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# The Effect of Self Identity and Social Identity on Technology Acceptance

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## Abstract

*While the effect of social factors on information technology (IT) acceptance behavior has been recognized as an important issue, only a few studies examined this topic in the context of the technology acceptance model. In this study, we incorporate two social factors, self identity and social identity, in the model and address their impacts on IT acceptance decision. An empirical study investigating the impact these social factors have on the acceptance of a web-based class support system is in progress. Upon completion of this study, we expect to provide further understanding on the role of social influence on individual technology acceptance decisions.*

**Keyword:** TAM, identity theory, social influence.

## INTRODUCTION

Individual acceptance of information technology (IT) has long been an interest of both managers and researchers. Many researchers have studied different aspects of the phenomenon from a variety of theoretical perspectives (Compeau and Higgins 1995a, 1995b; Davis 1989; Rogers 1994; Thompson et al. 1994). One of the most widely accepted theories is the technology acceptance model (TAM) around which a number of theoretical and empirical studies have been accumulated (Mathieson 1991; Taylor and Todd 1995a, 1995b; Venkatesh and Davis 2000).

Recently, some researchers have acknowledged the role of social factors in IT acceptance decisions and investigated a way to accommodate them into IT acceptance models as shown in Table 1 (e.g., Davis et al. 1989; Hartwick and Barki 1994; Karahanna et al. 1999; Thompson et al. 1991, 1994). Most of these studies focused on *subjective norm,* defined as "a person's perception that most people who are important to him think he should or should not perform the behavior in question" (Fishbein and Ajzen 1975, pg. 302). Other constructs used to date to measure social influence in TAM include *social outcomes* (Venkatesh and Brown 2001), *social image* (Venkatesh and Davis 2000), and *social presence* (Igbaria et al. 1996). While these empirical investigations have provided useful insights on the effect of social factors on technology acceptance, those studies examining the social factors are still relatively few in number. Further studies are needed for fuller examination of social factors influencing IT acceptance (e.g., Lucas and Spitler 1999).

This study investigates how, if at all, people's perception of *self identity* and *social identity* influence IT acceptance. These identity perceptions have been shown in social psychology to be important social factors contributing to behavioral intention in the theory of planned behavior (Biddle et al. 1987; Charng et al. 1988; Conner and Armitage 1998). Based on these findings, we propose a model to explore how the identity perceptions contribute to the behavioral intention to use a technology, how they are related to the other main constructs in TAM (perceived usefulness, perceived ease of use, subjective norm), and how much additional explanatory power they provide. We are empirically testing the model in the context of instructors' acceptance behavior of a web-based class support system that was recently adopted in a large Midwest university. We expect that those factors supplement the weakness of the previous social factors in TAM, thus increasing the explanatory power of TAM. The relationship between the identity perceptions and the other social factors proposed to date, although an important topic, is beyond the focus of this study and left for future research.

**Table 1.  A Summary of Social Influence Under IT Adoption Theories**

| Journal | Author | Target IS | Theory | Subjects (N) | Factor | Significance *significant, **insignificant |
|---|---|---|---|---|---|---|
| JMIS | Igbaria et al. (1996) | Microcomputer | TAM | CEOs of 52 U.S. Companies (519) | Social Pressure (SP) | SP → Usage* |
| JMIS | Thompson et al. (1994) | PC | Triandis Model | Eight individual organizations (325) | Social Factors (SF) | SF → Utilization of PCs by inexperienced user* SF → Utilization of PCs by the experienced* |
| MISQ | Thompson et al. (1991) | PC | Triandis Model | A multinational manufacturing organization (278) | SF | SF → Utilization of PCs by knowledge workers* |
| MISQ | Taylor and Todd (1995) | Computer Resource Center | TPB | Business students (786) | SN | SN → BI by inexperienced users* SN → BI by experienced users* |
| MISQ | Venkatesh and Brown (2001) | PC | TPB | American households (733) | Social Influence (SI) | SI → current PC purchase decision* SI → future PC purchase intent by the intenders* |
| MISQ | Karahanna et al. (1999) | Windows 3.1 | TRA | A Midwest Financial Institution PC users (268) | Subjective Norm (SN) | SN → Behavioral Intention (BI) to the current User* SN → BI to the potential adopters * |
| MISQ | Venkatesh and Morris (2000) | Data and Information Retrieval System | TAM | Five U.S. Organizations (445) | SN | Initial Adoption: SN → BI for Women* SN → BI for Men** After 3 months: SN → BI for Women** SN → BI for Men** |
| MISQ | Gefen and Straub (1997) | E-mail | TAM | U.S., Swiss, and Japanese Airline company (392) | Social Presence (SP) | SP → PU* |
| ISR | Mathieson (1991) | Spreadsheet | TAM and TPB | Undergraduate Students (262) | SN | SN → BI ** |
| ISR | Taylor and Todd (1995) | Computer Resource Center | TAM and TPB | Business Major students (786) | SN | SN → BI* |
| ISR | Harrison et al. (1997) | New IT | TPB | Senior executives (150) | SN | SN → BI* |
| MS | Venkatesh and Davis (2000) | Several business applications | TAM II | Manufacturing (48), financial firm (50), accounting firm (51), and intl. investment bank (51) | SN Image | Voluntary Use: - SN → BI** Mandatory Use: - SN → BI(Initial Adoption)* - SN → BI(3 mo later)** SN → PU*,  SN → Image* Image → PU* |
| MS | Davis et al. (1989) | WriteOne, wordprocessor | TAM and TRA | Full time MBA students (107) | SN | SN → BI** |
| MS | Hartwick and Barki (1994) | New business-oriented IS application | TRA | Canadian IP Society Members pre-development (293), post-imple mentation(127) | SN | SN → Pre-Development Intention to Use* SN → Post Implementation Intended Use** |
| DS | Lucas and Spitler (1999) | Workstations with business applications | TAM | Brokers (49) and Sales  (58) Assistants at investment bank | Social Norms | Social Norms → Intended Use* Social Norms → Use* |

## THEORETICAL BACKGROUND

### Technology Acceptance Model (TAM)

TAM is one of the most widely used models that explain individual's computer technology acceptance behavior. The model posits that *perceived usefulness* (PU) and *perceived ease of use* (PEOU) affect a person's IT acceptance behavior. PU is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance," and PEOU as "the degree to which a person believes that using a particular system would be free of effort"(Davis 1989, pg. 320). Previous studies have found that PU has a direct strong effect on acceptance intention, and that PEOU indirectly affects behavioral intention through PU. TAM has been applied to different technologies under different situations (e.g., time and culture) with different control factors (e.g., gender, organizational type and size), and received strong support (e.g., Gefen and Straub 2000; Igbaria, et al. 1997). Along the same context, we hypothesize that:

> **H1: There will be a positive relationship between PU and behavioral intention in technology acceptance.**

> **H2: There will be a positive relationship between PEOU and behavioral intention in technology acceptance.**

> **H3: PEOU will have an indirect positive relationship with behavioral intention via PU in technology acceptance.**

### Self Identity Theory

*Self identity*, developed from the *role identity theory* of McCall and Simmons (1978) and the *identity theory* of Stryker (1980), is defined as "the salient part of an actor's self which relates to a particular behavior that reflects the extent to which an actor sees him- or herself as fulfilling the criteria for any societal role" (Conner and Armitage 1998, pg. 1444). Self identity has been shown to have a significant effect on behavioral intention (Granberg and Holmberg 1990; Sparks and Shepherd 1992; Sparks et al. 1995), behavior (Theodorakis 1994), and attitude (DeBono and Snyder 1995). A meta-analysis of self identity indicates that it has significant causal relations to major constructs of the theory of planned behavior (Conner and Armitage 1998; Sparks and Guthrie 1998). As such, we hypothesize that those individuals who identify technology acceptance as one of his/her societal role will more likely intend to adopt the technology.

> **H4: There will be a positive relationship between self identity and behavioral intention in technology acceptance.**

Self identity also has been considered as an intrinsic motivation for human behavior since there is no apparent reinforcement other than one's own internal needs (Compeau and Higgins 1995a). *Image* defined as "the degree to which use of an innovation is perceived to enhance one's...status in one's social system" (Moore and Benbasat 1991, pg. 195) is similar to self identity. However, it is different from *image,* which focuses on the extrinsic oriented part of a person's self. Previous studies have found a positive causal association between intrinsic motivational factors and PEOU (Davis et al. 1992; Venkatesh 2000). Thus, we can also expect a positive relationship between self identity and PEOU.

> **H5: There will be a positive relationship between self identity and PEOU in technology acceptance.**

### Social Identity Theory

People in organizations derive part of their identity and self-concept from groups or teams to which they belong ("who we are"). The social identity is derived from the *social identity theory* of Tajfel (1972) and the *self-categorization theory* of Turner (1982). Tajfel defines *social identity* as "the individual's knowledge that he belongs to certain social groups together with some emotional and value significance to him of this group membership (p.292)." Like self identity, it has also been found to have a strong effect on human behavior, especially on the behavior of employees in organization (e.g., Hogg and Terry 2000; Marques et al. 1998). Pilegge and Holtz (1997) found that people who belong to groups or organizations represent the prototypical values and norms of their groups. Terry et al. (1999) suggested that social identity influences the attitude and behavioral intention of the recycling behavior of community residents. In the same context, we hypothesize that the more individuals perceive that using a web-based

class support system is important for their group, or perceive that the group has the positive norm to use the system, the more intention they will have to adopt it.

> **H6: There will be a positive relationship between social identity and behavioral intention in technology acceptance.**

Compared to self identity, social identity is an extrinsic motivation for achieving one's goals through maintaining a favorable group relationship. We hypothesize that there is positive relation between social identity and PU since PU is considered as the representative extrinsic motivational factor under TAM (e.g., Davis et al. 1992; Venkatesh and Davis 2000).

> **H7: There will be a positive relationship between social identity and PU in technology acceptance.**

## Subjective Norms

*Subjective norms,* defined as "a person's perception that most people who are important to him think he should or should not perform the behavior in question" (Fishbein and Ajzen 1975, pg. 302), has been used in TAM as a factor for measuring social influence (Azjen 1985; Mathieson 1991). Its importance has been tested through field studies in psychology (Ajzen 1985), information technology adoption (Venkatesh and Morris 2000), and computer-mediated communications (Ngwenyama and Lee 1997). Previous studies have, however, found that its effect is at most confusing: some studies showed that it is the weakest predictor for the behavior (Sheppard et al. 1988), while others found its relevance (Venkatesh and Davis 2000; Venkatesh and Morris 2000). Measurement problems and the failure to consider all of the relevant social factors (Conner and Armitage 1998; Davis et al. 1989) have been often sited as a reason that contributes to the mixed result. In this study, we expect that subjective norms will influence the technology acceptance decision directly or indirectly through PU. In particular, we include the following two hypotheses:

> **H8: There will be a positive relationship between subjective norms and behavioral intention in technology acceptance.**

> **H9: There will be a positive relationship between subjective norms and PU in technology acceptance.**

In sum, we have nine hypotheses for this study as shown in our research model (see Figure 1).
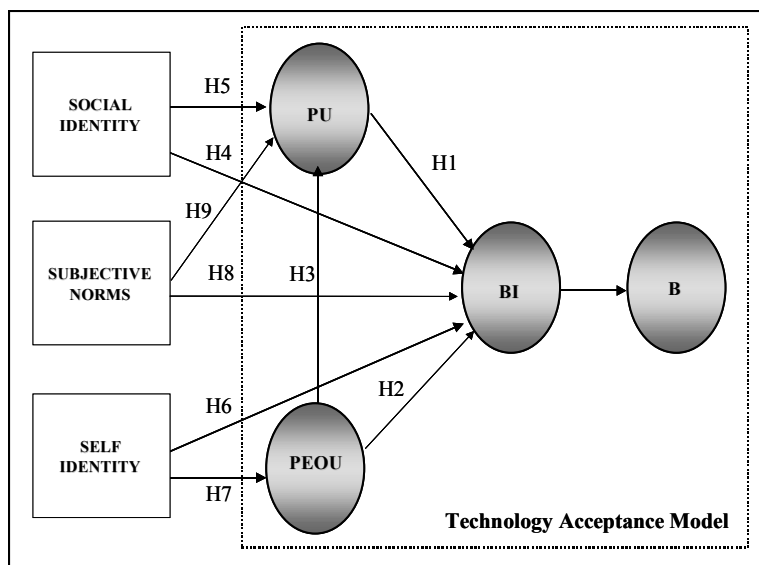


**Figure 1.  Research Model**

# RESEARCH METHOD

Our research model will be empirically tested based on instructors' acceptance of a web-based class support system. The web-based system used in the study is WebCT. It is a leading web-based teaching tool having various supporting functions including e-mail, BBS, online grading, personal homepage, simple syllabus posting, and calendar management. Over 148,000 faculty members at more than 1,700 colleges and universities are current users of WebCT. Recently, it was adopted by a large Midwest university.

This study is divided into pre-test, pilot test, and main survey. First, we performed a pre-test using 12 doctoral students at the university. For our pre-test, we adopted the electronic focus group study method, a cost-effective group interviewing technology characterized by synchronous idea generation, participation anonymity, and less dominance by the opinionated members (Stewart and Shamdasani 1990). We conducted the study by recruiting 12 doctoral students at the COMET lab with Group System developed by University of Arizona. Zigurs and Kozar (1994) applied the electronic focus group study and found it useful in gathering rich data for their study. The study results confirmed that self identity and social identity factors significantly influence the acceptance behavior of WebCT. The pre-developed questionnaire was circulated to the focus group participants as well as six faculty members for review of its wording, item order, contents, and format. We then performed a pilot test on 49 instructors at the university using the finalized questionnaire. We did principal component analysis (PCA) to measure the reliability and validity of the measurement scales. Table 2 shows that there is strong reliability and discriminant validity.

**Table 2. The Results of Principle Component Analysis: Pilot Test data (n = 49)**

| | **Constructor Loadings** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **BI** | **PU** | **PEOU** | **SI** | **IMAGE** | **SN** | **SOI** |
| BI1 | .889 | | | | | | |
| BI2 | .914 | | | | | | |
| PU1 | | .713 | | | | | |
| PU2 | | .802 | | | | | |
| PU3 | | .813 | | | | | |
| PU4 | | .843 | | | | | |
| PEOU1 | | | .883 | | | | |
| PEOU2 | | | .922 | | | | |
| PEOU3 | | | .813 | | | | |
| PEOU4 | | | .890 | | | | |
| SU1 | | | | .589 | | | |
| SI2 | | | | .636 | | | |
| IMAGE1 | | | | | .858 | | |
| IMAGE2 | | | | | .870 | | |
| IMAGE3 | | | | | .844 | | |
| SN1 | | | | | | .846 | |
| SN2 | | | | | | .581 | |
| SOI1 | | | | | | | .799 |
| SOI2 | | | | | | | .683 |
| Cronbach's α | 0.96 | 0.91 | 0.93 | 0.79 | 0.90 | 0.83 | 0.82 |

(Principle Component Analysis, Varimax Rotation)

Finally, we initiated a mail survey among 313 subjects who have been identified as users of the system in their class in the university. To increase the response rate, we developed both a questionnaire-based survey and a web-based survey.[1] Subjects can respond to the questionnaire according to their preference. We will test the hypothesized paths using LISREL8.3, which we chose because it can test the complicated causal relationship between newly introduced constructs and previous ones, and measure the explanation power of the model itself.

**Table 3. Measurement Scales**

| Constructs | Reference | | Measurement Items |
|---|---|---|---|
| Intention | Venkatesh (2000) | BI1 | Assuming I had access to WebCT, I intend to use it |
| | | BI2 | Given that I had access to Web CT, I predict that I would use it |
| PU | Venkatesh and Davis (2000) | PU1 | Using WebCT improves my performance in class |
| | | PU2 | Using WebCT in my class increases my productivity of teaching |
| | | PU3 | Using WebCT enhances my effectiveness of teaching in my class |
| | | PU4 | I find WebCT to be useful for teaching in my class |
| PEOU | Venkatesh and Davis (2000) | PEOU1 | My interaction with WebCT is clear and understandable |
| | | PEOU2 | Interacting with WebCT does not require a lot of my mental effort |
| | | PEOU3 | I find WebCT to be easy to use |
| | | PEOU4 | I find it easy to get WebCT to do what I want it to do |
| SN | Fishbein and Ajzen (1975) | SN1 | People who influence my teaching behavior would think that I should use WebCT |
| | | SN2 | People who are important to my teaching would think that I should use WebCT |
| Social identity | Ashforth et al. (1998); Mael and Tetrick (1992) | SQI1 | In general, I am very interested in what the faculty group important to me thinks about the WebCT for teaching support and management |
| | | SQI2 | I feel the belongingness to the faculty (or instructor) group important to me when I use WebCT for teaching support and management |
| | | SQI3 | I feel I will fit into the faculty (or instructor) group important to me when I use WebCT for teaching support and management |
| Self identity | Sparks and Shepard (1992); Charng et al. (1988) | SI1 | To use WebCT in class support and management is an important part of who I am as a faculty member (or an instructor) |
| | | SI2 | As a faculty member (or an instructor), I am not the type of person oriented to use WebCT actively in class support and management |
| | | SI3 | I think of myself as a faculty member (or an instructor) who is very concerned with using WebCT |
| Image | Moore and Benbasat (1991) | IMG1 | The faculty (or instructors) in my department who use WebCT have more prestige than those who do not |
| | | IMG2 | The faculty (or instructors) in my department who use WebCT have a high profile |
| | | IMG3 | Having WebCT is a status symbol in my department |

## MEASUREMENT OF VARIABLES

As shown in Table 3, our measurement scales are divided into seven groups: (1) acceptance intention toward the WebCT, (2) PU, (3) PEOU, (4) subjective norms, (5) social identity, (6) self identity, and (7) image. We use *subjective norms* and *image* to investigate if subjects found the clear perceptual differentiation with social and self identity. In this study, we do not measure

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[1]You can look at the web-survey form at the following web site: http://rtt.colorado.edu/~jintae/webCTsurvey.html.

the actual acceptance behavior, assuming that the acceptance intention is a strong predictor for the actual behavior based on several previous studies (e.g., Taylor and Todd 1995a; Venkatesh and Morris 2000). We performed the confirmatory factor analysis between subjective norms, social identity, self identity, and image to show that they are different constructs that measures different aspects of social influence.

## EXPECTED RESULTS AND IMPLICATION

The confirmatory factor analysis for the reliability and validity tests and the structural equation modeling analysis for the causal paths among the major variables were performed and will be presented at the conference. We found that two identity factors significantly influence the WebCT usage intention directly and indirectly. We expect this study will generate both theoretically and practically useful implications. Theoretically, this study includes two new social constructs in the TAM and measures their effects on the acceptance decision through an empirical study. Thereby the study answers the previous calls for further investigation of the social factors in technology acceptance behavior (e.g., Sparks and Guthrie 1998). If they prove significant, these two constructs will also have practical implications. For example, knowledge of identity perception can provide useful input to training programs. If perception significantly influences users' technology acceptance decision and works as both motivational and control factors, then including contents into training programs that would induce positive identity perception for a new technology may increase the intention to use the technology among the trainees. Managers may also find the identity perception important in their recruitment of employees, such as IT support groups, for whose jobs the acceptance of a given technology is critical.

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