

Customers' Beliefs behind Business-to-Consumer Electronic Commerce

Nena Lim

Commerce Department
University of Queensland
Brisbane, Australia
Email: nlim@commerce.uq.edu.au

Abstract

With the rising importance of electronic commerce, it is important for researchers and company executives to understand customers' beliefs behind online shopping behaviour. This proposed study extends the technology acceptance model (TAM) to test the influence of experience, self-efficacy, perceived risk, and social influence on customers' acceptance of the business-to-consumer (b2c) e-commerce.

Keywords

Electronic Commerce, Technology Acceptance Model, System Use, Adoption, Perceived Risk, Experience, User Acceptance, Online Buying Behaviour

INTRODUCTION

Based on the technology acceptance model (TAM), the present study examines the following research question: In what ways do experience (Davis et al., 1989; Karahanna et al., 1999; Taylor & Todd, 1995), self-efficacy (Bandura 1977; 1982), perceived risk (Cox & Rich, 1964; Jarvenpaa & Todd, 1996), and social influence (Salancik & Pfeffer, 1978; Fulk et al., 1990) affect customers' acceptance of the business-to-consumer electronic commerce? Acceptance of business-to-consumer e-commerce refers to when a customer prefers to buy online instead of buying through other marketing channels, such as store-based retailing and telephone shopping.

According to the Electronic Commerce Association, electronic commerce (e-commerce) is "any form of business or administrative transaction or information exchange that is executed using any information and communications technology" (Till, 1998, p. 9). With the rising importance of e-commerce, some people expect it to bring sociodemographic changes as well as business advantages. For business people, e-commerce is a unique two-way communication approach to a direct marketing channel (Jarvenpaa & Todd, 1996). Drucker (1999) suggests that e-commerce might even lead to an information revolution.

In monetary terms, Beer (2000) estimates that Australian businesses will spend over A \$2.64 billion on Web technology in 2000. ActivMeida (1999) reports that US \$95 billion revenues were generated from global e-commerce in 1999. Revenue is expected to exceed US \$220 billion in 2000 (ActivMedia, 1999), and reach US \$6.9 trillion by 2004 (Nua, 2000).

A common approach is to classify e-commerce in two ways: business-to-business (b2b) and business-to-consumer (b2c). B2b e-commerce refers to paperless exchange of business information over the Internet. It involves activities such as electronic data interchange (EDI) and electronic funds transfer (EFT). B2c e-commerce involves companies selling goods or services to customers online. This study focuses on b2c e-commerce. It uses the terms b2c e-commerce and online shopping interchangeably.

BUSINESS-TO-CONSUMER (B2C) ELECTRONIC COMMERCE

B2c e-commerce gets much publicity through companies, such as Yahoo.com and Amazon.com (MIS Australia, 2000). Studies show that customers purchase online because it is convenient, without sales pressure, and saves time (GVU, 1999; Henderson et al., 1998). A spate of studies by various consulting companies indicate that online shopping has a huge, relatively untapped market. According to a Boston Consulting Group report on b2c e-commerce, North-American retailers generated US \$33.1 billion revenues in 1999. The 2000 revenue figure is expected to jump to US \$61.1 billion (Boston Consulting Group, 2000). European retailers obtained US \$2.8 billion from online sales in 1999 (Conlin, 2000). They are expected to generate US \$8.9 billion by the end of year 2000 (Boston Consulting Group, 2000). Regarding Australia, Horey (1999) estimated that the online revenue was A \$920m in 1999. The number of Australian online shoppers is expected to reach 3.8 million by the end of 2000 (Consult Pty., 2000).

Although increasing results seem to suggest that online shopping is growing rapidly, predictions on b2c business could be optimistic (Switzer, 2000). For example, the 1999 North-American online revenue figure (US \$33.1 billion) is still relatively small, because it represents only 1.4 percent of all retail sales (Boston Consulting Group, 2000). Charlton et al. (1999) found that the general public in the United Kingdom exhibits little interest in e-commerce. Moreover, customers often browse items online but with no intention to buy (GVU, 1999). In their study on gender and Internet shopping, Fram & Grady (1997) suggest that women only have moderate interest in online shopping. In addition, 65 to 75 percent of online shoppers in two different studies abandoned their purchases before the purchases were completed (Boston Consulting Group, 2000; Vu et al., 1999).

In short, on the one hand, growing studies (e.g., ActivMedia, 1999; Boston Consulting Group, 2000; Nua Ltd., 2000) suggest that b2c business will grow substantially. On the other hand, evidence shows that many customers may still not want to purchase online (Boston Consulting Group, 2000; Charlton et al., 1999; GVU, 1999; Vu et al., 1999). Because of the increasing financial investment by organisations (Beer, 2000) and potentially large profits from b2c e-commerce (ActivMedia, 1999; Horey, 1999; Boston Consulting Group, 2000), it is important for researchers and company executives to understand more about online shopping behaviour. With the objective to enhance the acceptance of online shopping, this study examines the beliefs behind customers' behaviour.

TECHNOLOGY ACCEPTANCE MODEL (TAM)

Evaluation of the success of information technology or information systems has been an important topic for researchers and practitioners (Delone & McLean, 1992). Among the various evaluation criteria proposed by researchers, user acceptance of a new technology or system is considered to be a vital and useful criterion. Based on the theory of reasoned action (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980), the technology acceptance model (TAM) focuses on two perceptions, perceived usefulness and perceived ease of use, to predict users' acceptance of new technology (Davis, 1989; Davis et al., 1989).

Because the TAM is parsimonious and well developed (Davis & Venkatesh, 1996), many researchers have adopted this model to assess users' acceptance of different technologies, such as microcomputers (Igbaria et al., 1995), word processing systems (Adams et al., 1992; Davis & Venkatesh, 1996), spreadsheet systems (Adams et al., 1992; Davis & Venkatesh, 1996; Hendrickson et al., 1993; Mathieson, 1991), and database systems (Hendrickson et al., 1993).

Over the years, many researchers have added constructs to the TAM to try to enhance its predictive power. Some studies elaborated external variables that affect perceived ease of use

and perceived usefulness in TAM to better understand the motivation behind users' behaviour. For example, Gefen & Straub (1997) studied the impact of gender on usage of email. Gefen & Keil (1998) focused on the effect of perceived developer responsiveness on perceived ease of use and perceived usefulness. Karahanna & Straub (1999) examined the effect of four types of external variables, namely, social presence, social influence, availability of user training and support, and perceived accessibility, on an email system.

STUDIES ON THE WORLD WIDE WEB/ELECTRONIC COMMERCE

Literature indicates that many existing studies on the World Wide Web (WWW/Web) or e-commerce pertain to human-computer interaction (HCI). These HCI studies focus on the physical features, such as web interface design and the navigation pattern of surfers (e.g., Grose et al., 1998; McDonald & Stevenson, 1998). Results of these HCI studies give information, such as how to distinguish a good Web page from a bad one. Unfortunately, they do not tell company executives why customers buy or do not buy online.

Instead of focusing on HCI issues, some studies examine the acceptance of the Web technology by focusing on the beliefs and motivations of customers (Jarvenpaa & Todd, 1996; Agarwal & Prasad, 1997; Morris & Dillon, 1997; Fram & Grady, 1997; Fenech, 1998; Agarwal & Prasad, 1998; Parthasarathy & Bhattacharjee, 1998). Most Web-related studies adopted the TAM or the innovation diffusion theory as the basic research model. Innovation diffusion theory (Rogers, 1983; Moore & Benbasat, 1991) is similar to the TAM. This theory postulates that researchers can predict innovation diffusion by examining users' belief over various characteristics of the innovation. The eight perceived characteristics of innovations reported by Moore & Benbasat (1991) are voluntariness, relative advantage, image, compatibility, complexity, trialability, visibility, and result demonstrability. Table 1 is a summary of these Web-related prior studies.

Year	Author	Focus of study	Methodology	Sample	Theory + additional variables
1996	Jarvenpaa & Todd	electronic shopping on WWW	open-ended survey; focus group	220 shoppers	Nil
1997	Agarwal & Prasad	WWW for learning	experiment	73 MBA students	Innovation diffusion theory + perceived voluntariness
1997	Fram & Grady	cyber shopping pattern	field study (survey on the Web)	254 women	Nil
1997	Morris & Dillon	Information searching using Netscape	field study (survey)	76 students	Technology acceptance model (TAM)
1998	Agarwal & Prasad	WWW information services on the Internet	field study (survey)	175 part-time MBA students	TAM + personal innovativeness
1998	Fenech	WWW in general	survey	150 students	TAM + self-efficacy
1998	Henderson et al.	electronic supermarket	experiment (followed by focus groups); survey	57 families; 64 users	TAM + enjoyment + peer-group norms + usability + experience + individual-situational factors
1998	Parthasarathy & Bhattacharjee	online services	field survey	145 subscribers	Innovation diffusion theory + external influence + interpersonal influence + network externality
1999	Korgaonkar & Wolin	WWW in general	focus group; survey	6 focus groups; 401	Media uses and gratification theory

				consumers	
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Table 1: Summary of studies on acceptance of the Web/electronic commerce

Problems of Existing Web-related Studies

A few problems in the following aspects can be observed from Table 1:

- focus of study
- theory testing
- modification of the technology acceptance model

First, except for Henderson et al. (1998), all the Web-related studies in Table 1 examine users' overall impression of the Internet or the Web. Unfortunately, because of the broad nature of the Internet and the Web, results of these studies are not especially useful for practitioners.

Second, some studies in Table 1 are open-ended survey type studies. Such studies are exploratory in nature, and do not contain any theory or research model (Fram & Grady, 1997; Jarvenpaa & Todd, 1996). For instance, although Jarvenpaa & Todd (1996) classify customers' responses into four categories based on studies in store-based retailing and direct marketing, their results simply represent a list of concerns of the customers regarding online shopping. Their study suggests that experience, and perceived risk may play important roles in predicting Web acceptance.

Third, for those Web-related studies that specified research models, most applied the simple TAM approach or innovation diffusion theory (e.g., Agarwal & Prasad, 1997; Morris & Dillon, 1997). Nonetheless, because of the difference between ordinary information systems and e-commerce, a simple TAM or innovation diffusion approach is unlikely to predict acceptance accurately. For instance, the scope of e-commerce is much wider than ordinary information systems as it extends across numerous people and organisations. Moreover, e-commerce carries financial consequences for the users. Therefore, from the customers' or users' viewpoints, risk becomes a vital factor. As more than 50 percent of customers abandon purchases before purchases are completed (Boston Consulting Group, 2000; Vu et al., 1999), it is an interesting question to find out whether self-efficacy of customers contributes to this behaviour.

To tackle the problems of the existing studies, this study adds potentially important constructs to the TAM, and examines the effect of these constructs. Moreover, this study focuses on certain types of goods and services in online shopping. Fram & Grady (1997) found that women often purchase software, books, and music online. Across different countries, GVU (1999) also reported that hardware, software, books, music, and travel are the five most common items that customers intend to buy when they browse the Web. To enhance the predictive power of the proposed model, this research focuses only on online customers' purchasing behaviour in relation to these five items. This study does not distinguish between multichannel retailers, such as airlines, and online-only retailers, such as e-store.com.au and dstore.com.au.

CONCEPTUAL MODEL

This research examines the factors that motivate acceptance of online shopping from the customers' viewpoint. Figure 1 describes the research model for this study. Both Agarwal & Prasad (1997) and Agarwal & Prasad (1998) reported an adjusted coefficient of determination that is below 0.5. It is expected that the constructs proposed in the model will be able to explain a larger proportion of variance in online shopping behaviour than existing studies.

To focus on the subjective perceptions from customers' viewpoints, however, this study does not consider objective factors that may affect online shopping, such as speed of transmission lines, quality of products, and prices of products. The following sections describe the potentially important constructs and the proposed hypotheses.

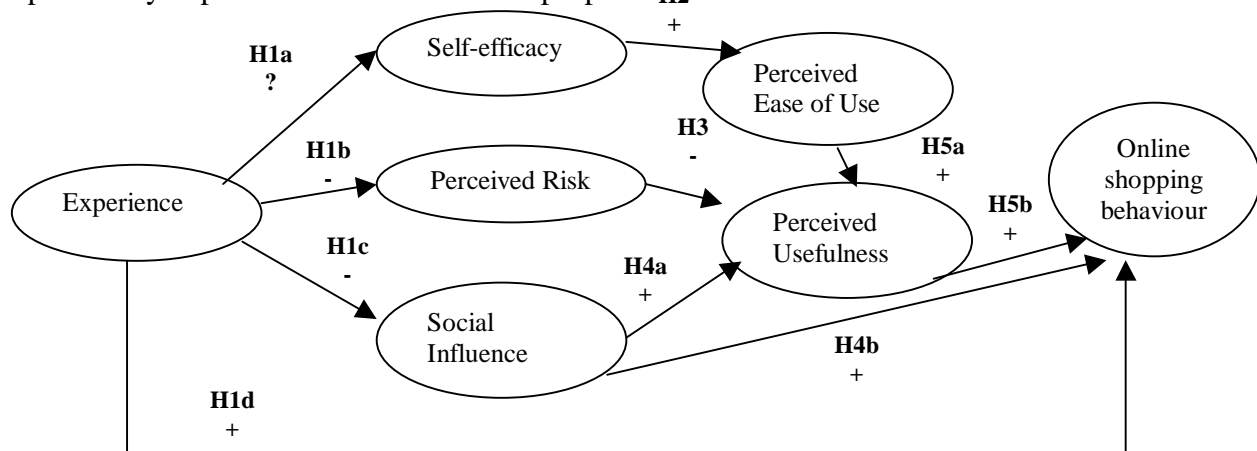


Figure 1: B2C e-commerce adoption model

Experience

Previous studies on TAM have shown that experience potentially influences users' acceptance of new technology (Adams et al., 1992; Chau & Hui, 1998; Davis, et al., 1989; Igbaria et al., 1995; Karahanna et al., 1999; Szajna, 1996; Taylor & Todd, 1995; Thompson et al., 1994). Ratnasingham (1999) found that companies are more secure when they trade with existing EDI partners. In a study regarding telephone shopping, Cox & Rich (1964) also found that prior shopping experience can reduce uncertainty. Thus, it is likely that customers will feel more comfortable buying online if they have good online buying experience. Experience was reported as vital in two of the studies in Table 1 (Henderson et al., 1998; Jarvenpaa & Todd, 1996).

This study defines experience as online shopping experience. To make the results more meaningful, this study focuses only on prior experience with b2c e-commerce. It is not concerned with general computer experience. This study measures experience in three ways: (a) the number of times a customer tried to buy goods or services online; (b) the number of times a customer bought goods or services online; and (c) the number of times a customer felt satisfied with completed online shopping.

It is expected that, with more practice, a user will learn new skills and possibly increase his or her self-efficacy. Compeau & Higgins (1995a) argue that previous experience of technology helps to enhance users' self-efficacy in using the technology. On the other hand, Venkatesh & Davis (1996) report that self-efficacy does not change over time with experience. In view of this contradictory result, the present study does not specify the direction of the association:

- H1a: Experience is associated with self-efficacy.

With prior online shopping experience, this study postulates that perceived risk of customers over b2c e-commerce will be reduced. Referring to EDI, Ratnasingham (1999) indicates that organisations get a higher level of security if they have previous experience with the business parties. Similarly, if customers buy from the same vendors, perceived risk will be reduced.

- H1b: Experience is negatively associated with perceived risk.

Karahanna et al. (1999) and Thompson et al. (1994) found that social influence had a greater impact on inexperienced users than experienced users. With experience, users may be better

able to form their opinions on the new technology instead of relying on or being affected by the comments of other people. Thus, the following hypothesis is proposed:

- H1c: Experience is negatively associated with social influence.

Hubona & Geitz (1997) conclude that external variables do not always affect usage behaviour through mediating belief constructs. Their results show that the direct linkage between experience and usage is significant. Moreover, Thompson et al. (1994) report that experience has a direct effect on the behaviour of personal computer usage. The results also indicate that the indirect effect of experience through users' beliefs is much smaller than the direct effect. Therefore, this study hypothesises that:

- H1d: Experience is positively and directly associated with online shopping behaviour.

Self-Efficacy

The concept of self-efficacy originated from Bandura's social cognitive theory (Bandura, 1977; 1982). Self-efficacy is about perception of ability. It refers to how confident users are in doing certain tasks, such as using new technologies. In this study, self-efficacy is defined as an individual's perceived ability to buy goods or services on the Web.

Pooling data on different technologies from different organisations, Compeau & Higgins (1995b) and Compeau et al. (1999) found that computer self-efficacy has an important impact on users' affect, anxiety, and usage. Moreover, Compeau & Higgins (1995a) reported that self-efficacy affects computing performance, whereas Davis et al. (1989) and Compeau et al. (1999) showed that self-efficacy perceptions affect the perceived ease of use of users.

In spite of the importance of self-efficacy, only Fenech (1998) has examined the impact of self-efficacy in the studies shown in Table 1. Fenech (1998) reported that the predictability of TAM was greatly improved by the addition of computer self-efficacy because adjusted goodness-of-fit index jumped from 0.556 to 0.89. Venkatesh & Davis (1996) suggest that users with a higher level self-efficacy tend to perceive new technology as easier to use. Users with high self-efficacy are more willing to learn a new technology. Therefore this study hypothesises that:

- H2: Self-efficacy is positively associated with perceived ease of use.

Perceived Risk

Researchers in psychology have widely studied risk theory, especially in relation to gambling behaviour (e.g., Pollatsek & Tversky, 1970; Jia et al., 1999). Traditionally, developers of information systems do not pay much attention to security or risk (Straub & Welke, 1998). Security and risk issues have always been described as one of the critical factors, however, for e-commerce success (Arnum, 1995; Fram & Grady, 1997; Rebel & Koenig, 1999; Till, 1998). For instance, Fram & Grady (1997) report that online customers are concerned about credit card fraud. They normally purchase only products with low purchasing risk.

The fragility of the Web and e-commerce was evidenced in February 2000. In that incident, traffic to websites such as Yahoo, Amazon, CNN, and eBay were jammed with junk messages (Richtel & Robinson, 2000). A telephone survey conducted after the incident indicates that 70 percent of online shoppers were worried about the attack. Thirty percent of the respondents said that they would be less likely to buy online (Schwartz, 2000).

New technologies and protocols, such as digital signatures, encryption (Arnum, 1995), and wireless application protocol (Zampetakis, 2000), are used to improve Internet security. Moreover, online companies obtain a Webtrust seal of assurance to enhance customers'

confidence in online shopping. A Webtrust seal indicates that a company has fulfilled certain security principles and criteria as specified by professional accounting bodies (ICAA, 1999).

In spite of the calls for better security, a study done by the Georgia Institute of Technology indicates that security is not the most important determinant for online shopping (GVU, 1999). Moreover, although Jarvenpaa & Todd (1996) found that risk is an important factor in electronic shopping, their results also indicate that consumers consider product perceptions, shopping experience, and customer service as more important. An objective of this study is to examine the extent to which perceived risk is a deterrent to online shopping.

In the marketing literature, Cox & Rich (1964) argue that customers who use telephone shopping perceive risk because they cannot personally inspect the products or compare the quality, size, or style of products. Customers may also perceive risk because time may be lost or frustration may result where the purchases are unsuccessful. Following Cox & Rich (1964), this study defines perceived risk as "the nature and amount of risk perceived by a consumer in contemplating a particular purchase action" (p. 33). In their study of mail-order shopping, Simpson & Lakner (1993) identify four types of perceived risk, namely, economic, performance-related, physical, and social/psychological. Based on Simpson & Lakner (1993), Jarvenpaa & Todd (1996) identify the following five types of risk in online shopping:

- Economic risk: The risk of monetary loss arising from online shopping. It is a result of the unreliability of vendors.
- Social risk: Social risk involves acceptance of the shopping behaviour by other society members, such as family, and friends.
- Performance risk: Performance risk is concerned about whether the purchased goods or services are able to meet customers' expectations.
- Personal risk: The possibility of any harm to the customers because of the purchase behaviour. For example, customers may suffer because credit card information is compromised.
- Privacy risk: Customers suffer from privacy risk if they lose their privacy. This may be a result of the fact that information is collected about the customers during the shopping process.

Jarvenpaa & Todd (1996)'s results indicate that personal risk and performance risk are more important than other types of risk. This study adapts Jarvenpaa & Todd's classification and proposes four types of perceived risk regarding b2c e-commerce. The privacy risk in Jarvenpaa & Todd (1996) is combined with the personal risk in this study because these two types of risk are similar.

In relation to b2c e-commerce, customers find online shopping useful if they can get the shopping done fast or the information provided on the Web can help customers make purchasing decisions. If customers perceive high levels of risk in online shopping, it is likely that they will find b2c e-commerce less useful. However, if customers are willing to continue to purchase online, it implicitly reflects that customers find online shopping useful. Therefore, this study hypothesises that:

- H3: Perceived risk is negatively associated with perceived usefulness.

Social Influence

The idea of social influence originated from social psychology (Salancik & Pfeffer, 1978; Fulk et al., 1990). In some cases, researchers used different terminology to describe social influence.

For example, the theory of reasoned action (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980; Karahanna et al., 1999) used the term "subjective norm", whereas Chau & Hui (1998) used "opinion leader."

Social influence in this study refers to the influence of colleagues, friends, and relatives on customers. Kelman (1961) identifies three stages in social influence: compliance, identification, and internalization. At the compliance stage, a person is under social influence because he or she simply wants to get a favourable reaction from others. At the identification stage, a person actually sees some advantages in the social influence, although the main motivation is still to meet others' expectations. At the final stage, a person internalises other people's values or opinions.

This study includes social influence because recent studies suggest that this factor has an impact on new technology usage (Gefen & Straub, 1997; Henderson et al., 1998; Jasperson et al., 1999; Venkatesh & Morris, 2000). Jasperson et al. (1999) found that social influence could lead to three types of responses (conformance, imitation, and mutual discovery) in new technology usage. So far, TAM researchers have different opinions on the usefulness of social influence. Davis (1989), Adams et al. (1992), and Szajna (1996) did not examine this construct in their research. Most studies that consider this construct report that it is significant (Karahanna & Straub, 1999; Venkatesh & Morris, 2000; Agarwal, & Prasad, 1997). Parthasarathy & Bhattacharjee (1998) found that social influence is more important than external influences such as advertisements. Nonetheless, some studies found social influence to be insignificant (e.g., Davis et al., 1989; Mathieson, 1991).

Schmitz & Fulk (1991) and Karahanna & Straub (1999) found that social influence has a significant impact on behavioural intention through perceived usefulness. However, the theory of reasoned action posits that social influence has a direct effect on behavioural intention (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980). Karahanna et al. (1999) also report that potential adopters' intention to adopt new technology was solely affected by social influence. Their model indicates a direct relationship between social influence and behavioural intention. Hence, this study tests the following two hypotheses:

- H4a: Social influence is positively associated with perceived usefulness.
- H4b: Social influence is positively and directly associated with online shopping behaviour.

Perceived Ease of Use and Perceived Usefulness

Prior studies found that perceived ease of use only has an indirect effect on usage through perceived usefulness (Gefen & Keil, 1998; Karahanna & Straub, 1999). Moreover, research to date consistently shows that perceived usefulness is a significant predictor of system usage (Davis, 1989; Davis et al., 1989; Karahanna & Straub, 1999). Therefore, this study examines the following two hypotheses:

- H5a: Perceived ease of use is positively associated with perceived usefulness.
- H5b: Perceived usefulness is positively associated with online shopping behaviour.

CONCLUSION

This proposed study reconstructs the boundary of TAM in the current Web-dominant situation by adding experience, self-efficacy, perceived risk, and social influence. Moreover, this study can help businesses adjust their e-commerce strategies. For instance, businesses can learn from the results, and decide whether it is worthwhile to spend more money on upgrading security over the Web. This in turn will affect the future development of security of the Web.

Moreover, if the results support the importance of experience on online shopping, this outcome should motivate companies to spend more effort, such as giving special discounts, to attract new customers. If social influence is found to be significant, managers may need to think of ways to create a positive social influence over customers.

The research methodology of this study is survey. It is assumed that this model is in equilibrium. Therefore, it is appropriate to examine the associations among constructs in a cross-sectional manner. The target participants are university students and employees of organisations involved in e-commerce. These two groups of people are believed to represent an important portion of the e-commerce customers because of their easy access to the Internet. The next step of this research is to prepare survey instruments. Existing instruments of perceived ease of use, perceived usefulness, and self-efficacy will be adopted (Davis, 1989; Compeau & Higgins, 1995b), whereas new instruments will be developed for the other constructs. A pilot study will be performed to confirm the validities and reliability of the instruments before actual data collection.

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