National culture and global diffusion of business-to-consumer e-commerce

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Abstract
Purpose – The purpose of this study is to investigate the effects of national culture on the diffusion process of business-to-consumer (B2C) e-commerce using Hall's cultural classifications and Hofstede's multicultural framework.
Design/methodology/approach – Time-series secondary data across 58 countries were utilized and independent samples t-test and nonparametric correlation analyses were conducted to test the proposed hypotheses.
Findings – Results of the study suggest that high-context and polychronic cultures are more conducive to the adoption and diffusion of internet retailing. An unexpected finding is evidence of the significant positive impact of uncertainty avoidance on B2C e-commerce adoption.
Practical implications – Based on the empirical findings of the study, managerial implications are derived. These insights may help global internet marketers predict B2C e-commerce adoption and diffusion across countries and formulate more effective online marketing and communication strategies by accommodating for cultural influences during the diffusion process. Limitations and directions for future research are also discussed.
Originality/value – This study is among the few large-scale empirical studies attempting to establish the importance of understanding cultural influences on consumers’ online purchasing behavior across countries.
Keywords National cultures, Culture, Electronic commerce, Consumer behaviour
Paper type Research paper

Introduction
The worldwide internet population exceeded one billion in 2006 (www.internetworldstats.com, 2007). The internet has experienced phenomenal growth in the US and is now dramatically increasing in use around the world, especially in Asia. With millions of products now being available online, consumers worldwide are showing growing interest in new varieties besides the traditional good sellers on the internet such as books or digital products. No doubt, more users and their rising interest in buying online mean more potential e-commerce transactions for global internet marketers. As the origin of online shoppers becomes progressively global and represents a growing multicultural community (Cyr et al., 2005), understanding what will influence consumers across different countries in the electronic marketplace is a central imperative. International consumer research in a cross-cultural context is necessary to better evaluate global online consumer purchase behavior (e.g. Javenpaa and Tractinsky, 1999; Gefen and Heart, 2006; Park and Jun, 2003).

In spite of the global booming of e-commerce (Doolin et al., 2005), growth has not occurred at the same pace in all nations. For example, even within Western Europe, adoption rates are different. Compared to 63.6 per cent of French internet users who are online buyers, 77 per cent of UK internet users have made online purchases (eMarketer.com, 2006). As such, global internet marketers need to appreciate why people in a particular country may be more receptive and willing to purchase online.
than people in other countries. Even more critical is the need to understand the factors that might account for these differences in consumer adoption of online purchasing across countries.

There is a growing body of literature examining consumer online behavior. Earlier research sought to develop profiles of internet buyers and identify predictors of consumers’ intention and adoption of online purchase. Synthesizing studies in this area from 1994 to 2002, Cheung et al. (2005) provided a critical and comprehensive review of the theories and empirical results of consumer online behavior. Recently, research in consumer site commitment, online shopping satisfaction and e-loyalty (online repurchasing) has become more prominent due to the increasing competitiveness in the digital economy (e.g. Ha, 2006; Li et al., 2006; Massad et al., 2006; Park and Kim, 2006).

While theory of planned behavior (TPB), theory of reasoned action (TRA), and technology acceptance model (TAM) are the dominant theories in the examination of consumer online behavior and the constructs of these theories such as attitude, subjective norms, and perceived behavioral control have received extensive investigation, as revealed by Cheung et al.’s study (2005), many other important factors related to consumer characteristics (e.g. value and lifestyle), medium characteristics (e.g. network availability and externalities) and environmental influences (e.g. culture and reference group) have been ignored. In addition, existing research efforts have been primarily based on Western contexts and little is known about non-Western societies.

Culture has long been recognized as an important factor shaping consumer behavior. On a macro level, studies have shown that different cultures react differently to new product and technological innovations (e.g. Dwyer et al., 2005; Gatignon et al. 1989; Kumar and Krishnan, 2002; La Ferle et al., 2002; Mahajan and Muller, 1994; Maitland and Bauer, 2001; Takada and Jain, 1991; Tellefsen and Takada, 1999; Tellis et al., 2003; van Everdingen and Waarts, 2003; Yeniyurt and Townsend, 2003). Thus, it is not uncommon for a new product or technological innovation to gain rapid acceptance in particular countries but take a substantially longer time to penetrate in others.

E-commerce, as a global transaction system that relies heavily on information and communications technology (ICT), must fall under multi-cultural scrutiny as with other ICT innovations (Sagi et al., 2004). However, despite an increasing number of studies focusing on examining the role of national culture in the adoption and diffusion of the internet and other ICT in a global setting, very few have looked at the effects of national culture on the diffusion of e-commerce across countries. The present study intends to address this gap in the extant literature by focusing on business-to-consumer (B2C) e-commerce, i.e., internet retailing[1]. The diffusion of innovations theory, Hall’s (1976) high vs. low context and polychronic vs. monochronic classifications are used to examine the effects of national culture on the adoption and diffusion of consumer online purchasing. Hall’s focus on communication in his cultural model is considered particularly relevant since e-tailing exchanges/transactions take place in the context of Web communication. This study intends to investigate how different national characteristics of the countries are reflected in the B2C e-commerce diffusion process.

In addition, the national culture framework of Hofstede (2001) is also used to help explain variations in B2C e-commerce diffusion across countries. Specifically, the dimension of uncertainty avoidance will be examined not only because it is easy to interpret in the context of e-tailing but also because the existing literature shows that individual characteristics such as perceived risk and trust are among the most
important determinants of consumers’ intention and adoption of purchasing online (Cheung et al., 2005). Time-series secondary data (1999-2006) across 58 countries from Euromonitor International (2007) are used to test the proposed hypotheses.

In the following sections, I first elaborate on the theoretical background upon which the research hypotheses are formulated. Then the research design and analytical methods are offered along with the empirical findings. The paper concludes with a discussion and implications from the results as well as the limitations and directions for future research.

**Literature review and hypotheses development**

*The internet and web-based communications*

Because of its multimedia capability, interactivity and user-friendly interface (Cho et al., 2001), the internet is used by people for many different purposes, such as for e-mail and other means of communication, for education and scientific research, as well as for business and leisure (De Mooij, 2000). Essentially, the internet facilitates information sharing. In terms of fulfilling users’ communication needs, the internet represents a merger of opportunities for interpersonal, group, organizational, and mass communication (Jeffres and Atkin, 1996). It acts as a great equalizer since everyone's voice can be heard in the cyberspace, regardless of one's size (Gong et al., 2007). The inherent global nature and the versatility of the communications enabled by the internet make it a perfect channel for firms to market and sell products and services to individual consumers internationally (Park and Jun, 2003).

It has been widely recognized in cross-cultural research that people derive different meaning and often key information from the contextual aspects of the interaction (Hall, 1976). As the internet and the Web have become increasingly ingrained in today's culture, a considerable amount of cultural transmission is accomplished with the assistance of technology on the Web nowadays (Lee and Choi, 2006). However, little is known regarding how cultural traits affect communication processes in the context of computer-mediated communication across nations (Stewart et al., 2001). This behooves us to inspect closely the relationship between people’s online behavior and their cultural orientations in a technology driven age.

*Adoption of technological innovations*

Diffusion of innovations (DOI) theory explains how adoption takes place over time within a social system (Rogers, 1983). A normal distribution is specified based on the timing of adoption, and five types of adopters are classified: innovators; early adopters; early majority; late majority; and laggards. According to this categorization, innovators are individuals whose initial purchase is not influenced by the number of previous buyers. They represent a very small segment and play a rather limited role in the diffusion process. In contrast, imitators who are influenced by the earlier adopters play a major role in the diffusion process and constitute a substantially larger segment. According to Rogers (1983), the adoption rate of an innovation is influenced by: characteristics of the innovation itself; the communication channels through which the benefits of the innovation are communicated; the time elapsed since the introduction of the innovation; and the social system in which the innovation is to diffuse.

As a theory of communications, the main focus of DOI theory is on the communication channels, which consist of both mass media and interpersonal communications (mainly word of mouth) (Mahajan et al., 1990). Members of a social system have different tendencies for relying on mass media or interpersonal channels
when seeking information about an innovation. Interpersonal communications, including nonverbal observations, are important in influencing the diffusion process (Mahajan et al., 1990). Based on DOI theory, diffusion analyses can be conducted at both the individual level (such as measuring adopters’ perceptions of an innovation’s characteristics) or the system level (such as those describing the nature of a social system). These factors can be used to compare the adoption rates of different innovations as well as the relative extent to which an innovation is adopted within communities, countries, or other social units of different economic, demographic and cultural characteristics. Culture can play an implicit or explicit role in either of these types of comparisons (Maitland and Bauer, 2001).

Culture and consumer behavior
Culture, as one of the most abstract constructs affecting human behavior, has been described and defined in many ways. One may conceive of culture in terms of its parts and components (Baligh, 1994). Social and economic systems, family, religion, education, language and communication, and technology are commonly listed parts within a culture (Chanlat and Bedard, 1991; Culpan, 1991; Ferraro, 1990; Hall and Hall, 1987, 1990). To an individual consumer, these macro-environmental influences determine the overall context, or the "objective reality," in which he or she makes a purchasing decision. Internalized beliefs, values, logic and decision rules are basic components of a culture and constitute the "subjective reality" of an individual consumer. Stemmed from these basic components, people’s economic behavior is not directionless but instead reflective of the culture in which it is embedded (Baligh, 1994). As such, culture can be seen as an underlying framework, consisting of the objective reality as manifested in societal institutions and the subjective reality that comprises socialized predispositions and beliefs that guide individuals' perceptions of observed events and personal interactions, and the selection of appropriate responses in social situations (Johansson, 1997, p. 68).

Although culture is abstract, it does have definite characteristics (Strauss and Quinn, 1992; Rohner, 1984). First, it is shared across members of a society. It is this sharing that distinguishes cultural phenomena from individual phenomena (McCort and Malhotra, 1993). Culture is reflected in people's general tendencies and/or preferences for particular states of affairs, specific social process, and general rules for selective attention, interpretation of environmental cues, and responses (Tse et al., 1988). Second, culture is a learned phenomenon. It is manifested in learned behavior acquired through socialization (Hofstede and Bond, 1988; Ward et al., 1987). Humans learn norms through imitation or by observing the process of reward and punishment in a society of members who adhere to or deviate from the group's norms (Engel et al., 1995, p. 613). In this sense, culture is observable and amenable to empirical description.

Meanings, values, ideas and beliefs of a social group are expressed through various cultural artifacts, such as products, information and communication technologies (Hasan and Ditsa, 1999). Douglas and Isherwood (1979) posit that people from different cultures use products as a means of communication. According to McCracken (1986), in a consumer society, cultural meaning moves from the culturally constituted world (the original location of cultural meaning) to consumer goods (carrying and communicating cultural meaning) and then from these goods to the individual consumer. The nature of cultural influence can be seen as a circular process from which meaning is created, maintained and transmitted within a society (McCort and Malhotra, 1993).
National culture and cross-national e-commerce diffusion

This study builds on two well-known theories on national culture: the cultural classification by Hall (1976) and Hofstede’s cultural framework (2001). Both are discussed below and hypotheses are formulated linking these cultural classifications to the diffusion of B2C e-commerce.

Hall’s high- vs low-context cultures. In Hall’s approach, culture is seen as a unidimensional construct in which countries are grouped into high or low context category (Appendix 1). He observes that “meaning and context are inextricably bound up with each other” (Hall, 2000, p. 36) and suggests that, to understand communication, one should look at meaning and context together with the code (i.e. the words themselves). Context is defined in terms of how individuals and their society seek information and knowledge. In high context cultures (e.g. Japan, China), people try to become well informed about the facts associated with a decision or a deal by obtaining information from personal information networks. In contrast, people from low-context cultures (e.g. U.S., Canada) seek information about decisions and deals from a research base and much emphasis is placed on the use of reports, databases, and the internet (Morden, 1999). The distinction is the relative importance of non-verbal vs. verbal communication in a culture and the importance of situational/contextual cues in determining meanings. In high context cultures, nonverbal and contextual cues are important in the interpretation of a message. In other words, verbal message may have little meaning without the surrounding context, which includes physical aspects, time and situation in which the communication takes place, and the overall relationship between all the people engaged in the communication. On the contrary, in low context cultures, information is explicitly expressed in the words that have precise and literal meanings, that is, the message itself means everything (Czinkota and Ronkainen, 1998; Johansson, 2003). Furthermore, key to interpersonal and communication behavior, high-context cultures seek subtlety, patience and empathy, while low-context cultures value straight talk, assertiveness and honesty (Stewart et al., 2001). Hall (1976) explains that high-context cultures value collective needs and goals and create “us-them” categories, while low-context cultures value individual needs and goals and believe that every individual is unique. As such, Hofstede (2001, p. 212) states, “High context communication fits the collectivist society, and low-context communication is typical of individual cultures.”

As mentioned earlier, the adoption and diffusion of an innovation is highly dependent on the communication channel and process within a social system (Rogers, 1983). Rogers (1983) describes two types of social systems – a homophilous social system and a heterophilous social system, and puts forth a fundamental principle of human communication by stating that the transfer of ideas occurs most frequently between individuals who are alike, or homophilous. In other words, communication between individuals sharing common meanings, beliefs, and mutual understandings is more likely to be effective. In contrast, talking with those who are markedly different from us requires more effort to make the communication effective. Also, heterophilous communication may cause cognitive dissonance because an individual is exposed to messages that are inconsistent with his/her beliefs, which may result in an uncomfortable psychological state. Further, homophily and effective communication engender one another. The more communication there is between members of a dyad, the more likely they are to become homophilous; the more homophilous two individuals are, the more likely that their communication will be effective. Takada and Jain (1991) found that the diffusion rates in countries characterized by high-context
cultures and homophilous communication were faster than the diffusion rates in countries characterized by low-context cultures and heterophilous communication, indicating that culture is inextricably related to communication (Hall, 1959).

Since people from high-context cultures seek information from social networks, the interconnected nature of such cultures should provide more opportunities for word-of-mouth communications among group members who respect and abide by a common set of beliefs and interests. This can increase the efficiency of the communication process, hence accelerating the diffusion process in high-context cultures. On the other hand, the ties between people from low-context cultures are not as integrated as they are in high-context cultures, thus reducing the flow of information in the communication channels. Also, due to the lack of a common basis of comparison and understanding, people from low-context cultures are more likely to form the judgment that the innovation adopted by others may not suit their own need (Dwyer et al., 2005). In sum, the high-context culture provides a communication context that is more conducive to the diffusion of an innovation while the opposite phenomenon is true in a low-context culture.

As noted above, e-commerce takes place in the context of web-based communication. The internet is considered as a largely low-context medium owing to its lack of contextual factors (Würtz, 2006). Intuitively, people from low context cultures would be initially more receptive to the arrival of e-commerce for its increased efficiency. However, according to the DOI theory, it is the imitators who, via interpersonal communications including nonverbal observations, play a major role in determining the speed and shape of the diffusion process (Mahajan et al., 1990; Rogers, 1983). With the rapid advancement of information and communications technology, dramatic increase in capacity is enabled within the internet, allowing for more and different cues to be included in the web communication environment. No longer a collection of text, today’s web-based communication is more of a conglomerate consisting of images, multimedia, interactive features, animated graphics and sounds, hence greatly enhancing the internet’s appeal to people from high-context cultures (Würtz, 2006). Further, as more and more people get on the internet not only to stay in touch but also to socialize (Stafford and Gonier, 2004; Stafford et al., 2004), it is increasingly becoming a mainstream interpersonal communications channel as manifested in the proliferation of chat rooms, blogs and social network sites. Such an evolution is expected to have greater impact in the diffusion of B2C e-commerce in high-context cultures.

Based on the above discussion, it is expected that diffusion rates of B2C e-commerce to be faster in high-context cultures. Thus, the following hypothesis is advanced:

**H1.** The adoption rate of B2C e-commerce in countries with high-context culture is faster than that in countries with low-context culture.

*Hall’s monochronic vs polychronic cultures.* The second distinction Hall (1959, 1976) made is based on a culture’s attitude towards time (Appendix 2). In monochronic cultures, such as Northern Europeans and North Americans, people prefer to do things in a structured and linear manner – one at a time, and tend to be well organized and punctual. In polychronic cultures, such as Latin America and the Middle East, people are laid-back, less concerned about how long a process takes, and tend to entertain multiple demands and handle several tasks simultaneously (Lee et al., 2006; Morden, 1999). While monochronic cultures emphasize schedules and promptness, polychronic cultures stresses involvement of people and are result-oriented instead of adhering to the present time scheme. According to Kotable and Helsen (2001), monochronic
cultures are often low-context cultures, while polychromic cultures can be associated with high-context cultures.

From a medium usage perspective, Lee et al. (2006) examined the relationship between polychronicity and internet use and perception on an individual level and noted that the internet seems to suit a polychron's tastes because it is flexible (e.g. no time restriction) and allows for multitasking (e.g. downloading information while browsing an online bookstore and monitoring email correspondence at the same time). Although their study did not find a positive relationship between polychronicity and internet use, the results did show that polychronicity was positively associated with internet perception (in terms of its usefulness and convenience). Teo et al. (1998) found that perceived usefulness had consistently strong effects on internet usage. Lohse et al. (2000), using panel data, showed that the longer the amount of time panelists spent online, the greater the chance they would make a purchase online. Following this line of reasoning and because national-level of polychronicity is a mere aggregation of that on an individual level in the nation, it is argued that a positive perception about the internet should be indicative of the online purchase inclination from users of polychronic cultures.

A decision to purchase online means that the consumer has to wait for the product to be delivered. From uses and gratifications perspective, such waiting would reduce the gratification generated from buying online for users in a monochronic culture that values promptness. Peng (2007) conducted a cross-cultural comparison of consumers’ online behavior and found that saving precious time was the main motive for users in Taiwan and Hong Kong to conduct internet shopping, while for Chinese users, it was the door-to-door delivery service. While users from Taiwan and Hong Kong, both a monochronic culture, seemed to focus on efficiency and promptness, users from China, a polychronic culture, seemed to stress end results. The study also reported that the percentage of users wanting to conduct e-transactions was much higher in China than that of Taiwan, indicating a potentially faster diffusion of B2C e-commerce in a polychronic culture. As such, the following hypothesis is proposed:

**H2.** The adoption rate of B2C e-commerce in countries with polychronic culture is faster than that in countries with monochronic culture.

*Hofstede’s cultural dimensions.* Hofstede defines national culture as “the collective programming of the mind which distinguishes the members of one group or category of people from another” (Hofstede, 1991, p. 5). He argues that people share a collective national character that represents their cultural mental programming, which shapes individuals’ values, beliefs, assumptions, expectations, attitudes and behaviors. He identifies five dimensions along which national cultures vary: power distance, uncertainty avoidance, individualism vs. collectivism, femininity vs. masculinity, and long-term vs. short-term orientation (Hofstede, 1980, 2001), and provides ratings on these dimensions for many countries (http://www.geerthofstede.com/hofstede_dimensions.php).

According to the existing literature on consumer online behavior, the relevant cultural dimensions manifested in an individual consumer’s online purchasing behavior seem to be collectivism/individualism as reflected in an individual’s propensity of being innovative and uncertainty avoidance as reflected in an individual’s perceived risk and trust associated with online purchasing (Cheung et al., 2005). However, it is not clear whether national cultural characteristics would parallel the individual-level demographic traits that have been prevalently found to be major players in predicting consumer online purchasing behavior. According to Hofstede (1980), the collectivism/individualism dimension is closely tied to the high context/low
context dimension. As such, for reasons of parsimony, this study focuses solely on the uncertainty avoidance dimension of Hofstede’s cultural framework. As noted by Gefen and Heart (2006), despite that e-commerce has become increasingly global, current research on trust in e-commerce deals almost exclusively in the US with few exceptions (e.g. Jarvenpaa and Tractinsky, 1999) and cross-cultural validation is called for to show that the way consumer trust affects e-commerce does vary by culture[2]. In addition, trust in the context of e-commerce has generally been treated as even more significant than in other settings because of the lack of personal contact and the lack of social cues in e-commerce (Gefen et al., 2003).

Hofstede (1980) describes uncertainty avoidance as the degree to which societies can tolerate uncertainty and ambiguity. Cultures with low uncertainty avoidance exhibit greater tolerance for risk and people in such societies tend to be more innovative and entrepreneurial and are more willing to try new things. On the other hand, countries that exhibit high uncertainty avoidance value security, clear rules, and a formality to the structure of life; their citizens are generally more resistant to change from established patterns and tend to focus on risk avoidance and reduction. In these countries, the cultural environment is less conducive to innovativeness. Several studies have found evidence of a negative relationship between a country’s degree of uncertainty avoidance and the penetration of the internet and other technological innovations (e.g. La Ferle et al., 2002; Lynn and Gelb, 1996; Yeniyurt and Townsend, 2003).

As noted by Jarvenpaa and Tractinsky (1999), in B2C e-commerce, e-vendors depend on an impersonal electronic storefront to act on their behalf. The unique nature of the internet – open, global, heterogeneous, and constantly changing, combined with the challenge of not being able to inspect physical goods, renders fewer assurances for consumers shopping online. In other words, due to the increased uncertainty associated with purchasing online (compared to that of traditional channels), consumers’ perceived risk also increases. Lynch and Beck (2001) reported that Asian consumers were less secure when shopping online, which could be a manifestation of the high uncertainty avoidance of these countries (e.g. China, Japan, and Taiwan). Based on the results of a series of experiments conducted in 12 countries, Lynch et al. (2001) found that consumer trust was critical in explaining both online purchase intentions and loyalty of visitors to the site. Gefen and Heart (2006) reported that consumer trust on e-commerce differed markedly between Israel (high uncertainty avoidance culture) and the US (low uncertainty avoidance culture). Therefore, based on the above discussion, the following hypothesis is proposed:

\[ H3. \] Uncertainty avoidance will be negatively associated with the adoption rate of B2C e-commerce.

Tests of hypotheses and empirical findings
In order to examine the proposed hypotheses, time-series secondary data (1999-2006) from Euromonitor International (2007) for B2C e-commerce revenue (i.e., internet retailing sales) and total gross domestic product (GDP) values are utilized. Altogether, data are available for 58 countries. The time span for all the countries is 8 years except that it is 6 years for China and 7 years for Greece. The list of countries in this study can be found in Appendix 3.

The adoption rate of B2C e-commerce for each country is calculated as the compound average growth rate (CAGR) of the ratio of B2C e-commerce revenue (internet retailing sales) over the GDP measure at purchasing power parity using
constant dollar for 2000. The diffusion literature shows that adoption and diffusion process is influenced by socioeconomic factors and the social-economic infrastructure of a country may have a concrete and direct manifestation of a culture’s impact on consumer behavior (Yeniyurt and Townsend, 2003). As such, a key socioeconomic aspect of a country’s economic infrastructure, total GDP value, is used not only to explicitly factor in its effect on internet use and access, but also in recognition that it may also moderate the effects of the cultural dimensions.

To test statistically whether Hall’s cultural classifications influence the rate of adoption of online purchasing, independent-samples $t$-test is conducted to examine the differences in the mean values of the CAGRs for both the high-context culture group and low-context culture group, as well as for the monochronic culture group and polychronic culture group. Results are presented in Table I.

As indicated by the $t$-values, there is a significant difference in the adoption rates for both the high- vs. low-context cultures and monochronic vs. polychronic cultures. The rates are significantly higher for the high-context cultures and polychronic cultures, supporting both $H1$ and $H2$.

Table II presents the results of two nonparametric correlation analyses that test $H3$, that is, the correlation between uncertainty avoidance dimension and the adoption rates across nations. Both the Spearman and Kendall’s tau correlation coefficients are significant at 95 per cent confidence level (one-tailed tests). However, contrary to what was expected, uncertainty avoidance had a significant, but positive effect on the adoption rate of B2C e-commerce. Thus $H3$ is not supported since the results indicate that B2C adoption rates are higher among countries with higher uncertainty avoidance indices.

### Discussion

The effect of cultural environment and communication system on the diffusion process is important in the sense that it determines the unique social value of a particular country (Fields, 1983) and it is pervasive in all marketing activities (Takada and Jain, 1991). This study is among the few large-scale empirical studies attempting to establish the importance of understanding cultural influences on consumers’ online

<table>
<thead>
<tr>
<th>Hypotheses tested</th>
<th>Cultural classification</th>
<th>Mean</th>
<th>$t$-value</th>
</tr>
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<tbody>
<tr>
<td>$H1$</td>
<td>Low-context cultures</td>
<td>22.40%</td>
<td>2.715**</td>
</tr>
<tr>
<td></td>
<td>High-context cultures</td>
<td>38.88%</td>
<td></td>
</tr>
<tr>
<td>$H2$</td>
<td>Monochronic cultures</td>
<td>27.81%</td>
<td>1.338*</td>
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<td></td>
<td>Polychronic cultures</td>
<td>36.71%</td>
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Notes: *$p < 0.1$ (one-tailed tests); **$p < 0.01$ (one-tailed tests)

<table>
<thead>
<tr>
<th>Hypothesis tested</th>
<th>Cultural dimension</th>
<th>Nonparametric statistic</th>
<th>Correlation</th>
</tr>
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<tbody>
<tr>
<td>$H3$</td>
<td>Uncertainty avoidance</td>
<td>Spearman rank correlation coefficient</td>
<td>0.275*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kendall’s tau</td>
<td>0.193*</td>
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Note: *$p < 0.05$ (one-tailed tests)
purchasing behavior across countries. Hall's low/high context and monochronic/polychronic cultural classifications and the uncertainty avoidance dimension of Hofstede's cultural framework were tested across 58 countries.

Comparing to the existing literature that mainly focuses on examining consumer online behavior on an individual level, the current study extends and enriches this area of research by investigating the role and effects of national characteristics on B2C e-commerce adoption and diffusion process. Knowledge in this area is crucial for international marketers and advertisers who are using the internet or intend to integrate it into their overall strategic planning. How e-marketing efforts interact with a culture can determine the degree of success or failure of those efforts in a foreign country. In particular, advertising and promotion on the internet and website design warrant special attention because of their key role in communicating product concepts and benefits to the target consumers.

The results of the $t$-tests show that high-context and polychronic cultures have significantly higher adoption rates than low-context and monochronic cultures, indicating that, with respect to the adoption of online purchasing, the way messages are communicated is of critical importance to online users and that time orientation/preference affects the way consumers use information technology. The results of the study suggest that culture influence consumers’ abilities and desires for online communication and purchase. As such, it becomes essential for e-marketers and advertisers to understand the factors that might inhibit or enhance the B2C e-commerce adoption and diffusion.

While Lynch and Beck (2001) observed no significant regional differences in consumers’ tendencies to take risks among online buyers in 20 countries, a more intriguing finding this study revealed is that a culture’s uncertainty avoidance had a significant, but positive effect on B2C e-commerce adoption and diffusion levels. Some early research at the individual level did suggest a minor role of risk perceptions in the adoption of online shopping (Jarvenpaa and Todd, 1997), but this finding contradicts the main results of past studies at the individual level, which typically suggest an inverse relationship between consumers’ perceived risk and their adoption of purchasing online. On the other hand, this finding did echo what was reported by Park and Jun (2003) – Koreans (high uncertainty avoidance) were more risk-taking than their American counterparts (low uncertainty avoidance) in internet buying behavior. The “cushion hypothesis” proposed by Hsee and Weber (1999) may provide a plausible explanation for this unexpected positive effects of uncertainty avoidance on the adoption and diffusion of B2C e-commerce. Hsee and Weber (1999) found that the Chinese were significantly more risk seeking than the Americans, arguing that in collectivistic cultures like China, family and social network will help out any group member who loses a lot of money after selecting a risky option. In contrast, in individualist cultures such as the US, a person is expected to bear the consequences of his/her own decision. As such, collectivism acts as a cushion against possible losses, or in other words, a social diversification mechanism of risks. Because high uncertainty avoidance countries tend to be collectivistic-oriented as indicated by the significant negative correlation between the two dimensions (Hofstede, 2001), the cushion hypothesis may be used to explain the results of this research. In addition, it is noteworthy that, with the rapid advancement of information and communications technologies, it is expected that the perceived risk associated with internet buying will decrease accordingly (Park and Jun, 2003). In other words, perceived risk may be a decreasingly important predictor of consumers’ online buying behavior. Based on the
findings of this study, an obvious conclusion is that the results of previous research at the individual level may not be automatically extendable to the country level. Careful interpretations at the country level are particularly warranted and additional research is needed to shed more light on the relationship between this dimension and the adoption of B2C e-commerce, especially now that internet retailing is taking off worldwide.

Managerial implications

Predicting B2C e-commerce adoption and diffusion with cultural variables

Although this study’s results are preliminary, they contribute to the understanding of cultural influences on B2C e-commerce adoption and diffusion across countries and provide guidelines in predicting potential diffusion rates and patterns for countries with similar cultural configuration.

High-context cultures. Such as Japan, China, and Latin America countries prefer to become well-informed about facts by obtaining information from personal information networks. The interconnected nature of such cultures engenders more word-of-mouth communications among group members sharing a common set of beliefs and interests and hence increases the efficiency of the communication process, which, in turn, leads to an accelerated diffusion process within such cultures.

Polychronic cultures. Such as those of Latin American and Arab nations, favor simultaneous activities. The internet is a technology that allows users to be flexible and to multitask. These unique characteristics of the internet appear to be congruent with those of polychronic cultures, where the emphasis is on communication and completing the task rather than adhering to a deadline or schedule. Therefore, it makes sense that internet retailing appeals more to a polychronic culture.

High uncertainty avoidance cultures. Such as Latin Americans, are generally more resistant to change from established patterns and tend to focus on risk avoidance and reduction. No doubt, in the beginning stage of internet retailing, purchasing online involves ambiguity and this would be higher for cultures strong on this dimension. However, with the advancement of information technology and consumers’ gaining more experience on the internet and internet shopping, a diminishing effect of the perceived risk on buying online can be assumed. Based on the results of this study, which revealed higher B2C e-commerce adoption rates in high-context cultures that dictate a higher propensity to trust (Cyr et al., 2005) and in polychronic cultures that are flexible and comfortable with uncertainty (Lee et al., 2006), it is not totally surprising that a positive impact of high uncertainty avoidance was found on the diffusion of internet retailing.

Based on the above guidelines, rapid diffusion of B2C e-commerce may be expected for countries in Asia, Latin America or Eastern European countries that are not included in this study due to their high-context and polychronic cultural traits. In addition, it seems that once internet retailing has passed the initial stage and consumers become more appreciative of the easiness, usefulness and convenience of online shopping, countries with high uncertainty avoidance could experience even faster adoption of internet retailing owing to their underlying high-context and polychronic national characteristics.

Web site design strategies for encouraging B2C e-commerce

Knowledge of cultural influence on diffusion process can help marketers enhance B2C e-commerce adoption by adjusting their web site design strategies. The message for
Web site designers is clear – a site with features that are congruent with a national culture will foster consumer online purchasing. It is not just a case of translating the words, but also transforming site characteristics to match cultural traits (Junglas and Watson, 2004). As such, it is essential that the virtual storefront be culturally adapted to meet the needs and desires of its customers. It has been reported that differences in communication styles between high-context and low-context cultures do occur on the Web (Würtz, 2006). For example, websites of high-context cultures implement more animations that assimilate human presence on the Web and are more likely to use images that reflect values characteristic of such cultures to convey information, especially related to navigation elements. With regard to the layout, new pages tend to open in new browser windows, giving the visitor a multitude of starting points for further site navigation. This type of opening of links seems to be reflective of polychronic characteristics associated with high-context cultures. For the presentation of product-related information, websites of high-context culture tend to picture the product together with an individual, thus giving the consumer a central place of attention but never the product only. As such, it would be necessary and beneficial for e-tailers to incorporate such features when targeting consumers of high-context cultures because they can greatly enhance the contextual cues upon which consumers from such cultures form their judgments and make decisions. On the other hand, when targeting people from low-context cultures, for example, products should be depicted separately since their attention tends to be very focused and page layout and color schemes should be consistent to allow for an easy and quick decoding of the information. No doubt, doing so will enhance website usability and increase the competitiveness of companies using web communications to reach and sell to online populations worldwide.

Promotional strategies
For an internet marketer, the company’s website serves both as a source of information and a point-of-purchase promotional site. People from high-context cultures seek information from personal social networks. As such, it is argued that the social aspect of the internet may be of greater value to internet users of high-context cultures, as compared to their counterparts from low-context cultures. Park and Jun (2003) found that Korean internet users like to use the internet for social (e.g. virtual communities) and recreational (e.g. network games) purposes but the usage is not related to internet buying. Therefore, internet marketers should look for innovative ways to draw consumers online socially. Strategies such as building and maintaining chat rooms, sending out regular e-newsletters or special deal emails to opt-in consumers, developing company blogs or advertising on social network websites should help lead users from communities of fantasy, relationship, and interest towards communities of transaction (Armstrong and Hagel, 1996). In contrast, when seeking to appeal to online users of low-context cultures, emphasis may be placed on the content offered to increase the perceived utility in the eyes of these consumers.

Message-design strategies
The idea that cultural values define who we are and therefore affect which advertising appeals we prefer has attracted considerable attention for developing global advertising strategies (Chang, 2007). Researchers have examined the use and effectiveness of cultural values in advertising appeals across countries (e.g. Aaker, 2000; Aaker and Maheswaran, 1997; Aaker and Sengupta, 2000; Aaker and Williams,
National culture and global diffusion

1998; Albers-Miller and Gelb, 1996; Chang, 2007; Shao et al., 1999; Zhang and Gelb, 1996) and found that culturally congruent appeals resulted in more favorable attitudes (Zhang and Gelb, 1996). Therefore, collectivistic appeals such as those stressing family values or sense of belonging and emotional appeals designed primarily to elicit a positive/affective response rather than provide information or arguments would work better in high-context cultures; while individualistic appeals such as those emphasizing personal achievements and logical appeals providing rational reasons and hard evidence to prove that a product is a logic choice may receive better responses from low-context cultures. Such understanding can help in message-design decisions for encouraging B2C e-commerce adoption.

To sum up, in practical terms, knowledge about cultural influences on consumer online purchasing behavior would help e-marketers better prepare their internet strategies and capitalize on the different patterns of adoption. Besides, such findings may be of interest and value to marketers whose business is beyond PC-based electronic commerce. With the evolution of m-commerce, applications of this study may find a new home in burgeoning markets.

Limitations and suggestion for future research
As with any research, this study has several limitations. First, the use of secondary data has been criticized for being inconsistent and unreliable (Yeniyurt and Townsend, 2003). Second, due to the availability of the data, a limited number of countries were included in this study, hence limiting its generalizability. Third, only one social-economic variable, total GDP, was accounted for for its moderating effect on the B2C e-commerce adoption rates. This does not, however, imply that other potential factors such as a nation’s demographic composition or technical and payment related aspects of internet retailing do not play an important role in adoption and diffusion of B2C e-commerce. Last, only one dimension from Hofstede’s multicultural dimension was tested. In fact, a post hoc analysis found no significant correlation between the other four dimensions and B2C e-commerce adoption rates. Further research is needed to validate the results by employing different measures of B2C e-commerce adoption such as the number of online buyers across nations or the percentage of online buyers among internet users and including all the dimensions of Hofstede’s multicultural framework in order to test which of these two theories better predicts consumer adoption of online purchasing across countries. The rapidly changing pattern of the internet population worldwide ensures continued interest in such research.

Despite these limitations, the results from this exploratory study are important and revealing. This study provides managers with insights to not only identify trends in global B2C e-commerce diffusion and the role culture plays in the diffusion process but also guide their web site design and the development of their communication and other promotional strategies to more effectively convert internet users into online buyers.

Notes
1. In this study, B2C (business-to-consumer) e-commerce is defined as retailers’ selling of goods and services to consumers via the internet, a web medium, whereby the payment is made online through the web platform. B2C e-commerce, internet retailing, e-tailing and consumer online purchasing are used interchangeably throughout the paper.

2. In this paper, for reason of simplicity, trust and consumer perceived risks associated with online purchasing are used interchangeably. Refer to Gefen and Heart (2006) for a comprehensive review of trust in the context of e-commerce.
References


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Appendix 1. High- and low-context cultures

(1) *High context:*
- Japanese;
- Chinese;
- Italians, Spanish, Portuguese, French, Mediterranean peoples;
- Latin Americans;
- Arabs, Africans;
- Indians and other Indian sub-continent;
- Koreans, South East Asians; and
- Central Europeans.

(2) *Low context:*
- Slavs;
- Other American cultures;
- Benelux countries;
- British, Australians;
- Scandinavians, Finns;
- North Americans (US WASPs and Canadians);
- New Zealanders, (white) South Africans; and
- Germans, Swiss, Austrians.

*Source:* Morden (1999)

Appendix 2. Monochronic and polychronic cultures

(1) *Monochronic:*
- Germans, Swiss, Austrians;
- Americans (White Anglo-Saxon Protestant or WASP);
- Scandinavians, Finns;
- British, Canadians, New Zealanders;
- Australians, (white) South Africans;
- Japanese;
- Dutch, Flemish Belgian;
- Other American cultures;
- French, Walloon Belgian; and
- Koreans, Taiwanese, Singaporeans.

(2) *Polychronic:*
- Czechs, Slovaks, Slovenians, Croats, Hungarians;
- Chinese;
- Northern Italians;
- Chile;
- Other Slavs;
• Portuguese;
• Spanish, Southern Italians, Mediterranean peoples;
• Indians, and other Indian sub-continent;
• Polynesians; and
• Latin Americans, Arabs, Africans.

Source: Morden (1999)

Appendix 3

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Table AI. Countries included in this study

About the author

Wen Gong is an assistant professor of marketing in School of Business at Howard University. Her research interests are in the areas of internet marketing and advertising, culture and consumer behavior, and international marketing. Dr. Gong has published in many journals including Journal of Advertising Research, International Marketing Review, Journal of Macromarketing (forthcoming), Journal of Asia-Pacific Marketing and Logistics, International Journal of Electronic Business, Business Horizons and Journal of American Academy of Business. She is a member of the American Marketing Association and the Academy of Marketing Science. Dr. Gong holds a bachelor’s degree from Beijing University of Posts and Telecommunications, a master’s degree from the University of International Business and Economics, and a doctorate from George Washington University. Wen Gong can be contacted at: gong.gw@gmail.com