Internet Culture And Information Privacy Concerns
In Developing Countries

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ABSTRACT
Individual Internet influenced and country level culture have been posited to affect consumers’ privacy concerns. This study examines how cultural factors and Internet experience influence individual’s information privacy concerns from Brazil, China, and Romania. Regression models, estimated with primary survey data collected from 18-30 year olds who use the Internet, are used to test research hypotheses derived from the literature to explain within-country privacy concern. The study also measures the differences in privacy concerns across countries. A hierarchical regression model explores the relative influence of Internet culture at the individual level versus country specific influences in explaining differences in privacy concern.

INTRODUCTION
Consumers’ use of the Internet continues to expand worldwide with many developing countries experiencing double digit growth rates applied to the previous small percentage of Internet users. As the Internet in developing countries is used for email communication, information gathering, and online purchasing, the potential for privacy abuse exists, which may limit the rate of adoption or consumers’ activities while on the net. While evaluating factors affecting Internet users’ privacy concern has been examined in the US (Cranor, Reagle and Ackerman 2000; Sheehan and Hoy 1999; 2000), with a few exceptions (e.g. Belman et al 2004; Singh and Hill 2003; Smith 2001; Milberg et. al. 1995), there is a paucity of published research that has examined these issues outside the US. This research is an effort to address the call for examining information privacy issues associated with the Internet in the international realm (Caudill and Murphy 2000; Milne 2000).

Expanding the scope of privacy research beyond the US permits a better understanding how cultural dimensions affect privacy concerns. Early research in privacy has noted that culture can explain differences in privacy attitudes (Westin 1967). However, in the extant marketing literature, culture is an amorphous construct, with some researchers measuring it at national level (Hofstede 1991, 2001), intra-cultural or sub national (Au 1999; Lenartowicz and Roth 2001) and individual levels (e.g., Triandis and Gelfand 1998). Pertinent to this study is the notion of a possible global Internet culture, where Internet consumers from around the globe are relatively homogeneous in their attitudes and behaviors (Nicovich and Cornwell 1998). Some support for this position is found by the fact that demographics of International Internet users tend to skew younger (Pastore 2001) and reflect a segment that is more likely to embrace the Internet. The possibility exists that for many countries, the Internet culture and national culture may conflict (Nicovich and Cornwell 1998). Under these conditions it is reasonable to expect that individual beliefs toward cultural attitudes may explain differences in privacy attitudes.

In addition to cultural determinants, experience on the Internet may also explain differences among individuals’ attitudes toward privacy concerns. For example, U.S. consumers have been found to exhibit a decrease in sensitivity to online privacy issues with Internet experience (Lohse et al, 2000). For many consumers in countries where access to markets is underdeveloped, the Internet (along with wireless technology), expands consumers ability to communicate, access information and make purchases. Email, in particular, has fueled consumers in developing countries foray to the Internet. However, along with this new form of communication on a distributed network is the risk that personal information that is relayed might not be treated securely and that consumer privacy might be compromised.
The purpose of this research is to understand how culture and Internet experience influence information privacy concerns of young adult Internet users from Brazil, China, and Romania. Based on country specific regression models, we explain within country variation in privacy concerns using measures of cultural determinants and Internet experience. In an effort to understand the relative influence of country specific culture and global Internet culture, we compare privacy attitudes by country and then run a hierarchical regression using pooled data from all three countries.

The remainder of the paper is organized in four sections. First we review background literature and develop research hypotheses. In the second section we discuss the methods, including sampling and survey procedures, measurement, and analysis approaches. Next in the third section, we discuss the results of the within country and pooled data analyses. We conclude by discussing the study limitations and future research opportunities.

CONCEPTUAL BACKGROUND AND RESEARCH HYPOTHESES

Personal information privacy is “the right to control information about one’s self” (Westin 1967). This idea of personal control of personal information along with concepts of consumer awareness of data collection has supported the underpinning of the extant business literature’s articulation of privacy (e.g. Caudill and Murphy 2000; Culnan 1995; Foxman and Kilcoyne 1995). In the United States, privacy has been viewed as a basic right (Warren and Brandeis 1890), and it has been suggested that privacy is valued by all societies in some form (Westin 1967).

There have been few studies that have examined informational privacy issues in an international realm with notable exceptions (e.g. Bellman et al 2004). While research has discussed different regulatory approaches across countries (Flaherty 1989; Smith 2001), empirical work, other than descriptive polls measuring consumers’ attitudes, is limited. In the direct marketing context, a 1996 study investigated consumers’ attitudes toward direct marketing and privacy in Argentina (Milne, Beckman, and Taubaum 1996). This study posited a conceptual model that suggested country level technology and infrastructure affects overall individual behavior. Individual differences in direct marketing and privacy attitudes were expected to be a function of adherence to individual rights, experience and demographic background. In replicating the 1996 Equifax survey, the study found that Argentinean consumers were not familiar with database tactics and thus privacy concerns were not central. A more recent study of direct marketing in Japan and the US, predicted differences between the two country’s consumers based on culture and communication styles (Taylor, Franke, and Maynard 2000). They found Japanese student subjects to be more concerned about information privacy than US subjects.

Milberg et. al. (1995, 2000) examined the relationships among nationality, cultural values, personal information concerns, and privacy regulation with an ex post facto quasi-experimental design. Members of the Information Systems Audit and Control Association were surveyed, and results were examined by a nine-country grouping (based on respondents nationality). Cultural dimensions (power-distance, uncertainty avoidance, and individuality) were assigned based on Hofstede’s indices. Across the various cultural classifications, no significant differences were found between the groups with regard to their overall level of information concern and of the cultural dimensions. Interestingly, respondents from Thailand--the only developing country examined and country with no privacy regulation, had the lowest privacy concerns for the collection, secondary use, and data errors subscales.

CONCEPTUAL FRAMEWORK

The conceptual framework guiding this study is shown in Figure 1. Variables measuring cultural influences, Internet experiences, and consumer background are posited to directly affect information privacy concerns.

[Insert Figure 1 here]
Privacy Concern

A strong consensus is emerging regarding the multi-faceted and multi-dimensional nature of privacy concerns (e.g., Milberg et al. 1995; Milne 2000; Sheehan and Hoy 2000; Smith, Milberg and Burke 1996; Yousefzai et al. 2005). In this study, the scope of information privacy concern is comprised of four dimensions: the collection of personal information, the accuracy of the information, unauthorized secondary use of the information, and the improper access of information stored on company databases (Milberg et al. 1995; Smith et al. 1996). Each of these privacy dimensions is directly relevant to Internet marketing efforts.

Cultural Influences

Research in marketing has examined how culture affects consumer behavior (e.g., Aaker and Maheswaran 1997; Roth 1985). Much of this research has relied upon Hofstede’s (1991) cultural dimensions: individualism/collectivism, uncertainty avoidance, power distance, and masculinity/femininity. Individualism/collectivism captures the extent to which the worth of the person is tied to being part of the social system. Uncertainty avoidance is a proxy for risk tolerance versus risk aversion. Power distance measures the extent to which a culture is authoritarian. The extent to which a culture is dominated by males rather than nurtured by females determines the level of masculinity/femininity.

While it is generally assumed that culture affects individual privacy concerns (Westin 1967) the relationship between nationality-based culture and privacy concerns is mixed. Milberg et al.’s (1995) study of 706 respondents from 9 nations, examined the first three Hofstede dimensions. They found that when culture and privacy concern are assessed at the national level, there was not a significant relationship between culture and privacy concern (p. 71). However, Smith (2001, p. 14) surveyed 595 information systems auditors around the world and found, using predetermined cultural categories, that a country’s cultural values had “a significant role in explaining the level of privacy concern reported by our respondents from that country.” This relationship held for individualism/collectivism, power distance, and masculinity/femininity, but not uncertainty avoidance.

Although culture has generally been extrinsically tied to nationality, it has been suggested that other cultural bases such as an Internet culture exist (Nicovich and Cornwell 1998). The Internet culture has been characterized as global, individualist, and risk seeking, as evidenced by the explosion of innovation in the online world. For many countries, however, the cultural bases and the Internet culture conflict, suggesting two things. First, a common set of values is emerging across various countries (i.e., global segments). Second, these global segments are more homogeneous across countries similar to the etic approach of culture (Leung and Bond 1989; Triandis et al. 1993) that transcend the pre-described dimensions of national level culture. Finally, national cultural dimensions, albeit stable, may change but there are cases of both cross country convergence and divergence (Hofstede 2001). In this research we adopt the etic approach and focus on two Hofstede dimensions (individualism/collectivism and uncertainty avoidance). Prior research has found these two dimensions to be the most relevant to the Internet (Lim et al. 2004). Our purpose is to see the extent to which these variables explain differences in privacy concern within a country sample.

Uncertainty avoidance

Uncertainty avoidance, refers to the avoidance of uncertainty and ambiguity in one’s environment and high levels of uncertainty avoidance are considered to be synonymous with feelings of insecurity (Hofstede 1991). Individuals low in uncertainty avoidance have low levels of anxiety and less fear about the future (Hofstede 2001). People living in cultures characterized by high uncertainty avoidance are risk averse, oppose change and variety, do not tolerate ambiguous situations and follow formally established rules (Gudykunst and Ting-Toomey 1988). Individuals who live in countries with high uncertainty avoidance characteristics live in stressful conditions and will try to seek security. In contrast, individuals in an Internet culture are more comfortable with ambiguous situations. Hofstede (2001) specifically notes the distinction...
between uncertainty avoidance and risk avoidance; it is the ambiguity of the situations that is of interest not the degree of the consequences. Individuals high in uncertainty avoidance do not avoid risk but only take actions when the risks are known. Research along this cultural dimension finds that those who are low in uncertainty avoidance do not need to understand the consequences or range of risks before acting. Individuals with high uncertainty avoidance, prefer detailed instructions for tasks, prefer children’s stories that stress strong security, prefer strong rules on what is taboo and use the internet less than low uncertainty avoidance individuals (Hofstede 2001). Low avoidance individuals have sought high levels of novelty and convenience two characteristics of Internet users (Donthu and Garcia 1999). When viewed at the individual level, Internet users who exhibit high levels of uncertainty avoidance (regardless of their nationality) are likely to be more concerned about their privacy on the Internet.

**H1:** Consumers’ uncertainty avoidance will be positively associated with privacy concern.

**Individualism/Collectivism**

Individualistic cultures are those in which people pursue personal goals and value freedom and individual actions (Hofstede 1991; Triandis 1995). People in collectivist countries value loyalty to the groups and group goals and outcomes are more important than individual rewards. In contrast, individualist cultures value independence and individual outcomes. Individualistic cultures value the right of everyone having a private life where individuals in a collectivist culture are integrated “horizontally and vertically” (p. 228) and individuals’ private lives are “invaded by institutions and organisations to which one belongs” (p. 227) (Hofstede 2001). Security in collectivist cultures comes from the social networks that are distinguished by in-group and out-group networks. For collectivist cultures there are conflicts between in-groups and out-groups, where there are high levels of trust for in-group members but lower levels of trust for out-group members. For individualist cultures that are more open to the outside world (p. 245), security is determined individually and separately from the social network. Group membership is not required for information to be shared; instead the norm is for individuals to share information across group boundaries (Hofstede 2001). Taylor, Franke and Maynard (2000) use the concepts of in-group and out-group descriptors of the collective Japanese culture and the concepts of *uchi* “inside” and *soto* “outside” (Nakane 1994). They predict and find that the more collectivist Japanese are higher on privacy concerns regarding direct marketing than are US consumers.

In a review of cultural correlates with consumer behavior, Hofstede (2001) finds that individualistic cultures are more likely to use the media for information where collectivist cultures look among their group members. This suggests that individualistic cultures share and expect more information to be shared openly. Finally, one additional finding from the comparisons is that collectivist cultures are less likely to own home computers than individualists.

**H2:** Consumers’ collectivism will be positively associated with privacy concern.

**Internet Experiences**

Much of the concern about privacy on the Internet can be attributed to consumers’ lack of experience on the medium. Research has shown that US consumers who have recent experience with the Internet are less likely to protect their privacy by removing their name from direct lists than those consumers with less experience (Milne and Rohm 2000). Experience with both purchasing and using email is expected to lower privacy concern. With regard to overall usage of the Internet as a predictor of privacy concerns, Miyazaki and Fernandez (2001) found mixed results with regard to consumers who had more experience and time using the Internet. Two of their three-privacy/security measures were not related. Similarly, Korgoankar and Wolin (1999) did not find a relationship between time online each day with concerns of transaction security or non transaction privacy concerns. They did however find a significant relationship between transaction security and the frequency of online shopping but no correlation with nontransaction
privacy concerns. This suggests that consumers make a clear distinction between transaction issues and general privacy issues, with transaction issues being more salient than general issues. Bellman et al (2004), in a study of frequent internet users across the 38 countries, find that concern for privacy issues decline with Internet experience. This suggests that in some capacity, online shopping has inherent privacy problems that individuals are willing to accept in shopping situations. This is supported by recent reports suggesting that online shoppers place higher weight to other aspects of online shopping (e.g., bargain hunting, convenience seeking, etc) than privacy concerns (Communications Today 1999; Slatalla 2001) or many don’t use ad blocking software due to hassles and slowing down their experience (Forrester 2001).

In essence, online shoppers and frequent users of email are less concerned about privacy to the point that they are willing to trade it for benefits—or as found with other direct marketing trade-offs, they are not willing to pay for the higher privacy levels (Culnan 1995, Milne and Gordon 1993).

H3: Consumers who purchase online will be less concerned about privacy than those consumers who have not purchased online.

H4: Consumers’ e-mail use will be negatively associated with privacy concern.

**Background Influences**

In developing nations, computer ownership is an important access to the Internet. Research on the effect of computer ownership is mixed. The U.S. based—Equifax/Harris survey found that computer owners were more likely to refuse to provide information to marketers than non-computer owners (Harris 1995). However, in another U. S. study (Milne and Rohm 2000), individuals who used a computer at home were found less likely than non home computer users to remove their names from email lists, indicating they were less concerned about privacy. Overall, we expect that computer ownership in developing countries will be negatively related to the levels of privacy concern.

H5: Consumers who own a computer will be less concerned about privacy than those consumers who do not own a computer.

The influence of gender on privacy concern is mixed. The 1990 and 1995 Harris studies for example found females to be more concerned about privacy (Harris 1990, 1995). In contrast, Phelps, Nowak and Ferrel (2000) found no influence of gender on privacy concerns. However, for international research, past empirical research in Argentina has produced results suggesting that females are more concerned about privacy than males (Milne, Beckman, and Taubman 1996). Thus,

H6 Females will be more concerned about privacy than males.

**METHOD**

**Sampling and Survey Procedures**

The sampling frame consisted of young adult Internet users from Brazil, China, and Romania. These countries were selected due to their developing status and differing regional locations. The restrictions on age and Internet experience were put in place to tap into a potential global Internet culture.

A questionnaire was first written in English and pretested with convenient samples of college students. The development of the questionnaires into Chinese, Romanian, and Portuguese followed procedures to assure translation equivalence (Kumar 2000). Native speaking bilingual translators (one each for Chinese, Romanian and Portuguese) translated the English version of the survey instrument into the respective languages. The surveys were then back-translated into English by a second bilingual translator, followed by a comparison of the translated version with the original English version. Minor discrepancies were
reviewed by both translators and revised and the surveys were then pre-tested in each of the countries of interest to assure equivalence.

The data collection in each country followed similar procedures. We employed research assistants in each country. Each of the lead assistants was involved in the development and pretesting of the survey and was familiar with the purpose of the study. The data collection used a convenience drop-off method (Babin and Boles, 1998). The respondents were screened to include those who were employed full time and used the Internet on a regular basis. The assistants were instructed to target young adults. In Brazil, 300 surveys were distributed and 100 were returned, while for Romania, 600 were distributed with 411 completed, and finally, there were 450 surveys distributed in China with 200 returned completed. Given the aims of the study, we restricted final sample to only Internet users who were 18 to 30 years of age based on their responses to two of the survey questions. The final sample descriptions are seen in Table 1.

Measurement

The measures used in the study were taken from existing measures in the literature. A complete list of the measurement items and the reliabilities for each country as well as the correlations along with other descriptive statistics for each country are found in Table 2. The Informational Privacy Concerns scale used the items developed by Milberg et al. (1995) and Smith et al. (1996). The multiple dimensions were assessed with 4 items each for the Collection, Accuracy, and Unauthorized Secondary Use dimensions. Three items were used to assess the Improper Access dimension. The endpoints for the items were “1 = Strongly Disagree,” and “ 7 = Strongly Agree.” Collectivism was measured using 3 items and Uncertainty avoidance using 4 items (Yoo, Donthu, and Lenartowicz 2000). As shown in the Table 2, the reliabilities for all the multi-item scales, except one, are above the .70 levels recommended by Nunnally and Bernstein (1994). The only except is the Collectivist scale for Romania which is .67

Analysis Approach

OLS Regression was used to test the hypotheses pertaining to individual consumer’s differences in privacy concern developed in the previous section. For each country dataset, the following regression model was estimated.

\[ Privacy \text{ Concern} = \beta_0 + \beta_1(Uncertainty) + \beta_2( Collectivism) + \beta_3(Email \text{ Use}) + \beta_4(Own \text{ Computer}) + \beta_5(Gender) + \epsilon \]

Next, differences in the privacy scale based on national differences are examined with a one-way ANOVA. To explore the relative influence of Internet Culture based on the within country regressions, and the national effects demonstrated by the ANOVA, a hierarchical regression approach is used on a pooled dataset from all three countries. The following
equations examine the incremental explanatory power of background variables, country variables, and individual cultural variables.

\[
\text{Privacy Concern} = \beta_0 + \beta_1 (\text{Email Use}) + \beta_2 (\text{Own Computer}) + \beta_3 (\text{Gender}) + \epsilon
\]

\[
\text{Privacy Concern} = \beta_0 + \beta_1 (\text{Email Use}) + \beta_2 (\text{Own Computer}) + \beta_3 (\text{Gender}) + \beta_4 (\text{Brazil Country Dummy}) + \beta_5 (\text{China Country Dummy}) + \epsilon
\]

\[
\text{Privacy Concern} = \beta_0 + \beta_1 (\text{Email Use}) + \beta_2 (\text{Own Computer}) + \beta_3 (\text{Gender}) + \beta_4 (\text{Brazil Country Dummy}) + \beta_5 (\text{China Country Dummy}) + \beta_6 (\text{Uncertainty}) + \beta_7 (\text{Collectivism}) + \epsilon
\]

**Results**

The results of the regression analysis for each country are presented in Table 3. As seen by the F-statistics, each of the regressions was significant at the \( p < .01 \) level. For the Chinese sample, the results were very strong with the dependent variables accounting for 30 percent of the variance (based on adjusted \( R^2 \)) in the independent variable, privacy. In the Brazilian sample, the adjusted \( R^2 \) was 24 percent and in the Romanian sample, 20 percent.

Hypothesis 1 predicts that consumers’ uncertainty avoidance will be positively associated with Privacy Concerns. For all three samples this hypothesis was supported (\( \beta_b = .338, p < .01; \beta_c = .201, p < .01; \beta_r = .310, p < .01 \)). For the Brazilian and Romanian samples, uncertainty avoidance was the strongest predictor of privacy concern. The cultural dimension of collectivism, predicted in Hypothesis 2 as being positively associated with privacy concern was also significant for all three samples (\( \beta_b = .286, p < .01; \beta_c = .411, p < .01; \beta_r = .152, p < .01 \)). Collectivism is the strongest predictor in the Chinese sample. In the Romanian sample those who have purchased online are less concerned with privacy (\( \beta_r = -.161, p < .01 \)) giving partial support for H3. The hypothesis that email use is negatively associated with privacy concern (H4) was not supported. In fact, for China, the opposite was true, with email use being positively associated with privacy concern (\( \beta_c = .156, p < .05 \)). A significant relationship opposite of what was hypothesized was found for H5. In the Brazilian sample computer ownership was found to be positively associated with privacy concern (\( \beta_b = .198, p < .05 \)). Finally, there was partial support for females having higher levels of privacy concern than males in the Romanian sample (\( \beta_r = .139, p < .01 \)).

We estimated a one-way ANOVA to examine the differences in the overall privacy concern overall scale and the four subscales (see Table 4). A comparison across countries is possible because this measure was found to have metric equivalence across the three countries (Bryne 1998). The F-tests indicate the overall scale and all subscales were statistically different across countries (\( p < .01 \)). In terms of overall privacy concern, Brazil has the lowest level of privacy concern (4.67 out of 7) compared to China (5.12) and Romania (5.19). The post hoc contrast found Brazil to be significantly lower (\( p < .05 \)) than the other two countries. Interestingly, the pattern of concern varied across the four dimensions of privacy. For example, China had the highest level of concern over the collection of personal information (4.80) compared to lower levels for Romania (3.62) and Brazil (3.46). On the other hand, Romania had the highest level of concern for accuracy of stored personal information (5.08), unauthorized secondary use of personal information (6.18), and improper access of personal information (6.08), compared with Brazil (4.51, 5.52, 5.35) and China (4.86, 5.45, 5.44).
shows that these respondents have lower privacy concern than the respondents from other countries ($\beta = -.191, p<.01$). However, when the individual cultural variables of uncertainty avoidance and collectivism are added to the equation, the amount of explained variance increases by 18.7%. As with the within country regressions, both these constructs are statistically significant at the .01 level. While the individual factors appear to explain a great deal of incremental variance, it is important to note that there were statistically significant differences in the amount of perceived uncertainty by different country respondents. Romania was the most uncertain (5.52 out of 7) compared with Brazil (5.10) and China (4.68). There were, however, no differences across countries for the collectivism construct.

DISCUSSION

The relationship between culture and privacy has traditionally been examined at the country level. In our study of Brazil, China, and Romania, privacy concern and uncertainty avoidance were statistically different across countries (see Figure 2). In particular, Brazil has statistically lower level of privacy concern than either China or Romania. Also, the level of uncertainty avoidance differed across all three countries with China having the lowest level, then Brazil, and Romania the highest. No statistical differences existed across countries for collectivism. Interestingly, the pattern among the countries is not clear-cut. In comparison to the Romanians who have high privacy concern and high uncertainty avoidance, the Chinese have the same level of privacy concern but the lowest level of uncertainty avoidance. In explaining the pattern in Figure 2, country level explanations could be made regarding the higher levels of technical investment in China than Romania, or the fact that Brazil is more developed and thus lower level of privacy concern than the other two countries. However, individual explanations might be more fruitful in explaining the data.

[Insert Figure 2 here]

The within country regressions, for all three countries, showed an individual’s adherence to collectivist practices and to the extent they avoid uncertainty is positively associated with privacy concern. The association of both of these variables is consistent with the hypothesized direction. Indeed, the explanatory power of these individual level variables is quite large, as they explain more variance in privacy concern in the hierarchical regressions than do country, or Internet background.

Implicit in the findings is that individualists (low on the collectivism scale) and risk seekers (low on risk avoidance) may share tendencies with the global Internet culture. Individuals who have these characteristics are more entrepreneurial, may embrace the Internet technology more readily, and are less concerned with privacy than individuals who stress loyalty to the group and avoid uncertainty. With the trend toward global convergence (Werther 1996), it is likely over time, more individuals from developing countries will gravitate toward the global Internet culture and thus be less concerned about privacy issues on the Internet.

In many respects, viewing privacy concern as an individual phenomena is appropriate for Internet Marketers because data collection is done on a one-to-one basis. As consumers from developing countries get more experience on purchasing on the Internet, they will demand their information be protected, but once given assurances; they will proceed with their purchase plans. Thus, it makes sense for marketers who target consumers in developing countries not to treat them in a monolithic fashion according to country of origin, but rather as individuals differentiated to the extent to which they have assimilated the Internet culture.

CONCLUSIONS

This study examined how culture and Internet experience influence information privacy concerns of young adult Internet users from Brazil, China, and Romania. Country specific regression models found individual cultural factors to explain much of the variation in privacy concern. While privacy concerns did differ by country, a hierarchical regressions of the pooled
data showed individual cultural factors explained more variance than country, or Internet experience.

In interpreting these findings, several limitations need to be considered. First, the study only examined three developing countries. Thus, this limits the generalizability to these three countries. Second, the data are not based on national probability sampling frames from the respective countries. This further limits the generalizability of the data. Still, despite these shortcomings, the data do offer a glimpse at the attitudes of young working adults who use the Internet from three developing countries. Third, while attention was made to properly translate the surveys into the respective languages, there remains the possibility that the meanings might not be exactly equivalent. This may lead to reliability problems. Although the measures crossed the .70 reliability threshold, the collectivist measures for Romania was .67.

Much of the privacy literature has focused on how background variables explain differences in privacy concern at the individual level and how culture explains privacy concern at the national level. This study furthered both streams of research by showing how cultural variables measured at the individual level explain more variation in privacy concern than country or background factors. Future research is need to see if these relationships hold with other sets of countries and to explore the extent of the global Internet culture and its expectations for security and privacy.

REFERENCES


*Criticism of the ACM*, Dec 22, 1999 v5 i247, “E-commerce convenience comes at a privacy price”.


### Table 1
Demographics (percentages)

<table>
<thead>
<tr>
<th></th>
<th>Brazil</th>
<th>China</th>
<th>Romania</th>
</tr>
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<tbody>
<tr>
<td>Average Age(^1)</td>
<td>23.53</td>
<td>21.06</td>
<td>23.99</td>
</tr>
<tr>
<td>Men</td>
<td>45</td>
<td>34</td>
<td>32</td>
</tr>
<tr>
<td>Women</td>
<td>55</td>
<td>66</td>
<td>68</td>
</tr>
<tr>
<td>Married</td>
<td>5</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>Single</td>
<td>84</td>
<td>94</td>
<td>76</td>
</tr>
<tr>
<td>Own a computer</td>
<td>96</td>
<td>45</td>
<td>38</td>
</tr>
<tr>
<td>Purchase online</td>
<td>40</td>
<td>23</td>
<td>8</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1- Much worse off than colleagues</td>
<td>2</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>2 - Worse off than colleagues</td>
<td>9</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>3 – Same as colleagues</td>
<td>75</td>
<td>26</td>
<td>52</td>
</tr>
<tr>
<td>4 - Better off than colleagues</td>
<td>11</td>
<td>10</td>
<td>19</td>
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<tr>
<td>5 – Much better off than colleagues</td>
<td>3</td>
<td>6</td>
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<tr>
<td>Missing</td>
<td>41</td>
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<td></td>
</tr>
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</table>

\(^1\)Age in years.

### Table 3
Regression Results\(^1\) Explaining Privacy Concern by Country

<table>
<thead>
<tr>
<th></th>
<th>Brazil</th>
<th>China</th>
<th>Romania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncertainty Avoidance</td>
<td>.338**</td>
<td>.201*</td>
<td>.310**</td>
</tr>
<tr>
<td>Collectivism</td>
<td>.286**</td>
<td>.411**</td>
<td>.152**</td>
</tr>
<tr>
<td>Purchased online (yes)</td>
<td>-.040</td>
<td>-.018</td>
<td>-.161**</td>
</tr>
<tr>
<td>Email at least once a day</td>
<td>-.108</td>
<td>.156*</td>
<td>.037</td>
</tr>
<tr>
<td>Own Computer (yes)</td>
<td>.198*</td>
<td>.150</td>
<td>-.040</td>
</tr>
<tr>
<td>Gender (female)</td>
<td>-.047</td>
<td>-.022</td>
<td>.139**</td>
</tr>
<tr>
<td>Adjusted R(^2)</td>
<td>0.24</td>
<td>0.30</td>
<td>0.20</td>
</tr>
<tr>
<td>F statistic</td>
<td>5.8</td>
<td>10.1</td>
<td>13.7</td>
</tr>
<tr>
<td>Degrees of Freedom</td>
<td>6,89</td>
<td>6,125</td>
<td>6,292</td>
</tr>
<tr>
<td>P Value</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

\(^1\)Standardized Betas reported.

\* ** p < .05

\* * p < .01
Table 2
Summary Statistics and Correlations for Model Constructs by Country

<table>
<thead>
<tr>
<th>Country</th>
<th>N</th>
<th>Information Privacy</th>
<th>Standard Deviation</th>
<th>Uncertainty Avoidance</th>
<th>Collectivism</th>
<th>Purchase Online</th>
<th>E-mail at least 1/day</th>
<th>Own Computer</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil (N=96)</td>
<td></td>
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<td></td>
<td></td>
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**p<.01
Table 5
Hierarchical Regression Results

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*Standardized Betas reported.
** p < .01
* p < .05

Appendix

Measures used in Study*

**Informational Privacy Concerns** - Smith, Milberg, and Burke 1996.
Full Scale [Coefficient Alphas: BR=.82, CH=.89, RO=.84]
  Collection [Coefficient Alphas: BR=.87, CH=.85, RO=.81]
  Accuracy [Coefficient Alphas: BR=.78, CH=.85, RO=.87]
  Unauthorized Secondary Use [Coefficient Alphas: BR=.83 CH=.89, RO=.85]
  Improper Access [Coefficient Alphas: BR=.85 CH=.84 RO=.86]

**Uncertainty Avoidance** [Coefficient Alphas: BR=.82, CH=.77, RO=.83]

**Collectivism** [Coefficient Alphas: BR=.70 CH=.81, RO=.67]
Figure 1
Conceptual Framework

Cultural Influences
- Uncertainty Avoidance
- Collectivism

Internet Experiences
- Whether Purchased Online
- Level of Email Use

Background Variables
- Own Personal Computer
- Gender

Information Privacy Concerns
- Collection
- Accuracy
- Unauthorized Secondary Use
- Improper Access

Figure 2
Comparison of Z-Scores of Privacy and Culture Variables by Country

Z-score

Uncertainty Avoidance
Privacy Concern
Collectivism

Brazil  China  Romania