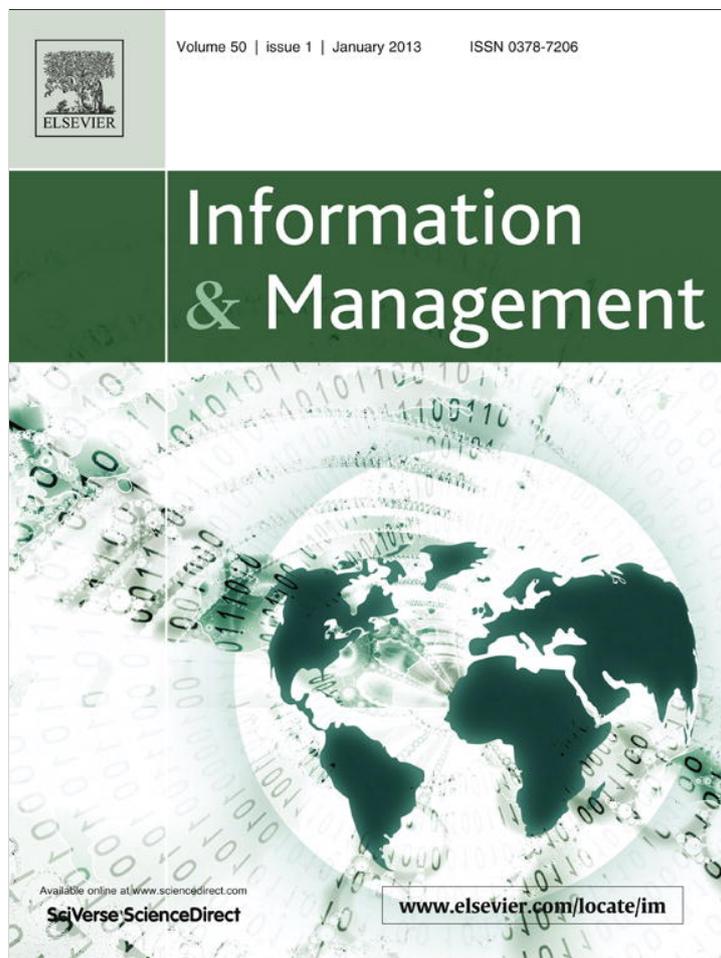


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A model of consumers' perceptions of the invasion of information privacy

Kathy S. Schwaig^{a,*}, Albert H. Segars^b, Varun Grover^c, Kirk D. Fiedler^d^a *Coles College of Business, Kennesaw State University, United States*^b *Kenan-Flagler Business School, University of North Carolina, United States*^c *College of Business and Behavioral Science, Clemson University, United States*^d *The Moore School of Business, University of South Carolina, United States*

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ABSTRACT

We examined factors that influence an individual's attitude and decisions about the information handling practices of corporations. Results from a survey of 425 consumers suggested that the hypothesized model was an accurate reflection of factors that affect privacy preferences of consumers. The results provide important implications for research and practice. Our study should contribute by initiating an integrative stream of research on the impact of IT and other factors on information privacy perception. For practitioners, our findings suggested that consumers hold corporations, not the IS, responsible for any inappropriate use of personal information. Organizations, therefore, must be proactive in formulating and enforcing information privacy policy in order to address consumers' concerns.

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1. Introduction

The loss of private, consumer information and the prosecution of culpable organizations have been heavily reported in recent years. Concerns for information privacy are especially important in the on-line context where face to face interactions are absent, behavioral intentions of the organization collecting personal data are not always evident, and personal information is often collected without the express consent of the customer [5]. For web vendors, software makes it easy and common to collect information about consumer purchases. Sophisticated and inexpensive software helps predict consumer behavior based on past purchases.

Arguably collection of personal information is a competitive necessity for organizations [10]. Increased competition, saturated markets, and demanding consumers have reduced profits in many industries. A popular competitive response has been to market new products and services to existing customers in an attempt to increase the profitability derived from each customer. Another has been to target narrowly defined market segments by identifying and satisfying individual consumer's product needs and wants. Both require consumer personal

information to make predictions on the best markets in which to sell products.

IT has increased IS efficiency but has also heightened consumer concern about the free flow of information [1], making individuals worried about engaging in e-commerce [3]. Media attention is even affecting where they do business and to whom they provide personal information. Breaches of trust between businesses and consumers can hurt the drive for improved business efficiency and the introduction of new product markets. Further, security concerns affect customer confidence in e-markets [19,20].

The threat of a loss of personal information resulting from the new IT [16], especially in industries such as finance and health care [15], has required solutions to the problem involving a wide set of actions ranging from organizational policy statements [22] to legislative intervention. Many experts have proposed that the public needs to be educated about privacy. Dinev and Hart [7] drew upon utility maximization theory to assess the effect of contrasting factors such as risk and trust on willingness to provide personal information. Hui et al. [9] used a similar approach, drawing upon contemporary choice theory, to propose a model that explained the impact of information practice on consumer's disclosure of information. Stewart and Segars [25] developed a network of variables and relationships to explain the concerns of privacy. Also Awad and Krishnan [2] looked at the effect of information transparency on consumer's willingness to partake in personalization.

* Corresponding author at: Coles College of Business, 1000 Chastain, Kennesaw, GA 30144, United States. Tel.: +1 770 423 6323; fax: +1 770 423 6539.

E-mail address: kschwaig@kennesaw.edu (K.S. Schwaig).

While this body of knowledge contributed to our understanding of privacy issues, much has been based on opinion and with sparse empirical results. Little has been reported that provides empirical evidence on why only some consumers are concerned with their privacy. Also, most work has been based on off-line operations and does not examine whether the technology medium influences privacy concerns; however it has been argued that privacy issues should also be studied in an on-line context [18]. The research objective of our study, therefore, was to develop a predictive model for understanding consumer attitudes and to test it empirically.

2. The theoretical framework

Recent articles have noted the importance of information privacy in the IS literature and the need for additional empirical studies [17,23]. Recent relevant literature and key findings indicate that:

- the literature is substantial and emphasizes the importance of the privacy issue and the need for its resolution;
- the human resource literature provides support for investigating the attributes of an *information practice* and its consequential impact on *perceptions* of privacy invasion and the appropriateness of using scenario-based methods to study such relationships;
- the literature emphasizes how individual differences, personality, trust, and perception of information practices can impact attitude and behavior.

While existing studies have identified constructs and relationships, the majority of the studies did not provide an integrated view of the network of relevant constructs. Based on the empirical literature reviewed, several categories of variables that impact a consumer's attitude toward information privacy invasion were identified. First, *individual differences and personality characteristics* have an impact on privacy perception. Next, a *general concern* for information privacy may impact a consumer's perception of privacy invasion in a specific context. Other research within marketing has also confirmed that consumer attributes, such as privacy concerns and personalization values, impact attitude toward services. Finally, attributes or characteristics of an IS can influence privacy perception. These three components became parts of our research model which assumes that beliefs affect attitudes, which, in turn, affect behavior. Prior privacy invasions, the media, personality traits, etc. can all influence this belief. Individuals form attitudes toward corporate information practice. This in turn can result in behavior counter to corporate interests. For example, consumers may intend to engage in some form of consumerism activity, such as boycotting a company or taking legal action, rather than contributing information.

The model posits that individual differences influence a general concern for information privacy. The individual differences, concern for information privacy, and various attributes of the corporate practice influence a consumer's attitude toward the organization. Both the concern for privacy and the attitude toward a specific practice then lead to behavioral intent.

2.1. Individual differences

Within the physical privacy domain, psychology research has consistently found that high self-esteem is related to positive privacy perception. Our study hoped to determine whether a similar relationship exists in the information privacy domain. Consumer alienation is a pertinent variable due to its policy orientation. It is important to understand the extent to which privacy perceptions are affected by consumers' distaste of

corporate practice. Finally, computer anxiety is a technology-oriented individual difference that provides insight into the impact of a consumers' general concerns about technology on information privacy.

2.1.1. Self-esteem

Related to the development of the self and the ability to function alone, self-esteem involves feelings of self-worth and self-respect [8]. Subjects low in self-esteem tend to be reserved and to seek solitude and anonymity; thus a low sense of well being and less ego are associated with an increased need for privacy [13]. Thus consumers low in self-esteem are expected to experience negative attitudes toward an information practice and be more concerned with privacy. This leads to two propositions:

P1: Consumers with high self-esteem will have more positive attitudes toward an information practice.

P2: Consumers with high self-esteem will have a lower concern for information privacy.

2.1.2. Consumer alienation

Such alienation involves feelings of separation from the norms and values of the marketplace [11]. We used the business ethics factor of this in our study with two tightly interrelated theoretical dimensions: feeling powerless (a consumer's inability to help determine market practices, market environment, or events within the marketplace) and normlessness (a distrust of business and market practices). Individuals high in consumer alienation should be more concerned about their information privacy and experience more negative attitudes toward an information practice. Therefore, we proposed:

P3: Consumers with low consumer alienation will have more positive attitudes toward an information practice.

P4: Consumers with low consumer alienation will have a lower concern for information privacy.

2.1.3. Computer anxiety

Despite the growth of computers in our society, some individuals avoid them due to anxiety. Individuals who experience low levels of computer anxiety are likely to behave more comfortably around computers. Consumers, who perceive that computers are having a profound affect on society by affecting the equitable flow and dissemination of personal information, are likely to respond negatively to an information practice. Therefore, we proposed:

P5: Consumers with low computer anxiety will have more positive attitudes toward an information practice.

P6: Consumers with low computer anxiety will have less concern for information privacy.

2.1.4. Concern for information privacy

Our model also explores the relationship between an individual's concern for information privacy and his or her attitude toward an information practice. Prior research had found that concern for information privacy influenced attitudes toward an information practice. Concern for information privacy may fall on a continuum from a little or no concern (low) to medium or great concern (high). It has four dimensions: addressing consumer concern about its collection (too much information is collected about people), secondary use (the practice of collecting information for one purpose and then using it for another), errors in (its quality), and access to it (whether or not an individual has access to information already collected) [21]. Individuals with positive attitudes toward

an information practice are less concerned about privacy. Therefore, we proposed:

P7: Consumers with less concern for information privacy will have more positive attitudes toward the information practice.

2.2. Attributes of an information practice

We also assume that the characteristics of an information practice (the procedures followed by a corporation in the handling of a consumer's personal information) influence a consumer's attitude toward it; the practice consists of one or a combination of attributes. Prior researchers have identified several characteristics that influence an individual's perception of the practice as beneficial or privacy-invasive [24]. They include *perceived control* (permission granted or not granted); *transfer* (recipient within or outside the organization); *type of information* (productivity vs. personality); and *consequence of disclosure* (favorable vs. unfavorable). Culnan and Bies [6], for example, suggested that attributes of an information practice help consumers make more accurate assessment of risk. However, because most consumers do not actually read privacy statements, privacy seals are present on most websites, and these have been found not to influence disclosure. We therefore chose to use more granular attributes of an information practice. In particular, two attributes, permission (due to its link with control, an issue in maintaining the perception of privacy) and transfer of information (due to its potentially offensive nature and relevance) were selected for our study. The other two attribute types were controlled in the context of the experiment.

2.2.1. Permission

When a person grants (or denies) their permission to a site owner to use their personal information, they perceive that they have maintained control over the use of their personal information and experience less apprehension of invasion of privacy. Giving permission, therefore, may be expected to positively influence attitude toward an information practice. Therefore, we proposed:

P8: Consumers who control the future use of personal information will experience a more positive attitude toward the information practice.

2.2.2. Transfer

Transfer refers to sharing a customer's personal information. Prior research has shown that subjects are more concerned about disclosure of personal information to parties outside the firm than to those inside it. Hence:

P9: Consumers will have a more positive attitude toward an information practice involving an internal transfer of personal information than they will toward a practice involving an external transfer of information.

2.2.3. Interaction with IT

Inclusion of this variable addresses whether or not consumers perceive a direct threat due to IT in an information practice. Several studies have found that the presence of a computer in an information practice provides a sense of privacy [4] and, therefore, people divulged more and felt more comfortable doing so when interacting with a computer. Thus, although consumers perceived an increased threat due to the use of computers, they may not attribute this threat to the technology itself. Based on this, we proposed:

P10: Consumers will experience a more positive attitude toward the information practice when they interact with IT.

2.2.4. Dependent variable: attitude toward an information practice

Consumers, on exposure to an information practice, will have some affective response to the practice; therefore, attitude refers to the predisposition of the individual to evaluate the attributes of the practice as privacy invasive or not.

2.3. Predictive validity: behavioral intention

Finally, our research model assumed that people behave rationally and therefore their intentions are good indicators of their actual behavior. Intentions, in turn, result from attitudes toward the proposed behavior as well as from subjective social norms. In our study, we focused on a subject's intention to engage in some type of behavior such as boycotting or threatening legal action. This variable is very relevant to businesses that would like to reduce such actions. Some studies support the association between information-privacy attitudes and behavioral intention. In addition, we proposed that general concern for privacy would manifest itself on intention both indirectly through attitudes as well as directly. Therefore:

P11: Consumers with negative attitudes toward an information practice are more likely to engage in consumerism behavior.

P12: Consumers with more concern for information privacy are more likely to engage in consumerism behavior.

3. Methodology

The purpose of our study was to understand consumer attitude toward an information practice and identify the factors that have the greatest explanatory power. Given the multidimensional nature of the study's variables, structural equation modeling (SEM) seems the most appropriate approach for assessing the hypotheses. Accordingly, each set of variables was assessed for its measurement efficacy and then assessed as a collective network.

3.1. Instrumentation

Measures for the individual differences and concern for information privacy constructs were based on existing scales that had been validated. None of the items were re-written for use in our study. All responses were based on a 7-point Likert scale ranging from strongly disagree to strongly agree. Table 1 presents the items used in the survey.

Data on individual differences and concern for information privacy were collected and analyzed for all respondents. However, eight different scenarios were written to systematically vary all possible combinations of the three independent variables (permission, transfer, and practice). Each subject read and responded to only one scenario. The scenario is described in more detail in Appendix A.

Three *independent* rounds of pretesting were conducted before final use of the research instrument. Appendix B summarizes the pretesting procedure.

3.2. Sample

The instrument was distributed to 500 consumers during late 2002 and 2003. Four interview sites were chosen (1) Washington, DC; (2) Atlanta, GA; (3) San Diego, CA; and (4) Minneapolis, MN. A modified mall-intercept approach was used in which individuals were approached and asked to complete the survey. The use of

Table 1
Survey items.

<p>Self-esteem [8]</p> <ol style="list-style-type: none"> 1. I feel that I'm a person of worth, at least on an equal basis with others 2. I feel that I have a number of good qualities 3. All in all, I am inclined to feel that I am a failure 4. I am able to do things as well as most other people 5. I feel I do not have much to be proud of 6. I take a positive attitude toward myself 7. On the whole, I am satisfied with myself 8. I wish I could have more respect for myself 9. I certainly feel useless at times 10. At times I think I am no good at all <p>Consumer alienation [11]</p> <ol style="list-style-type: none"> 1. It is not unusual to find out that businesses lied to the public 2. Stores do not care why people buy their products just as long as they make a profit 3. Business' prime objective is to make money rather than to satisfy the consumer 4. It is difficult to identify with business practices today 5. Unethical practices are widespread throughout business 6. Products are designed to wear out long before they should 7. A product will usually break down as soon as the warranty is up 8. Business is responsible for unnecessarily depleting our natural resources 9. Most claims of product quality are true 10. Harmful characteristics of a product are often kept from the consumer 11. Advertisements usually present a true picture of the product 12. Most companies are responsive to the demand of the consumer <p>Behavioral intention</p> <p>How likely are you, within the next three years to...</p> <ol style="list-style-type: none"> 1. Decide not to apply for something, like a job, credit, or insurance, because you do not want to provide certain kinds of information about yourself? 2. Refuse to give information to a business or company because you think it is too personal? 3. Take action to have your name removed from direct mail lists for catalogs, products, and services? 4. Write or call a company to complain about the way it uses personal information? 5. Write or call an elected official or consumer organization to complain about the way companies use personal information? 6. Refuse to purchase a product because you disagree with the way a company uses personal information? 	<p>Computer anxiety [14]</p> <ol style="list-style-type: none"> 1. Computers are a real threat to privacy in this country 2. Sometimes I'm afraid I'll damage a computer if I use it 3. Sometimes I'm afraid the data processing department will lose my data 4. I am anxious and concerned about the pace of automation in the world 5. I am easily frustrated by computerized bills 6. I am sometimes frustrated by increasing automation in my home 7. I sense that computers increase the level of frustration in my job <p>Concern for Information Privacy [25]</p> <p><i>Collection</i></p> <ol style="list-style-type: none"> 1. It usually bothers me when companies ask me for personal information 2. When companies ask me for personal information, I sometimes think twice before providing it 3. It is bothersome to give personal information to so many companies 4. I'm concerned that companies are collecting too much personal information about me <p><i>Secondary use</i></p> <ol style="list-style-type: none"> 5. Companies should not use personal information for any purpose unless it has been authorized by the individuals who provided the information 6. Companies should never sell the personal information in their computer databases to other companies 7. Companies should never share personal information with other companies unless it has been authorized by the individual who provided the information 8. When people give personal information to a company for some reason, the company should never use the information for any other reason <p><i>Unauthorized access</i></p> <ol style="list-style-type: none"> 1. Companies should devote more time and effort to preventing unauthorized access to personal information 2. Companies should take more steps to make sure that the personal information in their files is accurate 3. Companies should take more steps to make sure that unauthorized people cannot access personal information in their computers <p><i>Errors</i></p> <ol style="list-style-type: none"> 12. All the personal information in computer databases should be double-checked for accuracy no matter how much this costs 13. Companies should take more steps to make sure that the personal information in their files is accurate 14. Companies should devote more time and effort to verifying the accuracy of the personal information in their databases 15. Companies should have better procedures to correct errors in personal information <p>Attitude toward an information practice</p> <ol style="list-style-type: none"> 1. It was acceptable for the finance company to use my personal information in this way 2. It was necessary for the finance company to use my personal information in this way 3. I feel comfortable with personal information being used in this way 4. Greater internal controls are needed in the finance company to limit this kind of use of personal information 5. The above use of personal information is an invasion of privacy
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consumers provided a new context for analyzing privacy, as many prior studies have used students within a University setting. Of the 500 questionnaires distributed, 470 were returned and 425 were deemed usable, resulting in a response rate of 85%. To improve the generalizability of the results, quota sampling was used to assure that the sample possessed demographic characteristics in the same proportion as the U.S. population.

4. Results

All measures were evaluated for their reliability and validity. Cronbach's alpha, item-total correlations and factor analysis were used to evaluate reliability, convergent validity, and discriminant validity respectively. Appendix C presents these findings.

4.1. Measurement modeling

Fig. 2 presents the results of model estimation for exogenous constructs of our model. These constructs were self-esteem, consumer alienation, and computer anxiety. Remaining exogenous variables were categorical in nature and estimated within the context of SEM in a manner of an eight factorial design.

All paths were significant at $p < 0.001$.

All items of self-esteem seemed to be good indicators. The loadings of the items ranged from a low of 0.70 (SE7) to a high of 0.88 (SE9). The normed chi square (2.69) of the estimated model was below the suggested cutoff of 4.0 suggesting good fit. In addition, model measures of goodness of fit (GOF), adjusted goodness of fit (AGOF) and comparative fit index (CFI) were all

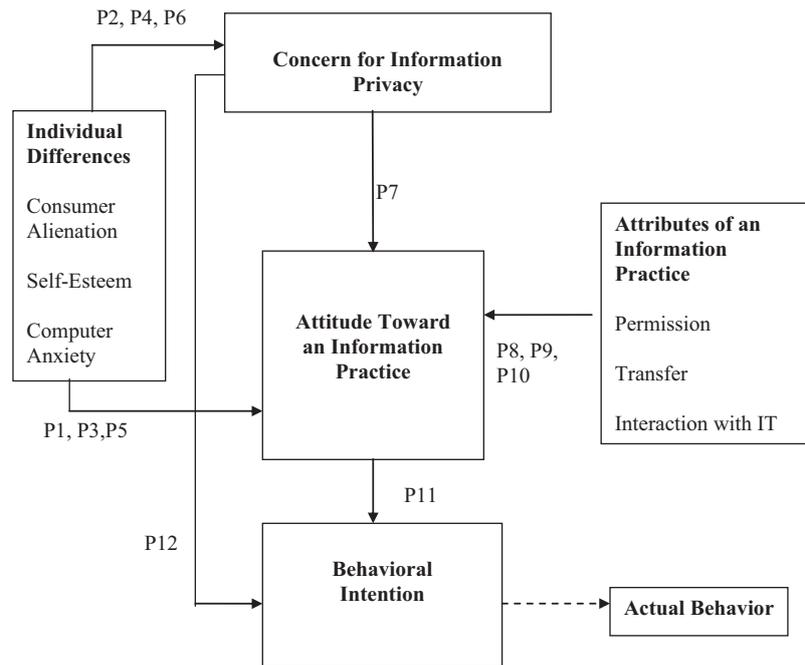


Fig. 1. Research model.

within acceptable ranges. Similarly, measures of consumer alienation seemed to deal reasonably with this latent variable. Item loadings range from a low of 0.71 (CA10) to a high of 0.84 (CA12). Fit statistics suggested that the observed covariances were similar to those implied by our model. Finally, loadings associated with item measures of computer anxiety seemed to suggest that the latent concept was sufficiently captured. These loadings ranged from a low of 0.71 (A6) to a high 0.85 (A1). Fit statistics for this model confirmed its measurement efficacy. In sum, these results suggested that item measures of computer anxiety, self-esteem, and consumer alienation exhibited reasonable properties of measurement.

Concern for information privacy (CFIP) was an endogenous variable within our model (see Fig. 1). This latent variable was also complex as several latent constructs (collection, unauthorized access, errors, and secondary use) constituted its definitional network. These dimensions we are estimated and assessed as a correlated network of constructs; the results are shown in Fig. 3, where their item measures demonstrate strength through the magnitude of their loadings. Further, no significant tendencies of cross loadings between item measures and constructs were noted. As expected, the constructs exhibited moderate patterns of correlation, reflecting the second-order dimension of CFIP. The model fit measures were within acceptable limits, suggesting that CFIP was captured by this network of constructs and their associated indicators.

The final two endogenous constructs of the research model were *attitude toward an information practice* and *behavioral intention*. Their item measures seemed to capture a significant amount of their variance. Specifically, item measures of attitude toward information practice range from a high of 0.81 (A5) to a low of 0.75 (A3). Fit measures of this model were moderately high also suggesting a good model fit. Similarly, item measures of behavioral intention suggested good model fit with item loadings ranging from a high of 0.86 (BI2) to a low of 0.70 (BI6). Again, model fit measures suggested acceptance of our model as an accurate reflection of the observed covariances. In sum, these results implied that the measurement models of endogenous

and exogenous variables reflected good measurement properties. A full measurement model of the nine latent variables was estimated. We did not detect any significant differences in item loads across isolated and combined measurement models, suggesting that the items loadings were stable and unidimensional. Therefore, to ensure model identification and isolate the impact of the path coefficients, these loadings were used to build composite scores for estimation of the structural equation model.

4.2. Structural equation modeling

SEM was used to evaluate the relationships among the research variables in an integrative framework. The data met all assumptions required for the application of SEM: interval or ratio-level variables, normally distributed data, absence of multicollinearity, over identified model, and sufficient sample size. With the exception of permission, transfer and technology, all variables were interval level. The exogenous variables were nominal because they were dummy coded.

All paths are significant at $p < 0.001$.

As shown in Fig. 4, the fit statistics of our model suggested that it is a good representation of the covariation among the research variables. The adjusted chi-square was very low, suggesting good fit relative to degrees of freedom. In addition, the GFI, adjusted GOF, and CFI were all within acceptable levels. The paths coefficients between variables were significant, of high magnitude, and in the direction implied by the hypotheses. In sum, the results suggest that perceptions of the invasion of information privacy were captured within this network of variable relationships.

5. Discussion

5.1. Individual differences

Results implied that self-esteem had a significant direct effect on concern for information privacy as well as a direct effect on attitude toward an information practice. They also indicated that

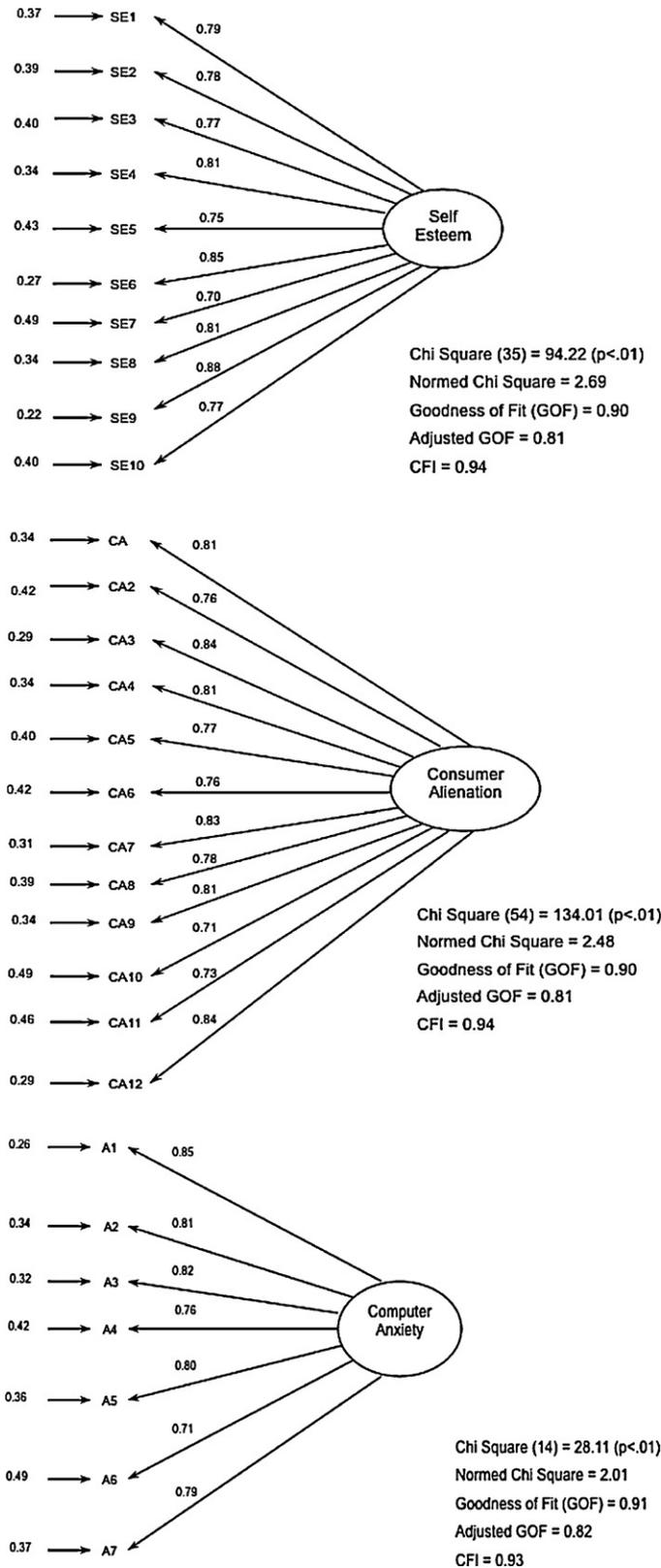


Fig. 2. Measurement model of exogenous constructs: self esteem and consumer alienation measurement model of exogenous constructs: computer anxiety.

self-esteem influenced attitude through its influence on concern for information privacy.

The analysis found that the path from consumer alienation to attitude toward an information practice was very strong and

significant, as was the path to concern for information privacy. The data indicate that consumers who feel helpless in the context of business practices are likely to perceive privacy invasion negatively and be concerned about information privacy in general.

The analysis found that both paths from computer anxiety to concern and attitude were significant. Once again, the data indicated that there was a mediating effect; computer anxiety also influenced attitude through its influence on concern of information privacy.

In general, strong support exists for all the propositions concerning individual differences. This suggested that individual differences manifest themselves via privacy concerns and attitudes. Of note are the consistently stronger direct relationships with attitude toward information practices. In general, the proportion of direct and indirect effects was about the same in both models for all three individual variables, suggesting that our model is a robust representation of the network of constructs.

Consumers with lower self-esteem, perceptions of greater consumer alienation, and higher computer anxiety are more concerned about information privacy and some information practices. A strong effect in both submodels was that of consumer alienation. Consumers who felt that businesses are without norms and standards and who felt unable to change business practices were more likely to be concerned about information privacy and to perceive a practice as invasive. Concern for information privacy appeared to be a major mediator in explaining degree of attitude toward an information practice. When examined as a system of causal effects, concern for information privacy acted as a partially mediating variable.

5.2. Concern for information privacy and attitude toward an information practice

Our results indicated that the path from concern for information privacy to attitude toward an information practice is strong and significant. An individual's general concern for information privacy strongly influences his or her attitude toward a specific information practice. As public awareness of information privacy escalates, so will the general level of concern for information privacy. Corporations must address consumer concern with respect to errors, secondary use, unauthorized access, and collection of personal information and communicate and publicize their efforts to the consumer.

5.3. Attributes of an information practice

The SEM results in Fig. 4 indicate that consumers who feel they have control over the use of their personal information perceive less invasion of privacy if their personal information is disclosed. Furthermore, subjects in the sample appear considerably more concerned about the disclosure of their personal information to external companies than they do about disclosure to other units within the firm.

Finally, the interaction through an IT-interface in an information practice was found to have a significant effect on attitudes. Further analysis suggested that there was no significant relationship between interaction with an IT-interface and a consumer's degree of computer anxiety. A t-test found that the level of computer anxiety did not differ significantly across the two levels of an IT-interface. This provided some interesting insights. Individuals apparently felt more comfortable when giving personal information through a computer interface than to another person. Consumers hold the corporations, not IT, responsible for violating their information privacy. The results provide a strong impetus for

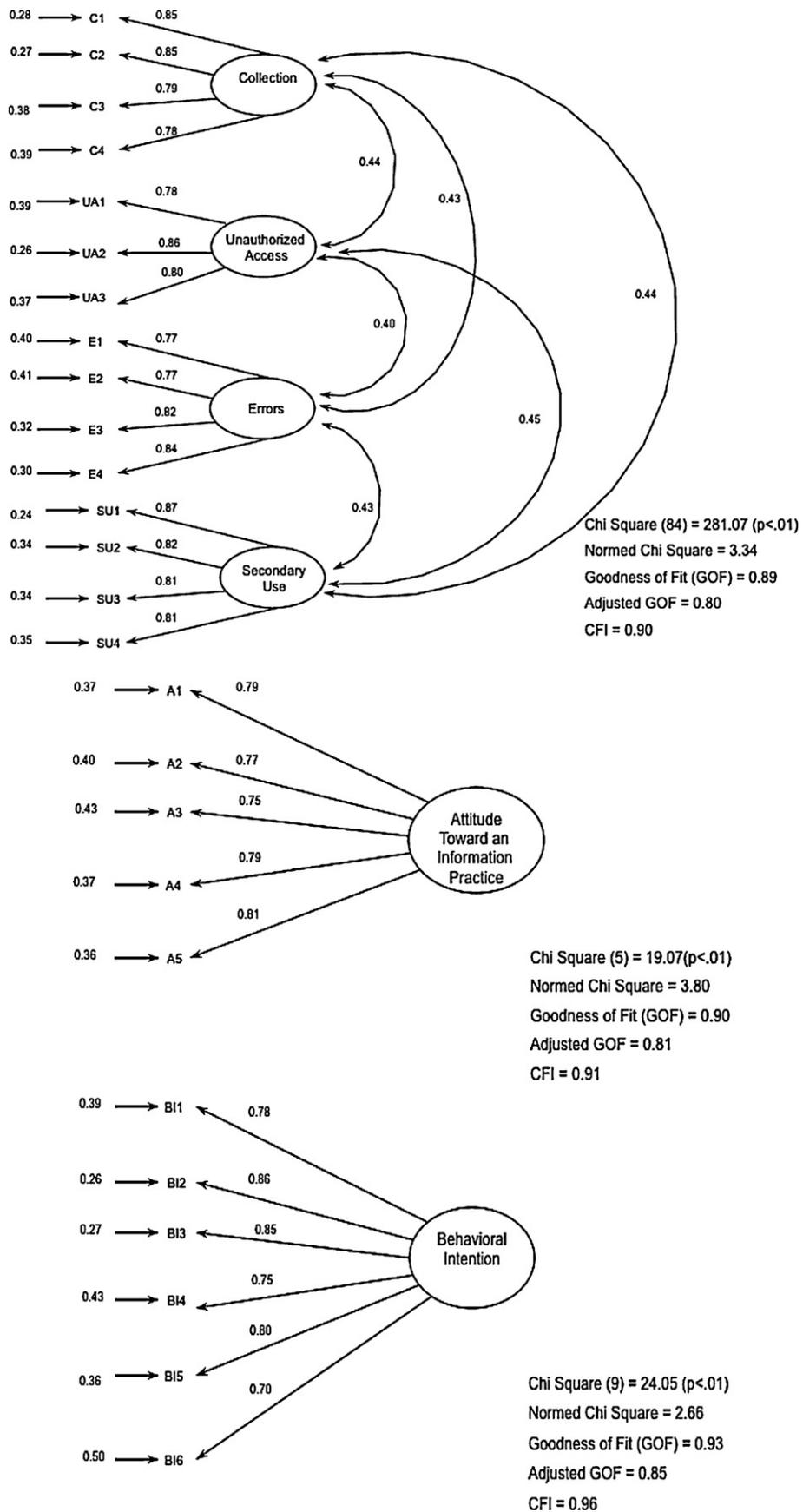


Fig. 3. Measurement model of endogenous constructs: concern for information privacy. Measurement model of endogenous constructs: attitude toward an information practice and behavioral intention.

All paths are significant at $p < 0.001$

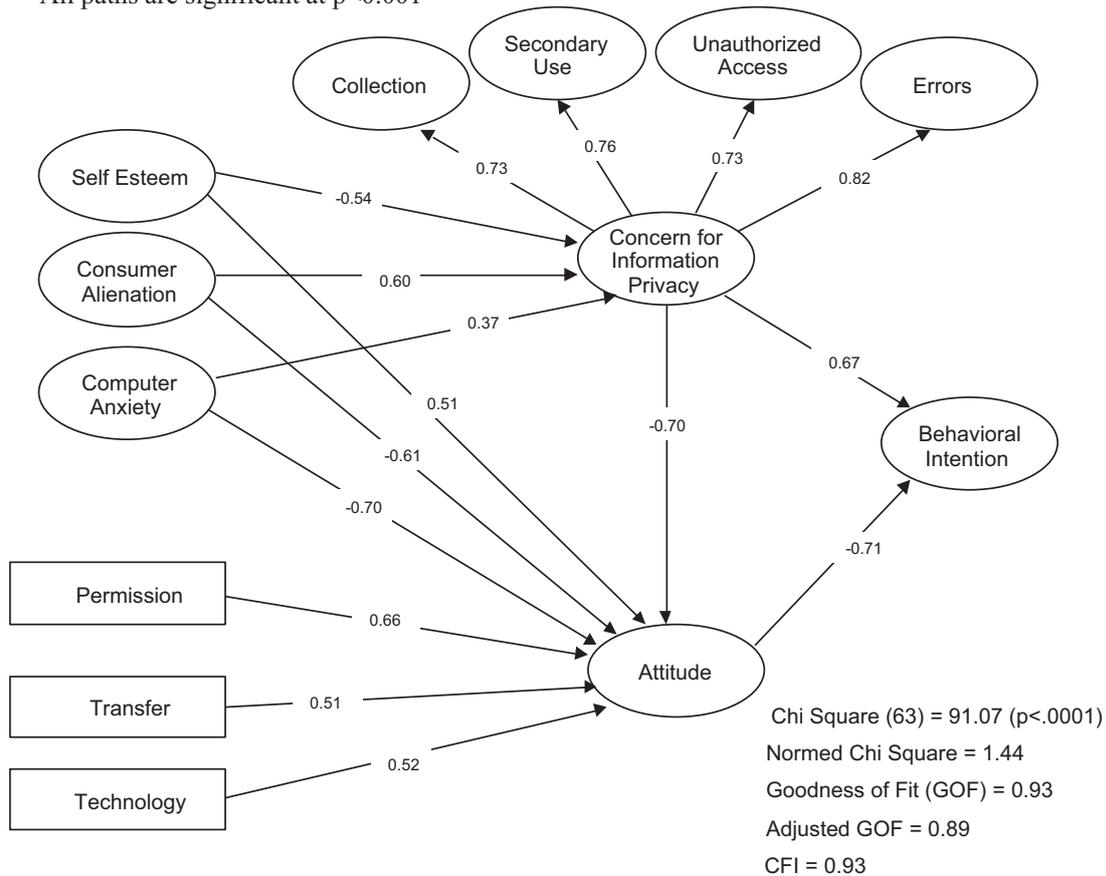


Fig. 4. Structural model of consumers' perceptions of the invasion of information privacy.

corporations to voluntarily draft information privacy policies that protect consumer information privacy.

5.4. Behavioral intention

Fig. 4 shows highly significant paths from both attitude and concern to behavioral intention. Specifically, the results indicate

that individuals may be predisposed to a general concern for privacy and also that those with negative attitudes toward an information practice are more likely to: refuse to provide personal information; have their names removed from mailing lists; file a complaint with the offending company; and complain to a government agency. Table 2 summarizes the results of proposition testing.

Table 2 Summary of results.

The more alienated a consumer feels because of business practices, the more concerned he or she is about the privacy of their personal information and their attitudes toward information practices are more negative	Support for P3, P4,
The more anxious a consumer is about computers the more concerned he or she is about information privacy and, the more negative is his or her attitude toward the information practice	Support for P5, P6
The lower a consumer's self-esteem, the more concerned he or she is about information privacy and the more negative is his or her attitude toward corporate information practice	Support for P1, P2,
The greater the perceived level of control a consumer has over his or her personal information, the more positive is his or her attitude toward corporate information practices	Support for P8
Internal transfers of personal information result in a more positive attitude toward corporate information practices than external transfers	Support for P9
The interaction with an IT-interface in an information practice has a positive effect on a consumer's attitude toward corporate information practices	Support for P10
The more concerned an individual is about information privacy, the more negative is his or her attitude toward information practices and the more likely he or she is to refuse to provide personal information. In addition, an individual's concern for his or her information privacy has a direct affect on the likelihood of refusing to provide personal information in the future	Support for P7, P11 and P12

6. Implications for practice

We found that consumers respond negatively to corporate information practices when they perceive that their information privacy has been invaded and that negative responses have tangible consequences for corporations. Managing consumer privacy perceptions, therefore, becomes important to firms basing strategic initiatives on personal information. Policies communicate to both the employer and the employees the value the organization places on protecting consumer personal information privacy.

Firms should make every effort to fully inform consumers about their information practices and should use technology interfaces to collect personal information as long as controls are in place to protect the information. Firms should restrict the external transfer of personal information without consumer consent. Most importantly, firms should be sensitive and responsive to the consumer's 'need to know' about how their personal information is being used.

7. Limitations and concluding remarks

Although our study provided and validated a robust model, certain limitations must be addressed. First, the attributes of an information practice, as well as the individual differences selected in our study, are representative, not exhaustive.

The interaction with IT was measured as a dichotomous variable. We did not investigate, however, how different types of IS may impact consumer perception. In addition, attitudes toward information privacy may vary from industry to industry. Furthermore, the questions related to concern for information privacy were presented prior to people responding to the questionnaire – it may have inflated the respondent's attitude toward privacy. In addition, the Internet Users' Information Privacy Concerns (IUIPCs) Instrument [12] may have been a better scale for assessing consumer concerns in an Internet context rather than our instrument. Also, individuals that are very sensitive to privacy issues may have been unwilling to participate.

Our research contributed to a growing body of literature investigating the effect of IT on information privacy. With few exceptions, most prior work was expository and based on expert opinion. We replicated and extended prior work and provided a broader context for understanding the nomological network of constructs that explain privacy concerns.

Finally, our study confirmed the scenario method as an appropriate technique for information privacy research by placing the privacy issue in a specific industry context. Furthermore, the use of quota sampling, a predominantly non-student sample, and test-retest validation of the model improved both confidence in the model and the generalizability of our results. Although it is not realistic to claim our methods were perfect, they do provide a strong foundation for generalizability.

Creating a win–win situation for all requires diligence on the part of the consumer and sensitivity on the part of the corporation. Legislative and market pressures have caused many firms to list privacy issues at the top of their strategic initiatives. Thus, consumers should know their rights and investigate corporate privacy practices before sharing their personal information. For corporations, designing information practices that address consumer concerns is a good first step, but formulating privacy policies that accurately characterize their information practices is essential. Furthermore, corporations must assure that their policies are being enforced and followed throughout the organization.

Appendix A

The context for the scenario was the American credit industry. Personal information privacy is a critical issue in this industry, as

firms use client information extensively for target marketing. The *permission* variable examined whether or not the applicant gave permission for their personal information to be used for another purpose. The *transfer* variable was manipulated by having the finance company either transfer the information to its own marketing department (internal transfer) or sell it to a third party (external transfer). The *interaction with information technology* was examined in terms of the entity to which the information was disclosed (human vs. computer based questionnaire). Quota sampling was used to reduce the variance due to the individual and to achieve homogeneity within each cell. Further, each subject responded to a set of questions that assessed the effectiveness of the experimental manipulations.

An example of the scenario is below:

Assume that you have found the perfect bedroom set for your home. In order to purchase the new furniture, you apply for a loan at a local loan company, Commercial Finance, Inc.

The loan application process requires that you provide personal information about yourself. To do this you are asked to answer questions by entering your responses directly into a computer/ participate in an interview with a loan officer. The computer asks/the loan officer asks questions about your income, employment status, credit card balances, mortgage payments, number of dependents, home address, etc. During the interview, the finance company does not ask for/asks for and receives your permission to use the information you provided for other purposes unrelated to your loan application.

Two weeks later, your loan application is still under review. Meanwhile, Commercial Finance, Inc. sells the information you provided to another company, Johnson Corporation/transfers your personal information to their marketing department. A few weeks later you receive a promotional letter from Johnson Corporation/ Commercial Finance encouraging you to apply for a loan.

Appendix B

Pretesting

Three *independent* rounds of pretesting were conducted on *different* samples before final use of the research instrument. In the first pretest, the survey was administered to five undergraduate classes at a major university ($n = 257$). Tests for reliability, content validity, and construct validity were conducted. Manipulation checks of the independent variables in the scenario led to some concern about the efficacy of the manipulations. The scenario was revised and a second pretest was administered to another undergraduate class ($n = 70$). Subsequent manipulation checks indicated that the subjects perceived the manipulation of the independent variables correctly. Then, a third pretest ($n = 156$) of the complete instrument was administered. Results indicated improved psychometric properties of the scale items as well as appropriate manipulations of the independent variables in the scenario. Appendix B summarizes the pretesting procedure and results.

Appendix C

Reliability and validity analysis

Sample data
(See Tables C1–C3).

Table C1
Reliability analysis-Cronbach's alpha-sample.

Construct measured	No. of items	Alpha
Consumer alienation	12	0.83
Self-esteem	10	0.81
Computer anxiety	7	0.82
Concern		
Collection	4	0.79
Errors	4	0.86
Unauthorized access	3	0.84
Secondary use	4	0.89
Attitude	5	0.79
Behavioral intention	6	0.86

Table C2
Item to total correlation's – sample.

Consumer alienation							
CA1	0.51	CA4	0.55	CA7	0.55	CA10	0.53
CA2	0.53	CA5	0.64	CA8	0.51	CA11	0.28
CA3	0.56	CA6	0.58	CA9	0.29	CA12	0.33
Self-esteem							
SE1	0.47	SE4	0.45	SE7	0.54	SE10	0.57
SE2	0.53	SE5	0.46	SE8	0.42		
SE3	0.58	SE6	0.54	SE9	0.49		
Computer anxiety							
A8	0.39	A10	0.53	A12	0.70	A14	0.62
A9	0.46	A11	0.58	A13	0.69		
Concern for information privacy							
C1	0.54	E1	0.63	SU1	0.71	UA1	0.72
C2	0.59	E2	0.76	SU2	0.75	UA2	0.69
C3	0.73	E3	0.75	SU3	0.75	UA3	0.74
C4	0.60	E4	0.77	SU4	0.82		
Attitude toward an information practice							
AT1	0.65	AT3	0.59	AT5	0.62		
AT2	0.40	AT4	0.60				
Behavioral intention							
BI1	0.48	BI3	0.71	BI5	0.76		
BI2	0.55	BI4	0.77	BI6	0.70		

Table C3
Factor loadings.

Factor	1	2	3	4	5	6	7
Eigenvalue	12.02	4.10	2.74	2.54	1.99	1.46	1.17
Variables							
E1	0.66						
SU1	0.68						
UA1	0.74						
E2	0.75						
SU2	0.74						
E3	0.72						
UA2	0.73						
SU3	0.70						
E4	0.76						
SU4	0.79						
UA3	0.78						
CA1		0.56					
CA2		0.56					
CA3		0.58					
CA4		0.50					
CA5		0.68					
CA6		0.65					
CA7		0.62					
CA8		0.57					
CA10		0.58					
BI2			0.45				
BI3			0.53				
BI4			0.72				
BI5			0.80				
BI6			0.78				

Table C3 (Continued)

Factor	1	2	3	4	5	6	7
BI7			0.67				
SE1				0.57			
SE2				0.61			
SE3				0.63			
SE4				0.53			
SE5				0.50			
SE6				0.61			
SE7				0.62			
SE8				0.45			
SE9				0.56			
SE10				0.62			
A9					0.56		
A10					0.52		
A11					0.58		
A12					0.74		
A13					0.75		
A14					.068		
AT1						0.65	
AT2						0.50	
AT3						0.62	
AT4						0.61	
AT5						0.62	
C3							0.61
C2							0.65
C1							0.60
C4							0.46

Coding scheme for sample data.
Consumer alienation: CA1–CA12.
Self-esteem: SE1–SE10.
Computer anxiety: A8–A14.
Concern for information privacy.
Collection: C1–C4.
Secondary use: SU1–SU4.
Unauthorized access: UA1–UA3.
Errors: E1–E4.

Appendix D

A useful indicator of measurement efficacy is the stability of item loadings across alternative measurement models. Correlations within and between latent variables can impact fit measures of estimated models. Unidimensionality is a desired property of measurement in which items load uniquely onto their respective constructs and are not falsely associated with their associated construct due to the correlation patterns of other items. This can be best discerned by estimating item loadings in isolation and as part of a larger network. Good measurement models should demonstrate stability in item loadings and fit measures in isolation and as part of a larger network. In this research, a complicating factor of model testing is the large number of items and constructs. In the present case, a fully unconstrained measurement model of latent constructs involves estimation of 55 item loadings and 36 correlations. Given that simpler models are rewarded in SEM, there is little likelihood that such a complex model will demonstrate adequate fit. Nonetheless, the results of such a model test can verify the magnitude and stability of the item loadings reported in the isolated model tests. Consistent with this notion, we estimated a full measurement model and found the item loadings to be very stable. Chi Square tests of item loadings between the full and isolated models revealed no significant differences verifying the magnitude and direction of the item loadings. Correlations between the latent factors are reported in the table below. Overall, the results of this model test confirm the item loadings reported in Figs. 2 and 3. They also seem to confirm the magnitude and direction of the paths reported in Fig. 4.

(See Table D1).

Table D1
Estimated correlations of full measurement model.

	Collection	Secondary use	Unauthorized access	Errors	Behavioral intent	Attitude	Self esteem	Consumer alienation	Computer anxiety
Collection	1.0								
Secondary use	0.45	1.0							
Unauthorized access	0.43	0.46	1.0						
Errors	0.42	0.43	0.40	1.0					
Behavioral intent	0.41	0.44	0.51	0.56	1.0				
Attitude	−0.45	−0.48	−0.45	−0.54	−0.69	1.0			
Self esteem	−0.33	−0.36	−0.36	−0.36	−0.31	0.49	1.0		
Consumer alienation	0.38	.027	0	0.47	0.37	−0.64	−0.51	1.0	
Computer anxiety	0.29	0.28	.026	0.33	0.29	−0.69	−0.61	0.55	1.0

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Kathy Schwaig is Dean and Dinos Eminent Scholar Chair and Professor of Information Systems in the Michael J. Coles College of Business at Kennesaw State University. Dr. Schwaig joined the faculty at KSU in 2002 bringing over twenty years of teaching and professional experience to the classroom. Dr. Schwaig has served in several administrative roles at the department and college levels. An authority on the topic of information privacy and policy formulation, her research has been published in some of the leading journals in the information systems field including *Information Systems Research*, *Communications of the ACM* and *Journal of Information Systems*. Currently, she serves on the editorial board of the *International Journal of Information Security and Privacy*. A native of central Texas, Dr. Schwaig earned a BBA in Accounting and an MBA in Information Systems from Baylor University and a PhD in Management Information Systems from the University of South Carolina. She formerly served on the board of the Atlanta Care Center. Currently, Dr. Schwaig serves as Chairman of the Board of Partnership and Academics and Development, a non-profit focused on education initiatives in Central Asia, and is a member of the advisory board of The Edge Connection, a non-profit organization providing business education to micro-entrepreneurs. In addition to her research, teaching, and administrative responsibilities, Dr. Schwaig serves as a consultant and board member to an Atlanta based IT staffing firm.



Segars is chair of the strategy and entrepreneurship faculty area, the RBC Bank Distinguished Professor and faculty director of the Center for Sustainable Enterprise. He is an active consultant with such organizations as Apple, Disney, DARPA, Pixar, Siemens, Xerox, Red Hat, IBM, Sprint, Bank of America, GlaxoSmithKline, the Department of the Navy and the Department of Army. He serves as a speaker and expert for state and federal governments on technology transfer and implementation for economic development. He received his PhD from the University of South Carolina in technology management with minors in international finance and corporate strategy, his MBA from UNC-Chapel Hill and his BS from UNC-Charlotte.



recipient of numerous awards from USC, Clemson, AIS, DSI, Anbar, PriceWaterhouse, etc. for his research and teaching and is a Fellow of the Association for Information Systems.

Varun Grover is the William S. Lee (Duke Energy) Distinguished Professor of Information Systems at Clemson University. He has published extensively in the information systems field, with over 200 publications in major refereed journals. Nine recent articles have ranked him among the top four researchers based on number of publications in the top Information Systems journals, as well as citation impact (h-index). Dr. Grover is Senior Editor (Emeritus) for MIS Quarterly, the Journal of the AIS and Database. He is currently working in the areas of IT value, system politics and process transformation and recently released his third book (with M. Lynne Markus) on process change. He is



IEEE Transactions in Engineering Management, and California Management Review.

Kirk Dean Fiedler is an Associate Professor of MIS at the Moore School of Business at the University of South Carolina. He received a BA from Wittenberg University, a MBA and a MS in Information Systems and Systems Science from the University of Louisville before completing his PhD in MIS at the University of Pittsburgh. His consulting experience includes several years at Arthur Young & Company where he earned a CPA certification. Currently, his research interests include technology assimilation, knowledge management, international business, assessment and risk management. He has published this research in Information Systems Research, Communications of the ACM, MIS Quarterly, JMIS, Decision Sciences,