

2010

# Introspection within the IS discipline - Social Cognitive Theory as a Reference Theory for Future Research

Kevin Daniel Andre Carillo  
*Victoria University of Wellington*

Follow this and additional works at: <http://aisel.aisnet.org/acis2010>

---

## Recommended Citation

Carillo, Kevin Daniel Andre, "Introspection within the IS discipline - Social Cognitive Theory as a Reference Theory for Future Research" (2010). *ACIS 2010 Proceedings*. 66.  
<http://aisel.aisnet.org/acis2010/66>

This material is brought to you by the Australasian (ACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ACIS 2010 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

## **Introspection within the IS discipline - Social Cognitive Theory as a Reference Theory for Future Research**

### **Abstract**

*A multitude of theoretical models and constructs has been used to investigate individual behavior. We have now reached a point where the IS discipline requires cohesive guidance to make sense of such a large number of theoretical considerations but also to assist future research in identifying theories that have the potential to shed some new light to understand individual behaviour. The aim of this paper is to use Social Cognitive Theory to organize the theoretical models and constructs used in IS and to provide a clear depiction of the state of our knowledge. First, a thorough review of the IS literature which used Social Cognitive Theory yielded 62 papers. Second, the major behavioral theoretical models used in IS research were also reviewed. This vast literature is mapped into the SCT framework, thus highlighting the main successes but also pitfalls of past research. Future research directions are then identified and discussed.*

### **Keywords**

Social Cognitive Theory, individual behavior, literature review, IS theoretical models

### **INTRODUCTION**

Since the mid-seventies, the study of the factors leading to the adoption and use of information technology has been largely represented in MIS research, concentrating ever-increasing research efforts. This line of research emerged when both organizations and researchers started realizing that in spite of the immense promises of IT, the level of adoption of information technology did not match by far the level of expectations. Lucas (1975) was among the first IS researchers to investigate the influence of individual and behavioral factors on IT adoption.

Drawn from social psychology, Social Cognitive Theory (Bandura, 1986) has been both promising and insightful in IS research. Focusing on individual learning, SCT relies mainly on the assumption that all individual behavior, cognition and other personal factors, and environmental influences operate as interacting determinants and influence each other bi-directionally. IS academics started using SCT in the early nineties when realizing the relevance of the concept of self-efficacy (a central notion in SCT) in understanding the use and adoption of information technology. Ever since, SCT has been widely used in IS in the context of computer/software training and use (Agarwal et al., 2000; Compeau and Higgins, 1995) but also internet (Hsu et al., 2004; Pearson and Peason, 2008), electronic commerce-related issues (Hernandez and Mazzon, 2006; Klopping and McKinney Jr., 2006), and e-learning (Hayashi and Chen, 2004).

In spite of the promises that were claimed by IS researchers during the introduction of Social Cognitive Theory in IS, the interest into the theory seems to have progressively faded within the IS community. The importance and success of the notion of self-efficacy in IS studies have progressively reduced the consideration of the main scope and important concepts leading to the loss of the realization of the full potential of the theory in the IS discipline. We believe that Social Cognitive Theory can greatly contribute to IS research at two different levels of analysis. First, Social Cognitive Theory identifies cognitive factors such as self-efficacy or outcome expectations but also self-regulation, emotional factors and both social and situational characteristics in the understanding of individual behaviour. The predictive power of the SCT constructs has been widely accepted in various disciplines, providing insights to IS researchers about the use of such constructs when investigating the interaction of individuals with technology. Second, by proposing a high-level understanding of human agency when considering individuals as parts of an inseparable triadic structure, Social Cognitive Theory allows to view human functioning from a more encompassing perspective. In other words, SCT can be seen as a meta-level framework in which other theories (which focus on individual behaviour) can be mapped according to the subset of SCT components they concentrate on. Such an approach enables to highlight unexplored areas of research at the theory level of analysis encouraging IS researchers to consider new theoretical perspectives in order to gain a broader and more encompassing view of individual behaviour.

The objective of this research project is to use Social Cognitive Theory as a reference theoretical perspective in order to stimulate an introspection within the IS discipline. Since the mid-seventies, a multitude of theoretical frameworks has been used in IS research and provided a vast array of successful results, but there seems to have been a lack of guidance and cohesion in the choice of the theories to be used. It is believed that such guidance can solely be provided through the acceptance of a commonly accepted meta-level framework which will help future research in pointing towards the unexplored areas that remain. To achieve such a high-level goal, the research strategy adopted in this research project relied on a two-level approach.

First, since Social Cognitive Theory as a theoretical framework has already been successfully used in IS research, a thorough review of the literature was performed in order to gain an overall understanding of the findings provided by SCT in IS research. Such a procedure answers the first level of the potential of SCT constructs stated previously, in proposing various explanatory factors to examine individual behaviour. The reviewed articles were then mapped into the SCT framework allowing to summarize past results but also to investigate whether past studies effectively integrated the over-encompassing assumptions of SCT or else a subset of it. The proposed results drew insights from a previous study of the author (Carillo, 2010).

Second, to answer the claim of the potential power of SCT at the theory level of analysis, the most used IS theoretical models were then reviewed and mapped into the SCT framework, identifying the areas of research that have been explored but also shedding some new light on areas that deserve further research efforts. The paper posits that by having been used in a restrictive context, SCT has still an unrevealed but promising potential in IS research, justifying the need for clarification of the theory and guidance for future research. This paper is organized as follows. The first section introduces SCT in social psychology and IS research. The research method is described next and is followed by our analyses. The paper concludes with the delineation of the state of our knowledge by highlighting key aspects in the identification of future research directions and guidance in IS research.

## **SOCIAL COGNITIVE THEORY: AN OVERVIEW**

Human psychosocial functioning has been interpreted and explained in many theories in both psychology and social psychology. Based on different views of human nature and different perspectives towards the determinants of human action and motivation, most theories have adopted a unidirectional view of human behavior in which individual dispositions or else environmental and social influences shape behavior (Wood and Bandura, 1989). Opposing the limited one-side determinism of the other theories, Social Cognitive Theory came up with a different approach which have adopted a “triadic reciprocal determinism” view (Bandura, 1986) in which individual cognitive and emotional characteristics, social and environmental factors, and behavior mutually influence each other (Bandura, 1978, 1982, 1986). The bi-directional determinism between individual and environmental factors can be summarized by admitting that individuals choose the environment in which they evolve, but they also shape their surrounding environment. Similarly, cognitive beliefs and behaviour mutually determine each other. How people interpret the outcomes of their performance for a given task influences their self-beliefs which in turn affect their future performance (Pajares, 1996). Social Cognitive Theory has been widely accepted and empirically validated in various fields of research such as therapeutic research (Bandura, 1997; Langlois et al., 1999), mass media (Bandura, 2001; Cantor, 1994), public health (Bandura, 1998; Holden, 1991) and education (Dai et al., 1998; Zimmerman, 1989). In SCT, 'environment' refers to the either social or physical factors that can affect a person's behavior. Environmental factors are thus seen as the factors that are physically external to the person and that provide opportunities and social support such as social pressure or situational characteristics (Compeau and Higgins, 1995).

Personal factors are any cognitive, personality, or demographic aspects characterizing an individual. Social Cognitive Theory rotates around two closely inter-related cognitive factors that play a major role in understanding human behavior: self-efficacy and outcome expectations. Self-efficacy is defined by Bandura (1986) as “*People's judgment of their capabilities to organize and execute courses of action required to attain designated types of performances. It is concerned not with the skills one has but with judgments of what one can do with whatever skills one possesses.* (p. 391)”. Outcome expectations refer to the extent to which an individual will undertake a certain behavior only if he/she perceives that it will lead to some valued outcomes or else favorable consequences (Compeau and Higgins, 1995). The inter-relation between perceptions of efficacy and outcome expectations stated in SCT highlights the fact that both notions must be analyzed jointly together when studying human behavior due to the synergistic nature of the two concepts (Williams and Bond, 2002). The probability for an individual to perform a certain behavior is diminished to a great extent if the outcomes associated with the behavior are not valued or else desired even with a high level of self-efficacy. Similarly, people may be strongly convinced and attracted by certain outcomes in relation to a given behavior, but are unlikely to perform the behavior in case they lack the confidence in abilities to attain the required performance level (Wise, 2002).

### **Social Cognitive Theory in IS Research**

The Technology Acceptance Model (Davis, 1989), Theory of Planned Behavior (Fishbein and Ajzen, 1975) and Diffusion of Innovations (Rogers, 1995) view behavior as a set of beliefs about technology, and a set of affective responses (typically measured in terms of attitude towards using) to the behavior (Compeau et al., 1999). Nonetheless, while TAM and DOI focus solely on beliefs about the technology, TPB and SCT integrate the notion of perceived outcomes when forecasting behavior. Indeed, both theories posit that the use of a certain technology is directly influenced by the perception that it will allow the individual to achieve positive outcomes.

For instance, a person's motivation might be increased if he/she perceives that learning to use a certain system will lead to a higher level of performance for his/her job. The consideration of individuals' environment as playing an important role is another common concept in both theories. A key aspect differentiates SCT from TAM, DOI, and TPB. The last three theories adopt a unidirectional perspective towards causal relationship, in which environmental factors influence cognitive beliefs, which influence attitudes and behaviors. On the contrary, SCT relies on the bidirectional nature of causation in which behavior, cognitive and emotional factors, and environment constantly and mutually influence each other.

The first instances of SCT in IS research occurred when computers started invading workplaces. In response to the partial understanding of the predictors of individual use of computers, some researchers turned towards a complementary view, Social Cognitive Theory, in order to capture the social dimension of individual behavior in the context of computer training and use (Compeau and Higgins, 1995; Bolt et al., 2001; Hasan and Ali, 2004; Srite, et al., 2008). The use and/or training of general office software was also largely investigated in light of SCT and provided a vast array of results (Agarwal et al., 2000; Chau, 2001; Compeau et al., 1999). SCT was also used to explore the use and/or training of more specific software such as ERP systems (Kamhawi, 2008; Noguera and Watson, 2004), banking (Reid, 2008) and medical information system (Stone and Henry, 2003). The advent of the Internet engendered a second wave in the use of SCT in IS research by again providing a complementary view to more techno-centric approaches provided by TAM or DOI for instance by modelling the use of the Internet in general or else the use of Internet-based applications or services as learning processes. Such processes are acquired by an individual in which his/her behavior, cognitive and emotional characteristics, and environment are inter-related, mutually influencing each other (Amin, 2007; Chan and Lu, 2004). SCT was used to investigate Internet use (Hsu et al., 2004; Pearson and Peason, 2008), online shopping (George, 2004; Ranganathan and Jha, 2007), online banking (Amin, 2007; Chan and Lu, 2004), e-learning system use (Gong et al., 2004; Lee, 2006), or electronic healthcare system (Ma and Liu, 2005).

## **RESEARCH METHOD AND DATA ANALYSIS**

The chosen research methodology was twofold in accordance with the choice to adopt a dual-level perspective of Social Cognitive Theory in IS research. On the one hand, to address the construct-level analysis of past SCT papers in IS research, a keyword search was performed using the two most commonly used online databases in order to identify the articles which had used Social Cognitive Theory in IS research. Furthermore, it was found during the initial stage, that online education journals had provided relevant and quality contributions to IS research by using SCT when investigating the spread of computers in educational institutions and the training it involved. The author decided to include in the review process the articles from top online education journals which were judged to have used an IS research angle in exploring a given IS-related issue through SCT.

Several rules were designed to provide a clear-cut condition to select articles to be integrated into the review. First, articles from IS journals were selected when at least one construct of the SCT framework was integrated in the theoretical model, and when the use of SCT was clearly referred. Second, articles from business academic journals were also selected in which an IS approach was used, focusing on the adoption or use of a certain technology and drawing insights from SCT. Finally, articles from online education peer-reviewed journals were eventually chosen in which researchers use an "IS research approach" and investigated individual behavior towards using a certain technology using SCT. It is important to highlight that only empirical papers were selected, and which adopted an individual level of analysis. The process resulted in a total of 62 empirical papers (contact the author for details of each reviewed article). The first step in data analysis consisted of identifying the variables taken into account in each study. The variables were then mapped into the SCT framework.

On the other hand, the following procedure was selected to perform the review of the main theoretical models used in IS research when studying individual behavior. In order to define objective criteria to select the IS theories to be reviewed and mapped into the SCT framework, it was decided to review the IS literature to search for relevant research articles that had scanned through the major IS journals and conferences and identified the most commonly accepted and used theories in IS research. Six such studies were found (Chin and Marcolin, 2001; Halawi and McCarthy, 2006; Jeyaraj et al., 2006; Liang and Chen, 2003; Liu et al., 2008; Williams et al., 2009). From the theories provided by the six sets, were selected only the theories which address individual behavior (in accordance with the focus of SCT). The procedure allowed to identify 12 theoretical models to be included. The final stage of the research method involved the review of the reference articles which introduced the theories in IS research and the mapping of their theoretical constructs into the SCT framework. The two research methodologies are summarized in Figure 1 and the selected theoretical models in Table 1.

Figure 1. Summary of the two research methodologies

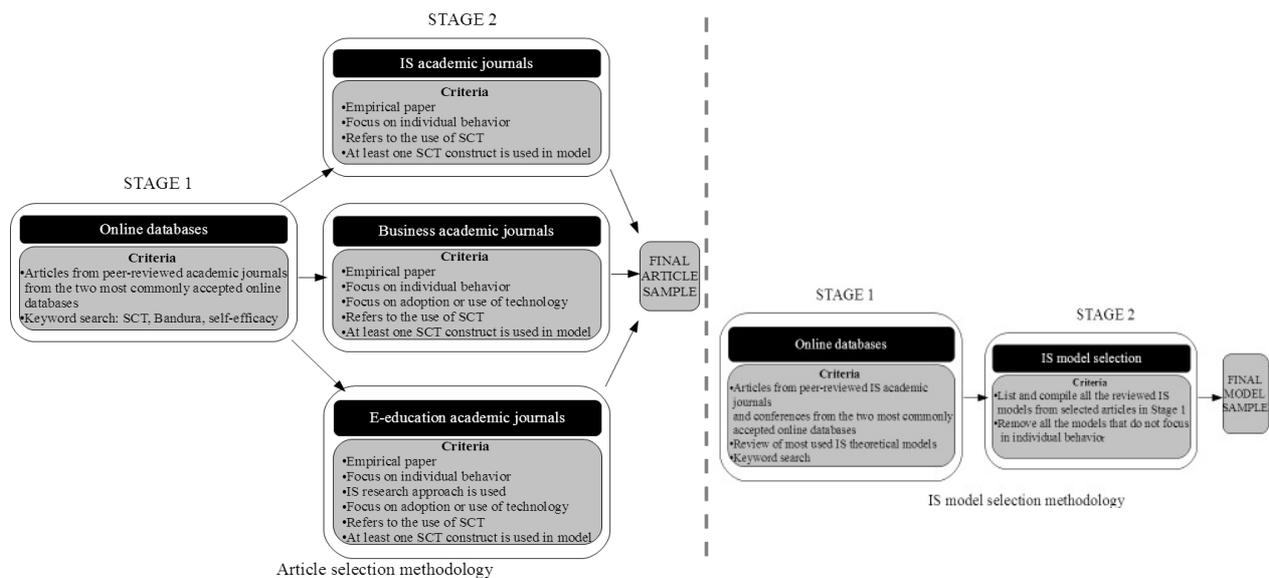


Table 1. Theoretical models included in the review

Theoretical Model	Authors
Diffusion of Innovations Theory	(Rogers, 1983, 1995)
Expectation-Confirmation theory of IS continuance	Bhattacharjee (2001)
IS Success Model	(DeLone and McLean , 1992)
Updated IS Success Model	(DeLone and McLean, 2003)
PC Utilization Model	(Thompson et al., 1991)
Perceived Characteristics of Innovations – PCI	(Moore and Benbasat, 1991)
Task-Technology Fit- TTF	(Goodhue, 1995)
Technology Acceptance Model – TAM	(Davis,1989)
Technology Acceptance Model II – TAM2	(Venkatesh and Davis, 2000)
Theory of Planned Behavior – TPB	(Ajzen, 1991)
Theory of Reasoned Action - TRA	(Fishbein and Ajzen, 1975)
Unified Theory of Acceptance and Use of Technology – UTAUT	(Venkatesh et al., 2003)

## RESULTS

The outcomes of the bi-dimensional analysis of both SCT articles and IS theoretical models highlighted the following results.

### Construct-level results

Because of article length restrictions, the results of the articles' review could not be integrated in the article (contact the author for detailed results). Out of 62 articles, 17 addressed computer use and/or training, 20 were related to software training and/or use (either adopting a general software approach or else specific such as ERP, ESS ...). Finally, 26 articles used SCT in the context of Internet based applications or services. Seven types of interaction were found to have been investigated (see Table 2). It is important to note that some studies were found to adopt a direct effect approach in which for instance personal factors directly influence individual behavior (Gong et al., 2004; Guriting and Ndubisi, 2006; Hasan and Ali, 2006, for instance). Such studies were classified into the P-B category (personal factors-behavioral factors). Other studies considered mediating effects in which, for instance, environmental factors influence personal factors, which in turn influence behavior. Such studies were classified in the E-P-B category (environment-personal-behavior). It was not rare to find an article

combining several approaches such as P-B and E-P-B for instance, in which some personal factors have a direct effect on behavior whereas others are mediators between environmental factors and behavior.

Table 2. Investigated SCT interactions in SCT articles and IS models.

SCT Interaction	P-P	P-B	E-P	E-B	E-P-B	B-P	E-B-P	E-B-E	E-P-E
Nb. of articles	5	51	16	8	13	1	1	0	0
Nb. of IS models	0	10	0	8	4	2	0	2	2

In terms of dependent variable, it was found that behavior intention was the most represented by far (24 studies) followed by use (11 studies), task performance (10 studies), continuance intention (7 studies), task effectiveness (2 studies), and adoption (1 study). Out of 62 articles, 51 explored the Personal factors-Behavior relationship from which 30 did not include any environmental/situational factors which is in direct contradiction with the core assumptions of SCT. Such findings revealed that only 20 articles from the selected 62 (that is to say nearly one third) considered personal factors, behavior, and environment all together, respecting the triadic nature of learning processes stated by SCT. From the remaining 11 articles which did not focus on the Personal factors-Behavior interaction, 6 studies investigated the relationship among various emotional and cognitive individual factors (self-efficacy, outcome expectations and more), 4 studied solely the Environment-Personal factors relationship, (excluding the behavioral dimension of SCT). The remaining study encompassed both the Environment-Behavior and Environment-Personal factors links. It was also astounding to find that in spite of the importance of emotional characteristics during learning processes posited in SCT, only 11 studies integrated such individual considerations (nearly 18% of the selected papers) highlighting a clear lack in IS research.

All the reviewed papers integrated the construct of self-efficacy in their research model but 20 of them did not include the concept of outcome expectations even though SCT strongly posits the synergic nature of both constructs in their interaction to an individual's environment and behavior (Wood and Bandura, 1989). Various research projects manifested some overlapping between the constructs of the Technology Acceptance Model (Davis, 1989): perceived ease of use and perceived usefulness to the SCT constructs of self-efficacy and outcome expectations. The literature review highlighted that some researchers noted the difference between the notions of perceived ease of use and self-efficacy. Indeed, from the 27 studies out of the 62 which integrated both TAM and SCT theories, 26 of them had used separate constructs: perceived ease of use and self-efficacy. It is important to note that such studies did not consider the concept of self-efficacy in direct relation to the investigated system but rather emphasized the concept of general computer self-efficacy as a predictor to perceived ease of use towards a given system. Most studies substituted outcome expectations with perceived usefulness highlighting the overall techno-centric approach adopted by researchers and omitting the social dimension of performance. This insightful issue will be debated in the discussion section.

Finally, among the other individual factors that were investigated, it was found that the notion of past experience was used in 19 research papers with successful results in most cases. Such findings insist on the temporal dimension of learning processes which should be seen as both evolving and dynamic (Wood and Bandura, 1989).

### Theory-level results

The reviewed theoretical models were found to focus on various aspects of individual behaviour that are: adoption, use and individual performance (see appendix for detailed results). Seven theories consider both behavioural intention and behaviour together, while one theory, the IS continuance model, primarily focus on continuance intention only. Apart from the Task-Technology fit model, all theories include individual factors. From these eleven models, only the DeLone and McLean's IS success models (1992, 2003) do not include cognitive factors. Five models consider emotional factors that are satisfaction, affect, and attitude. Other individual factors are also used: experience (UTAUT and TAM2), age, gender (UTAUT). Environmental factors were found to be considered in most models except TAM and the IS continuance models. Social considerations covered various aspects such as subjective norms, facilitating conditions or normative beliefs (seven models). Situational factors are included in seven models covering notions such as triability, observability, voluntariness, information/system/service quality. It is important to note that three models focus only on situational factors, three other models on social factors only, whereas four models encompass both situational and social considerations.

The most represented SCT interactions (See Table 2) were found to be the Personal factors-Behavior (all the models except Task-Technology Fit) and Environmental factors-Behavior paths (10 models). Four models consider the E-P-B interaction (UTAUT, TAM2, and DeLone and McLean's models). The B-P path was found to be investigated in the PC utilization model and the IS continuance models. Finally, only the DeLone and McLean's models suggested to adopt an environment-level dependent variable by focusing on either

organizational impact or net benefits (environmental component of the SCT framework), investigating interactions such as E-P-E, E-B-E.

## **DISCUSSION AND FUTURE RESEARCH**

The results issued from the literature review have allowed to highlight various research issues and avenues.

### **Self-efficacy theory versus social cognitive theory**

It has been commonly acknowledged that the concept of self-efficacy plays a central role in Social Cognitive Theory in which the belief that a person is capable of using a certain system influences significantly his/her performance. However, it is very restrictive to summarize SCT as being solely the concept of individual self-efficacy leading to the definition of a “self-efficacy theory”. Such a claim arose from the review of the articles that used SCT from which an overwhelming majority did not include the notion of outcome expectations. The power of SCT does not reside in discovering the importance of self-efficacy but rather in making explicit the complexity of learning processes in which self-efficacy is intimately intertwined with other cognitive factors such as outcome expectations, emotional factors (such as affect or else anxiety) but also individual behavior and environmental factors such as (others’ use or encouragements). At a higher consideration level, having realized that researchers often affirmed to use SCT in solely importing one construct from SCT, such findings raise an important issue in IS research: is it relevant to claim the use of a certain theory in a research project by simply integrating one or few concepts from a theory in an overall theoretical framework?

### **Inter-influence between self-beliefs and expected outcomes**

The assertion of the inter-relation between perceptions of self-efficacy and outcome expectations stated in SCT seems to have been an overall accepted view in various theoretical perspectives. The Technology Acceptance model relies on the central role of two closely related beliefs. Perceived ease of use tends to echo the notion of an individual’s perception of his/her ability to perform a certain task. Perceived usefulness can be seen as a component of outcome expectations in relation to the perception that an individual has towards the anticipated direct outcome from the use of a certain technology. Similar claims can be done by linking self-efficacy to the notions of complexity (from Innovation Diffusion Theory) or else control beliefs (from the Theory of Planned Behavior). Concepts such as relative advantage (IDT), result demonstrability and image (PCI and TAM2) for instance can be seen as parts of outcome expectations. Obviously, one must be extremely cautious when comparing or identifying constructs from different theories. The point here is rather to suggest that theories seem to converge towards analogous aspects in which self-beliefs and projected outcomes act as essential forces in determining individual behaviour. SCT reminds that both notions must be seen as multi-dimensional concepts encompassing both individual and environmental considerations. For example, the Technology Acceptance Model is a pure techno-centric model and the concept of perceived usefulness is purely task-related. In SCT, the notion of performance is much broader, and outcome expectations address both task-related performance but also personal-based expectations such as change of status, change of image, but also rewards within the environment (Compeau et al., 1999). This broader view of outcome expectancy should trigger research efforts.

### **Lack of emotional considerations**

SCT emphasizes the importance of the role played by emotional factors. Indeed, it is said that people’s self-beliefs of efficacy affect how much stress and depression they experience in threatening situations, as well as their level of motivation (Wood and Bandura, 1989). Few theoretical models were found to integrate emotional considerations and among the reviewed articles that used the SCT framework, few included emotional issues. Such findings seem to call for more research efforts to investigate the role played by emotional considerations on cognitive and behavioral factors. Prior results suggested that anxiety and stress reactions are low when people cope with tasks in their perceived self-efficacy range (Wood and Bandura, 1989) whereas self-doubts in coping efficacy produce substantial increases in subjective distress and physiological arousal. Such insights deserve further investigation in IS and tend to claim for a need to identify theories from various fields of research in which emotions play a core role.

### **Behavior as a temporal process**

IS research has started acknowledging the importance of past experience in learning processes. A significant number of reviewed articles included this notion while the TAM2 and UTAUT models have made past experience an important actor. Indeed, the bidirectional nature of causality stated in SCT indicates that performance has effects on both cognitive and emotional factors which in turn will affect future performance. Such a statement reminds that any learning process must be seen as a temporal and evolving phenomenon in

which past outcomes become future inputs. Too few studies have considered such temporal aspects when investigating the ability of an individual to learn to perform a certain task. For instance, the belief that an individual is capable of conducting a certain online transaction (self-efficacy) constantly varies based on past transactions and environmental influences (such as having a peer who encountered a certain fraud when conducting an online purchase). The PC utilization model addresses another aspect of the temporal nature of the use of computers by mentioning the notion of habits (a notion issued from the original Triandis' model, 1980). Such a claim insists on the relevance of studies that encompass temporal considerations and the importance of longitudinal studies in IS research when studying learning-related individual behavior.

### **Triadic reciprocity**

Bandura postulates that “the person, the behavior, and the environment were all inseparably entwined to create learning in an individual” (Bandura, 1986, p. 18). In the social cognitive view, people are neither driven by inner forces nor automatically shaped and controlled by external stimuli. Rather, human functioning is explained in terms of a model of triadic reciprocity in which behavior, cognitive and other personal factors, and environmental events all operate as interacting determinants of each other. Consequently, using SCT in an IS study consists of acknowledging the concept of triadic reciprocity which means integrating both individual and environment-based variables to predict an individual's behavior. In other words, SCT encourages researchers to encompass both types of factors in order to effectively understand human behavior. These considerations raise issues when considering studies and theories that focus solely on either technological or individual factors when striving to understand and predict the use or adoption of a certain system. IS research seems to have been mainly driven by a techno-centric approach when studying individual behavior, leading to the use of theories that omit the social nature of human behavioral functioning. Based on the triadic structure of human agency claimed by SCT and its inseparable nature, SCT raises the debate whether researchers should focus on individuals when studying human behaviour or else on a higher-level entity which consists of individual, his/her environment, and behaviour. Further research efforts should strive to measure the role of both environmental and social factors on behaviour.

### **Dependent variables and unexplored interactions**

Social Cognitive Theory indicates that behavioral, cognitive, emotional, and environmental factors constantly influence each other. An overwhelming majority of IS theories uses individual behavior as a dependent variable by providing factors that explain use, adoption, or performance. Based on the principle of the triadic reciprocity, several interactions in the SCT triangle have not been explored and deserve future research efforts. For instance, SCT indicates that an individual's behavior shapes his/her environment. The DeLone and McLean's models link individual behaviour and environment by emphasizing the influence of individual performance on organizational performance. Similarly, the impact of personal cognitive and emotional factors on an individual's environment has also never been explored even though it was suggested in DeLone and McLean's model when linking user satisfaction (an emotional belief) to net benefits (which encompass both individual and organizational performance). Another unexplored interaction regards the Behavior-Personal factors path of the SCT framework which echoes the temporal notion of individual learning and behavior. Indeed, past behavior influences current individual beliefs which in turn affect future performance. The PC utilization model proposes a challenging view by identifying the relationship between behavior, habits, and affect. It thus ascertains the role that individual behavior plays in shaping individual beliefs and perceptions, especially emotional ones. Indeed, gaining a deep understanding of human behavior in relation to technology certainly involves to identify the significant predictors (either individual or environmental) that can best be used when studying behavior, but it also imply that researchers should strive to understand how behavior impacts individuals in their future beliefs and perceptions as well as how it impacts individuals' environments.

## **CONCLUSION**

Any classification can certainly be seen as arbitrary and arguable (Delone and McLean, 1992). A theory has always limitations and will not entirely explain and predict the complex issue of individual behavior. However, this paper defends the viewpoint that the use of the SCT framework will shed some new light on the individual behavior issue in IS research. The full potential of SCT has still not been unveiled due to a lack of consideration of SCT from a higher point of view that encompasses both theoretical models and constructs. This research paper has provided a thorough review of past IS studies which integrated SCT, and a review of the most common IS theories. Numerous unexplored areas were identified in order to help and guide researchers for future studies. I hope this paper will trigger such new research efforts.

## REFERENCES

- Agarwal, Ritu, V. Sambamurthy, and R. M. Stair. "Research report: The evolving relationship between general and specific computer self-efficacy: An empirical assessment." *Information Systems Research*, vol. 11(4), pp. 418, December 2000).
- Ajzen, I. (1991). *The theory of planned behavior*. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Amin, H. "Internet Banking Adoption Among Young Intellectuals." *Journal of Internet Banking and Commerce*, vol 12(3), pp. 1, December 2007).
- Bandura, A., "Reflections on self-efficacy," in *Advances in Behavioral research and Therapy*, S. Rashman, Eds. Pergamon Press, Oxford, England, 1978, pp. 237-269.
- Bandura, A., "Social foundations of thought and action," Prentice Hall, Englewoods Cliffs, NJ, 1986.
- Bandura, A. "Self-efficacy: the exercise of control," W.H. freeman and Company,: New York, 1997.
- Bandura, A. "Social cognitive theory of mass communications," In J. Bryant, & D. Zillman (Eds.). *Media effects: Advances in theory and research* (2nd ed., 121-153). Hillsdale, NJ: Lawrence Erlbaum, 2001.
- Bhattacharjee, A., "Understanding Information Systems Continuance: An Expectation-Confirmation Model," *MIS Quarterly* (25:3), September 2001, 351-370
- Cantor, J. "Fright Reactions to Mass Media." In *Media Effects*, eds. Jennings Bryant and Dolf Zillman. Hillsdale, NJ: Lawrence Erlbaum, 1994.
- Carillo, K.D. "Social Cognitive Theory in IS Research – Literature Review, Criticism, and Research Agenda" *Communications in Computer and Information Science, Information Systems, Technology and Management* (54).
- Chin, W. W, and B. L Marcolin. "The future of diffusion research." *ACM SIGMIS Database* 32, no. 3 (2001): 7–12.
- Bolt, M. A., L. N. Killough, H. C. Koh, "testing the interaction effects of task complexity in computer training using the social cognitive model," *Decision Sciences*, vol. 32(1), pp. 1, 2001.
- Carillo, K. D. "Social Cognitive Theory in IS Research–Literature Review, Criticism, and Research Agenda," *Information Systems, Technology And Management, Communications in Computer and Information Science*, vol. 54(2), pp. 20-31, 2010.
- Chang, S.-C., and M.T. Lu. "Understanding Internet Banking Adoption and Use Behavior: A Hong Kong Perspective." *Journal of Global Information Management*, vol. 12(3), pp. 21, September 2004.
- Compeau, D. R., and C.A. Higgins. "Computer self-efficacy: development of a measure and initial test." *MIS Quarterly*, vol. 19(2), pp. 189, 1995.
- Compeau, D. R., and Meister, D. B. "Measurement of Perceived Characteristics of Innovating: A Reconsideration Based on Three Empirical Studies," presented at a workshop of the Diffusion Interest Group on Information Technology, Atlanta, GA, December 13,1997. Davis, F. D. "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly*, vol. 13(3), pp. 319-340, 1989.
- Dai, D. Y., S. M. Moon, J. R. Feldhusen, "Achievement motivation and gifted students: A social cognitive perspective," *Educational Psychologist*, vol. 33, pp. 45-63, 1998.
- Davis, F. D. "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS Quarterly*, vol. 13(3), pp. 319-339, 1989.
- Davis, S. A., R. P. Bostrom, "training end-users: an experimental investigation of the role of the computer interface and training methods," *MIS Quarterly*, vol. 17, pp. 61-86, 1993.
- DeLone, W.H., and E.R. McLean "Information Systems Success: The Quest for the Dependent Variable," *Information System Research*, vol. 3(1), pp 60-95, 1992.
- DeLone, W.H., and McLean, E.R. 2003. "The DeLone and McLean Model of Information Systems Success: A Ten-Year Update," *Journal of Management Information Systems* (19:4), Spring, pp 9-30.
- Fishbein, M. and I. Ajzen, *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*, Addison-Wesley, Reading, MA, 1975.

- Gong, M., Y. Xu, and Y. Yu. "An Enhanced Technology Acceptance Model for Web-Based Learning." *Journal of Information Systems Education*, vol. 15(4), pp. 365, Winter 2004.
- Goodhue, D.L., Thompson, R.L. (1995), Task-Technology Fit and Individual Performance, *MIS Quarterly* 19.2, 213-236.
- Guriting, P., and N. O. Ndubisi. "Borneo online banking: evaluating customer perceptions and behavioural intention." *Management Research News*, vol. 29(1/2), pp. 6, 2006.
- Halawi, L., and R. McCarthy. "Which Theory Applies: An Analysis of Information Systems Research." *Issues in Information Systems* 7 (2006): 252–256.
- Hasan, B., and J. H. Ali, "The impact of general and system-specific self-efficacy on computer training learning and reactions," *Academy of Information and Management Sciences Journal*, vol. 9(1), pp. 17, 2006.
- Hasan, B., and J. H. Ali. "The impact of general and system-specific self-efficacy on computer training learning and reactions." *Academy of Information and Management Sciences Journal*, vol. 9(1), pp. 17, 2006.
- Hayashi, A., C. Chen, T. Ryan, and J. Wu. "The Role of Social Presence and Moderating Role of Computer Self Efficacy in predicting the continuance usage of e-learning systems." *Journal of Information Systems Education*, vol. 15(2), pp. 139, Summer 2004.
- Hernandez, J. M. C., and J. A. Mazzon. "Adoption of internet banking: proposition and implementation of an integrated methodology approach." *International Journal of Bank Marketing*, vol. 25(2), pp. 72-88, 2007.
- Holden, G. "The relationship of self-efficacy appraisals to subsequent health related outcomes: a meta-analysis," *Social Work in Health Care*, vol. 16, pp.53–93, 1991.
- Hsu, M. H., C. M. Chiu, and T. L. Ju. "Determinants of continued use of the WWW: an integration of two theoretical models." *Industrial Management + Data Systems*, vol. 104(8/9), pp. 766, 2004.
- Holden, G. "The relationship of self-efficacy appraisals to subsequent health related outcomes: a meta-analysis," *Social Work in Health Care*, vol. 16, pp.53–93, 1991.
- Jeyaraj, A., J. W Rottman, and M. C Lacity. "A review of the predictors, linkages, and biases in IT innovation adoption research." *Journal of Information Technology* 21, no. 1 (2006): 1–23.
- Langlois, M. A., R. Petosa, J. S. Hallam, "Why do effective smoking prevention programs work? Student changes in social cognitive theory constructs," *Journal of School Health*, vol. 69(8), pp.326-31, 1999.
- Liang, T. P, and D. N Chen. "Evolution of information systems research." In *Proceedings of Pacific Asian Conference on Information Systems*, 257–269, 2003.
- Liu, Z., Q. Min, and S. Ji. "A Comprehensive Review of Research in IT Adoption." In *4th International Conference on Wireless Communications, Networking and Mobile Computing*, 2008. WiCOM'08, 1–5, 2008.
- Lucas H.C., Jr. "Behavioral Factors in System Implementation, in "Implementing Operations Research/Management Science, R.L. Schultz and D.P. Slevin (eds.), American Elsevier, New York, 1975.
- Klopping, I. M., and E. McKinney Jr. "Practice makes a difference: experience and e-commerce." *Information Technology, Learning, and Performance Journal*, vol. 24(1), pp. 25, Spring 2006.
- Marakas, G.M., Yi, M.Y., and Johnson, R., "The multilevel and multifaceted character of computer self-efficacy: Toward a clarification of the construct and an integrative framework for research," *Information Systems Research*, 9 (2), pp. 126-163, 1998.
- Moore, G. C., and Benbasat, I. "Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation," *Information Systems Research*, vol. 2(3), pp. 192-222, 1991.
- Pajares, F. Self-efficacy beliefs in academic settings. *Review of Educational Research*, vol. 66, pp. 543-578, 1996.
- Parraga, I. M. "Determinants of Food Consumption," *Journal of American Dietetic Association*, vol. 90, pp. 661-663, 1990.
- Pearson, J Michael, and Ann M. Pearson. "An exploratory study into determining the relative importance of key criteria approach." *The Journal of Computer Information Systems*, vol. 48(4), pp. 155, Summer 2008.
- Rogers, Everett M. *Diffusion of Innovations*. 4th ed. New York: Free Press, 1995.

- Schunk, D. H. Coming to terms with motivation constructs. *Contemporary Educational Psychology*, vol. 25, pp. 116-119, 2000.
- Thompson, R.L., Higgins, C.A., and Howell, J.M. "Personal Computing: Toward a Conceptual Model of Utilization," *MIS Quarterly*, vol. 15(1), pp. 125-143, March 1991.
- Venkatesh, V. and F. D. Davis, "A model of the antecedents of perceived ease of use: development and test," *Decision Sciences*, vol. 27(3), pp. 451, 1996.
- Venkatesh, V. and Davis, F.D. "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies," *Management Science* (46:2), 2000, 186-204.
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425.
- Webster, J. and Martocchio, J.J. "Microcomputer Playfulness: Development of a Measure With Workplace Implications," *MIS Quarterly*, vol. 16(2), pp. 201-226, June 1992.
- Williams, M. D, Y. K Dwivedi, B. Lal, and A. Schwarz. "Contemporary trends and issues in IT adoption and diffusion research." *Journal of Information Technology* 24, no. 1 (2009): 1–10.
- Williams, K.E. & Bond, M.J. (2002). The roles of self-efficacy, outcome expectancies and social support in the self-care behaviours of diabetes. *Psychology, Health & Medicine*, 7, 127-141.
- Wise, J. B. "Social Cognitive Theory: A Framework for Therapeutic Recreation Practice." *Therapeutic Recreation Journal* (2002).
- Wood, R. E., and A. Bandura. "Social cognitive theory of organizational management." *Academy of Management Review*, vol. 14(3), pp. 361-384, 1989.
- Yi, M. Y., and F. D. Davis, "Developing and validating an observational learning model of computer software training and skill acquisition," *Information Systems Research*, vol. 14(2), pp. 146, 2003.
- Zimmerman, B. J. "A social cognitive view of self-regulated academic learning," *Journal of Educational Psychology*, vol. 81, pp. 329-339, 1989.

**APPENDIX: REVIEW OF IS THEORETICAL MODELS**

Theoretical Models	Individual					Environmental		Behavior		SCT Paths
	SE	OE	Others	Emotional	Others	Social	Situational	Behavioral Intention	Behavior	
Diffusion of Innovations Theory	complexity	relative advantage	compatibility				trialability, observability		innovation adoption	P-B E-B
Expectation-confirmation theory of IS continuance		perceived usefulness	confirmation of expectations	satisfaction with IS use				IS continuance intention		P-B B-P
IS Success Model (DeLone & McLean)				user satisfaction		organizational impact	information quality, system quality		use, individual impact	E-P-B E-P-E E-B-E
Updated IS Success Model (DeLone & McLean)				user satisfaction		net benefits	information quality, system quality, service quality	intention to use	use	E-P-B E-P-E E-B-E
PC utilization model (subset of Triandis model)		perceived consequences (perceived complexity, perceived job fit, perceived long-term consequences)		affect	habits	social factors, facilitating conditions		behavioral intention to use PCs	utilization of PCs	P-B E-B B-P
Perceived Characteristics of Innovations	ease of use	relative advantage, result demonstrability, image	compatibility				trialability, visibility, voluntariness		innovation adoption	P-B E-B
Task-Technology Fit							task characteristics, technology characteristics		performance impacts, utilization	E-B
Technology Acceptance Model	perceived ease of use	perceived usefulness						behavioral intention to use a system	actual system use	P-B
Technology Acceptance Model II	perceived ease of use	perceived usefulness, image, result demonstrability	job relevance, output quality		experience	subjective norms	voluntariness	behavioral intention to use a system	actual system use	P-B E-B E-P-B
Theory of Planned Behavior	control beliefs, perceived behavioral control	behavioral belief, attitude toward behavior				normative belief, subjective norm		behavioral intention to use a system	use behavior	P-B E-B
Theory of Reasoned Action		behavioral belief, attitude toward behavior				normative belief, subjective norm		behavioral intention to use a system	use behavior	P-B E-B
Unified Theory of Acceptance and Use of Technology (UTAUT)		performance expectancy		Attitude toward using technology	gender, age, experience	social influence, facilitating conditions	voluntariness	behavioral intention to use a system	use behavior	P-B E-B E-P-B

**COPYRIGHT**

Carillo © 2010. The authors assign to ACIS and educational and non-profit institutions a non-exclusive licence to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The authors also grant a non-exclusive licence to ACIS to publish this document in full in the Conference Papers and Proceedings. Those documents may be published on the World Wide Web, CD-ROM, in printed form, and on mirror sites on the World Wide Web. Any other usage is prohibited without the express permission of the authors.