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Understanding Users' Continuance of Facebook: The Role of General and Specific Computer Self-Efficacy

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UNDERSTANDING USERS' CONTINUANCE OF FACEBOOK: THE ROLE OF GENERAL AND SPECIFIC COMPUTER SELF-EFFICACY

Comprendre la persistance d'utilisation de facebook : le rôle de l'efficacité personnelle en informatique, générale et spécifique

Completed Research Paper

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Abstract

Prior research has distinguished general computer self-efficacy (CSE) and application-specific computer self-efficacy, but few studies have investigated the relationship between the two levels of CSE as well as their antecedents and consequences. With the increasing popularity of social networking sites such as Facebook, we are interested in assessing the role of general and specific CSE in predicting users' continuance intention of these sites. An extended technology acceptance model with both cognitive and affective predictors is utilized to capture the decision process of Facebook users' continuance intention. The proposed research model examined antecedents as well as consequences of both general CSE and specific CSE in Facebook. A survey was conducted for data collection. The results show that general CSE and specific CSE are closely related but play different roles in predicting continuance intention in Facebook through cognition and affect, and are affected differently by general computer and Facebook-specific experience.

Keywords: General computer self-efficacy, specific computer self-efficacy, continuance intention, social cognitive theory, Facebook, cognition, affect

Résumé

L'efficacité personnelle en informatique compte beaucoup dans l'intention d'utilisation continue des sites de réseaux sociaux. Un modèle d'acceptation des technologies complété par des prédicteurs affectifs est testé par une enquête auprès d'utilisateurs de facebook. Les résultats montrent que l'efficacité personnelle à la fois générale et spécifique sont fortement reliées mais jouent des rôles différents pour prédire l'intention d'usage continu, et sont affectées différemment par l'expérience générale en informatique et l'expérience spécifique sur facebook.

Abstract in Chinese

Facebook

Facebook

Facebook

Facebook

Introduction

Self-efficacy refers to individuals' judgment about their ability to perform particular tasks (Bandura 1977). Self-efficacy plays a crucial role in self-motivation because it can influence decisions about what behaviours to undertake and the amount of effort and persistence in attempting those behaviours (Barling and Beattie 1983). Computer self-efficacy (CSE), a judgment of one's capability to use a computer (Compeau and Higgins 1995a), has been validated as an individual trait which mediates the influence of prior experience, computer training and management support on beliefs (e.g., perceived ease of use, perceived usefulness, perceived behaviour control), affect (e.g., playfulness, anxiety), behaviour (e.g., adoption, system use), satisfaction and actual performance (e.g., Burkhardt and Brass 1990; Compeau and Higgins 1995a, 1995b; Henry and Stone 1994; Igbaria and Iivari 1995; Taylor and Todd 1995; Venkatesh and Davis 1996). Therefore, an improved understanding of the nature of CSE from both an antecedent and consequence perspective has positive implications for applied activities in computer training, education, implementation, information technology (IT) acceptance and information systems (IS) continuance.

Prior research has established the distinction between self-efficacy at the general computing level (general CSE) and self-efficacy at the specific application level (application-specific CSE) (Compeau and Higgins 1995a; Agarwal et al. 2000; Marakas et al. 1998). However, most of the CSE studies focus on either general CSE (e.g., Taylor and Todd 1995; Whitley 1997), or application-specific CSE (e.g., Venkatesh 2000; Yi and Hwang 2003). The number of studies that investigate the relationship between the two levels of self-efficacy as well as their antecedents and consequences is limited (e.g., Agarwal et al. 2000).

Due to the importance and scarcity of relevant research, this paper aims to explore the relationship between the general CSE and specific CSE in the context of Facebook, one of the most popular social networking sites. Social networking sites are systems that offer free accounts, with ways to display profile information, visualize connections to friends, and share digital media (Dwyer 2007). Over the past few years, the use of social network sites is increasing, which has been a compelling topic for both popular media and academic research. In early 2008, Facebook has more than 69 million active users worldwide. Basic features of Facebook include: Wall, which is a space on each user's profile page that allows friends to post messages; Pokes, which allows users to send a virtual "poke" to each other; Photos, where users can upload albums and photos; and Status, which allows users to inform friends of their current whereabouts and actions. Over time, Facebook has added several new features. Examples are Gifts (i.e., allow users to send virtual gifts to their friends), Marketplace (i.e., allow users to post free classified ads), Events (i.e., enable users to inform their friends about upcoming events), and Video (i.e., allow users to share homemade videos with one another), and even Chess and games (i.e., allow users to play games against their friends). In addition, Facebook offers opportunities for businesses to advertise and set up Facebook Page and Platform to interact with customers, which can help them promote their products and get feedbacks from the customers. While emerging features may be attractions to Facebook adopters, learning new features and functions is a prerequisite for keeping up with Facebook. Thus, users' computer self-efficacy might be crucial for their adoption, use and continuance of Facebook. It is reported that there has been a drop in Facebook visitors since December 2007 (Varley 2008). Although the short lifespan of Facebook has been attributed to privacy concerns (Acquisti and Gross 2006), applications spamming (Perez 2007), and censorship issues, there are few empirical studies that assess users' experience and identify factors influencing their continuance intention.

To summarize, our research objectives mainly include three aspects. Firstly, we want to examine the relationship between general CSE and specific CSE in Facebook. Secondly, we want to evaluate their effects on Facebook users' continuance intention. Technology acceptance model (TAM), extended by integrating two affective factors, is utilized as the framework to understand the decision process of Facebook continuance. Furthermore, we want to identify the antecedents of both general and specific self-efficacy in Facebook.

Theoretical Background

Computer Self-Efficacy

Derived from the broader construct of self-efficacy, computer self-efficacy (CSE) is rooted in the widely accepted model of individual behaviour: Social Cognitive Theory (SCT, Bandura 1977, 1982, 1986). SCT explains human behaviour from the perspective of a continual reciprocity among behavioural, cognitive, and environmental determinants. As a key element in social learning theory, self-efficacy (SE) refers to an individual's belief in his or her capability to perform a specific task. Central to Bandura's notion of self-efficacy is the idea that this personal judgment is a major basis of action. He suggested three outcomes of self-efficacy that can predict changes in people's behaviours: choice behaviour, effort expenditure and persistence, and thought patterns and emotional reactions or arousal. In addition, it is suggested that the measurement of self-efficacy should be tailored to the specific domain of interest to maximize the power to predict people's ability (Bandura 1986).

Bandura postulates that self-efficacy beliefs are developed though four primary sources of information: "enactive experience that serves as indicators of capability; vicarious experience that alters efficacy beliefs through transmission of competence and comparisons with attainment of others; verbal persuasion and allied types of social influence that one possesses certain capabilities; and psychological and affective states from which people judge their capableness, strength and vulnerability to dysfunction" (Bandura 1997, p. 79).

Applying this notion to information technology domain, Compeau and Higgins (1995a) defined CSE as a personal judgment of one's capability to use a computer to accomplish a particular job or task. Originally conceptualized at the task-specific level, CSE was later suggested to be far more complex. According to Marakas et al. (1998), CSE is a multi-level construct operating at two distinct levels: at the general computing level (general CSE) and at the specific application level (application-specific self-efficacy). General CSE is defined as an individual's judgment of efficacy across multiple computer domains and application-specific self-efficacy is defined as an individual's perception of efficacy in using a specific application or system within the domain of general computing. In CSE literature, some early studies investigated CSE at a general level (e.g., Taylor and Todd 1995; Whitley 1997). Recent studies mainly focused on CSE at application-specific level, such as word processing, spreadsheet (Agarwal et al. 2000), software packages (Venkatesh 2000), and web-based application system (Yi and Hwang 2003).

CSE has been utilized by IS researchers to provide additional insights into the determinants of IS acceptance behaviours. It is expected that an individual who has a strong sense of his or her capability in dealing with a system is more willing to accept and use the system. This speculation has been tested and verified by many researchers, but the ways that CSE influence user intentions and actual use have been proposed differently across studies. Some found that CSE directly determined IS use (Compeau and Higgins 1995a, 1995b) or behavioural intentions to adopt IS (Hill et al. 1987). Others showed that CSE indirectly influenced user intentions through mediating variables such as perceived behavioural control (Taylor and Todd 1995), perceived ease of use (Agarwal et al. 2000; Venkatesh 2000; Yi and Hwang 2003), affect (Compeau and Higgins 1995a, 1995b) or playfulness (Webster and Martocchio 1992). In particular, CSE has been validated as an external factor to technology acceptance model (TAM), a widely-accepted framework to understand users' IT acceptance processes. According to a meta-analysis of TAM (King and He 2006), TAM has experienced four major categories of modifications since its formation, one of which is the inclusion of external variables (prior factors), such as computer self-efficacy.

Extended TAM for IS Continuance

Although TAM was originally developed to predict users' initial adoption of a new IT, researchers have advocated that TAM can extend its application to the understanding of users' continuance usage intention and behaviour (Hong et al. 2006). With the assumption that continuance usage is an extension of adoption, TAM was applied to examine continuance adoption intentions after people had already adopted and were using the IT (e.g., Davis 1989; Karahanna et al. 1999; Konana and Balasubramanian 2005; Taylor and Todd 1995), and it showed its potential to predict users' continuance usage. A comparison between TAM and other IS continuance models by Hong et al. (2006) found that TAM even accounted for more variance in user intention to continue IT usage than the Expectation-Confirmation Model of continued IT usage (ECM-IT) (TAM: 63%; ECM-IT: 50%).

In this study of Facebook continuance, TAM is utilized as a theoretical framework. Besides its merit of parsimony, predictive power, as well as general applicability across different technologies and user contexts (Mathieson 1991), we would also take advantage of its flexibility. Specifically, TAM is flexible to allow other factors, such as emotional factors or external variables, to be easily integrated into the basic framework to better explain users' decision processes. Computer self-efficacy, as discussed previously, is a salient external variable that influences the two basic beliefs in TAM. Furthermore, researchers have called for the inclusion of affect into TAM to improve its predictability when applied to consumer contexts. Several emotional factors have been studied. Among them are perceived enjoyment, anxiety, playfulness, pleasure, and arousal (Davis et al. 1992; Fang et al. 2005; Hong et al. 2006; Kim et al. 2007; Van der Heijden 2004). In this study, we adopt *pleasure* and *arousal* to capture the affective bases for using Facebook, because they reflect two basic dimensions of affect (see Circumplex Model of Affect, Russell 1980), while other constructs from previous IS research can be mapped to the Circumplex Model. Pleasure refers to the degree to which a user feels good or happy with the target object, and arousal refers to the degree to which a user feels excited, stimulated or active (Russell 1980). Therefore, (computer) anxiety, for instance, can be mapped onto the quadrant characterized by unpleasantness and arousal (Kim et al. 2007). And enjoyment can be mapped onto the quadrant characterized by arousal and pleasantness (Russell 1980; Reisenzein 1994). Furtherrmore, using pleasure and arousal as primary components of affect is consistent with Kim et al.'s (2007) balanced thinking-feelings model, which has been validated as a useful model to predict the continuance of Mobile Internet.

To summarize, the extended TAM posits that predictors of continuance intention are constituted of both cognitive and affective components. Cognitive components are represented by the two basic beliefs — perceived usefulness (PU) and perceived ease of use (PEOU), while affective components are represented by two basic emotional states — pleasure and arousal. The organization of cognition and affect in a system reflects the individual's total experience (Mischel and Shoda 2000). With cognitive and affective determinants, we hope to capture the decision process of Facebook users' continuance intention.

Hypothesis Development

General CSE and Specific CSE in Facebook

Research has been conducted to understand the relationship between general CSE and application-specific CSE. Marakas et al. (1998) treated general CSE as a collection of all specific CSE accumulated over time. Specifically, the formation of specific CSE estimation and its associated enactive experience can contribute to the formation of the next subsequent specific CSE estimation. Each specific CSE contributes to the formation of a perception of general CSE (Marakas et al. 1998). Other researchers suggested that general CSE beliefs would strongly predict subsequent application-specific CSE beliefs. For example, Gist et al. (1989) found empirical evidence of a relationship between pre-training general CSE and the software-specific self-efficacy developed through training. It was later confirmed by Agarwal et al. (2000) that initial general CSE strongly predicted Windows 95 CSE and Lotus 123 CSE.

In our context, specific CSE in Facebook refers to an individual's perception of efficacy in performing major tasks in Facebook, including editing (e.g., editing profiles, adding new features), electronic communication (e.g., adding and deleting friends, inviting new friends, sending and replying messages), photo manipulation (e.g., uploading photos, creating photo album, sharing photos) and music manipulation (e.g., adding music player, editing a music playlist, sharing music). Our focus is on how initial general CSE impacts subsequent CSE in Facebook. Consistent with prior studies (Agarwal et al. 2000; Gist et al. 1989), we expect that people with a higher level of general CSE would have higher CSE in Facebook. Therefore, we have the following hypothesis:

H1: General computer self-efficacy is positively related to specific computer self-efficacy in Facebook.

Antecedents of Computer Self-Efficacy

Previous research has identified several antecedents of CSE, which may fall into two main categories. One category is social influence factors, such as encouragement by others (Compeau and Higgins 1995b) and management support (Henry and Stone 1994; Igbaria and Iivari 1995). The second category is demographic variables, such as computer experience (Henry and Stone 1994; Igbaria and Iivari 1995), prior performance (Compeau and Higgins

1995a) and gender (Busch 1995; Harrison and Rainer 1992). This study focuses on prior experience, because experience is considered as the most salient source of efficacy information among the four sources of self-efficacy mentioned by Bandura (1997). According to Bandura (1997), experience gained through progressive trial (either success or failure) in a task domain can affect one's perception of ability in performing the task. Successful experiences build strong self-efficacy beliefs, whereas failed experiences weaken especially less-established self-efficacy beliefs. A higher level of enactive experience leads to higher CSE beliefs (Compeau et al. 2006). Therefore, we choose to study the influence of experience on CSE. We distinguish general experience with computers from experience with Facebook. There are two reasons. Firstly, Facebook, as well as other social networking sites, was launched in recent years, so even experienced computer users may not be involved for a long time. Secondly, this is in line with the distinction of general CSE and specific CSE. Experience with computers/Facebook refers to how much a person is involved in or exposed to computers /Facebook. Although the predictive power of experience on CSE and Facebook has been established, prior research has seldom differentiated the level of the prediction. Since self-efficacy judgment is idiosyncratic to particular domains (Bandura 1977), and Facebook is a relatively new system, we expect that CSE in Facebook would be more accurately predicted by the experience with Facebook rather than general experience with computers. Hence, we have the following hypotheses:

H2: Experience with computers is positively related to general computer self-efficacy.

H3: Experience with Facebook is positively related to specific computer self-efficacy in Facebook.

Influence of Computer Self-Efficacy on Cognition

Cognition means the mental process of knowing, including aspects such as perception, reasoning, and judgment (Kim et al. 2007). In this study, we treat perceived ease of use and perceived usefulness as two cognitive factors because they are two types of perception by people. Perceived ease of use refers to the degree to which a person believes that using Facebook would be free of effort (Davis 1989). People generally perceive a technology to require less effort to use when they gain more knowledge and confidence through direct experience with the technology. Prior research on user acceptance of technology has validated general CSE as an anchor for the subsequent development of ease of use perceptions (Venkatesh and Davis 1996). Recent studies also provide support for positive relationship between application-specific CSE and ease of use (Venkatesh 2000; Yi and Hwang 2003).

Furthermore, Agarwal et al. (2000) proposed a model with both general CSE and specific CSE as antecedents to ease of use. They found a stronger relationship between specific CSE and ease of use (beta=0.43) than between general CSE and ease of use (beta=0.20), empirically suggesting a more direct and powerful effect of application-specific CSE on the ease of use perception. It indicates that users regard a system easier to use when their conviction in their self-efficacy regarding the target system is higher, and application-specific CSE is a more powerful and direct determinant of ease of use than is general CSE. We want to examine this difference in this study. Therefore, we hypothesize:

H4: General computer self-efficacy is positively related to perceived ease of use of Facebook.

H5: Specific computer self-efficacy in Facebook is positively related to perceived ease of use of Facebook.

H6: Specific computer self-efficacy in Facebook has stronger influence on perceived ease of use of Facebook than general computer self-efficacy does.

Perceived usefulness in this study refers to the degree to which one believes that using Facebook would be advantageous to achieve some objectives (i.e., developing or maintaining social networks). Compeau et al. (1999) suggested that CSE influenced outcome expectations, which is a construct similar to perceived usefulness. The more individuals are confident in their abilities to master or use a technology, the more they will perceive the usefulness of such a technology. In a recent study on mobile devices, Lee et al. (2002) found that self-efficacy in mobile Internet influenced perceived usefulness and played a critical role in the acceptance of the technology. Therefore, we predict that both general CSE and specific CSE in Facebook would influence perceived usefulness of Facebook.

H7: General computer self-efficacy is positively related to perceived usefulness of Facebook.

H8: Specific computer self-efficacy in Facebook is positively related to perceived usefulness of Facebook.

Influence of Computer Self-Efficacy on Affect

Pleasure and arousal are two emotional factors that represent affect generated from interaction with Facebook. In this context, pleasure refers to the degree to which using Facebook makes a user feel good or happy. Arousal refers to the degree to which a user feels excited, stimulated or active through using Facebook.

Studies in psychology suggest that self-efficacy judgements have substantial influence on the emotional responses of the individual. Individuals tend to prefer and enjoy behaviours they feel they are capable of performing and to dislike those they do not feel they can successfully master (e.g., Betz and Hackett 1981; Bandura 1977). This effect has been confirmed by research on CSE. Compeau and Higgins (1995a) posited and found that CSE positively influenced affect (i.e., similar to liking) and negatively influenced computer anxiety. In addition, Webster and Martocchio (1992) found that microcomputer self-efficacy was a precursor of playfulness (i.e., a trait positively associated with positive mood). This can be explained by the theory of primary flow, which suggests that skills lead individuals to engage in an activity in a more enjoyable state (Csikszentmihalyi 1975; Hoffman and Novak 1996).

Arousal can also be influenced by self-efficacy because individuals are more likely to be positively aroused (i.e., excited, enthusiastic) when they feel that they have related skills or are capable of performing a specific task (Kulviwat et al. 2005). For example, Bandura (1977) and Henry and Stone (1994) found that self-competence was positively related to susceptibility to self-arousal. Similarly, Gist and Mitchell (1992) suggested that efficacy in mastering challenges generated greater interest and arousal.

Therefore, we expect that CSE, regardless of general computing level or application-specific level, would contribute to pleasure and arousal generated from the use of Facebook.

H9: General computer self-efficacy is positively related to pleasure generated from the use of Facebook.

H10: Specific computer self-efficacy in Facebook is positively related to pleasure generated from the use of Facebook.

H11: General computer self-efficacy is positively related to arousal generated from the use of Facebook.

H12: Specific computer self-efficacy in Facebook is positively related to arousal generated from the use of Facebook.

Cognition and Affect as Antecedents of Continuance Intention

Perceived usefulness is consistently a strong predictor of user intention over time in previous adoption research (Davis et al. 1989; Venkatesh et al. 2003; Thong et al. 2006). We expect that the positive relationship between perceived usefulness and continuance intention would hold in the Facebook context. The rational is that "if an individual believes that continuing to use a technology would help in attaining certain goals, he would have the intention to carry on using it" (Kim et al. 2007, pp. 518). Although there is an argument that ease of use may play a less critical role in deciding continuance usage (Davis et al. 1989), recent studies have suggested that the impact of perceived ease of use on continuance usage intention was significant and may be even stronger than perceived usefulness (Roca et al. 2006; Thong et al. 2006). According to Thong et al. (2006), if the technology inherently requires users to undergo a long and continuous learning process, perceived ease of use may not remain as a secondary factor in the post-adoption stage. As discussed previously, Facebook does keep evolving and changing, so even after the initial adoption, users need to adapt to new features, interfaces and upgrades by learning. Hence, it is plausible that ease of use would affect the continuance intention of Facebook. Furthermore, we expect that the positive relationship between ease of use and usefulness, which is posted in TAM, holds for this context. Therefore, the following hypotheses are proposed:

H13: Perceived usefulness of Facebook is positively related to continuance intention of Facebook.

H14: Perceived ease of use of Facebook is positively related to continuance intention of Facebook.

*H15: Perceived ease of use of Facebook is positively related to perceived usefulness of Facebook.*

Previous research (Lazarus 1991) suggested that feelings can be represented as a direct antecedent of behavioural intention. That is, emotional responses lead either to approach or avoidance behavioural intention. Findings from consumer behaviour literature showed that pleasure and arousal significantly predicted intended shopping behaviour

(Donovan and Rossiter 1982). In IS research, Kim et al. (2007) proposed that pleasure and arousal predicted consumers' continuance intention of M-internet service, and they found pleasure to be significant. Extending the above relationships to the Facebook context, we hypothesize:

H16: Pleasure generated from the use of Facebook is positively related to continuance intention of Facebook.

H17: Arousal generated from the use of Facebook is positively related to continuance intention of Facebook.

The complete research model is presented as Figure 1.

Figure 1. The Research Model
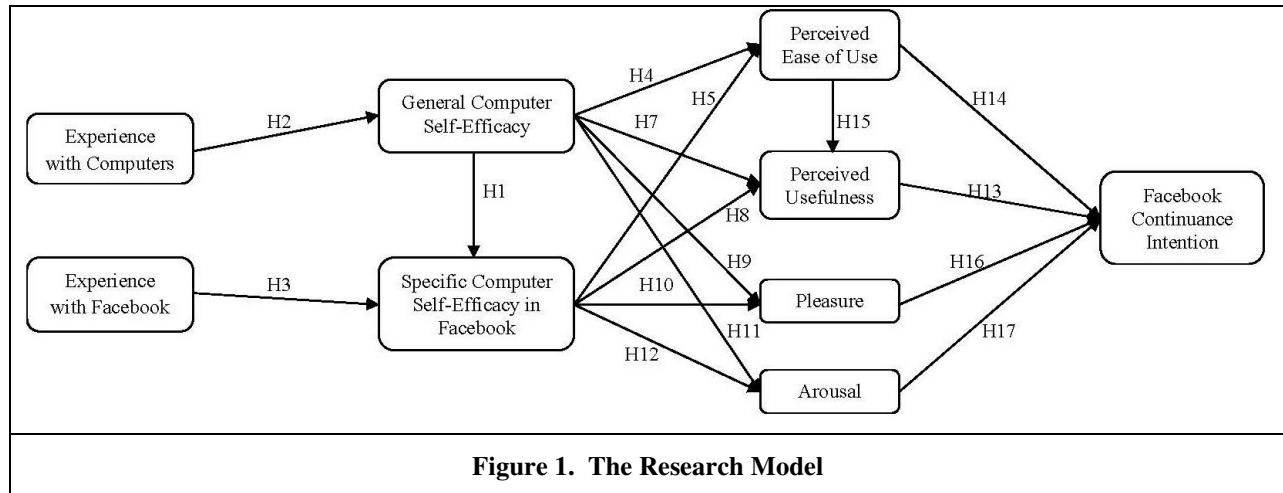
Research Methodology

Consistent with prior research on CSE and IT users' continuance behaviour (e.g., Agarwal et al. 2000; Hong et al. 2006; Kim et al. 2007), a survey was employed for data collection. Instrument development and survey administration are discussed in the following sections.

Instrument Development

Most instruments were adapted from previous research. *Experience with computers* and *experience with Facebook*, are operationalized as formative constructs, with items adapted from Henry and Stone (1995). Questions are concerning the length of time using computers/Facebook, hours per week using computers/Facebook, and the amount of experience with computers/Facebook.

Items for *general CSE* were adapted from Marakas et al. (2007). Instrument for *specific CSE in Facebook* was created following the framework for constructing CSE measuring instruments (Marakas et al. 1998) and the guide for creating self-efficacy scales (Bandura 2006). *Specific CSE in Facebook* was treated as a second-order construct which had multidimensional entities (Bagozzi 1985, 1988) — *CSE for editing in Facebook*, *CSE for electronic communication in Facebook*, *CSE for photo manipulation in Facebook*, and *CSE for music manipulation in Facebook*. Each of the four types of specific CSE was measured by three questions. To formulate the higher-order formative construct *specific CSE in Facebook,* the molar approach was used (Chin and Gopal 1995). An example of this approach is molar attitude (Bagozzi 1985), a global or macro presentation of a person's affective response to an object or action. A molar construct represents an emergent construct that is formed from the first-order factors (Chin and Gopal 1995). Hence, the second-order formative construct *specific CSE in Facebook* was formed from the individual specific CSE judgments into a single summary representation, using PLS.

Instruments for the consequences of CSE were adapted from previous studies to fit the Facebook context. Specifically, items for *perceived ease of use* and *perceived usefulness* were adapted from Davis (1989) and Parthasarathy and Bhattacherjee (1998), items for *pleasure* were adapted from Holbrook et al. (1984), items for *arousal* were adapted from Holbrook et al. (1984), and items for *Facebook continuance intention* were adapted from Bhattacherjee (2001). They have all been validated in their respective studies.

The questionnaire is shown in Appendix A. Items for pleasure and arousal were rated with 7-point semantic differential scales. Most of the other items were rated with 7-point Likert (1932) scales. Questions about respondent characteristics were also included in the questionnaire.

We carried out conceptual validation of constructs in three stages. First, we distributed the survey instrument to a number of information systems faculties and postgraduate students to assess if adequate items have been generated to cover the domain of the constructs. Second, we discussed the survey instrument with some undergraduate students to ensure that the questions generated make sense to potential respondents. Third, we carried out a similar sorting procedure as used by Moore and Benbasat (1991) for all the theoretical constructs. The sorting results were good. These steps ensured a high content validity and conceptual validity of the constructs.

Survey Administration

Subjects were recruited from undergraduate students from non-computing faculties in a large university. Students from computing-related faculties were excluded, because they tend to have a higher level of computing knowledge than an average student, which would result in difficulty in differentiating CSE scores. Student volunteers were paid about US$4 each for their participation. The questionnaire took about 15 minutes to complete. 111 students completed the questionnaire. One response was discarded due to missing data. The remaining 110 responses were kept for data analysis. 59.1% of respondents were third year students, and first, second and fourth year students took up 10.9%, 13.6% and 16.4% respectively. The numbers of female and male respondents were 83 and 27. This was not unexpected. According to recent statistics about Facebook users, females users are up to 71.4% in the country where the study was conducted, compared to 63.9% worldwide (Arrington 2007).

Data Analysis

SmartPLS 2.0, developed by Ringle et al. (2005), was used to analyze the data. Partial Least Squares (PLS) was preferred for two reasons. Firstly, it does not require data to follow a strict normal distribution (Fornell and Cha 1994) and can deal with non-interval scales. Second, it makes minimal demands in terms of sample size to validate a model compared with alternative structural equation modelling. Following the two-stage analytical procedures (Anderson and Gerbing 1991), confirmatory factor analysis was first conducted to assess the measurement model. Then the structural model was examined.

Measurement Model

To validate our measurement model, three types of validity were assessed for the constructs with interval scales: content validity, convergent validity, and discriminant validity. Content validity was adequately assessed through extensive literature review, conceptual validation, and discussion with faculty members and doctoral students. Convergent validity was assessed by examining composite reliability (CR), item loadings and average variance extracted (AVE) from the measures (Hair et al. 2006). As shown in Table 1, CR values range from 0.79 to 0.93, which are higher than the recommended value of 0.7 (Chin 1998). AVE values range from 0.53 to 0.92, which are above the acceptable value of 0.5 (Fornell and Larcker 1981). In addition, all the item loadings are significant at the level of 0.01 (see Table 3). Finally, discriminant validity was verified by examining the square root of the AVE as recommended by Fornell and Larcker (1981). The results shown in Table 2 confirm discriminant validity: the square root of the AVE for each construct is greater than the levels of the correlations involving the construct. Results of the inter-construct correlations in Table 3 also show that each construct shares larger variance with its own measures than with other measures. In addition, internal consistency reliability was also assessed by computing Cronbach's alphas. All the constructs except CED has Cronbach's alpha larger than the guideline of at least 0.70 (Nunnally and Bernstein 1994). This shows high internal consistency reliability in the measurement model.

Structural Model

With adequate psychometric properties in the measurement model, we examined the structural model. Path coefficients and the R squares for each dependent variable are shown in Figure 2. A summary of hypothesis testing is presented in Table 4.

H1 was supported, as general CSE was positively related to specific CSE in Facebook (p<.01). Experience with computers and experience with Facebook significantly predicted general CSE and CSE in Facebook, respectively. Hence, H2 and H3 were supported.

The predictions about the effect of general CSE and specific CSE in Facebook on cognition were largely supported. Significant results were obtained for H7 and H8, which added evidence to the argument that self-efficacy judgments at both general and application-specific level lead to the usefulness perception of the systems. General CSE did not turn out as a significant predictor of PEOU (p=.095), but specific CSE did (p<.01). Hence, H4 was not supported and H5 was supported. The insignificant effect from general CSE is not unexpected, because prior study has shown that the effect of general CSE on ease of use is less prominent compared with that of application-specific CSE (Agarwal et al. 2000; Yi and Hwang 2003). This can be seen as evidence that application-specific CSE is a more powerful, direct determinant of ease of use than is general CSE. Thus, H6 was supported.

Regarding the effect of CSE on pleasure and arousal, H9 was supported, while H10, H11 and H12 were not supported. As predicted, pleasure was determined by CSE, but only at the general level (p<.01). The effect of specific CSE on pleasure was not significant (p=.095). In addition, the relationships between two levels of CSE and arousal were not significant (p=.088, and p=.099).

Furthermore, most of the predictions from the four antecedents of continuance intention were supported. Consistent with previous TAM studies, the two basic beliefs—PU and PEOU—significantly predicted Facebook continuance intention (both p<.01). Surprisingly, the path from PEOU to PU was not supported (p=.353). The two emotional states, pleasure and arousal, contributed to subjects' Facebook continuance intention, with pleasure marginally significant (p=.059) and arousal significant (p<.01).

Table 1. Cronbach's alpha, Composite Reliability and AVE

	GCSE	CED	CEC	CPM	CMM	FBCI	PEOU	PU	PLE	ARS
Cronbach's alpha	0.82	0.60	0.71	0.87	0.96	0.88	0.83	0.77	0.72	0.73
CR	0.87	0.79	0.84	0.92	0.97	0.93	0.90	0.87	0.83	0.84
AVE	0.53	0.57	0.64	0.80	0.92	0.82	0.74	0.68	0.62	0.64

Note: GCSE – General CSE; CED – CSE for Editing in Facebook; CEC – CSE for Electronic Communication in Facebook; CPM – CSE for Photo Manipulation in Facebook; CMM – CSE for Music Manipulation in Facebook; FBCI –Continuance Intention in Facebook; PEOU – Perceived ease of use; PU – Perceived usefulness; PLE – Pleasure; ARS – Arousal.

Table 2. Correlations between Constructs

	EXPC	EXPF	GCSE	CED	CEC	CPM	CMM	FBCI	PEOU	PU	PLE	ARS
EXPC	**N.A.**											
EXPF	0.27	**N.A.**										
GCSE	0.42	0.16	**0.73**									
CED	0.33	0.44	0.30	**0.76**								
CEC	0.23	0.29	0.10	0.37	**0.80**							
CPM	0.13	0.24	0.12	0.41	0.58	**0.89**						
CMM	0.11	0.25	0.33	0.32	0.26	0.44	**0.96**					
FBCI	0.09	0.25	0.07	0.21	0.29	0.28	0.24	**0.90**				
PEOU	0.24	0.46	0.24	0.51	0.36	0.42	0.27	0.28	**0.86**			
PU	0.25	0.17	0.39	0.19	0.12	0.16	0.28	0.43	0.19	**0.83**		
PLE	-0.02	0.13	0.18	0.09	0.05	0.09	0.17	0.30	0.24	0.36	**0.79**	
ARS	0.05	0.13	0.13	0.14	0.00	0.11	0.16	0.33	0.13	0.31	0.29	**0.80**

Note: EXPC – Experience with Computers; EXPF – Experience with Facebook.

Items	Correlations						Item Loading	
	GCSE	FBCI	PEOU	PU	PLE	ARS	Loading	T-value
GCSE1	**0.60**	0.08	0.06	0.19	0.07	0.11	0.60	9.26
GCSE2	**0.77**	0.18	0.19	0.46	0.16	-0.01	0.77	23.9
GCSE3	**0.86**	0.04	0.03	0.34	0.11	0.07	0.86	31.6
GCSE4	**0.66**	-0.04	0.15	0.16	0.03	0.12	0.66	14.6
GCSE5	**0.72**	-0.01	0.29	0.25	0.17	0.08	0.72	16.9
GCSE6	**0.74**	0.02	0.30	0.23	0.21	0.25	0.74	13.2
FBCI1	0.10	**0.96**	0.30	0.42	0.26	0.37	0.96	133
FBCI2	0.02	**0.94**	0.27	0.43	0.28	0.29	0.94	72.6
FBCI3	0.06	**0.80**	0.17	0.32	0.30	0.25	0.80	17.6
PEOU1	0.09	0.20	**0.79**	0.01	0.21	0.38	0.79	17.9
PEOU2	0.19	0.32	**0.89**	0.21	0.21	0.11	0.89	53.3
PEOU3	0.31	0.19	**0.90**	0.23	0.20	0.11	0.90	70.1
PU1	0.43	0.37	0.23	**0.87**	0.35	0.25	0.87	37.2
PU2	0.20	0.41	0.15	**0.88**	0.30	0.22	0.87	28.6
PU3	0.30	0.29	0.05	**0.73**	0.22	0.32	0.73	15.9
PLE1	0.15	0.32	0.22	0.35	**0.85**	0.38	0.85	15.6
PLE2	0.13	0.16	0.18	0.23	**0.76**	0.07	0.76	7.83
PLE3	0.14	0.19	0.14	0.22	**0.75**	0.11	0.75	6.11
ARS1	0.13	0.36	0.18	0.30	0.27	**0.90**	0.90	33.1
ARS2	0.07	0.19	0.00	0.20	0.19	**0.75**	0.75	7.89
ARS3	0.11	0.18	0.05	0.23	0.20	**0.74**	0.74	9.39

Table 3. Correlations between Items and Latent Variables

Note: * p < .05; ** p < .01; - - - -▶ means that the path is not significant at 0.05 level.

Figure 2. The Path Estimates and R Squares of the Model
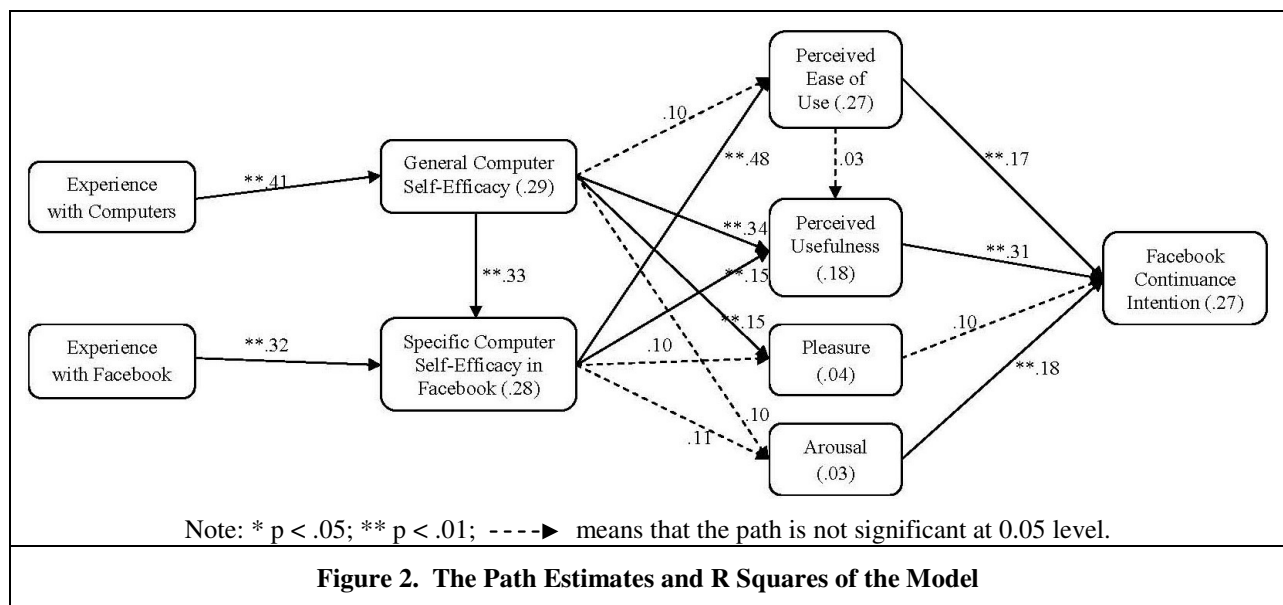
Table 4. Summary of Hypotheses Testing					
Hypotheses	**Path Estimate**	**Standard Error**	**t-value**	**Significance**	**Supported**
H1: GCSE → CSEF	0.334	0.053	6.341	<0.01	Yes
H2: EXPC → GCSE	0.407	0.051	7.990	<0.01	Yes
H3: EXPF → CSEF	0.319	0.057	5.618	<0.01	Yes
H4: GCSE → PEOU	0.101	0.077	1.318	0.095	No
H5: CSEF → PEOU	0.484	0.048	10.143	<0.01	Yes
H6: GCSE < CSEF	-	-	-	-	Yes
H7: GCSE → PU	0.338	0.092	3.654	<0.01	Yes
H8: CSEF → PU	0.147	0.047	3.118	<0.01	Yes
H9: GCSE → PLE	0.149	0.085	1.750	0.041	Yes
H10: CSEF → PLE	0.096	0.073	1.317	0.095	No
H11: GCSE → ARS	0.102	0.075	1.363	0.088	No
H12: CSEF → ARS	0.112	0.087	1.294	0.099	No
H13: PU → FBCI	0.308	0.072	4.305	<0.01	Yes
H14: PEOU → FBCI	0.170	0.057	2.971	<0.01	Yes
H15: PEOU → PU	0.033	0.087	0.378	0.353	No
H16: PLE → FBCI	0.101	0.064	1.574	0.059	Marginally
H17: ARS → FBCI	0.183	0.064	2.854	<0.01	Yes

Discussions

The objective of this study is to explore the relationship between the general CSE and specific CSE in Facebook, to examine their antecedents as well as to evaluate their influence on the continuance intention of Facebook. In the following sections, we would first discuss the findings from our empirical study. After that, we would discuss the limitations and implications for both research and practice. Opportunities for future research would also be explored.

Summary of Findings

Determinants of General and Specific Computer Self-Efficacy

This study confirms prior research on the general relationship between experience and CSE, and provides additional insights. We argued that predictions should be made at the corresponding level (general or application-specific level). The results confirmed that subjects with more computer experience were more confident in their ability to use computers in general, while subjects with more Facebook experience were more confident in their ability to use Facebook. Additional analysis was done by adding the cross-level paths from computer experience to specific CSE, and from Facebook experience to general CSE. The two original paths remained significant (beta=0.37, t=6.05; beta=0.31, t=4.73, respectively), while cross-predictions were not (beta=0.05, t=0.49; beta=0.11, t=1.25, respectively). Our findings add to the CSE literature by suggesting that predictions of relationship between experience and CSE should be made at the corresponding level.

Computer Self-Efficacy as an Important Antecedent of IS Continuance

General support was found that CSE was a determinant of perceived ease of use, perceived usefulness, and pleasure. However, for each of the construct, the roles of general CSE and specific CSE in Facebook were different. For ease of use, specific CSE is a more powerful, direct determinant than general CSE. This argument was suggested by prior

researchers (Agarwal et al. 2000; Yi and Hwang 2003), but not formally tested. It is now verified in this study. Perceived usefulness was influenced by both types of CSE, suggesting that if individuals were not confident in their abilities to using computers or Facebook, they may not perceive it as advantageous for developing and maintaining social networks. For pleasure, significant influence was only from general CSE.

CSE showed no significant effect on arousal. It seems to suggest that judgment of one's skills does not affect feelings of excitement with regard to the target system. A possible explanation for this unexpected result is that the Facebook features examined in our study (i.e., editing, electronic communication, photo manipulation, music manipulation) have been common to the subjects. Thus, subjects are not easily stimulated by these features; especially, they are college students exposed to various creative applications. Should the features be more challenging and innovative, or had the sample included more subjects with less Internet exposure, the hypothesized relationship might be supported.

Our results also validated the predictive power of extended TAM for Facebook continuance. Most cognitive and affective factors were significant predictors of Facebook continuance intention, with perceived usefulness as the strongest one. It added more evidence to the argument that research on users' IS adoption and continuance should consider both cognitive and affective bases (Kim et al. 2007; Thong et al. 2006;). In particular, this study provides evidence for the positive link from arousal to continuance intention, which failed to achieve a significance level in Kim et al. (2007). The non-significant relationship between perceived ease of use and perceived usefulness was unexpected. It might be due to the existence of CSE. The strong effect of general CSE and Facebook CSE on perceived usefulness may eliminate the contribution of perceived ease of use.

Distinct Role of General CSE and Specific CSE

A very salient finding of this study is that general CSE and specific CSE are related but distinct constructs. On one hand, they have close association. General CSE strongly predicts specific CSE in Facebook, which is consistent with prior studies (Agarwal et al. 2000; Gist et al. 1989). On the other hand, they are different in terms of antecedents and consequences. As discussed previously, individual characteristics like prior experience influenced general CSE and specific CSE in different ways, and the two types of CSE played a distinct role in formulating subjects' perception and feeling about the use of Facebook.

Limitations of the Study

Before discussing the contribution of this study, we acknowledge some limitations. The first limitation is the use of cross-sectional data to test causality. For example, we postulated that specific CSE is a predictor of perceived ease of use. However, the data for both constructs were collected at the same point in time, although such a concurrent measurement was consistent with prior studies that examined the identical relationship (e.g., Agarwal et al. 2000; Yi and Hwang 2003). Since a model that integrates general and specific CSE as well as cognitive and affective determinants of continuance intention is new, cross-sectional study is appropriate to explore the relationships. Future research in this area can employ a longitudinal design to investigate the directions of causality. Secondly, the use of student subjects may limit the generalizability of the results. College students were chosen as the target population in this study, because Facebook has been hugely popular among college students since its inception in 2004, and statistics shows that 52% of Facebook user are 18-25 years old (MacManus 2007). Nevertheless, caution should be taken when generalizing the results to other individuals. Thirdly, the sample size may be relatively small, considering the number of constructs in the model. Future research with a larger sample size can be done to further verify our findings.

Research and Practical Implications

This study has contributions to both research and practice. Firstly, we contribute to the CSE literature by examining the relationship between general CSE and specific CSE in the context of Facebook. In their recent work, Marakas et al. (2007) suggested that no empirical evidence has yet appeared in the literature to establish the true relationship between general CSE and specific CSE. This study, using Facebook as the context, serves to empirically test this relationship. The distinct role of general CSE and specific CSE in Facebook, supported by the results, not only verify posits of previous researchers, but also identify some potential topics for future studies.

This paper also contributes to research methodology by creating and validating measures for the construct *Specific CSE in Facebook*. Significant efforts have been put into developing the instrument with adequate validity. The significant results for most hypotheses suggest adequate predictive validity and construct validity of the measurement. The measures may be considered for future studies on CSE in Facebook and other applications.

Thirdly, this study contribute to adoption research by integrating two types of CSE with the balanced thinking-feelings model for IS continuance (Kim et al. 2007). Although CSE has been identified as an external variable to TAM (King and He 2006; Yi and Hwang 2003), few studies have distinguished the effects of general and specific CSE on adoption behaviour. Our findings provide rich information about how each type of CSE influences users' cognition and affect about using Facebook. In addition, we also examined how these factors subsequently lead to continuance intention of Facebook. This is also a new area in IS research.

Furthermore, interesting findings of this study provide cues for further research. For example, due to the non-significant relationship between perceived ease of use and perceived usefulness, future studies can be conducted to investigate the relationship between perceived ease of use, CSE (general and specific), and perceived usefulness. The impact of CSE on pleasure and arousal is another topic worthy to be re-examined in the future. Although some paths to/from the emotional factors were not significant, the p values are quite low (<0.10). A bigger sample may lead to significant findings.

In terms of practice, this study has implications for software vendors and platform providers of social network sites like Facebook. In order to keep consumers using their applications or systems, it is critical to show the advantages of the system as well as the good feeling generated from using the system. In addition, a user-friendly interface is indispensible.

In current social network sites, new functions and features are launched from time to time. Results of our study point out that greater functionality may not necessarily lead to wider use, if consumers do not believe that they have the ability or skills to use the functions. Moreover, there might be some consumers that have the requisite abilities but are not confident to apply them. In this case, communication to consumers should emphasize on how straightforward the feature is to use. Good examples are advertisements with words "just one click", or "everyone can do it".

As users' experience with the system contributes to their CSE judgment, vendors of new functions should try to get consumers exposed to the new features. Effective ways can be providing demos or interactive trials on the website. Furthermore, to encourage the use of new features in Facebook, vendors may target individuals who exhibit greater general CSE. The reason is that general CSE may help to build on consumers' confidence in their ability to use the new functions.

Conclusion

By empirically testing the role of CSE in Facebook users' continuance processes, this study found that the two levels of CSE — general CSE and specific CSE in Facebook — were related but distinct constructs. Facebook-specific CSE was determined by initial general CSE. Both of them were determined by individual prior experience, but the influences were different. Specifically, general experience with computers only predicted general CSE, while experience with Facebook only predicted Facebook-specific CSE. Furthermore, both levels of CSE played important roles in affecting users' continuance of Facebook, through the mediation of thinking and feelings. Thinking included perceived usefulness and perceived ease of use, and feelings mainly included pleasure. The effects of general CSE and Facebook-specific CSE were not identical. General CSE significantly influenced perceived usefulness and perceived ease of use, while Facebook-specific CSE significantly influenced perceived ease of use and pleasure. Our findings are an important contribution to the better understanding of continuance intention.

Appendix A - Instrument for Constructs

Experience with Computers
EXPC1 How long have you been using computers? _____ years and _____ months.
EXPC2 How many hours per week do you use computers on average? _____ hours.
EXPC3 How much experience do you have with computers? (None – Extensive)

Experience with Facebook
EXPF1   How long have you been using Facebook? _____ years and _____ months.
EXPF2   How many hours per week do you spend on Facebook on average? _____ hours.
EXPF3   How much experience do you have with Facebook? (None – Extensive)

General Computer Self-Efficacy
GCSE1   I believe I have the ability to describe how a computer works.
GCSE2   I believe I have the ability to install new software applications on a computer.
GCSE3   I believe I have the ability to identify and correct common operational problems with a computer.
GCSE4   I believe I have the ability to unpack and set up a new computer.
GCSE5   I believe I have the ability to remove information from a computer that I no longer need.
GCSE6   I believe I have the ability to use a computer to display or present information in a desired manner.

Computer Self-Efficacy for Editing in Facebook
CED1   I believe I have the ability to edit profiles in Facebook.
CED2   I believe I have the ability to add new applications (e.g., Super Wall, MyGifts) in Facebook.
CED3   I believe I have the ability to change the background of my home page in Facebook.

Computer Self-Efficacy for Electronic Communication in Facebook
CEC1   I believe I have the ability to add and delete friends in Facebook.
CEC2   I believe I have the ability to invite new friends to Facebook.
CEC3   I believe I have the ability to send and reply messages in Facebook.

Computer Self-Efficacy for Photo Manipulation in Facebook
CPM1   I believe I have the ability to upload photos in Facebook.
CPM2   I believe I have the ability to create a new photo album to Facebook.
CPM3   I believe I have the ability to share others' photos in Facebook.

Computer Self-Efficacy for Music Manipulation in Facebook
CMM1   I believe I have the ability to add a music player in Facebook.
CMM2   I believe I have the ability to edit a music playlist to Facebook.
CMM3   I believe I have the ability to share others' music in Facebook.

Facebook Continuance Intention
FBCI1   I intend to continue using Facebook over the next six months.
FBCI2   I expect to continue using Facebook over the next six months.
FBCI3   I would like to discontinue my use of Facebook.

Perceived Ease of Use
PEOU1 Learning to use Facebook is easy for me.
PEOU2 My interaction with Facebook is clear and understandable.
PEOU3 It is easy for me to become skillful at using Facebook.

Perceived Usefulness
PU1   Using Facebook enables me to find my friends more quickly.
PU2   Using Facebook makes it easier to keep in touch with my friends.
PU3   Using Facebook saves me time and effort in keeping in touch with my friends.

Pleasure
Using Facebook makes me feel …
PLE1   Unhappy – Happy
PLE2   Annoyed – Pleased
PLE3   Unsatisfied – Satisfied

Arousal
Using Facebook makes me feel …
ARS1   Calm – Excited
ARS2   Relaxed – Stimulated
ARS3   Unaroused – Aroused

References

Acquisti, A. and Gross, R. "Imagined Communities: Awareness, Information Sharing, and Privacy on the Facebook", in *Privacy Enhancing Technologies*, Springer Berlin, Heidelberg, 2006, pp. 36-58.

Agarwal, R., Sambamurthy, V., and Stair, R. M. "The Evolving Relationship between General and Specific Computer Self-Efficacy – an Empirical Assessment," *Information Systems Research* (11:4), 2000, pp. 418-430.

Anderson, J. C. and Gerbing, D. W. "Predicting the Performance of Measures in a Confirmatory Factor Analysis with a Pretest Assessment of Their Substantive Validities," *Journal of Applied Psychology* (76:5), 1991, pp. 732-740.

Arrington, M. "Facebook is Almost 2/3 Women (and other stats)", November 21, 2007, accessed January 2008, from http://www.techcrunch.com/2007/11/21/facebook-is-almost-23-women-and-other-stats/.

Bagozzi, R. P. "Expectancy-Value Attitude Models: An Analysis of Critical Theoretical Issues," *International Journal of Research Marketing* (2), 1985, pp. 43-60.

Bagozzi, R. P. "The Rebirth of Attitude Research in Marketing," *Journal of the Market Research Society* (30:2), 1988, pp. 163-195.

Bandura, A. "Self-Efficacy: Toward a Unifying Theory of Behavioural Change," *Psychological Review* (84:2), 1977, pp. 191-215.

Bandura, A. "Self-Efficacy Mechanism in Human Agency," *American Psychologist*, *37*, 1982, pp. 122-147.

Bandura, A. *Social Foundations of Thought and Actions*, Prentice Hall, Englewood Cliffs, New Jersey, 1986.

Bandura, A. *Self-Efficacy: The Exercise of Control*, W. H. Freeman, New York, 1997.

Bandura, A. "Guide for Creating Self-Efficacy Scales", in *Self-Efficacy Beliefs of Adolescents*, Pajares, F., and Urdan, T. (Eds.), Information Age Publishing, Greenwich, Connecticut, 2006, pp. 307-338.

Barling, J. and Beattie, R. "Self-Efficacy Beliefs and Sales Performance," *Journal of Organizational Behavior Management* (5:1), 1983, pp. 41-51.

Betz, N. E. and Gail, Hackett, "The Relationship of Career-Related Self-Efficacy Expectations to Perceived Career Options in College Women and Men," *Journal of Counseling Psychology* (28:5), 1981, pp. 399-410.

Bhattacherjee, A. "Understanding Information Systems Continuance: An Expectation-Confirmation Model," *MIS Quarterly* (25:3), 2001, pp. 351-370.

Burkhardt, M. E. and Brass, D. J. "Changing Patterns or Patterns of Change: The Effects of a Change in Technology on Social Network Structure and Power," *Administrative Science Quarterly* (35:1), 1990, pp. 104-127.

Busch, T. "Gender Differences in Self-Efficacy and Attitudes toward Computers," *Journal of Educational Computing Research* (12:2), 1995, pp. 147-158.

Chin, W. W. and Gopal, A. "Adoption Intention in GSS: Relative Importance of Beliefs," *The Data Base for Advances in Information Systems* (26:2/3), 1995, pp. 42-64.

Chin, W. W. (1998). "The Partial Least Squares Approach to Structural Equation Modelling", in *Modern Methods for Business Research*, Marcoulides, G. A. (Ed.), Lawrence Erlbaum, Mahwah, New Jersey, 1998, pp. 295-396.

Compeau, D., Gravill, J., Haggerty, N., and Kelley, H. "Computer Self-Efficacy: A Review," in *Human-Computer Interaction and Management Information Systems: Foundations*, Zhang, P. and Galletta, D. (Eds.), M.E. Sharpe, Armonk, New York, 2006, pp. 225-261.

Compeau, D. R. and Higgins, C. A. "Computer Self-Efficacy: Development of a Measure and Initial Test," *MIS Quarterly* (19:2), 1995a, pp. 189-211.

Compeau, D. R. and Higgins, C. A. "Application of Social Cognitive Theory to Training for Computer Skills," *Information Systems Research* (6:2), 1995b, pp. 118-143.

Compeau, D. R., Higgins, C. A., and Huff, S. "Social Cognitive Theory and Individual Reactions to Computing Technology: A Longitudinal Study," *MIS Quarterly* (23:2), 1999, pp. 145-158.

Csikszentmihalyi, M. *Beyond Boredom and Anxiety*, Jossey-Bass, San Francisco, California, 1975.

Davis, F. D. "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly* (13:3), 1989, pp. 319-340.

Davis, F. D., Bagozzi, R. P., and Warshaw, P. R. "User Acceptance of Computer Technology: A Comparison of Two Theoretical Models," *Management Science* (35:8), 1989, pp. 982-1002.

Davis, F. D., Bagozzi, R.P., and Warshaw, P.R. "Extrinsic and Intrinsic Motivation to Use Computers in the Workplace," *Journal of Applied Social Psychology* (22:14), 1992, pp.1111-1132.

Donovan, R. J. and Rossiter, J. R. "Store Atmosphere: An Environmental Psychology Approach," *Journal of Retailing* (58:1), 1982, pp. 34-57.

Dwyer, C. "Task Technology Fit, the Social Technical Gap, and Social Networking Sites", in *Proceedings of the Thirteenth Americas Conference on Information Systems*, Keystone, Colorado, 2007.

Fang, X. W., Chan, S., Brzezinski, J., and Xu, S. "Moderating Effects of Task Type on Wireless Technology Acceptance," *Journal of Management Information Systems* (22:3), 2005, pp. 123-157.

Fornell, C. and Cha, J. *Advanced Methods of Marketing Research*, Blackwell Business, Cambridge, Massachusetts, 1994.

Fornell, C. and Larcker, D. F. "Evaluating Structural Equation Models with Unobservable Variables and Measurement Errors," *Journal of Marketing Research* (18:1), 1981, pp. 39-50.

Gist, M. E. and Mitchell, T. R. "Self-Efficacy: A Theoretical Analysis of Its Determinants and Malleability," *Academy of Management Review* (17:2), 1992, pp. 183-211.

Gist, M. E., Schwoerer, C., and Rosen, B. "Effects of Alternative Training Methods on Self-Efficacy and Performance in Computer Software Training," *Journal of Applied Psychology* (74:6), 1989, pp. 884-891.

Hair, J. F., Anderson, R. E., Tatham, R. L., and Black, W. C. *Multivariate Data Analysis* (6th ed.), Pearson Prentice Hall, Upper Saddle River, New Jersey, 2006.

Harrison, A. W. and Rainer, R.K. Jr. "The Influence of Individual Differences on Skill in End-User Computing," *Journal of Management Information Systems* (9:1), 1992, pp. 93-111.

Henry, J. W. and Stone, R. W. "A Structural Equation Model of End-User Satisfaction with a Computer-Based Medical Information System," *Information Resources Management Journal* (7:3), 1994, pp. 21-33.

Henry, J. W. and Stone, R. W. "Computer Self-Efficacy and Outcome Expectancy: The Effects on the End-User's Job Satisfaction," *Computer Personnel* (16:4), 1995, pp. 15-34.

Hill, T., Smith, N. D., and Mann, M. F. "Role of Efficacy Expectations in Predicting the Decision to Use Advanced Technologies: The Case of Computers," *Journal of Applied Psychology* (72:2), 1987, pp. 307-313.

Hoffman, D. L. and Novak, T. P. "Marketing in Hypermedia Computer-Mediated Environments: Conceptual Foundations," *Journal of Marketing* (60:3), 1996, pp. 50-68.

Holbrook, M.B., Chestnut, R.W., Oliva, T.A., and Greenleaf, E.A. "Play as a Consumption Experience: The Roles of Emotions, Performance, and Personality in the Enjoyment of Games," *Journal of Consumer Research* (11), 1984, pp. 728-739.

Hong, S. J., Thong, J. Y. L., and Tam, K. Y. "Understanding Continued Information Technology Usage Behaviour: A Comparison of Three Models in the Context of Mobile Internet," *Decision Support Systems* (42), 2006, pp. 1819-1834.

Igbaria, M. and Iivari, J. "The Effects of Self-Efficacy on Computer Usage," *Omega* (23:6), 1995, pp. 587-605.

Karahanna, E., Straub, D. W., and Chervany, N. L. "Information Technology Adoption across Time: A Cross-Sectional Comparison of Pre-Adoption and Post-Adoption Beliefs," *MIS Quarterly* (23:2), 1999, pp. 183-213.

Kim, H. W., Chan, H. C. and Chan, Y. P. "A Balanced Thinking-Feelings Model of Information Systems Continuance," *International Journal of Human-Computer Studies* (65), 2007, pp. 511-525.

King, W. R. and He, J. "A Meta-Analysis of the Technology Acceptance Model," *Information and Management* (43), 2006, pp. 740-755.

Konana, P. and Balasubramanian, S. "The Social–Economic–Psychological Model of Technology Adoption and Usage: An Application to Online Investing," *Decision Support Systems* (39:3), 2005, pp. 505-524.

Kulviwat, S., Bruner II, G., and Neelankavil, J. P. "The Role of Self-efficacy in Predicting Technology Acceptance," *Academy of Marketing Science Conference*, Tampa, Florida, 2005.

Lazarus, R. S. *Emotion and adaptation*, Oxford University Press, New York, 1991.

Lazarus, R. S. and Folkman, S. *Stress, appraisal, and coping*, Springer, New York, 1984.

Lee, W. J., Kim, T. U., and Chung, J-Y. "User Acceptance of the Mobile Internet", in *Proceedings of the First International Conference on Mobile Business*, Athens, Greece, 2002.

Likert, R. "A Technique for the Measurement of Attitudes," *Archives of Psychology* (140), 1932, pp. 1-55.

MacManus, R. "OpenSocial and Facebook Stats from Rapleaf", November 12, 2007, accessed January 2008, from http://www.readwriteweb.com/archives/opensocial_and_facebook_statistics.php.

Marakas, G. M., Johnson, R. D., and Clay, P. F. "The Evolving Nature of the Computer Self-Efficacy Construct: An Empirical Investigation of Measurement Construction, Validity, Reliability and Stability over Time," *Journal of the Association of Information Systems* (8:1), 2007, pp. 16-46.

Marakas, G. M., Yi, M. Y., and Johnson, R. D. "The Multilevel and Multifaceted Character of Computer Self-Efficacy: Toward Clarification of the Construct and an Integrative Framework for Research," *Information Systems Research* (9:2), 1998, pp. 126-163.

Mathieson, K. "Predicting User Intentions: Comparing the Technology Acceptance Model with the Theory of Planned Behaviour," *Information Systems Research* (2:3), 1991, pp. 173-191.

Mischel, W. and Shoda, Y. "A Cognitive-Affective System Theory of Personality: Reconceptualizing Situations, Dispositions, Dynamics, and Invariance in Personality Structure", in *Motivational Science: Social and Personality Perspectives*, Higgins, E. T., and Kruglanski, A. W. (Eds.), Psychology Press, Philadelphia, Pennsylvania, 2000, pp. 150-176.

Moore, G. C. and Benbasat, I. "Developing of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation," *Information Systems Research* (2:3), 1991, pp. 192-222.

Nunnally, J. C. and Bernstein, I. H. *Psychometric Theory* (3rd ed.), McGraw-Hill, New York, 1994.

Parthasarathy, M. and Bhattacherjee, A. "Understanding Post-Adoption Behaviour in the Context of Online Service," *Information Systems Research* (9:4), 1998, pp. 362-379.

Perez, J. C. "Facebook Cracks Down on Developer Spam", *The Washington Post*, August 28, 2007, accessed January 2008, from http://www.infoworld.com/article/07/08/28/Facebook-cracks-down-on-developer-spam_1.html.

Reisenzein, R.. "Pleasure–arousal theory and the intensity of emotions," *Journal of Personality and Social Psychology* (67:3), 1994, pp. 525–539.

Ringle, C. M., Wende, S., and Will, A. *SmartPLS 2.0 (beta)* [Software], available from http://www.smartpls.de, 2005.

Roca, J.C., Chiu, C. M., and Martinez, F. J. "Understanding e-learning intention: An extension of the Technology Acceptance Model," *International journal of Human-Computer Studies* (64), 2006, pp.628-696.

Russell, J. A. "A Circumplex Model of Affect," *Journal of Personality and Social Psychology* (39), 1980, pp. 1160-1178.

Taylor, S. and Todd, P. A. "Understanding Information Technology Usage: A Test of Competing Models", *Information Systems Research* (23:6), 1995, pp. 144-176.

Thong, J. Y. L., Hong, S. J. and Tam, K. Y. "The Effects of Post-Adoption Beliefs on the Expectation-Disconfirmation Model for Information Technology Continuance," *International Journal of Human-Computer Studies* (64:9), 2006, pp. 799-810.

Van der Heijden, H. "User Acceptance of Hedonic Information Systems," *MIS Quarterly* (28:4), 2004, pp. 695-704.

Varley, M. "Facebook Suffers First Drop in Visitors," *mad.co.uk*, February 21, 2008, accessed March 2008, from http://www.mad.co.uk/BreakingNews/BreakingNews/Articles/3153b7447b4645c2bff648d566ef5f77/Facebook-suffers-first-drop-in-visitors.html.

Venkatesh, V. "Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model," *Information Systems Research* (11:4), 2000, pp. 324-365.

Venkatesh, V. and Davis, F. D. "A Model of the Antecedents of Perceived Ease of Use: Development and Test," *Decision Sciences* (27:3), 1996, pp. 451-481.

Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly* (27:3), 2003, pp. 425-478.

Webster, J. and Martocchio, J. J. "Microcomputer Playfulness: Development of a Measure with Workplace Implications," *MIS Quarterly* (16:2), 1992, pp. 201-226.

Whitley, B. E. Jr. "Gender Differences in Computer-Related Attitudes and Behaviour: A Meta-Analysis," *Computers in Human Behaviour* (13:1), 1997, pp. 1-22.

Yi, M. Y. and Hwang, Y. J. "Predicting the Use of Web-based Information Systems: Self-Efficacy, Enjoyment, Learning Goal Orientation, and the Technology Acceptance Model," *International Journal of Human-Computer Studies* (59), 2003, pp. 431-449.