AN INVESTIGATION OF THE DETERMINANTS OF TRANSACTIONAL WEBSITE USE FROM PUBLIC COMPUTERS

By

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- Millbrook Free Library
- Mooers Free Library
- Newark Public Library
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- Niagara Falls Public Library
- Norwood Library
- Ogden Farmers' Library
- Olive Free Library
- Orchard Park Public Library
- Paine Memorial Library
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- Suffern Free Library
- Sullivan Free Library
- Swan Library
- Tappan Library
- Tonawanda Public Library
- Town of Concord Public Library
- Town of Indian Lake Public Library
- Town of Inlet Public Library
- Town of Pelham Public Library
- Tully Free Library
- Vestal Public Library
- West Winfield Library
- Wide Awake Club Library, Filmore NY
- Wimodaughsian Free Library
- Yates Community Library

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ABSTRACT

These three interrelated essays study the central problem of transactional website use from computers located in a public environment. The first essay[1] is an exploratory study of determinants of website use in a public environment. This study incorporates an extension of Triandis' modified TRA [1980] and considers Affect, Social Norms and Facilitating Conditions in combination with User Characteristics to begin to answer the question, are people willing engage in website transactions while using computers located in a public environment. To explore this question, survey data gathered from New York State public library users was tested using structural equation modeling.

The second essay[2] considers the external physical environment and the internal virtual environment present in and around publicly located computers that are used for Internet access. The public environment in which a computer is located contains many dimensions that are different from those of a private computer. A public computer is used by a multitude of people and the maintenance of the equipment is the responsibility of others, unknown to the user. This creates a situation in the computer where spyware and tracking software may be present on the machine gathering information about the individual users Internet activities, this is of particular importance when the user inputs information during a web-based transaction. Likewise the physical environment commonly affords little privacy and thus leaves a user susceptible to interruptions and unable to concentrate on web-based transactions. This study focuses solely on the physical and virtual facilitating conditions found in and around a public computer and examines the moderating effect of the individual difference, Individual Need for Privacy, on these relationships. In order to empirically test

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[1] A prior version of this paper was presentation at the 39th Annual Hawaii Conference on Science and Systems, Poipu, Kauai. January 4-7, 2006.

[2] A previous version of this article was presented at the MISRC/CRITO Symposium on the Digital Divide, Minneapolis MN, Aug 27-28, 2004. The article was invited to revise and resubmit for publication in the Special Edition of the Journal of the Association of Information Systems. The paper has been revised accordingly and appeared in JAIS, Vol.7 No. 1, pp 19-50.

this model, a moderated partial least squares (PLS) approach is employed using survey data gathered from computer users in public libraries.

The third essay examines the influence of Internet Self-Efficacy in combination with Risk Attitudes on public transactional website use. Grounded in Bandura's Social Cognitive Theory [1986] this essay considers a specific form of self-efficacy relevant to online transactional web-site use, Internet Self-Efficacy, and three categories of expected outcomes in combination with risk perception to attempt to predict public transactional web-site use. The model is empirically tested using a PLS approach using statewide public library computer use survey data and the findings indicate that risk attitudes and concerns about internet transactions are determinants of public transactional website use. The attitudes toward internet risk arise from a perception of risk in the online environment and a perception of risk in being tracked. There was no evidence users are sensitive to the potential risks in the virtual environment of the public computer.

PROLOGUE

The development and dispersion of the internet across most aspects of modern life, across the U.S. and around the world, has increased individual access to a myriad of information sources, access to a vast array of entertainment sources and access to goods and services from both commercial and government suppliers. Providing information, entertainment, goods and services in this manner is cost effective and efficient for the provider and convenient for the consumer, thus many commercial and government organizations interact with their customers through these electronic channels. The overarching issue is that in order for people to access goods and services in this manner they require access to the internet which includes (1) some type of connection device (generally a computer) and (2) a connection to the internet. Many people have these technologies within their residences, however a substantial number cannot afford this technology, or do not wish to have this technology in their homes, thus these people may use publicly provided computers to bridge this technology access divide.

The interaction between host and consumer occurs when the host provides information through a webpage and provides a webbased form into which the consumer enters information for submission to the host. The consumer accesses the webpage through the local computer and thus is subjected to the physical environment surrounding the computer and the virtual environment within the computer. People who have access to private computers can control these environments; people who must engage in website interactions through public computers have little control over either of these computer environments. This leads to the question, will people use publicly provided computers for these types of interactions.

This study attempts to first identify the dimensions that lead to a person's engaging in these interactions with the host, hereafter called transactions. A combination of behavioral dimensions, technology adoption factors and individual differences are considered as a way

to try to understand how each influence the transactional use of website in a public environment. The second part of this study expands on the results of the first study and specifically examines the moderating effect of an individual's need for privacy on the relationship between the physical and virtual environments in and around a public computer. In the third part of this study, the results of the first study are further expanded and the influences of internet self-efficacy and risk perception on public transactional website use are explored.

These studies have both theoretical and practical implications. From a theoretical perspective, a relationship between environment facilitating conditions and use behavior is established, and we find that individual characteristics moderate this relationship within the context of this study. Further we find that although an apparently important relationship between internet self-efficacy and use behavior exists, when self-efficacy is considered with risk perception, the influence of risk perception is much greater than the influence of self-efficacy in this environment. From a practical perspective this study enhances our knowledge about the impact of computer environment on public transactional website use. Further this study proposes and validates a measure of transactional website use and further validates an existing measure of internet self-efficacy.

Essay 1: Publicly Accessible Computers: An Exploratory Study of the Adoption of Transactional Website Use from Computers in Public Locations

Abstract

Businesses and governments are continuing to expand the use of the internet to provide a wide range of information and transactional services to consumers. These changes present barriers to access for people without internet connections in their homes. Publicly provided computers are an attempt to bridge this gap however it is not clear if people are willing to use computers in these environments to fully exploit these web-based capabilities and engage in online transactions. There are individual differences in the users as well as characteristics of the environmental conditions that may impact transactional website use from these locations. This explore determinants of public transactional website use by extending Triandis' modified Theory of Reasoned Action model to consider the influence of user characteristics, computer anxiety, social norms in the form of encouragement and environmental facilitating conditions on transactional website use from computers in a public environment.

1. Introduction

Businesses and governments have been changing the way they provide service to consumers in a effort to reduce costs, improve delivery speed and increase consumer accessibility to goods and services. The internet and e-commerce technologies are key components of this new delivery method. These changes in the way people interact with commercial enterprises and government agencies present an access to resources problem for people who do not have computers with internet connections in their homes. Recent statistics from the U.S. Census (Newburger 2001) indicate that approximately 40% of people do not have computers in their homes and many of those who do have computers do not have

internet access from their residence. An important element in addressing the issues of this gap in access, or digital divide, is to ensure that access is available to people who may not have a way to access electronically provided services from private computers (National Telecommunication and Information Administration 2000). Thus, an important step in overcoming the digital divide will be accomplished when everyone has access to electronic resources in an environment where they are willing to fully participate in all aspects of Internet use (Stiglitz et al. 2000).

Current internet technology supports not only the delivery of host-supplied information to a consumer but also the delivery of consumer supplied information back to the host through the a webpage interface (Chaudhury et al. 2002). When the transaction based activities involve a monetary exchange of some type this is referred to as B-to-C e-commerce. Similar activities occur when personal information is submitted by the consumer back to the host organization (be it commercial or governmental) without a monetary dimension (Featherman et al. 2003). The information transfer activities are quite common with applying for government services, when submitting an online job applications or signing up for some type of online information service. This broad landscape of website interaction involves *transactions* and people who engage in these transactions are consumers. Consumers of online information and/or services are also IT users by necessity (Gefen et al. 2003), and IT usage encompasses not only the hardware and software but also the people and the associated support services (Taylor et al. 1995b). A consideration of the environment in which the user functions with public computers leads to a key question, are people willing engage in e-transactions in this environment given the surrounding, public conditions? The adoption of technology has been widely studied in organizations, however there have been few studies focused on the adoption and use of computer technologies in public environments (Kibirige 2001; Nicholas et al. 2002; Slack et al. 2004). The public environment is different from a more traditional business environment in that public computers are commonly positioned so that there is little workspace privacy, distractions and interruptions are common while working on the computer, the computers themselves are used by many people and the equipment may not well maintained or be of good quality.

Conversely, the public use environment may provide user assistance if difficulties occur with the computer or internet connection.

Public libraries are a source of free public access to computers with connections to the internet and thus are an important factor in helping overcome the technology access divide. The libraries are a unique environment in which to study public computer usage behavior because libraries are traditionally viewed as an information resource (D'Elia et al. 2002) and are a logical place for people to go to access information, and in the current era, access electronic information. Internet technologies have merged information access and transaction capabilities into one channel so modern libraries function as an access point for electronic information while at the same time supporting electronic transactions, all in a public environment. This paper is an exploratory investigation of how user characteristics, affect, social influence and physical facilitating conditions influence the transactional use of web sites by users in the environment of a public library.

2. Theoretical Framework

2.1 Behavioral Theory

The Theory of Reasoned Action (Fishbein et al. 1975) describes attitudes and subjective norms as leading to behavioral intention which in turn leads to the actual behavior. Triandis (Triandis 1980) proposed an extension of this model in which the intention to behave arises from the feelings people have toward the behavior (affect), what important others think they should do (social influences) and what they expect from the behavior (outcomes). In his extended model, Triandis further suggested that the actual behavior is a result of the behavioral intention and other facilitating conditions that exist to support the behavior. In the current investigation we are concerned with the actual behavior of completing transactions in a public library, not the intention to complete transactions. The antecedents of behavioral intention are therefore considered to lead directly to the behavior itself. This modification of the Triandis framework has been successfully used to explore actual behavior by Thompson et. al. (Thompson et al. 1991) in the study of personal

computer adoption and by Cheung et. al. (Cheung et al. 2000) in their exploration of world wide web usage.

2.2 Innovation Adoption Theory

Studies of innovation adoption have found that differences among individuals impacts their speed and their willingness to adopt an innovation (Rogers 1995). User characteristics are key differences and have been shown to be an important consideration when studying technology innovation adoption (Agarwal et al. 1999; Kwon et al. 1987). A public computer user incorporates a set of unique individual characteristics that may influence their willingness to adopt transactional website use in a public environment. The experience a user has with a technology (Igbaria et al. 1995b; Nelson et al. 1987; Taylor et al. 1995a) and training (Agarwal et al. 1999; Igbaria et al. 1995b; Nelson et al. 1987) are significant determinants of technology use. A third user characteristic that incorporates the sensitivity of the person to external intrusions (Laukka 2000) is the individual's need for privacy (Oldham 1988). We include individual need for privacy in this research because of the lack of privacy in many public computer use environments.

The quality of a computer system directly influences the use of a computer (Igbaria et al. 1995b) thus the quality of the computer equipment and Internet connection used to connect to the transactional website will seemingly impact the willingness of people to engage in online transactions. Literature on web delays indicates that slower page loading causes users to seek alternative sites (Ranganathan et al. 2002) and users tend to abort loading pages from an e-commerce as page delays increase (Rose et al. 2001). User sensitivity to web page delays suggests that if publicly provide equipment is 'slow' or of 'poor quality' users will be less likely to use that equipment for web transactions, likewise, fast, high quality access may encourage use in the public environment,

Assistance with technology supports the adoption of technology (Bergeron et al. 1990; Goodhue 1995). Public libraries present a unique environment in which public computers are freely available for individual use and library staff members are available to provide assistance with the use of the equipment and the available applications. Investigation

into public library internet use (D'Elia et al. 2002) has found that the availability of assistance is a reason people use public libraries. Computers have become a standard part the services provided by public libraries (Kibirige 2001) thus the availability of assistance with the computer technology may facilitate technology usage.

2.3 Workspace Design

The transactional use of a website is an activity in which a person enters information into a webpage and then transmits the information through the internet to a remote host computer (Chaudhury et al. 2002). These activities involve a series of steps and can be considered to be a task. The immediate work area provided for engaging in the task is a workspace. Workspace design research in organization (Oldham 1988; Sundstrom 1986) has found that low levels of workspace privacy lead to people experiencing an increased number of interruptions (Sundstrom et al. 1980), decreased ability to concentrate on tasks and increased reluctance to address confidential issues (Sundstrom 1986). The computer workspaces commonly provided in public locations provide low levels of workspace privacy resulting in a use environment where users can be exposed to numerous interruptions while engaging in a website supported transaction, decreased user ability to concentrate on the web transaction itself and a general reduction in the willingness of the person to engage in any type of confidential information exchange with websites when using a computer in a public location.

Each of the previously discussed dimensions may have varying levels of influence on the transactional website usage behavior of public computer users. We incorporate streams of research in workspace design and innovation adoption into the Triandis framework to develop the research model in the following section.

3. Conceptual Model and Research Hypotheses

User characteristics are incorporated into Triandis's (1980) TRA model to explore the impact of both the physical environment and individual user characteristics on the public transactional use of websites. The conceptual model guiding the current investigation is

provided in Figure 1. We propose that the transactional website use behavior occurs as a result of a combination of the feelings a user has about the technology, the encouragement they receive from important others, individual user characteristics and the conditions in the public environment that facilitate (or deter) use in these locations.

Triandis (1980) describes facilitating conditions as factors in the environment that encourage or discourage a specific behavior. The physical location of computers in public environment may influence computer and Internet usage behavior. Considering that computers in public facilities are commonly placed on open tables or in carrels, there tends to be a lack of physical privacy in the area surrounding the equipment. Many public computing sites, particularly libraries have received up-to-date equipment and support for internet connections from private (Seattle Daily Journal, 2002) and government sources (Federal Communications Commission, 2004). Thus the computers provided in public libraries are generally of good quality with reasonable internet connections.

3.1 Facilitating Conditions

3.1.1 Task Privacy

Research in workspace design by Oldham (1988) has identified task privacy as the degree to which a person is able to focus attention on a task. Task privacy includes protection from distractions, infrequent interruption and isolation from disturbances. Triandis (1980) suggests that a behavior cannot occur if some condition in the environment prevents it. The public library environment will encourage transactional use behavior if a work area affording the user some level of task privacy is available, similarly transactional use will be discouraged if people perceive that they have little privacy, others can see what

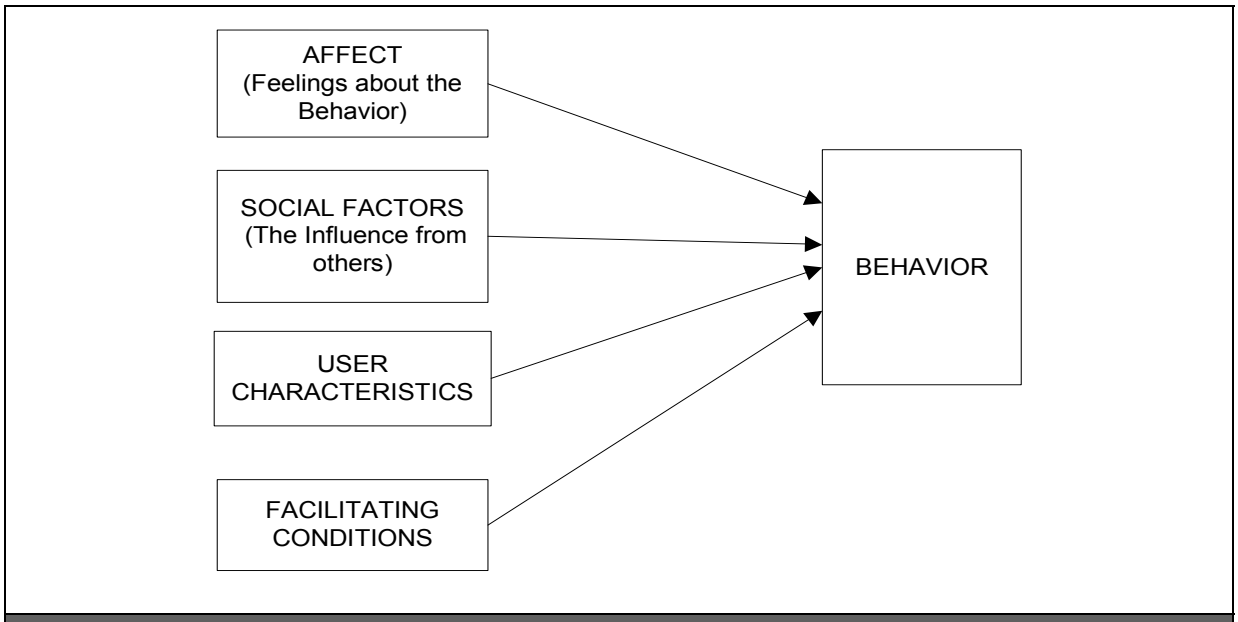

Figure 1: Conceptual Model

they are doing and the surrounding area is noisy, making concentration difficult. We expect that the user's perception of task privacy will positively impact the transactional use of websites.

H1: A perception of task privacy will positively influence the transactional use of websites accessed from computers located in public libraries.

3.1.2 Equipment Quality

The quality of the equipment has been found to be important to the overall adoption of technology, better performing equipment supports adoption while poorly performing equipment deters adoption (Igbaria et al., 1995). Recent research findings have shown that the quality of the internet connection, reflected in the speed at which a website loads, is important to website usage (Ranganathan and Ganapathy, 2002; Rose et al., 2001). The quality of the equipment and the internet connection provided in public libraries will influence equipment use and the willingness of people to engage in website transactions. We expect that better performing equipment and a high-quality internet connection will support transactional website use in the public library environment.

H2: *The quality of equipment will be positively related to the transactional use of websites from this equipment.*

3.1.3 Available Assistance

Readily available assistance to support computer users positively supports technology use (Goodhue, 1995). The presence of people to answer questions about the technology tends to encourage use. Thompson et. al. (1991) included assistance as a facilitating condition of PC use and found no relationship. However, we revisit this dimension because of the unique environment found in a public library. The staff in public libraries are considered to be knowledgeable and helpful (D'Elia et al. 2002; Kibirige 2001) with all aspects of the available services and resources. Since computers and the Internet are available in this environment, people tend to consider public library staff members to be knowledgeable about the computer based resources as well and available to provide assistance with Internet use and hardware function. This creates a use environment where users perceive that they have freely available and knowledgeable help available if they encounter difficulties while using the computer or the Internet. We expect that the perception of the readily available assistance will encourage transactional website use in this environment.

H3: *The perception that assistance is available in a public library will be positively related to the transactional use of websites in this environment.*

3.2 User Characteristics

3.2.1 Individual Need for Privacy

An individual's need for privacy is the desire to control information transmission to others and control inputs from others (Margulis, 1977; Oldham, 1988). Research in workspace design has found that individual need for privacy is related to task completion rate (Sundstrom et al., 1980), people with greater need for privacy complete tasks more effectively in a work space that affords more privacy. Within the context of the current

work, the level of an individual's need for privacy may influence that person's inclination to engage in electronic transactions with websites from computers available in public locations. We expect that there will be a negative relationship between the individual's need for privacy and their transactional use of websites in public libraries.

H4: *Individual need for privacy is inversely related to the transactional use of websites in a public library.*

3.2.2 Experience

The unique individual characteristics of a technology user have been found to influence technology adoption (Agarwal et al. 1999; Harrison et al. 1992; Thompson et al. 1994). We are seeking to understand the individual characteristics that support the adoption of transactional website use in public. A computer user's experience level (Igbaria et al. 1995; Nelson and Cheney, 1987) directly impacts user-perceived computer usage level, user experience exerts a positive effect on usage behavior (Venkatesh et al. 2000) and reduces the perceived risk in conducting business through the web (Kim et al., 2000; Kim et al., 2003). This suggests that transactional use of websites from public computers may be influenced by user Internet experience because using the Internet to engage in a website transaction requires a rather large set of technology skills. A more experienced Internet user would have acquired these skills and thus be more inclined to use a website for transactions, regardless of the physical location. We expect that a user's perceived level of Internet experience will positively impact the transactional use of websites.

H5: *A user's level of experience will be positively related to the transactional use of a website.*

3.2.3 User Training

User training has been identified as an important element of information technology adoption (Davis 1989; Igbaria et al., 1995; Nelson and Cheney, 1987). These prior results

clearly indicate that end-user training has a significant impact on the adoption and use of technology. The amount of training a person has received would be expected to influence their willingness to engage in complex Internet activities such as purchasing goods and services or using the Internet to transmit personal information. People who have received more training would be seemingly more likely to use a website for transactions while we would expect that a lack of training will discourage transactional use because the users are unsure of how to use the technology. The impact of training would be greater when transactional use is considered because of the additional complexity involved in providing and submitting electronic information through a webpage. The effect of training would be further magnified when a public environment is considered because of the distractions and interruptions that may occur.

H6: *The level of computer training a person has received is positively related to the transactional use of websites in a public library*

3.3 Social Factors

3.3.1 Encouragement from Others

Triandis suggests that social norms develop from messages received from others and these messages are determinants of behavioral intention and thus the resulting behavior. Social factors have been found to positively influence PC usage (Thompson et al. 1991) and external social pressure has been shown to have an effect on technology acceptance (Agarwal and Prasad, 1997; Venkatesh and Morris, 2000). Social influence may be exerted through the encouragement provided by family and friends to engage in an activity. We expect that the encouragement by family and friends to use public computers to engage in electronic transactions will have a positive effect on an individual's transactional use of websites in public libraries.

H7: *The amount of encouragement a person receives to use websites for transactions is positively related to the transactional use of web sites.*

3.4 Affect

3.4.1 Computer Anxiety

As part of his model framework, Triandis (1980) suggested that the affect or feelings about a behavior is a determinant of behavioral intention. Affect in the context of technology use has been measured as the 'enjoyment of using computers' (Thompson et al. 1991) and was found to have a non-significant impact on PC usage. Computer anxiety has also been identified as an affective response to computers (Brown et al. 2002; Heissen et al. 1987; Igbaria and Chakrabarti, 1990). Anxiety or apprehension about using a computer for Internet access may be exacerbated by the public library environment. The interruptions and distractions would seemingly add to the user's concern and reduce the use of the publicly provided equipment. A web transaction involving personal and/or monetary information will increase this apprehension because of the private nature of information required. We expect that computer user anxiety is inversely related to the transactional use of websites, particularly in a public library environment.

H8: *Computer use anxiety is inversely related to the transactional use of websites in the public library environment.*

3.4.2 Internet Self-Efficacy

Self-efficacy is defined as the belief in "one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura 1997). Self-efficacy is an important determinant of computer usage (Igbaria and Iivari, 1995) and is an important trait in an individual's decision to use computers (Agarwal et al. 2000; Compeau and Higgins, 1995b). A recent refinement of the computer self-efficacy construct suggests that using the internet involves a distinct group of activities, somewhat different from computer self-efficacy (Eastin and LaRose, 2000). Considering that transactional website use involves the

complexities of the Internet and there is minimal use of the broader set of computer capabilities, we consider Internet self-efficacy in this work. Specifically focusing on Internet self-efficacy also presents an opportunity to further validate the Internet self-efficacy construct developed by Eastin and LaRose (2000). We have suggested that the public environment presents several deterrents to transactional website use thus higher levels of Internet self-efficacy will be necessary to overcome the effect of these deterrents. We hypothesize that there will be a direct relationship between internet self efficacy and transactional web site usage in a public location.

H9: *Internet self-efficacy is directly related to the transactional use of websites in the public library environment.*

The model underlying this research is presented in Figure 2.

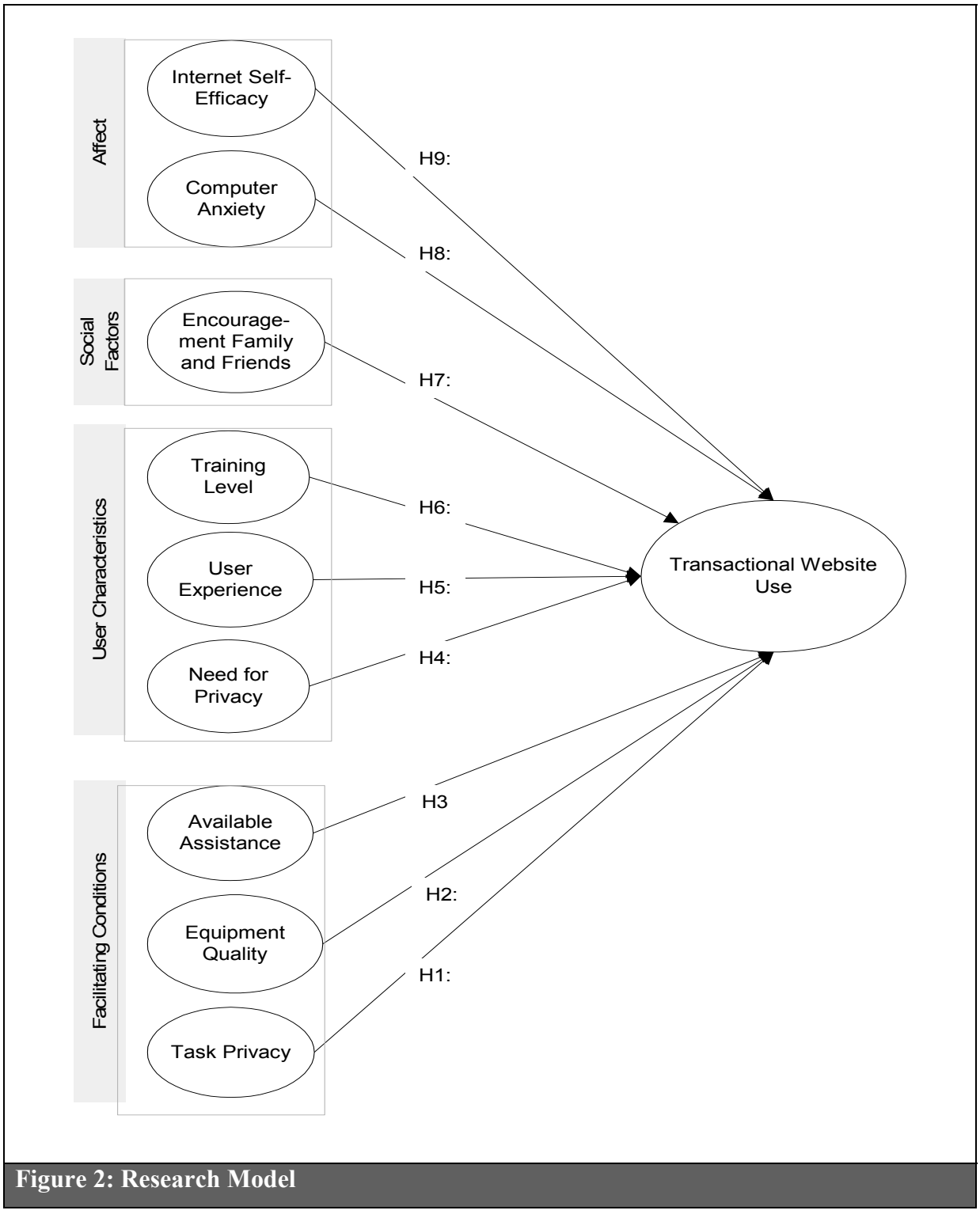

Figure 2: Research Model

Research Methods

The constructs were operationalized by adapting existing measures from literature and by developing a measure of transactional use. This work involves computer use outside of a formal business organization but in a specific public use environment thus the adaptation of measures developed in the business context is considered reasonable.

Measurement items, sources, number of times and example questions are provided in Table 1. The dependent variable used in this research is the Transactional Use of websites, measured as the reported number of web-based electronic transactions the respondent has completed. The data were gathered separately for the number of monetary transactions of value less than $50, greater than $50 (Bhatnagar et al., 2000) and information transactions in order to generate a more complete picture of transactional use.

All variables except transactional use were measured using multi-item 5 point Likert scales. Previous research has shown that although a 7 point Likert scale captures more detail, it is unlikely that the survey respondents can differentiate between the fine distinctions during the limited time of the survey (Gupta and Somers, 1992). The smaller 5 point scale created a more user-friendly survey instrument and this was an important feature considering how the survey needed to be administered. Transactional use was measured with a 6 point Likert scale with a "0" anchor at the left side indicating no transactions and a "5" anchoring the right side indicating 5 or more transactions.

A self administered survey was the preferred method of data collection as data about transactional website use from public computer is not available and the use of similar survey methods to study library computer use have been used previously (Sturges et al., 2003). Individual observation was not possible as there are 23 public library systems grouped into 9 regions across New York State, with a total of 744 public libraries within the state. In-person observation and interviews were not an option also because the purpose of the survey was to determine if people are sensitive to the environment while using a public computer in a public location. An observer would change the normal environment and impact the results. Individual interviews with library directors indicated that data needed to be gathered through a voluntary survey where patrons were asked to participate when using a public computer.

Table 1: Constructs and Measurement Items		
Construct	Measure (# questions)	Example Question
Facilitating Conditions	Task Privacy (4 questions) *Adapted from Oldham (1988)*	"I can work with few distractions when using a public computer in a library."
	Equip. Quality (3 questions) *Igbaria (1995), Ruth (2000)*	"The library computer equipment performs very well."
	Available Assistance (3 questions) *Adapted from Thompson et. al. (1991)*	"Assistance is available at the library with using the computer."
User Characteristics	Individual Need for Privacy (7 questions) *McKechnie (1971)*	"I have difficulty concentrating when things are noisy"
	Experience (4 questions) *Adapted from Nelson & Cheney (1988)*	"How much experience do you have using the internet?"
	Training (6 questions) *Igbaria et. al. (1995)*	"How much computer training have you received from high school classes?"
Social Factors	Encouragement (4 questions) *Compeau & Higgins (1995)*	"To what extent is your use of web sites for monetary transactions encouraged by your family?"
Affect	Computer Anxiety (5 questions) *Heinssen et. al. (1987)*	"Working with a computer makes me nervous"
	Internet Self-Efficacy (7 questions) *Adapted from Eastin & LaRose (2000)*	"I feel confident understanding terms related to the internet"
Use Behavior	Transactional Use (6 questions) *Developed in the current work*	"How many monetary transactions of value less than $50 have you completed through a website while using a public computer in a library?"

The survey was administered electronically through a password protected survey website and through paper surveys distributed through the public libraries. Electronic survey methods are an effective and efficient way to reach participants and required the use of the information distribution channel that is under consideration. The electronic surveys could not be used to the exclusion of more traditional paper surveys however, because of the unique situation currently found in public libraries. Libraries impose rather stringent time limits on patron use of computers because of the high demand for these resources. Some patrons were unwilling to use their limited computer time to complete a 10 minute survey thus paper surveys were available for them to complete. Paper surveys were also used to accommodate patrons who wanted to participation but were uncomfortable or unwilling to use the electronic version.

4.1 Sample

The subjects for this study were library patrons who use the computers provided in the public libraries across the State of New York. The dual-media survey methodology was employed to most efficiently reach public library computer users. A stratified single stage sampling plan was developed as suggested by Babbe (1990). The sampling region consisted of a wide variety of library sizes, ranging from the very larger metropolitan New York libraries to the small, one-room libraries found in remote rural areas. In order to generate a sample of representative users of these widely diverse configurations, all libraries in New York State were initially classified as rural or urban in preparation for generating a random sample of potential libraries from each group. The use of the initial rural/urban classification was felt to be necessary so that a sample representing the entire region would be generated. The classification of the libraries was done using the zip code of each library and cross referencing the code to the rural/urban classification as generated by MABLE/Geocorr Geographic Correspondence Engine (Blodgett, 2005). The MABLE/Geocorr system is administered by the University of Missouri and provides geographical correspondence to U.S. Census data. For the purposes of this project, all of the ZIP Codes in New York State were generated along with the U.S. Census regional classification as Rural, Urban or a

combination of Rural and Urban areas. The ZIP code for each library was compared to this list, and classified as rural or urban. In instances where the zip code indicated a mixture, the larger percentage (rural or urban) was used to classify that library.

Once each library was classified as predominantly rural or urban, each group was randomly ordered, using the RAND() function found in the Microsoft Excel Spreadsheet program. Next, libraries were selected from the random lists so that approximately equal activity levels between rural and urban sites were represented. The annual circulation number for a library is generally used as an indicator of activity and as a surrogate for library size. The annual circulation numbers were obtained from the New York State Library information services and combined with the library address and the rural/urban classification. Libraries were randomly selected from each list until the sum of the total circulation numbers for the selected rural libraries and urban libraries was approximately equal and the total number of identified libraries was approximately 100. This selection resulted in the identification of a group of 17 large urban libraries and 78 small rural libraries as possible participants in this project. The identified libraries were first contacted via e-mail and then subsequently contacted by telephone if there was no response to the initial e-mail. The telephone follow-up was an important part of contacting the libraries because e-mail accounts had been discontinued, library directors seldom read the e-mail and many directors automatically deleted the e-mail because they did not recognize the name of the sender. Of the original urban libraries only 6 agreed to participate. The library refusal reasons ranged from, 'we are too busy and not interested' to 'we do not participate in any data gathering.' The rural libraries were even more difficult to contact and engage in the project; out of the initial 78 rural libraries contacted, only 20 agreed to participate in the project. This low library participation rate required another selection from the lists and in the second wave, another 11 urban libraries were contacted and 6 more agreed to participate and another 50 rural libraries were contacted, 15 more agreed to participate. The Brooklyn Public Library in New York City was one of the urban libraries who participated and they included 12 of their branches in this project. A summary table of participating libraries is provided in Appendix 1.

4.2 Survey Administration

Library participation in this project was voluntary therefore it was necessary to minimize the impact of the project on library operations. In order to minimally the impact library staff members, the methodology was designed to be as 'self-serve' as possible. Invitation/information cards were developed and provided to libraries to distribute to patrons using the public computers. The cards contained brief information about the project, the project web-site address and the password necessary to access the survey, an illustration of the invitation card is provided in Appendix 2. The number of cards provided to the individual libraries was based upon circulation levels, the smallest libraries received 25 cards while the largest libraries received 1000 cards. In addition to the cards, the smaller libraries received 5 paper survey packets and the larger libraries each received 10 paper survey packets. Each packet contained an information/consent letter, the survey, a response card for entering in the gift card drawing and a business reply envelope for returning the completed survey. A participation incentive was offered to increase participation; each survey participant who voluntarily supplied contact information was entered to a drawing to receive one of 100 $10 gift cards from either (1) a large local grocery store, (2)a national bookseller or (3)a large discount store chain. The drawing was conducted at the conclusion of the survey period.

4.3 Results

The demographic characteristics of the sample are provided in Table 2. The nature of the survey distribution created a situation where the response rate cannot be determined. The number of cards provided to each library is known, however we do not know how many cards were actually distributed nor how many cards were just discarded. Requesting that the unused cards be returned would have created a time and money hardship for most of the participating libraries and would have lead to further difficulty in gaining library participation. Therefore the demographic characteristics of the sample are examined instead

Table 2: Sample Demographics		
	Count	Percentage
Gender		
Male	87	49.7%
Female	88	50.3%
Age		
Under 20	4	2.5%
20-30	25	15.3%
31-40	30	18.4%
41-50	33	20.2%
51-65	55	33.7%
Over 65	16	9.8%
Ethnicity		
Black	16	9.8%
White	126	77.3%
Hispanic	7	4.3%
Asia/Pacific Islander	3	1.8%
Native American	1	0.6%
Mixed Ethnic Heritage	8	4.9%
Education		
Some High School	5	3.0%
High School Grad.	33	20.0%
Some College	47	28.5%
College Grad	44	26.7%
Post 4 Year College	36	21.8%
Employment Status		
Full-time Employed	60	37.0%
Part-time Employed	22	13.6%
Student	6	3.7%
Non-employed	35	21.6%
Retired	30	18.5%
Other	9	5.6%
Household Income		
Less than $20,000	72	45.3%
$21,000-$40,000	52	32.7%
$41,000-$60,000	23	14.5%
$61,000-$80,000	8	5.0%
Over $80,000	4	2.5%
Residence Location		
Urban/Suburban	69	41.8%
Rural/Town-Village	96	58.2%

to determine if the overall sample was representative of people who do not have computers in their homes.

This survey was distributed to all library patrons, so the group of respondents who do not have internet access at home were first identified and then used for the subsequent analysis. A total of 384 people responded to this survey, of this group 175 reported that they did not have residential internet access. The purpose of this project was to determine what factors support e-transactions among people who do not have computers in their homes therefore we consider this group throughout the rest of this analysis.

The results of the demographics indicate that approximately an even number of men and women use public library computers and about 40% are over 50 years of age. The education level is rather evenly distributed across the different categories and most of the people are either part-time or full-time employed. The most definitive demographic is the income level, over 70% of the respondents made less than $40,000/year, 40% made less than $20,000 per year. The sample respondents are fairly evenly distributed between rural and urban groups and 60% of the respondents do not have a home computer. The only demographic dimension that is not consistent with other studies of the digital divide and library use are the results for ethnicity. This sample was overwhelmingly white, even though many urban libraries were included in the project. This is a puzzling result and may a reflection of the unwillingness of some groups to participate in a project such as this rather than a shift in public internet usage. The primary indicator of lack of private computer access is income (Moore et al., 2002), this sample strongly reflects that characteristic therefore we consider this sample to be a reasonable reflection the larger group of people who rely on public internet access.

The dependent variable in this study recorded the number of times a respondent had completed a transaction. We asked about the location (public/private), the type of transaction (monetary/information) and the size (less than $50 or greater than $50). A summary of these results are presented in Table 3 and indicate that people without their own private internet access do have access to the internet in other private locations. We note that people appear to be more willing to complete less costly transactions in public and rather more willing to engage in information transactions than monetary transactions. Also notable is that in all

categories when users have completed transactions, they engage in this activity five or more times.

Table 3: Transactional Use Results					
		Using a Public Computer		Using a Private Computer	
		Freq.	Percent	Freq.	Percent
Monetary Transaction < $50	No Transactions	114	*65.5%*	127	*73.0%*
	1 transaction	10	*5.7%*	10	*5.7%*
	2 transactions	14	*8.0%*	15	*8.6%*
	3 transactions	6	*3.4%*	9	*5.2%*
	4 transactions	5	*2.9%*	2	*1.1%*
	5 + transactions	25	*14.4%*	11	*6.3%*
Monetary Transaction > $50	No Transactions	23	*70.7%*	132	*75.9%*
	1 transaction	16	*9.2%*	12	*6.9%*
	2 transactions	5	*2.9%*	8	*4.6%*
	3 transactions	8.	*4.6%*	7	*4.0%*
	4 transactions	4	*2.3%*	4	*2.3%*
	5 + transactions	18	*10.3%*	11	*6.3%*
Information Transaction	No Transactions	65	*37.6%*	114	*65.9%*
	1 transaction	14	*8.1%*	8	*4.6%*
	2 transactions	18	*10.4%*	10	*5.8%*
	3 transactions	9	*5.2%*	8	*4.6%*
	4 transactions	11	*6.4%*	4	*2.3%*
	5 + transactions	56	*32.4%*	29	*16.8%*

4.4 Assessment of Measurement Properties

4.4.1 Reliability

The multiple item constructs were first assessed for internal consistency using Cronbach's alpha. Cronbach alpha values greater than 0.8 are considered acceptable for established scales (Nunnally 1978) and values greater than 0.6 are considered reasonable for developing scales (Chin 1998) however higher values are preferable. The reliabilities reported in Table 4 are all above 0.8 except for the Training construct which is still acceptable above the 0.6 level and the Transactional Use construct which is a little low at .6630. The Transactional Use construct is a newly developed scale, thus we consider it acceptable as it is greater than 0.6.

The factor loadings were evaluated for each construct. All constructs loaded cleanly except Individual Need for Privacy. Two of the seven factors of Individual Need for Privacy did not load on this factor in this context and were dropped. Prior research (McKechnie, 1971) had shown that these factors form the Individual Need for Privacy construct, however the current work suggests that in fact this construct may contain two dimensions, at least within the public content. The measurement model was tested using partial least squares (PLS) structural equation modeling. The PLS method was chosen due to the rather small sample size and the common use of this method in other IS research. The model was constructed so that the independent latent variables were modeled as reflective as there were no indexes or formative measures included in the model. Chin suggests (2002) that with this type of model, using a heuristic of 10 cases per predictor will yield adequate statistical power. The no residential access subgroup had an n= 156 thus the sample was considered adequate for this analysis. PLS is frequently used to investigate relationships and supports empirical assessment of the theoretical model (Chin 1998) thus PLS also provides measures of reliability and convergent validity. The adequacy of the measures from the PLS perspective is done by examining the factor loadings to determine convergent validity of blocks of measures. Generally the standardized loadings should be greater the 0.7 (Chin 1998) however lower bounds of 0.5 are acceptable in new scales and when scales are applied across contexts (Chin 2002). Convergent validity results from the PLA analysis are also

presented in Table 4. Two of the measures of Training appear to lack convergence; however

Table 4: Construct Factors and Reliabilitie

Construct	Variable	Principle Components Factor Loading	PLS Component Factor Loading	Cronbach Alpha	Alpha if Item Deleted	PLS Composite Reliability
Encouragement	ENC1	0.816	.8522	.8596	.8349	.901
	ENC2	0.796	.7327		.8447	
	ENC3	0.888	.9236		.7904	
	ENC4	0.854	.8189		.8116	
Internet Self-Efficacy	ISE1	0.800	.7171	.8426	.8101	.855
	ISE2	0.768	.6918		.8144	
	ISE3	0.727	.5371		.8246	
	ISE4	0.704	.5944		.8246	
	ISE5	0.802	.6731		.8033	
	ISE6	0.759	.6689		.8107	
	ISE7	0.537	.8327		.8573	
Computer Anxiety	CA1	0.777	.7516	.8713	.7231	.897
	CA2	0.830	.8850		.7048	
	CA3	0.872	.8617		.6991	
	CA4	0.497	.8068		.8713	
	CA5	0.898			.6801	
Training	TRAIN1	0.785	.6254	.7497	.6769	.656
	TRAIN2	0.742	.2207		.6870	
	TRAIN3	0.556	.1040		.7397	
	TRAIN4	0.499	.7235		.7544	
	TRAIN5	0.724	.4750		.6957	
	TRAIN6	0.680	.7251		7061	
Experience	EXP1	0.920	.9050	.9190	.8822	.942
	EXP2	0.851	.8598		.9176	
	EXP3	0.871	.8758		.9085	
	EXP4	0.946	.9374		.8658	
Individual Need for Privacy	INP1	***	***	.8011	.7879	.828
	INP2	0.592	.6115		.7664	
	INP3	0.860	.6203		.7894	
	INP4	0.600	.8200		.7593	
	INP5	0.821	.8120		.7645	
	INP6	***	***		.7830	
	INP7	***	***		.7588	
Task Privacy	TASK1	0.812	.7998	.8647	.8469	.908
	TASK2	0.883	.8705		.8020	
	TASK3	0.783	.7632		.8610	
	TASK4	0.895	.9315		.7922	
Available Assistance	ASSIST1	0.858	.8067	.8397	.7848	.893
	ASSIST2	0.857	.9106		.7938	
	ASSIST3	0.895	.8541		.7324	
Equipment Quality	QUAL1	0.908	.8818	.9105	.8859	.941
	QUAL2	0.941	.9313		.8306	
	QUAL3	0.914	.9395		.8827	
Public Transactional Use	TRANS1	0.852	.8490	.6630	.4419	.819
	TRANS2	0.859	.8438		.4289	
	TRANS3	0.594	.6187		.7635	

*** Components did not load on the factor, thus were removed

the presence of weak items will not effect the structural paths and thus should be included in the final model (Chin 1998). In summary the analysis indicates that the measures exhibit convergent validity and are reliable across two statistical techniques thus these measures are reasonably designed for this analysis.

4.4.2 Discriminant Validity

To evaluate discriminant validity the average variance extracted for the latent variables must be larger than the correlation among the latent variables. This indicates that more of the variability is within a latent variable and its indicators than between the latent variables themselves. The AVE attempts to quantify the amount of variability in the indicators that is captured in the latent variable relative to the measurement error. The lower bound for AVE is suggested to be 0.5 (Fornell et al. 1981), we compare the square root of the AVE to the correlation between the individual measures and constructs.. The results of the correlation between latent variables are presented in Table 5. All measures appear to display discriminant validity.

A second test of discriminant validity was conducted to evaluate the constructs and the measures. A crossloadings table was constructed to determine if a particular measure loads more strongly on constructs other that the predicted construct. All measures should load more strongly on the predicted construct, if a measure is found to load strongly on another construct then the value of that measure to inform on the predicted construct is questionable. The table of the crossloadings is presented in Table 6. All measures appear to discriminate except two training measures, TRAIN2 and TRAIN3. A review of the original questions indicates that TRAIN2 asks about the training received from college level classes and TRAIN 3 addresses self-teaching; these measures more strongly correlate with the Experience variable than with the Training variable. This may reflect that within individuals, training from courses and self-teaching is considered to be experience and separating these two concepts is difficult. This presents an area for further research. Other than the problem with TRAIN2 and TRAIN3, the other measure exhibit discriminant validity thus we proceed with evaluating the structural model.

Table 5: Construct Correlations and Mean Values												
	Mean	Std. Dev	ENC	ISE	CANX	TRAIN	EXP	INP	TP	ASSIST	EQUAL	TRANS
ENC	2.56	.98	**(0.835)**									
ISE	3.59	0.95	0.283	**(0.679)**								
CANX	2.09	1.17	-0.020	-0.419	**(0.828)**							
TRAIN	2.22	1.22	0.099	0.128	-0.151	**(0.535)**						
EXP	3.70	1.00	-0.145	0.194	-0.331	-0.044	**0.895)**					
INP	3.232	1.12	-0.048	0.029	0.018	0.038	0.069	**(0.404)**				
TP	3.55	.930	0.063	0.180	-0.068	0.053	-0.054	0.052	**(0.615)**			
ASSIST	3.77	0.95	0.073	0.257	-0.087	0.041	-0.076	-0.087	0.305	**(0.858)**		
EQUAL	4.06	0.84	0.312	0.393	-0.197	0.025	0.075	-0.003	0.309	0.422	**(0.918)**	
TRANS	1.48	1.93	0.265	0.387	-0.166	0.203	0.119	-0.262	0.287	0.068	0.279	**(0.778)**
Note: The √(AVE) is on the diagonal of this table.												

Table 6: Construct and Factor Crossloadings

	ENCOURAG	TRANS	INTERNET	COMPANX	TRAIN	EXPERIEN	INP	TASKPRIV	ASSISTAN	EQUIPQUA	PRIVATET
ENC1	0.85218	0.19384	0.27471	-0.07089	-0.14904	0.05852	0.05393	0.09661	0.11605	0.29007	0.19652
ENC2	0.73266	0.10726	0.21677	0.07072	0.01545	-0.08357	0.02999	0.09924	0.17447	0.20153	0.10163
ENC3	0.92364	0.24028	0.26144	-0.14704	-0.16484	0.10246	-0.02130	0.11388	0.14656	0.23285	0.23779
ENC4	0.81883	0.13846	0.21432	-0.17627	-0.09529	0.08148	-0.00548	-0.00975	0.16895	0.20885	0.15511
TRANS1	0.19083	0.84899	0.33782	-0.23189	0.19401	0.06003	-0.09337	0.22253	0.08578	0.17791	0.30202
TRANS2	0.11917	0.84378	0.25360	-0.13121	-0.24454	0.09776	-0.16675	0.14270	0.11526	0.19980	0.26380
TRANS3	0.20858	0.62017	0.22056	-0.09289	-0.18913	-0.00825	0.03513	0.08086	0.05363	0.1028	0.25197
ISE1	0.18802	0.14326	0.71718	-0.28808	-0.01750	0.35689	0.07859	0.07262	0.02650	0.07904	0.05675
ISE2	0.08181	0.11716	0.69296	-0.33485	0.00659	0.40862	-0.02953	0.12189	0.05926	0.06337	0.0353
ISE3	0.07838	0.05543	0.54037	-0.37831	-0.06035	0.38622	0.04298	0.11708	0.21919	0.31107	-0.03497
ISE4	0.15597	0.12247	0.59440	-0.33976	-0.03285	0.29599	0.21381	0.16462	0.28874	0.33772	0.07370
ISE5	0.12317	0.08277	0.67303	-0.32672	0.04233	0.42614	0.03774	0.20581	0.08843	0.02864	0.17507
ISE6	0.14456	0.12158	0.66885	-0.22606	0.04849	0.39285	0.10196	0.20521	0.10319	0.03716	0.06926
ISE7	0.32462	0.45862	0.83516	-0.29333	-0.03128	0.12242	-0.07893	0.29549	0.25965	0.28378	0.21193
CA1	-0.04382	-0.11169	-0.26237	0.75157	0.16099	-0.26452	0.19051	-0.02429	0.01045	-0.08757	0.00501
CA2	-0.12333	-0.21884	-0.38021	0.88781	0.03550	-0.37347	0.18706	-0.19708	-0.03677	-0.14454	-0.08463
CA3	-0.09190	-0.16024	-0.39561	0.86170	0.16836	-0.41105	0.07988	-0.19261	-0.09053	-0.24789	-0.05970
CA4	-0.09610	-0.15557	-0.30792	0.80682	0.17170	-0.29238	0.16587	-0.18931	-0.15393	-0.18458	-0.08049
TRAIN1	-0.11976	-0.16226	0.13632	0.05361	0.63451	0.15310	0.09837	0.13709	-0.08195	0.02791	0.13061
TRAIN2	-0.00434	0.09361	0.26430	-0.11269	*0.22320*	0.37686	0.00814	0.07691	-0.06906	0.01201	0.19115
TRAIN3	-0.11663	0.03516	0.20119	-0.35522	*0.10476*	0.41893	-0.01965	0.22147	0.08470	0.13623	0.05549
TRAIN4	-0.11236	-0.15919	0.01830	-0.00726	0.73061	0.02568	-0.19081	-0.02273	-0.02288	0.09857	-0.04152
TRAIN5	0.04121	-0.00384	0.10410	0.06281	0.47372	0.12291	-0.01503	0.07810	0.04428	0.00006	0.08535
TRAIN6	-0.07162	-0.15346	0.00784	0.09886	0.74061	0.05922	-0.06067	0.15415	-0.01508	-0.03026	0.05689
EXP1	0.07966	0.05167	0.34632	-0.32405	-0.07046	0.90497	0.16036	0.04735	0.12741	0.13038	0.14780
EXP2	0.10357	0.07084	0.30120	-0.42081	-0.09747	0.86838	0.07695	-0.04840	0.11524	0.05186	0.14327
EXP3	0.01065	0.06502	0.33401	-0.36755	0.03700	0.87576	0.09441	0.02562	0.07853	0.13247	0.21258
EXP4	0.04649	0.05680	0.34516	-0.33980	-0.00705	0.93739	0.12802	-0.04676	0.09326	0.07415	0.14009
INP2	-0.02657	-0.03119	-0.07284	0.17835	-0.01033	0.06925	0.61339	-0.08209	-0.05981	-0.08918	-0.04596
INP3	0.04826	-0.03781	-0.05273	0.10329	-0.09575	-0.03788	0.62224	-0.25078	0.06338	-0.01685	-0.13143
INP4	-0.04707	-0.10254	0.08522	0.14464	-0.01392	0.21749	0.82216	-0.17727	-0.09338	-0.07706	-0.00317
INP5	0.00061	-0.09155	-0.03637	0.28763	0.00957	0.02373	0.81198	-0.20488	-0.00452	-0.16139	-0.06664
TASK1	0.03214	0.11091	0.22301	-0.09706	0.15290	-0.04045	-0.13699	0.79697	0.13387	0.21278	0.06887
TASK2	0.05810	0.14863	0.22171	-0.12399	0.05049	-0.00300	-0.17738	0.87043	0.19431	0.29425	0.03226
TASK3	0.06150	0.11009	0.18359	-0.23156	0.08060	-0.03557	-0.16081	0.76327	0.16184	0.23190	-0.07628
TASK4	0.13179	0.24060	0.29226	-0.20147	0.05147	0.01776	-0.15244	0.93146	0.33036	0.38077	-0.02968
ASSIST1	0.09400	0.06707	0.14442	-0.08633	0.02701	0.12048	-0.09777	0.30017	0.80669	0.53619	-0.07337
ASSIST2	0.20621	0.13000	0.24071	-0.02956	-0.09557	0.03088	0.07938	0.19236	0.91951	0.48821	-0.12069
ASSIST3	0.10186	0.06625	0.22776	-0.14465	-0.01322	0.21770	-0.07394	0.25985	0.85511	0.54316	-0.18470
QUAL1	0.25479	0.14202	0.16207	-0.11962	0.03744	0.04168	-0.10582	0.38157	0.48471	0.88186	0.09491
QUAL2	0.27984	0.17592	0.24480	-0.14963	0.07956	0.09884	-0.09158	0.32100	0.51334	0.93439	0.07420
QUAL3	0.24853	0.23882	0.29955	-0.25530	-0.01252	0.13222	-0.06048	0.29254	0.59809	0.93952	0.03253
TRANS4	0.18427	0.32644	0.17608	-0.06496	0.01708	0.14796	-0.10988	-0.00515	-0.14993	0.05180	0.93018
TRANS5	0.26176	0.27034	0.10342	-0.02315	-0.02398	0.09498	-0.06578	-0.05444	0.06231	0.07880	0.77028
TRANS6	0.17468	0.28030	0.12618	-0.07706	0.01019	0.19232	0.00947	0.01133	-0.09766	0.05836	0.79799

4.5 The Structural Model

The structural model was evaluated using the bootstrap procedure within PLS. The fit of the model exhibited $R^2 = .382$ with 4 paths significant at the .05 or .01 level, one path was significant at the 0.1 level. The results of model are summarized in Table 7 and provided in Figure 3.

Table 7: PLS Results

Hypothesis	Path	Path Coefficient
H1	TP → Public Transactional Use	0.178**
H2	QUAL → Public Transactional Use	0.030
H3	ASSIST → Public Transactional Use	0.005
H4	INP → Public Transactional Use	-0.150*
H5	EXP → Public Transactional Use	-0.052
H6	TRAIN → Public Transactional Use	-0.259***
H7	ENC → Public Transactional Use	0.005
H8	CA → Public Transactional Use	0.008
H9	ISE → Public Transactional Use	0.264***
Control	Private Trans Use → Public Transactional Use	0.346****
Control	Age → Public Transactional Use	0.129*
Control	Race → Public Transactional Use	-0.111 *ns*
Control	Gender → Public Transactional Use	0.013 *ns*
Control	Income → Public Transactional Use	0.003 *ns*

**** p < .001,
*** p< .01
** p < .05
* p < .1

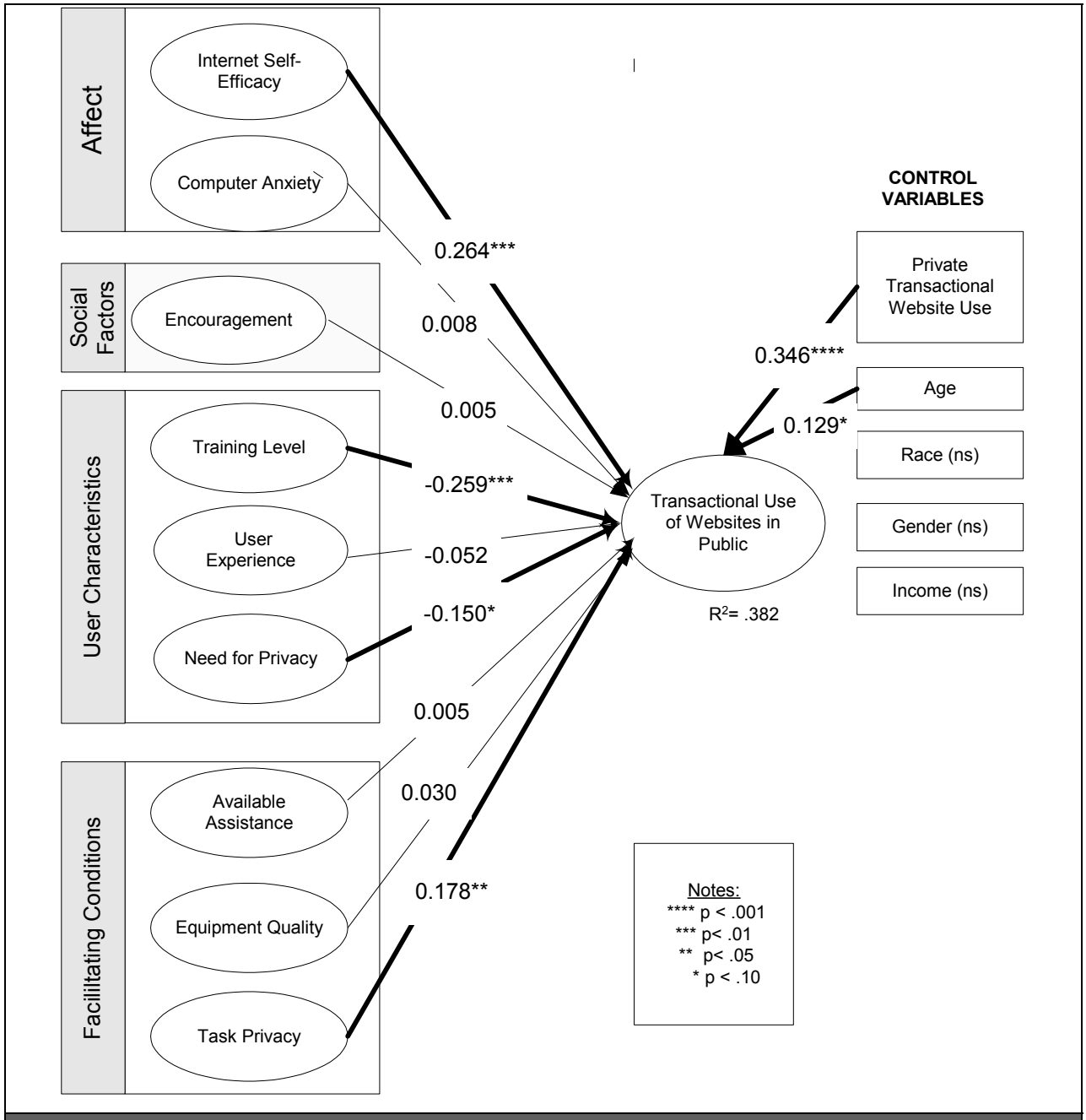

Figure 3: Results Model

The results of this analysis indicate that one dimension of Facilitating Conditions supports public transactional website use. Task Privacy exhibited a significant relationship to public transactional use (0.178, $p < .05$) while neither the availability of assistance nor

equipment quality appear to be important. Two User Characteristics appear to be important determinants of transactional website use in public, the level of training a person has received exhibited a strong path (-.259, $p<.01$) although in a direction opposite of the hypothesized direction. This unexpected result suggests that people who have received little formal training are willing to engage in public transactional website use. A majority of the survey participants were in the higher age brackets; this implies that they would not have received much training but they were willing to engage in public transactional website use. Although the results seem to indicate that there is a negative relationship between training and transactional use, a more correct interpretation might be that people are willing to engage in public transactional website use *regardless* of the amount of computer training they have received.

Individual need for privacy was the second User Characteristic that was found to negatively impact public transactional website use. This relationship occurred in the hypothesized direction and suggests that individual differences may inhibit public transactional website use and should be a concern as more and more publicly located Internet access points are being provided. Encouragement from others, the Social Factor, considered in the model was found to be insignificant. Although prior research has found that PC usage and technology acceptance are positively influenced by messages received from others (Agarwal and Parasad. 1997; Thompson et al. 1991; Venkatesh and Morris, 2000) this research has found that encouragement from others is not a determinant of public website usage. Affect, or attitude toward the behavior was considered in two dimensions. Computer Anxiety was found not be a deterrent to public transactional website use, however Internet Self-Efficacy considered here as a attitude was found to significantly support public transactional website use.

Control variables were added and age was found to have a weak but significant impact on the behavior. The other demographic control variables were found to be non-significant. Of greater interest and more importance an additional control variable, Private Transactional Use, was added to the model to control for other sources of access to the internet for people without home computers. Private Transactional website use appears to be one of the strongest determinants of public transactional website use. This factor was highly significant and warrants further investigation. It appears from these results that even though people do no have computers in their homes, they do have access to the Internet through other private locations.

This use in the private context is a very important determinant of use in the public environment. This is an interesting and unexpected result of this research and presents opportunities for future research.

5. Discussion and Conclusions

This paper contributes to the existing literature on technology adoption behavior and e-commerce adoption by (1) developing a measure of transactional website use behavior, (2) examining the impact of the work area environment on technology use, (3) considering the importance of a user's individual need for privacy characteristic and (4) successfully using a recently developed measure of Internet Self-Efficacy to study public transactional website use.

The purpose of this work was to explore the impact of individual characteristics and environmental factors on the transactional use of websites when using computers located in public locations because the use of Internet access point extends from public sector organizations such as libraries, community centers and government offices to privately funded access point such as internet cafes, coffee shops and retail stores seeking to expand access to products (On Demand Machine Corporation, 2005). The results have implications for both the users of public access facilities and for organizations providing public access to the internet for consumers. We find that the environment external to the computer as well as individual characteristics and attitudes influence the decision to engage in public transactional website use, therefore these dimensions need to be considered when providing Internet access facilities where people may engage in transactional website use. The results of this study also provide further validation for the Internet Self-Efficacy construct suggested by Eastin & LaRose (2000) and further indicates that Internet use involves a specific self-efficacy which is an important determinant of public transactional website use.

6. Future Research

Interacting on the Internet connection requires the use of a computer or internet-enabled device. The device is local to the user, however in a public context, the device is used by a

multitude of people in an environment where many people are frequently in the surrounding environment. We see from the current research that physical facilitating conditions of the computer environment are a determinant of public transactional website usage, however we do not know if the internal or 'virtual' environment of the local device is a concern to the users. We also know from the current research that an individual's need for privacy exerts a weak but significant direct influence on public transactional use. Previous research (Oldham 1988) has found that this factor will moderate the impact of the physical environment on task completion. Considering the current public context, the moderating influence of individual need for privacy on both the physical and virtual environmental facilitating conditions should be investigated.

The scope of this work needs to be expanded as well. The current study has focused on the unique public environment found in public libraries, the provision of public Internet access has extended into many different environments both social and business. If these access points are expected to help bridge the digital divide then we need to know if people are willing to fully use the equipment provided in these contexts to engage in electronic transactions as well as information gathering, otherwise we may have succeeded in bridging the information divide by still be faced with a divide in service delivery.

7. Acknowledgements

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Essay 2: Private Transactions in Public Places: An Exploration of the Impact of the Computer Environment on Public Transactional Web Site Use

Abstract

Organizations and governments continue to advance toward using electronic means to interact with their customers. However, the use of this medium presents an access-to-service issue for people across the digital divide who do not have private Internet access from their homes. Publicly-available computers connected to the Internet are an important and expanding source of Internet access for consumers. Still, we do not know if people are willing to engage in e-commerce transactions in such environments. We expand the Facilitating Conditions construct of Triandis' (1980) modified theory of reasoned action to develop a model of transactional Web site use in public environments that incorporates the physical and virtual computer environments associated with publicly accessible computers, moderated by the individual's need for privacy. The model was tested in public libraries, and the results indicate that the virtual and physical facilitating conditions of a public computer are determinants of e-commerce use in a public environment, and the user's need for privacy moderates these relationships.

Keywords: Digital divide, facilitating conditions, individual need for privacy, public computing, e-commerce, theory of reasoned action.

1. Introduction

The Internet is a technology that has migrated across business boundaries into many areas of modern life and has become a necessary information technology (IT) for businesses and other organizations to contact and interact with potential and existing consumers. The Internet has become so pervasive that many people routinely engage in transaction-based e-commerce activities, such as making Internet-based online banking transactions instead of going to the physical bank, purchasing goods from virtual e-commerce stores rather than going shopping, and engaging in information transactions such as submitting job applications online rather than filling out a paper form and sending it to the organization. The pervasiveness of the technology allows many people to do all of this from their homes or other non-business locations (Venkatesh, 1996; Venkatesh and Brown, 2001). In addition, non-profit entities such as governments employ this efficient and cost effective channel to provide access and services to citizens. For example, following recent hurricanes, citizens were instructed to apply for Federal Emergency Management Agency (FEMA) assistance using an Internet-based application process (FEMA, 2005).

The multitude of services provided through the Internet creates a problem for people without access it. Much has been discussed about the presence of a digital divide in the United States and around the globe (Dewan and Riggins, 2005). This *digital divide*, considered in some contexts to be the lack of access to Internet technologies, has been studied along racial lines (Hoffman et al., 2000; Stanley, 2003), along economic lines (Lane, 1999; Preiger, 2003) and along geographic lines (Gabe and Able, 2002; Hoffman et al., 2000; National Telecommunication and Information Administration, 2000). Recent studies of the people using the Internet indicate that even as more people are becoming Internet users, others are dropping out (Horrigan et al., 2003). So the problem of access to technology is expected to continue into the future. Recent census figures indicate that more than 40% of the citizens of the United States do not have access to the Internet from their homes (National Telecommunication and Information Administration, 2000). Thus many people need access to the Internet from other physical locations if they are going to be able to use the economic and information goods available online.

For those who do not have Internet access from their home or place of work, publicly-provided computers with Internet connections have become a critical source of access for people on the other side of the digital divide. Indeed, the integration of Internet technology into everyday life has expanded to such an extent that computers connected to the Internet are provided in many public places including (Nicholas et al., 2002):

- schools and universities where students work in staffed computer labs,
- coffee houses where patrons use their laptops to connect to the Internet,
- government point of service locations,
- community centers that provide access to underserved populations,
- libraries that seek to augment their physical book collections and expand patron services with PC and Internet access, and
- public kiosks that allow users to check e-mail or purchase goods online.

Some public locations use Internet access as a way to draw in customers and increase business activity. While providing such publicly-available Internet connections to allow users to download basic information is an important public policy goal, at this point it is not clear whether people are willing to adopt the full use of Internet technologies and engage in transaction-based e-commerce activities from these public locations. If users without personal Internet connectivity are not willing to use publicly-provided Internet connections to engage in transaction-based e-commerce, then it is doubtful that these provisions will successfully bridge the digital divide. While we may succeed in bridging the *information digital divide*, we may still be left with an *e-commerce divide* (Dewan and Riggins, 2005).

The adoption of technology has been widely studied in organizations. However, little attention has focused on the use of computer technology in public environments. Orlikowski and Iacono (2001) call for a broader definition and examination of the IT artifact, which includes not only use, but the context of use as well. In this paper we explore the issue of public computer use by specifically examining the use of public computers to engage in transaction-based e-commerce activities. Guided by the suggestions from Orlikowski and Iacono (2001), we examine the transactional use of the Internet within the specific context of the public computing

environment. We engage in theory building to expand on Triandis' (1980) *modified version of the theory of reasoned action* to examine the physical and virtual facilitating conditions present in the public computing environment. We then test in a public library environment where we find both physical and virtual facilitating conditions. These are moderated by an individual difference variable, the *need for privacy*, which seems to influence e-commerce activities conducted using public computers. This research examines Internet-based, *private transactions in public places*, an emerging research domain at the intersection of existing e-commerce research and digital divide literature. It contributes to the e-commerce literature by extending current knowledge about online transactions by incorporating the computing environment as a factor in online purchasing. It also contributes to the digital divide literature by exploring the use of transactions-based e-commerce by people without Internet access in their homes.

In the following section we discuss the background of this problem and describe the physical and virtual computing environments present in computers in public places.

2. Background

2.1 Transactional Use

Current information about Internet use indicates that most Internet users engage in information-seeking activities (Nie and Erbring, 2000). However, an important and expanding activity that exploits the full functional capability of the Internet is the use of Web sites to conduct business-to-consumer (B2C) information and business transactions. Activities such as registering for college courses; selecting, ordering, and paying for goods and services; completing stock transactions; or engaging in online banking (Nie and Erbring, 2000) are just a few of the common, daily activities that can now be conducted through the Internet. Exchanges of this type between user and host organization involve the transactional use of a Web site. We note that there are two types of online transactions. An *information transaction* involves the user entering personally-identifying information such as name, social security number, or unique identifying code into a Web-based form and then electronically transmitting it to the host Web site through the Internet. A *monetary transaction* generally involves submitting to the host website personally-identifying information in addition to information linked to a monetary

source of some type, such as a credit card or bank account. A monetary transaction usually occurs during the completion of the purchase of some type of good or service. For the purposes of this discussion, we group both types of transactions together and refer to them in a broad sense as *e-commerce*.

Users of e-commerce have concerns about actually engaging in these types of online activities. Users are concerned about the privacy of the personal information they provide during e-commerce transactions (Sheehan and Hoy, 2000), and they have security concerns about third-party access to personal information and the fraudulent behavior of online retailers (Miyazaki and Fernandez, 2001). In each of these cases, people who choose (or do not choose) to use e-commerce balance the risk they perceive with the convenience e-commerce provides (Bhatnagar et al., 2000). Much of the existing research in this area has explored user concerns about Web sites and hosting organizations. But little is known about whether e-commerce users are sensitive to the risks present in the hardware and software used to access e-commerce Web sites or those risks present in the physical environment where they engage in e-commerce transactions. User concerns may be less pronounced when using a private computer; however, a public computer encompasses a multifaceted physical and virtual environment substantially different from that of a private computer.

An Internet-based transaction involves two elements; the actual computer local to the user and the Web page hosted by the e-commerce organization. The problem is that there is a substantial difference between using the Internet in a unidirectional fashion for downloading information from a Web site and using the Internet in a bidirectional manner for e-commerce transactions that involve submitting information through the Internet to the host organization. The unidirectional download required to view a Web page involves nothing more that receiving information from the host and viewing that information on the local computer. In this case, the Internet presents some risk to the user tracking applications may be installed on the local machine. However, because the user submits nothing to the host Web site, the risk to personal information is limited.

The bidirectional interaction is more complex. It involves receiving the Web page information from the host, entering the return information using the local computer equipment and a host-provided Web page object, and submitting the information back to the host. The data

entered through these transactions are subject to a wider range of risks, such as third- party security of the data stored on the retailer's machine or fraudulent use of the data. In addition, the information entered through the local computer is subject to risks inherent in the virtual characteristics of the local machine, even before the information enters the Internet and returns to the retailer. Likewise, the person using the local computer is subject to the physical environment surrounding that computer during the information exchange, such as noise level, interruptions, and eavesdropping. Bidirectional exchanges are generally not an issue when an individual uses a privately owned computer in a quiet location because the user controls both the virtual environment and the physical environment. Problems with bidirectional exchanges occur when the local computer is used by multiple people, the surrounding physical environment is public and noisy, and the virtual computer environment is administered by others.

2.2 The Physical and Virtual Computer Environments

How people set up the *physical environment* to position a computer in a living space has been investigated as part of an ongoing project exploring the use of computers in the home (Kraut et al., 1999; Venkatesh, 1996). Considering that use of computers and the Internet within a business environment are primarily used for business activities, home or non-business computers are the most common means of Internet access for personal use. Research has shown that home computers are used for a wide range of tasks, including personal financial transactions, communications, and home shopping (Venkatesh, 1996; Kraut et al., 1999). Thus, looking at the characteristics of home computer placement will provide insight into the environmental characteristics that are desirable for engaging in online activities from a public computer. A computer located in a public environment is commonly positioned in a somewhat noisy area, frequently surrounded by external activity, and generally lacks privacy for engaging in computer-based activities such as e-transactions. It is apparent that, at times, the public environment does not have many of the physical environment characteristics that people appear to prefer when using a computer at home and by extension, the Internet.

A computer also encompasses a *virtual environment* consisting of the applications and application settings that are installed on the machine. The primary users of private computers control the virtual elements on the computer. Individual users commonly install virus protection

software, spyware detecting software, firewalls, and content filtering software in an attempt to control the virtual environment of their Internet-connected computer (Whitman and Mattord, 2005). On a public computer, the virtual environment is set up and maintained by people beyond the control of the individual user, who may add opportunities that log keystroke and gather confidential information (Jesdanun, 2003). Keystroke logging software can also be downloaded onto computers inadvertently by users (Soloman, 2003), who respond to spam e-mail or visit questionable Web sites. Once such software has been downloaded, others using that virtual environment are vulnerable to the same application. The exposure to this type of threat exists in a private setting, but in a public context, where multiple users are engaging in a multitude of activities, the potential is greater. Use of the correct operating systems settings and configurations can reduce these threats in many cases, but public equipment may not be set up and maintained properly.

There are constraints on the activities that can be carried out on a publicly-provided computer (Cullen, 2001) due to the lack of privacy, time restrictions, and equipment availability. These constraints, in combination with the physical and virtual computing environments of the public computer, present an even larger problem when a person seeks to engage in e-commerce. The physical environment of the public computer may deter computer use in general, and the virtual environment may deter transactional use, especially if the user is aware of the risks. Thus even if access to the Internet is provided in a public environment, the gap in information access may be bridged, but not the gap in e-commerce access. Unfortunately, the people most impacted by the physical configurations and the technological advances are those who have no other way to participate in the digital world and are confined to using the computers in a public environment. In the next section we develop a model of public transactional use and then test it in the public library environment.

3. Theory Development

The use of the Internet for transactions has been quite extensively studied within the context of B2C e-commerce transactions (Gefen et al., 2003; Gefen and Straub, 2000; Heijden et al., 2001; Jarvenpaa and Tractinsky, 1999; Jarvenpaa et al., 2000). The current work is more

broadly defined and considers both commerce-based monetary transactions and information transactions. However, the underlying activity is the same, users submit personally significant information to a host Web site using a local device connected to the Internet. Previous work studying the adoption and use of e-commerce provides a particularly relevant framework on which to expand and develop a model of private transactions in public places.

The *theory of planned behavior* (TPB) (Ajzen, 1991) has been successfully used as a reference theory to investigate technology use in many settings and also e-commerce adoption (Mathison, 1991; Morris and Venkatesh, 2000; Taylor and Todd, 1995a and 1995b; Venkatesh et al., 2000). The theory has been used to study the impact of attitude and risk on online shopping behavior (Jarvenpaa et al., 2000), that attitudes toward Internet purchasing are a determinant of the intent to purchase, and that both the intent to purchase and the overall Internet experience lead to Internet purchasing (George, 2002). The TPB has been extended by Pavlou and Fygenson (2006) to help predict information gathering and e-commerce purchasing behavior and the linkage between the two activities. A second and related model, the technology adoption model (TAM) (Davis, 1989), has been another widely-applied model of technology adoption behavior that incorporates perceived ease of use and usefulness in forming attitudes toward technology adoption. TAM can be considered to be a special case of TPB, focusing just on the attitude dimension of the larger model, and has been used to explore the intrinsic and extrinsic dimensions of e-commerce adoption (Gefen and Straub, 2000). Trust has been integrated with TAM to further inform the intention to use e-commerce (Gefen et al., 2003). Research on e-commerce adoption has generally focused on the individual's beliefs and perceptions about engaging in e-commerce, while the impact of the use environment on e-commerce adoption has not been considered. In a private setting such as a home or office, the environment may have little impact, however, in a public setting the use environment becomes important.

The TPB is an extension of an earlier behavior model, the *theory of reasoned action* (TRA) (Fishbein and Ajzen, 1975). The TRA model suggests that attitudes and social norms lead to a behavioral intention, which in turn results in a behavior. The TRA model did not incorporate a dimension to capture situations where people do not have complete control over the situation, so *perceived behavioral control* was added to TRA dimensions of attitudes and norms to form the TPB model. In TPB, perceived behavioral control determines both behavioral

intention and the actual behavior. Perceived behavioral control is considered to be quite similar to self-efficacy, and it arises from an individual's beliefs about "the perceived ease or difficulty of performing the behavior" (Ajzen, 1991, pg 188). Ajzen makes a distinction between perceived behavioral control and actual behavioral control. He states that actual behavioral control is the likelihood of achieving a behavior. It is dependent upon the resources and opportunities that are available to the person, whereas perceived behavioral control encompasses the person's belief about performing the behavior.

Triandis (1980) proposed an extension to the TRA that related behavior and behavioral intention to several other constructs, such as habit, culture, and facilitating conditions, in addition to the original social norms and attitude dimensions of TRA. Triandis defined facilitating conditions as the factors in the environment that encourage or discourage a behavior, and these factors directly impact both behavioral intention and the resulting behavior. Ajzen (1991) also alluded to these relationships in his description of actual behavioral control, which is similar to the facilitating conditions construct introduced by Triandis (1980) in his extension of TRA. The facilitating conditions construct has been occasionally incorporated into somewhat larger frameworks considering computer adoption, such as the one proposed by Thompson et al. (1991) and in the decomposed model of planned behavior developed by Taylor and Todd (1995b).

The decomposed TPB model tested by Taylor and Todd (1995b) includes hardware and technology-facilitating conditions as antecedents to perceived behavioral control. In other literature, however, the perceived behavioral control construct has two distinct dimensions: *perceived internal* and *perceived external* behavioral control (Conner and Armitage, 1998; Kidwell and Jewell, 2003). An *internally-controlled behavior* occurs when a person perceives that he has control over personal resources (Armitage and Conner, 1999), similar to the self-efficacy antecedent of perceived behavioral control in the Taylor and Todd (1995b) model and the original definition of perceived behavioral control described by Ajzen (1991). An *externally-controlled behavior* occurs when there are few perceived external influences acting as barriers to performing the behavior (Armitage and Conner, 1999). Thus, an externally-controlled behavior can be considered comparable to Triandis' definition of facilitating conditions (Bagozzi and Kimmel, 1995), the two types of facilitating conditions in Taylor and Todd's model, and the resources described by Ajzen (1991) as part of actual behavioral control. Although facilitating

conditions have been considered as determinants of perceived behavioral control, external control has a significant main effect on behavioral intention (Kidwell and Jewell, 2003) as suggested by Triandis. These prior results imply that perceived external conditions exert a direct influence on behavior, thus the presence or lack of external facilitating conditions in a user environment will directly influence e-commerce use.

A computer is used in a specific physical environment and at the same time the computer system itself encompasses a virtual environment. Thus, there are two distinct types of environmental facilitating conditions present in any computer environment, and user perceptions of these environments will exert individual impacts on e-commerce use behavior.

Prior research in innovation adoption has shown that individuals differ in their willingness to adopt and use innovations (Agarwal and Prasad, 1999; Bagchi et al., 2003; Gallivan, 2000; Karahanna et al., 1999). An individual user encapsulates a set of characteristics that influence their adoption and use of a technology. Oldham (1988) suggests that an individual's need for privacy will influence the work activities he or she pursues in a specific environment. Previous research focused on workspace configurations has shown that the need for privacy also moderates the relationship between workspace configuration and the willingness of people to complete tasks (Sundstrom et al., 1980). Individual need for privacy is included in the model as a factor moderating the impact that environmental facilitating conditions exert on e-commerce transactions. Figure 1 illustrates the conceptual model guiding this investigation.

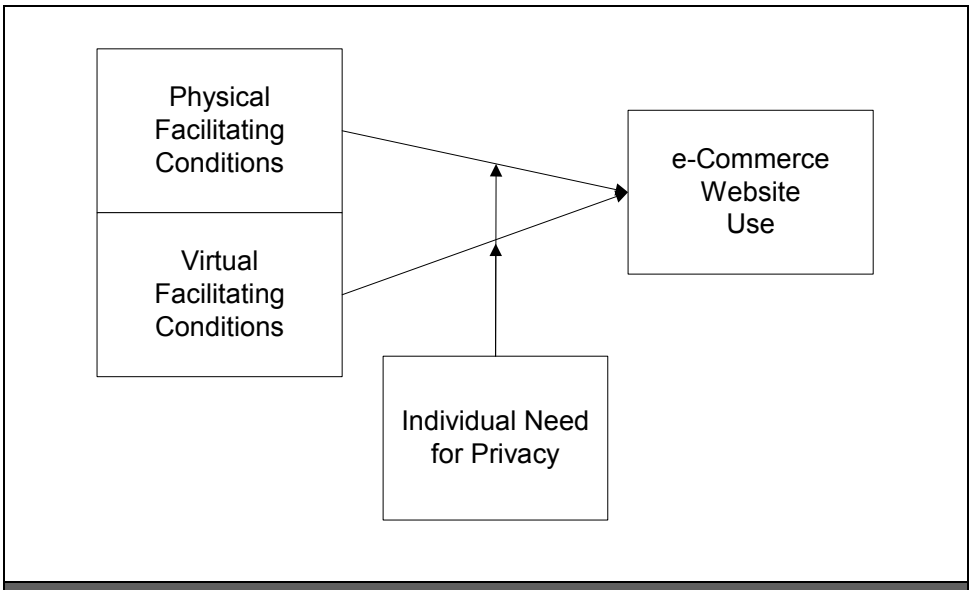


Figure 1: Conceptual Model

3.1 Physical Facilitating Conditions

The physical environment surrounding a computer (or any piece of equipment) includes the work area around the device, the presence of other people, the general atmosphere of the equipment location and the availability of staff members and/or others to provide support. Research has found that when a person places a computer in their private home space, the privacy of the work area and the mood of the room are key elements in the computer placement decision. Studies have shown that the most desirable place for a computer is in a private work area, such as a home office, or a room away from the hustle and bustle of the household (Mateas et al., 1996) so that the user is able to concentrate on computer tasks (Frohlich and Kraut, 2003). The atmosphere of the surrounding environment is also an important dimension. Placement of a personal computer in a private area supports the use of the computer for completing tasks like tracking household finances, while computer placement in a more social area of the home encourages more fun and self-expressive activities (Frohlich and Kraut, 2003). An E-commerce transaction generally requires a fair degree of concentration through a series of steps and involves personal or monetary information. Thus the most desirable environment for supporting e-commerce activities would be a rather quiet, somewhat private work area where other people cannot see what is displayed on the computer monitor. Workspace design research in organizations (Oldham, 1988; Sundstrom, 1986), has found that low levels of workspace privacy leads to people experiencing increased interruptions (Sundstrom et al., 1980), a decreased ability to concentrate on tasks, and an increased reluctance to address confidential matters (Sundstrom, 1986).

3.2 Task Privacy

Research in workspace design (Oldham, 1988) has identified *task privacy* as the degree to which a person is able to focus and concentrate on a task. Task privacy is considered to be the perceived characteristics of the workspace such as infrequent interruptions, protection from distractions, and isolation from disturbances. Triandis (1980) suggests that a behavior will not occur if conditions in an environment do not facilitate the behavior. Therefore, in order for a behavior to occur, the physical environment needs to be supportive. In a public environment the

computers are generally positioned in a rather open area, sometimes placed on open tables or inside of carrels. These physical conditions may result in (a) increased interruptions during e-commerce transactions, (b) decreased user ability to concentrate and complete a transaction, and (c) reduced willingness to engage in a confidential information exchange with the e-commerce Web site. Given these physical conditions, we would expect that higher levels of perceived task privacy will support transactional Web site activities.

- **Proposition 1 (Task Privacy):** *Perceived task privacy facilitates transactional use of Internet connections in public places*.

3.3 Available Assistance

Some studies have shown that the assistance available to people using technology positively influences technology use in some instances (Bergeron and Berube, 1988; Goodhue, 1995), while other studies involving assistance availability and PC usage found that available assistance had no impact on usage (Thompson et al., 1991). In yet other instances, the presence of assistance had a negative impact on system usage (Bergeron, 1995). The impact of available assistance is revisited in this investigation because of the unique use environment found in public computing locations. Users may perceive that assistance is available to help with hardware, software, and Internet difficulties, and this assistance would be provided by knowledgeable people. In such a case, it is likely that users would perceive less risk in engaging in e-commerce. Prior investigation into the special case of public library Internet use (D'Elia et al., 2002) has found that the availability of assistance does encourage use in this setting. Computers available in most public locations generally have some form of supervision. A staff member associated with a public computing site would be expected to have reasonably good computer skills, and users may perceive that such support personnel will provide assistance with web-basd e-commerce transactions in this environment.

Public computer equipment consists of the physical hardware, a set of installed software programs, and a connection to the Internet. A computer user may encounter difficulties with any of these elements while engaging in e-commerce transactions. A staff person present in the public facility may provide assistance with using the computer, the Internet, and software. We

expect that having assistance available to support connecting to the Internet, engaging in web-based activities and using the computer will encourage transactional use in this environment.

- **Proposition 2 (Available Assistance):** *Perceived available assistance facilitates transactional use of Internet connections in public places.*

3.4 Virtual Facilitating Conditions

Privacy enhances autonomy and/or minimizes vulnerability, thereby protecting autonomy (Margulis, 1977). Privacy is the control over the transmission of information to others and control over inputs from others. If we consider that the environment in which a public computer user functions is subject to many external influences, it is apparent that privacy, or control over information outputs and inputs, can be compromised.

Privacy in the physical environment can be controlled by physical mechanisms, such as barriers, while the virtual environment of a computer is controlled by the software installed on the system. The installed software can potentially reduce an Internet user's anonymity and control, thereby increasing the person's vulnerability to privacy violations, such as activity tracking and recording. Conversely, public computing occurs in a fairly anonymous manner (Slack and Rowley, 2004), which may encourage transactional Web site use in some situations. Persons using a public computer may perceive their activities to be anonymous, which would enhance their perception of privacy and thus encourage computer use in a public environment.

3.5 Perceived Tracking

Privacy is defined as (a) control of information and (b) the control of interactions with others (Archea, 1977; Stone and Stone, 1990). The unauthorized and unbeknownst tracking of an individual's activities on a public computer eliminates the ability of the individual to control information about personal activities and may increase individual concern about negative consequences resulting from engaging in e-commerce transactions. The computer and network a person uses to interact with an e-commerce Web site facilitates the interaction, thus a perception of risk that the computer or Internet connection may be recording, tracking or monitoring a

user's activities outside of the confines of the public location infringes on the individual's feelings of control over their personal information and the contents of the e-commerce transaction. Utilities such as network packet sniffers or spyware are outside the purview of the public site but can gather information about a user's activities. We would expect that the user's perception that their activities are being monitored or tracked while they are using a public computer would discourage that person from using a public computer and would also discourage the transactional use of a Web site from that location.

- **Proposition 3 (Perceived Tracking):** *Perceived computer activity tracking inhibits transactional use of Internet connections in public places.*

3.6 Anonymous Use

The use of a computer in a public site provides a rather anonymous environment, as user Web activities can generally be linked to a workstation, but are not generally linked to an individual user. In group research, an anonymous environment has been found to promote interaction among group members because it offers a low-threat and low-risk environment (Valacich et al., 1992). The Internet, in general, appears to provide a fairly anonymous environment for users, although communications executed through a computer can be traced back through their ISP to the actual connection, so activities can be traced to a specific machine. Anonymity is greater in a public use environment where users are not specifically linked to a computer. This anonymity may lead users to engage in behavior they would not pursue if they were identifiable (Jessup et al., 1990) because they perceive that the risk is lower. Perceived anonymity may encourage general Web site use in public and then lead to more complex e-commerce use as well. In addition, a person who perceives that Internet activities are anonymous from a public computer may tend to feel that he has control over the amount and content of information that he provides during a transaction. We would expect that higher perceptions of anonymity will support e-commerce use from public computers.

- **Proposition 4 (Anonymous Use):** *Perceived anonymous computer use facilitates transactional use of Internet connections in public places.*

3.7 Individual Need for Privacy

An individual's need for privacy is derived from psychological privacy and is a characteristic unique to the individual. Psychological privacy need protects an individual at some level from personal intrusions and includes levels of freedom from intentional or unintentional persuasive pressures (Laukka, 2000). The individual level of need for privacy varies among people (McKechnie, 1971), so the level of protection from personal intrusions and persuasive pressures that an individual requires and the sensitivity to privacy intrusion varies as well. Given the nature of the information generally provided during e-commerce transactions, the level of concern over privacy intrusions may weaken or enhance the impact of the facilitating conditions on transactional use behavior in a public environment. Previous research suggests that individual need for privacy interacts with workspace privacy in an organizational setting (Oldham, 1988); the same effect would be expected in a public workspace.

- **Proposition 5 (Individual Need for Privacy):** *Individual need for privacy will diminish the positive impact of task privacy, assistance and anonymity while enhancing the negative impact of activity monitoring perception on transactional Web site use in public environments.*

3.8 Hypotheses and Research Model

We test our theoretical model in the library setting because public libraries are a major means of free access to the Internet, especially for people without access to private computers. Libraries are traditionally viewed as a source of information; and have, across history, supported the general public's right to obtain information (Kibirige, 2001). To help address the gap in Internet access and to provide publicly-available electronic resources as a way to bridge the digital divide, initiatives to provide computers in libraries with connections to the Internet have developed both privately and publicly. Microsoft has provided computers to public libraries through the Gates Foundation (Douglas, 2004) and the Federal Government supports public technology through the e-Rate program (Federal Communications Commission, 2004). Public libraries provide an important and relevant environment in which to study public Internet usage behavior, as libraries are widely known to have free public Internet access, are traditionally

viewed as a source of information and have, across history, supported the general public's right to obtain information [Kibirige, 2001]. Libraries are common places for people to go to access information electronically and have been heavily involved in incorporating computers and free Internet service to provide access to electronic information resources (American Library Association Office for Intellectual Freedom, 2004; D'Elia et al., 2002; Kibirige, 2001). Since the current Internet technology is no longer limited to information retrieval, users in libraries may engage in e-commerce as well as information seeking when using a machine connected to the Internet. We are now in a position to restate our more general propositions as testable hypotheses for the public library context.

A library presents a public environment where people move freely around the public access areas, and although libraries are traditionally considered places of quiet study, the overall environment in a public library can be somewhat noisy and full of activity. The configurations of libraries range from large institutions with vast physical information resources to tiny, one room buildings with small physical information resources and little space for computers. Computers in public libraries are provided in a variety of different workspace configurations ranging from open tables to individual carrels to small rooms in rare instances. The physical environment surrounding a computer in a public library affords varying degrees of privacy; generally there is very little work-area privacy available to users in these locations and the computer screens are visible to library staff members and other patrons. In addition, computers are frequently placed in the central areas of the library, resulting in a generally "busy" atmosphere surrounding the user. We hypothesize that in a public library:

- **Hypothesis 1 (The Task Privacy Hypothesis):** *The perception of task privacy will have a positive effect on the transactional use of Web sites in a public library.*

Libraries are generally considered to be sources of knowledge and information staffed by people able to provide assistance in accessing this information. Assistance with using the Internet for e-commerce transactions would be expected to be available, and thus would support e-commerce. We hypothesize that for a public library:

- **Hypothesis 2 (The Available Assistance Hypothesis):** *The perception of available assistance in a library will have a positive effect on the transactional use of Web sites in a public library.*

The virtual environment of public computers differs among libraries. In larger, more sophisticated libraries, the expansion of technological capabilities has resulted in the ability to electronically capturing not only the lending activities of patrons but also other personal confidential data gathered in user profiles. In a multidimensional study of large libraries in the United Kingdom, 93% of the institutions studied generated electronic files containing personal information about patrons, and within this group 28% recorded Internet sites visited (Sturges et al., 2003); most of these data were collected and stored at a central administration site. Patrons depend on libraries to preserve their privacy (Sturges et al., 2003), however, the computers and equipment may record information unbeknownst to the user or library personnel. In some libraries, users can either purposely or inadvertently install spyware or keystroke-logging software on the public computers because computers in many libraries, especially small libraries, receive minimal set up and configuration.

In addition, programs and information stored on the hard drive can remain active and available on such public machines for a substantial time because the equipment receives minimal routine maintenance. Patrons' perception that such programs are on the local computer and their computer activities may be tracked and/or recorded is hypothesized to exert a negative impact on their willingness to use public library equipment for e-commerce transactions.

- **Hypothesis 3 (The Activity Tracking Hypothesis):** *The perception of computer activity tracking will have a negative impact on the transactional use of Web sites in a public library.*

Although some larger libraries use sophisticated electronic applications to support library usage, most libraries depend on daily sign-out lists to reserve computer time, and these lists are destroyed after aggregate daily usage numbers have been compiled. Libraries are very concerned about patron privacy and any archived information of this type is protected (Sturges et

al., 2003) to protect user privacy. This concern for patron privacy and the protection of any saved patron records creates an anonymous use environment that may encourage library patrons to engage in online activities. Specifically, it is hypothesized that:

- **Hypothesis 4 (The Anonymity Hypothesis):** *The perception of anonymity provided by public library computers will have a positive impact on the transactional use of Web sites in a public library.*

The users of computers in public libraries are very diverse (D'Elia et al., 2002), and the individual need for privacy varies among people (McKechnie, 1971). Individual need for privacy influences the workspace privacy needs of individuals (Oldham, 1988). Therefore, we hypothesize that the level of individual need for privacy will moderate the relationship between task privacy available in a library and transactional computer use in the public library environment.

- **Hypothesis 5a (The Need for Privacy Moderation of Task Privacy Hypothesis):** *Individual need for privacy will diminish the positive impact of perceived task privacy on transactional use of Web sites in public in a public library.*

The readily-available assistance found in a library may support e-commerce use in that environment. However, the public environment would not appeal to a person with a high individual need for privacy, thus we hypothesize that a high level of individual need for privacy will tend to decrease the positive impact of having knowledgeable assistance available in the library.

- **Hypothesis 5b (The Need for Privacy Moderation of Available Assistance Hypothesis):** *Individual need for privacy will diminish the positive impact of perceived available assistance on transactional use of Web sites in a public library.*

People with a high need for privacy will be more concerned about privacy invasions and activity monitoring than will those with a lower need for privacy. Thus, we hypothesize that a

higher need for privacy will enhance the concerns about activity tracking that may occur through the public computers in libraries, and in turn enhance the impact of perceived anonymity on Internet use, and by extension, e-commerce use. All public libraries have a fundamental reputation for preserving patron privacy regarding other library materials. Thus we hypothesize that a person with a high need for privacy will find the anonymous computer use environment provided by a library to be important.

- **Hypothesis 5c (The Need for Privacy Moderation of Activity Tracking Hypothesis):** *Individual need for privacy will enhance the negative impact of perceived activity tracking on the transactional use of Web sites in public environments.*

- **Hypothesis 5d (The Need for Privacy Moderation of Anonymity Hypothesis):** *Individual need for privacy will enhance the positive impact of perceived anonymity on transactional Web site use in public environments.*

The research model guiding this investigation is provided in Figure 2.

4. Research Methodology

4.1 Study Context and Sample

A self-administered survey methodology was employed in this project. The survey was conducted in three library systems involving twelve libraries in the western New York state region. The participating libraries were chosen based upon their willingness to participate and the type of service area (rural/village, suburban/city). Groups of twenty surveys were provided to each library for distribution. Twenty surveys per library were determined to be reasonable number, after conversations with library and system directors. The number of surveys per library needed to be small in order to gain library participation. Discussions with library directors indicated that computer usage is low in some rural areas that getting a large number of surveys completed would be impossible and library staff members did not have the time to handle a large number of surveys. A similar method of surveying library computer users had

been used previously (Sturges et al., 2003), in which small samples were gathered from several libraries. Considering this previous research, we felt that the sample generated was representative of library computer users in the survey region.

Library staff members distributed the surveys, according to written instructions and a supporting script provided with the survey materials. The staff members were requested to ask each patron using a computer to participate; participation was totally voluntary and did not impact the patron's subsequent use of the computers. The patrons completed the survey while seated at a computer workstation and the surveys were returned to the library personnel for return to the investigators.

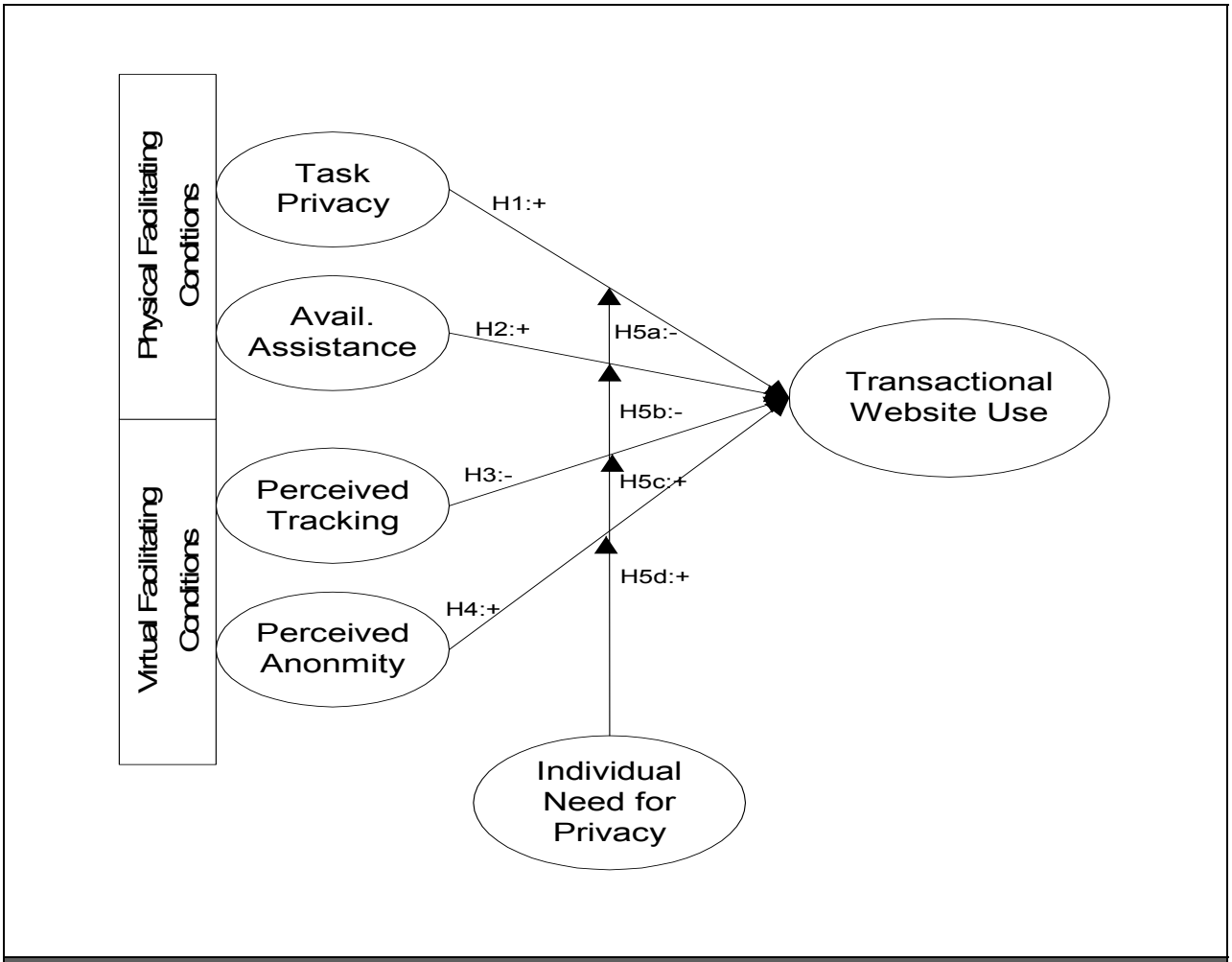


Figure 2: Research Model

4.2 Response Rate and Sample Characteristics

A total of 240 surveys were distributed, 137 were returned, resulting in a return rate of 57.1%. The return rate was impacted by the fiscal crisis facing libraries in the survey area. Staff members in several of the libraries were not always able to cooperate in distributing the surveys, even though the library directors had been very supportive and willing to participate in the project. This unfortunate situation resulted in a lower than expected response. Two of the returned surveys were not completed and were removed from the sample.

The survey administration method did not support a formal test of non-response bias. Since the sample was obtained on an opportunistic basis, we compared the sample demographics to existing literature on public library computer usage to determine if the sample appeared to be representative. About 60% of this sample reported not having Internet access from their homes, almost 56% were male and 82% were white. Approximately 62% lived in urban or suburban areas, and the remainder lived in small towns, villages, or rural areas. Over 65% of the sample indicated annual household incomes of less than $40,000, most of the respondents were between 35 and 65 years old, the largest group was in the 35 to 49 year age group. These results are comparable to the results from other library usage studies (D'Elia et al., 2002; Hoffman et al. 2000). The sample was not nationally comparable on the racial dimension, however, it was reflective of the survey region. Census data indicate that in the region surveyed, 85% of the citizens are white. Based on the majority of demographic characteristics and the U.S. census data, the sample is considered reasonably representative of public library computer users on all except the racial dimension.

The primary focus of this project was the group of people who are on “the other side” of the digital divide and do not have access to the Internet from their homes. Altogether, 82 people in the total sample reported not having Internet access from their homes. Almost 40% of this sub-group reported income less than $20,000 annually, 56% of them were male and 44% were female. Many report being employed full-time (33%), however, a substantial number (24%) indicated that they were unemployed. The respondents were fairly evenly distributed in age from 20 to 65 years old, while 7% were over 65 years of age. A complete description of the sample is provided in Table 1. The characteristics of this subgroup were similar to the full

Table 1: Sample Demographics			
		Frequency	**Percent %**
Gender	Male	46	56
	Female	36	44
Age	Under 20	1	1
	20-34	26	32
	35-49	28	35
	50-65	21	26
	Over 65	6	7
Ethnicity	Black	8	10
	White	65	81
	Hispanic	3	4
	Asian/Pacific Islander	0	0
	Native American	3	4
	Mixed Ethnic Heritage	1	1
Education	Some High School	1	1
	H.S. Graduate	19	23
	Some College	23	28
	College Graduate	24	29
	Post 4 Year College	15	19
Employment Status	Full-time Employed	25	34
	Part-time Employed	21	24
	Student	6	6
	Non-employed	21	24
	Retired	9	12
Household Income	Less than $20,000	32	44
	$21,000-$40,000	17	23
	$41,000-$60,000	17	23
	$61,000-$80,000	5	7
	Over $80,000	1	3
Residence Locale	Urban	28	35
	Suburban	22	27
	Village/Town	20	24
	Rural	12	14

sample, and thus are similar to the library computer user patterns previously reported (D'Elia et al., 2002; Hoffman et al., 2000).

The sub-group of library computer users without Internet access from their residences forms the sample considered in this investigation. The transactional use of Web sites was measured across four dimensions of information and monetary transactions involving both commercial and governmental sites. The respondents were presented with questions that focused on commercial and governmental Web sites individually, with the expectation that they would consider a broad range of transaction possibilities, not just commercial purchases. The results of this set of questions indicate that users engage in information transactions more frequently than in monetary transactions from public library computers, and the number of respondents reporting multiple transactions is higher for information transactions. A summary table of the transactional use activities for this sample is provided in Table 2.

Table 2: Transactional Use Results

Transactional Use		Freq.	Percent
Monetary Transactions			
	No transactions	55	67.9
	1	3	3.7
	2	7	8.6
	3	8	9.9
	4	3	3.7
	More than 4	5	6.2
Informational Transactions			
	No transactions	38	46.9
	1	10	12.3
	2	12	14.8
	3	9	11.1
	4	3	3.7
	More than 4	9	11.1

4.3 Instrument Development

The constructs were operationalized adapting existing measures from literature and developing measures of tracking concern and anonymous use. This research involved computer use outside of a traditional business environment. However, the computer-based activities of users in a public library are similar to those in a business environment, so we considered measures developed in the business literature to be reasonable. The new measures, related to tracking concerns and anonymous use, were developed in conjunction with experts in the library science and IS fields. Content validity was considered reasonable after the questions were evaluated by a professor of library science, a professor of IS, and two management doctoral students. The measurement items and sources (where appropriate) are provided in Table 3.

The dependent variable in this study is the number of times the respondent completed either monetary or informational transactions from public library computers. A set of four

Table 3: Constructs and Sources

Physical Facilitating Conditions	Task Privacy	Oldham (1988)
	Assistance Availability	Thompson et al. (1991)
Virtual Facilitating Conditions	Perceived Tracking	Developed
	Anonymity	Developed
E-Commerce Usage	Transactional Use (Dependent)	Developed
Individual Differences	Individual Need for Privacy (Moderating)	McKechnie (1971)

questions were developed to capture transactional use of both commercial and governmental Web sites. These questions were felt to provide a broad measure of transactional use because they encouraged the participant to consider the major categories of Web sites supporting transactional activities when responding to the questions.

All variables except the transactional use variable were measured using five-point Likert scales. Previous research has shown that, although seven-point Likert scales capture more detail, it is unlikely that respondents make such fine distinctions during the limited time of survey completion (Gupta and Somers, 1992). The smaller scale created a more user-friendly survey instrument, and considering the target respondents, an attractive survey instrument was important

to gain participation. Transactional use was measured as 0 indicating no transactions, 1 indicating a single transaction up to 5, which indicated five or more transactions. A complete description of constructs and measures is provided in Table 4.

Table 4: Measurement Items

Construct/Variable		Measures
Task Privacy (TP)	TP1	- I am able to concentrate fully on my task when using a public computer in a library
	TP2	- I can work with few distractions when using a library computer
Available Assistance (AA)	AA1	- I feel that assistance with using computer software is available in the library
	AA2	- I feel that assistance with hardware difficulties is available in the library
	AA3	- I feel that assistance with using the Internet is available in the
Perceived Tracking (TRACK)	TRACK1	- I feel apprehensive about using a public library computer
	TRACK2	- I am concerned that a record of my computer activities will be saved in the library computer
	TRACK3	- I am concerned that any personal information I put into a public library computer will be saved in that computer
	TRACK4	- I am concerned that anyone who uses the library computer after me will be able to track my activities
	TRACK5	- I am concerned that someone located outside of the library may be able to track my activities on the library computer
	TRACK6	- I am apprehensive that a government authority can get records of my computer usage in a public library
Anonymity (ANON)	ANON1	- I feel that my computer activities are anonymous when using a computer in a public library
	ANON2	- I am confident that the public library computers are well managed and do not record user activities
Individual Need for Privacy (INP)	INP1	- It is annoying to have to share my workspace with someone
	INP2	- There is too little emphasis on privacy in our society
	INP3	- I have my best thoughts when I am alone
Transactional Use	TRANS1	- Have you ever completed a monetary transaction using a credit card on a Government Web site while using a public computer in a library? If yes, number of transactions?
	TRANS2	- Have you ever completed the submission of personal information to a Government Web site while using a public computer in a library? If yes, number of transactions?
	TRANS3	- Have you ever completed a monetary transaction with a credit card on a commercial Web site while using a public computer in a library? If yes, number of transactions?
	TRANS4	- Have you ever completed the submission of personal information to a commercial Web site while using a public computer in a library? If yes, number of transactions?

5. Results

The survey data was analyzed using partial least squares structural (PLS) equation modeling software PLS-Graph Version 3.00 Build 1066. PLS has been used previously in IS research (Agarwal and Karahanna, 2000; Compeau and Higgins, 1995; Gefen et al., 2000; Venkatesh, 2000) and is appropriate due to the small sample size (Agarwal and Karahanna, 2000) and ordinal measurement scales. The latent variables were modeled from reflective indicators using all measurement items as recommended by Chin (1998). A two-step approach to model testing was employed in which the measurement model was first assessed and then the structural model was tested. The interactions were analyzed using a hierarchical PLS modeling approach, as suggested by Chin et al. (2003). This approach involved forming the interaction terms by multiplying the standardized variable indicators from the predictor and moderator variables together and submitting the original indicators and interaction variables to PLS for analysis. The construct indicators were standardized using SPSS 11.5 prior to calculating the interaction product variables. The standardization approach was employed because of the Likert-scale items used in the survey (Chin et al., 2003). In applying this approach, the fit of the main effects model was considered first, followed by the model that included the interaction components. An improvement in the model fit statistics indicated the importance of the interaction terms. The measurement model results are presented in the next sub-section, followed by the structural model results for the main effects model and the complete model.

5.1 Measurement Model

The psychometric properties of the measures were assessed by considering the item reliabilities and discriminant validity. The item reliabilities were evaluated by examining the composite reliability of the main effects and the interaction components. The descriptive statistics for the main effects portion of the model are provided in Table 5, as well as the composite reliabilities. All of the constructs indicated reasonable internal consistency as evidenced by the composite reliability values above the 0.70 threshold (Nunnally, 1978), most were above 0.80. The results indicate that the main effects and interaction constructs can be considered to be internally consistent.

Discriminant validity was analyzed by comparing the average variance extracted (AVE) to the R^2 among the latent variables (Fornell and Larcker, 1981). This comparison indicates that more variability is within a latent variable and its indicators than between the latent variables themselves. The results of the correlation matrix are provided in Table 5. Discriminant validity is indicated when the square root of the AVE (provided on the diagonal of the chart) is larger than the correlations among the other constructs. An examination of Table 5 indicates reasonable discriminant validity.

To further evaluate the discriminant validity of the model, the factor loading measurement for each item was examined to ensure that each item loaded higher on its own construct than on any of the other constructs. The results of the analysis of the main effects constructs are presented in Table 6. The reader should note that the mean of the transactional use variable has a rather large standard deviation. This aberration is probably due to the large group of respondents who had never participated in online transactions. The results of the reliability and validity analyses indicate that the measurement model exhibits reasonable reliability and discriminant validity, thus we proceed to consider the structural model.

Table 5: Statistics, Correlations and Reliabilities of the Measures													
	Mean	Std. Dev	C.R.	TP	AA	TRAC	ANON	USE	INP	TP x INP	AA x INP	TRAC x INP	ANON x INP
TP	3.72	1.12	0.833	(0.850)									
AA	3.54	0.91	0.837	0.316**	(0.798)								
TRACK	2.60	1.10	0.903	-0.101	-0.115	(0.782)							
ANON	2.54	1.17	0.925	-0.028	-0.032	-.289**	(0.928)						
USE	4.63	5.21	0.791	0.198	0.186	-0.292*	-0.151	(0.563)					
INP	3.42	0.89	0.817	-0.047	0.049	0.14	-0.117	-0.117	(0.775)				
TP x INP			0.835	0.118	-0.002	-0.040	-0.031	-0.188	-0.188	(0.684)			
AA x INP			0.782	0.176	0.059	0.051	-0.048	-0.242	-0.242	-0.397	(0.569)		
TRAC x INP			0.532	-0.172	0.004	-0.146*	-0.074	0.344	0.344	0.039	-0.040	(0.301)	
ANON x INP			0.903	-0.070	-0.054	0.222*	-0.098	-0.187	-0.187	0.031	-0.088	-0.205	(0.779)

N = 82; √AVE is provided in parentheses on the diagonal. Generally the value of the √AVE should be greater than the correlations in the body of the chart. ** Correlation is significant at the .01 level, * Correlation is significant at the 0.05 level.

Table 6: Cross-Factor Analysis and Factor Loadings						
	Task Privacy	Assistance Available	Perceived Tracking	Anonymity	Individual Need for Privacy	Trans Use
TP1	0.9998	0.3370	-0.0924	0.0161	-0.0591	0.1848
TP2	0.6004	0.3494	-0.1885	0.1508	0.0429	0.0349
AA1	-0.2718	0.8937	-0.1451	-0.0256	-0.0241	0.0606
AA2	-0.3410	0.9748	-0.1178	-0.0050	0.0136	0.0330
AA3	-0.3523	0.8439	-0.0208	0.0098	0.0866	0.0531
TRACK1	0.1099	-0.0666	0.7530	-0.0143	0.1109	0.0815
TRACK2	0.0412	-0.1795	0.8330	0.3741	0.0979	0.0523
TRACK3	0.0015	-0.1223	0.8898	0.3837	0.1045	0.1117
TRACK4	0.0920	-0.1410	0.8208	0.3203	0.1307	0.1526
TRACK5	0.0680	-0.2082	0.7121	0.4102	0.0418	-0.0020
TRACK6	0.0511	-0.1734	0.5839	0.3880	0.0975	0.0064
ANON1	0.0081	-0.0152	-0.2231	0.9803	-0.1173	0.0739
ANON2	0.0210	0.0758	-0.3559	0.8787	-0.0995	0.0271
INP1	-0.0463	0.0258	0.0597	0.1115	0.6156	0.1275
INP2	0.1020	-0.0888	0.0478	0.0932	0.7176	0.0847
INP3	-0.2034	0.1716	0.0594	0.0821	0.5875	0.1358
TRANS1	-0.1120	0.0687	0.1009	0.0409	0.0885	0.8486
TRANS2	-0.0657	0.1037	-0.0204	0.0549	0.0601	0.5135
TRANS3	-0.0373	0.1969	-0.1643	0.1006	-0.0117	0.3392
TRANS4	-0.0391	0.2223	0.0669	0.0336	0.0281	0.6601

5.2 Structural Model

The main effects structural model was evaluated using the bootstrap procedure within PLS using 500 resamples. The fit of the main effects model exhibited $R^2 = 0.274$ with four paths indicating significance at the 0.05 or 0.01 level. The results of the main effects model are summarized in Table 7.

Testing for the interaction effects was carried out as described by Chin et al. (2003). The predictor and moderator variables were modeled as latent constructs. The moderation variables were created by calculating the product of the predictor and moderator variables and adding these new variables into the model. Standardized measures were used in this product calculation as recommended by (Chin et al., 2003) so that no emphasis was given to any member of the indicator set. The standardized measures were calculated using the SPSS 11.5 statistical package. Controlling for income, education level and experience, a hierarchical process, was

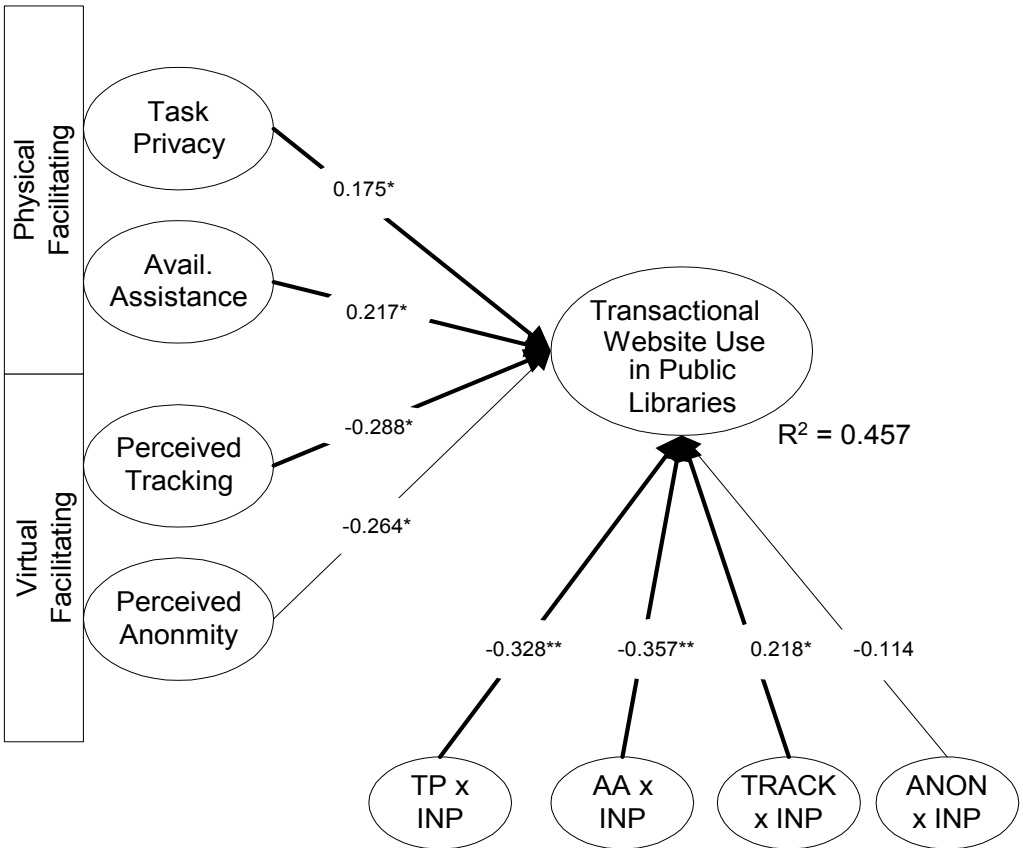
Table 7: PLS Results

		Main Effects	Interaction Model
Hypothesis	Path	Path Coefficient	Path Coefficient
H1	TP → TRANS	0.316***	0.175**
H2	AA → TRANS	0.247**	0.217**
H3	TRACK → TRANS	-0.346***	-0.288**
H4	ANON → TRANS	-0.276**	-0.264**
H5a	TP X INP → TRANS		-0.328***
H5b	AA X INP → TRANS		-0.357***
H5c	TRACK X INP → TRANS		0.218**
H5d	ANON X INP → TRANS		-0.114
		$R^2 = 0.274$	$R^2 = 0.457$

** $p<0.05$, *** $p<0.01$
Controls: Income level, education level and experience

followed looking first at the structural main effects model and then at the structural model incorporating the interaction constructs. The results of this additional analysis are summarized in Table 7 and displayed in Figure 3.

The impact of the interaction variable was evaluated by examining the difference in model variation explained with the interaction effect added to the model. The inclusion of the moderator



Notes: - INP designates individual need for privacy

- Highlighted lines indicate supported hypotheses
- Confidence levels: * p< .01, **p < .05

Figure 3: Results Model

resulted in a substantially increased $R^2 = .457$. The effect size of this change was 0.25, which is considered to be moderate to large (Chin et al., 2003). These overall results indicate that interaction factors add to the overall explanatory power of the model and suggest that individual need for privacy does moderate the impact of the physical and virtual facilitating conditions on transactional use.

Hypotheses 1 though 4 were tested using PLS analysis of the main effects variables. The use of the main effects model is suggested in this portion of the analysis due to the possibility of confounding main and moderating effects (Carte and Russell, 2003). The path coefficient of 0.318 ($p < .01$) between task privacy and transactional use indicates that task privacy is important to transactional use in a public environment. Likewise, the path coefficient of 0.248 ($p < .05$) between available assistance and transactional use also indicates an important relationship exists between these variables. The Activity Tracking Hypothesis, H3, and the Anonymity Hypothesis, H4, focus on the virtual environment within a public computer. The path coefficient of -0.346 ($p < 0.01$) indicates that the perception of being tracked is a deterrent to public computer users and exerts a negative influence on transactional use. The path between anonymous use and transactional use, while significant, is in the opposite hypothesized direction and does not support the Anonymity hypothesis. This unforeseen result may indicate that since Web-based transactions generally involve some type of personal information, anonymity is not a determinant of transactional use, and this result may in fact indicate that those people who perceive their actions to be anonymous on a public computer are not inclined to complete Web site transactions in any environment. This unexpected but interesting result needs to be further investigated.

The Need for Privacy Moderation of Task Privacy Hypothesis, H5a, and the Need for Privacy Moderation of Available Assistance Hypothesis, H5b, explore the impact of the individual difference variable, need for privacy, on facilitating conditions. Interval scales were used in this investigation, therefore the change in R^2 and the effect size were used to evaluate the moderating effects. A direct interpretation of the path values is not recommended (Carte and Russell, 2003), however, the direction of the path values adds insight into each of the interactions and suggests that individual need for privacy diminishes the impact of task privacy on transactional use. At the same time, individual need for privacy appears to enhance the effects of perceived tracking on transactional use. Individual need for privacy was found to diminish the impact of available assistance, and it does not appear to influence the impact of anonymity on transactional use.

The results of this analysis indicate that the two dimensions of the physical facilitating conditions, task privacy and available assistance, provide support for transactional use. Task privacy exhibited a slightly weaker path than did available assistance. This would be expected in

the libraries studied because there was essentially no privacy in any of the locations. Perceived tracking does appear to discourage transactional Web site usage, as this was the strongest path (0.288, $p < .01$). Therefore this suggests that public computer users are concerned about these issues. fairly large and significant (-.264, $p < .01$) negative relationship was found between anonymity and transactional use. This was contrary to the expected direction of this relationship and should be further investigated. This unexpected result might be explained by considering that people who are conscious about preserving their anonymity would not engage in an e-commerce activity, which in and of itself requires that a person provide personal information. While the original hypothesis may be supported in a public environment where people are just using the Internet for information access, it is understandable why it would have been unsupported in this study where specific information transactions were required.

The interaction of individual need for privacy markedly improved the explanatory power of the model. The strongest interaction effects of individual need for privacy were with task privacy and available assistance. In both cases, the individual need for privacy diminished the primary relationship. The moderating effect of individual need for privacy on the relationship between perceived tracking and transactional use was fairly strong and significant (.218, $p < .01$). This suggests that the individual's need for privacy enhances the negative relationship between perceived tracking and transactional use. These results support the hypotheses and indicate that an individual's unique characteristics do influence the effect of the facilitating conditions on their use of public computers for e-commerce transactions. The interaction with anonymity yielded an insignificant relationship, which is not unexpected based upon the main effects and the information exchange-nature of the Internet activities under study. A summary of the overall results is provided in Table 8.

Engaging in private transactions from public computers appears to be a somewhat limited activity, even among people without Internet access from their residences. A majority of the public computer users participating in this study reported no monetary or information transaction activity while using the public access computers. However, among the people who have engaged in e-commerce transactions in this environment, the facilitating conditions do exert an impact. Both the physical environment and the virtual computer environment significantly influenced e-commerce behavior among study participants, as suggested by Triandis (1980) in his extension to TRA and Ajzen (1991) in his definition of actual behavioral control.

We also find that individual differences are a factor in these behavioral relationships. A person's individual need for privacy moderates the impact of the physical and virtual environments on e-commerce behavior in these locations. The results from our model suggest that the facilitating conditions found in a public situation will influence the use of the Internet in that context.

Table 8: Results Summary

H1 (Task Privacy Hypothesis)	Supported	The relationship between task privacy and public transactional use is positive and significant.
H2 (Available Assistance Hypothesis)	Supported	The relationship between available assistance and public transactional use is positive and significant
H3 (Perceived Tracking Hypothesis)	Supported	The relationship between perceived activity tracking and public transactional use is negative and significant.
H4 (Anonymity Hypothesis)	Not Supported	The relationship between anonymous use and public transactional is negative and significant
H5a (INP Moderation of Task Privacy Hypothesis)	Supported	The effect of INP on the relationship between task privacy and transactional use is negative and significant.
H5b (INP Moderation of Available Assistance Hypothesis)	Supported	The effect of INP on the relationship between Available Assistance and public transactional use is negative and significant.
H5c (INP Moderation of Activity Tracking Hypothesis)	Supported	The effect of INP on the relationship between perceived tracking and public transactional use is positive and significant.
H5d (INP Moderation of Anonymity Hypothesis)	Not Supported	The effect of INP on the relationship between Anonymity and public Transactional is not significant.

6. Discussion and Conclusions

Engaging in e-commerce transactions in public places carries an inherent risk to the user that is not found in e-commerce activities conducted through private computers, due to the environmental conditions found in and around publicly provided computers. Users have shown a reluctance to engage in e-commerce due to risks they perceive in these activities (Jarvenpaa and Tractinsky, 1999; Miyazaki and Fernandez, 2001) in these activities. Perceived risk can be considered to be the uncertainty a person feels regarding the possible negative consequences of an action (Featherman and Pavlou, 2003). People have expressed concerns about the privacy of their personal transaction information, the use of their personal information for fraudulent purposes, and the security of the transaction information (Miyazaki and Fernandez, 2001). However, public computer users are exposed to a wider array of risks, both in the physical environment and in the virtual environment of the computer. The uncertainties that people have about the negative consequences of using a public computer for e-commerce may be reflected in their unwillingness to adopt e-commerce in a public environment and may be a consequence of the facilitating conditions present in the computer environment.

Public computers are provided in many public environments as a way to narrow the digital divide by providing a means to access the Internet for all people. The publicly-available computers should be provided in such a manner that people will perceive less risk in the public computer environment and be willing to fully use all aspects and functionality of Internet resources and services. The goal of this research was to define characteristics of the public computer use environment that influence e-commerce adoption in public and to investigate the impact of each of these dimensions on e-commerce usage. This investigation included an expansion of the Facilitating Conditions construct defined by Triandis (1980) to include two distinct types of facilitating conditions, the facilitating conditions perceived in the physical environment and the facilitating conditions perceived in the virtual environment of the computer used to interface with the Internet. Our results show that a lack of task privacy and user concerns about activity tracking impede the use of public computers for Web site transactions, while the availability of on-site staff to provide assistance with the equipment supports e-commerce use in this environment. Perceived anonymity was not found to be a motivating factor for completing transactions in this environment. Anonymity may be more of an issue for people engaging in unidirectional information gathering from the Internet because e-commerce transactions, of necessity, contain personally identifying information. The results further indicate that an

individual difference characteristic, *individual need for privacy*, influences the significant relationships, except for the negative relationship between anonymity and transactional use. Overall, these factors explained 45.7% of the variability in e-commerce use in the public environment.

Before we discuss the implications of this study, the limitations of this work should be noted. Self-report data was used throughout this project. Problems regarding self-report data have been discussed in IS literature (Straub et al., 1995; Trice and Treacy, 1986) however multiple report measures were not possible in collecting data for this type of research. This research project was focused on the respondents' perceptions, thus a self-report measure of transaction usage would reasonably reflect these factors. A further limitation of this study was the lack of a pilot study to evaluate the survey instrument. Gaining support from libraries and encouraging patron participation was a large problem with this initial study, therefore experts were used to review the survey and the data gathered was used for analysis. It is noted that this is a limitation of the study, and subsequent work will involve a pilot study to validate the survey instrument. The sample was, by necessity, a convenience sample, although every effort was made to gather input from a diverse group of public library computer users. Such constraints occur when pursuing research such as this, and thus are noted as limitations. A further limitation of this work is the lack of racial diversity in the study sample. Research in the digital divide indicates that minorities are heavy users of public computers (Hoffman et al., 2000). This was not reflected in this sample, due possibly to the racial profile of the region in which this study was conducted, where 85% of the population is white. This flaw in the sample may lead to a lack of generalizability of these results outside of this area. An expansion of this work to gather input from a broader cross section of public computer users will add further insights into this problem.

In conclusion, the results of this research suggest that environment is an important facet of technology use, especially in public computing. Our findings suggest that providing greater task privacy may promote transactional use in a public environment, however individual characteristics will moderate the impact of these environmental factors. The availability of assistance appears to be a supporting factor in public transactional use, even among those people with a high individual need for privacy however, individual need for privacy moderates this relationship as well. The activity tracking results indicate that users have concerns about being tracked and monitored while using public library computers, and this concern impacts

transactional use. The impact is amplified by the individual's need for privacy. The overall results of this study suggest that just providing public Internet access is not sufficient to fully bridge the digital divide. It is apparent that people are willing to use the computers provided in public libraries to access the Internet and reduce the information divide, but they are unwilling to fully use this public equipment to participate in Web-based transactions, thus we are still left with an e-commerce divide.

7. Future Research

The installation and use of publicly-available information devices is expanding quickly to provide access to information resources from a variety of places like stores, malls, airports, hospitals, offices, schools, libraries, and community centers, to name a few. In addition to wired access, wireless access is also becoming ubiquitous in many public areas as another source of Internet access. As public computer availability burgeons, we are encouraged to consider the IT context (Orlikowski and Iacono, 2001) and include the impact of computing environment on technology adoption and use. The current work suggests that the technology environment can be viewed in at least two dimensions; the physical environment and the virtual environment, and each should be considered when investigating technology adoption in public environments. Subsequent work needs to investigate different types of public environments, for instance community centers, which tend to be more socially focused and may be used more frequently for e-commerce than computers located in libraries. Public computers in retail environments may receive more e-commerce activity than public access sites in airport.

Risk perception in the public environment is another area that warrants investigation. Previous research has found that time risk, privacy risk, and financial risk are all concerns of people adopting an e-service (Featherman and Pavlou, 2003). Extending these finding by also considering the computing environment suggests a series of further research areas. For example, the results of the current work indicate that people are concerned about possible activity tracking and information gathering that might occur through a public computer. These concerns could be further decomposed into concerns about the perceived risk to a person's privacy and perceived financial risk from these activities; both risks are a direct result of the environment, and each may exert a different influence on e-commerce adoption. Further research into how to best

address these user concerns or reduce the perceived risk in this environment would be valuable to enterprises seeking to support e-commerce activities through public computers and to organizations seeking to provide Internet access to people across the digital divide.

The measures for capturing perceived tracking and anonymous use have not been previously established, so this leads to validity concerns. Further work and testing of these measures in a variety of use environments also needs to be completed in order to develop empirically sound environmental measures necessary to support further research focused on the impact of the environment on technology use.

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ESSAY 3: An Investigation of Public Transactional Website Use: The Influence of Internet Self-Efficacy, Expected Outcomes and Risk

Abstract

The use of the internet to provide service and information has expanded to the point that access to cost effective goods and efficient services is frequently available only through web pages displayed on a computer connected to the internet. In order to participate in this new way of doing business and obtaining service, people must have access to a computer with an internet connection. In many instance publicly available computers provide access to this cyber-world. However, there is little research that has investigated whether people are willing to engage in internet facilitated transactions through machines located in public facilities. The public environment contains many barriers to access as well as risks, some of which are inherent in the equipment itself. We use the Theory of Planned Behavior (TPB) and Social Cognitive Theory (SCT) to expand on previous research and examine the impact of three types of perceived risks (the risk in the online transaction, risk in the computer virtual environment and risk of being tracked) in conjunction with self-efficacy to explore the determinants of public transactional website use.

The results of the study, conducted with users of computers in public libraries, indicate that the perception of risk in the online transaction is an important deterrent to public transactional website use and is an important factor in risk attitude toward online transactions. Further, we find that concerns about the virtual environment in which the computer is located do not impact public transactional website use nor do these concerns influence online transaction risk attitude.

Keywords: Digital Divide, Perceived Risk, Risk Attitude, Internet Self-Efficacy, SCT, TPB, Computing Environment, Publicly Accessible Computers

1. Introduction

The internet has permeated many aspects of modern life, providing instant access to vast information resources and electronically provided services. A large segment of this modern communication channel supports electronic communication not only from the provider to the end user but from the end user back to the content provider. This web-based, two-way communication channel has spawned a new, efficient and economical way for governments and commercial enterprises to interact with consumers. In order for people to utilize this new way of interfacing with providers, the consumer must have access to a device, most commonly a computer, connected to the internet.

Many people in the U.S. and throughout the world do not have computers with internet connections in their homes (U.S. National Commission on Libraries and Information Science, 2005) thus they must use alternative sources of internet access in order to participate in these service delivery channels and receive the economic and efficiency benefits from this new way of doing business. Public computing facilities are an important part of the effort to bridge the divide and provide computer and internet access to people without residential or "private' access." A potential problem with this solution to the digital access gap is that the environment within and around these publicly situated computers is quite different from the environment commonly found in a private setting. In a public facility, computers are generally placed out in the open, on tables or sometimes in low carrels providing the users with minimal privacy. The public computers are also used by multiple individuals who have diverse computing skills; unfortunately many of the public computers receive minimal initial configuration or routine maintenance. The public computer users themselves face access barriers as they are generally required to first request the use of a public computer, frequently wait to use the equipment and then accomplish their computer facilitated task within a stringent time limitation. In order to provide internet access to public computer users in a manner that will support all levels of internet use, it is important to understand the determinants of the most complex use and thus understand how to provide the equipment for access in a manner that will support the full range of internet activities.

Internet activities require the use of a computing device connected to the internet. Prior research has found that computer use requires a considerable set of technical skills supported by an array of individual difference characteristics (Agarwal & Prasad, 1999; Harrison & Rainer, 1992; Zmud, 1979). Among these individual differences, self-efficacy (sometimes considered to be self-confidence) is an important determinant of basic computer use (Compeau & Higgins, 1995b; Igbaria & Iivari, 1995). Internet use for information search and website viewing requires basic computer use skills in addition to the skills necessary to surf the web. Transactional use of websites introduces an additional level of complexity in that users are first required to access the internet site and then interact with the webpage. Figure 1 illustrates the dependency of complex online transactions on fundamental computer skills and internet knowledge. In addition, a user engaging in the two-way interaction of online transactions may be exposed to the risk of information or monetary loss resulting from these interactions. Public computer users who engage in transactional internet access are confronted with both the greater complexities and risks of internet use in addition to the complexities and risks present in the public environment. User confidence, or self-efficacy is important to basic computer use (Igbaria and Iivari, 1995). Therefore self-efficacy specifically addressing internet use is expected to be an important determinant of transactional website use in the unique environment of a public computer because the full use of electronically provided services frequently involves the input of user provided information into a webpage displayed through the local computer. Online transactions involve the potential risk of monetary and/or information loss, the extent to which a user perceives these risks may deter public transactional website use. The impact of the public computing environment on user activities has been minimally studied, however, some results suggest that user perceptions and characteristics may influence transactional website use in computers located in public environments (Rensel et al. 2006a; Rensel et al. 2006b). In order to effectively provide internet access

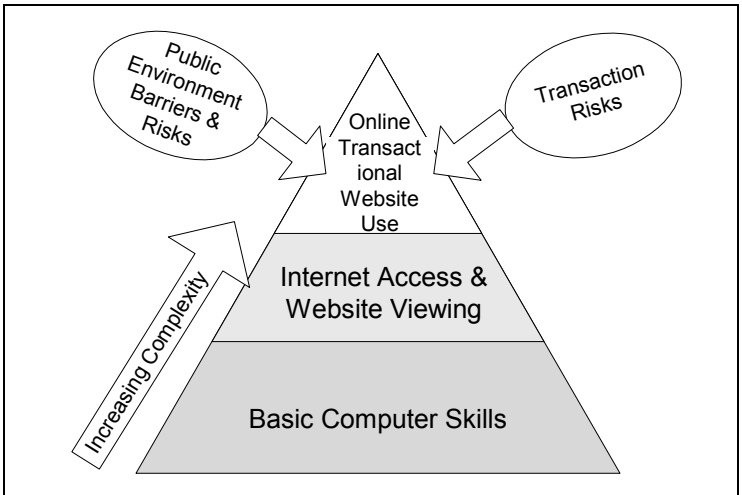


Figure 1: Online Transactions and Computer Skills

through public computers, it is necessary to understand the factors that encourage or discourage the full use of the electronic technologies in this unique environment.

1. In summary, publicly provided computers provide an important internet access point for people without private internet access, however there has been little consideration of the influence of the public environment on user activities. This study helps us to gain insight into some of the dimensions that support (or deter) the full, transactional use of websites accessed through public computers. The outcomes of this work will be a source of guidance to current and future service and resource allocation decisions and for the organizations supporting these initiatives. This study adds the following contributions to the digital divide and technology adoption literature: It considers Internet Self-Efficacy as a determinant of transactional website use in a public environment and explores the relationship between perceived risk, self-efficacy and public transactional website use in the public environment.
2. This work specifically includes three expected self-efficacy outcomes: material, social and self-evaluative (specified by Bandura (1977)) and attaches an importance value to each outcome in an effort to more clearly understand the determinants of transactional website use.
3. It empirically tests an alternative model of public transactional website use that is based upon the Theory of Planned Behavior (TPB) and Social Cognitive Theory (SCT) that is combined with risk perception.

2. Background

The internet is commonly used for information seeking (Nie & Erbring, 2000) however an important and expanding use of the internet involves information transfer from a user back to the website host organization (Chaudhury & Kuilboer, 2002). For example, most commercial banks support the use of the internet for customers to complete financial transactions, and an ever-increasing part of commerce activity involves shopping for goods and services over the internet. Governments at many levels support and encourage the use of the internet for routine activities such as tax filing, paying for services such as licenses and permits (Horrigan 2004). Similarly, personal information is transferred over the internet to government and private firms

when applying for jobs online (Tiscali, 2005), when requesting access to information resources, or when filling out government applications for services and benefits. Each of these activities involves some form of a two-way interaction, or *transaction*, between user and website provider, that involves either monetary or information transactions. Monetary information is provided in many ways. For example, credit card account numbers, gift card code numbers or private bank account numbers are entered into webpage based payment forms provided by the host organizations. These interactions are considered to be monetary transactions. Other two-way interactions involve the entry of personal information such as social security numbers, PIN numbers. or similar unique identification codes into webpage forms along with personal information. These interactions are considered to be information transactions.

The opportunity to purchase goods and services through the internet provides wider access to goods and services, frequently at reduced prices. People who do not have access to the internet from a private computer have the opportunity to access these electronic internet resources through computers provided free of charge in public locations. The use of public computers is voluntary, thus individual characteristics and perceptions are determinants of usage behavior (Hartwick, 1994; Jurison, 1996; Hargittai, 2006) and an individually motivated activity. Exploratory research has found that internet self-efficacy is an important determinant of transactional website use in the public library environment (Rensel et al., 2006a; Rensel et al., 2006b). The results gathered from the unique public environment are comparable to the results of other research exploring the impact of self-efficacy on technology adoption and use in more traditional environments (Compeau & Higgins, 1995b; Compeau et al., 1999; Eastin & LaRose, 2000; Taylor & Todd, 1995a).

Self-efficacy exerts an influence on end user performance during computer skills training (Compeau & Higgins, 1995a; Martocchio, 1993) and exerts a strong influence on the decision to use computing technologies (Compeau & Higgins, 1995b; Hill et al., 1987; Igbaria & Iivari, 1995). Self-efficacy is also an important determinant of perceived control in using information systems (Taylor and Todd, 1995b). Computer self-efficacy has been included in an expanded TAM model (Venkatesh & Davis, 1996) and is a strong determinant of the "perceived ease of use" dimension and is an indicator of organizational commitment (Stone & Henry, 2003). Across all of these investigations very little consideration has been given to the anticipated outcome expectancies that are a key dimension of self-efficacy as described by Bandura

(1977;1986), and how these expected outcomes may influence the resulting use of technology. Compeau and Higgins (1995) included two categories of outcome expectancies: performance outcome expectancies and personal outcome expectancies. Eastin and LaRose (2000) included three types of outcome expectancies in their model of internet use, however, little other research incorporates the self-efficacy construct with the three outcome expectancies (material, social and self-evaluative) described by Bandura (1997). These outcome expectancies are important dimensions to explore within the context of this research as they may provide a clearer picture of what expected outcomes encourage technology usage, which outcomes are strong enough to overcome the barriers presented by the public environment, and which outcomes influence the user risk attitude toward transactional website use.

Risk is inherent in an exchange of monetary or personal information. The public environment adds another dimension of risk to such exchanges. The use of internet supported electronic channels to engage in monetary and information transactions incorporates elements of risk that tend to reduce the willingness of consumers to engage in electronic purchases (Bhatnagar et al. 2000). The security of personal and financial information during an online purchase is a major concern among online shoppers (Miyazaki & Fernandez, 2001), with users citing credit card number theft and the unauthorized use of personal information as major problems (Liebermann & Stashevsky, 2002). These identified risks involve the transfer of information between the user and the merchant or website host,

However, there is another dimension that is particularly relevant in the public environment. A computer encompasses a "virtual environment" that can gather and retain information about user activities. A computer in a library may be configured to capture and store a user's personal information and web surfing activities (Sturges et al. 2003). Furthermore this virtual environment can be a result of the cumulative activities of prior users. For example, the computers in public locations may be configured so that users are able to install programs themselves, the public computers may have spyware or keystroke logging applications running in the background that were inadvertently installed during users' surfing activities (Soloman 2003) or purposefully installed by other knowledgeable users (Jesdanun 2003). Because the machines in some public locations receive minimal maintenance, the virtual environment of such machines is a reflection of the activities of previous users. This "unknown" virtual environment presents a potential risk to subsequent users whose personal or monetary information may be

gathered while using the public computer or whose internet activities are tracked and monitored. If users perceive that these virtual risks exist in public computers, this may impact there users' willingness to engage in transactional website use through publicly accessible equipment.

Research in the health behavior field has found that individual behavior is impacted by both self-efficacy and perceived risk (Schwarzer and Fuchs, 1995). Extending these findings to the current study, we suggest that the transactional use of internet based websites in any context is influenced by both the individual's self-efficacy and the individual's perception of the risk involved with engaging in transactional website use. The public transactional use of websites would be expected to exhibit an even stronger relationship between these dimensions because of the increased complexity in the public use environment and the unknown and uncontrollable virtual environment of the public computer. This paper explores the relationships between self-efficacy, risk perception and public transactional website use.

Bandura (2001) states that self-efficacy is specific to the task therefore since we are concerned with an internet-based task we focus specifically on internet self-efficacy (Eastin & LaRose 2000). Behavior motivation arises from the importance an individual attaches to an expected outcome (Vroom, 1964), thus we consider the expected material outcomes, the expected social outcomes and the self-evaluative outcomes in combination with the importance of these outcomes to investigate the transactional website usage behavior of public computer users. Perceived risk is included as a direct determinant of transactional website use; in this paper we will consider three dimensions of perceived risk: (1) the individual perception of online transaction risk, (2) the user concerns about the internal public computer environment, and (3) the risk of external monitoring of their website transactions.

3. Conceptual Framework and Research Hypotheses

The theory of planned behavior (TPB) (Ajzen 1991) posits that the determinants of behavioral intention consist of attitudes toward a behavior, the beliefs about the behavior and the perceived behavioral control over the behavior. This paper is concerned with the actual use of transactional websites so we do not consider behavioral intention to engage in website transactions, rather we proceed directly to study the actual behavior. In developing TPB as a refined version of the theory of reasoned action (TRA) Ajzen (1991) states that self-efficacy is

an important dimension within the perceived behavioral control construct. In the current research we focus on self-efficacy as described by Bandura (1977;1989;1997) and include both the individual's perceived internet self-efficacy in addition to the anticipated outcome expectancies that may influence transactional website use.

According to TPB, a second important determinant of behavioral intention, and thus the actual behavior, is the attitude towards behavior. In the current context we are interested specifically in the person's attitude toward risk involved in web-based monetary and information transactions. In terms of attitude, this paper focus of the users' attitudes toward the risk involved in transactional website use and does not consider user attitudes toward the website providers themselves. Perceived risk has been shown to directly influence online shopping behavior and attitude toward online purchasing (Jarvenpaa et al., 2000). In this paper we extend previous online shopping research results by considering both monetary transactions and informational transactions, and we examine two additional dimensions of perceived risk, the online transaction risk and the virtual computer risk. Further, we investigate the influence of expected outcomes on the overall attitude toward transactional website use. The conceptual model guiding the following hypothesis development is provided in Figure 2.

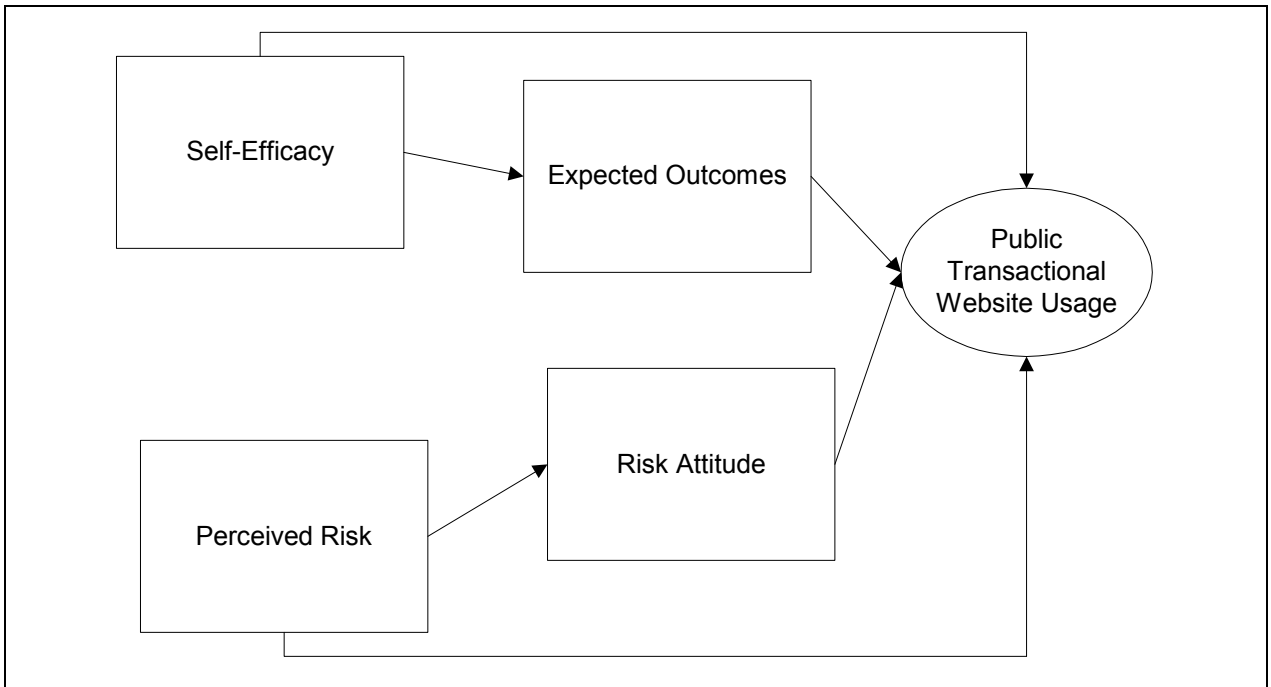


Figure 2: Conceptual Model

3. 1 Self-Efficacy

Social Cognitive Theory (SCT) (Bandura, 1986; Bandura,1989) states that an individual's behavior results from the interaction of personal factors, the behavior and the environment. A model of this interaction is provided in Figure 3. The underlying principle of SCT is that humans are self-regulating and the central mechanism of this self-regulation is self-efficacy. Bandura (1986) defines self efficacy as "people's judgments of their capability to organize and execute courses of action required to attain designated levels of performances" (p 391).The results of these actions lead to outcomes. Humans are also anticipatory so the anticipation or expectation of a positive outcome will increase their tendency to pursue a behavior and likewise, the expectation of a negative outcome will decrease their tendency to engage in a behavior. Self-efficacy beliefs contribute to the expected outcomes (Bandura, 1997), which means if a person's self-efficacy helps them anticipate an outcome, then that anticipated outcome will lead to a particular behavior. These expected outcomes are said to occur in three forms (1) the expected physical or material outcomes, (2) the expected social outcomes and (3) the expected self-evaluative outcomes (Bandura, 1986). The combination of these three expected outcomes in conjunction with the specific feelings of self-efficacy toward the behavior helps to determine whether a person will engage in a particular behavior

.

3.1.1 Internet Self-Efficacy

Bandura (2001) states that self-efficacy is specific for specific tasks and should be viewed within the context of the specific behavior under consideration. Internet self-efficacy is concerned with a person's perception of efficacy in using the Internet in general. Following the guidelines of Bandura we conceptualize internet self-efficacy within the context of internet use and focus on the

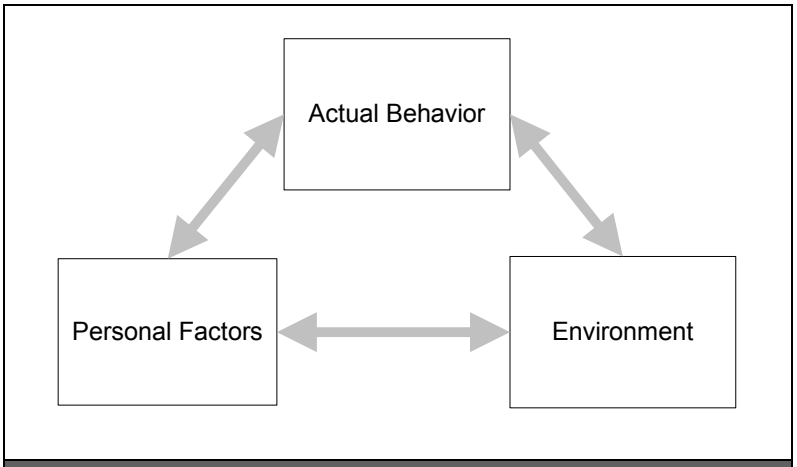


Figure 3: SCT Interactions

individual's overall attainments (Bandura, 1997; Eastin & LaRose, 2000) in using and understanding internet activities. Internet self-efficacy is concerned not with the actual skills a person has, such as downloading an image or saving a file, but with the individual's judgment of what they can do with the skills they possess (Bandura, 1986; Compeau and Higgins, 1995b). The internet self-efficacy construct used in this research considers such things as an individual's confidence in learning how to do new things with the internet, coping with new webpage situations, handling problems encountered on the internet and using the internet to gather information. Using the computer to access Internet websites requires a complex set of skills, and the skills required generally vary according to the internet based task that is being pursued. Web surfing and information gathering require a set of skills, completing online, web-based transactions requires a somewhat different set of skills, in addition to a broader knowledge of how the internet functions.

A basic precept of social cognitive theory is that belief in personal self-efficacy underpins an individual's perception of vulnerability. Thus the willingness of a person to engage in an online transaction in which that person's monetary and/or private information is provided, will be a result of the level of that individual's internet self-efficacy. A person with a high level of internet self-efficacy will be more confident that they can successfully use their internet skills to complete transactions, which in turn leads to their transactional use of websites. Transactional use in a public environment makes internet self-efficacy a more important consideration. Barriers to access in the form of time constraints, the need to request access time, and waiting for access, in addition to the overall public environment, tend to deter potential users. These barriers will be less important to users who are confident in their overall internet skills and in their ability to use the internet to engage in a variety of activities.

Hypothesis 1: People with a high level of internet self-efficacy will be willing to engage in transactional website use in a public environment.

3.2 The Importance of Expected Outcomes

Expectancy theory (Vroom, 1964) of behavior and motivation is somewhat different from Bandura's Social Cognitive Theory of behavior (SCT). Expectancy theory assumes that people will make behavior choices in order to maximize the benefit received while minimizing costs

incurred. This theory has been the subject of numerous empirical studies (Van Eerde & Thierry, 1996) which have found that motivation results from: (1) the importance of the expected rewards, (2) the expectation the person can perform in such a manner to receive the rewards and (3) the perception the person will actually receive the desired rewards. Within the theory, expectancy is defined as the anticipation of a particular action leading to an outcome, valence is defined as all possible affective orientations toward an outcome, most commonly viewed as the importance or desirability of the outcome, and instrumentality is commonly considered to be the perceived probability of attaining an outcome. These elements of expectancy theory have been extensively studied and combinations of these factors have resulted in several models of behavior and motivation (Van Eerde & Thierry, 1996). Of particular interest in this study is the *force model* of expectancy theory. The force model suggests that motivation to behave or perform (B) is determined by the product of the expectancy of the outcome (E) and the associated importance or valence,(V) in our model we consider this to be the *outcome value*. In the context of the current work we state the relationship as:

*Expected Outcomes(E) * Outcome Importance(V) → Transactional Use Behavior(B)*

Where

*Outcome Value = Expected Outcome (E) * Outcome Importance (V)*

This relationship implies that a person's transactional use of a website is a direct result of the product of the expected outcomes and the importance attached to those outcomes. This is particularly relevant when considered in conjunction with Bandura's SCT. We have already hypothesized that an individual's level of internet self-efficacy will directly influence their transactional use of websites. SCT suggests that self-efficacy is reflected in the expected outcomes of a behavior, therefore, if we apply expectancy theory concepts to the expected outcomes of SCT we can develop a more complete understanding of what motivates a person to engage in risky web-based transactions in the open atmosphere of a public computing site. Weighting each of the three types of outcome expectancies with an associated outcome importance for each of the outcomes will provide a clearer picture of how each expected outcome dimension of internet self-efficacy motivates or deters transactional website use. In factors of this type, it is possible that we may not see a significant effect of outcomes on transactional use due to the influence of the importance factor. To be sure that the importance

weighting does not obscure the individual effect of the outcomes on the usage behavior, we examine separately the direct effects of the outcome factors prior to considering the product of outcomes and importance.

3.2.1 Material Expectancy Outcomes

Material outcomes are similar to the physical outcomes described by Bandura, however, in the context of the study, material outcomes are considered to be the material benefits realized by expanded information acquisition (Vishwanath, 2005) or by using the internet to access a wider variety of goods and services. Purchasing commercial goods and services through the internet greatly extends the choices available to consumers. No longer are people confined to what is available in the local area, they now have the resources available to search the world for products, and in many cases, purchase these products at a reduced rate. Acquiring items and services electronically from governments expands individual access to these resources, increases the efficiency of the access and service delivery and makes government services equally available to all citizens who have access to a computer with an internet connection. These improvements in access to goods and services in both the private and public sector leads us to suggest that if the expected material outcomes to be gained from using a website for transactions are high, more transactional website use will result, even if that use is through a computer located in an open public environment. Recalling that *outcome value* is the product of an expected outcome and associated importance, we stat the following hypothesis:

Hypothesis 2a: Higher levels of expected material outcome value will be reflected in higher levels of public transactional website use.

3.2.2 Social Expectancy Outcomes

Human behavior is often influenced by the social reaction that occurs among others (Fishbein, 1980). A positive reaction from others will tend to support and even encourage a particular behavior while a negative reaction will tend to deter a behavior. A person perceiving a positive reaction from others to the transactional use of a website will tend to engage in that behavior even if the surrounding environment contains barriers. The importance the individual attaches to this reaction from another person will impact transactional website use.

Hypothesis 2b: Higher levels of expected social outcome value will result in higher levels of public transactional website use.

3.2.3 Self-Evaluative Outcomes

People tend to do things that give themselves self-satisfaction (Bandura, 1997). The acquisition of knowledge or improved skills helps to build a more positive self-image for the individual. The transactional use of websites requires a set of technology skills. Acquiring and using these skills (1) improves a person's personal knowledge of technology, (2) provides access to a vast information source to further enhance technology skills and gain information about other subjects, and (3) improves an individual's access to goods and services. An individual's interest in gaining self-satisfaction from using a complex tool for their own benefit is expected to be an important determinant of the transactional use of websites from publicly located computers. The importance that the individual attaches to an expected outcome will be reflected in the amount of transactional website use behavior.

Hypothesis 2c: *Higher levels of expected self-evaluative outcome values will result in higher levels of public transactional website us.*

3.3 Risk Attitude and Risk Perception

Using the internet for information and monetary transactions involves potential risks, thus engaging in purchasing goods and services, or transmitting information through online facilities, can be considered to be a risky behavior. Using a computer located in a public environment adds an additional and unique dimension of risk. Information entered into the webpage displayed on the local computer can be captured and retained on the public machine or tracked externally if software programs such as spyware or keystroke logging software are resident and functioning on the machine (Jesdanun, 2003). The presence of such contaminants in the virtual environment of the physical computer may be a result of purposeful or inadvertent actions of other users. However subsequent users are vulnerable to what remains in the system. A public computer user's sensitivity to, or perception of, such risk in the virtual computer environment may be

reflected both in their attitude toward engaging in web-based transaction and in their actual transactional website use behavior.

Perceived risk in consumer literature has been defined as the nature and amount of risk or uncertainty perceived by a person contemplating a purchase decision (Cos and Rich, 1964; Dowling and Staelin, 1994). Since we are focusing on online transaction behavior perceived risk is conceptualized as capturing the general feeling s or perceptions of risk in the electronic transactions activity. We do not focus on the specific risk identified in other research such as privacy risks, the risk of non-delivery of goods or the risk of personal information loss (Miyazaki and Fernandez, 2001). Rather we seek to capture the risk perceptions in a general sense so that environment and context issues will not be lost. This broader view of risk enables us to capture a wider array of risk perceptions users may have in general with using the internet for different types of transactions, especially through a public internet access location.

The determinants of risky behavior have been theorized by Sitkin and Pablo (1992) in their seminal work on risk behavior to include the individual characteristics of risk propensity and risk perception. Risk perception refers to a person's assessment of how risky a situation is with respect to the magnitude and likelihood of gains and losses resulting from pursing the behavior (Dowling and Staelin, 1994; Mayer et al. 1995; Sitkin and Weingart, 1995), while risk propensity is considered to be the general tendency of the individual to engage in risky behavior (Mayer et al. 1995; Sitkin and Pablo, 1992). Risk can be considered to be specific to a particular situation, however, an individual's assessment of risk involves the individual bringing their individual characteristics to the situation and appraising the risk involved in that situation (Conchar et al., 2004) and forming an attitude toward the risk. Empirical tests of the Sitkin-Pablo model (Sitkin and Pablo, 1995) have found that risk perception exerts a strong influence on risk behavior and mediates the relationship between a person's risk propensity and the risky behavior. When considered within the context of electronic transactions completed through the internet, the perception of risk has been found to directly influence, in fact deter, the willingness of people to engage in online purchases (Bhatnagar and Ghose, 2004; Bhatnagar et al., 2000; Jarvenpaa et al., 2000; Tan, 1999).

3.3.1 Risk Attitude

Attitudes toward online purchasing also influence online purchase intention and result, in part, from risk perception (Heijden et al., 2001; Jarvenpaa and Tractinsky, 1999; Jarvenpaa et al., 2000). Behavior theory suggests that a person's attitude toward a behavior is an important determinant of engaging in the actual behavior (Ajzen, 1991). Therefore we suggest that a person's attitude toward the risk or appraisal of the risk involved in an online transaction will directly influence their transactional use of websites through computers located in public environments. The attitude toward a behavior refers to the "degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question" (Ajzen 1991, pg. 188), and attitude is an important determinant of behavioral intention and the resulting behavior (Ajzen, 1991; Fishbein, 1979; Fishbein and Ajzen, 1975). A shopper's attitude toward an online store has been found to be an important determinant of online purchasing (Heijden et al., 2001; Jarvenpaa et al., 2000) from that virtual establishment. In the current research we are concerned not only with online purchases, but also with transactions of all types with commercial and government websites and thus we include *risk attitude* in the model. Returning to Ajzen's definition of attitude toward behavior, we extend the definition and suggest that risk attitude is an individual's favorable or unfavorable appraisal of engaging in a potentially risky behavior, specifically when engaging in transactional website use. Since a positive attitude toward a behavior supports the behavior in question, it is expected that an individual with a positive risk attitude toward a somewhat risky behavior, or an individual who displays less concern about possible risks or losses involved in an online transaction, will tend to be more willing to engage in the transactional use of websites, regardless of the surrounding environment. From this discussion we state the hypothesis:

Hypothesis 3: A positive risk attitude toward engaging in transactions through a website will result in the transactional use of websites through publicly provided computers.

3.3.2 Perceived Risk

Perceived risk is defined as a person's assessment of the riskiness of a situation with regard to the level of uncertainty, specifically, how controllable the uncertainty is, and how confident the individual is with their estimates of the risk (Baird and Thomas, 1985). This suggests that in a public computing environment, a person's risk assessment includes two dimensions: an assessment of the risk in the online interaction with the provider and an assessment of the risks in the virtual environment of the public computer. Potential risks in the

online interaction environment include concerns about credit card number theft (Liebermann and Stashevsky, 2002) (Bhatnagar et al., 2000), privacy infringements by online retailers and fraudulent behavior (Miyazaki and Fernandez, 2001). Such concerns lead to an individual's assessment of the risks involved with the online transaction itself. Virtual risks include such things as the presence of spyware, key-stroke logging application (Jesdanun,2003), the storage of gathered information locally or transferring information about user activities through external monitoring of computer activities. The public environment of this project allows us to investigate the user's perception of risk in two dimensions of the computer's virtual environment and their perception of risk involved with the actual online transaction.

It is not clear if people perceive any particular risks when using a public computer that is accessed by many unknown others. Given the virtual environment of the publicly located computer, in addition to the possible risks involved with a transaction involving a third party, we suggest that there are two principle dimensions of perceived risk unique to the public computer environment: (1) the perceived risk in the transaction itself and (2) the perceived virtual risk which occurs in two forms: (a) the risk in the local machine and (b) the risk of external activity tracking. Prior research has shown that risk perception and individual self-efficacy work in combination to cause a resulting behavior (Schwarzer and Fuchs, 1995) hence, we suggest that the public transactional use of websites will be directly influenced by the perceived risk in the online transaction, the perceived risk in the public computer virtual environment and the perceived risk of external tracking through the virtual environment of the local computer.

Hypothesis 4a: A high level of perceived risk in the online transaction will deter transactional website use through public computers.

Hypothesis 4b: A high level of perceived risk in the local public computer virtual environment will deter transactional website use through public computers.

Hypothesis 4c: A high level of perceived risk that the virtual environment of the local public computer supports external user activity monitoring will deter transactional website use through public computers.

Prior research has shown that attitudes toward the use of online stores develop from risk perception (Heijden et al., 2001; Jarvenpaa et al., 2000). We suggest that a person's risk attitude

toward an online transaction (either monetary or informational) will develop from their perception of risk in the activity, particularly, when the virtual environment of the physical computer is considered A person who perceives minimal risk in exchanging information with a website will exhibit a positive risk attitude toward transactional website use, similarly a person who perceives little risk from either dimension of the virtual environment will also exhibit a positive attitude toward web-based transactions. In an extension of the perceived-risk processing framework (Conchar et al., 2004) we contend that risk attitude partially mediates the relationship between perceived risk and public transactional website usage, and as such develops from the dimensions of perceived risk.

Hypothesis 5a: A low level of perceived risk in an online transaction will result in a positive risk attitude toward website transactions.

Hypothesis 5b: A low level of perceived risk in the local public computer virtual environment will result in a positive risk attitude toward website transactions.

Hypothesis 5c: A low level of perceived risk of external activity monitoring will result in a positive risk attitude toward website transactions.

3.3.3 Expected Outcomes and Risk Attitudes

Risk attitude has been previously defined in this paper as an "individual's favorable or unfavorable appraisal of engaging in a potentially risky behavior." According to the TPB (Ajzen, 1991) "outcomes contribute to attitude development in direct proportion to the subjective probability that the behavior will produce the desired outcome" (Ajzen 1991, pg 191). If we assume that expected outcomes are closely linked to the individual's belief in their ability to attain desired levels of performance and that these are the beliefs discussed by Ajzen, then risk attitude will develop in direct proportion to the product of the individual's self-efficacy expected outcomes (belief) and the importance (subjective evaluation) of this outcome, the outcome value. These relationships lead us to the final 3 hypotheses:

Hypothesis 6a: High levels of expected material outcome value will be reflected in a positive risk attitude toward website transactions.

Hypothesis 6b: Higher levels of expected social outcome value will result in a positive risk attitude toward website transactions.

Hypothesis 6c: Higher levels of expected self-evaluative outcome value will result in a positive risk attitude toward website transactions.

3.4 Control Variables

3.4.1 Transactional Website Use through Private Computers

People who use public internet connections may also access the internet through private computers owned by friends, relatives or other acquaintances. The use of these non-public access locations to complete online transactions may contribute to the user's experience, familiarity and willingness to engage in transactions from public access locations. Liang and Haung (1998) found that consumers' previous experience moderated their acceptance of Internet shopping, therefore, we control for the impact of experience in an alternative environment in this study. This control variable may be especially important for public users who do in fact have internet access available in their home.

3.4.2 Internet Connection available at Home

Previous research has found that computers located in the home are used for a variety of activities, such as personal financial transactions, communications and home shopping (Kraut et al., 1999; Venkatesh and Brown, 2001). All of these activities involve online transactions. Thus the presence of a computer in the home may impact the use of a public computer for these activities. Therefore, we control for the impact of a home computer in this study.

3.4.3 Demographics

We also controlled for Age, Gender, Ethnicity, Employment status, Residence Location, Education Level and Income level. Each of these demographic variables have been shown to impact computer and internet use (Moore et al., 2002; DiMaggio and Hargittai, 2001).

3.5 Research Model

The research model guiding this study is presented in Figure 4.

4. Research Methodology

4.1 Measurement Development

The constructs were operationalized by adapting measures from existing literature. This project involves transactional use outside of standard business organizations thus the adaptation of some existing measures applied in business settings is considered reasonable.

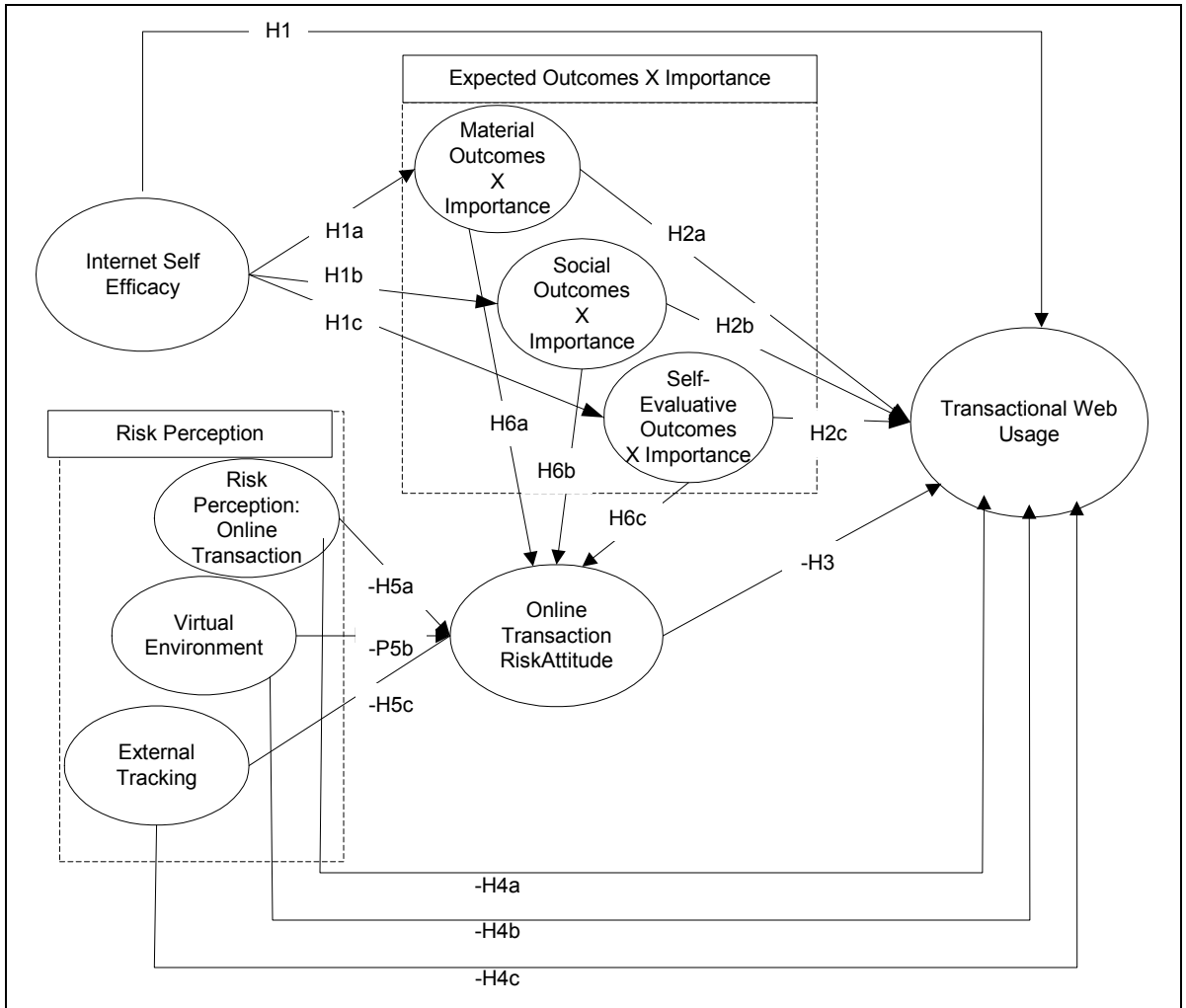


Figure 4: Research Model

A summary of the constructs, sources and number of items are provided in Table 1, details about the measurement items are provided in Appendix 3. The dependent variable is the Transactional Use of a website and it is measured as the reported number of completed transactions through websites. The questions were structured so that transactions completed

All of the variables except transactional use were measured using multi-item five-point Likert-type scales. Previous research has indicated that although a seven-point Likert scale captures more detail and provides a finer scale, however, survey respondents can seldom differentiate between the fine dimensions during the short time they spend answering survey

Table 1: Constructs and Measures

Construct	Measure *[source]*	Number of Questions
Self Efficacy	Internet Self Efficacy *[Eastin & Rose (2000)]*	7
Expected Outcomes	Material Outcomes X Importance *[Adapted from Viswanath, 2005, Ajzen, 1991]*	5
	Social Outcomes X Importance *[Adapted from Viswanath, 2005, Ajzen, 1991]*	4
	Self-Evaluative Outcomes X Importance *[Adapted from Vishwanth, 2005, Ajzen, 1991]*	4
Perceived Risk	Internet Transaction Risk *[Adapted from Jarvenpaa et al. 2000)]*	3
	Local Computer Virtual Environment Perceived Risk *[Adapted from Rensel,Abbas,Rao, 2006b]*	5
	Local Computer External Tracking Perceived Risk *[Adapted from Rensel, Abbas, Rao, 2006b]*	6
Risk Attitude	Risk Attitude *[Jarvenpaa et al. 2000]*	6
Use Behavior	Transactional Website Use *[Rensel,Abbas,Rao,2006a, 2006b]*	6

questions (Gupta and Somers, 1992). A five-point scale created a more user-friendly instrument which was considered important to encourage voluntary participation from a wide range of respondents. The five-point scale also allowed the font size of the electronic version to be

enlarged which again created an instrument that was easier for respondents to read. Transactional use was measured with a six-point Likert-type scale with "0" as the left anchor indicating zero transactions have been completed and "5" as the right anchor indicating five or more transactions have been completed. The overall scale consisted of nine questions focused on public use and a set of nine related questions focused on private transactional use.

Following Fishbein and Ajzen's (1975) expectancy-value model of attitudes and Expectancy Theory (Vroom, 1964), the importance (or value) a person placed upon the self-efficacy expected outcome was multiplied by the probability (or subjective evaluation) of that outcome to form the Outcome Value measures. The subject outcome expectances were gathered with standard Likert-type scales ranging from Strongly Disagree to Strongly Agree and the Importance values were captured through related questions focused on the importance attached to each outcome. The product of these responses formed the variables entered into the analysis.

The perceived risk measurements were captured along three dimensions. The perceived risk in the actual Internet transaction was based on previous work on online transactions (Jarvenpaa et. al., 2000) and seeks to capture the respondent's concern about the actual transfer of information across the internet. Perceived risk was expanded in this project to look at issues more local to the user and directly linked to the public internet access environment. The perceived risk in the virtual environment of the public computer seeks to explore the risks users perceive within the public computer and the perceived risk of tracking seeks to explore user perception of the risk of their activities being monitored while using the public computer. Both of these dimensions were captured using measures previously developed in earlier work by the authors (Rensel et al., 2006b).

Risk attitude was based upon the overall attitude toward online transactions similar to Jarvenpaa et al. (2000), however, in their particular study, the focus was on the general risks and uncertainty people feel with regard to online monetary transactions. We apply these constructs to both monetary and information transactions.

4.2 Context and Survey Administration

Public libraries are a major source of access for people without computers and without access to the internet (Hoffman et al. 2000; Kibirige 2001). Almost all libraries in the U.S. provide free access to computers with internet connections (American Library Association

Office for Intellectual Freedom, 2004), however, many libraries provide these public access computers in an open environment and there is little restriction on the activities users can pursue on these machines. Hence public libraries are a fertile area in which to explore the determinants of complex website use accessed through publicly provided equipment.

A survey instrument was developed that would support self-administration, either on paper or through an electronic survey site. A self administered survey was the preferred method of data collection as data on transactional website use from public computers is not available and the use of similar survey methods to study library computer use has been used previously (Sturges et al., 2003). Individual observation was not possible as there are 23 public library systems grouped into 9 regions, with a total of 744 public libraries within the survey region spanning the state of New York.

The survey was administered electronically through a password protected survey website and through paper surveys distributed through public libraries. Electronic survey methods are an effective and efficient way to reach participants and involve the information channel that is under study. This method could not be used to the exclusion of more traditional paper surveys however, because of the unique situation currently found in public libraries. The time allocated for patron use of computers is rather stringent and some patrons were unwilling to use their limited computer time to complete a 10 minute online survey, thus paper surveys were provided in addition to the electronic survey. Paper surveys also accommodated patrons who were uncomfortable with or unwilling to complete an electronic survey.

Individual library participation in this project was voluntary as was the participation by library patrons. In order to encourage library participation it was necessary to minimize the impact of the project on routine library operations. In order to require minimal intervention by library staff members, invitation cards were designed to briefly describe the project, encourage participation and to provide the password to the electronic survey site. Groups of these cards were sent to the participating libraries for distribution to computer users. In addition, groups of 5 or 10 paper surveys with return envelopes and incentive drawing entry cards (depending on circulation levels) were sent with the invitation cards to accommodate users who preferred that survey media. The number of invitation cards sent to the libraries was determined based upon circulation numbers. The minimum number of cards sent to a library was 25 to the smallest of

rural libraries and the maximum number of cards provided to the largest urban libraries was 1000.

An incentive was offered to patrons to encourage participation. Each survey participant who voluntarily supplied contact information, either through the web page or by returning a drawing entry postcard, was entered into a drawing to receive one of over one hundred $10 gift cards for a store of their choice. (e.g. Wal-Mart, Barnes & Noble bookstore or Webman's grocery store).

4.3 Pilot Study

A pilot study involving the electronic and paper surveys was conducted prior to the full scale survey to determine if the survey methods were feasible and to determine the reliability of the measures. Three libraries in the Erie County (NY) Library System were contacted as possible participants in the pilot study one agreed to participate. Care was taken to make sure that the libraries were not in the group targeted for the full-scale survey. The pilot study was run during a two week period in a member library located in an older suburb. In this time period, 44 people accessed the electronic web site and 41 people completed the survey, one person completed a paper version of the survey. Most of the respondents were over 40 years old while over 50% of the respondents made less than $20,000/year. The pilot study participants were predominantly white (84%) which is unusual because other literature on the digital divide and library usage indicates more racial diversity (Hoffman et al., 2000), however this may be reflective of the general demographics of the area surrounding the library. The demographics of the pilot study were fairly reflective of other library computer usage studies (D'Elia et al., 2002) and of the population surrounding the library location. Therefore his survey methodology was found to be usable for gathering information on public library computer users. Analysis of the survey results indicated that the measures employed were reliable and effective for reaching public library computer users and the research methodology was deemed reasonable for this investigation.

4.4 Full-scale Survey Sample

The subjects of this study were library patrons who use computers provided in the public libraries across New York state. A stratified single stage sampling plan was used as suggested

by Babbe (1990). The libraries were initially classified as rural or urban to ensure that a representative cross-state sample was obtained. The classification was done using the zip code of each library and cross-referencing that code with the U.S. Census rural/urban classification as generated by the MABLE/Geocorr Geographic Correspondence Engine (Blodgett, 2005). A target number of approximately 100 libraries was considered reasonable given the scope of the project, however, there is a wide diversity in size and activity among the libraries. In order to generate a list of libraries that would provide state wide representation in the sample, a random sample of libraries was pulled from each group. Next the total circulation numbers of the rural groups were calculated and matched with the summation of the total circulation numbers in the urban group. This matching resulted in a group of 17 urban libraries and 78 rural libraries identified as participants. Each of these libraries were contacted through e-mail and then by telephone. The response from the initial contacts resulted in twenty-six libraries agreeing to participate in the project. A second wave of contacts were made which resulted in thirty-six more sites agreeing to participate. A total of sixty-two libraries participated in this phase of the project.

5. Results

5.1 Response Rate and Sample Characteristics

Electronic surveys are prone to participants "opting" out after they have entered the electronic survey website (Dillman et al., 1998) thus a careful examination and parsing of the responses was necessary prior to combining the electronic surveys with the results of the paper surveys. The survey site recorded a total of 392 "hits" however only 295 users completed the survey. Seventy-nine paper surveys were completed thus the total number of useable responses was 374. The response rate cannot be calculated due to the nature of this survey. In order to gain library participation and minimize the amount of extra work for the library staff members, the number of cards and surveys actually distributed to patrons was not recorded. To evaluate the quality of the sample we examined the demographic characteristics of the sample and compared those values to the demographics of the survey area. The sample demographics are provided in Table 2. As indicated by the demographic summary, the sample obtained closely resembles the profile of the sample area in the important areas of gender and ethnicity.

Table 2: Sample Demographics				
	Sample Characteristics			New York State Demographics
	Number	*Percent*		*Percent*
Gender				
Male	150	40.7%		48.2%
Female	219	58.6%		51.8%
Age				
18- 20	35	9.5%		N/A
20-30	54	14.6%		13.5%
31-40	63	17.1%		16.0%
41-50	80	21.7%		15.0%
51-65	113	30.6%		15.3%
Over 65	24	6.5%		12.9%
Ethnicity				
Black	51	13.9%		15.9%
White	265	72.4%		67.9%
Hispanic	19	5.2%		15.1%
Asian/Pacific Islander	6	1.6%		5.5%
Native American	1	0.3%		0.4%
Mixed Ethnic Heritage	13	3.6%		3.1%
Other	11	3.0%		7.1%
Education				
Some High School	12	3.2%		21%
H.S. Graduate	70	18.9%		27%
Some College	97	26.2%		26%
College Graduate	93	25.1%		15%
Post 4-year College	98	26.5%		10%
Employment Status				
Full-time Employed	140	37.8%		Not available in these sub-categories
Part-time Employed	66	17.8%		
Student	35	9.5%		
Not Employed	54	14.6%		
Retired	58	15.7%		
Other	17	4.6%		
Household Income				
Less than $20,000	118	32.6%		Median Income: 43,393
$21,000-$40,000	103	28.5%		
$41,000-$60,000	73	20.2%		
$61,000-$80,000	29	8.0%		
Over $80,000	39	10.8%		

The sample was representative of people with lower than median income and represented a somewhat older and more educated segment of the population. These differences may be an artifact of the segment of the population who visit libraries, however, overall the sample was considered to be reasonably representative of the sample region. The demographic results suggested that in New York State, older, more educated and poorer people tend to be users of the publicly provided internet access in libraries.

The dependent variable in this investigation recorded the number of times a respondent had completed online monetary and information transactions. We asked about the location (public/private), the type of transaction (information/monetary) and the size of the transaction (less than $50 or more than $50). We found that over 50% of the participants report completing information transactions in public, while smaller numbers have engaged in monetary transactions in the same environment. Overall these summary statistics indicate that people do engage in transactional website use while using a public computer. A summary of these results is provided in Table 3.

5.2 Measurement Model Validation

Partial least squares (PLS) was used to analyze the data, specifically PLS-Graph Version 3.0, Build 1126. PLS is commonly used in IS research (Agarwal and Karahanna, 2000; Gefen and Straub, 2000; Pavlou and Fygenson, 2006; Venkatesh and Morris, 2000) because of the small sample sizes and minimal restriction on measurement scales (Chin et al., 2003). The latent variables were modeled from reflective indicators and a two step approach was employed in

Table 3: Online Transaction Results

		Public Computer		Private Computer	
		Number	*Percent*	*Number*	*Percent*
Information Transaction	No Transactions	149	40.7%	188	51.4%
	Yes , have completed Transactions	217	59.3%	178	48.6%
Monetary Transaction < $50	No Transactions	257	68.9%	206	55.6%
	Yes, Have completed Transactions	116	31.1%	164	44.3%
Monetary Transaction > $50	No Transactions	278	74.6%	155	41.9%
	Yes, Have completed Transactions	94	25.3%	215	58.1%

which the measurement model was first assessed and then the full structural model was tested (Anderson and Gerbing, 1988). The item reliabilities were evaluated by examining the descriptive statistics and composite reliabilities of the individual measures. Composite reliabilities above 0.8 are considered to be acceptable (Nunnally, 1978), the results indicate that the constructs exhibit an acceptable level of reliability. Discriminant validity was evaluated by comparing the square root of the average variance extracted (√AVE) to the correlation among the latent variables (Fornell and Larcker, 1981). This examination ensures that more variability occurs within the latent variable than between the latent variables themselves. In this situation, the square root of the AVE should be larger than the correlation among latent variables. A summary of the results is presented in Appendix 4. An examination of the results indicates that the measurement model exhibits a reasonable level of discriminant validity. Cross-factor loadings are an additional test of discriminant validity in which each item is examined to ensure that it loads more strongly on the construct to which it is assigned than onto other constructs. The results of this analysis are presented in Appendix 5. The evaluation of the measurement model indicates a reasonable level of measurement reliability and discriminant validity.

5.3 The Structural Model

The structural model was tested using the full sample with the bootstrap procedure using 800 resamples. The main effects of the three expected outcome dimensions were tested and initial relationships identified. The outcome value factors were then tested in the model and yielded an improved model. We concluded that the importance weights applied to the expected outcome factors did not obscure the effect of the expected outcome variable and improved the overall model, therefore we use the outcome value factors throughout the remainder of the analysis. The main effects results are provided in the top section of Table 4.

The control variables were added into the model and we found that two of the demographic variables exerted a slight positive impact on public transactional website use. Age was found to have an impact as well as Income level. Age and Income exerted positive impacts on transactional use, older adults appeared to transact more than younger adults, and lower income people reported completing fewer transactions. The results indicate that age and income are important and should be considered in future work.

In addition, the presence of a connection to the internet within the residence and transactional use through other private access points were also was found to exert an influence on public transactional use. The presence of a residential computer or internet connection is a key dimension of the digital. Since we found residential access to be a significant determinant of public internet use, we extended this work to focus on the transactional use behavior of people without residential internet access. The results of the models are reported in Table 4.

The second part of this analysis focused on the subset of respondents who reported no residential internet access, and this subset was tested with the model. The explanatory power of the model of public transactional website use increased from $R^2 = 0.191$ to $R^2 = 0.329$, the effect size of this change was 0.205, which is considered to be moderate to large (Chin et al., 2003). There were slight changes in R^2 of the intervening constructs, however, nothing of magnitude. The model results for the subgroup of people without residential internet access are also provided in Table 4 and in Figure 5.

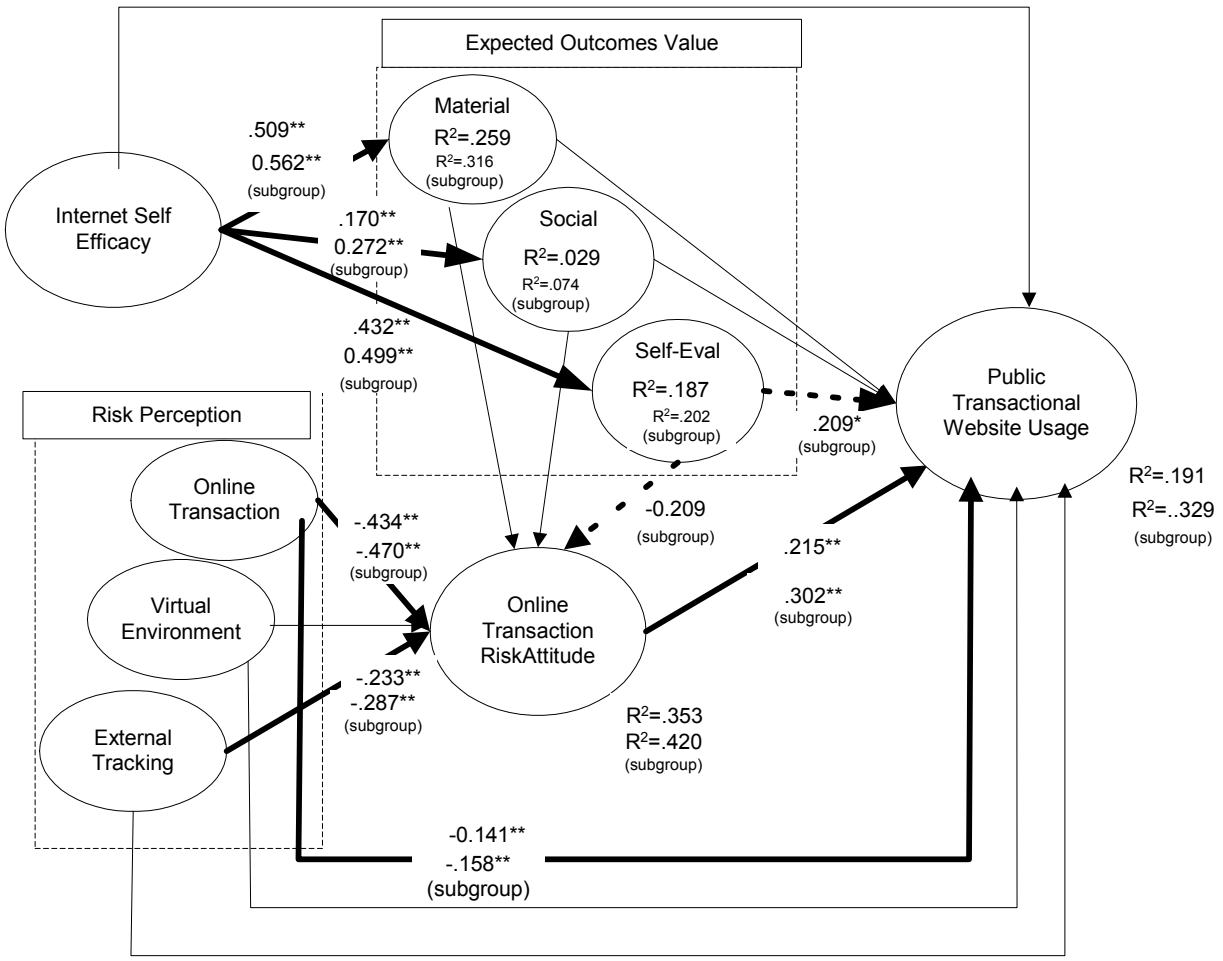
Internet self-efficacy was found to be a significant predictor of each of the three expected outcome value dimensions, however, contrary to prior findings (Rensel et al., 2006a), internet self-efficacy was not a significant predictor of public transactional use in either the full-sample or the subgroup of people without residential internet access.

Risk perception was conceptualized in three dimensions. Online transaction risk perception, appeared to be an important determinant of public transactional website use as we found a significant path (0.141 , $p<.01$) between Online Transaction Risk Perception and public transactional use behavior. In addition, Online Transaction Risk Perception appeared as an important, though negative, antecedent to Internet Risk Attitude with a path coefficient of -0.434 ($p < .01$). The other two dimensions of risk perception pertain to the locally situated computer and internet connection. The perceived risk of external tracking was found to be an non-significant determinant of public transactional use, however, it was a significant determinant of Internet Risk Attitude with a path coefficient of 0.233 ($p<.01$). The third dimension of risk perception, internal computer or 'virtual' risk perception, was not found to be a significant direct determinant of public transactional use nor was it found to influence internet risk attitude.

Table 4: PLS Results

	Path	Full-Sample	No Residential Internet Access	
	ISE -> MO	.**509****	.**553****	
	ISE -> SO	.086	.**311****	
	ISE -> SE	**.405****	**.469****	
	MO -> Public Transactional Use	.038	.042	
	SO -> Public Transactional Use	.046	-.084	
	SE -> Public Transactional Use	.046	.115	
	MO -> Risk Attitude	-.055	.051	
	SO -> Risk Attitude	.018	.085	
	SE -> Risk Attitude	-.021	-.160	
	ISE->Public Trans Use	.013	.062	
	ISE->Material Outcome Value	.**509****	**.562****	
	ISE->Social Outcome Value	**.170****	**.272****	
	ISE->Self-Evaluative Outcome Value	**.432****	.**499****	
	Material Outcome Value -> Public Trans Use	.026	.040	
	Social Outcome Value -> Public Trans Use	.024	-.141	
	Self-Evaluative Outcome Value -> Public Trans Use	.073	**.209***	
	Risk Attitude -> Public Trans Use	**.215****	**.302****	
	Online Transaction Risk Perception ->Trans Use	**-.141****	**-.158***	
	External Tracking Risk Perception -> Trans Use	-.005	-.034	
	Virtual Environment Risk Perception -> Trans Use	-.048	-.164	
	Online Transaction Risk Perception -> Risk Attitude	**-.434****	**-.470****	
	External Tracking Risk Perception -> Risk Attitude	**-.233****	**-.287****	
	Virtual Environment Risk Perception -> Risk Attitude	-.058	-.025	
	Material Outcome Value -> Risk Attitude	-.012	.128	
	Social Outcome Value -> Risk Attitude	-.013	.053	
	Self-Evaluative Outcome Value -> Risk Attitude	-.029	**-.209***	
	Private Transactional Use	**.228****	**.230***	
	Residential Internet Access	**-.179****	---	
	Age	**.137****	**.192***	
	Income	**-.105***	-.041	

		R^2 =	R^2 =	Effect Size
Explanatory Power of the Model	Public Transactional Use	0.191	0.329	*.205*
	Risk Attitudes	0.353	0.420	*.116*
	Material Outcome Value	0.259	0.316	*.083*
	Social Outcomes Value	0.029	0.074	*.048*
	Self-Evaluative Outcome Value	0.187	0.202	*.018*



** significant at the 0.05, ** significant at the 0.01 level or higher*

Figure 5: Model Results

Note that the results from the "No Residential Access" subgroup are included in this diagram. Additional paths that were significant for this subgroup are indicated with dashed lines.

The attitude toward a behavior has been shown to be an important determinant of the end behavior (Ajzen, 1991) and in this investigation we explicitly focused on the individuals' attitude toward internet risk, and expected that the attitude toward internet risk would impact their use of the internet, especially for complex activities such as online transactions. We found that Risk attitude ($R^2 = 0.353$) does exert an influence on public transactional website use (.215, $p<.01$).

These results indicate that a positive attitude toward the risks involved with public transactional website use encourage people to use this channel to access goods and services.

The impact of residential internet access was explored as a subsequent part of this investigation. The results of the model using only this subgroup replicated the findings from the entire sample, and added two more significant paths and improved model quality. The subgroup data indicated that for the people without residential internet access, an important relationship exists between the self-evaluative outcome vales and public transactional use (path coefficient: 0.209, $p < .05$). The self-evaluative outcome value appeared to exert an unexpected negative impact on internet risk attitude (-0.209, $p < .05$). The third important finding from this subgroup analysis was that the value of the overall model in explaining public transactional use improved significantly when applied to this group. The R^2 improved from 0.191 to 0.329, with a moderate to large effect size of 0.205. These results seem to indicate that this model may be better suited for predicting public transactional use for people who have no access in their homes.

To explore the lack of impact of internet self-efficacy in this analysis, we considered the possible differences between people who engage in information transactions and those who also complete monetary transactions. Monetary transactions include the added dimension of financial gains and losses beyond the potential for personal information losses. In order to investigate these potential influences we considered the group of people who completed information transactions (either alone or as part of a monetary transaction) and then the subgroup of people who had in addition, engaged in monetary transactions from public computers. The results of these further analyses are presented in Table 5.

The findings from the successive subgroup models indicate an apparent difference between information transactional use and monetary transactional use. We see from the results that for people who complete monetary transactions of value less than $50 internet self-efficacy is an important determinant of public transactional use (.285, $p<.01$), however self-efficacy is not a very significant determinant of transactional use when the value of the monetary transaction is

Table 5: PLS Results Information-Monetary Transaction Subgroups				
	All Respond N = 374	Information Transaction N = 253	Monetary Trans < $50 N = 116	Monetary Trans >$50 N = 94
ISE -> Public Trans Use	.013	.052	.285***	.275*
ISE->Material Outcome Value	.509***	.498***	.580***	.605***
ISE -> Social Outcome Value	.170***	.172**	.261***	.324***
ISE->Self-Evaluative Value	.432***	.408***	.459***	.493***
Material Outcome Value->Public Trans Use	.038	-.040	-.416***	-.325*
Social Outcome Value -> Public Trans Use	.046	-.006	-.049	-.124
Self Evaluative Value->Public Trans Use	.046	.122	.268	.395***
Risk Attitude ->Public Trans Use	.215***	.247***	.040	.153
Online Transaction Risk Perception -> Public Trans Use	-.141***	-.148*	-.124	-.011
External Tracking Risk Perception -> Public Trans Use	-.005	.0370	-.029	-.150
Virtual Environment Risk Perception -> Public Trans Use	-.048	.081	-.165	-.286*
Online Transaction Risk Perception ->Risk Attitude	-.434***	-.420***	-.246***	-.166
Virtual Environment Risk Perception ->Risk Attitude	-.058	-.041	-.113	-.126
External Tracking Risk Perception ->Risk Attitude	-.233***	-.314***	-.423***	-.390***
Material Outcome Value->Risk Attitude	-.012	-.068	-.204*	-.224*
Social Outcome Value->Risk Attitude	-.013	-.022	-.091	-.103
Self-Evaluative Outcome Value->Risk Attitude	-.029	-.027	.193	.257**
Control Variables				
Private Transactional Use	.228***	.124	.310*	.2160
Residential Internet Access	-.179***	-.113	-.184*	-.103
Age	.137***	.131*	.100	.0910
Income	-.105*	-.0240	-.095	-.019
** p<0.1 ** p<.05 *** p<.01 or greater*				
	R^2	R^2	R^2	R^2
Public Trans Use	.191	.154	.197	.249
Risk Attitude	.353	.394	.402	.360
Material Outcome Value	.259	.248	.337	.366
Social Outcome Value	.029	.029	.068	.105
Self-Evaluative Outcome Value	.187	.166	.211	.243

greater than $50 (.275, p<.1). Among the group of people who complete monetary transactions through public computers we note a significant inverse relationship between material outcomes and public transactional use (-.416, p<.01; -.325, p<.10). This is quite unexpected as Bandura (1997) indicates that a direct relationship should exist. This unexplained result will provide an interesting topic for future investigations. We also find that Self-Evaluative Outcome Value exerts a positive influence on public transactional use (.395, p<.01) for people who engage in monetary transactions from public computers.

Online transaction risk attitude was found to be a non-significant determinant of public transactional website use for people who had completed monetary transactions from public machines. This is a rather unexpected finding because results from the complete group indicated that online transaction risk attitude was a very strong determinant of public transactional website use. These results seem to indicate that even though the online transaction risk attitude of people who complete monetary transactions in public is impacted by online risk perception (-.246, p<.01) and tracking risk perception (-423, p< .01; -.390, p<.01) this attitude does not impact their use of publicly available internet connections for website based transactions.

None of the dimensions of risk perception were found to influence transactional use in this environment except risk perceived in the virtual environment for people who have completed transactions of value greater than $50 (-.286, p<.1). The primary determinants of public transactional use appear to arise from the internet self-efficacy dimensions for the group of people who conduct monetary transactions, while risk issues and concerns predominate when the entire group of people who complete any type of online transactions are considered. The overall results of the analysis of the people who have completed monetary transactions in public seem to indicate that people are not deterred by potential risks in the environment and internet self-efficacy is an important factor for this group. A summary of the complete results from the entire sample, the No Residential Access subgroup and Residential Access sub group investigation is provided in Table 6. We include in Table 7 a complete summary of the results of the analysis focused on the Monetary Transaction group and the Information Transaction group.

Table 6: Results Summary - No Residential and Residential Access Subgroups					
	Hypothesis	*All Users*	*No Residential Internet Access Subgroup*	*Yes Residential Internet Access Subgroup*	Hypothesis Results
Internet Self-Efficacy	H1: Internet Self-Efficacy: Transactional Use	Not Supported	Not Supported	Not Supported	The relationship between Internet Self-Efficacy and Transactional Use is not significant in this model.
	H1a: Internet Self-Efficacy : Material Outcome Value	Supported	Supported	Supported	There is a significant positive relationship between Internet Self-Efficacy and Material Outcome value
	H1b: Internet Self-Efficacy : Social Outcome Value	Supported	Supported	Not Supported	There is a significant positive relationship between Internet Self-Efficacy and Social Outcome value except for people with residential access
	H1c: Internet Self-Efficacy : Self-Evaluative Outcome Value	Supported	Supported	Supported	There is a significant relationship between Internet Self-Efficacy and Self-Evaluative Outcome value.
Outcome Value	H2a: Material Outcome Value : Transactional Use	Not Supported	Not Supported	Not Supported	The relationship between Material Outcome value and Transactional Use is not significant.
	H2b: Social Outcome Value : Transactional Use	Not Supported	Not Supported	Not Supported	The relationship between Social Outcome value and Transactional Use is not significant.
	H2c: Self-Evaluative Value : Transactional Use	Not Supported	Supported	Not Supported	The relationship between Self-Evaluative value and Transactional Use is significant for people without residential internet access.
Risk Attitud	H3: Transaction Risk Attitude : Transactional Use	Supported	Supported	Supported	There is a significant positive relationship between Online Transaction Risk Attitude and Transactional Use.
Risk Perception	H4a: Online Transaction Risk Perception : Transactional Use	Supported	Supported	Not Supported	There is a significant negative relationship between Online Transaction Risk Perception and Transactional Use except for people with residential access.
	H4b: Virtual Environment Risk Perception : Transactional Use	Not Supported	Not Supported	Not Supported	The relationship between Virtual Environment Risk Perception and Transactional Use is not significant.
	H4c: External Tracking Risk Perception: Transactional Use	Not Supported	Not Supported	Not Supported	The relationship between External Tracking Risk Perception and Transactional Use is not significant.
	H5a: Online Transaction Risk Perception : Online Transaction Risk Attitude	Supported	Supported	Supported	There is a significant inverse relationship between Online Transaction Risk Perception and Online Transaction Risk Attitude.
	H5b: Virtual Environment Risk Perception : Online Transaction Risk Attitude	Not Supported	Not Supported	Not Supported	The relationship between Virtual Environment Risk Perception and Online Transaction Risk Attitude is not significant.
	H5c: External Tracking Risk Perception : Online Transaction Risk Attitude	Supported	Supported	Supported	There is a significant inverse relationship between External Tracking Risk Perception and Online Transaction Risk Attitude.
Outcome Value	H6a: Material Outcome Value : Online Transaction Attitude	Not Supported	Not Supported	Not Supported	The relationship between Material Outcome Value and Online Transaction Risk Attitude is not significant.
	H6b: Social Outcome Value : Online Transaction Attitude	Not Supported	Not Supported	Not Supported	The relationship between Social Outcome Value and Transaction Attitude is not significant.
	H6c: Self-Evaluative Outcome Value : Online Transaction Attitude	Not Supported	Supported: Opposite Direction	Not Supported	There is a significant negative relationship between Self-Evaluative Outcome Value and Online Transaction Attitude for people without Residential Internet Access.

Table 7: Results Summary - Monetary and Information Transaction Results

	Hypothesis	*Completed Information Transaction*	*Completed Monetary Transaction < $50*	*Completed Monetary Transaction > $50*	Hypothesis Results
Internet Self-Efficacy	H1: Internet Self-Efficacy: Transactional Use	Not Supported	Supported	Supported	The relationship between Internet Self-Efficacy and Transactional Use in is significant for people completing monetary transactions.
	H1a: Internet Self-Efficacy : Material Outcome Value	Supported	Supported	Supported	There is a significant positive relationship between Internet Self-Efficacy and Material Outcome value
	H1b: Internet Self-Efficacy : Social Outcome Value	Supported	Supported	Supported	There is a significant positive relationship between Internet Self-Efficacy and Social Outcome value
	H1c: Internet Self-Efficacy : Self-Evaluative Outcome Value	Supported	Supported	Supported	There is a significant relationship between Internet Self-Efficacy and Self-Evaluative Outcome value.
Outcome Value	H2a: Material Outcome Value : Transactional Use	Not Supported	Supported	Supported	The relationship between Material Outcome value and Transactional Use is significant for people completing monetary transactions..
	H2b: Social Outcome Value : Transactional Use	Not Supported	Not Supported	Not Supported	The relationship between Social Outcome value and Transactional Use is not significant.
	H2c: Self-Evaluative Value : Transactional Use	Not Supported	Not Supported	Supported	The relationship between Self-Evaluative value and Transactional Use is significant for people completing more expensive transactions.
Risk Attitud	H3: Transaction Risk Attitude : Transactional Use	Supported	Not Supported	Not Supported	The relationship between Online Transaction Risk Attitude and Transactional Use is not significant for people completing monetary transactions.
Risk Perception	H4a: Online Transaction Risk Perception : Transactional Use	Supported	Not Supported	Not Supported	There no significant relationship between Online Transaction Risk Perception and Transactional Use
	H4b: Virtual Environment Risk Perception : Transactional Use	Not Supported	Not Supported	Supported	The relationship between Virtual Environment Risk Perception and Transactional Use is not significant expect for people completing higher value transactions..
	H4c: External Tracking Risk Perception: Transactional Use	Not Supported	Not Supported	Not Supported	The relationship between External Tracking Risk Perception and Transactional Use is not significant.
	H5a: Online Transaction Risk Perception : Online Transaction Risk Attitude	Supported	Supported	Supported	There is a significant inverse relationship between Online Transaction Risk Perception and Online Transaction Risk Attitude.
	H5b: Virtual Environment Risk Perception : Online Transaction Risk Attitude	Not Supported	Not Supported	Not Supported	The relationship between Virtual Environment Risk Perception and Online Transaction Risk Attitude is not significant.
	H5c: External Tracking Risk Perception : Online Transaction Risk Attitude	Supported	Supported	Supported	There is a significant inverse relationship between External Tracking Risk Perception and Online Transaction Risk Attitude.
Outcome Value	H6a: Material Outcome Value : Online Transaction Attitude	Not Supported	Supported	Supported	The relationship between Material Outcome Value and Online Transaction Risk Attitude is significant for people completing monetary transactions.
	H6b: Social Outcome Value : Online Transaction Attitude	Not Supported	Not Supported	Not Supported	The relationship between Social Outcome Value and Transaction Attitude is not significant.
	H6c: Self-Evaluative Outcome Value : Online Transaction Attitude	Not Supported	Not Supported	Supported	There is a significant direct relationship between Self-Evaluative Outcome Value and Online Transaction Attitude for people completing higher value monetary transactions.

6. Discussion

This paper attempts to provide insight into transactional internet usage through connections provided in public locations, specifically public libraries. This study draws upon Social Cognitive Theory and the Theory of Planned Behavior and incorporates prior research on the influence of risk on behavior to develop a model of public transactional website use that provides insight into the use of public computers for transactional website interaction.

6.1 Conclusions and Insights

The overall results of this investigation indicate that the perception of risk in the online transaction and risk attitude are the primary determinants of transactional website use in public. Although internet self-efficacy has been found in other research to be a determinant of transactional use (Rensel et al., 2006a), in this model, internet self-efficacy impacted the expected the three outcome value dimensions, but not use-behavior. This result appears to indicate that higher levels of internet self-efficacy leads people to anticipate positive outcomes however these outcome values do not generally motivate public transactional website use. The lack of findings for a previously important determinant may be due to the strength of the risk dimensions considered in this model, the perception of risk in the online environment and attitude toward risk are still the most important determinants of public transactional website use. This is not unexpected based upon prior research (Bhatnagar et al. 2000; Jarvenpaa & Tractinsky, 1999; Jarvenpaa et al. 2000). What is unexpected is that the public computer users, while concerned about engaging inonline transacgtions, they do not seem to be concerned about the internal environment of the physical machine that they are for these online transactions. This lack of concern may be a reflection of a lack of awareness of the potential risks in the virtual environment; this is an area for future consideration.

Risk attitude was found to be an important determinant of public transactional website use and resulted from a person's perception of online transaction risk and concerns about activity tracking and monitoring external to the public computing site. Concerns about the risks in the virtual environment of the public computer did not significantly influence online transaction risk attitude.

The results for the subgroup of users who did not have residential internet access closely paralleled the findings from the complete sample, however in the subgroup, the self-evaluative outcome value appears to negatively impact the online transaction risk attitude. This unexpected result seems to indicate that no matter how confident people are with their internet skills or how good they feel about acquiring these skills, they still perceive risks in the online environment and thus they have a poor attitude toward online transactions. The self-evaluative outcome value does, however, directly lead to public transactional website use. This result may indicate that people without ready and convenient access to an internet connection feel a sense of accomplishment when they use the internet for interactive transactions and these feelings support public transactional use even will still generating a negative attitude toward online transaction risks. Overall this model appears to be useful for studying the determinants of public transactional website use however the explanatory power is much greater for the subset of people without residential internet access.

Further analysis of the results seems to indicate that people who complete monetary transactions from public computers are not deterred by their perception of risk. The perception of risk contributes to the development of risk attitude among these users but risk perception apparently impacts transactional use in the public environment. Among this group internet-self efficacy is an important determinant of use, although the material outcome values exert a negative rather than positive influence on public transactional use. The conclusion of this analysis focused on transactional website users suggests that people who complete public information transactions are primarily concerned about the risks involved with online transactions and their risk attitude deters transactions. The groups of people who have completed monetary transactions appear to be undeterred by perceived risks in the online environment and their internet self-efficacy or confidence supports transactional use in the public environment.

The overall model results suggest that an alternative relationship among perceived risk, internet self-efficacy and public transactional website use may exist. The full sample model results indicate that internet self-efficacy becomes non-significant in the presence of perceived risk. These results suggest that the relationship between internet self-efficacy and public transactional website use is mediated by perceived risk. This is a topic for future study.

6.2 Implications

Much of the work studying user adoption of transactional website use has not considered the computer use environment, although this is an important access source for many people, especially those of lower socio economic status. The results of this work indicate that perceived risks and risk attitude are still the predominant determinants of transactional website use in public although the expected self-evaluative outcome value are also important public transactional use determinants for people without residential internet access. These results suggest that we may be able to encourage public transactional use among people without residential internet access by providing information about how to reduce the risks and to highlight the self-evaluative benefits.

What is troubling however, is the apparent lack of concern or sensitivity to the risks inherent in the equipment used to access the internet from these public facilities. Users appear to be aware of the potential risks of the online transaction itself, however, they do not seem to be sensitive to the potentially contaminated virtual environment in which they engage in these transactions that involve both their personal information and/or monetary information. We can ultimately conclude that the environment of the public computer does not appear to inhibit transactional website use, use is inhibited by online risk concerns and attitudes.

6.3 Limitations

Self-report data was used throughout this study and problems with this type of data have been discussed in IS literature (Straub et al., 1995) however given the nature of this study, multiple report measures were not possible. A further limitation is the method used to gather data. Although every effort was made to gather input from a diverse and representative group of public library computer users, a convenience sample was the only way to gather data from this group of users. In order to reduce the effect, a formal sample plan was used to contact and supply materials to the libraries based upon their circulation numbers, however participation was voluntary, therein lies the problem of gathering a truly statistically representative sample. A possible limitation of this study is the apparent lack of ethnic group representation. Research on the digital divide indicates that minorities are frequent users of library internet (Hoffman et al. 2000) however gaining participation in a voluntary survey from these groups is quite difficult. Although the demographics of the sample are quite similar to the demographics of the survey

region and are comparable to a nationwide survey conducted by the Gates Foundation (Moore et. al., 2002), we note that minority representation is lower than expected. These flaws in the sample may lead to a lack of generalizability of the results, however given the minimal research in this area, the results of this project do provide insight into the transactional use of websites through computers located in public facilities.

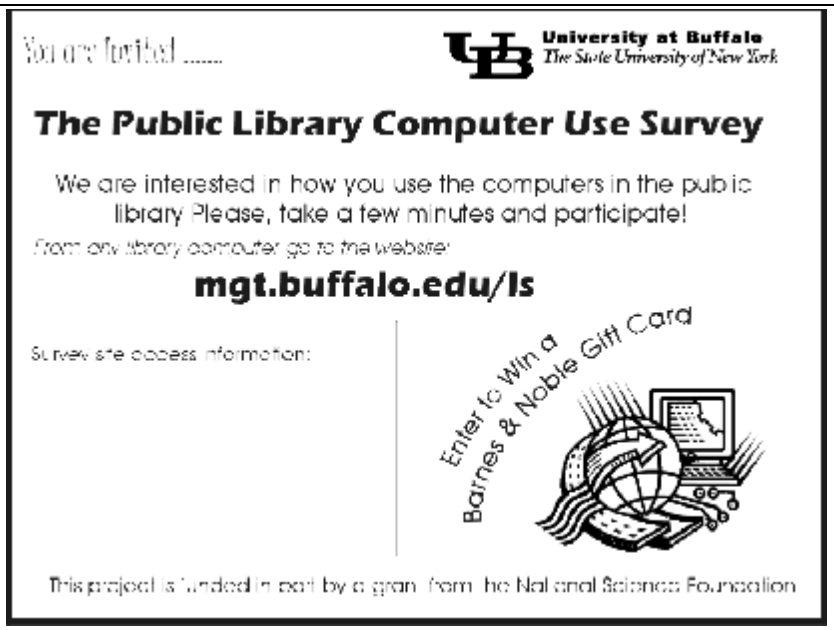
6.4 Future Research

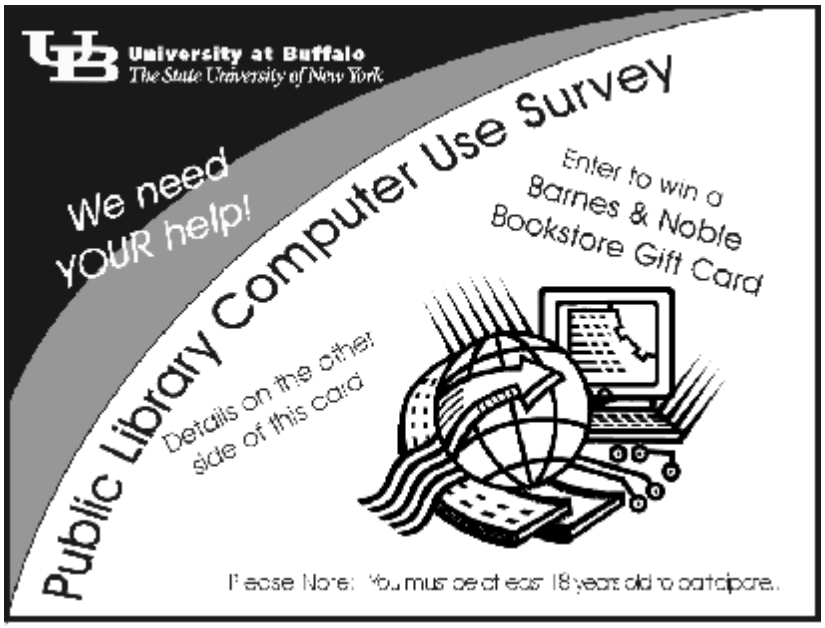
The model developed in this project has been fairly successful in providing insight into the determinants of public transactional website use across people who have computers in their homes and those who do not have residential access. Internet self-efficacy is an important determinant of website use in situations where risk is not considered (Rensel et al. 2006a) however becomes non-significant when considered in conjunction with risk. These results seem to indicate that perhaps risk perception mediates the relationship between internet self-efficacy and transactional use in this context. Our findings are contrary to those from health behavior literature and may add some important insights into online behavior after further study. Similarly the results of the transaction type subgroup analysis open up other avenues for investigation. For example, we wonder, why do some people who engage in information transactions perceived risk such that they are unwilling to pursue monetary transactions, while others do not let perceived risks deter them? We do not know if there are economic issues, age issues or other factors exerting an influence. Much work has yet to be done to understand the differences.

The 'knowledge gap hypothesis' suggests that as the infusion of mass media information increases, people from higher socioeconomic status (SES) absorb and apply this new information at a higher rate than for people from a higher SES. The knowledge gap increases between these groups as the amount of information increases, but education diminishes this gap (Tichenor et al, 1970). This dichotomy may be reflected in the acceptance and use of electronic channels for goods and services as well. As the use of the electronic channel increases, people of higher SES continue to expand their use of this channel, while people of lower SES fall behind. If people of lower SES gain more education about the risks in online transactions, the knowledge gap, and thus the use gap, should decrease. This is another avenue for further investigation which may help close the digital divide gap within the U.S. and in other areas of the world**.**

Appendix 1: List of Participating Libraries			
Library Name/Location	**Rural/Urban**	**Library Name/Location**	**Rural/Urban**
Arcade	R	Sherburne Public Library	R
Byron Bergen Public	R	Schuylerville	R
Canastota	R	West Winfield	R
Champlain Memorial	R	Wide Awake Club- Filmore NY	R
Chittenango	R	Albany Public	U
Cuba Circulating Library	R	Brooklyn – Kings Highway	U
Geneva Free Library	R	Brooklyn – Business	U
Guernsey/Norwich	R	Brooklyn Heights	U
Haines Falls Free Library	R	Brooklyn – Midwood	U
Hammondsport	R	Brooklyn – Central Branch	U
Harris Memorial	R	Brooklyn – Cadman Plaza	U
Indian Lake	R	Brooklyn – Grand Army Plaza	U
Inlet Public	R	Brooklyn – Court Street	U
King Memorial – Machias	R	Brooklyn – Leonard Street	U
Louise Adelia Reed/Hancock	R	Brooklyn – Tillary St.	U
Lowville	R	Chappaqua	U
Marilla	R	Kenmore-Town of Tonawanda	U
Mendon	R	Massapequa	U
Middleville Free Library	R	Newark Public Library	U
Millbrook	R	Pelham	U
Mooers Free Library	R	Penfield	U
Olive Free Library	R	Port Washington	U
Paine Memorial Library	R	Ramapo Catskill Library/Tappan	U
Port Leyden	R	Sullivan Free Library	U
Sanborn-Pekin Free Library	R	Tappan	U
Schoharie Free Library	R	Vestal Public Library	U
PARTICIPATING LIBRARIES, WITH NO PATRONS COMPLETING SURVEYS			
Suffern	U		U
Bedford	U		R
Canaseraga	R		R
Friendship	R		R
Hay Memorial	R		R
Wimodaughsian/Canisteo	R		R
Tully	R		R
Haines Memorial			R

APPENDICES





Appendix 2: Invitation/Information Card

Appendix 3: <Essay 3> Constructs and Measures		
Construct/Variable		Measures
Material Outcome	MO1	Outcomes I will be able to gain access to more information
	MO2	I will be able to access more goods
	MO3	I will be able to access more services
	MO4	It will require less effort to access goods and services
Material Outcome Importance	MOIMP1	How important is it to you to: Spend less time on tasks?
	MOIMP2	Be able to gain access to more information?
	MOIMP3	Be able to access more goods? Be able to access more services?
	MOIMP4	Use less effort to access goods and service?
Social Outcomes	SO1	Outcomes My family will think I am competent
	SO2	My friends will think I am competent
	SO3	My status in my family will increase
	SO4	My status among my friends will increase
Social Outcomes Importance	SOIMP1	How important is it to you to: Have your family think you are competent
	SOIMP2	Have your friends think you are competent
	SOIMP3	Increase your status within your family
	SOIMP4	Increase your status among your friends
Self-Evaluative Outcomes	SE1	Outcomes I will increase my effectiveness in functioning in the modern world.
	SE2	It will increase my sense of personal accomplishment.
	SE3	It will expand my skills and abilities
	SE4	It is necessary for me to use the internet.
Self-Evaluative Outcomes	SEIMP1	How important is it to you to: Increase your effectiveness in functioning in the modern world
	SEIMP2	Increase you sense of personal accomplishment
	SEIMP3	Expand your skills and abilities
	SEIMP4	Use the internet
Public Transactional Website Use	ITRANSU	How many personal Information Transactions have you completed through a website while using a public computer in a library?
	MTRANS1U	How many monetary transactions of value less than $50 have you completed through a website while using a public computer in a library?
	MTRANS1U	How many monetary transactions of value greater than $50 have you completed through a website while using a public computer in a library

Internet Self-Efficacy	ISE1	I feel confident: Understanding terms related to the internet
	ISE2	Describing internet activities.
	ISE3	Using the internet to gather information
	ISE4	Learning to do more things with the internet.
	ISE5	Handling any problems that develop while using the internet
	ISE6	Explaining why a task will not work on the internet
	ISE7	Using the internet for transactions
Internet Perceived Risk	I-PR1	How would you characterize the risk in your decision to complete a transaction with a website?
	I-RP2	How would you characterize your potential loss (or gain) in completing a transaction with a website?
	I-PR3	How would you characterize the situation when completing a transaction with a website? (Reverse Coded)
Risk Attitude	RATT1	There is too much uncertainty associated with monetary transactions completed through the internet.
	RATT2	There is too much uncertainty associated with information transactions completed through the internet
	RATT3	Compared with other ways of completing monetary transactions with organizations, using the internet is more risky.
	RATT4	Compared with other ways of completing information transactions with organizations, using the internet is more risky.
Tracking Perceived Risk	T-PR1	I am concerned that anyone who uses the library computer after me will be able to track my activities.
	T-PR2	I am concerned that someone located outside of the library may be able to track my activities on the library computer
	T-PR3	I am concerned that a government authority can get records of my computer usage in a public library.
Internal Perceived Risk	Int-PR1	I feel apprehensive about using a public library computer
	Int-PR2	I am concerned that a record of my computer activities will be saved in the library computer
	Int-PR3	I am concerned that any personal information I put into a public library computer will be saved in that computer.

Appendix 4: <Essay 3> Correlations and Statistics												
	Mean	Std. Dev.	C.R.	MOxIMP	SOxIMP	SExIMP	Public Trans Use	ISE	I-RP	RA	T-RP	Int-RP
Material Outcomes x Importance	15.3	2.122	0.904	**(0.837)**								
Social Outcomes x Importance	9.61	0.851	0.930	0.330	**(0.876)**							
Self-Evaluative Outcomes x Importance	15.67	1.141	0.901	0.634	0.513	**(0.833)**						
Public Transactional Use	1.34	1.070	0.812	0.127	0.044	0.140	**(0.773)**					
Internet Self-Efficacy	3.73	0.605	0.916	0.495	0.186	0.394	0.139	**(0.782)**				
Internet Perceived Risk	2.95	0.562	0.834	0.175	-0.026	0.062	0.282	0.222	**(0.792)**			
Risk Attitude	3.28	0.266	0.858	-0.079	0.034	-0.009	-0.283	-0.155	-0.533	**(0.718)**		
Tracking Perceived Risk	2.78	0.095	0.900	-0.087	-0.013	-0.049	-0.051	-0.094	-0.317	0.401	**(0.867)**	
Internal Perceived Risk	2.61	0.340	0.864	-0.062	0.140	0.011	-0.080	-0.112	-0.365	0.393	0.663	**(0.827)**

Appendix 5: <Essay 3> Factor-Variable Crossloadings

	MOxIMP	SOxIMP	SExIMP	Public Trans Use	ISE	I-PR	RA	T-PR	INT-RP
MO2IMP2	0.7699	0.2187	0.4499	0.0299	0.3040	-0.0061	0.0405	-0.0425	-0.0245
MO3IMP3	0.5543	0.2373	0.4441	0.0980	0.2063	0.0809	-0.0655	-0.0946	-0.0647
MO4IMP4	0.5595	0.1963	0.4959	0.0265	0.2244	0.0165	0.0134	-0.0713	-0.0305
MO5IMP5	0.5984	0.2233	0.4522	0.1140	0.2415	0.0441	-0.0387	-0.0804	-0.0696
SO1IMP1	0.2433	0.8546	0.2168	0.0068	0.0383	-0.1008	0.0821	0.0286	0.0769
SOC2IMP2	0.2110	0.8320	0.2331	-0.0259	0.0465	-0.1219	0.1247	0.0562	0.0940
SOC3IMP3	0.1311	0.6655	0.1606	0.0209	-0.0005	-0.0844	0.0864	0.0064	0.0089
SOC4IMP4	0.1646	0.6725	0.1783	0.0156	0.0323	-0.1205	0.0955	-0.0144	0.0071
SE1IMP1	0.4392	0.2957	0.5694	0.0573	0.2041	0.0653	0.0356	0.0530	0.0432
SE2IMP2	0.3816	0.3803	0.4838	0.0470	0.1606	-0.0034	0.0580	0.0205	0.0592
SE3IMP3	0.6058	0.2850	0.7271	0.0236	0.2450	0.0410	-0.0129	-0.0489	-0.0440
SE4IMP4	0.5291	0.1955	0.6150	0.0659	0.2125	0.0275	-0.0222	-0.0456	-0.0658
MTRANS1U	0.0671	0.0342	0.0756	0.8953	0.0937	0.1642	-0.2444	-0.0298	-0.0209
MTRANS2U	0.0290	-0.0104	0.0204	0.7910	0.0681	0.1006	-0.1579	-0.0330	-0.0637
ITRANSU	0.0391	0.0345	0.0101	0.4437	0.0181	0.1007	-0.1181	-0.0952	-0.1128
ISE1	0.3203	0.0782	0.2932	0.0666	0.8851	0.0724	-0.0749	-0.0742	-0.0457
ISE2	0.4012	0.0676	0.3544	0.0447	0.7777	0.0823	-0.0412	-0.0478	-0.0327
ISE3	0.2582	0.0480	0.1953	-0.0484	0.5330	0.0443	-0.0283	-0.0512	-0.0500
ISE4	0.3205	0.0749	0.2730	0.0180	0.7113	0.0370	0.0181	0.0363	-0.0437
ISE5	0.2612	0.0264	0.2035	0.0490	0.8606	0.0740	-0.1045	-0.1080	-0.0572
ISE6	0.2306	0.0283	0.1746	0.0484	0.8251	0.0577	-0.1030	-0.1051	-0.0400
ISE7	0.1556	-0.0075	0.1293	0.2150	0.5646	0.3051	-0.3715	-0.1280	-0.2124
I-PR1	0.0520	-0.0098	0.0342	0.0981	0.0676	0.5794	-0.3417	-0.1831	-0.1677
I-PR2	0.0617	-0.0626	0.0394	0.1427	0.1105	0.7237	-0.4154	-0.2293	-0.2667
I-PR3	0.0060	-0.0923	0.0081	0.0788	0.0679	0.7468	-0.2793	-0.2062	-0.2051
RATT3	0.0136	0.0186	0.0832	-0.1770	-0.0646	-0.2400	0.6640	0.1817	0.1699
RATT4	0.0244	0.0770	0.0034	-0.1245	-0.0185	-0.3593	0.7436	0.3337	0.3089
RATT5	-0.0106	0.0467	-0.0052	-0.1579	-0.0986	-0.3306	0.6323	0.2322	0.1908
IRATT6	0.0622	0.0556	0.0247	-0.1556	0.1247	-0.3961	0.6822	0.2598	0.2743
T-PR1	-0.0125	0.0105	-0.0160	0.0070	-0.0689	-0.2443	0.3016	0.7980	0.6267
T-PR2	-0.0555	0.0249	-0.0539	-0.0108	-0.0998	-0.2304	0.3369	0.8183	0.5886
T-PR3	-0.0343	-0.0070	-0.0350	0.0010	-0.0200	-0.1424	0.2254	0.6193	0.3861
Int-PR1	-0.0124	0.0240	-0.0123	-0.0985	-0.0366	-0.0178	0.1951	0.4907	0.8963
Int-PR2	-0.0495	0.0587	-0.0154	-0.0466	-0.0920	-0.3384	0.4219	0.3335	0.9211
Int-PR3	-0.0351	0.0719	-0.0523	-0.0106	-0.0626	-0.1761	0.1971	0.3590	0.8783

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EPILOGUE

The purpose of this investigation has been to gain an understanding of the transactional use of websites in a public environment. The results of the first investigation indicated that affect, some user characteristics and some facilitating conditions are important determinants of public transactional use. Further investigation of these initial results indicates that the facilitating conditions of the physical and virtual environments are important to users and tend to influence their transactional use of websites in the public environment. The final investigation expanded on the prior research results and examined the impact of internet self-efficacy and risk perception on transactional use in conjunction with impact of risk perception. We find that although self-efficacy was an important determinant in the original behavioral model, when internet-self efficacy is considered with risk perception and risk attitude, risk perception and risk attitude become the most significant determinants of transactional website use. Interestingly, when the subgroup of people who complete monetary transactions are considered, risk becomes less of a determinant and we again see that self-efficacy is the important determinant of transactional use. These results seems to indicate in a broad sense that users are sensitive to the physical environment in which a public computer is placed and they indicate some concern about having their activities tracked, however they seem to be much less concerned about the virtual, or internal environment of the actual computer they are using.

The public user's apparent lack of concern about the virtual environment of the computer is disturbing because users seem to be the least concerned about the environment that can is potentially the most polluted. A person can readily see where a computer is placed, the potential for distractions and other's viewing the screen contents, it is much more difficult to determine what may be lurking in the virtual environment of the public computer. Results indicate that users are sensitive to the possibility that the library may be recording and tracking their activities, the final study seem to suggest that users are unconcerned about the virtual environment of local computer, and are unconcerned that the local machine may be saving a record of the information entered into an internet based form or recording where the user has accessed webpages. This is an interesting result as well, because the users do exhibit a strong concern about the potential risks in engaging in a transaction through the internet with the host, so they are not oblivious to

issues of the cyberworld, they just do not seem to be concerned about the physical device they are using for these interactions.

The general results of this investigation seem to indicate that although a majority of people do not engage in website based transactions from public computers, there are many who do use these access points for both transactions that involve their personal information and transactions that include some type of monetary information. The broad results indicate that while the public computers are apparently a viable way to help bridge the gap in information access, these same machines maybe effective in bridging the transactional access gap if the environment is adjusted. Unfortunately public users do not seem to be sensitive to potential hazards within the actual computer they are using, so attempts should be made to inform the users and make them aware of these potential problems. Overall, the results indicate that some people are willing to engage in a full range of internet based activities while using a public computer, attention to the computing environment may lead to a broader use of these public resources and a reduction in the transactional access divide.

FUTURE RESEARCH DIRECTIONS

This project answered some of the questions about public transactional use within the specific context of public libraries. Libraries are only one source of public internet access, public access is provided in community centers and through other similar public access and community support organizations. Libraries are traditionally considered to be a source of knowledge while community centers tend to be more socially focused and thus may impact the level and type of transactional website use. Future research should consider community centers and similar sources of internet access to first determine if people are engaging in web based transactions and secondly to evaluate the impact of these environments on transactional website usage. This work may also be expanded to focus on the issues of public computing access for specific underserved groups.

A second area of future research may be to change the focus of the investigation to consider what users expect from the public access provider and what the public access provider supplies to the user. The access provider potentially performs more services that just providing a computer. For example, users may expect public access computers to have applications in place to shield the user from the undesirable materials prevalent on the web and thus provide a filtered and monitored environment in which to engage in internet based interactions. Similarly, users may expect public computing sites to provide a high quality and functional computer along with a high speed internet connection. Each of these considerations will shift the focus away from what people are receiving now, to what the public internet access market can provide in order to further support the full use of websites from public computers.

In conclusion, computer and internet adoption has been studied across many dimensions over the past years, an area that has been rather neglected involves the understanding of adoption in a public computing context. This is a fertile area of exploration given the expanding use of public internet connection technologies. For example, public information kiosks are being used in hospitals, ticket check-in kiosks requiring a credit-card swipe are present in most airports, public computers are provided in government offices to facilitate access to services. In addition, free wireless access to the internet is an expanding service and enticement offered by organizations to encourage patronage. Although in this case, the user is responsible for

providing the internet connection device, the use is occurs in public and the connection between the computer and the wireless hub is under the control of a third party provider, not the end user. In each of these instances, computing activities have moved from the privacy of a residence or office and out into the public realm, the environment or computing context becomes a factor, and should be more completely understood.

SURVEY QUESTIONNAIRE

The survey questionnaire used in Essay 3 is included in the following pages. As the essays developed the survey instrument was modified to accommodate the changes in the factors under consideration. Prior versions of the questionnaire are available from the author

University at Buffalo
The State University of New York

Public Library Computer Use Survey

We are interested in your use of public computers in libraries and the facilities that are provided for your use. This survey will take about 10 minutes for you to complete. Please take a moment and participate!

The survey is anonymous, you are asked to complete the survey while sitting at a computer workstation. When you are finished, put the survey into the envelope provided and return the sealed envelope to a library staff member.

We are offering an opportunity for survey participants to enter into a drawing for a Gift Card. If you wish to provide your contact information for this survey please complete the contact information card

We sincerely appreciate your time in assisting with this research project.

Instructions: Please circle the number or answer that best reflects your response to each question or statement. When you are asked for the number of times you have engaged in an internet activity, please provide your best estimate.

Definition of Terms:

Workstation: The combination of a computer, a monitor, keyboard and mouse

Workspace: The physical area surrounding the computer workstation.

Monetary Transaction : A monetary transaction is the purchase of goods or services through a website. Generally a credit card or similar mechanism is used for payment in these types of types of transactions.

Information Transaction: An information transaction involves submitting personal information to an organization through their website. You may have completed this type of transaction while applying for a loan, requesting product information or while applying for a job on line.

1. To begin the survey, please enter the Name of the Library where you are completing this survey: _____						
2. How many computers do you have in your home?	NONE	1	2	3 or More		
3. What type of Internet connection do you have in your home?	NONE	Dial-up Telephone Model	DSL	Cable Modem	Other	
Do you access the internet from any of these locations:	At work, only user of the computer	At work, shared computer	School Computer	Other (not including your home)		
5. What is your age range?	18-20	21-30	31-40	41-50	51-65	65 +
6. What is your Gender?	Female	Male				
7. What is your Ethnic Heritage?	Black	White	Hispanic	Asia/ Pacific	Native American	Mixed Ethnic Heritage	Other
8. How much school have you completed?	Less than High School	High School Graduate	2-year College Graduate	4-year College Graduate	Post 4-year College	
9. What is your employment status?	Full-time Employed	Part-time Employed	Student	Not-Employed	Retired	Other
10. What is your household average income range?	$0-$20,000	$21,000-$40,000	$41,000-$60,000	$61,000-$80,000	$81,000+	
11. In what type of area is your residence located?	Urban	Suburban	Village/Town	Rural		
12. What is the Zip Code of your residence?						
13. Please consider your use of transaction supporting websites like Amazon.com, WalMart.com, www.nydmv.state.ny.us, or similar sites during the PAST YEAR.						

Public Computer: A Computer shared by many people, generally found in a public location.

Private Computer: A Computer used by a limited number of people, the computer is generally located in a private location such as a home or office.

How many MONETARY TRANSACTIONS of value **Less Than $50** have you completed through a website while using a public computer in a library?	None	1	2	3	4	5+
How many MONETARY TRANSACTIONS of value **Greater Than $50** have you completed through a website while using a public computer in a library?	None	1	2	3	4	5+
How many personal INFORMATION TRANSACTIONS have you completed through a website while using a public computer in a library?	None	1	2	3	4	5+
How many MONETARY TRANSACTIONS with a value **Less Than $50** have you completed through a website while using a private computer?	None	1	2	3	4	5+
How many MONETARY TRANSACTIONS with a value **Greater Than $50** have you completed through a website while using a private computer?	None	1	2	3	4	5+
How many personal INFORMATION TRANSACTIONS have you completed through a commercial website while using a private computer?	None	1	2	3	4	5+

14. Please consider the computer you are currently using, how likely would you be to:	Very Unlikely	Unlikely	Neither Likely nor Unlikely	Likely	Very Likely
Complete a monetary transaction with a website while using this computer ?	1	2	3	4	5
Submit personal information to a website site from this computer?	1	2	3	4	5

15. If you consider your friends and family, to what extent is your use of web sites:	Strongly Discouraged	Discouraged	Neutral	Encouraged	Strongly Encouraged
For monetary transactions encouraged by your family members?	1	2	3	4	5
To submit personal information encouraged by your family members?	1	2	3	4	5

For monetary transactions encouraged by your friends?	1	2	3	4	5
To submit personal information encouraged by your friends?	1	2	3	4	5
16. What is your agreement with the following statements?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I feel apprehensive about using a public library computer.	1	2	3	4	5
I am concerned that a record of my computer activities will be saved in the library computer.	1	2	3	4	5
I am concerned that any personal information I put into a public library computer will be saved in that computer.	1	2	3	4	5
I am concerned that anyone who uses the library computer after me will be able to track my activities.	1	2	3	4	5
I am concerned that someone located outside of the library may be able to track my activities on the library computer.	1	2	3	4	5
I am apprehensive that a government authority can get records of my computer usage in a public library.	1	2	3	4	5
I feel that my computer activities are anonymous when using a computer in a public library.	1	2	3	4	5
I am confident that the public library computers are well managed and do not track user activities.	1	2	3	4	5
17. With respect to the <u>public library computer</u> you are currently using, what is your response to:	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I feel little risk in completing monetary transactions over the internet.	1	2	3	4	5

I feel little risk in completing a personal information transaction over the internet.	1	2	3	4	5
There is too much uncertainty associated with monetary transactions completed through the internet.	1	2	3	4	5
There is too much uncertainty associated with information transactions completed through the internet.	1	2	3	4	5
Compared with other ways of completing monetary transactions with organizations, using the internet is more risky.	1	2	3	4	5
Compared with other ways of completing information transactions with organizations, using the internet is more risky.	1	2	3	4	5
18. How would you characterize the risk in your decision to complete a transaction with a website?	A Significant Risk	A Risk	Neither Risk nor Opportunity	An Opportunity	A Significant Opportunity
19. How would you characterize your potential loss (or gain) in completing a transaction with a website?	A High Potential for Loss	A Potential Loss	Neither Loss nor Gain	A Potential for a Gain	A High Potential for a Gain
20. How would you characterize the situation when completing a transaction with a website?	A Very Positive Situation	A Positive Situation	Neither Positive nor Negative Situation	A Negative Situation	A Very Negative Situation
21. Considering your confidence in using the internet, what is your opinion of: "I feel confident... :"	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Understanding terms related to the internet.	1	2	3	4	5
Describing internet activities.	1	2	3	4	5
Using the internet to gather information.	1	2	3	4	5
Learning to do more things with the internet.	1	2	3	4	5

Handling any problems that develop while using the internet.	1	2	3	4	5
Explaining why a task will not work on the internet.	1	2	3	4	5
Using the internet for transactions.	1	2	3	4	5
22. Considering the internet, what is your response to: "If I use the internet..":	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I will spend less time on tasks.	1	2	3	4	5
I will be able to gain access to more information.	1	2	3	4	5
I will be able to access more goods.	1	2	3	4	5
I will be able to access more services.	1	2	3	4	5
It will require less effort to access goods and services.	1	2	3	4	5
My family will think I am competent.	1	2	3	4	5
My friends will think I am competent.	1	2	3	4	5
My status in my family will increase.	1	2	3	4	5
My status among my friends will increase.	1	2	3	4	5
I will increase my effectiveness in functioning in the modern world.	1	2	3	4	5
It will increase my sense of personal accomplishment.	1	2	3	4	5
I will expand my skills and abilities.	1	2	3	4	5
It is necessary for me to use the internet.	1	2	3	4	5
23. How important is it to you to:	Totally Unimportant	Unimportant	Neutral	Important	Very Important
Spend less time on tasks?	1	2	3	4	5
Be able to gain access to more information?	1	2	3	4	5
Be able to access more goods?	1	2	3	4	5

Be able to access more services?	1	2	3	4	5
Use less effort to access goods and services?	1	2	3	4	5
Have your family think you are competent?	1	2	3	4	5
Have your friends think you are competent?	1	2	3	4	5
Increase your status within your family?	1	2	3	4	5
Increase your status among your friends?	1	2	3	4	5
Increase your effectiveness in functioning in the modern world?	1	2	3	4	5
Increase your sense of personal accomplishment?	1	2	3	4	5
Expand your skills and abilities?	1	2	3	4	5
Use the internet?	1	2	3	4	5
24. If you consider each of the following, what is your opinion?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I like to be by myself much of the time.	1	2	3	4	5
It is annoying to have to share my workspace with someone.	1	2	3	4	5
I have difficulty concentrating when things are noisy.	1	2	3	4	5
I have trouble getting the privacy I want.	1	2	3	4	5
I am easily distracted by people moving about.	1	2	3	4	5
There is too little emphasis on privacy in our society.	1	2	3	4	5
I have my best thoughts when I am alone.	1	2	3	4	5
I am able to concentrate fully on my task when using a public computer in a library.	1	2	3	4	5
I can work with few distractions when using a public computer in a library.	1	2	3	4	5

I experience few interruptions when using a public computer.	1	2	3	4	5
I am able to give full attention to my task when I'm working on a public computer.	1	2	3	4	5
25. What are your opinions about using a computer?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I feel apprehensive about using computers.	1	2	3	4	5
I hesitate to use a computer to provide information through a web page because I might make a mistake that I cannot correct.	1	2	3	4	5
Working with a computer makes me nervous.	1	2	3	4	5
I am concerned that I could cause the computer to destroy a large amount of information on a web page.	1	2	3	4	5
I feel apprehensive about using an internet web page.	1	2	3	4	5
26. Please consider the library facilities, what is your opinion of the following:	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The computer equipment performs very well.	1	2	3	4	5
The connection to the internet works well.	1	2	3	4	5
The library's public computers are easy to use.	1	2	3	4	5
27. Assistance is available at the library with:	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Using computer software.	1	2	3	4	5
Difficulties with the computer hardware.	1	2	3	4	5
Using the internet.	1	2	3	4	5
28. Which of these activities have you used on a public library computer?	Reference Material		Word Processing		Spreadsheets
	Web Browsing		e-Mail		Other
29. How is your workspace enclosed?	No Enclosure		Partitions between Computers		Walls with 1 computer in the room
30. Considering that an arm's length distance is about 3 feet, about how close are you to another workstation?	Less than 5 feet away		5-10 feet away		No other computer is in the area

31. Is there another computer user visible from your work location?	Yes	No			
32. Are you able to read the content on another user's screen from where you are seated?	Yes	No			
33. Is the screen of your computer visible from a library staff member's work area?	Yes	No			
34. Is the screen of your computer visible to other library patrons?	Yes	No			
35. Is there a barrier of some type between you and anyone working to your left or right?	Yes	No			
36. On average how often do you use a public computer in the library in a month?	Less than 5 times	5-10 times	11-15 times	16-20 times	20 + times
37. On average, how long do you <u>use</u> a computer in a library?	Less than 5 minutes	5-15 minutes	16-30 minutes	30-45 minutes	45+ minutes
38. Generally, how long do you have to <u>wait</u> to use a computer in the library?	0 minutes	1-5 minutes	6-10 minutes	11-15 minutes	15 + minutes
39. How often do you have to wait to use a computer in the library?	Never	Seldom	Frequently	Very Frequently	Always
40. How much EXPERIENCE do you have:	No Experience	Some Experience	Moderate Experience	Substantial Experience	Extensive Experience
Accessing information on the internet?	1	2	3	4	5
Using e-mail?	1	2	3	4	5
Understanding computer user instructions?	1	2	3	4	5
Using the Internet?	1	2	3	4	5
41. How much COMPUTER TRAINING have you received from:	No Training	Some Training	Moderate Training	Most Training	All Training
High School Classes	1	2	3	4	5
College level Classes	1	2	3	4	5
Self-teaching	1	2	3	4	5
Community or Continuing Education opportunities	1	2	3	4	5
Your friends	1	2	3	4	5
Your family	1	2	3	4	5

Thank you for taking the time to complete our survey. Please, fold the survey, slip it into the envelope provided and return the *sealed envelope* to a library staff person for mailing. If you wish to participate in the Gift Card Drawing, please complete the contact information card and return it to a Library Staff member who will collect the cards and return them to the investigators in a separate envelope.