

**H1:** Different age groups of online shoppers will evaluate the SEC rating for the same goods differently.

Based on existing research of the gender impact on goods perception in online shopping, we have following hypothesis:

**H2:** The gender of online shoppers does not affect the evaluation of the SEC rating for the same goods.

Web shopping experience, including using various Web-based decision support tools to conduct the searching, comparing, and analyzing products and services in the online environment, also plays an important role in the perception and evaluation of goods on the Web. Though some studies (Dennis et al. 2002; Udo et al. 2001) assume that younger people are "more Web-literate than older age groups" (Dennis et al. 2002), one research finds that young consumers with more Web shopping experience have a more positive attitude towards Web shopping than those without it (Dillon et al. 2004). The study implies that Web shopping experience begets a more positive stance towards Web shopping and that younger shoppers tend to embrace a non-traditional shopping channel, like the Web, more receptively than older shoppers.

Experience in using online information searching may also influence the perception of goods in online shopping. Sorce et al. (2005) report that older generations actually purchase more on the Web than the younger generations whereas older Web shoppers search significantly fewer products than did younger shoppers. This suggests that probably older Web shoppers have more experience for purchase decisions, needing less Web search for each purchase decision. Another research (Bigne et al. 2005) indicates that the Web shopping experience has a positive influence on adopting m-commerce.

Since online shopping is a relatively new shopping mode and is still less than 15% of the U.S. retailing market, we expect that the extent to which an online shopper benefits from online shopping is still highly influenced by that shopper's Web purchasing experience and online search skills. That is, the Web is still a new shopping environment where most online shoppers still need to learn how to use it effectively.

Thus, compared to a shopper with little or no Web shopping experience and few online information searching skills, a Web savvy shopper may rate credence goods more like experience goods and experience goods more like a search goods in the online environment. So we have our third and fourth hypotheses:

**H3:** Shoppers assess the SEC classification of the same goods differently based on their level of Web shopping experience.

**H4:** Shoppers assess the SEC classification of the same goods differently based on their level of online search engine experience.

Finally, when someone has prior experience purchasing a product or service, that shopper accumulates more experience about this "good" with each additional purchase. Thus, one can change their future perception of this good. This experience accumulation can come from either online or Main Street purchases. Thus we have the last hypothesis:

**H5:** Shoppers give the same good a different SEC classification based on their level of prior purchasing experience with that good.

Now we have explained all our hypotheses. In the next section, we explain the design of our experiment to verify these hypotheses.

## RESEARCH DESIGN

We used online survey questionnaires to verify our hypotheses. Six goods were selected in this experiment as representative SEC goods, two in each category. We selected mostly common goods whose purchases are relatively neutral to age, gender, income and ethnic groups.

- Search goods are *PCs* and *bestselling books* (Ekelund et al. 1995; Girard et al. 2003, 2002; Hoskins et al. 2004).
- Experience goods are *cell phones* and *cars* (Girard et al. 2002; Iacobucci 1992; Nelson 1970).
- Credence goods are *vitamins* and *auto insurance* (Chiu et al. 2005; Girard et al. 2002; von Ungern-Sternberg 2004).

We have three scenarios for examining the influence of shopping contexts. In the first scenario, shoppers can only shop online for the above six items (“Web Only”). In the second scenario, they cannot use the Web for shopping at all (“No Web”). In the third scenario, consumers can shop using any means – whether using the Web or not (“No Restriction”).

In each scenario, there are two survey sections. The first section solicits subject’s age, gender, Web shopping experience, and web search experience.

In the second section, respondents identified the SEC category for the six selected items. We used the same survey instrument as Iacobucci (1992) and asked respondents to rate items in their respective SEC category by using a 7-point Likert scale on a single item construct. That is, we asked the respondent to evaluate if the quality of an item “could be assessed prior to purchase” (search), “could be evaluated only after purchase” (experience), or “would be difficult evaluate even after trial” (credence). And similar ratings were conducted in all three scenarios.

For each of the six goods, we asked if the subject had purchased it from the Web or Main Street before, the frequency of purchases, and the ratio of purchases between online vs. Main Street.

After a pilot study with students from two Midwest and Southwest universities, we made improvements on wordings. We then recruited subjects from general population by using online forums and sites like Craigslist. A modest Amazon.com gift certificate was used as an incentive for participation.

Altogether this study got 549 valid completed questionnaires. We removed the questionnaire when its data set is incomplete or invalid (e.g., entering the first choice for all the questions). For the valid questionnaires, 52.4% are male, and 47.6% are female. All these indicate a largely balanced sample of the general population.

## DATA ANALYSIS AND FINDINGS

We set the minimal age group sample size to  $n \geq 30$ , since we want to compare the means of the dependent variable for three scenarios within each age group. So “the age 60 or over” is removed from the analyses due to its small sample size ( $n = 16$ ). We use factorial ANOVA models with the SEC rating as the dependent variable and the following items as control variables or factors: three-scenario treatments, age, gender, web shopping experience, Web search experience, and online shopping frequency of the product. Only age and Web shopping experience turned out to be significant control variables.

In other words, gender, web search experience, and online shopping and frequency of the product have no significant impact on the SEC ratings by online shoppers. Thus, Hypothesis 2 is supported. And Hypotheses 4 and 5 are not supported. For Hypotheses 1 and 3, the results of factorial ANOVA models (Table 1) affirmed them.

### The concave relationship between age and Web shopping experience

We find a concave relationship between age and Web shopping experience (Figure 1). Web shopping experience increases steadily from age group 18-19 to 40-49. This is probably due to patterns in income levels and family/life style. Web shopping experience peaks at 40-49, and then it declines.

This pattern parallels that of consumer spending figure by age in the Consumer Expenditure Survey of the U.S. Bureau of Labor Statistics (see: <http://www.bls.gov/cex/2007/Standard/age.pdf>).

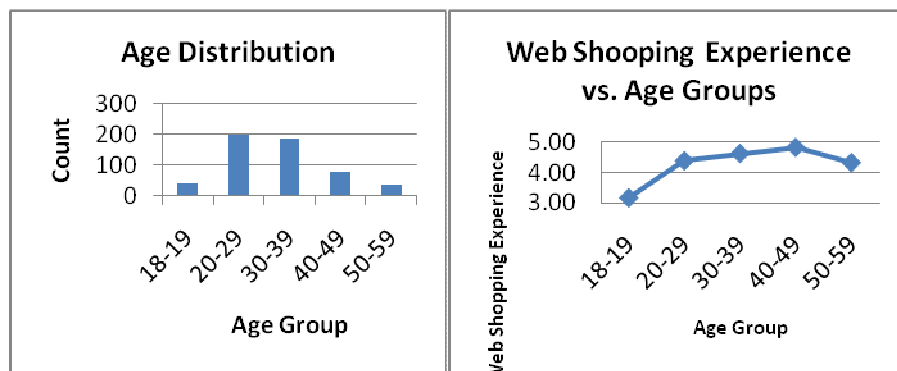
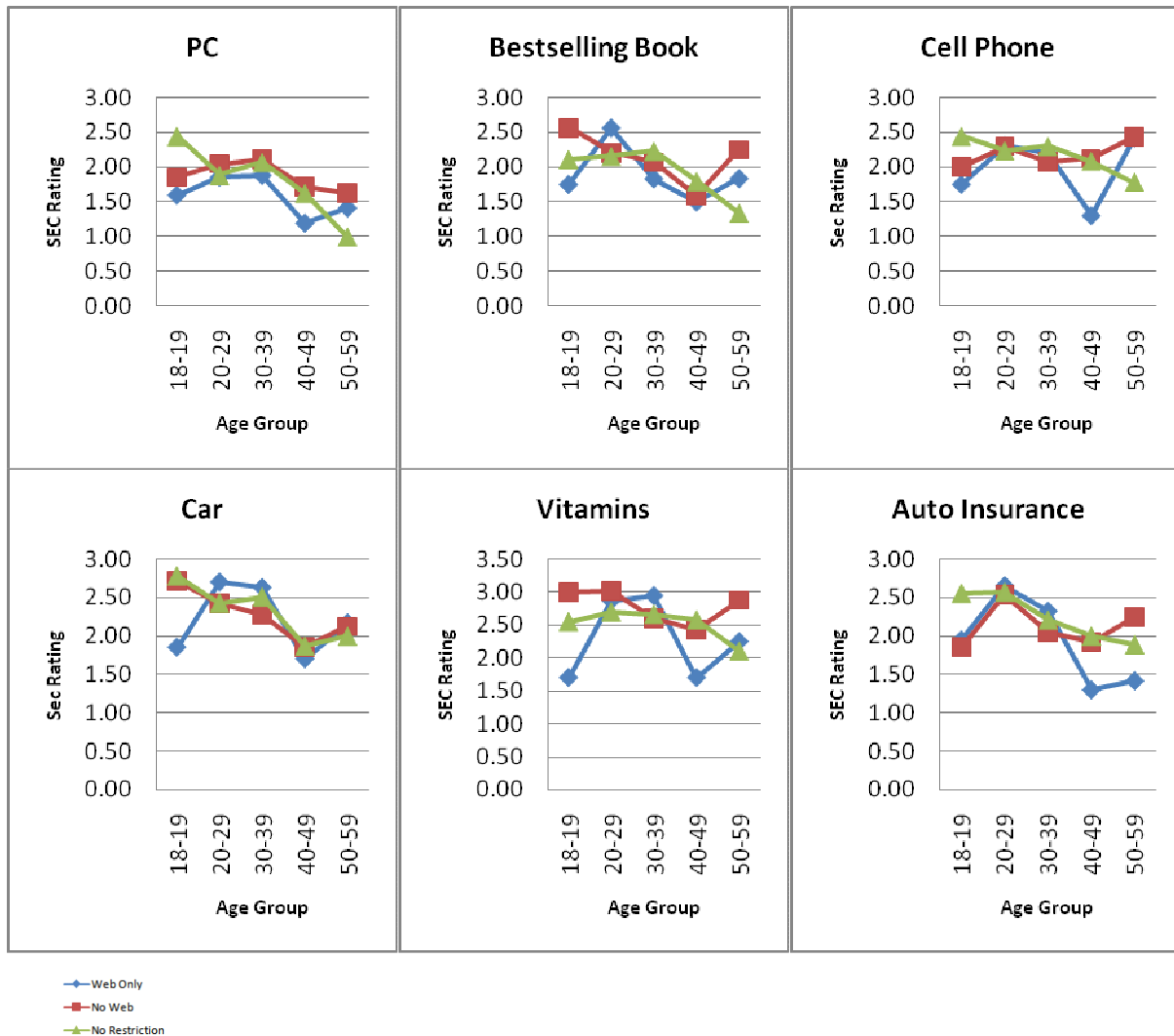


Figure 1. Web Shopping Experience and Age Group

**The SEC ratings of the 6 products by age groups**

By closely examining the individual goods, we found that H1 is supported for all goods except cell phone. Specifically, PC’s SEC rating is higher for age 30-39 than for age 50-59. Bestselling book’s SEC rating is higher for age 20-29 than for age 40-49. Car’s SEC rating is higher for age groups 18-19, 20-29 and 30-39 than for age 40-49. Auto insurance’s SEC rating is higher for age 20-29 than for age 30-39 and 40-49.

While statistically not significant, the charts on SEC ratings vs. age groups show as follows (Figure 2). For cell phones, the SEC ratings of Web-only group of age 40-49 is more than a 0.5 point lower than those of the no-Web and no-restriction groups of the same age. For cars, the SEC rating of Web-only group of age 18-19 is 0.75 point lower than those of the no-Web and no-restriction groups of the same age. In the credence goods category, for vitamins, the SEC ratings of the Web-only group are much lower (by .8 to 1.3) than those of the no-Web group among age groups 18-19 and 40-49. For auto insurance, the SEC ratings of the Web-only group are lower by .5 to 1.0 point than those of the no-Web group among age groups 40 or above.



**Figure 2: Age Group and SEC ratings**

**Web shopping experience**

Upon further examination of the age variable, we find that H3 is supported for experience and credence goods but not for search goods (PCs and bestselling books). In the experience goods category, we find that, for cell phones, shoppers with less Web shopping experience generally give higher SEC ratings. There is a statistically significant difference between the shoppers with the least Web shopping experience and those with the most Web shopping experience. For cars, similar results

are seen. The shoppers with the most Web shopping experience have statistically lower SEC ratings than the shoppers with the modest Web shopping experience. For credence goods like vitamins and auto insurance, the shoppers with the most Web shopping experience have lower SEC ratings compared with the shoppers that have less Web shopping experience.

**The interaction effect of age and Web shopping experience**

Since both age and Web shopping experience have significant impacts on SEC ratings, their interaction effect may also influence. It is possible that the SEC ratings for the same goods are rated differently in their SEC category by consumers with a combination of age and Web shopping experience. Specifically, older generation with more Web shopping experience rate credence, experience, and search goods more towards experience and search goods compared with other combinations. Through our analysis, we found this is supported for search and credence goods, but mixed for experience goods.

Age impacts the SEC ratings only for search goods. For experience goods, car’s SEC ratings are affected by age and Web shopping experience. However, cell phone’s SEC ratings are affected only by Web shopping experience. Both age and Web shopping experience impact the SEC ratings of credence goods. The summary of ANOVA with post-hoc tests are as follows (Table 1).

Product	Significant factors for SEC rating
PC	age** (30-39 vs. 50-59*)
Bestselling book	age*** (20-29 vs. 40-49***)
Cell phone	web shop experience** (slightly above novice vs. expert web shoppers*)
Car	age*** (18-19 vs. 40-49**, 20-29 vs. 40-49***, 30-39 vs. 40-49***) web shop experience*** (moderate vs. expert web shoppers***)
Vitamins	age* (no between-age group significance) web shop experience** (occasional vs. moderate web shoppers***, moderate vs. expert web shoppers***)
Auto insurance	age*** (20-29 vs. 40-49***, 30-39 vs. 40-49*) web shop experience** (moderate vs. expert web shoppers**) interaction between age and web shop experience*

\*:  $\alpha = .10$ , \*\*:  $\alpha = .05$ , \*\*\*:  $\alpha = .01$

**Table 1: SEC ratings by age group, Web shopping experience and their interactions**

**IMPLICATIONS**

There are several important implications from this research.

First, we find that the more Web shopping experience an individual has, the less one feels uncertain about product quality regardless of age. This indicates that the traditional SEC classification for goods and its directive function on advertising maybe limited by an individual’s Web shopping experience. For younger generation, though they have less shopping experience that can be used to evaluate products and services, their relatively rich Web shopping experience may compensate this limitation.

Second, even controlling for Web shopping experience, the age gap exists regarding how uncertain consumers feel about product quality. As indicated previously, age group 40-49 seems benefit most from their past Web shopping experience because they have an optimal combination of long enough Main Street and Web shopping experience. Their Main Street shopping experiences came from their accumulation through the ages. They are also the first generation that has both the income and opportunity to be familiar with the Internet and the Web as well as conducting online shopping. Thus, they have the comparatively best combined advantage. Their perception of goods, which is reflected in SEC ratings, is also significantly lower for most item categories in the experiment.

Third, the impact of online shoppers’ age and Web shopping experience are different on search, experience, and credence goods. The evaluation of credence goods probably requires both cumulative (long-term) Web shopping experience and Main Street experience (age) to lower product quality uncertainty. This indicates age and Web-shopping experience are both very

important to reduce the evaluation barrier for online shoppers. The SEC ratings of search goods, on the other hand, are more sensitive to age. It is a bit surprising to know that the SEC ratings are not affected by prior purchase experience for a specific product or service. This could be the easy access of product or service review information on the Web – since an individual could always depend on others' experience retried by electronic decision aids like comparison-shopping agents.

## CONCLUSION

The generation gap exists in many shopping scenarios. This research explored the age gap in the perception of goods in search, experience, and credence goods, or the SEC framework, specifically for the online shopping environment. We find that age and Web shopping experience, and in some cases, their interaction, have significant influence on online shoppers' perception of search, experience and credence goods. Even controlling Web shopping experience, we found the effect of generation gap on how consumers feel about product quality. Web shopping experience and senior age can reduce the uncertainty towards credence goods while the perception of search goods are only sensitive to age. We believe these findings will have important implications for future research on the SEC framework in the online environment.

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