

Consumer Decision Making on the Web: A Theoretical Analysis and Research Guidelines

Girish Punj
University of Connecticut

ABSTRACT

Recent empirical data on online shopping suggests that consumers have the potential to make better quality decisions while shopping on the web. But whether such potential is being realized by most consumers is an unresolved matter. Hence, the purpose of this research is to understand how (1) certain features of electronic environments have a favorable effect on the abilities of consumers to make better decisions, and (2) identify information-processing strategies that would enable consumers to make better quality decisions while shopping online. A cross-disciplinary theoretical analysis based on constructs drawn from economics (e.g., time costs), computing (e.g., recommendation agents), and psychology (e.g., decision strategies) is conducted to identify factors that potentially influence decision quality in electronic environments. The research is important from a theoretical standpoint because it examines an important aspect of online consumer decision making, namely, the impact of the electronic environment on the capabilities of consumers. It is important from both a managerial and public policy standpoint because the ability of shoppers to make better quality decisions while shopping online is directly related to improving market efficiency and enhancing consumer welfare in electronic markets. © 2012 Wiley Periodicals, Inc.

Due to the rapid growth of e-commerce, consumer purchase decisions are increasingly being made in online stores. In the 12 years that the U.S. Census Bureau has kept track, e-commerce sales have grown at a double-digit rate from \$5 billion in 1998 to an estimated \$194 billion in 2011 (<http://www.census.gov/retail/mrts/www/data/pdf/ec-current.pdf>). Web-based stores offer immense choice and provide a virtual shopping experience that is more real-world than ever before, through the use interactive video, animation, flash, zoom, three-dimensional rotating images, and live online assistance.

The conventional wisdom is that online shopping has been a boon to consumers. The Internet has certainly made it easier for consumers to search for the best price when that is most important due to the profusion of merchants on the web. Likewise, the large product assortments offered by these merchants has also made it easier to find the best product fit (i.e., the match between consumer needs and product attributes) when that is most important. Recommendation agents offered by sellers and third-party shopbots enable consumers to quickly navigate through huge product assortments to find that elusive bargain or “dream” product (i.e., one they were not sure even existed). The ability to electronically screen (and rescreen) product choices enables consumers to focus on the primary benefit they

seek while shopping online, be it paying a lower price or finding a product that best matches needs.

In a seminal article on the expected impact of the Internet on consumer information search behavior, Peterson and Merino (2003) cautioned that there was no assurance that the Internet would lead to better consumer decision making. In a recent comprehensive review of empirical research on consumer decision making in online environments, Darley, Blankson, and Luethge (2010) conclude that there is a paucity of research on the impact of online environments on decision making. According to a 2008 report on “Online Shopping” (Horrigan, 2008) from Pew Internet and American Life Project (a leading nonprofit authority on Internet usage trends), almost 80% of shoppers say that the Internet is the best place to buy items that are hard to find. Yet, at the same time, almost 60% of shoppers also say that they get frustrated, confused, or overwhelmed while searching for product information.

Based on the studies by Peterson and Merino (2003), Darley, Blankson, and Luethge (2010), and the 2008 Pew Internet report (Horrigan, 2008), it appears that online choice settings certainly offer consumers the *potential* to make better quality decisions, but whether this potential is being realized is still an unresolved matter. Hence, the purpose of this research is to understand how (1) certain features of electronic

environments have a favorable effect on the abilities of consumers to make better decisions, and (2) identify information-processing strategies that would enable consumers to make better quality decisions while shopping online.

A better quality decision may be defined along two dimensions, one relating to price and the other to product fit (i.e., the match between consumer needs and product attributes). Consumers may seek the best price for a product, or the best product fit, or more commonly a price–product fit combination that represents how they trade-off price with product fit. The potential for making better quality decisions while shopping online can then be related to the ability of the consumer to select an optimal price–product combination more readily than when shopping in a traditional retail environment (Bakos, 1998).

Previous research on decision making in online settings has found that consumers are able to make better decisions with less search effort in online settings (Häubl & Murray, 2006; Häubl & Trifts, 2000). The ability to control the flow of information via an interactive information display has also been found to be related to decision quality (Ariely, 2000; Wu & Lin, 2006). The empirical improvements in decision quality observed in both of the above studies are consistent with the premise of this paper. But what is the theoretical basis for them?

A cross-disciplinary theoretical analysis based on constructs drawn from economics (e.g., time costs), computing (e.g., recommendation agents), and psychology (e.g., decision strategies) is conducted to identify factors that potentially influence decision quality in electronic environments. The research is important from a theoretical standpoint because it examines an important aspect of online consumer decision making, namely, the impact of the electronic environment on the capabilities of consumers. It is important from both a managerial and public policy standpoint because the ability of shoppers to make better quality decisions while shopping online is directly related to improving market efficiency and enhancing consumer welfare in electronic markets.

THEORETICAL ANALYSIS

The purpose of the theoretical analysis of decision quality in online settings is to identify the impact of the electronic environment on the abilities of consumers. The *human capital* model of consumption (Putrevu & Ratchford, 1997; Ratchford, 2001) applied to a decision-making context provides a way of understanding the effects that apply in both traditional retail and electronic information environments, but have a differential impact on the consumer in online settings. Likewise, the *human–computer interaction* model (e.g., Häubl & Dellaert, 2004; Pirolli, 2007; Smith & Hantula, 2003) may be used to understand how consumers interact with and process electronic information. The ability of consumers to make better quality decisions in online stores

is related to their ability to take advantage of the characteristics of online settings that improve decision quality, while avoiding those which impair it (Lee & Lee, 2004). Several of the constructs selected for the theoretical analysis have previously been used to evaluate consumer decisions in off-line settings (Bettman, Johnson, & Payne, 1991; Maes, 1999; Thaler, 1999; Todd & Benbasat, 1999). Next, the influence of these factors on decision quality in online settings is assessed.

Time Costs

Time costs influence information search depending upon the opportunity cost of time (Putrevu & Ratchford, 1997). Higher time costs decrease search, while lower time costs lead to increased search. When time costs become too low, consumers engage in more exploratory search, potentially having an unfavorable effect on decision quality. Previous research has found that the influence of time costs on search in off-line settings is dominated by the physical search effort required in these settings (Beatty & Smith, 1987; Srinivasan & Ratchford, 1991). In other words, time costs are not adequately considered by consumers in traditional retail settings. The physical effort required to conduct search is significantly lower in the electronic environment (Johnson, Bellman, & Lohse, 2003). Moreover, the typical online consumer is “time starved” and shops online to save time (Bellman, Lohse, & Johnson, 1999). Online consumers also exhibit search and evaluation patterns that are consistent with time constraints (Sismeiro & Bucklin, 2004). Hence, there is more importance placed on time costs in online settings. Further, the use of electronic sources of information can increase search effectiveness by decreasing the time needed to search and evaluate information (Ratchford, Lee, & Talukdar, 2003; Ratchford, Talukdar, & Lee, 2007). Time-related investments during search and evaluation can reduce future time costs due to the acquisition of skill capital (Ratchford, 2001).

- P1:** A decrease in time costs will have a greater positive effect on decision quality in the electronic environment in comparison to a traditional retail environment.

The above proposition can be empirically tested using measures of time costs reported in Srinivasan and Ratchford (1991), Putrevu and Ratchford (1997), Ratchford, Lee, and Talukdar (2003), Oorni (2003), and Ratchford, Talukdar, and Lee (2007) and measures of decision quality reported in Olson and Widing (2002), Häubl and Trifts (2000), Widing and Talarzyk (1993), and Jacoby (1977).

Cognitive Costs

Cognitive costs relate to the cognitive effort expended during decision making. The cognitive cost model

proposes that consumers maintain a focus on accuracy but also consider the cognitive costs associated with the attainment of that goal (Bellman, Johnson, Lohse, & Mandel, 2006; Payne, Bettman, & Johnson, 1993). Previous research findings show consumers limit processing in off-line settings, because of a greater emphasis on effort reduction than on accuracy improvement (Payne, Bettman, & Johnson, 1993). Cognitive costs are lower in electronic environments, because cognitive effort can be shifted to the recommendation agents that are typically available in these environments (Johnson, Bellman, & Lohse, 2003). Hence, the extent to which consumers focus on accuracy improvement in an online setting can potentially have a favorable influence on decision quality. The cognitive costs of search include the cost of acquiring information and the cost of processing information (Shugan, 1980). While the cost of processing information remains unchanged between off-line and online settings, the cost of acquiring information is reduced in online settings due to the availability of electronic decision aids (West et al., 1999). Electronic decision aids are helpful for performing routine processing tasks, such as sorting information on the alternatives.

P2: A decrease in cognitive costs will have a greater positive effect on decision quality in the electronic environment in comparison to a traditional retail environment.

The above proposition can be empirically tested using measures of cognitive costs reported in Todd & Benbasat (1992), Payne, Bettman, and Johnson (1993), Chu and Spires (2000), and Chiang, Dholakia, and Westin (2004) and measures of decision quality reported in Olson and Widing (2002), Häubl and Trifts (2000), Widing and Talarzyk (1993), and Jacoby (1977).

Perceived Risk

Perceived risk influences search and evaluation due to the uncertainty associated with the choice alternatives. Previous research has found that search is determined by both absolute and relative levels of uncertainty associated with the choice alternatives, but with a greater emphasis on the latter (Moorthy, Ratchford, & Talukdar, 1997). The separation of product information from the physical product increases perceived risk in online settings (Johnson, Bellman, & Lohse, 2003). Further, consumers tend to focus more on absolute, rather than relative, levels of risk associated with the product alternatives in an electronic environment (Biswas, 2002). Thus, consumers will need stronger signals (e.g., brand names, retailer reputation) to reduce risk (Biswas & Biswas, 2004; Degeratu, Rangaswamy, & Wu, 2000). However, risk assessments may be counterbalanced by the convenience of purchasing online (Bhatnagar, Misra, & Rao, 2000). Risk-taking consumers may reduce search as they trade off the con-

venience of purchasing online with the risk of so doing, while risk-averse consumers may increase search (Biswas & Biswas, 2004). Further, consumers seek and accept online recommendations as a way to manage risk during online search and evaluation (Smith, Menon, & Sivakumar, 2005).

P3: An increase in perceived risk will have a greater negative effect on decision quality in the electronic environment in comparison to a traditional retail environment.

The above proposition can be empirically tested using measures of perceived risk and amount of information search reported in Beatty and Smith (1987), Dowling and Staelin (1994), Moorthy, Ratchford, and Talukdar (1997), Biswas (2002), and Biswas and Biswas (2004) and measures of decision quality reported earlier.

Product Knowledge

Consumers often rely on prior knowledge during search and evaluation due to information processing limitations (Bettman, Luce, & Payne, 1998; Lynch & Srull, 1982). The stimulus-rich nature of online settings will cause memory-based influences on search and evaluation to diminish while enhancing the role of externally available information (Alba et al., 1997). Consumers use prior knowledge to initiate search (John, Scott, & Bettman, 1986) with information on uncertain beliefs being acquired earlier (Simonson, Huber, & Payne, 1998). The iterative nature of online search and evaluation may result in information on previously preferred alternatives being disconfirmed (Oorni, 2003). Preference reconstruction can then be expected to be based on exposure to new alternatives and selection criteria (Häubl & Murray, 2003). Consumers who are skillful at using the Internet to research products rely on it as an important source of information (Ratchford, Lee, & Talukdar, 2003; Ratchford, Talukdar, & Lee, 2001). However, some consumers have a difficult time learning the search terminology (i.e., keywords) necessary for seeking out the product that best matches needs in an electronic environment (Belkin, 2000). Thus, consumers need both "web expertise" (i.e., device knowledge) and product knowledge (i.e., domain knowledge) to make better decisions in an online setting. It is possible for web expertise to compensate for the lack of product knowledge, provided consumers use the former to develop the latter (Spiekermann & Paraschiv, 2002). If consumers do not have the necessary level of product knowledge, they may focus on easy to use, but unimportant product attributes, which will adversely affect decision quality.

P4: An increase in product knowledge will have a greater positive effect on decision quality in

the electronic environment in comparison to a traditional retail environment.

The above proposition can be empirically tested using measures of product knowledge reported in Brucks (1985), Srinivasan and Ratchford (1991), Simonson, Huber, and Payne (1998), Ariely (2000), and Jepsen (2007) and measures of decision quality reported earlier.

Screening Strategies

The more information consumers consider the more likely are they to make a better purchase decision (Orni, 2003; Peterson & Merino, 2003). Online merchants offer wide and deep product assortments so that consumers can find a product fit that best matches needs. But navigating through all the product choices available online can be time consuming. The desire to consider a wide variety of product options and be able to do so quickly has been labeled the “tyranny of choice” (Schwartz, 2004). Hence, the typical online store has a recommendation agent (i.e., an electronic decision aid) available for screening product alternatives. The ability of the consumer to calibrate a recommendation agent affects decision quality in online settings (Smith, 2002; Wu & Lin, 2006). It is easy to over-calibrate a recommendation agent by including even less important attributes during alternative evaluation (resulting in the “no matches found” message).

The manner in which a recommendation agent is used also influences decision quality in online settings. Recommendation agents can be used for information filtration (i.e., sorting alternatives on an attribute) or information integration (i.e., combining information on the alternatives using multiple attributes). The heuristics consumers in online settings are better suited for sorting alternatives rather than combining information on the alternatives. While information filtration screening strategies can help rapidly narrow the set of available alternatives, they are relatively rigid (i.e., inflexible) in their application (Olson & Widing, 2002). Alternatives that are otherwise attractive may be eliminated if they are dominated on the attributes used for screening (Alba et al., 1997). Hence, the use of recommendation agents for information filtration, relative to information integration, can potentially have an unfavorable influence on decision quality.

- P5:** The use of an information filtration strategy will be negatively related to decision quality in an electronic environment in comparison to a traditional retail environment.

The above proposition can be empirically tested using definitions of screening strategies reported in Todd and Benbasat (1992, 1994, 2000) and Olson and Widing (2002) and measures of decision quality reported earlier.

Digital Attributes

An electronic environment is characterized by both digital and non-digital attributes (Lal & Sarvary, 1999) with the distinction relating to how easily attribute information can be digitized in an online setting. Search costs are lower for digital attributes in comparison to non-digital attributes (Bakos, 1997). Hence, consumers may initially screen product alternatives using digital attributes, but as diminishing returns set in, switch to non-digital attributes for final alternative evaluation. If digital attributes are used for initially screening alternatives, the alternatives retained for final evaluation are likely to be similar on those digital attributes. Consequently, final alternative evaluation is then likely to be based on non-digital attributes. Further, parity of the screened alternatives on digital attributes could potentially lead to extremeness aversion (Chernev, 2004) when they are evaluated using non-digital attributes. The use of digital attributes can influence evaluation when alternatives are sorted from best-to-worst in an electronic environment, because consumers begin to consider mediocre options in addition to superior ones (Diehl, 2005). Further, the enhanced use of digital attributes may lead to a reduced consideration of product features that are linked to non-digital attributes.

- P6:** The use of digital attributes will be negatively related to decision quality in an electronic environment in comparison to a traditional retail environment.

The above proposition can be empirically tested using definitions of digital and non-digital attributes reported in Lal and Sarvary (1999), Biswas and Biswas (2004), and Ancarani and Shankar (2004) and measures of decision quality reported earlier.

Perceptual Influences

Perceptual factors may influence decision making in online settings, because electronic environments have vivid (i.e., graphic) information, which is likely to encourage perceptually driven information processing (Alba et al., 1997; Demangeot & Broderick, 2010; Häubl & Dellaert, 2004). The visual salience of attributes influences decision making to a greater extent than importance weights in such settings (Jarvenpaa, 1990), while also evoking mental imagery that can influence purchase intention (Kim and Lennon, 2010; Schlosser, 2003). Consumers may also take more notice of attributes presented through the use of flash and animation. Animation has a negative effect on focused attention (Hong, Thong, and Tam, 2004). Background pictures have been found to influence decision making and product choice (Mandel and Johnson, 2002), while page color has been found to influence perceived download (i.e., search) time (Gorn, Chattopadhyay, Sengupta, & Tripathi, 2004). The perceptual influences described above when acting singly or in combination can

adversely influence the ability of consumers to make better decisions in electronic environments.

- P7:** The use of perceptual cues will be negatively related to decision quality in an electronic environment in comparison to a traditional retail environment.

The above proposition can be empirically tested using conceptualizations of selective attention and related measures reported in Janiszewski (1998), Jarvenpaa (1990), Mandel and Johnson (2002), and Hong, Thong, and Tam (2004) and measures of decision quality reported earlier.

Affective Influences

Affective factors may influence decision making in electronic environments, because the psychological state of “flow” is a characteristic of online settings (Hoffman & Novak, 1996; Mathwick & Rigdon, 2004). Flow will induce positive affect (Novak, Hoffman, & Yung, 2000).

Two effects normally associated with flow are “focused attention” and “time distortion,” with focused attention being an antecedent of time distortion (Chen, Wigand, & Nolan, 2000; Skadberg & Kimmel, 2004). Time distortion can either compress or expand the perception of time (Novak, Hoffman, & Yung, 2000). When time perceptions are altered, consumers will begin to make a distinction between physical time (i.e., Newtonian time) and “internet time” which, in turn, will adversely affect the opportunity cost of time (i.e., the valuation of time) in online settings. Again, the affective influences described above when acting singly or in combination can influence the ability of consumers to make better decisions in electronic environments.

- P8:** The use of affective cues will be negatively related to decision quality in an electronic environment in comparison to a traditional retail environment.

The above proposition can be empirically tested using conceptualizations of time perception and related measures reported in Chen, Wigand, and Nolan (2000), Novak, Hoffman, and Yung (2000), Skadberg and Kimmel (2004), and Gorn et al. (2004) and measures of decision quality reported earlier.

Trust

Trust and privacy concerns influence search and evaluation in online settings, because of the potential for misuse of personal information (Bart, Shankar, Sultan, & Urban, 2005). Consumers seem to be willing to trust the product recommendations offered by an electronic decision aid, but only when it sorts information on product alternatives (Häubl & Murray, 2003). Electronic environments decision aids are less trustworthy when

advice (e.g., expert opinions) is needed and the privacy of information is a concern (West et al., 1999). Privacy concerns lead some consumers to limit the use of electronic environments for seeking product information. Likewise, a lack of trust can cause some consumers to limit contact to only reputable Internet retailers (Brynjolfsson & Smith, 2000).

- P9:** An increase in trust will have greater positive effect on decision quality in an electronic environment in comparison to a traditional retail environment.

The above proposition can be empirically tested using conceptualizations of trust and related measures reported in Jarvenpaa and Tractinsky (1999), Bart et al. (2005), and Smith, Menon, and Sivakumar (2005) and measures of decision quality reported previously.

Summary

The preceding theoretical analysis identifies effects that may be combined into a conceptual model of decision quality in online settings (see Figure 1). The potential for consumers to make better quality decisions while shopping on the web can be realized by encouraging consumers to benefit from the favorable influences on decision quality in web-based choice environments, while countering the unfavorable influences, as articulated through the propositions. The main prediction of the model is that decision quality is likely to improve when consumers focus both on cost reduction and benefit improvement, as compared to when the focus is only on cost reduction or benefit improvement. Why would consumers not focus on both cost reduction and benefit improvement all the time? It is because of the limited cognitive abilities of consumers. Consumers have to allocate available cognitive resources between these two options. They are more likely to direct these resources to cost reduction in off-line settings because the results of so doing are immediate, certain, and tangible as substantiated in numerous studies of off-line information search and product evaluation. In online settings, many of the resources that were previously directed to cost reduction now become available for benefit improvement, because of the availability of electronic decision aids such as shopbots and recommendation agents. Hence, there is a shift in the cost–benefit trade off from cost reduction toward benefit improvement. The contingency perspective adopted in the manuscript enables us to predict the effect of various factors on decision quality in online settings.

ENABLING CONSUMERS TO MAKE BETTER ONLINE DECISIONS

While shopping in traditional retail stores, consumers encounter a variety of frustrations (e.g., limited store

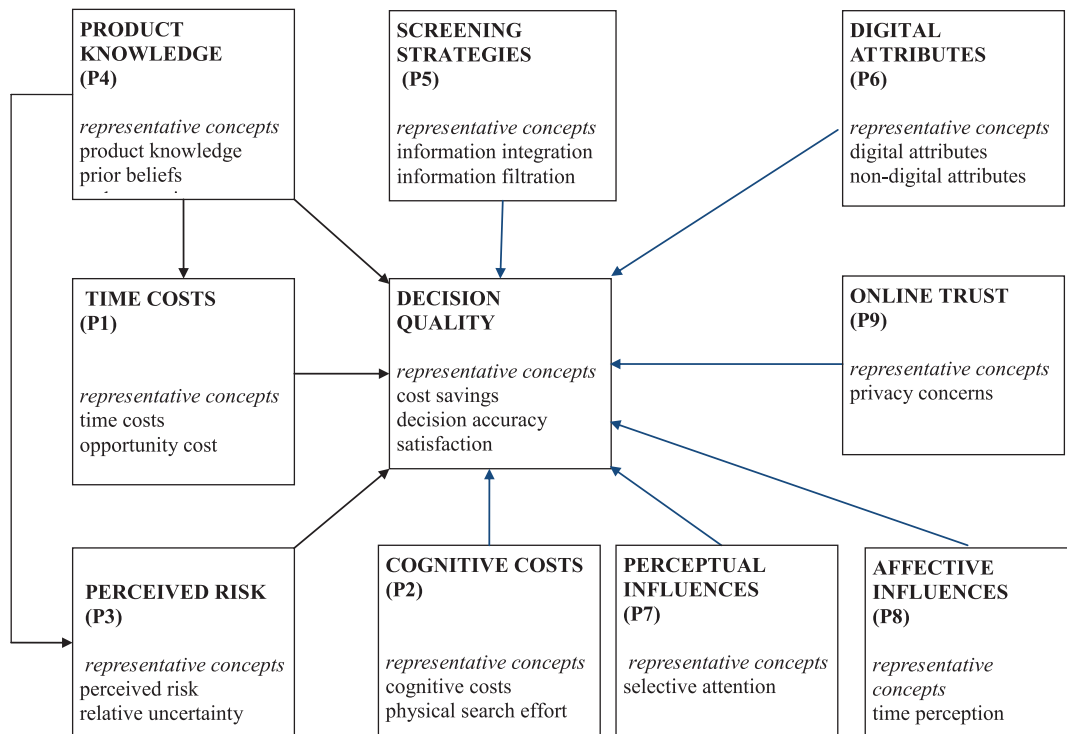


Figure 1. A model of decision quality for an online information environment.

hours, crowded stores, under-stocked merchandise, disorganized racks and bins, inadequate sales help, long check-out lines, etc.) The assessment of these “costs” has primacy over the potential “benefits” of finding the best price, product fit, or more commonly, a price-product fit combination that maps these two dimensions. Hence, consumers tend to focus more on costs while shopping in brick-and-mortar stores (Bellman et al., 2006).

Online stores provide shoppers the opportunity to shift their focus from “costs” to “benefits” because many of the annoyances associated with traditional retail shopping are absent. How can consumers be persuaded to focus more on benefits while shopping online? By getting them to modify their decision frame (i.e., task definition) about shopping when they are in an online setting. Three information search and evaluation strategies that are likely to enable them to do so are described next.

Processing Strategy 1: Recalibrating the Costs Versus Benefits Trade Off

The 2008 report on “Online Shopping” (Horrigan, 2008) from Pew Internet and American Life Project cited earlier shows that about 80% of consumers find online shopping to be convenient, while 70% say it saves time. These numbers suggest that most online shoppers may be focusing more on the “costs” of searching for product information. If consumers recalibrate the “costs”

versus “benefits” trade off while shopping online they are likely to make better decisions. So, doing requires them to become adept at comparing different benefits. For example, finding a great price is certainly an important benefit of shopping online, but so is finding the best product fit. It is easier to think about value of the bargain, because that is approximately the amount of money saved. But it is harder to place a value on having located the product with the best fit. In one case the reward is *economic* while in the other instance it is *psychological*. In both instances consumers have to decide on the costs to incur to realize these disparate benefits.

To improve decision quality in online settings, shoppers should be encouraged to strike a better balance between the relative benefits of a better product fit and that of a lower price. Particularly, when there is already some assurance that online prices are lower (Baye, Morgan, and Scholten, 2003). Most shoppers are able to make the *economic* trade off between time spent and money saved that is appropriate for them, but find it more difficult to make the *psychological* trade off between cognitive effort and product fit (see Figure 2).

Why so? It is because time and money are resources (or “currencies”) that consumers are familiar with in both the online and physical world. For example, consumers have been reported as being willing to forgo a \$2.49 difference in price between a retailer they normally buy from and a new retailer, because of the timesavings (Brynjolfsson and Smith, 2000). While consumers are also quite familiar with the *physical* effort

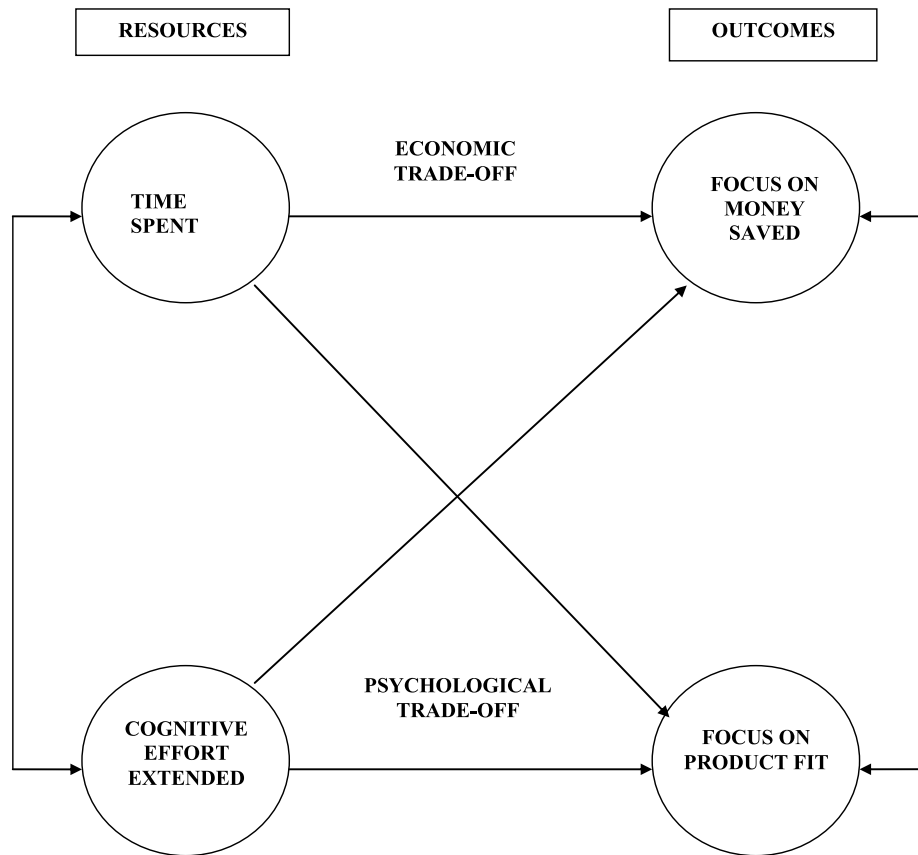


Figure 2. Economic and psychological trade offs affecting decision quality in online settings.

shopping takes in the brick-and-mortar world, they are unable to calculate the appropriate trade off (or “exchange rate”) between that and the *cognitive* effort that is required while shopping online.

Online shoppers looking for the best product fit take longer to make a purchase because they spend more time searching for product information and evaluating options, while those looking for the best price stop searching once they find an acceptable price–product fit combination that maps these two dimensions. In other words, shoppers calibrate the “costs” versus “benefits” calculus that determines online product search differently. To improve decision quality in online settings, shoppers should be encouraged to make the appropriate *monetary* (time spent vs. money saved) and *nonmonetary* (cognitive effort expended vs. product fit obtained) trade offs associated with how “costs” and “benefits” are to be valued in electronic environments (see Figure 2).

Making a choice forecloses other options that may be nearly as attractive as the one selected. Hence, whenever a product is eliminated from consideration there are psychological “regret costs” that have to be incurred regardless (Schwartz, 2004). For those looking for the best price these costs are low. But for those looking for the best product fit they can be quite high, particularly if evaluating the final choices involved difficult trade offs between important product attributes. Once

consumers begin to focus more on benefits and less on costs, the potential for making better quality decisions while shopping online may be realized.

Processing Strategy 2: Recalibrating the Time Spent Versus Price Trade Off

The Pew Internet and American Life Project report (Horrihan, 2008) also shows that about 50% of buyers state that the Internet is the best place to find bargains. These numbers suggest that almost half of consumers focus on the money saving aspect of online shopping. The use of electronic sources of information increases effectiveness (i.e., productivity) by decreasing the time needed to search for information (Ratchford, Lee, and Talukdar, 2003; Ratchford, Talukdar, & Lee, 2007). Lower time costs lead to increased search and the consideration of more alternatives (Oorni, 2003).

While saving time and money have been mentioned as the primary drivers of online shopping, saving time may be more important than saving money for most consumers (Bellman, Lohse, & Johnson, 1999). For example, median income shoppers have been reported to consider a saving of 200 seconds as being worth \$1.44 (Johnson, Moe, Fader, Bellman, & Lohse, 2004). But most consumers are unable to monetize these

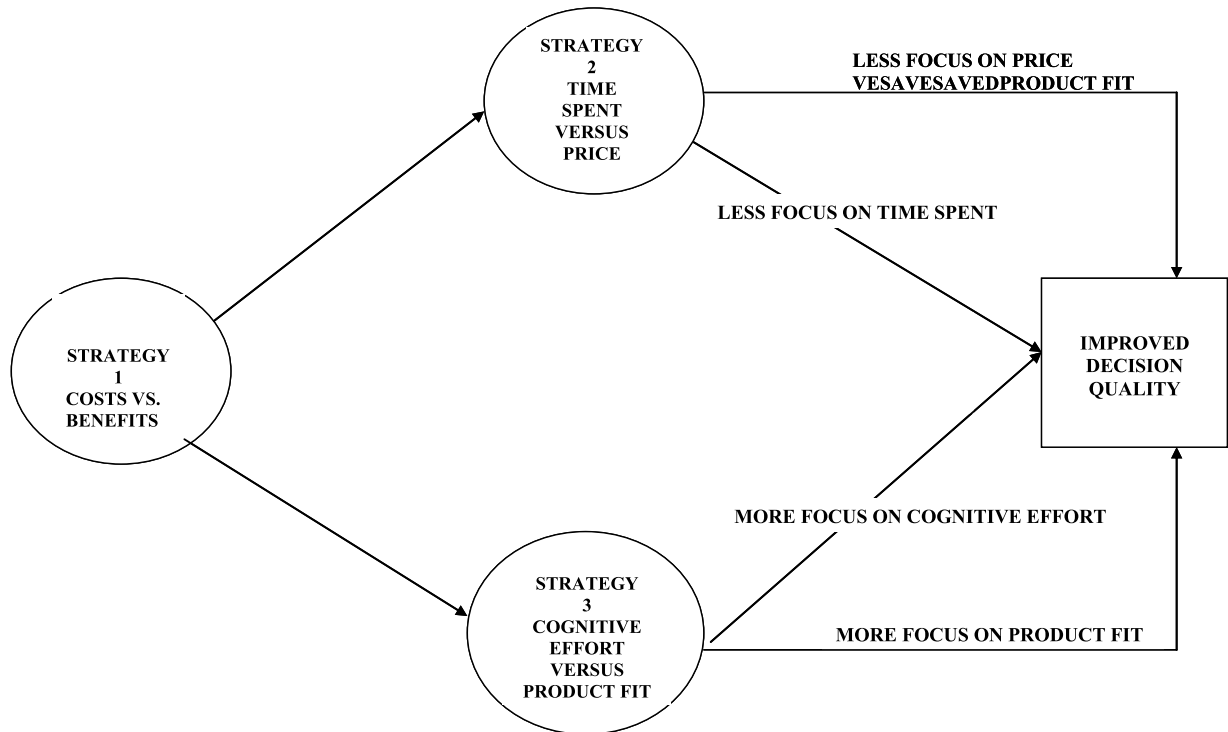


Figure 3. Depiction of strategies that improve decision quality in online settings.

timesavings. Hence, they should be encouraged to spend them on seeking a better product fit thereby improving decision quality making (see Figure 3).

Economic models show that when there is the focus on obtaining a low price, consumers invariably choose the less-than-ideal product (Aron, Sundararajan, & Viswanathan, 2006). Worse still, there is a transfer of consumer surplus (i.e., the difference between the price paid and the “willing to pay” price) from consumers at the high-end to those who are only looking for a low price. To improve decision quality in online settings, shift in emphasis from seeking the best price to seeking the best product fit at the lowest price should be encouraged. Once consumers begin to focus more on product fit and less on price, the potential for making better quality decisions while shopping online may be realized.

Processing Strategy 3: Recalibrating the Cognitive Effort Versus Product Fit Trade Off

The Pew Internet and American Life Project report (Horrigan, 2008) also shows that about 60% of shoppers get frustrated, confused, or overwhelmed while searching for product information. One possible interpretation of these numbers is that shoppers are not making the effort to find the best price–product fit suited to their needs. Recommendation agents offered by retailers and third-party shopbots attempt to match consumer needs

with available products. Both buyers and sellers have a vested interest in making the matching process function effectively (Redmond, 2002). For buyers finding products that closely match needs boosts customer satisfaction. For sellers providing products that satisfy buyer needs creates loyal customers. Yet, the matching process is not a straightforward task. Buyers need to learn that finding the best product fit requires considerable cognitive effort. Sellers need to provide wide product assortments and suggest objective (i.e., unbiased) selection criteria. To improve decision quality in online settings, consumers should be encouraged to recalibrate their cognitive effort versus product fit obtained trade off (see Figure 3).

To enable them to do so shoppers need to be educated on how to properly value their time while researching products on the Internet. They need to be convinced that online shopping is a potentially high-value pursuit, and does not belong in the same “mental account” as surfing and other low-value online pursuits. Terminating product search prematurely because of slow-loading web pages does not make sense, particularly when one is not sure what else they could do with that time. Manufacturers can play a more active role in educating consumers to make the appropriate trade off between cognitive effort and product fit obtained, because they stand to benefit the most from the corresponding increase in consumer welfare.

The shift in focus from reducing cognitive effort to improving product fit is easier for consumers who are knowledgeable of the product category. These

consumers already know the terminology to use for searching for their ideal product. Hence, they are likely to use the available recommendation agent (i.e., recommendation agent) to discover new products, while also gathering more information on previously known choice options (Maes, 1999). But the shift in focus from reducing effort to improving fit is much harder for consumers who have limited experience with the product category. These consumers are less likely to know the appropriate keywords to use for locating the product that best matches needs (Glover, Prawitt, & Spilker, 1997). They need to be encouraged to use the recommendation agent to become knowledgeable about the product category. Once consumers begin to focus more on product fit and less on cognitive effort, the potential for making better quality decisions while shopping online could be realized.

Summary

The preceding analysis identifies three information-processing strategies that can enable consumers to make better decisions while shopping on the web. The analysis reveals that consumers can improve decision quality in online settings by modifying the decision frame (i.e., task definition) they typically employ in offline settings. By so doing they are more likely to invoke one or more of the three information-processing strategies described above to take advantage of the features of online settings that improve decision quality, while avoiding those which impair it.

GENERAL DISCUSSION

The theoretical analysis indicates that decision quality in online settings is influenced by both a macrolevel cost-benefit mechanism and microlevel heuristics that are locally optimal. It also reveals that there are both *structural* effects and *process* influences on decision quality. The structural or macroinfluences, which are primarily economic and cognitive, are normally included in models of consumer decision making. They provide the backdrop within which process or microinfluences, which are primarily perceptual and affective, are observed. The economic, cognitive, affective, and perceptual influences come together in time and space to create the information environment in which consumers search for and evaluate product information (see Figure 1).

To better understand the confluence of economic, cognitive, perceptual, and affective influences in an online setting, consider the differences in the *resources* required and *goals* pursued in traditional retail and online search (Feather, 2001). The resources required for search in an electronic environment (e.g., selective attention) are different from those in a traditional retail environment (e.g., physical search effort). Thus, there is a resource-shift that occurs between the two environments, which affects decision quality. Further, the

goals associated with search and evaluation in a traditional retail environment (e.g., reducing search effort) are also different from those in an online setting (e.g., improving search efficiency). Thus, there is a goal-shift that occurs between the two environments, which also affects decision quality.

The empirical evidence from studies that have reviewed online consumer decision making (Darley, Blankson, & Luethge, 2010; Dholakia & Bagozzi, 2001; Peterson & Merino, 2003) supplemented with the theoretical analysis reported here, and corroborated by the 2008 report on "Online Shopping" (Horrigan, 2008) by the Pew Internet and American Life Project suggest that the potential for making better quality decisions offered by online retail settings may not yet have been realized. The theoretical analysis suggests information-processing strategies that could enable consumers to make better quality decisions in electronic environments. The strategies describe how consumers could take advantage of the features of these environments (e.g., lower search costs, wider product selections) to improve decision quality. The ability of consumers to make better decisions enhances consumer welfare and improves market efficiency in electronic markets, as described next.

Enhancing Consumer Welfare

Electronic markets can increase consumer welfare (Bakos, 1998). But the potential of improving consumer welfare is still far from being realized, because the objectives of consumers and manufacturers are not fully aligned. Most online buyers want customized products, but are only willing to pay a mass-produced price for them. Likewise, most online sellers want customized prices for products they have mass-produced (Elofson and Robinson, 1998). The reason is that while manufacturers can readily determine the price sensitivity of buyers for mass-produced products, they have difficulty predicting the mix of product attributes that consumers want in their customized products (Elofson and Robinson, 1998). In other words, online sellers are able to estimate the effect of price on demand, but have trouble doing the same for product attributes. Thus, the ability of online sellers to estimate demand for customized products from buyers who are willing to pay extra for them affects the potential for consumers to make better quality decisions while shopping online.

Improving Market Efficiency

Electronic markets can increase market efficiency, which potentially benefits both buyers and sellers (Bakos, 1998). Transaction costs for both manufacturers and consumers have been reduced making things better for both parties. The gap between online and offline prices has narrowed considerably. In fact, for some product categories (e.g., books and CD's) price dispersion on the Internet is now higher than offline (Brynjolfsson and Smith, 2001). Consumers can pay lower prices

for the products they want, while manufacturers can better differentiate their product offerings. Although lower prices can potentially hurt a seller's profits, the harm is offset by the seller's ability to compete with other manufacturers by making differentiated products (Smith, 2002). But, as prices decline further, additional constraints on manufacturer profits limit their ability to compete effectively. The rapid growth of the online shopping may have lowered search costs for buyers faster than the ability of sellers to offer differentiated products. Thus, the ability of sellers to produce differentiated products for buyers who desire them affects the potential for consumers to make better quality decisions while shopping online.

Empowering Consumers

The challenge that remains is how to get consumers to adopt information-processing strategies that could potentially improve decision quality in online settings (Henry, 2006). Fortunately, the news for the future is good. There is an unmistakable trend away from using the Internet to search for the lowest price to finding the best product fit. Recent studies show that online shoppers are not just buying the same products for less money, they are buying different products. The phenomenon of "the long tail" portends important changes in the ability of online sellers to meet the needs of niche buyers (Brynjolfsson, Hu, & Smith, 2006).

According to a recent JD Power and Associates report, new car buyers are now paying less attention to "finding the right vehicle price" than to "finding the right vehicle." There is evidence that customers will pay more for products in online settings when the electronic decision aid matches their preferences to a richer mix of attributes. Consumers have become good at finding the best prices, products, and service support. But the ability to find the best product still lags the ability to find the best price. A recent study found that new car buyers will pay \$633 more on average if a website provides product-related information that helps find a vehicle that matches needs (Viswanathan, Gosain, Kuruzovich, & Agarwal, 2007). The findings are encouraging because they suggest that the balance between using the Internet for finding a low price versus a custom product may be shifting. Merchants can better differentiate their products and offer a wider selection, while consumers can find the best product fit if they are willing to take the time.

Consumers may choose to use their timesavings for other tasks or invest them to improve decision quality. Consumers who have a higher opportunity cost of time stand to benefit most from such an investment in "skill capital." The formation of skill capital leads to an increase in search effectiveness by substituting for less efficient sources, which potentially further increases search benefits (Biswas, 2002; Ratchford, Lee, & Talukdar, 2003; Ratchford, Talukdar, & Lee, 2001). Yet, consumers may still use perceptual (Häubl & Dellaert, 2004) or affective cues to manage the flow of in-

formation (Ariely, 2000). While such use may lead consumers to over-search or under-search available alternatives based on global optimization criteria (Bhatnagar & Ghose, 2003; Zwick, Rapoport, Lo, & Muthukrishnan, 2003), they may still rely on optimal heuristics such as information foraging based on a "scent" (Pirolli, 2007; Pirolli & Card, 1999) to increase search benefits.

Although significant progress has been made, several challenges lie ahead. Consumers who are savvy with digital technology are more likely to make better purchase decisions while shopping online. But, fortunately the digital divide is narrowing as more offline shoppers go online. Gender and ethnic and gender gaps have already closed and the income gap is closing fast. Yet, most consumers still like to "see" and "touch and feel" products. But, due to the vividness and detail of high-resolution three-dimensional images "see" is becoming less of a factor. Other consumers miss the social interaction that offline retail environments provide. But, as social networking sites enter the online shopping domain, more social interaction can be expected among online shoppers.

Conclusion

Despite what is currently known about how consumers make decisions in a web-based choice environment, more remains to be determined (Darley, Blankson, and Luethge, 2010; Dholakia & Bagozzi, 2001). The similarities between traditional retail and online decision making may be traced to the characteristics of the searcher given that human traits do not change whether the decision making is offline or online. However, the differences between traditional retail and online decision making can be attributed to the "technology" that is available to the decision maker in the two information environments. In the case of the electronic information environment, these include access to electronic sources of information and the availability of electronic decision aids (e.g., recommendation agents, shopbots).

Thus, the essential difference in decision quality between offline and online settings comes down to (1) the effect the technology has on the abilities and capabilities of the consumer, and (2) how the consumer interacts with the technology in the online setting to make decisions. As revealed by the theoretical analysis, the human capital model is appropriate for understanding the first effect, while the human-computer interaction model is best suited for examining the second. When taken together, the human capital and human-computer interaction models capture both the favorable and unfavorable influences on the ability of consumers to make better decisions in online settings.

REFERENCES

- Alba, J., Lynch, J., Weitz, B., Janiszewski, C., Lutz, R., Sawyer, A., & Wood S. (1997). Interactive home shopping:

- Consumer, retailer, and manufacturer incentives to participate in electronic marketplaces. *Journal of Marketing*, 61, 38–53.
- Ancarani, F., & Shankar V. (2004). Price levels and price dispersion within and across multiple retailer types: Further evidence and extension. *Journal of the Academy of Marketing Science*, 32, 176–187.
- Ariely, D. (2000). Controlling the information flow: Effects on consumers' decision making and preferences. *Journal of Consumer Research*, 27, 233–248.
- Aron, R., Sundararajan, A., & Viswanathan, S. (2006). Intelligent agents in electronic markets for information goods: Customization, preference revelation and pricing. *Decision Support Systems*, 41, 764–786.
- Bakos, Y. (1997). Reducing buyer search costs: implications for electronic marketplaces. *Management Science*, 43, 1676–1692.
- Bakos, Y. (1998). The emerging role of electronic marketplaces on the internet. *Communications of the ACM*, 41, 35–42.
- Bart, Y., Shankar V., Sultan F., & Urban G. L. (2005). Are the drivers and role of online trust the same for all web sites and consumers? A large-scale exploratory empirical study. *Journal of Marketing*, 69, 133–152.
- Baye, M. R., Morgan J., & Scholten P. (2003). The value of information an online consumer electronics market. *Journal of Public Policy & Marketing*, 22, 17–25.
- Beatty, S. E., & Smith, S.M. (1987). External search effort: An investigation across several product categories. *Journal of Consumer Research*, 14, 83–95.
- Belkin, N. J. (2000). Helping people find what they don't know. *Communications of the ACM*, 43, 58–61.
- Bellman, S., Lohse G. H., & Johnson E. J. (1999). Predictors of online buying behavior. *Communications of the ACM*, 42, 32–38.
- Bellman, S., Johnson, E. J., Lohse G. H., & Mandel N. (2006). Designing marketplaces of the artificial with consumers in mind: Four approaches to understanding consumer behavior in electronic environments. *Journal of Interactive Marketing*, 20, 21–33.
- Bettman, J. R., Johnson E. J., & Payne, J. W. (1991). Consumer decision making. In T.S. Robertson & H.H. Kassarian (Eds.), *Handbook of Consumer Research* (pp. 50–84). Englewood Cliffs, NJ: Prentice Hall.
- Bettman, J., Luce, M. F., & Payne, J. W. (1998). Constructive consumer choice processes. *Journal of Consumer Research*, 25(December), 187–217.
- Bhatnagar, A., & Ghose, S. (2003). Online information search termination patterns across product categories and consumer demographics. *Journal of Retailing*, 80, 221–228.
- Bhatnagar, A., Misra, S., & Rao, H.R. (2000). On risk, convenience, and internet shopping behavior. *Communications of the ACM*, 43, 98–105.
- Biswas, D. (2002). Economics of information in the web economy towards a new theory? *Journal of Business Research*, 57, 724–733.
- Biswas, D. & Biswas, A. (2004). The diagnostic role of signals in the context of perceived risks in online shopping: Do signals matter more on the web? *Journal of Interactive Marketing*, 18, 30–45.
- Brucks, M. (1985). The effects of product class knowledge on information search behavior. *Journal of Consumer Research*, 12(June), 1–16.
- Brynjolfsson, E., & Smith, M. D. (2000). Frictionless commerce? A comparison of Internet and conventional Retailers. *Management Science*, 46, 563–585.
- Brynjolfsson, E., & Smith, M. D. (2001). Consumer decision-making at an internet shopbot: Brand still matters. *Journal of Industrial Economics*, 49, 541–558.
- Brynjolfsson, E., Hu, Y. J., & Smith M. D. (2006). From niches to riches: Anatomy of the long tail. *MIT Sloan Management Review*, 47, 67–71.
- Chen, H., Wigand, R., & Nilan, M. (2000). Exploring web users' optimal flow experiences. *Information Technology & People*, 13, 263–281.
- Chernev, A. (2004). Extremeness aversion and attribute-balance effects in choice. *Journal of Consumer Research*, 31, 249–264.
- Chiang, K-P., Dholakia, R. R., & Westin S. (2004). The needle in the cyberstack: consumer search for information in the web-based marketplace. *Advances in Consumer Research*, 31, 8–89.
- Chu, P. C., & Spires, E. E. (2000). The joint effects of effort and quality on decision strategy choice with computerized decision aids. *Decision Sciences*, 31, 259–292.
- Darley, W. K., Blankson C., & Luethge D. J. (2010). Toward an integrated framework for online consumer behavior and decision making process: A review. *Psychology and Marketing*, 27, 94–116.
- Degeratu, A. M., Rangaswamy, A., & Wu, J. (2000). Consumer choice behavior in online and traditional supermarkets: The effects of brand name, price, and other search attributes. *International Journal of Research in Marketing*, 17, 55–78.
- Demangeot, C., & Broderick, A. J. (2010). Consumer perceptions of online shopping environments: A gestalt approach. *Psychology and Marketing*, 27, 117–140.
- Dholakia, U., & Bagozzi, R. P. (2001). Consumer behavior in digital environments. In J. Wind & V. Mahajan (Eds.), *Digital marketing* (pp. 163–200). New York, NY: John Wiley.
- Diehl, K. (2005). When two rights make a wrong: searching too much in ordered environments. *Journal of Marketing Research*, 42(August), 313–322.
- Dowling, G. R. & Staelin, R. (1994). A model of perceived risk and intended risk-handling activity. *Journal of Consumer Research*, 21, 119–134.
- Elofson, G., & Robinson, W. H. (1998). Creating a custom mass-production channel on the internet. *Communications of the ACM*, 41, 56–62.
- Feather, F. (2001). FutureConsumer.com: The webolution of shopping to 2010. *Journal of Consumer Marketing*, 18, 374–376.
- Glover, S., Prawitt, D., & Spilker, B. (1997). The influence of electronic decision aids on user behavior: Implications for knowledge acquisition and inappropriate reliance. *Organizational Behavior and Human Decision Processes*, 72, 232–255.
- Gorn, G. J., Chattopadhyay A., Sengupta J., & Tripathi, S. (2004). Waiting for the web: How screen color affects time perception. *Journal of Marketing Research*, 41, 215–225.
- Häubl, G., & Dellaert, B. (2004). A behavioral theory of consumer product search. In B. E. Kahn & M. F. Luce (Eds.) *Advances in consumer research*, 31 (pp. 689–691). Valdosta, GA: Association for Consumer Research.
- Häubl, G., & Murray, K. B. (2003). Preference construction and persistence in digital marketplaces: The role of electronic recommendation agents. *Journal of Consumer Psychology*, 13, 75–91.
- Häubl, G., & Murray, K. B. (2006). Double agents: Assessing the role of electronic product-recommendation systems. *MIT Sloan Management Review*, (Spring), 47(3), 8–12.

- Häubl, G., & Trifts, V. (2000). Consumer decision making in online environments. *Marketing Science*, 19, 4–21.
- Henry, P. (2006). Is the internet empowering consumers to make better decisions or strengthening marketers' potential to persuade. In C. P. Haugtvedt, K. Machleit, & R. Yalch (Eds.) *Online consumer psychology: Understanding and influencing behavior in the virtual world* (pp. 345–400). Mahwah, NJ: Lawrence Erlbaum Associates Inc.
- Hoffman, D. L., & Novak, T. P. (1996). Marketing in hypermedia computer-mediated environments: Conceptual foundations. *Journal of Marketing*, 60, 50–68.
- Hong, W., Thong, J. Y., & Tam, K. Y. (2004). Does animation attract online users' attention? The effects of flash on information search performance and perceptions. *Information Systems Research*, 15, 60–86.
- Horrigan, J. B. (2008). *Online shopping*. Washington, DC: Pew Internet Life & American Project Report.
- Jacoby, J. (1977). Information load and decision quality: Some contested issues. *Journal of Marketing Research*, 14, 569.
- Janiszewski, C. (1998). The influence of display characteristics on visual exploratory search behavior. *Journal of Consumer Research*, 25(December), 290–301.
- Jarvenpaa, S. L. (1990). Graphic displays in decision making: The visual salience effect. *Journal of Behavioral Decision Making*, 3, 247–262.
- Jarvenpaa, S. L., & Tractinsky, N. (1999). Consumer trust in an internet store: A cross-culture validation. *Journal of Computer Mediated Communication*, 15, 1083–6101.
- Jepsen, A. L. (2007). Factors affecting consumer use of the internet for information search. *Journal of Interactive Marketing*, 21, 21.
- John, D. R., Scott, C. A., & Bettman, J. R. (1986). Sampling data for covariation assessment: The effect of prior beliefs on search patterns. *Journal of Consumer Research*, 13, 38–47.
- Johnson, E. J., Bellman, S. & Lohse, G. L. (2003). Cognitive lock-in and the power law of practice. *Journal of Marketing*, 67, 62–75.
- Johnson, E. J., Moe, W., Fader, P., Bellman, S., & Lohse, G. L. (2004). On the depth and dynamics of online search behavior. *Management Science*, 50, 299–308.
- Kim, M., & Lennon S. (2010). The effects of visual and verbal information on attitudes and purchase intentions in internet shopping. *Psychology and Marketing*, 25, 146–178.
- Lal, R., & Sarvary, M. (1999). When and how is the internet likely to decrease price competition? *Marketing Science*, 18, 485–503.
- Lee, B. K., & Lee W. N. (2004). The effect of information overload on consumer choice quality in an on-line environment. *Psychology and Marketing*, 21, 159–183.
- Lynch, J. G., Jr., & Srull, T. K. (1982). Memory and attentional factors in consumer choice: Concepts and research methods. *Journal of Consumer Research*, 9(June), 18–37.
- Maes, P. (1999). Smart commerce: The future of intelligent agents in cyberspace. *Journal of Interactive Marketing*, 13, 66–76.
- Mandel, N., & Johnson, E. J. (2002). When web pages influence choice: Effects of visual primes on experts and novices. *Journal of Consumer Research*, 29, 235–245.
- Mathwick, C., & Rigdon E. (2004). Play, flow, and the online search experience. *Journal of Consumer Research*, 31, 324–332.
- Moorthy, S., Ratchford, B. T., & Talukdar, D. (1997). Consumer information search revisited: Theory and empirical analysis. *Journal of Consumer Research*, 23(March), 263–277.
- Novak, T. P., Hoffman, D. L., & Yung, Y. F. (2000). Measuring the customer experience in online environments: A structural modeling approach. *Marketing Science*, 19, 22–42.
- Olson, E. L. & Widing, R. E. (2002). Are interactive decision aids better than passive decision aids? A comparison with implications for information providers on the Internet. *Journal of Interactive Marketing*, 16, 22–33.
- Oorni, A. (2003). Consumer search in electronic markets: An experimental analysis of travel services. *European Journal of Information Systems*, 12, 30–40.
- Payne, J. W., Bettman, J. R., & Johnson, E. J. (1993). *The adaptive decision maker*. New York: Cambridge University Press.
- Peterson, R. A., & Merino, M.C. (2003). Consumer information search behavior and the internet. *Psychology and Marketing*, 20, 99–121.
- Pirolli, P. (2007). *Information Foraging Theory: Adaptive Interaction with Information*, New York: Oxford University Press.
- Pirolli, P., & Card, S. (1999). Information foraging. *Psychological Review*, 106(October), 643-675.
- Putrevu, S., & Ratchford, B. T. (1997). A model of search behavior with an application to grocery shopping. *Journal of Retailing*, 73, 463–486.
- Ratchford, B. T. (2001). The economics of consumer knowledge. *Journal of Consumer Research*, 27, 397–411.
- Ratchford, B. T., Talukdar, D., & Lee, M. S. (2001). A model of consumer choice of the internet as an information source. *International Journal of Electronic Commerce*, 5(3), 7–21.
- Ratchford, B. T., Lee, M. S., & Talukdar, D. (2003). The impact of the internet on information search for automobiles. *Journal of Marketing Research*, 40, 193–209.
- Ratchford, B. T., Talukdar, D., & Lee, M. S. (2007). The impact of the internet on consumers' use of information sources for automobiles. *Journal of Consumer Research*, 34, 111–119.
- Redmond, W. (2002). The potential impact of artificial agents in e-commerce markets. *Journal of Interactive Marketing*, 16, 56–66.
- Schlosser, A. E. (2003). Experiencing products in the virtual world: The role of goal and imagery in influencing attitudes versus purchase intentions. *Journal of Consumer Research*, 30, 184–198.
- Schwartz, B. (2004). The tyranny of choice. *Scientific American*, 290, 70–75.
- Shugan, S. M. (1980). The cost of thinking. *Journal of Consumer Research*, 7, 99–111.
- Simonson, I., Huber, J., & Payne, J. (1998). The relationship between prior brand knowledge and information. *Journal of Consumer Research*, 14, 566–579.
- Sismeiro, C., & Bucklin, R. E. (2004). Modeling purchase behavior at an e-Commerce web site: A task-completion approach. *Journal of Marketing Research*, 41, 306–323.
- Skadberg, Y. X., & Kimmel, J. R. (2004). Visitors' flow experience while browsing a web site: Its measurement, contributing factors and consequences. *Computers in Human Behavior*, 20, 403–422.
- Smith, M. D. (2002). The impact of shopbots on electronic markets. *Journal of the Academy of Marketing Science*, 30, 446–454.
- Smith, C. L., & Hantula, D. A. (2003). Pricing effects on foraging in a simulated internet shopping mall. *Journal of Economic Psychology*, 24, 653–674.
- Smith, D., Menon, S., & Sivakumar, K. (2005). Online peer and editorial recommendations, trust, and choice in virtual markets. *Journal of Interactive Marketing*, 19, 15–37.

- Spiekermann, S., & Paraschiv, C. (2002). Motivating human-agent interaction: Transferring insights from behavioral marketing to interface design. *Electronic Commerce Research*, 2, 255–285.
- Srinivasan, N., & Ratchford, B. T. (1991). An empirical test of a model of external search for automobiles. *Journal of Consumer Research*, 18, 233–242.
- Thaler, R. H. (1999). Mental accounting matters. *Journal of Behavioral Decision Making*, 12, 183–206.
- Todd, P., & Benbasat, I. (1992). The use of information in decision making: An experimental investigation of the impact of computer-based decision aids. *MIS Quarterly*, 16, 373–393.
- Todd, P., & Benbasat, I. (1994). The influence of decision aids on choice strategies: An experimental analysis of the role of cognitive effort. *Organizational Behavior and Human Decision Processes*, 60, 36–74.
- Todd, P., & Benbasat, I. (1999). Evaluating the impact of DSS, cognitive effort, and incentive on strategy selection. *Information Systems Research*, 10, 356–374.
- Todd, P., & Benbasat, I. (2000). Inducing compensatory information processing through decision aids that facilitate effort reduction: An experimental assessment. *Journal of Behavioral Decision Making*, 13, 91–106.
- Viswanathan, S., Gosain, S., Kuruzovich J., & Agarwal R. (2007). Online infomediaries and price discrimination: Evidence from the auto-retailing sector. *Journal of Marketing*, 71, 89–107.
- West, P., Ariely, D., Bellman, S., Bradlow, E., Huber, J., Johnson, E., et al. (1999). Agents to the rescue? *Marketing Letters*, 10, 285–300.
- Widing, R. E., & Talarzyk, W. W. (1993). Electronic information systems for consumers: An evaluation. *Journal of Marketing Research*, 30, 125.
- Wu, L. L., & Lin, J. Y. (2006). The quality of consumers' decision-making in the environment of e-commerce. *Psychology and Marketing*, 23, 297–311.
- Zwick, R., Rapoport, A., Lo, A.K.C., & Muthukrishnan, A. V. (2003). Consumer sequential search: Not enough or too much? *Marketing Science*, 22, 503–519.

Correspondence regarding this article should be sent to: Girish N. Punj, Department of Marketing, School of Business, University of Connecticut, 2100 Hillside Road, Storrs, Connecticut 06269-9013 (Girish.Punj@business.uconn.edu).

Copyright of Psychology & Marketing is the property of John Wiley & Sons, Inc. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.