The Intended and Actual Adoption of Online Purchasing: A Brief Review of Recent Literature

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Executive Summary

The rapid growth of e-commerce is imposing profound impacts on modern society. On the supply side, the emergence of e-commerce is greatly changing the operation behavior of some retailers and is increasing product internationalization due to its geographically unlimited nature. On the demand side, the pervasiveness of e-commerce affects how, where, and when consumers shop, and indirectly influences the way in which we live our lives. However, the development of e-commerce is still in an early stage, and why consumers choose (or do not choose) online purchasing is far from being completely understood. To better evaluate and anticipate those profound impacts of e-commerce, therefore, it is important to further refine our understanding of consumers' e-shopping behavior.

A number of studies have investigated e-shopping behavior, and reviewing them is valuable for further improving our understanding. This report aims to summarize previous e-shopping research in a systematic way. In this review, we are interested primarily in the potential benefits and costs that the internet offers for the business-to-consumer segment of e-commerce in the transaction (purchase) channel. An overview of the 65 empirical studies analyzed in this report is provided in the Appendix.

Most previous studies fall into one or more of several theoretical frameworks, including the theory of reasoned action, the theory of planned behavior, the technology acceptance model, transaction cost theory, innovation diffusion theory, and others. Among them, social psychological theories (the theory of reasoned action, the theory of planned behavior, the technology acceptance model) were widely applied. As shown in the applications of different theories, e-shopping behavior is not a simple decision process, and thus an integration of various theories is necessary to deal with its complexities. We suggest synthesizing these theories through the development of a comprehensive list of benefits and costs, using each of the key constructs of the pertinent theories as a guide to identifying the nature of those benefits and costs.

The dependent variables mainly include e-shopping intention and actual e-shopping behavior (a few studies used attitudes toward e-shopping). E-shopping intention was measured by various dimensions. Among them, the directly-stated intention to purchase online is the most frequently used measure. Although some studies used a unidimensional measure, most adopted a latent construct to assess consumers' e-shopping intentions. Actual e-shopping behavior mainly includes three dimensions: adoption, spending, and frequency. Most studies examined one or more of these three dimensions directly, while a few studies constructed a latent variable to measure actual e-shopping behavior. When both behavioral intention and actual behavior are included in model development, attention should be paid to the time precedence between intention and behavior.

With respect to sampling, a choice-based sampling approach is probably preferable given that online shopping activity accounts for a minor proportion of all consumers, and a far smaller proportion of total retail sales. In previous studies, most chose internet/computer/email users or students as their subjects. Generally, a student sample is a natural choice for some particular products such as books. However, parameter estimates developed from a student sample lack generalizability to a larger population because of its homogeneity. By contrast, a more general sample of internet/computer/email users is more applicable for e-shopping behavior research.

The characteristics of products strongly influence the degree to which they are suitable for selling online. Mixing product categories in e-shopping behavior research tends to yield vague or inconsistent results. It is therefore necessary to explicitly consider product characteristics when exploring consumers' e-shopping behavior. However, relatively little effort has been invested into product classification in the context of e-shopping. Although Nelson's dichotomized system (search and experience goods) and Peterson et al.'s three-dimensional system (cost, tangibility, and differentiability) provide useful guides for product type classification, each has some shortcomings. Therefore, more research should focus on the construction of product classification systems.

Different methodologies have been applied in previous research. Generally, descriptive analysis is used to describe consumers' e-shopping behavior; correlational analysis goes beyond descriptive analysis and attempts to analyze how two variables are related; and multivariate analysis is mainly used to explain consumers' behavior using many variables considered together. Therefore, although descriptive and correlational analyses are important steps in helping to construct multivariate analyses, multivariate studies provide more information than these other two types of analyses. Multivariate analysis is ideal to study e-shopping behavior in depth. Among multivariate analysis techniques, multiple regression, structural equations modeling, and discrete choice models were most frequently used.

Previous studies have identified various determinants of consumers' e-shopping behavior. These determinants mainly cover three essential elements: characteristics of e-shopping as a shopping channel, consumer characteristics, and vendor and product characteristics. Among these characteristics, the former two have been examined extensively in previous research, confirming their importance in understanding e-shopping behavior. Specifically, the dimensions of channel characteristics of e-shopping include e-shopping service quality, relative advantages, perceived risk of and confidence in e-shopping, and trust. Consumer characteristics include their shopping orientations, personality, social and psychological characteristics, computer/internet experience, in-home shopping experience, and socio-demographics.

1. Introduction

New information and communication technologies (ICTs) have had profound and pervasive impacts on modern society – impacts that are still evolving with the ongoing development of new technologies and the continued adoption/adaptation of older ones. ICT applications and services are changing how and where we work, shop, play, travel, and in other ways live our lives. In particular, the emergence and spread of electronic commerce (e-commerce) have greatly influenced the behavior of both retailers and consumers. For example, the Association of National Advertisers stated that 44% of US companies were selling online, and an additional 36% would participate in e-selling by 2000 according to Nua Internet Surveys (the Internet Economy Indicators, 2004); in their sample of more than 2,000 households across the U.S., Cole et al. (2003) found that about 66% of internet purchasers have reduced their purchasing in traditional retail stores somewhat or a lot in 2002.

E-commerce refers to "the buying, selling, marketing, and servicing of products or services over computer networks" (Wikipedia, 2004). E-commerce consists of several components: business to business (B2B), business to consumer (B2C), and consumer to consumer (C2C) (such as eBay). Although the B2B segment dominates e-commerce in terms of the dollar value of transactions made, B2C remains important for its potential impacts on consumers' shopping behavior. As a flexible, interactive, efficient medium, e-shopping is likely to be a substitute for traditional shopping media, and may well dominate the exchange of certain products (e.g., digital assets such as music, software, movies, and the written word) in the future. The review presented here focuses on the *B2C* segment of e-commerce.

B2C e-commerce has grown rapidly worldwide over the past few years. In Singapore, about 30% of internet users aged 15 years and above have purchased online as of 2004, an 18-percentage point increase since 2000; and the average amount spent online per internet shopper has increased from $336 in 2003 to $539 in 2004 (IDA, 2005). In South Korea, the B2C volume of the e-commerce market increased from $0.61 billion in 2000 to $2.15 billion in 2001 (http://www.ecommerce.or.kr/about/ec_market1.asp, accessed on April 24, 2005). In the UK, one in ten adults has frequently purchased online; 25% of adults were frequent online purchasers in some areas; and total e-commerce revenues are expected reach 20 billion pounds by 2005, accounting for 7.6% of retail sales (CACI, 2000). According to the US Census Bureau (2004), adjusted retail sales through e-commerce reached $16.1 billion in the first quarter of 2004 (compared to $5.9 billion in the first quarter of 2000), or 1.8% of total retail sales. However, this percentage has yet to reach the starting point (2.5%) of the classical sigmoid diffusion curve presented by Rogers (1983). On the other hand, the development of e-commerce is still in a volatile stage. One survey of American internet users and non-users found that fewer adult internet users bought online in 2002 than in the previous two years, and that more than half of internet purchasers spent less than they intended when shopping online (Cole et al., 2003). The Boston Consulting Group estimated that 65% of internet buyers, accounting for 80% of the dollar value of prospective purchases, terminated their transaction before checking out (Maravilla, 2001). This evidence highlights the importance of understanding the behavior of online purchasers.

A growing number of studies have explored the determinants of consumers' electronic-shopping (e-shopping) behavior during recent years. Most studies either explicitly or implicitly embedded online purchasing behavior into various theoretical frameworks, including the theory of reasoned action, the theory of planned behavior, the

technology acceptance model, transaction cost theory, innovation diffusion theory, and others. According to the dependent variables of interest, previous studies can be generally classified into three categories: online purchasing intention, online purchasing adoption, or both. Further, these studies used different sampling approaches such as internet-based survey, paper and pencil survey, telephone interview, or using an available database, and recruited their samples from different populations, including students, computer/internet/email users, online purchasers, and the general population. With respect to the product, some studies dealt with all products sold online, while others chose particular products (or product categories). In addition, a variety of statistical methodologies (including descriptive as well as multivariate analyses) has been applied, to answer different kinds of questions.

Previous works identified various antecedent factors of online purchasing intention and usage, and hence greatly improve our understanding of the behavior of online purchasers. This understanding offers a useful foundation to a number of different actors. To retailers, it provides a basis for implementing e-commerce promotion policies and better designing e-retail sites; to academics, it serves as an important example of the impact of ICT in a key realm of everyday life; and to transportation and urban planners, it presents a critical background from which to assess the follow-on implications for travel and land use (Mokhtarian, 2004). This report represents an effort to summarize previous e-shopping research in a systematic way. Specifically, this report covers topics related to consumer theories, dependent variables of interest, sampling approaches, product classification, methodologies, and the determinants of e-shopping intention and adoption.

Marketing activities can occur through three types of channels: communication, transaction, and distribution. Communication channels enable "the exchange of information" between vendors and consumers; transaction channels "generate sales activities" between vendors and consumers; and distribution channels facilitate "the physical exchange of products and services" (Peterson et al., 1997, p.334). Although the internet will play a role in all three channels, in this review, we are interested primarily in the potential for efficiency improvement and other benefits, as well as drawbacks, that the internet offers in the *transaction* channel. Thus, we focus on studies of actual or intended online *purchase* behavior, not just information-gathering activities.

The report is organized as follows: the next chapter summarizes the theories employed by researchers; Chapter 3 discusses the dependent variables (the phenomena of interest typically measured); Chapter 4 presents various approaches used by previous studies to recruit their samples; Chapter 5 highlights various product classification systems that have been employed; Chapter 6 reviews the statistical methodologies used to describe and explain the phenomena of interest; Chapter 7 recapitulates the statistically significant determinants of e-shopping intention and actual adoption; and Chapter 8 summarizes the report. An appendix tabulates key facts with respect to 65 empirical studies reviewed for this report.

2. Theoretical Frameworks

Theory plays a critical role in empirical research. According to the Merriam-Webster dictionary, theory refers to "a plausible or scientifically acceptable general principle or body of principles offered to explain phenomena". In deductive analysis, research hypotheses are constructed based on the available theory, and then are tested with empirical data. Conversely, in inductive research, empirical examination further enriches and modifies theory. Accordingly, theory and empirical analysis are interrelated and influence each other: theory guides empirical observation and empirical observation improves theory. Over time, the interactions between theory and empirical analysis enhance our understanding of the phenomenon of interest. In scientific research, once the subjects of interest are determined, theory influences the research through the choice of explanatory variables, hypothesis construction, and result interpretation.

As indicated in the Introduction, various theories have been explicitly or implicitly applied in research on consumers' e-shopping behavior, including the theory of reasoned action, the theory of planned behavior, the technology acceptance model, transaction cost theory, innovation diffusion theory, and so on. The remainder of this section will discuss each of these theories and their applications to e-shopping research in turn.
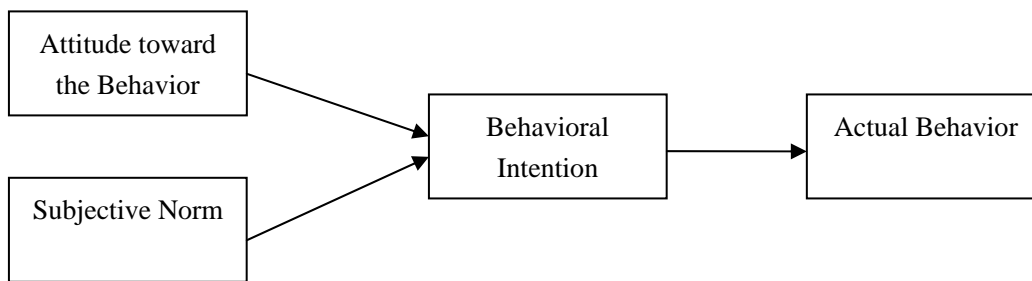
2.1 Theory of Reasoned Action (TRA)

The TRA describes the psychological process behind conscious human behavior, and aims to explore the determinants of that behavior (Ajzen and Fishbein, 1980). According to the TRA, an individual's behavioral intention impacts the performance of her behavior, and her attitudes toward a behavior and subjective norms with respect to the behavior compose two antecedent factors that determine her behavioral intention. Behavioral intention measures "how hard people are willing to try, [and] how much of an effort they are planning to exert, in order to perform the behavior" (Ajzen, 1991, p. 181). Generally, individuals' behavioral intentions have a positive impact on the performance of the intended behavior. Attitudes toward a behavior constitute an individual's evaluation of the behavior. They are determined by her salient beliefs about the benefits and costs of performing the behavior. An individual's subjective norms are determined by her normative beliefs about the feasibility of a behavior as evaluated by referent people, and her willingness to follow these beliefs. Further, the TRA assumes that external factors such as an individual's characteristics will affect her behavior only indirectly, through their influence on the attitudes and subjective norms.

Vijayasarathy (2002) identified four types of salient beliefs that collectively determine an individual's attitude toward e-shopping: product perception, shopping experience, customer service, and consumer risk. The individual's normative beliefs were constructed based on her evaluation of the opinions of spouse, parents, siblings, or friends about e-shopping. In this study, however, the author did not test the validity of the TRA, but examined the influences of product type on the three key constructs: salient beliefs, normative beliefs, and intention to purchase online. Cho (2004) and Verhoef and Langerak (2001) adapted the TRA to study e-shopping behavior. Specifically, Cho assumed that attitude toward e-shopping is determined by perceived consequences associated with e-shopping, past behavior, and attitudes toward other shopping channels, and that likelihood to abort an intended online transaction is jointly determined by these three dimensions as well as the attitude toward

e-shopping. Verhoef and Langerak incorporated the constructs of innovation diffusion theory and hypothesized that an individual's e-shopping intention is determined by her perceptions of its relative advantage, compatibility, and complexity. In these two studies, subjective norm was not considered as a determinant of behavioral intention, in keeping with its less well-understood status (Fishbein and Ajzen, 1975).

Figure 1. Theory of Reasoned Action

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┌──────────────────┐
│ Attitude toward  │
│  the Behavior    │ ──┐
└──────────────────┘   │      ┌──────────────┐        ┌──────────────────┐
                       ├────▶ │  Behavioral  │ ─────▶ │  Actual Behavior │
┌──────────────────┐   │      │  Intention   │        └──────────────────┘
│ Subjective Norm  │ ──┘      └──────────────┘
└──────────────────┘
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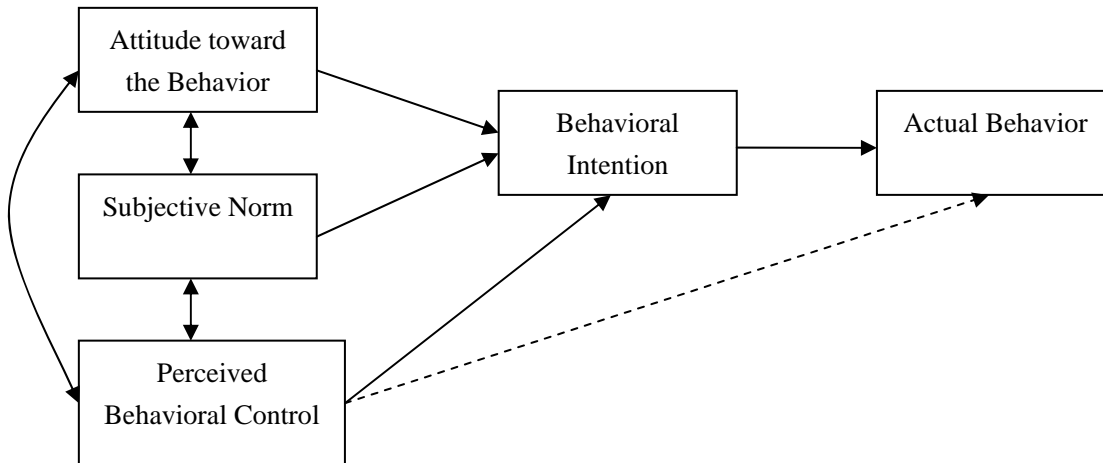Source: Davis et al. (1989)

2.2 Theory of Planned Behavior (TPB)

The TPB is an extension of the TRA. The major difference of the TPB from the TRA is its inclusion of perceived behavioral control (Ajzen, 1991). The TRA assumes that actual behavior is a motivational result of behavioral intention, and it does not consider the influence of behavioral constraints on the link between intention and behavior. In reality, most behavior is to some extent dependent on non-motivational factors such as availability of resources and opportunities. For example, an individual with a high intention to engage in e-shopping may not do so due to the lack of availability of the network or her inferior internet skills. These factors *can* represent *actual* behavioral control; however, psychologists are more interested in the *perception* of behavioral control and its influence on behavioral intention and actual behavior. Perceived behavioral control refers to an individual's perception of how difficult it is for her to perform a behavior (Ajzen, 1991). As shown in Figure 2, the TPB postulates that an individual's behavioral performance jointly relies on and can be predicted by her behavioral intention and perceived behavioral control.

Empirically, Hansen et al. (2004) applied both TRA and TPB. They found that TPB with an additional path from subjective norm to attitude explains a higher proportion of variation in online grocery purchasing intention than does TRA. Choi and Geistfeld (2004) used perceived risk and perceived self-efficacy to measure the individual's attitude and perceived behavioral control, respectively. Limayem et al. (2000) augmented the TPB with two additional constructs: perceived consequences and perceived innovativeness. These two constructs were assumed to influence both attitude and behavioral intention. In their models, subjective norms were evaluated by an individual's perception of the opinions of her family, friends, and media; and behavioral control consisted of site accessibility, product description, transaction efficiency, navigation ability, speed, and efficiency. Shim et al. (2001) adapted the TPB by incorporating the influence of past behavior and ignoring the

impacts of subjective norms. Further, they assumed that perceived behavioral control indirectly affects intention to shop online, through the intention to use the internet for information search.

Figure 2. Theory of Planned Behavior

Source: Ajzen (1991)

2.3 Technology Acceptance Model (TAM)

TAM is another adaptation of TRA, which initially had mainly been used in explaining and predicting computer acceptance (Davis, 1993; Davis et al., 1989). As shown in Figure 3, the original TAM proposes two new beliefs – perceived usefulness (PU) and perceived ease of use (PEOU) – and ignores the influence of subjective norm. PU refers to an individual's subjective evaluation of benefits (in the initial application, specifically regarding job performance) induced by using information technology. PEOU indicates "the degree to which the prospective user expects the target system to be free of effort" (Davis et al., 1989, p. 985). PU and PEOU directly impact attitude toward using. Additionally, PU has a direct effect on intention to use, in that one can be motivated to use information technology to benefit one's job performance, independently of one's personal attitudes toward it (Davis et al., 1989). Recently, Venkatesh and Davis (2000) proposed a second version of the TAM, which incorporates additional constructs regarding social influence (including subjective norm, voluntariness, and image) and cognitive instrument process (including job relevance, output quality, and result demonstrability). Legris and his colleagues (2003) supported the usefulness of the TAM after reviewing a number of empirical studies, but they pointed out that results based on the TAM are not totally consistent or clear. They recommended the incorporation of factors related to human and social change processes, and the adoption of an innovation, into the model.

The TAM is widely used in e-shopping research. Ahn et al. (2004) and O'Cass and Fenech (2003) directly applied the TAM to investigate e-shopping behavior. On the other hand, most studies constructed an adapted (simplified and/or expanded) conceptual framework drawn from the TAM. Gefen and Straub (2000) proposed that PU and PEOU directly affect intention to use and ignored the influence of the mediating variable, attitude

toward using. Adopting the same simplification, Liu and Wei (2003) additionally proposed that perceived risk is an antecedent factor of intention to use. Henderson and Divett (2003) tested direct links from PU and PEOU to actual use of e-shopping. Shang et al. (2005) adapted the TAM in two ways: adopting the same simplification as Henderson and Divett, and adding the influences of two constructs (cognitive absorption and fashion involvement) on actual behavior.

Figure 3. Technology Acceptance Model
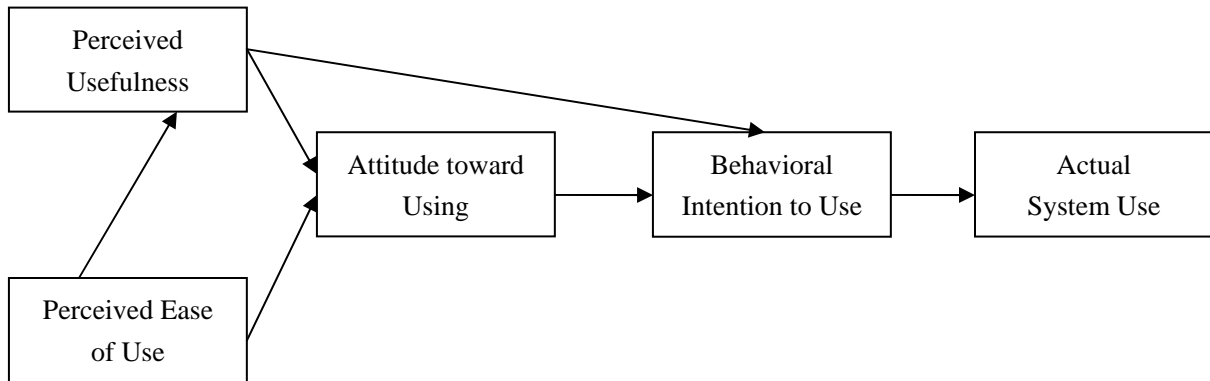
Source: Davis et al. (1989)

By contrast, Childers et al. (2001) and Koufaris (2002) augmented the TAM with the enjoyment of e-shopping, a positive predictor of attitude toward using. Chen et al. (2002) incorporated innovation diffusion theory in the TAM. Specifically, they assumed that the compatibility between using electronic stores (e-stores) and an individual's belief and need affects her attitude toward using. Chen and Tan (2004) further expanded this model by adding two more links, from perceived trust and perceived service quality to attitude toward using. Van der Heijden et al. (2003) hypothesized that attitude toward using is determined by trust in e-stores and perceived risk in addition to PU and PEOU. Shih (2004) proposed a more complex modeling structure based on the TAM.

2.4 Transaction Cost Theory (TCT)

Williamson (1985) defines a transaction as a process by which a good or service is transferred across a technologically separable interface. "In classical economic theory, it is assumed that information is symmetric in the market. Since both buyers and sellers are assumed to have the same amount of information, the transaction can be executed without cost. In reality, however, markets are often inefficient. In order to proceed with a transaction, consumers must conduct activities such as searching for information, negotiating terms, and monitoring the on-going process to ensure a favorable deal. The costs involved with such transaction-related activities are called transaction costs" (Liang and Huang, 1998, p. 31).

TCT can explain various problems of economic organizations (Rindfleisch and Heide, 1997). Its basic principle is that individuals would like to conduct transactions in the most efficient way (Williamson, 1985). That is, the lower the transaction costs, the more likely individuals are to conduct the transaction. Transaction costs are

determined by several constructs, including uncertainty and asset specificity as shown in Figure 4. Since information in the market is always asymmetric, the outcomes of a transaction may not follow, or may even be contrary to expectations, leading to uncertainty. Transactions are encouraged through reducing uncertainty, as one form of lowering the transaction costs. Asset specificity refers to the lack of transferability of the assets from one transaction to the other. Since "assets with a high amount of specificity represent sunk costs that have little value outside of a particular exchange relationship" (Rindfleisch and Heide, 1997, p. 41), higher asset specificity is associated with lower transaction costs for the exchange relationship to which the specificity applies, and higher transaction costs for other exchange relationships.

Figure 4. Transaction Cost Theory
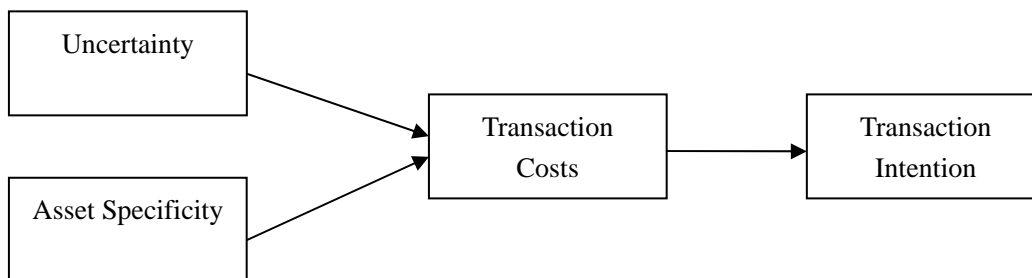
Source: Liang and Huang (1998)

Liang and Huang (1998) applied TCT to investigate consumers' intention to shop online. In addition to the modeling structure presented in Figure 4, they further assumed that e-shopping intention is also directly influenced by uncertainty and asset specificity. Teo and Yu (2005) proposed that buying frequency is also a (negatively-associated) predictor of transaction costs, with trust replacing asset specificity.

2.5 Innovation Diffusion Theory (IDT)

Compared to traditional shopping, e-shopping is an innovative application of information technology by retail industries. Therefore, IDT can be applied to explore consumers' e-shopping behavior. Generally, the cumulative adoption of an innovation follows a sigmoid curve, with adoption growing slowly in its initial years, growing steeply as it reaches its half-way point, and growing slowly again as it nears its saturation level (maximum penetration). The rate of adoption is mainly dependent on five attributes of an innovation: relative advantage (the extent to which an innovation is perceived to be better than the one it substitutes for or competes with), compatibility (the extent to which an innovation is perceived to be consistent with the experiences and requirements of potential adopters), complexity (the extent to which an innovation is perceived to be difficult to use), trialability (the extent to which an innovation can be experimented with on a limited basis) and observability (the extent to which the utility of an innovation is visible to the public). Relative advantage, compatibility, trialability, and observability of an innovation are found to be positively related to its rate of adoption, while complexity is negatively associated with its rate of adoption (Rogers, 1983). Dearing et al. (1994) further suggested that applicability and reliability are important for diffusion of risky innovations.

Innovation diffusion models are commonly used in aggregate studies although there are some recent efforts at the disaggregate level (Roberts and Lattin, 2000). In the context of e-shopping, most studies consider the influences of the constructs derived from IDT on disaggregate e-shopping behavior, rather than model the overall diffusion of e-shopping at an aggregate level. As mentioned earlier, Verhoef and Langerak (2001) explored the impacts of relative advantage, compatibility, and complexity of e-shopping; and Chen et al. (2002) and Chen and Tan (2004) introduced the compatibility of e-shopping into their TAM. Finally, Eastin (2002) examined the influences of compatibility, reliability, complexity, and relative advantage on the frequency of e-shopping.

2.6 Other theories

In addition to the theories discussed above, various constructs from other theories have been introduced to explore the determinants of consumers' e-shopping behavior. Grazioli and Jarvenpaa (2000) investigated the role of perceived internet deception (from *social exchange theory*) in the adoption of e-shopping. Swaminathan et al. (1999) viewed e-shopping as a *social influence process* and examined the influences of the social characteristics of actors, namely, e-shopping vendors and consumers. Li et al. (1999) applied *channel theory* and studied the impacts of retail channel knowledge and utilities. Foucault and Scheufele (2002) applied *social influence theory*, *social learning theory*, and *use and gratifications theory* in their empirical work.

Mathwick et al. (2001) applied *experiential value theory* to the preference for and intention to use a certain retailer's internet site (and, separately, catalog). This theory suggests that an activity such as shopping can offer intrinsic as well as extrinsic benefits, and may involve an active (participatory) or reactive (passive) role of the individual. The combination of these two dimensions yields (p. 41) "a value landscape divided into four quadrants framed by intrinsic/extrinsic sources of value on one axis and active/reactive value on the other", as shown in Figure 5.

Figure 5. Typology of Experiential Value

Intrinsic Value	Playfulness: • intrinsic enjoyment • escapism	Aesthetics: • visual appeal • entertainment
Extrinsic Value	Consumer Return on Investment (CROI): • economic utility • efficiency	Service excellence
	Active Value	**Reactive Value**

Source: Adapted from Mathwick et al. (2001)

2.7 Summary

Various theories have been applied in previous research to explain and predict consumers' e-shopping behavior. Overall, more attention has been paid to theories in the social psychology area: TRA, TPB, and TAM. The empirical studies based on these theories highlight the importance of consumers' attitudes, since attitudinal factors explain most of the variation in e-shopping behavior. However, the explanatory power of these theories varies from one study to another.

E-shopping behavior is a complicated decision process. First, consumers make a shopping decision based on their family needs, budget limitations, and other constraints impinging on them. Accordingly, they are likely to minimize transaction costs and maximize compatibility with needs. Second, e-shopping behavior is a social influence process and it is affected by social influence (e.g., social norms), vendor and consumer characteristics, and third parties (e.g., competitive offerings) (Bagozzi, 1974). Third, e-shopping can be viewed as an innovation and its adoption is impacted by its intrinsic attributes as well as by mass media and word of mouth (Mahajan et al., 1990). When multiple retail channels are present for the same transaction, the adoption of e-shopping can become a substitution for traditional retail channels; alternatively, it may complement or supplement these channels. Therefore, no single theory appears capable, as is, of capturing the complexities of e-shopping behavior: a comprehensive integration of several theories becomes necessary. For example, Konana and Balasubramanian (2005) incorporate elements of TRA, TPB, and TAM as well as economic factors (perceived financial gains) into their model of online investing.

In the current context, we suggest, as an initial approach, that integration across theories can be viewed in terms of the utility maximization theory of economics, in which the utility of an alternative is positively associated with its benefits and negatively related to its costs. The evaluation, weighting, and way of combining benefits and costs (or, advantages and disadvantages, pros and cons) may vary by individual, but each individual is assumed to balance the benefits of each alternative against its costs, and choose the one with the highest net benefits, or utility. To briefly place each of the theories discussed in Sections 2.1-2.5 in this context, we can note that:

(1) In the TRA, both attitudes and subjective norms can be positive with respect to the behavior (benefits) or negative (costs). For example, in Cho (2004), an inability to physically examine the good and concerns over delivery and return can be viewed as liabilities or disadvantages of e-shopping, while the saving of effort it makes possible can be viewed as a benefit.

(2) Similarly, in the TPB, measures of perceived behavioral control (such as the site accessibility and transaction efficiency of Limayem et al., 2000) represent costs or benefits of adoption, depending on whether the measure is positively or negatively oriented, and whether a shopping alternative rates high or low on it. Cost measures can in some cases represent prohibitively high costs or outright constraints, and in other cases may fall on a continuum constituting gradually stronger disincentives to adopt. The converse is true for benefit measures.

(3) In the TAM, usefulness and ease of use are two categories of benefits (or, if negatively oriented, costs) which, broadly construed, can contain most or all of the constructs of the other theories. For example, a negative subjective norm can be viewed as reducing the ease of use of an alternative.

(4) In TCT, uncertainty is a cost and asset specificity is a benefit with respect to the asset in question.

(5) In IDT, as implied by their descriptions, relative advantage, compatibility, trialability, and observability are benefits while complexity is a cost.

Thus, a first-cut synthesis of these theories can be achieved through the development of a comprehensive list of benefits and costs, using each of the key constructs of the pertinent theories as a guide to identifying the nature of those benefits and costs.

3. Dependent Variables of Interest

Various dimensions of consumers' e-shopping behavior have been explored in previous studies. Generally, these dimensions can be classified into two categories: behavioral intention and actual behavior. Some studies treated e-shopping intention as the dependent variable (e.g., Choi and Geitsfeld, 2004); some studies chose actual e-shopping behavior as the dependent variable (e.g., Eastin, 2002); and a few studies examined the determinants of multiple dependent variables including both behavioral intention and actual behavior (e.g., Grazioli and Jarvenpaa, 2000; Liang and Lai, 2002). In addition, several studies considered attitudes toward e-shopping as the ultimate dependent variable (e.g., Childers et al., 2001; Vijayasarathy and Jones, 2000). The remainder of this chapter will provide an overview of measures of e-shopping intention and actual e-shopping behavior.

3.1 E-shopping intention

As discussed previously, behavioral intention measures how hard an individual is intended to try, or the strength of intended effort to perform a behavior (Ajzen, 1991). Behavioral intention does not perfectly correlate with the actual behavior. An individual may engage in a less intended choice due to the presence of constraints (behavioral control factors). In addition, of course, stated intentions often differ from true intentions due to social desirability bias (the tendency to provide the response that is socially expected) or consistency bias (the need to appear consistent to the analyst, which can result in stated intentions that are consonant with previously-expressed attitudes, when in reality one's actual behavior will be dissonant from those attitudes). Generally, however, behavioral intention tends to have a positive association with the actual choice of that behavior. That is, the stronger an individual's behavioral intention, the more likely she is to perform the behavior.

E-shopping intention can measure an individual's conative beliefs with respect to adopting or using e-shopping (e.g., Belanger et al., 2002), as well as with respect to planning to abort an online transaction before checkout (Cho, 2004). Previous studies have adopted various scales to measure respondents' e-shopping intention: a two-point scale and multi-point qualitative scales. Among the latter, five-point scales and seven-point scales have been most commonly used. Further, e-shopping intention has been constructed in different ways. In some studies, a single question was used to ask respondents to report their e-shopping intentions (e.g., Chen and Tan, 2004, Goldsmith, 2002; Koufaris, 2002; Liang and Huang, 1998; Liao and Cheung, 2001; Phau and Poon, 2000; van den Poel and Leunis, 1999; Verhoef and Langerak, 2001). In most studies, however, e-shopping intention was evaluated by a latent construct. That is, several dimensions related to e-shopping intention were individually measured in the survey and then integrated into a scalar intention, generally through factor analysis. Table 1 presents an overview of these dimensions. Clearly, the intention to purchase products from online retail sites is the most direct indicator of e-shopping intention. This purchasing intention was expressed in various ways such as likelihood, probability, expectation and so on, and was measured at different time points such as currently, at the next visit, or in the future. In some studies, e-shopping intention was also assessed by an integration of near-term and long-term intentions (e.g., Choi and Geistfeld, 2004; Jarvenpaa et al., 2000; van der Heijden et al., 2003; van der Heijden and Verhagen, 2004).

Chen et al. (2002) and Limayem et al. (2000) theoretically considered e-shopping intention as an antecedent factor of actual e-shopping behavior, which in principle is the expected direction of causality. Limayem et al. (2000) employed a longitudinal survey, the first survey measuring respondents' attitudes, online purchasing intention, and so on, and the second survey asking for the number of online purchases they made since the first survey. However, in Chen et al. (2002), an individual's e-shopping intention was measured at the *current* time point, while her *previous* e-shopping behavior was used as the dependent variable. This model inverted the time precedence between intention and actual behavior and thereby violated temporal consistency. Since individuals' intentions may be influenced by their prior e-shopping experience and/or change over time (Liang and Huang, 1998, Vijayasarathy, 2002), the validity of such model results is in great doubt. More reasonably, some studies used previous e-shopping behavior to explain consumers' current intention of purchasing over the internet (Goldsmith, 2002; van den Poel and Buckinx, 2005).

Table 1. Dimensions of E-shopping Intention

Intention Dimensions	References
Purchasing from e-shopping sites	Ahn et al. (2004); Belanger et al. (2002); Foucault and Scheufele (2002); Gefen (2000); Gefen and Straub (2000, 2004); Grazioli and Jarvenpaa (2000); Hansen et al. (2004); Huang (2000); Jarvenpaa et al. (2000); Liang and Huang (1998); Liang and Lai (2002); Liao and Cheung (2001); Limayem et al. (2000); Liu et al. (2004); Liu and Wei (2003); Phau and Poon (2000); Ranganathan and Ganapathy (2002); Shih (2004); Shim et al. (2001); Teo and Yeong (2003); Teo and Yu (2005); van den Poel and Buckinx (2005); van den Poel and Leunis (1999); van der Heijden et al. (2003); van der Heijden and Verhagen (2004); Vijayasarathy (2002); Verhoef and Langerak (2001).
Using e-shopping sites	Ahn et al. (2004); Chen et al. (2002); Chen and Tan (2004); Mathwick et al. (2001).
Recommending others to use e-shopping sites	Ahn et al. (2004); Grazioli and Jarvenpaa (2000); Liu et al. (2004).
Using credit card on e-shopping sites or paying online	Belanger et al. (2002); Gefen (2000); Gefen and Straub (2000, 2004); Shih (2004).
Returning to e-shopping sites	Grazioli and Jarvenpaa (2000); Jarvenpaa et al. (2000); Koufaris (2002); Liang and Lai (2002); Liu et al. (2004); Mathwick et al. (2001); van der Heijden et al. (2003); van der Heijden and Verhagen (2004).
Creating an account on e-shopping sites	Belanger et al. (2002).
Providing information to e-shopping sites	Gefen and Straub (2000).
Positive remarks on e-shopping sites	Liu et al. (2004).
Willingness to pay more online	Srinivasan et al. (2002).
Collecting information using the internet	Vijayasarathy (2002).

3.2 Actual e-shopping behavior

In previous studies, e-shopping behavior was defined in different ways. Most studies considered only purchase behavior. On the other hand, some studies treated both purchases and information gathering as e-shopping behavior (e.g., Chen et al., 2002). The measures of actual e-shopping behavior mainly include three dimensions:

the adoption of e-shopping, the amount spent online, and the frequency of using e-shopping, as shown in Table 2. The measurement periods span from a few months to several years, or even longer (for example: have you ever … ?). The adoption of e-shopping was measured as a binary variable, yes or no. E-shopping frequency was assessed on either a numerical scale or an ordinal scale. For example, Limayem (2002) asked respondents to report the number of purchases they made over the internet; Eastin (2002) measured the frequency of e-shopping on a six-point ordinal scale: never, at least once, once a month, several times per month, once a week, and daily.

In most studies, these three dimensions were investigated separately. By contrast, several studies adopted a latent construct of e-shopping behavior generated by factor analysis. Specifically, Chen et al. (2002) used two items regarding e-shopping frequency to construct a behavior scale; Kim et al. (2000) extracted actual e-shopping behavior from four variables measuring e-shopping spending and frequency; and Corbitt et al. (2003) integrated four dimensions of e-shopping behavior: frequency, spending, the ratio of online purchases to total purchases in value, and the intention to increase/decrease purchasing in the future.

Table 2. Dimensions of E-shopping Behavior

Behavior Dimensions	References
E-shopping adoption	Bellman et al. (1999); Bhatnagar et al. (2000); Donthu and Garcia (1999); Foucault and Scheufele (2002); Goldsmith and Goldsmith (2002); Grazioli and Jarvenpaa (2000); Koufaris (2002); Koyuncu and Bhattacharya (2004); Liang and Lai (2002); Lohse et al. (2000); O'Cass and Fenech (2003); Shang et al. (2005); Sim and Koi (2002); Sin and Tse (2002).
E-shopping spending	Bellman et al. (1999); Corbitt et al. (2003); Lohse et al. (2000); Forsythe and Shi (2003); Henderson and Divett (2003); Kim et al. (2000); Lunn and Suman (2002); Shang et al. (2005); Swaminathan et al. (1999).
E-shopping frequency	Blake et al. (2003) ; Chen et al. (2002); Corbitt et al. (2003); Eastin (2002); Forsythe and Shi (2003); Henderson and Divett (2003); Kim et al. (2000); Koyuncu and Bhattacharya (2004); Li et al. (1999); Limayem et al. (2000); Lunn and Suman (2002); Miyazaki and Fernandez (2001); Shang et al. (2005); Swaminathan et al. (1999).

3.3 Summary

The dependent variables used in e-shopping behavior research mainly relate to e-shopping intention and actual e-shopping behavior. E-shopping intention was measured by various dimensions. Among them, the intention to purchase online is the most frequently used measurement. Although some studies used a unidimensional measurement, most adopted a latent construct to assess consumers' e-shopping intentions. Actual e-shopping behavior mainly includes three dimensions: adoption, spending, and frequency. Most studies examined one or more of these three dimensions directly, while a few studies constructed a latent variable to measure actual e-shopping behavior.

In most studies, either e-shopping intention or actual behavior was chosen as the dependent variable of interest. A few studies investigated both jointly. When behavioral intention and actual behavior are simultaneously included in an empirical study, attention should be paid to the time precedence between intention and behavior.

4. Sampling Approaches

Distributing surveys randomly to members of the general population is a traditional sampling approach. If truly random, such a sample can be a good representation of the population. However, with respect to an e-shopping survey, non-response bias may be a major concern with the traditional approach. For example, those who do not have access to computers or are unaware of e-shopping may be less likely to respond, leading to a higher representation of existing online consumers in the sample than in the population as a whole. Even so, since only a minority of the general population purchases online, such a sample may not contain a substantial number of e-shopping occasions. Accordingly, the lack of e-shopping observations in the sample tends to limit the statistical robustness of research results. Therefore, from the standpoint of efficiency, a choice-based sampling approach is probably more appropriate for e-shopping surveys, at least with the current state of adoption and use.

Among the studies reviewed here, 34 used data collected from computer/internet/email users (e.g., Shim et al., 2001; Swaminathan et al., 1999; van den Poel and Leunis, 1999). Obviously, online consumers must be computer and internet users, and are probably email users. Therefore, understanding these users' e-shopping behavior is somewhat equivalent to understanding the e-shopping behavior of the general population, aside from descriptive statistics on the *prevalence* of such behavior in the population. Also, this sampling approach has several advantages. First, compared to the general population, these users are more likely to be aware of e-shopping even if they do not purchase online. Thus, they are likely to be more representative of potential near-term future buyers. Second, internet users are essentially the only ones who have the choice to shop online; it would produce statistically inconsistent estimates (Thill, 1992) to include those who *do not* have a choice in an e-shopping adoption model (on the other hand, current non-users can provide important insight into *intentions*, and more generally are essential to understanding the choice to become a computer/internet/email user, as a necessary precursor to e-shopping adoption). Third, by excluding non-users, this sampling approach is more likely to capture an adequate number of e-shopping observations and will achieve a better balance between internet buyers and non-buyers. Finally, e-vendors' marketing policies mainly target internet users rather than the whole population. Therefore, understanding the e-shopping behavior of internet users will provide e-vendors direct information on how to improve site design and marketing strategies.

When the survey subjects were internet users, some studies used the internet as the data collection tool, which acted as a natural filter to exclude ineligible respondents. These studies adopted different channels to recruit their samples. Most studies used email to announce their surveys. Specifically, some researchers sent an invitation email to a mailing list, with a URL link to the survey web site. The mailing list was obtained in various ways. Chen and Tan (2004) distributed their emails to 1,865 registered users of a non-profit organization and three e-shopping-related news groups. Limayem et al. (2000) chose 6,110 email users from four internet-based directories. O'Cass and Fenech (2003) recruited their sample through a major Australia internet service provider. Shang et al. (2005) obtained their mailing list from a major computer magazine in Taiwan. Van den Poel and Leunis (1999) collected email addresses from the Belgian White Pages. Eastin (2002) harvested more than 1,300 email addresses from 50 e-commerce-related news groups (randomly selected from the population of 127 e-commerce news groups in a USENET organization). To increase response rate, he explicitly removed business accounts and sent two emails to recipients: one introduced the background and objective of the survey and the

other contained a link to the internet-based survey. Li et al. (1999) drew their sample from about 50,000 internet users registered in the company's Cyberleague™ online panel. After an invitation email was distributed to these users, they sent two email reminders at five-day intervals to those who did not respond.

Moreover, several studies adopted different announcement strategies. For example, Ahn et al. (2004) posted the banner of their survey on e-shopping sites and provided a URL link to the survey site; and Teo and Yeong (2003) announced the survey through local newsgroups, URL links from faculty homepages, and personal emails. On the other hand, van den Poel and Leunis (1999) argued that an internet-based survey is expected to be more prone to self-selection bias than one requiring little effort to access, and hence directly distributed the surveys to recipients by email.

Some studies extracted their analysis sample from available databases. Bellman et al. (1999) and Lohse et al. (2000) used data from the Wharton Virtual Test Market (WVTM), which were collected to understand the demographics and attitudes of online consumers, and determinants of e-shopping behavior. As stated in Bellman et al. (1999, p. 32), "the Wharton Forum on Electronic Commerce began recruiting a panel of Web users from around the world in October 1997. As part of the participant registration process, 10,180 people completed a survey asking 62 questions about online behavior and attitudes about Internet communication and privacy issues, as well as routine demographic questions. People were attracted to the survey site (wvtm.wharton.uppen.edu) through an online banner advertising campaign targeting specific segments of Web users worldwide, links provided by members' sites, and word of mouth. Survey respondents self-selected themselves as panel members, and their answers to the survey questions were self-reported."

Some studies analyzed data from the Graphic, Visualization, and Usability (GVU) Center of the Georgia Institute of Technology (e.g., Bhatnagar et al. 2000; Forsythe and Shi, 2003). "Since its beginning in 1994, the GVU WWW User Survey has accumulated a unique store of historical and up-to-date information on the growth and trends in Internet usage. It is valued as an independent, objective view of developing Web demographics, culture, user attitudes, and usage patterns. Recently the focus of the Survey has been expanded to include commercial uses of the Web, including advertising, electronic commerce, intranet Web usage, and business-to-business transactions" (http://www.cc.gatech.edu/gvu/user_surveys, accessed on March 4, 2005). The GVU has conducted 10 surveys up to 1998. Internet shopping is one component of these surveys. The population for the GVU surveys is internet users. In addition to the seventh GVU WWW User Survey, Hoffman et al. (1999) also analyzed the data from the 1997 Nielsen Media Research and CommerceNet Internet Demographics Study. The Nielson study focused on U.S. web users and studied the use of the internet for shopping and purchasing.

In addition, some studies collected data from known online consumers, for the purpose of examining their future e-shopping intentions. Ranganathan and Ganapathy (2002) collected data from 214 individuals in Illinois, who had completed at least one online purchase in the last six months. Srinivasan et al. (2002) sent an email invitation to 5,000 consumers randomly selected from a list of online consumers compiled by a market research firm. Koufaris (2002) simulated actual consumers by first asking the respondents to visit a specific online

bookstore (booksamillion.com) and then asking them to complete the questionnaires. This sampling approach leads to a more homogeneous sample.

Finally, 22 studies chose students (either undergraduates or graduates) as their subjects (e.g., Belanger et al., 2002; Choi and Geistfeld, 2004). The student sample is often criticized due to its higher-than-average proportion of younger adults. However, most studies did not discuss the acceptability and appropriateness of using students in this area of research. Actually, a student sample has some advantages for an e-shopping study, since those respondents will tend to be harbingers of future adoption patterns in the population at large. That is, the e-shopping behavior of today's over-50 adults is apt to tell us less about the future than that of today's 20-somethings. Further, compared to traditional consumers, online consumers tend to be young and well-educated (OECD, 1999). Therefore, the profile of a student sample is in some ways closer to that of the online consumer population than is the profile of the general population more broadly. Further, if books are one product type chosen for detailed study, a student sample is a natural group of consumers to analyze. However, these studies have limited generalizability of parameter estimates to a larger population because of their homogeneous samples. For example, cost-conscious student consumers may weight price more heavily in their purchase decisions than would the population of online shoppers as a whole. They may also be more risk-taking, more innovative, and more trusting than their elders.

5. Product Classifications

The characteristics of products greatly determine the degree to which they are suitable for marketing online (Peterson et al., 1997). That is, these characteristics are important factors that influence consumers' internet purchases of specific products. Accordingly, to better understand consumers' e-shopping behavior, we must differentiate various types of products.

A number of different classifications have been proposed in the literature. In one early study, Copeland (1924) grouped products into three categories: convenience goods, shopping goods, and specialty goods. Convenience goods refer to "goods which the customer usually purchases frequently, immediately, and with the minimum of effort", for example, newspapers and many grocery products (AMA, 1948, p. 206). Shopping goods are "goods which the customer in the process of selection and purchase characteristically compares on such bases as suitab[ilit]y, quality, price, and style", such as furniture and apparel (AMA, 1948, p. 215). Specialty goods refer to "goods on which a significant group of buyers characteristically insists and for which they are willing to make a special purchasing effort", for example, specific brands of gourmet foods and computers (AMA, 1948, p. 215). Online consumers' satisfaction with delivery and post-delivery services differs along these three product types. Specifically, Thirumalai and Sinha (2005) found that, on average, convenience and shopping goods consumers tend to be more satisfied with product order fulfillment process than specialty goods consumers. However, this classification system is less able to evaluate the online-purchasing suitability of products.

On the other hand, Nelson (1970) distinguished two types of qualities of a product: search qualities and experience qualities. Search qualities refer to the traits that consumers can fully ascertain prior to use, while experience qualities indicate those that cannot be determined until using the product. A particular product may possess both search qualities and experience qualities. If search qualities dominate the attributes of a product, such as software, it is called a search good. Conversely, if experience qualities of a product, such as apparel, outweigh its search qualities, it is called an experience good. Consumers can identify the important attributes of a search good based on an information search over the internet. In such cases, if an e-shopping transaction is at least as efficient and cost-effective as traditional store shopping, the likelihood of conducting an online transaction will greatly increase. On the other hand, if a product is an experience good, the available information may not be sufficient for consumers to engage in an online transaction. They may have to evaluate its attributes by physical inspection or personal trial, and hence the probability of adopting e-shopping is likely to decrease. Of course, neither the character of the product nor the choices facing the consumer are purely binary; various hybrid processes are possible, such as using online searches and in-store trials to narrow the choice set and then making the final purchase based on price information obtained over the internet. Bhatnagar and Ghose (2004) comment that in the context of the internet, some goods that are traditionally search goods become experience goods, and conversely.

Although Nelson's classification is useful, Peterson et al. (1997, pp. 335-336) proposed a more detailed classification system

"in which products and services are categorized along three dimensions that are more relevant in the context of the Internet: cost and frequency of purchase, value proposition, and degree of differentiation. Goods

vary along the first dimension from low-cost, frequently purchased goods (e.g., consumable products such as milk) to high-cost, infrequently purchased goods (e.g., durable products such as stereo systems). … In general, when purchase fulfillment requires physical delivery, the more frequent the purchase and the smaller the cost (e.g., milk), the less likely there is to be a good 'fit' between a product or service and Internet-based marketing.

"Goods vary along the second dimension according to their value proposition, whether they are tangible and physical or intangible and service related. Internet-related marketing is particularly well suited to certain types of intangible or service-related goods (i.e., those with a digital basis). To the extent that the value proposition is intangible, the greater the frequency of purchase or use of a good, the greater the advantage of the Internet as a transaction and distribution channel.

"The third dimension reflects the degree to which a product or service is differentiable. In particular, it reflects the extent to which a seller is able to create a sustainable competitive advantage through product and service differentiation. Internet-based marketing can result in extreme price competition when products or services are incapable of significant differentiation. … When products or services are capable of significant differentiation, the Internet can serve as an effective segmentation mechanism for guiding consumers to their ideal product or service".

As shown in Table 3, they presented an example classification of products or services along the three dimensions, dichotomized for simplicity of exposition.

Table 3. Product and Service Classification

Cost & Frequency	Value Proposition	Differentiation	Examples
Low cost, frequently purchased goods	Tangible or physical	Potential high	Wines, soft drinks, cigarettes
		Potential low	Milk, eggs
	Intangible or informational	Potential high	Online newspapers and magazines
		Potential low	Stock market quotes
High cost, infrequently purchased goods	Tangible or physical	Potential high	Stereo systems, automobiles
		Potential low	Precious metal ingot of known weight & purity
	Intangible or informational	Potential high	Software packages
		Potential low	Automobile financing, insurance

Source: Peterson et al. (1997).

Once a product category is determined, consumers need to decide which brand to choose, from which channel(s) to gather product information, and over which channel to complete the purchase (Peterson et al., 1997). (Note that although Peterson et al. characterized the choice of information-gathering channel as either-or, in reality both the internet *and* store or other conventional channels can be used). Combined with the classification system, Peterson et al. (1997) proposed some logical consumer decision sequences. As shown in Table 4, low-cost, frequently-purchased, and tangible or physical products are more likely to be purchased in traditional retail stores. Conversely, low-cost, frequently-purchased, and intangible or informational products are more likely to be purchased over the internet. And both channels are suitable for high-cost, infrequently purchased products.

Phau and Poon (2000) applied this classification system in an empirical study. They found that product and service type classification significantly influence the consumer choice between a retail store and an e-shopping

mall. In general, products and services that have a low cost, are frequently purchased, have intangible value proposition, and/or are relatively high on differentiation are more amenable to be purchased over the internet. Specifically, flowers, videos/music, paid subscription to online newspapers and financial reports, computer software, and consultancy services were found to be more likely to be purchased over the internet; while milk, eggs, vegetables, car loans, and insurance were found to be more likely to be purchased in traditional retail stores.

Table 4. Likely Consumer Decision Sequences.

Cost & Frequency	Value Proposition	Differentiation	Likely Decision Sequences*
Low outlay, frequently purchased goods	Tangible or physical	Potential high	Brand choice likely after retail search. Price search on the internet is unlikely. Final acquisition likely in retail store.
		Potential low	Brand choice likely after retail search. Price search on the internet is unlikely. Final acquisition likely in retail store.
	Intangible or informational	Potential high	Brand choice likely after internet search. Price search in retail channels is unlikely. Final acquisition likely on the internet.
		Potential low	Brand choice likely after internet search. Price search in retail channels is unlikely. Final acquisition likely on the internet.
High outlay, infrequently purchased goods	Tangible or physical	Potential high	Brand choice likely after search of both channels. Price search likely in both channels. Final acquisition may occur in either channel (the need for personal product inspection may strongly influence the decision in this case).
		Potential low	Brand choice likely after search of both channels. Price search likely in both channels. Final acquisition may occur in either channel.
	Intangible or informational	Potential high	Brand choice likely after search of both channels. Price search likely in both channels. Final acquisition may occur in either channel (if prices are comparable, the internet may be convenient for final delivery of such products).
		Potential low	Brand choice likely after search of both channels. Price search likely in both channels. Final acquisition may occur in either channel.

Source: Peterson et al. (1997).

* The authors considered only two shopping media (the internet and traditional retail store) and three decision dimensions (information search leading to brand choice, price search, and final acquisition).

Based on cost outlay and tangibility, Vijayasarathy (2002) classified four types of products, as shown in Table 5. He found that consumers' salient beliefs and normative beliefs about e-shopping were significantly different

between tangible and intangible products, and that a product's tangibility had a significant influence on consumers' intentions toward e-shopping. In particular, consumers' intentions to shop online for intangible products were higher than their intentions to shop for tangible products. However, cost and the interaction between cost and tangibility were not significantly associated with consumers' intentions.

Table 5. Product Type Description

	Tangible	Intangible
Low cost	A physical product that is relatively inexpensive (less than $50). Examples: groceries, clothing, toys, health and beauty products, pet supplies, sporting goods and garden supplies	Non-physical items and services that are relatively inexpensive (less than $50). Examples: computer software, music, movie/ concert/theater/sporting event tickets, online banking and online brokerage/trading services
High cost	A physical product that is relatively expensive (greater than $300). Examples: computer hardware, household appliances, furniture, and consumer electronics	Non-physical items and services that are relatively expensive (greater than $300). Examples: mortgage or automobile financing, insurance for real estate/auto/life, vacation/travel planning, and airline tickets

Source: Vijayasarathy (2002).

While the classification system of Peterson et al. is clearly an improvement over that of Nelson in some ways, the dimensions of search and experience should not be neglected. The experience dimension of Nelson, for example, is synonymous with neither the value proposition nor the differentiation dimensions of Peterson et al. Consider soft drinks: while there is clearly differentiation between soft drink brands, there is virtually no differentiation within a brand. A specific soft drink not only *need not* be experienced before being purchased, it *cannot* be experienced beforehand in the same way that a specific garment can be tried on before a purchase decision is made (of course that brand of soft drink can be experienced before making a later purchase of the same brand. The fact that the previous experience is completely transferable to the present purchase context is precisely the point). Similarly, the content of a specific book is essentially identical from one platform to the next, and so (with some obvious exceptions, such as collector's items, preferences for hardback versus paperback, accompanying information such as commentary or background) once having determined to buy a certain book, the need to experience a particular version of that book before purchase is minimal. On the other hand, consider wine: while there is clearly variation by vintage within brand, many wine purchases are made without first having tasted the specific brand-vintage combination being purchased; in fact the opportunity to do such tasting is generally rather limited. Combining these observations, we suggest that the *need/ability to experience the specific purchase* in advance is a relevant product classification dimension. All else equal, products with either a low need *or* a low ability to be tried in advance are more likely to be purchased over the internet. Empirically, Cho (2004) found that concern for the risks involved in the inability to physically examine products increases the likelihood of aborting an online transaction.

For different products, the internet shows diverse suitability as a shopping medium. Therefore, mixing product categories in e-shopping behavior research tends to yield vague or inconsistent results. For example, a consumer may be more likely to purchase software online, but less inclined to acquire clothing over the internet; her overall e-shopping intention will be some unknown mixture of the high intention and the low intention. Further, when

respondents are asked to report their *overall* e-shopping intention without specifying any product categories, they might overstate or understate their intention because one or several products they considered may be more or less suitable for e-shopping. Many studies measured intention in this way (e.g., Belanger et al., 2002; Huang, 2000; Ranganathan and Ganapathy, 2002).

On the other hand, some studies chose particular product categories with which to study e-shopping behavior. This specification reduces the heterogeneity resulting from different product types. Books/ textbooks are the most common choice of online products in these studies (e.g., Foucault and Scheufele, 2002; Gefen, 2000, Gefen and Straub, 2000 & 2004; Liu et al., 2004). Apparel and used laptops were chosen at least once each (Goldsmith and Goldsmith, 2002; Grazioli and Jarvenpaa, 2000). Shim et al. (2001) focused on search products (books, software, and videos) to investigate the influences of intention to search on e-shopping intention. Bhatnagar et al. (2000) studied the adoption of 14 types of online products and services. Hansen et al. (2004) and Henderson and Divett (2003) respectively investigated the intention and adoption of e-shopping for groceries.

In conclusion, consumers' decisions to participate in e-shopping activities differ by product type. However, relatively little effort has been invested into product classification in the context of e-shopping. As a result, confounding suitable products and unsuitable products in e-shopping surveys hinders our understanding of consumers' e-shopping behavior.

6. Methodologies

Previous studies have employed a number of approaches to empirically analyze consumers' e-shopping behavior. Researchers use specific methodologies to answer specific questions in which they are interested. These approaches can be classified into three categories, based on the complexity with which e-shopping behavior and their precedent factors are presented: descriptive analysis, correlational analysis, and multivariate analysis. The purpose of the overview of methodologies presented here is not to critique approaches used in a specific study, but to summarize the types of methodologies ever used and the strengths and weaknesses of the approaches themselves.

6.1 Descriptive analysis

Descriptive studies analyze e-shopping behavior at the aggregate level; for example, what percent of internet users in the sample purchased online, or had an intention to e-shop (Cole et al., 2003)? The strength of descriptive analyses is in showing us what happened for a particular sample at a particular time, which provides a clear picture of observed behavior. Accordingly, descriptive analysis is a very important step in helping us understand what is going on. However, descriptive studies convey little information about why consumers behave as they do and hence do not attempt to explain their behavior. Specifically, descriptive studies can provide only a simple accounting of consumers' e-shopping experiences on average. But this simplicity may mask the complex interactions among the factors that explain consumers' e-shopping behavior.

On the other hand, some descriptive studies do attempt to explain consumers' behavior (Hoffman et al., 1999; Lim, 2003; Raijas, 2002). These researchers asked respondents to report the reasons why they did (or did not) use e-shopping. Based on the aggregated results, these studies illuminate consumers' behavior to some extent. However, these findings are unable to explain consumers' behavior at the individual level; for instance, a consumer's e-shopping choice may be a tradeoff among various determinants (see Chapter 7), and it is desirable to know the relative weights of each determinant in the decision.

6.2 Correlational analysis

Here, a correlation refers loosely to the relationship between two variables, where (in our context) one is taken to be dependent and the other explanatory. Correlational methods used in previous studies mainly include Pearson correlations (both the dependent and explanatory variables are continuous), t-tests (the dependent variable is continuous and the explanatory variable is binary), and chi-square tests (both variables are categorical) (e.g., Corbitt et al., 2003; Donthu and Garcia, 1999). Through correlational analysis, researchers can test a specific hypothesis about whether a certain variable affects e-shopping behavior. As a result, correlational studies attempt to explain rather than merely describe the observed behavior (or intention). However, the observed correlation of one variable with e-shopping behavior may act as a proxy for another variable. For example, high income consumers may be found to be more likely to adopt e-shopping, but this observed correlation may be a surrogate for the correlation between e-shopping adoption and education status (since higher education is correlated with higher income and higher educated consumers have more opportunities to access the internet).

Therefore, the weakness of correlational analysis is its lack of ability to account for the influences of other factors on e-shopping behavior.

6.3 Multivariate analysis

Multivariate analysis permits the researcher to test specific hypotheses about the direction and magnitude of influence some variable(s) have on e-shopping behavior, while controlling for other variables. Previous studies have applied multiple regression, structural equations modeling (SEM), discrete choice modeling, and discriminant analysis. The purpose of these kinds of approaches is to explain rather than describe consumers' behavior. Therefore, multivariate studies can provide a more robust understanding of e-shopping behavior, although the appropriateness of the particular method chosen and the validity of the statistical results are highly dependent on other assumptions.

Multiple regression is the most common approach used in previous e-shopping studies (e.g., Henderson and Divett, 2003; Liao and Cheung, 2001). Analysis of variance (ANOVA) is a special type of regression model, in which the dependent variable is continuous and the explanatory variables are categorical. Multiple regression is easy to understand and implement. However, the results of regression models may be threatened by the interactions among explanatory variables and possible correlations between some explanatory variables and residuals. Alternatively, SEM is capable of solving these problems. SEM allows for multiple simultaneous directions of causality, and distinguishes the direct effect and the indirect effect as well as the total effect of an explanatory variable on each dependent variable. Most applications of SEM in e-shopping behavior research are tied to some specific theories such as TAM in Ahn et al. (2004), TPB in Choi and Geistfeld (2004), TRA in Cho (2004), and TCT in Liang and Huang (1998), although some researchers established their own modeling structures (e.g., Gefen and Straub, 2004; Goldsmith, 2002). Srinivasan et al. (2002) applied seemingly unrelated regressions (SURs) to study multiple dependent variables. Theoretically, both multiple regression with two or more equations and SUR are specific types of SEM (Long, 1983). The major difference between multiple regression and SUR is that seemingly unrelated regression assumes that the error terms of several regression equations are correlated, while multiple regression assumes independent errors across equations. The difference between SUR and SEM is that in SUR, only the error terms are allowed to be correlated; the explanatory variables in each equation are still assumed to be uncorrelated with the error terms, while in SEM this assumption is relaxed.

Some studies also used multiple analysis of variance (MANOVA) (e.g., Goldsmith and Goldsmith, 2002; Kaufman-Scarborough and Lindquist, 2002). MANOVA is used to examine the main and interaction effects of categorical variables on multiple continuous dependent variables. In addition, Vijayasarathy (2002) applied analysis of covariance (ANCOVA) and multiple analysis of covariance (MANCOVA) to study e-shopping behavior. In contrast to ANOVA and MANOVA, ANCOVA and MANCOVA are used to test the effects of both continuous and categorical explanatory variables on single and multiple continuous dependent variables, respectively. All of these approaches are also special cases of SEM, in the same way that ANOVA is a special case of multiple regression.

When the dependent variable was categorical, some researchers employed discrete choice models, which are tied to utility maximization theory (UMT). UMT is extensively used in the development of predictive models of human behavior. It assumes that when a consumer is confronted with a set of choices, she attempts to choose the alternative with the highest utility to her (Ben-Akiva and Lerman, 1985). "Utility" refers to a scalar measurement of the attractiveness of an alternative, and is a function of a vector of attribute values. A decision maker explicitly or implicitly uses this single index to compare different alternatives. In the context of random utility theory, what an analyst observes is consumers' behavior and the utility for each alternative is not known to her with certainty. As a result, the utility is treated as a random variable. Consumers' choices are predicted probabilistically: the probability that an individual chooses an alternative is the probability (evaluated from the perspective of the analyst having only incomplete information) that the utility of this alternative exceeds the utilities of other alternatives in the choice set. Discrete choice models deal with only categorical dependent variables. When consumers make e-shopping decisions, they may be confronted with a binary choice, such as whether or not an online purchase is made (e.g., Bellman et al., 1999; Bhatnagar et al., 2000; Lohse et al., 2000; van den Poel and Buckinx, 2005), or multiple categorical choices, such as the frequency of e-shopping (treated as a nominal variable by Koyuncu and Bhattacharya, 2004) or conventional store vs. internet vs. catalog.

Several studies applied discriminant analysis to study e-shopping behavior (e.g., Ranganathan and Ganapathy, 2002; Sin and Tse, 2002). The purpose of discriminant analysis is to find the best functions of a set of explanatory variables by which we can determine which variables discriminate between two or more predefined groups. In the context of e-shopping behavior, discriminant analysis can be used to determine which variables are the best predictors of consumers' e-shopping choice. In most studies, consumers' e-shopping choices were pre-classified into two groups such as internet buyers and internet non-buyers.

Finally, various modeling approaches were used to segment e-shoppers and non-e-shoppers. Such approaches provide further insight into the relationship of e-shopping behavior to various explanatory variables, by identifying groups of people who weight various characteristics, such as risks and benefits, differently in their shopping decisions. Bhatnagar and Ghose (2004) developed a latent segmentation model to classify internet consumers into three segments, based on their sensitivity with respect to e-shopping benefits, product risks, and security risks. Brengman et al. (2005) factor-analyzed responses to 21 (of an original 38) psychographic statements into six underlying factors: internet convenience, perceived self-inefficacy, internet logistics, internet distrust, internet offer (referring to the comparative prices, quality, and selection of goods for internet versus store shopping), and internet window shopping. They then applied cluster analysis to the factor scores to identify four e-shopper segments (tentative shoppers, suspicious learners, shopping lovers, and business users) and four internet user but non-e-shopper segments (fearful browsers, positive technology muddlers, negative technology muddlers, and adventurous browsers).. Clearly, the non-adopter segments differ on their propensity to become adopters, while all eight segments differ in the types of marketing approaches to which they would be most receptive.

6.4 Summary

Different methodologies have been applied to answer different levels of questions. Generally, descriptive analysis is used to describe consumers' e-shopping behavior; correlational analysis goes beyond descriptive analysis and attempts to analyze how two variables are related; and multivariate analysis is mainly used to explain consumers' behavior using many variables considered together. Therefore, although descriptive and correlational analyses are important steps in helping to construct multivariate analyses, multivariate studies provide more information than these other two types of analyses. Further, if the sample is somewhat biased, multivariate analysis is the least affected by the bias (Sommer and Sommer, 1997). Therefore, multivariate analysis is ideal to study e-shopping behavior in depth.

7. Determinants of E-shopping Behavior

A general purpose of studies relevant to e-shopping behavior is to understand and predict consumers' e-shopping behavior as well as, in some cases, to improve the design of e-shopping sites. Accordingly, identifying the factors influencing e-shopping behavior becomes very important to achieving the goal. Although previous studies have investigated a large number of potential antecedent factors, this chapter summarizes only those factors that were empirically found to be significantly associated with e-shopping behavior. It is worth noting that Chang et al. (2005) has reviewed the literature (published before 2004) related to the adoption of online shopping, which provided a guideline for our work. They classified the antecedent factors of e-shopping behavior into three categories: perceived characteristics of the web as a sales channel, online consumer characteristics, and vendor and product characteristics. This review adapts their work and incorporates some new studies published in 2004 and 2005. As a convenience, we have appended to the end of this chapter their tables summarizing the empirical findings with respect to influences on (1) online shopping intention and usage, (2) attitudes toward online shopping, (3) risk perception, and (4) trust, as well as determinants of online shopping discussed in the popular media. In an appendix to the report itself, we have included a tabulation of key facts regarding the 65 empirical studies we reviewed and cited herein.

7.1 Perceived characteristics of the web as a shopping channel

As a sales channel, the internet deals with both information system and marketing activities. Therefore, both online features (such as information) and offline features (such as delivery) of an online store influence consumers' e-shopping behavior (Ahn et al., 2004). Further, e-stores, traditional stores, and other shopping channels compete with each other to survive. Consumers' adoptions of e-shopping are highly dependent on its superiority to other shopping channels and its perceived drawbacks.

Qualities of e-shopping service
Qualities of e-shopping service include system quality, information quality, service quality, product quality, delivery quality, and post-purchase quality (Ahn et al., 2004; Lee, 2002). System quality "describes the measures of web sites as information processing systems and taps engineering-oriented performance characteristics such as operational efficiency and appearance" (Ahn et al. 2004, p. 407). Ahn et al. (2004) found that an indicator of system quality, which was derived from measurements on multiple traits such as design, navigation, response time, and so on, had a positive impact on consumers' e-shopping intention. Similarly, Belanger et al. (2000) and McKnight et al. (2002) concluded that the impact of site quality on e-shopping behavior is positive. Further, some specific measurements of system quality were found to positively influence consumers' e-shopping intention and actual use; for example, ease of navigation (Childers et al., 2001, Yoon 2002) and better design (Liang and Lai, 2002; Ranganathan and Ganapathy, 2002). Generally, better system quality tends to increase the likelihood of purchasing online.

Traditionally, information quality means "the quality of reports that the system produces" (Ahn et al. 2004, p. 407). In the context of e-shopping, information quality refers to the content and content quality that the e-sites provide. High-quality information is assumed to help consumers to compare products and make better choices.

Empirically, information quality was found to be positively associated with consumers' e-shopping intention (Ahn et al., 2004; Ranganathan and Ganapathy, 2002; Shih, 2004). Conversely, if products are hard to find or little product information is available for an e-store, consumers are less likely to choose it (Raijas, 2002).

Service quality can be defined as a global judgment about the superiority or excellence of the service provided. Its typical dimensions include tangibles, reliability, responsiveness, assurance, and empathy (Berry et al., 1988). "Tangibles refer to physical facilities, equipment, and appearance of personnel. Reliability is defined as the ability to perform the promised service dependably and accurately. Responsiveness refers to the willingness to help customers and provide prompt service. Assurance refers to knowledge and courtesy of employees and their ability to inspire trust and confidence. The fifth dimension, Empathy, is defined as individualized attention given to visitors" (Li and Lee, 2001). Presumably, high-quality service can improve the ease of use of an internet service, and hence help consumers complete their e-shopping transactions with minimal intellectual input. Ahn et al. (2004), Chen and Tan (2004), and Shih (2004) found that service quality is positively associated with consumers' intention to use e-shopping. Vijayasarathy and Jones (2002) concluded that providing good post-selection information increases consumers' intention to shop online.

Product quality refers to the actual functionality of the product. The variety and quality of products in an e-store have the potential to influence consumers' patronage. Empirically, product quality was found to positively affect consumers' e-shopping intention (Ahn et al., 2004). By contrast, if the quality of a product cannot be verified in an e-store, consumers are less likely to choose this e-store (Raijas, 2002). Further, product variety was found to be positively associated with consumers' e-shopping intention and adoption (e.g., Cho, 2004; Sin and Tse, 2002).

Reliable and timely delivery is one of the fundamental objectives for e-shoppers. Reliable and timely delivery increases satisfaction and hence likelihood of adoption (e.g., Ahn et al., 2004, Koyuncu and Bhattacharya, 2004). Conversely, consumers having concerns over delivery are more likely to abort an online transaction (Cho, 2004). E-shopping reduces consumers' physical travel to traditional stores, and thus those who prefer to avoid performing the product picking and delivery tasks themselves are more likely to purchase online (Raijas, 2002).

Post-purchase service quality also influences e-shopping behavior. Previous studies explored the influences of money-back guarantees and ease of return. Van den Poel and Leunis (1999) concluded that providing a money-back guarantee for consumers increases the likelihood of purchasing online. Consumers concerned over return difficulties are more likely to abort an online transaction (Cho, 2004).

As consequences of specific perceived qualities of e-shopping service, perceived usefulness and perceived ease of use were extensively found to positively influence consumers' e-shopping intention and actual use (e.g., Chen et al., 2002; Childers et al., 2001). These findings are consistent with the fundamental assumptions of TAM (see Chapter 3). Conversely, complexity reduces the probability of shopping online (e.g., Huang, 2000; Verhoef and Langerak, 2001).

Relative advantages of e-shopping

Previous studies have identified various advantages of e-shopping. Some studies presented these advantages in a general way, such as relative advantage (Verhoef and Langerak, 2001) and perceived consequences (Limayem et al., 2000). Other studies employed more specific measurements: quickness (Goldsmith and Goldsmith, 2002; Koyuncu and Bhattacharya, 2004), time saving, ease of ordering (Raijas, 2000), effort saving (Cho, 2004; Verhoef and Langerak, 2001), product value in terms of price and quality (Vijayasarathy and Jones, 2000), decreased transaction costs (Liang and Huang, 1998; Teo and Yu, 2005), price reduction or financial benefits (e.g., Eastin, 2002; van den Poel and Leunis, 1999). Some advantages fall under the qualities discussed above, such as increased product variety and value. Generally, e-shopping advantages were found to have a positive impact on consumers' e-shopping intention and actual use. Further, if relative advantages of e-shopping fit consumers' shopping orientations or personalities (discussed in Section 7.3), they are more likely to value such benefits and purchase online.

Combining several elements both of the qualities of e-shopping and its relative advantages, Mathwick et al. (2001) surveyed 213 internet and 302 catalog customers of a women's apparel and housewares retailer with respect to six types of characteristics: visual appeal, entertainment value, escapism, intrinsic enjoyment, efficiency, and economic value of the vendor's web site and catalog (see Figure 5 of Section 2.6, and accompanying discussion). Those perceptions were then linked to measures of preference and future patronage intentions.

Perceived risk of and confidence in e-shopping

Perceived risk refers to the uncertainty and negative outcomes of performing a behavior. The perceived risk of e-shopping has been extensively researched. These studies measured the perception of risks either in a general way (e.g., Jarvenpaa et al., 2000; Liu and Wei, 2003) or in a specific way. Specific risks include financial (e.g., Bhatnagar et al., 2000), product performance, time/convenience (e.g., Forsythe and Shi, 2003), payment (e.g., Koyuncu and Bhattacharya, 2004), transaction security (e.g., Liao and Cheung, 2001), technology, vendor, consumer (e.g., Lim, 2003), privacy (e.g., Lunn and Suman, 2000), and web deception (e.g., Grazioli and Jarvenpaa, 2000). Further, the uncertainty measurements derived from TCT (such as performance uncertainty, behavioral uncertainty, environmental uncertainty) are also indicators of risks. In general, perceived risk negatively influences consumers' intention and actual use of e-shopping. Conversely, consumers are more likely to patronize the e-stores having sound security and privacy features (e.g., Liu et al., 2004; Miyazaki and Fernandez, 2001).

Perceived confidence in the web as a shopping channel is positively associated with consumers' e-shopping intention and actual use. Perceived confidence was measured in two respects: confidence and self-efficacy. The dimensions of confidence cover confidence in the ability to buy online, diversity of e-shopping companies, and information availability (Goldsmith and Goldsmith, 2002). Self-efficacy refers to the belief in one's ability to successfully perform a behavior; or the level of task difficulty an individual believes is attainable with her perceived skill level (Bandura, 1997). In the e-shopping environment, self-efficacy measures consumers' confidence in participating in e-shopping activities, including the online shopping process and actual purchase (Choi and Geistfeld, 2004; Eastin, 2002).

Trust

Trust is essentially another way of formulating some of the risk factors discussed above, specifically those related to "individuals' uncertainty regarding the motives, intentions, and prospective actions of others on whom they depend" (Kramer, 1999, p. 571). If risk is present, consumers need trust before conducting a transaction; and the higher the perceived risk, the more the need for trust (Grazioli and Jarvenpaa, 2000). As found in many studies, lack of trust in the online transactions and the web vendors is an important obstacle in the market penetration of e-shopping (e.g., Corbitt et al., 2003; Liu et al., 2004). Previous studies defined and operationalized trust in a number of ways. Some studies conceptualized trust as an overall construct: the trustor is willing to be vulnerable to the action of the trustee (e.g., Gefen, 2000; van der Heijden, et al., 2003) or a general belief that the trustee can be trusted (e.g., Grazioli and Jarvenpaa, 2000). Some researchers combine these two kinds of definitions to establish their own trust constructs (e.g., McKnight et al., 2002). Aside from overall trust, studies have also investigated the effects of specific trust beliefs on the intention to purchase online. Specifically, integrity, predictability, and familiarity have been found to increase consumers' e-shopping intention (e.g., Gefen and Straub, 2004; van der Heijden and Verhagen, 2004). Web awareness was also found to positively impact consumers' e-shopping intention (Foucault and Scheufele, 2002; Yoon, 2002).

7.2 Vendor and product characteristics

Vendors and consumers constitute two basic actors of a product exchange system. Vendors have the potential to influence consumers' e-shopping behavior (Swaminathan et al., 1999); for example, a well-known vendor name may help relieve consumers with respect to perceived risk and establish trust with them, and hence motivate consumers to shop in this e-store. As discussed in Chapter 5, it is important to identify what products are more suitable to purchase online, since product characteristics will affect consumers' choices among e-stores, traditional stores, and other shopping options.

Vendor characteristics

Liao and Cheung (2001) evaluated the impacts of the overall quality of e-vendors on e-shopping behavior and found positive relationships between them. Perceived vendor reputation and size were found to positively affect consumers' e-shopping intention with respect to those specific vendors (Jarvenpaa et al., 2000; McKnight et al., 2002).

Product characteristics

Phau and Poon (2000) concluded that products and services that have a low cost, are frequently purchased, intangible, and/or are relatively high on differentiation (that is, for which a vendor is able to create a sustainable competitive advantage through product and service differentiation) are more amenable to be purchased over the internet. Vijayasarathy (2002) also found that a product's tangibility had a significant influence on consumers' intentions toward e-shopping. However, cost and the interaction between cost and tangibility were not significantly associated with consumers' intentions. Further, a product's asset specificity, the lack of transferability of the assets from one retailer to another, is positively associated with transaction costs, which, in turn, have a negative impact on e-shopping intention (Liang and Huang, 1998).

7.3 Online consumer characteristics

Among the two basic actors of product exchange, the retailers' role is apparent in Sections 7.1 and 7.2; here we note that consumers' purchasing behavior is expected to be influenced by their own personal characteristics. Consumers with different characteristics may react to e-shopping in different ways; for example, those unfamiliar with computers and the internet will not think e-shopping is an active alternative. Empirically, previous studies have found that e-shopping behavior is affected by a variety of personal characteristics, such as their shopping orientations, personality, experiences, demographics, and social and psychological characteristics. The impact of these characteristics can either be modeled in linear compensatory form together with the traits discussed in Sections 7.1 and 7.2, or as segmentation variables affecting the weights given to other attributes.

Shopping orientations

Shopping orientations refer to a consumer's general predispositions toward shopping activities. They are conceptualized as specific dimensions of lifestyle and operationalized based on activities, interests and opinions regarding shopping behavior (Li et al., 1999). Various studies have explored the links between consumers' shopping orientations and their intention (or actual choice) to shop online. First, convenience-oriented consumers are more likely to purchase online (e.g., Childers et al., 2001; Bhatnagar et al., 2000). *Convenience* mainly refers to two dimensions of shopping activities: when to shop and where to shop. E-shopping is convenient compared to traditional stores since it is free from temporal and spatial constraints. Further, since e-shopping increases search efficiency and transaction efficiency, *time-conscious* consumers are more likely to buy via the internet (e.g., Sim and Koi, 2002; Sin and Tse, 2002). Consumers who treat e-shopping as an enjoyable or fun activity are also more likely to purchase online (e.g., Goldsmith and Goldsmith, 2002; van der Heijden and Verhagen, 2004). *Enjoyment* indicates the extent to which consumers perceive e-shopping to provide an intrinsic utility.. Moreover, consumers who think e-shopping is compatible with their lifestyle and shopping habits are more likely to engage in e-shopping (e.g., Chen et al., 2002; Verhoef and Langerak, 2001). E-shopping *compatibility* is adapted from innovation diffusion theory, and refers to the degree to which e-shopping is viewed as being consistent with individuals' shopping requirements (Verhoef and Langerak, 2001). *Price-conscious* consumers are more likely to purchase online when e-shopping sites offer a lower price or financial benefits (e.g., Sim and Koi, 2002; Koyuncu and Bhattacharya, 2004). Finally, *brand-oriented* consumers are more likely to purchase online since well-known brands help relieve consumers with respect to perceived risk (Lunn and Suman, 2002; van den Poel and Leunis, 1999)

Personality

Consumers' personality characteristics influence their e-shopping behavior. *Innovativeness* was found to be positively associated with the adoption of e-shopping (e.g., Blake et al. 2003; Donthu and Garcia, 1999; Limayem et al., 2000). Innovativeness refers to "the degree to which an individual is receptive to new ideas" (Chang et al., 2005, p. 553). Similar dimensions of innovativeness include novelty (Huang, 2000), trying something new (Raijas, 2002) and being first to use new technology (Bellman et al., 1999). Some studies further defined domain-specific innovativeness – how innovative a consumer is regarding a product category (e.g., Goldsmith, 2002). Donthu and Garcia (1999) concluded that consumers who are *impulsive* or *variety-seeking*

are more likely to purchase online, and those who tend to minimize risk (*risk aversion*) are less likely to adopt e-shopping. By contrast, consumers who are willing to take risks are more likely to buy online (Sim and Koi, 2002). These results are consistent with the perception that e-shopping is riskier than traditional shopping. Gefen (2000) found that the *disposition to trust* (a general inclination to display faith in humanity and to adopt a trusting stance toward others) is positively related to the adoption of e-shopping. Also, McKnight et al. (2002) found that the willingness to depend on a web vendor has a positive association with the intention to purchase online.

Social and psychological characteristics
Consumers' relevant social and psychological characteristics are mainly derived from psychological theories such as TPB and TAM. Previous findings are consistent with these theories. Favorable attitudes toward e-shopping are positively associated with consumers' e-shopping intention and actual use (e.g., Ahn et al., 2004; O'Cass and Fenech, 2002). In addition, favorable attitudes toward the internet (Grazioli and Jarvenpaa, 2000; Sim and Koi, 2002), toward catalog retailing (Cho, 2004), and toward marketing and advertising (Donthu and Garcia, 1999) were also found to positively affect the adoption of e-shopping. Similarly, favorable behavioral intention to use has positive impacts on the actual usage of e-shopping (e.g., Chen et al. 2002; and Limayem et al., 2000). Favorable intention to use the internet for information gathering was found to positively influence consumers' e-shopping intention (Shim et al., 2001).

Another important social/psychological variable is perceived behavioral control, which refers to an individual's perception of her ability to perform a behavior. Perceived behavioral control was found to have a positive impact on consumers' e-shopping intention and actual use (Limayem et al, 2000; Shim et al., 2001). Similarly, the subjective norm of an individual (that is, perceptions of the feasibility of a behavior as evaluated by referent people) positively influences her intention to purchase online, which, in turn, has a positive effect on the actual choice of e-shopping (Choi and Geistfeld, 2004; Limayem et al., 2000). Blake et al. (2003) found strong evidence that the greater the prevalence of internet shopping among one's social network, the greater one's own frequency of e-shopping.

Computer/internet experience
Consumers' computer/internet experience refers to their knowledge of the computer and the internet, as well as the frequency, duration, length, and nature of their usage (such as working online, checking email, reading online news, and information search). Generally, internet usage is positively associated with the intention to use e-shopping and with actual use (e.g., Bellman et al., 1999; Forsythe and Shi, 2003). Education and information technology training (Liao and Cheung, 2001) and internet knowledge (Goldsmith and Goldsmith, 2002; Li et al., 1999) were also found to positively impact consumers' e-shopping intention and adoption.

In-home shopping experience
In-home shopping refers to shopping activities conducted by mail, telephone, catalog, TV, and internet. In general, consumers' in-home shopping experience increases the likelihood of purchasing online. Specifically, Eastin (2004) found that prior usage of the telephone for product acquisition positively affects consumers' adoption of e-shopping. Similarly, Lunn and Suman (2002) found that previous purchases by mail and phone are

positively associated with purchasing online. And previous purchases from catalogs were found to have positive influences on the spending and adoption of e-shopping (Lohse et al., 2000; Cho, 2004). By contrast, Bellman et al. (1999) found a negative association between ordering by mail from print catalogs and online spending. Their explanation is that regular mail is too slow for those who spend more money online. Kaufman-Scarborough and Lindquist (2002) found that e-shoppers tend to experience more non-store (catalog and TV) shopping activities. Similarly, prior internet shopping experience was found to have a positive association with e-shopping intention and adoption (e.g., Shim et al., 2000; Cho, 2004). However, consumers who experienced negative consequences of e-shopping are less likely to purchase online (Lunn and Suman, 2002).

Socio-demographics

Consumers' socio-demographic characteristics influence their e-shopping behavior. The findings on demographic variables are mixed. For example, Bhatnagar et al. (2000) found that men are more likely to purchase some products (such as hardware, software, and home electronics) online, but less likely to buy others (such as apparel and food) via internet. Generally, however, consumers who are male, higher educated, and have higher incomes are more likely to purchase online. The studies that measured whether consumers owned a credit card found those who did to be more likely to shop online (Sim and Koi, 2002; van Slyke et al., 2002). The speed of the internet connection which consumers used for e-shopping was also found to be positively associated with actual use of e-shopping (e.g., Lunn and Suman, 2002).

7.4 Summary

Previous studies have identified various determinants of consumers' e-shopping behavior. These determinants mainly cover three essential elements: characteristics of e-shopping as a shopping channel, consumer characteristics, and vendor and product characteristics. Among these characteristics, the former two have been examined extensively in previous research, confirming their importance in understanding e-shopping behavior. Also, consumers' e-shopping intention and actual use differ by product types.

It should be kept in mind that only significant influences were summarized here. Although some variables showed consistent effects over some studies, their impacts may be mixed if we consider the insignificant effects in other studies. Interested readers can refer to Chang et al. (2005) for a more detailed discussion on both significant and insignificant variables.

Table 6. Summary of the Effect of Antecedents on the Intention and Usage of Online Shopping

Independent variables	Studies including this variables	Summary of findings
Perceived channel characteristics		
Perceived risk		
Risk perception	[40–43,48,53,55,64,86]	Six studies found a significant negative impact, while other three did not find any
Concern of privacy infringement	[7,55]	Both studies did not find any impact
Concern of system security	[13,55,64,72]	Three studies found a significant negative impact, while the other one did not find any
Fraudulent behavior	[55]	No significant impact was found
Product risk	[8]	Significant negative impact was found
Credit card fault risk	[8]	Significant negative impact was found
Uncertainty	[46]	Significant negative impact was found
Relative advantages		
Utility as communication channel	[45]	Significant positive impact was found
Utility as distribution channel	[45]	Significant positive impact was found
Time saving	[63]	Significant positive impact was found
Convenience	[23,72]	One found a significant positive impact, while the other did not
Easy to order	[63]	No significant impact was found
Can try something new	[63,72]	Significant positive impact was found
Can avoid collecting and transporting product	[63]	No significant impact was found
Product value	[40,50,86]	Significant positive impact was found in all studies
Lower transaction cost	[23,34,46]	One found a significant negative impact, while the others did not
Representative retail price on the e-market	[48]	Significant negative impact was found
Perceived usefulness (TAM)	[14,18,29]	Two found a significant positive impact, while the other did not
Perceived ease of use	[29]	Significant positive impact was found
Perceived consequence	[49]	Significant positive impact was found
Online shopping experience		
Accessibility	[45]	Significant positive impact was found
Level of expertise required	[19]	No significant impact was found
Shopping experience (effort, compatibility, playfulness)	[34,40,50,86]	Two studies found a significant positive impact while the other two did not find any
Aesthetics	[50]	No significant impact was found
Website satisfaction	[92]	Significant positive impact was found
Service quality		
Providing good pre-order information	[86]	No significant impact was found
Providing good post-selection information	[86]	Significant negative impact was found
Reliability	[86]	No significant impact was found
Tangibility	[86]	No significant impact was found
Empathy	[86]	No significant impact was found
Customer service	[13,40,50]	Three studies found a significant positive impact while the other one did not find any
Perceived quality of e-vendors	[48]	Significant positive impact was found
Trust		
Trust (overall)	[9,27,28,29,53,92]	All six studies found a significant positive impact
Ability	[30]	No significant impact was found
Integrity	[30]	Significant positive impact was found
Benevolence	[30]	No significant impact was found
Familiarity	[9,27]	Both studies found a significant positive impact

Reprinted from Chang et al. (2005); the citations to which the numbers above refer can be found therein.

Table 6 (continued)

Independent variables	Studies including this variables	Summary of findings
Consumer characteristics		
Consumer shopping orientations		
Convenience oriented	[21,45,77]	Significant positive impact was found
Recreational oriented	[21,45,77]	One study found a significant positive impact while the other two did not
Price-oriented	[21,45]	No significant impact was found
Experiential oriented	[45]	Significant negative impact was found
Time conscious	[72]	No significant impact was found
Brand conscious	[21]	No significant impact was found
Impulsiveness	[21]	Significant positive impact was found
Demographic variables		
Education level	[13,21,45,72]	Three studies found a significant positive impact and one did not find any
Gender	[10,13,21,34,45,63,72,75]	Three studies found that males purchase more online, while the other did not find any difference
Income level	[13,21,45,50,54,63,72]	Five studies found a significant positive impact, while the other two did not find any impact
Age	[8,10,21,34,45,50,54,63,72]	Three studies found a significant positive impact, while the other three did not find any impact
Social status	[63]	No significant impact was found
Time starvation	[7]	Significant positive impact was found
Access to credit card	[75]	Significant positive impact was found
Race	[34]	No significant impact was found
Employment status	[10]	No significant impact was found
Computer/internet knowledge and usage		
Training on computer	[48]	Significant positive impact was found
Level of internet usage	[8,10,13,19,34,48,72]	Six studies found a significant positive impact, while the other one did not
Channel knowledge	[45]	Significant positive impact was found
"Wired" lifestyle	[7]	Significant positive impact was found
Non-internet in-home shopping experience	[72]	No significant impact was found
Internet purchase experience	[23,30,34,33,70]	Significant positive impact was found in all studies
Website awareness	[92,23]	Significant positive impact was found
Computer experience	[75]	Significant positive impact was found
Email usage	[75]	Significant positive impact was found
Word processing use	[75]	No significant impact was found
Web browser use	[75]	No significant impact was found
Consumer innovativeness		
Domain specific innovativeness	[10,19,32,33]	Significant positive impact was found in all studies
General innovativeness	[19,21,49,72]	Two study found a significant positive impact, while the other did not find any
Psychological variables		
Attitude	[33,36,41,42,49,85]	Significant positive impact was found in all studies
Perceived behavioral control	[49]	Significant positive impact was found
Subjective norm	[10,23,49]	Significant positive impact was found in all studies
Intention	[49]	Significant positive impact was found
Risk aversion	[21]	Significant negative impact was found
Self-confidence	[72]	No significant impact was found
Intention to use the internet for information search	[70]	Significant positive impact was found
Site commitment	[60]	Significant positive impact was found

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Table 6 (continued)

Independent variables	Studies including this variables	Summary of findings
Website and product characteristics		
Risk reduction measures		
Provide money-back guarantee (risk relievers)	[84]	Significant positive impact was found
Offering well-known brand (risk reliever)	[84]	Significant positive impact was found
Selling at reduced price (risk reliever)	[84]	Significant positive impact was found
Security measure	[64]	Significant positive impact was found
Privacy measure	[64]	Significant positive impact was found
Website features		
Information content	[64]	Significant positive impact was found
Website design	[47,64]	Significant positive impact was found in both studies
Product characteristics		
Low cost and frequently purchased vs. high cost and infrequently purchased (product type)	[61,87]	One study found that people are more likely to buy low cost and frequently purchased products, while the other one did not find any relationship
Tangible vs. Intangible (product type)	[61,87]	People are more likely to buy intangible products
Low vs. high differentiation (product type)	[61]	People are more likely to buy highly differentiated products
Asset specificity	[46]	No significant impact was found

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Table 7. Summary of the Findings of the Effect of Antecedents of Attitude toward Online Shopping

Independent variables	Studies including this variables	Summary of findings
Perceived channel characteristics		
Perceived risk		
Risk perception	[40–43,49,85]	Significant negative impact was found in all studies
Perceived advantages		
Product value	[40,86]	Significant positive impact was found in both studies
Perceived consequence	[49]	Significant positive impact was found
Perceived usefulness	[14,85]	One found a significant positive impact while the other did not
Perceived ease of use	[14,85]	Significant positive impact was found in both studies
Online shopping experience		
Shopping experience (effort, compatibility, playfulness)	[40,86]	Significant positive impact was found in both studies
Service quality		
Providing good pre-order information	[86]	Significant positive impact was found
Providing good post-selection information	[86]	No significant impact was found
Reliability	[86]	No significant impact was found
Tangibility	[86]	No significant impact was found
Empathy	[86]	No significant impact was found
Customer service	[40]	No significant impact was found
Trust		
Overall trust	[41–43,85]	Significant positive impact was found in all studies
Consumer characteristics		
Consumer innovativeness		
General innovativeness	[49]	Significant positive impact was found

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Table 8. Summary of the Findings of the Effect of Antecedents of Risk Perception

Independent variables	Studies including this variables	Summary of findings
Perceived channel characteristic		
Overall trust	[41,42,43,85]	Significant negative impact was found in all studies
Individualism	[41]	Significant positive impact was found
Assurance mechanisms (seals, warranties, news clips)	[36]	Significant negative impact was found
Deception	[36]	Significant positive impact was found
Consumer characteristics		
Internet experience	[55]	Significant negative impact was found
Telephone purchase experience	[55]	Significant negative impact was found
Mail order purchase experience	[55]	Significant negative impact was found
Product characteristics		
Tangible vs. intangible	[87]	Perceived higher risk for intangible product

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Table 9. Summary of the Findings of the Effect of Antecedents of Trust

Dependent variables	Independent variables	Studies	Hypotheses	Result
Willingness to depend or trust (overall trust)	Trust (beliefs)	[53]	+ve	Sig.
	Ability	[30]	+ve	Not sig.
		[44]	+ve	Not sig.
	Integrity	[30]	+ve	Sig.
		[44]	+ve	Sig.
	Benevolence	[30]	+ve	Sig.
	Familiarity	[28]	+ve	Sig.
	Structural assurances	[53]	+ve	Sig.
	Third-party recognition	[44]	+ve	Not sig.
		[43]	+ve	Not sig.
	Pervious buying	[30]	+ve	Not sig.
	Disposition to trust	[43]	+ve	Sig.
	Individualism	[41]	+ve	Sig.(--ve)
	Perceived size	[41]	+ve	Not sig.
		[42]	+ve	Sig.
	Perceived reputation	[41]	+ve	Sig.
		[42]	+ve	Sig.
		[53]	+ve	Sig.
	Transaction security	[92]	+ve	Sig.
	Site quality	[53]	+ve	Sig.
	Website properties	[92]	+ve	Sig.
	Navigational functionality	[92]	+ve	Not sig.
Trust (beliefs)	Familiarity	[9]	+ve	Sig.
		[29]	+ve	Not sig.
	Calculative-based trust builder	[29]	+ve	Sig.
	Structural assurances	[29]	+ve	Sig.
		[53]	+ve	Sig.
	Situational normality	[29]	+ve	Sig.
	Perceived ease of use	[29]	+ve	Sig.
	Perceived reputation	[53]	+ve	Sig.
	Trust mechanisms (testi-monials, size reputation)	[36]	+ve	Sig.
	Deception	[36]	--ve	Not sig.
	Site quality	[53]	+ve	Sig.

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Table 10. Summary of the Determinants of Online Shopping Discussed in Popular Press

Independent variables	References
Perceived characteristics of the web as a sale channel	
Privacy	[6,11,57,88,91]
Security	[6,25]
Brand	[25]
Time saving	[57,89]
Convenience	[3,25,80,89,91,93]
Ease of use	[25,62,76,93]
Transaction cost	[6,57,79,89,80]
Price	[3,25,57,89,91]
Accessibility	[3,11,26]
Information provided	[4,57,89,93]
Post-order service	[79]
Service reliability	[91]
Customer service	[4]
Trust	[6,91]
Website and product characteristics	
Well-known brand	[89,91]
Website design	[62,76,79,93]
Reputation	[6]
Consumer characteristics	
Gender	[6,79]
Income	[25,79]
Age	[3]
Credit card usage	[26,57]
Internet purchase experience	[62,79,89]
Use of PC	[89]
Adoption of internet	[25]
Customers' attitude towards technology	[22]

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8. Summary

The rapid growth of e-commerce is imposing profound impacts on modern society. On the supply side, the emergence of e-commerce is greatly changing the operation behavior of some retailers, and is increasing product internationalization due to its geographically unlimited nature. On the demand side, the pervasiveness of e-commerce affects how, where, and when consumers shop, and indirectly influences the way in which we live our lives. However, the development of e-commerce is still in an early stage, and why consumers choose (or do not choose) online purchasing is far from being completely understood. To better evaluate and anticipate those profound impacts of e-commerce, therefore, it is important to further refine our understanding of consumers' e-shopping behavior.

A number of studies have investigated e-shopping behavior, and reviewing them is valuable for further improving our understanding. This report aims to summarize previous e-shopping research in a systematic way. In this review, we are interested primarily in the potential benefits and costs that the internet offers for the business-to-consumer segment of e-commerce in the transaction (purchase) channel. An overview of the 65 empirical studies analyzed in this report is provided in the Appendix.

Most previous studies fall into one or more of several theoretical frameworks, including the theory of reasoned action, the theory of planned behavior, the technology acceptance model, transaction cost theory, innovation diffusion theory, and others. Among them, social psychological theories (the theory of reasoned action, the theory of planned behavior, the technology acceptance model) were widely applied. As shown in the applications of different theories, e-shopping behavior is not a simple decision process, and thus an integration of various theories is necessary to deal with its complexities. We suggest synthesizing these theories through the development of a comprehensive list of benefits and costs, using each of the key constructs of the pertinent theories as a guide to identifying the nature of those benefits and costs.

The dependent variables mainly include e-shopping intention and actual e-shopping behavior (a few studies used attitudes toward e-shopping). E-shopping intention was measured by various dimensions. Among them, the directly-stated intention to purchase online is the most frequently used measure. Although some studies used a unidimensional measure, most adopted a latent construct to assess consumers' e-shopping intentions. Actual e-shopping behavior mainly includes three dimensions: adoption, spending, and frequency. Most studies examined one or more of these three dimensions directly, while a few studies constructed a latent variable to measure actual e-shopping behavior. When both behavioral intention and actual behavior are included in model development, attention should be paid to the time precedence between intention and behavior.

With respect to sampling, a choice-based sampling approach is probably preferable given that online shopping activity accounts for a minor proportion of all consumers, and a far smaller proportion of total retail sales. In previous studies, most chose internet/computer/email users or students as their subjects. Generally, a student sample is a natural choice for some particular products such as books. However, parameter estimates developed from a student sample lack generalizability to a larger population because of its homogeneity. By contrast, a more general sample of internet/computer/email users is more applicable for e-shopping behavior research.

The characteristics of products strongly influence the degree to which they are suitable for selling online. Mixing product categories in e-shopping behavior research tends to yield vague or inconsistent results. It is therefore necessary to explicitly consider product characteristics when exploring consumers' e-shopping behavior. However, relatively little effort has been invested into product classification in the context of e-shopping. Although Nelson's dichotomized system (search and experience goods) and Peterson et al.'s three-dimensional system (cost, tangibility, and differentiability) provide useful guides for product type classification, each has some shortcomings. Therefore, more research should focus on the construction of product classification systems.

Different methodologies have been applied in previous research. Generally, descriptive analysis is used to describe consumers' e-shopping behavior; correlational analysis goes beyond descriptive analysis and attempts to analyze how two variables are related; and multivariate analysis is mainly used to explain consumers' behavior using many variables considered together. Therefore, although descriptive and correlational analyses are important steps in helping to construct multivariate analyses, multivariate studies provide more information than these other two types of analyses. Multivariate analysis is ideal to study e-shopping behavior in depth. Among multivariate analysis techniques, multiple regression, structural equations modeling, and discrete choice models were most frequently used.

Previous studies have identified various determinants of consumers' e-shopping behavior. These determinants mainly cover three essential elements: characteristics of e-shopping as a shopping channel, consumer characteristics, and vendor and product characteristics. Among these characteristics, the former two have been examined extensively in previous research, confirming their importance in understanding e-shopping behavior. Specifically, the dimensions of channel characteristics of e-shopping include e-shopping service quality, relative advantages, perceived risk of and confidence in e-shopping, and trust. Consumer characteristics include their shopping orientations, personality, social and psychological characteristics, computer/internet experience, in-home shopping experience, and socio-demographics.

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Appendix: Overview of Previous Research on E-shopping Intention and Adoption

Reference	Sample (survey type, year)	Method (Theory)	Dependent Variables	Significant Explanatory Variables (0: insignificant; 1: not tested)	Note
Ahn et al. (2004)	932 internet users in Korea (internet, 2003)	SEM (TAM)	E-shopping intention	Attitude toward using e-shopping (+) Perceived usefulness (+) Perceived ease of use (+, indirect) System quality (+, indirect) Information quality (+, indirect) Service quality (+, indirect) Product quality and delivery service (+, indirect)	Provides question wording
Belanger et al. (2002)	140 students in a US southeastern university (paper)	Regression (none)	E-shopping intention	Importance of privacy and security features (-) Site quality (+)	Provides question wording
Bellman et al. (1999)	10,180 internet users of Wharton Virtual Test Market (internet)	Logistic regression and regression (none)	E-shopping adoption and annual online spending	Looking at product information (+, +) Months online (+, 0) Number of daily emails (+, +) Working online at work every week (+, 0) Reading news online at home every week (+, 0) Total household working hours (+, 0) Clicking on banners (+, 0) Agreeing internet improves productivity (+, +) Ordering from catalogs using the internet (0, +) Using internet at office regularly for work (0, +) Ordering from catalogs (0, +) Like being first to use new technologies (0, +) Number of years online (0, +) Hours per week online (0, +) Not ordering by mail (0, +)	Similar results in Lohse et al. (2000) except Male (+, +) HH income (0, +)
Bhatnagar et al. (2000)	Internet users surveyed by Georgia Institute of Technology (GIT), Graphics, Visualization, and Usability (GVU) Center (internet, 1997)	Binary logit model (none)	E-shopping adoption for 17 product categories	Convenience (+ or -) Financial risk (- or 0) Age (+ or -) Years using internet (+ or 0) Male (+, -, or 0) Married (+ or 0) Age * financial risk (+ or 0) Access point * financial risk (+, -, or 0) Years using internet * financial risk (+ or 0) Male * financial risk (+ or 0) Married * financial risk (- or 0)	A variable may impact the adoption differently for different categories. Provides question wording

Blake et al. (2003)	208 US midwestern internet users (paper, 2001)	Regression (none)	E-shopping frequency, total purchase variety, popular purchase variety, and unpopular purchase variety	Age 41-50 (0, 0, 0, +) Age 51+ (+, 0, +, 0) Gender (0, -, 0, -) Network prevalence (+, +, 0, +) Using internet for education (0, +, +, 0) Internet usage frequency (0, 0, 0, +) Innovativeness (+, +, +, +)	
Chen et al. (2002)	253 email users in the US (internet)	SEM (TAM and IDT)	E-shopping usage	Behavioral intention to use e-shopping (+) Attitude toward using e-shopping (+, indirect) Compatibility (+, indirect) Perceived usefulness (+, indirect) Perceived ease of use (+, indirect)	Provides question wording
Chen and Tan (2004)	253 email users in the US (internet)	SEM (TAM and IDT)	E-shopping intention	Attitude toward using e-shopping (+) Perceived usefulness (+) Perceived trust (+, indirect) Compatibility (+, indirect) Perceived ease of use (+, indirect) Perceived service quality (+, indirect) Product offerings (+, indirect) Usability of storefront (+, indirect)	
Childers et al. (2001)	Study 1: 274 students in a large US midwestern university, (paper) Study 2: 266 computer users in the US (paper)	SEM (TAM)	Attitude toward e-shopping	Perceived usefulness (+, +) Perceived ease of use (+, +) Enjoyment (+, +) Navigation (+ indirect, + indirect) Convenience (+ indirect, + indirect) Substitutability of personal examination (+ indirect, + indirect)	Provides question wording
Cho (2004)	294 internet users in the US (paper)	SEM (TRA)	Aborting an online transaction	Lack of physical examination (+) Purchasing experience from internet (-) Frequency of purchasing from catalogs (-) Concerns over delivery and return (+) Attitude toward e-shopping (-) Product offering (-, indirect) Control in information search (-, indirect) Attitude toward catalog retailing (-, indirect) Effort saving (-, indirect) Time spent on internet per visit (-, indirect)	Provides question wording
Choi and Geistfeld (2004)	Study 1: 386 students in a Korea university (paper)	SEM (TPB)	E-shopping intention	Perceived risk (-, -) Perceived self-efficacy (+, +) Subjective norm (+, +)	

	Study 2: 369 students in a US midwestern university (paper)			Individualism-collectivism (+ indirect, + indirect) Uncertainty avoidance (- indirect, + indirect)	
Corbitt et al. (2003)	80 students in New Zealand (internet)	Correlation analysis (none)	E-shopping usage	Trust (+) Web experience (+)	Provides question wording
Donthu and Garcia (1999)	790 internet users in a US large city (telephone)	t-test and chi-square test (none)	E-shopping adoption	Age (+) Income (+) Importance of convenience (+) Innovativeness (+) Risk aversion (-) Impulsiveness (+) Variety-seeking propensity (+) Attitude toward direct marketing (+) Attitude toward advertising (+)	Provides question wording
Eastin (2002)	274 email users in the US (internet, 1999)	Regression (IDT)	E-shopping adoption	Prior use of telephone for the same activity (+) Self-efficacy (+) Perceived convenience (+) Perceived financial benefits (+)	
Forsythe and Shi (2003)	641 internet users surveyed by the GIT GVU center (internet, 1998)	Regression (none)	Amount spent online in the last 6 months, frequency of searching with intention to buy, and e-shopping frequency	Heavy internet shoppers (+, +, +) Product performance risk (0, 0, -) Financial risk (-, -, -) Time/convenience risk (0, -, -) Age (+, 0, 0) Household income (0, +, +) Online experience (0, 0, +)	Provides question wording
Foucault and Scheufele (2002)	156 students in a large US northeastern university (paper)	Chi-square test (social influence theory, social leaning theory, use and gratifications theory)	Textbook online purchasing adoption, frequency of previous online textbook purchase, and likelihood for future online textbook purchase	Adoption: Men (+) Frequency and likelihood: Frequent previous online purchase (+, +) Sufficient time to purchase textbook online allowed by professor (+, 1) Professor's suggestion (+, 1) Ability to name online textbook retailers (+, +) Perception that customer service is better online (+, +) Frequent online textbook purchase by friends (1, +) Frequent discussion of online textbook purchasing (1, +) Perception that e-shopping is less hassled (1, +)	Provides question wording Textbooks
Gefen (2000)	217 students in the	SEM (none)	Intended purchase	Trust (+, +)	Provides

	mid-Atlantic region, USA (paper)		and intended inquiry	Familiarity (+, +) Disposition to trust (+ indirect, + indirect)	question wording Books
Gefen and Straub (2000)	202 students in the mid-Atlantic region, USA	Regression (TAM)	Intended purchase and intended inquiry	Perceived usefulness (+, +) Perceived ease of use (+ indirect, +)	Provides question wording Textbooks
Gefen and Straub (2004)	Study 1: 226 students in the mid-Atlantic region, USA Study 2: 171 other students	SEM (none)	E-shopping intention	Integrity (+, +) Predictability (+, +) Familiarity (+, +) Trusting disposition (+ indirect, + indirect) Social presence (1, +)	Provides question wording Books
Goldsmith (2002)	107 students in a large US southeastern university (paper)	SEM (none)	Future likelihood of buying online	Current online buying (+) Internet innovativeness (+) Internet involvement (+) Global innovativeness (+, indirect)	Provides question wording
Goldsmith and Goldsmith (2002)	566 students in a large US southern university (paper, 2000)	MANOVA (none)	E-shopping adoption	Composite e-shopping frequency (+) Fun (+) Safe (+) Quick (+) Confident (+) Internet knowledge (+) Internet innovativeness (+)	Provides question wording Apparel
Grazioli and Jarvenpaa (2000)	80 students at a major US university (internet)	Logistic and linear regression (Social exchange theory)	Actual online purchase and willingness to buy	Attitude toward e-store (+, +) Attitude toward web (0, +) Trust (+ indirect, (+ indirect) Risk (- indirect, - indirect) Risk by high trust (+ indirect, + indirect) Attitude toward web safety (+ indirect, + indirect) Assurance mechanism (+ indirect, + indirect) Deception (- indirect, - indirect) Assurance by high deception (+ indirect, + indirect) Trust-building mechanism (+ indirect, + indirect)	Provides question wording Used laptop
Hansen et al. (2004)	Study 1: 1,222 Danish internet users Study 2: 1,038 Swedish internet users (internet, 2002)	SEM (TRA & TPB)	E-shopping intention	Subjective norms (+, +) Attitudes (+, +) Perceived behavioral control (0, +)	Grocery
Henderson and Divett	247 individuals in Auckland, New	Regression (TAM)	The number of log-ons, the	Perceived usefulness (+, +, +) Perceived ease of use ((0, +, +)	A model for every month,

(2003)	Zealand		number of grocery deliveries, and purchase amount		over 7 months Grocery
Hoffman et al. (1999)	1,555 US internet users (from 1997 CommerceNet/Nielsen Internet Demographic Survey) and 14,014 internet users (from GIT, GUV Center)	Descriptive (none)	Likelihood of buying on the Web and reasons for not shopping online	Likelihood of buying on the Web: Not safe to give credit number over Web (-, 64% of users) Web sties will sell my name (-, 60%) Not all Web sites are legitimate (-, 37%) Will not get what I ordered (-, 19%) Reasons for not shopping online: Do not trust security (38% of non-buyers) Privacy (11%)	Importance rating
Huang (2000)	115 internet users in Taiwan (paper)	SEM (none)	Desire to shop online	Desire to explore (+) Complexity (-, indirect) Novelty (+, indirect)	
Jarvenpaa et al. (2000)	184 students in Australia	SEM (none)	Willingness to buy online	Attitude (+) Perceived risk (-) Trust in store (+, indirect) Perceived reputation (+, indirect) Perceived size (+, indirect)	Provides question wording Books and travel
Kaufman-Scarborough and Lindquist (2002)	257 internet users	MANOVA (none)	Web non-shopper E-browser E-shopper	Non-store (catalog and TV) browsing (+) Non-store (catalog and TV) shopping (+) Non-store convenience (+)	
Kim et al (2000)	306 internet users (from GIT GVU Center, 1998)	SEM (none)	E-shopping behavior	Income (+) Time-oriented lifestyle (+) Net-oriented lifestyle (+)	Provides question wording
Koufaris (2002)	280 online customers (internet)	Logistic and linear regression (TAM and flow theory)	Unplanned purchase and intention to return	Shopping enjoyment (0, +) Perceived usefulness (0, +) Involvement (0, + indirect) Challenges (0, + indirect) Skills (0, + indirect) Value-added information (0, + indirect)	Provides question wording
Koyuncu and Bhattacharya (2004)	1,842 internet users in the US (from GIT GVU Center, 1998)	Binomial logistic and multinomial logistic models (none)	E-shopping adoption and e-shopping frequency	Income (+, +) Education (+, +) Male (+, +) Experience (+, +) Quickness (+, +) Better price (+, +)	Provides question wording

				Payment risk (-, -)	
				Longer delivery (-, -)	
Lee (2002)	424 university students (paper and internet)	Descriptive (none)	E-shopping intention	Short delivery time (74% saying important) Convenience (80%) After-sale service (79%) Protection of personal information (91%) Money back guarantee (80%) Warranty (86%) Advertisement through TV, radio, print (40%) Online advertisement (21%) Stolen credit card (52% saying risky) Transacting with fake company (38%) Inaccurate billing (26%) Receiving wrong items (24%) Ranking of web features: Good product description Company background information Speed of website Currency of data Ease of navigation	
Li et al. (1999)	999 email users (internet)	ANOVA, chi-square test, and regression (channel theory)	E-shopping frequency	Male (+) Income (+) Education (+) Convenience (+) Experience (-) Channel knowledge (+) Communication (+) Distribution (+) Accessibility (+)	
Liang and Huang (1998)	86 internet users in Taiwan (paper)	SEM (TCT)	Acceptance of e-shopping for experienced and inexperienced shoppers	Transaction cost (-, -) Uncertainty (-, - indirect) Asset specificity (0, +)	Provides question wording
Liang and Lai (2002)	30 students in Taiwan (paper)	ANOVA (none)	Online purchase, revisit, and purchase again	Better store design (+, +, +)	Provides question wording
Liao and Cheung	312 internet users in Singapore	Regression (none)	Willingness to e-shop	Perceived risks on transaction security (-) Education and IT training (+)	

				Price (-)	
(2001)				Price (-) Perceived relative life content of e-shopping (-) Perceived quality of e-vendors (+) Level of internet usage (+)	
Lim (2003)	16 individuals in Queensland, Australia (interview, 2001)	Focus group (theory of perceived risk)	Decision to purchase online	Perceived technology risk (-) Perceived vendor risk (-) Perceived product risk (-) Perceived consumer risk (0)	
Limayem et al. (2000)	705 email users from four internet–based directories (internet)	SEM (TPB)	E-shopping frequency	Intention to use e-shopping (+) Behavioral control (+) Subjective norm (+, indirect) Personal innovativeness (+, indirect) Attitude toward e-shopping (+, indirect) Perceived consequences (+, indirect)	Provides question wording
Liu et al. (2004)	212 students in a large US midwestern university (internet)	SEM (none)	E-shopping intention	Trust (+) Privacy (+, indirect)	Provides question wording Textbooks
Liu and Wei (2003)	308 university students	SEM (TAM)	E-shopping intention	Perceived usefulness (+) Perceived risk (-)	Books
Lunn and Suman (2002)	1,173 internet users in the US (interview, 2001)	Regression and discriminant analysis (none)	E-shopping frequency and e-shopping amount	Previous purchase by mail and phone (+, +) Negative consequences of shopping internet (-, -) Internet access experience (+, +) Privacy/security concerns (-, -) Income (+, +) High-speed internet (+, +) Availability of good and services (+, 0) Male (+,+) Internet prices lower (+, 0) More likely buy brand products on internet (+, 0)	Provides question wording
Mathwick et al. (2001)	302 catalog and 213 internet customers of a direct retailer of women's apparel and housewares	SEM (experiential value)	Separate models of internet shopping preference and intent, and catalog shopping and intent (with respect to the vendor in question)	Customer Return On Investment (+) (economic value and efficiency)	
McKnight et al. (2002)	1,403 students in three large US universities	SEM (none)	Intention to purchase from site	Perceived web risk (-) Trust beliefs in web vendor (+)	Provides question

				Willingness to depend on web vendor (+)	wording
(paper)			(service)	Perceived vendor reputation (+, indirect)	
				Perceived site quality (+, indirect)	
				Structural assurance of the web (-, indirect)	
Miyazaki and Fernandez (2001)	160 internet users in a large US city (paper)	Regression and t test (none)	E-shopping frequency	Web usage rate (+) Perceived risk (-) Perceived security concerns (-) Adoption of mail-order shopping (+)	
O'Cass and Fenech (2003)	392 email users in Australia (internet)	SEM (TAM)	E-shopping adoption	Attitude toward web retail (+) Opinion leadership and impulsiveness (+, indirect) Web experience (+, indirect) Perceived usefulness (+, indirect) Perceived ease of use (+, indirect)	Provides question wording
Phau and Poon (2000)	183 email users (internet)	Discriminant analysis (none)	E-shopping intention for 20 product and service categories	Products and services having low outlay (+) Having intangible value (+) Having high differentiation (+)	
Raijas (2002)	91 online purchasers and 155 store purchasers in Helsinki, Finland (paper and interview, 1999)	Descriptive (none)	E-shopping adoption	Avoidance of product picking and delivery (+) Time saving (+) Easiness to order (+) Trying something new (+) Products are difficult to find (-) Higher price (-) Product quality cannot be verified (-) Little product information (-)	Important rating
Ranganathan and Ganapathy (2002)	213 online purchasers in Illinois, USA	Discriminant analysis (none)	E-shopping intention	Information content (+) Web design (+) Security (-) Privacy (-)	Provides question wording
Shang et al. (2005)	478 email users and 650 students in three universities in Taiwan (internet and paper)	SEM and logistic regression (TAM)	E-shopping intensity and adoption	Perceived ease of use (+, +) Fashion involvement (+, +) Cognitive absorption (+ indirect, +) Income (1, +) Frequency of using internet (1, +) Online experience (1, +)	Provides question wording
Shih (2004)	212 employees in Taiwan (paper)	Regression (TAM)	Acceptance of online physical products, online digital products, and online services	Attitudes (+, +, +) User satisfaction (0, +, +) Perceived information quality (+, +, 0) Perceived system quality (0, +, 0) Perceived service quality (-, -, 0)	Provides question wording

				Access costs (0, 0, -)	
Shim et al. (2001)	684 computer users in 15 US metropolitan areas	SEM (TPB)	E-shopping intention	Intention to use web for information search (+) Attitudes (+) Internet purchase experience (+) Perceived behavioral control (+, indirect)	
Sim and Koi (2002)	175 individuals in Singapore (paper)	t-test and chi-square test (none)	E-shopping adoption	Time consciousness (+) Positive attitude toward internet (+) Risk taking (+) Price consciousness (+) Household income (+) Credit card owner (+)	Provides question wording
Sin and Tse (2002)	400 internet users in Hong Kong (interview, 2000)	t-test, chi-square test, and discriminant analysis (none)	E-shopping adoption	Male (+) Age (26-30, +) Family income (+) Personal income (+) Education (+) Time consciousness (+) Security and reliability (+) Convenience (+) Product variety (+) Internet usage rate (+) In-home shopping experience (+)	Provides question wording
Srinivasan et al. (2002)	1,211 online consumers (internet)	Seemingly unrelated regression (none)	Search, word of mouth promotion, and willingness to pay more	e-loyalty (-, +, +) Through e-loyalty: Customization ability (-, +, +) Contact interactivity (-, +, +) Cultivation (providing information and incentives) (-, +, +) Customer care (-, +, +) Community (opinion and information exchange) (-, +, +) Choice (product and category variety) (-, +, +) Character (building reputation) (-, +, +)	Provides question wording
Swaminathan et al. (1999)	428 internet users (from GIT, GVU Center,1998)	Regression (theory of exchange)	E-shopping frequency and amount	Vendor characteristics (+, 0) Security of transactions (-, 0) Concern for privacy (0, -) Privacy laws (0, +) Social interaction (+, +) Convenience (+, +)	
Teo and Yeong (2003)	1,133 internet and email users in	SEM (none)	Willingness to buy online	Overall deal evaluation (+) Perceived benefits of search (+, indirect)	Provides question

				Perceived risk (-, indirect)	wording
Teo and Yu (2005)	1,171 internet and email users in Singapore (internet)	SEM (TCT)	Willingness to buy online	Transaction cost (-) Performance uncertainty (-, indirect) Behavioral uncertainty (-, indirect) Environmental uncertainty (-, indirect) Dependability (+, indirect) Online buying frequency (+, indirect)	Provides question wording
Van den Poel and Buckinx (2005)	1,382 observations (unknown number of internet users) (recorded by system, 2001-2002)	Binary logit model (none)	E-shopping adoption during the next visit	Number of days since last visit (+) Squared number of days since last visit (-) The average time per click in the session is lower than the average (-) Number of personal pages viewed during the last visit (-) Total number of products viewed (-) Male (+) Trust (+) Total number of purchases ever made at the site (+) Number of days between the visit and the last purchase (-)	Provides question wording
Van den Poel and Leunis (1999)	93 email users in Belgium (internet)	ANOVA and t test (none)	Likelihood of e-shopping	Heavy internet users (+) Price reduction (+) Well-known brand (+) Money-back guarantee (+)	
Van der Heijden and Verhagen (2004)	312 students in Vrije Universiteit, Netherlands	Regression (none)	E-shopping intention	Attitude toward online purchasing (+) Online store usefulness (+, indirect) Enjoyment (+, indirect) Familiarity and settlement (+, indirect) Performance (+, indirect)	Provides question wording
Van der Heijden et al. (2003)	228 students in a Dutch academic institution	SEM (TAM)	E-shopping intention	Attitude toward online purchasing (+) Trust in online store (+, indirect) Perceived risk (-, indirect) Perceived ease of use (+, indirect)	Provides question wording
Van Slyke et al. (2002)	511 individuals	Regression (none)	E-shopping intention	Male (+) Computer use (+) Email use (+) Prior web use (+) Access to credit card (+)	
Verhoef and Langerak (2001)	415 individuals in a medium-sized Dutch town (paper)	SEM (TRA)	E-shopping intention	Relative advantage (+) Compatibility (+) Complexity (-) Time pressure (+, indirect) Physical effort in store shopping (+, indirect)	Provides question wording

Vijayasarathy (2002)	767 individuals in a US upper midwestern city (paper)	Chi-square test, ANCOVA, and MANCOVA (TRA)	E-shopping intention	Tangibility (+) Prior experience (+)	Provides question wording
Vijayasarathy and Jones (2000)	201 students at a small US midwestern university (paper)	Regression (none)	Attitudes toward e-shopping and e-shopping intention	Product value (+, +) E-shopping experience (+, +) Pre-order information (+, 0) Post-selection information (0, +) Consumer risk (+, +)	
Yoon (2002)	122 students at a university in Seoul, Korea (paper)	Regression (none)	E-shopping intention	Web-site awareness (+) Web-site trust (+) Web-site satisfaction (+) Transaction security (+, indirect) Site properties (+, indirect) Navigation functionality (+, indirect) Personal variables (+, indirect)	Provides question wording

Notes: TAM-Technology Acceptance Model; TRA-Theory of Reasoned Action; TPB-Theory of Planned Behavior; TCT- Transaction Cost Theory;

IDT-Innovation Diffusion Theory; None-No explicit theory used; SEM-Structural Equation Model (including partial least squares and path analysis).