The theory of planned behavior and Internet purchasing

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Keywords

Internet, Shopping, Retail trade, Buying behaviour, Privacy, Trust

Abstract

Several opinion polls have found that many consumers resist making purchases via the Internet because of their concerns about the privacy of the personal information they provide to Internet merchants. Using the theory of planned behavior as its basis, this study investigated the relationships among beliefs about Internet privacy and trustworthiness, along with beliefs about perceived behavioral control and the expectations of important others, and online purchasing behavior. Data were collected from 193 college students. Analysis of the data indicates that beliefs about trustworthiness positively affect attitudes toward buying online, which in turn positively affect purchasing behavior. Beliefs about self-efficacy regarding purchasing positively affect perceived behavioral control, which in turn affects online purchasing behavior. In short, respondents who believed in the trustworthiness of the Internet and in their own abilities to buy online were more likely to make Internet purchases than were those without such beliefs.

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Introduction

Some 53 percent of Internet users in the USA have used the Internet to make purchases (Horrigan, 2002). Total e-tailing sales in the USA for 2002 were estimated at between US$45 billion (Regan, 2003) and US$52 billion (Jupiter Research, 2003). By 2005, the proportion of total retail sales conducted over the Internet in the USA should increase from the current 1.8 percent to 5 percent of total retail sales (Green, 2002). Not everyone buys online, however. For example, some 74 percent of Internet users did not use the Internet to purchase gifts during the 2001 holiday gift buying season. Their primary reason for not buying gifts over the Internet? A total of 36 percent of those who did not use the Internet to buy gifts over the holidays reported they did not want to risk using their credit card online (Rainie, 2002). A more recent study found similar sentiments: 28 percent of undergraduate students and 31 percent of non-students surveyed said they did not buy online due to concerns about privacy and security, their number one reason for not shopping online (Ahuja et al., 2003). These findings square with results of past studies of the reasons Internet users have been hesitant to buy online. For example, Ernst & Young (2001, p. 37), in a report on e-tailing, reported that “for millions of Web site visitors, privacy is the overriding concern: they want their history, behavior, and data protected.” An October 2001 study revealed that 72 percent of respondents were either “extremely concerned” or “very concerned” about their control over the release of private information after they had bought something online (Better Business Bureau, 2001). In this same survey, 56 percent of respondents reported they would be more willing to make online purchases if they had access to a secure ordering process.

The purpose of this paper is to examine the relationships between Internet purchasing and beliefs about the privacy and trustworthiness of the Internet. Specifically, how do individual beliefs about privacy and trustworthiness of the Internet affect individual intentions to make Internet purchases and actual purchasing behavior? To answer this question, a theoretical framework using the theory of planned behavior (TPB) as its basis was established. Using measurement scales created to assess different aspects of privacy and trustworthiness, as well as perceived behavioral control and subjective norms, a survey instrument was developed to test the various relationships implied by TPB. Data were collected from undergraduate students during the 2001 holiday season.
season, and the analysis of this data helps answer questions about the relationship of beliefs about Internet privacy and trustworthiness to actual online purchasing behavior.

A past paper (George, 2002) investigated similar issues but used secondary data collected as part of the GVU Internet surveys at the Georgia Institute of Technology. Because the data collected as part of the GVU effort had been originally collected for other purposes, the findings from that initial study were necessarily limited. For this study, it was possible to include measures that enabled testing of most aspects of the TPB as it relates to Internet purchasing.

The plan for this paper is as follows: first, the TPB is briefly reviewed, as are the relevant literatures on Internet privacy and trustworthiness. Next, the research model and hypotheses are presented, followed by a discussion of the research method and findings from the data analysis. A discussion of the meaning of the results and their implications ends the paper.

**Theory and past research**

**TPB**

TPB (Azjen, 1985, 1991) is an extension of the theory of reasoned action (TRA) (Azjen and Fishbein, 1980), made necessary by the latter model's inability to deal with behaviors over which individuals have incomplete volitional control (explained in more detail below). At the heart of TPB is the individual's intention to perform a given behavior (see Figure 1). For TPB, attitude toward the target behavior and subjective norms about engaging in the behavior are thought to influence intention, and TPB includes perceived behavioral control over engaging in the behavior as a factor influencing intention. TPB has been used in many different studies in the information systems literature (cf. Mathieson, 1991; Taylor and Todd, 1995a, b; Harrison et al., 1997). TRA and TPB have also been the basis for several studies of Internet purchasing behavior (Battacherjee, 2000; George, 2002; Jarvenpaa and Todd, 1997a, b; Khalifa and Limayem, 2003; Limayem et al., 2000; Pavlou, 2002; Suh and Han, 2003; Song and Zahedi, 2001; Tan and Teo, 2000).

According to TPB, an individual's performance of a certain behavior is determined by his or her intent to perform that behavior. Intent is itself informed by attitudes toward the behavior, subjective norms about engaging in the behavior, and perceptions about whether the individual will be able to successfully engage in the target behavior. According to Azjen (1985), an attitude toward a behavior is a positive or negative evaluation of performing that behavior. Attitudes are informed by beliefs, norms are informed by normative beliefs and motivation to comply, and perceived behavioral control is informed by beliefs about the individual's possession of the opportunities and resources needed to engage in the behavior (Azjen, 1991). Azjen compares perceived behavioral control to Bandura's concept of perceived self-efficacy (Bandura, 1997). TPB also includes a direct link between perceived behavioral control and behavioral achievement. Given two individuals with the same level of intention to engage in a behavior, the one with more confidence in his or her abilities is more likely to succeed than the one who has doubts (Azjen, 1991). As a general theory, TPB does not specify
the particular beliefs that are associated with any particular behavior, so determining those beliefs is left up to the researcher.

An underlying premise of the current study is that beliefs about privacy and trustworthiness of the Internet inform attitudes toward Internet purchasing. TPB provides a robust theoretical basis for testing such a premise, along with a framework for testing whether attitudes are indeed related to intent to engage in a particular behavior, which itself should be related to the actual behavior. Based on the theory, beliefs about how important referent others feel about Internet purchasing, and motivation to comply with the views of important others, should also influence intent to make Internet purchases. Finally, beliefs about having the necessary opportunities and resources to engage in Internet purchasing should influence intent to purchase as well as directly influence purchasing behavior itself.

Privacy
As indicated previously, privacy concerns have often been cited as one of the key reasons consumers do not make online purchases over the Internet. A March 2000 poll of Internet users who had not yet purchased anything over the Internet found that 94 percent of respondents were either very or somewhat concerned that companies they might buy from might use their information to send them unwanted information (*BusinessWeek*, 2000).

There are, of course, many different aspects of privacy as it relates to the Internet. Byford (1998) focused on two different theoretical aspects of privacy (Byford, 1998), a social relationships view and a property view. In the social relationships view, privacy is understood to act as a balance to the development of social relationships. Privacy is not so much the right to be let alone, as defined in American jurisprudence, as it is an important mechanism in social processes. This concept of privacy on the Internet would be manifested in anonymous interactions and assumed identities, as in chat rooms and MUDs, where social relationships among members of various Internet communities are being worked out. In the property view (Byford, 1998), individuals see privacy as the extent to which they control their own information in all types of cyberspace exchanges. The property view manifests itself in willing exchanges of personal information in exchange for valued services such as free e-mail or special discounts from merchants.

Although both of Byford’s conceptualizations of privacy are important to understanding individual behavior on the Internet, most of the concerns about privacy related to Internet purchasing seem to fall under the property view of privacy.

For example, results from the 1997 GVU Internet surveys indicate that 53 percent of online users are wary of the collection of personal data by commercial Web sites, and 66 percent do not register with Web site for fear that their personal information may be misused (GVU, 1997). In a more recent study, in which respondents were allowed to articulate their own concerns about Internet purchasing, 5.6 percent named the unauthorized sharing of personal data as one of their key concerns about Internet purchasing, while 7.1 percent named unauthorized access to personal information, and 20.1 percent named unauthorized access to credit card information (Miyazaki and Fernandez, 2001). The Ernst & Young (2001) and Better Business Bureau (2001) studies mentioned in the introduction echo these concerns about control over personal information.

Privacy has long been a concern in the information systems literature, especially in the work of Culnan and Smith, and concern about control over personal information has been one of the key aspects of privacy that has been investigated in this literature. Culnan (1993), in a study on direct marketing and attitudes toward secondary information use, developed two scales for measuring two different facets of attitudes towards privacy, loss of control and unauthorized secondary use. The loss of control scale makes references to the loss of control over personal information by consumers, but it also references the loss of privacy due to having a credit card. Secondary use refers to personal information being used for some additional purpose other than that for which it was originally collected. Culnan found that people who are less sensitive about unauthorized secondary use of information are more positive about shopping by mail, have developed coping strategies for dealing with unwanted mail, and have a lower concern about privacy, as measured by loss of control over personal information, than do those individuals who are more sensitive about the secondary use of their information. Although her study did not focus on privacy and the Internet, its measure of attitudes towards unauthorized secondary use and its associated findings are applicable to studies of Internet privacy.

Smith *et al.* (1996) developed and validated an instrument that measures dimensions of organizational information privacy practices. Their work revealed four dimensions of information privacy practices: collection, errors, unauthorized secondary use (similar to Culnan’s concept), and improper access. Although the focus of their instrument development and validation was on people’s attitudes towards how organizations dealt with their own personal data,
Smith and colleagues’ measurements could easily extend to attitudes toward how Web sites, and the organizations that operate them, deal with personal information.

Given past research on information systems and privacy, with its focus on unauthorized use of personal information, and given the primacy of consumer fears about the misuse and unauthorized sharing of their personal data, beliefs about privacy are conceptualized in this study in terms of the authorized use and sharing of personal data by Internet entities that collect it. This approach differs from past studies that have considered the role of privacy in Internet purchasing. Limayem et al. (2000) and Khalifa and Limayem (2003) had a single global measure for privacy ("[p]rivacy violation is a major problem for purchasing through the Web"), as did Jarvenpaa and Todd (1997a, b) ("[t]he process of shopping on the Web puts the consumers' privacy in jeopardy") and Miyazaki and Nath (2003)[1]. Miyazaki and Fernandez (2001) collapsed responses to open-ended questions about online shopping concerns into the presence of absence of three categories of concerns: privacy, system security (i.e. Internet security), and security (i.e. fraudulent behavior on the part of Internet retailers). George (2002) used pre-existing GVU survey items to measure Byford’s social relationships and property views of privacy. Swaminathan et al. (1999) also analyzed the GVU data, using 11 items to measure four aspects of privacy, two of which were similar to George’s measures of Byford’s views of privacy. The measure of privacy most similar to the one used in this study was designed by Suh and Han (2003). They used five indicators of privacy, three of which dealt with unauthorized use of personal information. Their other two items asked about the selling of personal information by a Web site and whether or not a Web site would remove personal information if asked to do so.

The findings from these studies regarding privacy and Internet purchasing are mixed, partly because the research models differ across studies in terms of what other constructs privacy is hypothesized to be related to. Where privacy is hypothesized to directly affect intention to shop online, there appears to be no relationship (Limayem et al., 2000; Khalifa and Limayem, 2003; Jarvenpaa and Todd, 1997a, b). On the other hand, there is support for a hypothesized relationship between privacy and attitudes toward Internet shopping (Jarvenpaa and Todd, 1997a, b; George (2002)). A direct link between privacy concerns and actual online purchasing behavior is tenuous: Miyazaki and Fernandez (2001) found no relationship between privacy concerns and Internet purchasing behavior, while Swaminathan et al. (1999) found two of their four measures of privacy to be related to Internet purchasing behavior: concerns about the creation of laws protecting Internet privacy were associated with higher levels of Internet purchasing, and beliefs about marketers’ need for information about consumers had a slight \( p < 0.1 \) negative effect on the amount spent on Internet purchases. Two other studies found a relationship between privacy concerns and trust in e-commerce (Mukherjee and Nath, 2003; Suh and Han, 2003).

**Internet trustworthiness**

Much of an individual’s attitude toward making Internet purchases can be thought of in terms of trust. Many consumers do not trust Web providers enough, with their personal information, to engage in relationship exchanges with them (Hoffman et al., 1999). Although trust has been defined in various ways, a particularly straightforward definition is “that one believes in, and is willing to depend on, another party (McKnight et al., 1998, p. 474).” Trust occurs only when those involved “are assured of others’ willingness and ability to deliver on their obligations (Ratnasingham, 1998, p. 314).” In view of consumer concerns over the trustworthiness of the Internet, it should not be surprising that a recent laboratory experiment found that subjects perceived Internet shopping as more risky than print catalog shopping (Jones and Vijayasarthathy, 1998). Consumer views of the trustworthiness of the Internet, then, should be expected to affect their willingness to purchase online.

Five recent studies looked at trust in the Internet and its role in online purchasing behavior. Battacherjee (2002) developed and validated a seven-item scale for measuring trust in online firms. George (2002) measured trustworthiness with three items taken from the GVU survey instruments, and found that positive beliefs about the trustworthiness of the Internet were related to positive attitudes toward Internet purchasing. Pavlou (2002), using a TPB model, found that trust in an online retailer was statistically significantly correlated with attitudes toward online transactions and with perceived behavioral control. Suh and Han (2003) found trust in e-commerce was statistically significantly related to both attitudes toward using e-commerce and intention to use e-commerce. They measured trust in e-commerce, however, with five items that focused on a single Web site instead of on e-commerce more generally. Mukherjee and Nath (2003) found trust to be statistically significantly related to relationship commitment to an online vendor. They did not report the items they used to measure trust, but it appears to be a global
measure of trust in the Internet. Their study focused on Internet banking, and in discussing trust, they say that “The customers’ orientation toward the technology of electronic communication and the Internet is frequently a proxy for their trust in Internet banking.” This study follows George (2002), Suh and Han (2003), and Mukherjee and Nath (2003) conceptually in seeking to measure global trust in the Internet for personal, as opposed to employer-related, business.

### Research model and hypotheses

The research model used in the study, shown in Figure 2, is based on TPB. The behavior in question is purchasing over the Internet. As mentioned earlier, the typical TPB model would include the intention to make Internet purchases as a construct antecedent to purchasing behavior. However, as the data in this study were all collected at one point in time, it is not possible to include both intention to perform a behavior and the behavior itself in the model. Intentions reflect future behavior, while reports of actual behavior reflect what happened in the past. Past behavior is at best a surrogate for future behavior and not always a good one. Therefore, intention does not appear in the model, and instead there is a direct path from attitudes towards Internet purchasing to purchasing behavior. The relationship between subjective norms and purchasing is also posited as a direct relationship here. Similarly, in a typical TPB model, the relationship between perceived behavioral control and behavior would be both direct and mediated by intention, but the mediated relationship has been omitted in this model, given the absence of intention. The direct relationship between PCB and behavior remains. Two sets of beliefs are posited that help determine attitudes toward Internet purchasing:

1. beliefs about Internet trustworthiness (based on work by Hoffman *et al.* (1999), and Jones and Vijayasarathy (1998)), i.e. whether the Internet is trustworthy for conducting personal business; and
2. beliefs about the unauthorized secondary use of personal information (Culnan, 1993; Smith *et al.*, 1996), specifically whether companies should be able to use personal information without permission.

The seven hypotheses embodied in the model are listed below. The directionality stated in each hypothesis is derived from the prior discussion about different beliefs about privacy and from the basic structure of TPB. Beliefs in the trustworthiness of the Internet should be associated with a willingness to buy online. If an individual believes that the Internet is a trustworthy channel for conducting personal business generally, then those beliefs should positively influence the individual’s attitudes
toward using the Internet for shopping and buying. Therefore:

**H1.** Beliefs that the Internet is trustworthy should positively influence attitudes toward Internet purchasing.

Given the often reported concerns about privacy that current and potential Internet users have, one would expect that beliefs about privacy would also influence attitudes about Internet purchasing. Respondents to surveys reported earlier in the paper indicated that they were not buying on the Internet because of their concerns about misuse of personal information they would need to provide to successfully transact over the Web. Concerns about unauthorized sharing or use of personal information by vendors should lead to negative attitudes toward Internet purchasing:

**H2.** Beliefs that companies should not share or use personal information without permission should negatively influence attitudes toward Internet purchasing.

The remaining five hypotheses and the expectations they contain are derived directly from TPB. Positive attitudes toward the behavior in question should result in the conduct of that behavior:

**H3.** Positive attitudes toward Internet purchasing should positively influence online purchasing behavior.

An individual’s normative structure, i.e. his or her beliefs about what important others think about the behavior in question, should directly influence his or her subjective norms, or perceptions of the social pressure to comply with expectations about engaging in the behavior. Subjective norms should in turn influence the individual’s proclivity to engage in the behavior. If social expectations are that people should engage is the behavior in question, then the individual should be more likely to do so. Conversely, if social expectations are that people should not engage in the behavior, then the individual should be less likely to do so. In this case, if purchasing over the Internet is seen as socially desirable behavior, based on what important others think about it, then the individual is more likely to make Internet purchases:

**H4.** Beliefs about what important others think about Internet purchasing should influence an individual’s subjective norms about Internet purchasing.

**H5.** Subjective norms about Internet purchasing should positively influence online purchasing behavior.

According to TPB, an individual’s beliefs about his or her abilities to perform the behavior in question also influence whether or not he or she actually engages in the behavior. As stated earlier, given two individuals with the same intention to engage in a behavior, the one with the stronger beliefs about his or her abilities, or perceived behavioral control, is more likely to actually perform. One of the key antecedents to perceived behavioral control in most formulations of TPB in MIS is self-efficacy, or the individual’s self-confidence in his or her ability to perform the behavior. In terms of Internet purchasing, if an individual is self-confident about engaging in activities related to purchasing online, he or she should feel positively about his or her behavioral control over making Internet purchases. The more in control an individual feels about making Internet purchases, the more likely he or she will be to do so. Therefore:

**H6.** Positive beliefs about self-efficacy of making Internet purchases should positively influence perceived behavioral control over making Internet purchases.

**H7.** Positive beliefs about perceived behavioral control should positively influence online purchasing behavior.

### Study design

Data collection took place in November and December 2001. A total of 193 undergraduate students were recruited from sophomore level classes at a southeastern university to complete a questionnaire that contained measures of the constructs of concern. The questionnaire was pilot tested with a small number of undergraduate students. Table I lists descriptive statistics about the sample.

The approach to testing the TPB model was based on that used by Taylor and Todd (1995a) to test a TPB model with decomposed belief structures. Measures of attitude (four items), subjective norms (two), perceived behavioral control (three), normative structure (four), and self-efficacy (four) were all based on an instrument developed by Taylor and Todd (1995a). The referent others used in the normative structure questions were parents, friends, classmates, and professors. Items measuring Internet trustworthiness (four) were based on Jarvenpaa et al. (1998), who measured the trustworthiness of virtual teams, and who adapted the organization trustworthiness scale developed by Pearce et al. (1994). Measures of the beliefs about the unauthorized secondary use of personal information (two) were based on Culnan’s (1993) scale. Each belief item (normative structure, control structure, trustworthiness, and
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Table I Sample statistics

<table>
<thead>
<tr>
<th>Age</th>
<th>Mean (years)</th>
<th>SD (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>23.2</td>
<td>4.7</td>
</tr>
<tr>
<td>Female</td>
<td>23.0</td>
<td>5.1</td>
</tr>
</tbody>
</table>

Gender

<table>
<thead>
<tr>
<th>Race</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>4</td>
</tr>
<tr>
<td>Black</td>
<td>12</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5</td>
</tr>
<tr>
<td>White</td>
<td>75</td>
</tr>
<tr>
<td>Chose not to disclose</td>
<td>4</td>
</tr>
</tbody>
</table>

Academic major

| MIS        | 36              |
| Marketing  | 19              |
| Accounting | 14              |
| Other      | 12              |
| General business | 10        |
| Finance    | 9               |

Internet experience (years)

<table>
<thead>
<tr>
<th>Frequency of online buying</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
</tr>
<tr>
<td>Twice per year</td>
</tr>
<tr>
<td>Monthly</td>
</tr>
<tr>
<td>Weekly</td>
</tr>
<tr>
<td>Daily</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amount spent online each month (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>&lt;50</td>
</tr>
<tr>
<td>50-100</td>
</tr>
<tr>
<td>100-250</td>
</tr>
<tr>
<td>&gt;250</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items bought online during the last six months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other (includes hardware, flowers, phone cards</td>
</tr>
<tr>
<td>and airplane tickets)</td>
</tr>
<tr>
<td>Clothes</td>
</tr>
<tr>
<td>Books</td>
</tr>
<tr>
<td>Music CDs</td>
</tr>
<tr>
<td>Movies</td>
</tr>
<tr>
<td>Software</td>
</tr>
<tr>
<td>Sports equipment</td>
</tr>
</tbody>
</table>

Notes: All figures are percentages unless otherwise stated. a There is a discrepancy between the 22 percent of respondents who say they have never bought anything online and the 31.5 percent who say they spend nothing per month on Internet purchases. A cross-tabulation reveals this discrepancy to be due to 16 respondents who report spending nothing per month on Internet purchase but who also report making such purchases "a couple times per year." Although it is impossible to know why these 16 respondents would answer these questions this way without asking them (which was not done), it is possible the discrepancy comes from the differences in timing in the relevant items on the questionnaire. The spending question was framed in terms of amount per month, while the amount spent question was framed in terms of number of purchases per year. It is plausible that the 16 respondents who made only one or two purchases per year were trying to average the amount of their purchases over a 12-month period in order to get a monthly amount, and the resulting monthly amount was so low it was essentially nothing. A single annual purchase of US$10 averages out to about 80 cents per month, which is essentially nothing. b Proportion of sample that reported buying these items: total does not add to 100 percent as respondents could choose more than one item.

unauthorized secondary use (had a corresponding evaluation item. For analysis, each belief item score was multiplied by its corresponding evaluation item score. Actual purchasing behavior was measured with a single item, “How much would you say you spend on Internet purchases each month?” Although multiple-item scales are preferred in most cases, a single item will suffice in some instances, as when individuals can be counted on to respond to a single item with relatively high degrees of accuracy (DeVellis, 2003). There were also eight demographic questions included in the instrument. These items are included in the Appendix, and descriptive statistics for the scales are included in Table II.

The data were analyzed using partial least squares (PLS), using PLSGraph software developed by Chin (Chin and Frye, 1998). First, the model in Figure 2 was run. The average variance explained (AVE) for each construct was above the 0.5 cutoff level (Table III). Next, item loadings were checked to make sure they were all above 0.5, and all were. Internal consistency reliabilities (ICRs) were then computed for each construct that had more than two indicators. The measurement model with item loadings appears in Figure 3. All constructs made up of three items had ICRs of 0.8 or higher, and all constructs made up of four items had ICRs of 0.9 or higher. For scales with only two items, Cronbach alphas were calculated. Measures of reliability for all scales are included in Table III. The statistical significance of the paths in the model was tested using PLSGraph’s jackknifing procedure, with a sample size of 1, for 193 samples. Using one-tailed tests, five of seven paths were statistically significant, one at the p < 0.05 level, and four at p < 0.01, providing support for H1, H3, H4, H6, and H7. The evaluated model is shown in Figure 4, with adjusted t-statistics and path coefficients listed in Table IV.

Results and discussion

Several past surveys have reported that many consumers have claimed that privacy concerns have prevented them from making online purchases, but none of these studies have investigated the actual associations between beliefs about privacy and either intended or actual purchasing behavior. This study has demonstrated, at least for this sample, that the trustworthiness of the Internet is more important than concerns over the unauthorized use of personal data provided to third parties, for shaping attitudes toward Internet purchasing. Internet trustworthiness beliefs had a significant impact on attitudes (H1), while privacy beliefs about
Table II Descriptive statistics for constructs

<table>
<thead>
<tr>
<th>Construct</th>
<th>n</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>193</td>
<td>1</td>
<td>7</td>
<td>5.10</td>
<td>1.279</td>
</tr>
<tr>
<td>Trust</td>
<td>191</td>
<td>1</td>
<td>7</td>
<td>4.65</td>
<td>1.008</td>
</tr>
<tr>
<td>Unauthorized use</td>
<td>192</td>
<td>2</td>
<td>7</td>
<td>6.25</td>
<td>0.961</td>
</tr>
<tr>
<td>Subjective norms</td>
<td>191</td>
<td>1</td>
<td>7</td>
<td>3.88</td>
<td>1.178</td>
</tr>
<tr>
<td>Normative structure</td>
<td>190</td>
<td>1</td>
<td>6.5</td>
<td>3.92</td>
<td>1.129</td>
</tr>
<tr>
<td>Perceived behavioral control</td>
<td>193</td>
<td>3</td>
<td>7</td>
<td>6.26</td>
<td>0.734</td>
</tr>
<tr>
<td>Efficacy</td>
<td>192</td>
<td>2</td>
<td>7</td>
<td>6.13</td>
<td>0.835</td>
</tr>
<tr>
<td>Purchasing</td>
<td>181</td>
<td>1</td>
<td>5</td>
<td>1.88</td>
<td>0.765</td>
</tr>
</tbody>
</table>

Table III Correlations and average variance extracted (on diagonal in italic)

<table>
<thead>
<tr>
<th>Reliability</th>
<th>Purch</th>
<th>Att</th>
<th>SNorm</th>
<th>PBC</th>
<th>Unauth</th>
<th>Trust</th>
<th>NStr</th>
<th>Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purch</td>
<td>1.000</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Att</td>
<td>0.94</td>
<td>0.458</td>
<td>0.790</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SNorm</td>
<td>0.81</td>
<td>0.199</td>
<td>0.425</td>
<td>0.900</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>0.81</td>
<td>0.292</td>
<td>0.245</td>
<td>0.042</td>
<td>0.781</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unauth</td>
<td>0.75</td>
<td>0.056</td>
<td>0.040</td>
<td>−0.045</td>
<td>−0.035</td>
<td>0.781</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>0.94</td>
<td>0.263</td>
<td>0.536</td>
<td>0.455</td>
<td>0.227</td>
<td>0.029</td>
<td>0.733</td>
<td></td>
</tr>
<tr>
<td>NStr</td>
<td>0.90</td>
<td>0.061</td>
<td>0.248</td>
<td>0.634</td>
<td>0.003</td>
<td>0.037</td>
<td>0.268</td>
<td>0.699</td>
</tr>
<tr>
<td>Efficacy</td>
<td>0.80</td>
<td>0.364</td>
<td>0.408</td>
<td>0.269</td>
<td>0.480</td>
<td>−0.052</td>
<td>0.317</td>
<td>0.080</td>
</tr>
</tbody>
</table>

Note: All reliability measures are internal consistency reliability (ICR) measures, except those for subjective norms and unauthorized use, both of which are Cronbach alphas, computed because these scales only had two items each.

Figure 3 Measurement model with item loadings
Unauthorized use of personal information did not (no support for H2). Attitudes toward Internet purchasing, in turn, affected actual purchasing behavior (H3). As would be expected from TPB, beliefs about self-efficacy of using the Internet for consumer purchases directly affected perceived behavioral control (H6), and PCB in turn directly affected online purchasing behavior (H7). There was no relationship between subjective norms and Internet purchasing (no support for H5), although there was a strong relationship between normative structure and subjective norms, as expected (H4). In short, respondents who believed in the trustworthiness of the Internet and in their own abilities to successfully engage in online buying behavior actually engaged in Internet purchasing.

These findings are similar to those reported in other studies. Like George (2002), Pavlou (2002), and Suh and Han (2003), there was a strong relationship between trust and attitudes toward e-commerce. Like Battacherjee (2000) and Song and Zahedi (2001), there was a strong relationship between normative structure and subjective norms. Like Limayem et al. (2000) and Khalifa and Limayem, there was a strong relationship between PBC and actual Internet purchasing. Like Battacherjee (2000) but unlike Song and Zahedi (2001), there was a strong relationship between self-efficacy and PBC. However, the lack of a relationship between beliefs about privacy contradicts findings of such a relationship in Jarvenpaa and Todd (1997a, b) and George (2002).

Table IV Adjusted t-statistics and standardized path coefficients for hypothesized paths in the model

<table>
<thead>
<tr>
<th>Path</th>
<th>Path coeff.</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1. Trustworthiness to attitudes*</td>
<td>0.535</td>
<td>6.066</td>
</tr>
<tr>
<td>H2. Unauthorized use to attitudesns</td>
<td>0.024</td>
<td>-0.678</td>
</tr>
<tr>
<td>H3. Attitudes to purchasing*</td>
<td>0.403</td>
<td>5.238</td>
</tr>
<tr>
<td>H4. Norm. structure to subj. norms*</td>
<td>0.634</td>
<td>10.464</td>
</tr>
<tr>
<td>H5. Subjective norms to purchasingns</td>
<td>0.020</td>
<td>0.242</td>
</tr>
<tr>
<td>H6. Efficacy to PBC*</td>
<td>0.480</td>
<td>3.653</td>
</tr>
<tr>
<td>H7. PBC to purchasing**</td>
<td>0.192</td>
<td>1.746</td>
</tr>
</tbody>
</table>

Notes: * Statistically significant at p > 0.01; ** statistically significant at p > 0.05; ns not statistically significant
In the current study, TPB served as a useful foundation for helping explain Internet purchasing, even though the model used here departed from TPB traditions by not including intentions. The relationship between attitudes towards online purchasing and the actual behavior was strong and positive, even though it was not mediated by intention. The direct relationship in TPB between perceived behavioral control and behavior was supported here, and the relationship between self-efficacy and PBC was strong. Typically in TPB models, the effects of subjective norms on behavior would also be mediated by intention instead of the direct relationship posited here. That hypothesized direct relationship was not supported, even though the expected relationship between normative structure and subjective norms was. In this particular case, it may be that parents, friends, professors and classmates are not the important others that students listen to for determining their Internet behavior. Battacherjee (2000) found a strong relationship between subjective norms and intention, with the strongest antecedent to subjective norms being such external influences as news reports, the popular press, and mass media. It may also be the case here that external influences such as mass media would have been more persuasive than the referent others specified in the questionnaire.

As for the behavior studied, Internet purchasing, the findings imply that consumers are swayed more by their perceptions about the trustworthiness of the Internet than by concerns they might have about unauthorized use of their personal information by Internet merchants. Beliefs about improper access to personal information were not significant determinants of attitudes toward Internet purchasing. The secondary use of personal information has always been a strong theme in IS-related privacy literature (Byford, 1998; Culnan, 1993; Smith et al., 1996), so it is surprising beliefs about unauthorized use of personal information were not an important shaper of attitudes toward Internet purchasing. This finding could be due to the youth of the respondent pool, with an average age just over 23. This age group may not have the same views about secondary use of information as older generations.

**Implications for research and practice**

From a research perspective, the study results demonstrate once again the robustness of the TPB for helping to explain Internet purchasing behavior. Other studies have also successfully used the TPB or the TRA as a theoretical framework from which to explain intention toward Internet purchasing or other e-commerce activity (Battacherjee, 2000; Jarvenpaa and Todd, 1997a, b; Pavlou, 2002; Song and Zahedi, 2001; Tan and Teo, 2000) or to explain actual purchasing behavior (George, 2002; Khalifa and Limayem, 2003; Limayem et al., 2000; Suh and Han, 2003). In addition to the importance of attitudes toward the behavior in question, some of these studies have found subjective norms to also be important (e.g. Khalifa and Limayem, 2003), while others have found perceived behavioral control to also be important (e.g. Tan and Teo, 2000). Both cases demonstrate the increased power of the TPB over the simple TRA. As more and more studies of Internet purchasing behavior and its antecedents are done within the TPB framework, we are more able to discover and confirm which antecedents are most important, helping us build a robust theory of Internet purchasing behavior.

From a practical perspective, as a cumulative body of work on Internet purchasing emerges, we will be better able to advise vendors on the elements they need to address in order to increase their Web site traffic. In this study, the one area of findings that may help Web merchants the most concerns trust. We found that beliefs about the trustworthiness of the Internet as a channel for conducting personal business were associated with positive attitudes toward Internet purchasing, and these positive attitudes were in turn associated with actual purchasing behavior. Note that we did not measure trustworthiness in Internet merchants but that we instead measured trust in the Internet itself. The implication is that vendors can focus on promoting the Internet as trustworthy, and in doing so, they can generate positive attitudes toward buying online. Groups of merchants might go in together on advertising that promotes the trustworthiness of the Internet, and Internet service providers, portals, and business associations made up of Web merchants might adopt a similar stance. Such a strategy can be accompanied by steps to promote the trustworthiness of a particular Web site and is not considered a replacement for such a campaign. As we did not measure trust in Internet merchants per se, we cannot address the relationship between trust in Internet vendors and attitudes toward online buying.

**Directions for future research**

This study considered only two antecedents to attitudes toward Internet purchasing. There may well be others that should be considered in future research, such as other aspects of privacy, such as Byford’s (1998) social relationship and property views of privacy. Valid and reliable scales for these constructs need to be developed, however, in order to include them in future studies (George, 2002).
Beliefs about security, distinguished from beliefs about privacy, could also be included, given the current media focus on computer and network security. Also, this study asked respondents about the importance of classmates, parents, teachers, and friends in determining their views about buying on the Internet. For this sample, not all of these “important others” were viewed as influential. Future studies could test the importance of a normative structure based on other influences than the ones tested here. Mass media, including the Internet itself, seem likely candidates. TPB can be used to test these modified models of salient beliefs and influential others, in order to provide additional insights into how to induce more consumers to make Internet purchases.

Future research could include measures of both intention to buy and actual purchasing behavior. As intention measures future behavior, and actual purchasing measures past behavior, there should be a time lag between when intention is measured and when behavior is measured. How long such a time lag should be is not always clear. For example, Davis et al. (1989), in one of the first tests of the Technology Acceptance Model, which was based on TRA, waited 14 weeks between measuring intention and measuring behavior. Fourteen weeks may be too long a period to wait between measures of intention and of buying for Internet purchases, but some time lag is needed. Having measures of both intention and behavior strengthen the results of almost any TPB-based study, even though past studies have typically demonstrated a strong relationship between these two constructs (Azjen, 1991).

Despite the fears some consumers have about making online purchases, online purchasing behavior continues to grow in volume, and more and more people seem to be taking the plunge and buying online (Green, 2002; Horrigan, 2002). As the proportion of people who refuse to buy online continues to shrink, concerns about privacy, trust, and security may be overshadowed by other concerns. Ahuja et al. (2003) found privacy and security concerns to be the most common reason their respondents gave for not shopping online, but other reasons were not far behind on their list. While 31 percent of non-students among their respondents cited security and privacy as their main concern, another 28 percent cited customer service, and 10 percent cited high prices. As shopping on the Internet starts to lose its novelty, it becomes more comparable to other ways to purchase products and services, and as such, the concerns shift to those typical of doing business with any other type of merchant. It will be important for surveys, such as the one conducted by Ahuja and colleagues, to be conducted regularly over the next several years in order to track changes in consumer perceptions about the Internet and online purchasing, to inform both vendors and researchers about what the most salient issues have become.

**Limitations**

As with any study, there are limitations to the study described here. One possible drawback is the use of student as respondents. College students have extensive experience with the online world, however. In the sample used here, 88 percent had 4 or more years of experience with the Internet. College students should have enough knowledge about the Internet, then, to answer questions about making online purchases and their beliefs about the privacy and trustworthiness of the Internet. If anything, students may not be completely representative of the population at large because they have more Internet experience. They may in fact represent the vanguard of online purchasers, providing insight into the potential behavior of consumers to come.

Nevertheless, the usual cautions about overgeneralizing findings from this sample, to populations for which it is not strictly representative, apply. The sample was not randomly drawn to represent a population to which findings could be generalized. Instead, it was a convenience sample, and as such, the ability to generalize the findings very far beyond the sample is limited. The most optimistic generalization may be to American undergraduate students, with four or more years of Internet experience, at large state universities.

**Note**

1 The Mukherjee and Nath (2003) item on privacy is not reported in their paper, but it apparently deals with privacy violations and data confidentiality.

**References**


Ernst & Young (2001), "Global online retailing", available at: www.ey.com/global/gcr.nsf/US/Library_-_Retail&Consumer_Products_-_Ernst&Young LLP


Appendix

Figure A1 Items from questionnaire on Internet purchasing

Unless indicated otherwise, all items used this scale:

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Neutral</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Attitude

Buying things over the Internet is a:
Bad idea  1  2  3  4  5  6  7 Good idea

Buying things over the Internet is a:
Foolish idea  1  2  3  4  5  6  7 Wise idea

Buying things over the Internet is an idea I:
Dislike  1  2  3  4  5  6  7 Like

Using the Internet to buy things would be:
Unpleasant  1  2  3  4  5  6  7 Pleasant

Unauthorized secondary use

Companies should not use personal information for any purpose other than the one authorized.

A company using my personal information for any purpose other than the one authorized is:
Good  1  2  3  4  5  6  7 Bad

A company should not share personal information about me without my permission.

A company sharing personal information about me without my permission is:
Good  1  2  3  4  5  6  7 Bad

Internet trustworthiness

The Internet is a reliable way for me to take care of my personal affairs.

Taking care of personal business over the Internet is a:
Bad idea  1  2  3  4  5  6  7 Good idea

The Internet is trustworthy.

Putting trust in the Internet is a:
Bad idea  1  2  3  4  5  6  7 Good idea

I can use the Internet to achieve my goals related to my personal affairs.

Achieving your personal goals by using the Internet for personal business is a:
Bad idea  1  2  3  4  5  6  7 Good idea

I believe in the integrity of the Internet for conducting personal business.

Believing in the integrity of the Internet for conducting personal business is a:
Bad idea  1  2  3  4  5  6  7 Good idea

Subjective norms

People who influence my behavior would think that I should buy things over the Internet.

People who are important to me would think that I should buy things over the Internet.

(continued)
Figure A1

Normative structure

My friends would think that I should buy things over the Internet.

Generally speaking, I want to do what my friends think I should do.

My classmates would think that I should buy things over the Internet.

Generally speaking, I want to do what my classmates think I should do.

My professors would think that I should buy things over the Internet.

Generally speaking, I want to do what my professors think I should do.

My parents would think that I should buy things over the Internet.

Generally speaking, I want to do what my parents think I should do.

Perceived behavioral control

I am capable of buying things over the Internet.

Buying things over the Internet is entirely within my control.

I have the resources and the knowledge and the ability to buy things over the Internet.

Control structure: Self-efficacy

I would feel comfortable buying things over the Internet on my own.

For me, feeling comfortable buying things over the Internet on my own is:

Unimportant 1 2 3 4 5 6 7 Important

If I wanted to, I could easily buy things over the Internet on my own.

For me, being able to easily buy things over the Internet on my own is:

Unimportant 1 2 3 4 5 6 7 Important

I would be able to buy things over the Internet even if there was no one around to show me how to.

For me, being able to buy things over the Internet even if there is no one around to show me how to is:

Unimportant 1 2 3 4 5 6 7 Important

On-line purchasing behavior

How much would you say you spend on Internet purchases each month?

Nothing 1 Less than $50 2 $50 to $100 3 $100 to $250 4 More than $250 5

Demographics

How long have you been using the Internet (including using email, gopher, ftp, etc.)?

Less than 6 months 1 6 to 12 months 2 1 to 3 years 3 4 to 6 years 4 7 years or more 5

What is your age? _____

What is your major? _______________________

What is your gender? _____ Male _____ Female _____ Do not wish to disclose

Do you own a PC? _____ Yes _____ No

(continued)
Figure A1

Race/Ethnicity:
- Asian/Pacific Islander
- Black
- Hispanic
- Native American
- White
- Do not wish to disclose

How often do you buy things over the Internet?

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>A couple times a year</th>
<th>Monthly</th>
<th>Weekly</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

If you have bought some things over the Internet in the last 6 months, what did you buy? *Please circle the numbers of all that apply.*

1) Books  
2) Music CDs  
3) Software  
4) DVDs or videotapes  
5) Clothes  
6) Sports equipment  
7) Other (please specify: ________________________)