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정보시스템 수용모델에 있어서 사회적영향의 조작화와 역할

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The Operationalization and Role of Social Influence in Technology Acceptance Model

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Abstract

In numerous studies of Technology Acceptance Model (TAM), the social influence construct has been operationalized as subjective norm. This study proposes to stretch this construct to include two more constructs : image and visibility. This paper also questions about the paths regarding this comprehensive construct. Due to the controversies regarding the significance of social influence on IS usage, this study taps the possibility that social influence works as an antecedent to PU (Perceived Usefulness) and PEU (Perceived Ease of Use). We could find the significant differences in path coefficients depending on how social influence is operationalzied.

Keyword : Technology Acceptance Model, Social Influence, Structural Equation Modeling

1. Introduction

Technology Acceptance Model (TAM), based on the Theory of Reasoned Action (TRA [4]), has been widely used for predicting individual's voluntary adoption and use of information technologies in conducting tasks [15]. The beliefs determining attitude and intention posited by

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TAM are perceived ease of use (PEU) and perceived usefulness (PU). Davis ([14, 16]) regressed onto these two important cognitive factors regarding IS acceptance. Numerous IS literature has followed to retest the construct validity of these two concepts, and confirmed it (e.g., [1, 13, 22, 36]). In his Technology Acceptance Model, Davis found that attitude was just a mediating factor of PU on IS use, and that social norm does not influence IS use.

While being powerful in helping predict user acceptance, one of the limitations of TAM is it does not help understand and explain acceptance in ways that guide development beyond suggesting such generic characteristics (usefulness and ease-of-use) ([45] : 472). Therefore, recent TAM studies have focused on the antecedents that lead to PU and PEU as well as to IS use intention or actual usage.

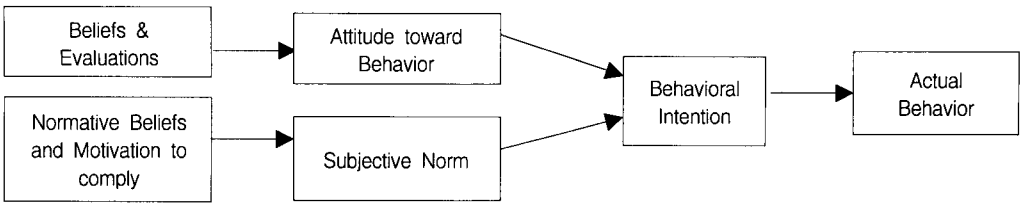
Recently, the social influence on the adoption of information systems is getting more attention (e.g., [5, 19, 27, 32, 33, 48]). Most empirical studies with interest in this issue are based on Theory of Reasoned Action (e.g., [24]), Theory of Planned Behavior (TPB) (e.g., [8, 9, 28, 38]), and Triandi's attitude theory (e.g., [11, 40, 41]). [Figure 1] introduces these IS adoption theories.

Some TAM studies also included the social influence construct as an antecedent in the model (e.g., [26, 46]), even though the path structure around social influence has not been uniform. However, social influence still remains as a subtle and vague construct in terms of operationalization and path analysis. We are concerned that this construct has been treated too narrowly (as subjective norm) or too blindly without comprehensive attention to its nature. In their updated TAM (named TAM 2), Venkatesh & Davis [46] picked up subjective norm, image, and voluntariness as the manifestations of social influence. However, we point out the following issues in their operationalization. First, voluntariness should not be considered in TAM by its nature. TAM is about individual's voluntary adoption and use of IS. A mandatory usage of IS is not the appropriate situation where TAM can be referred. Second, subjective norm and image are not the social influence itself, but the drivers of it. Social influence is the individual's perception triggered by subjective norm and image, etc. Therefore, social influence may well be regarded as the latent factor of such drivers. Third, the role of social influence is not necessarily confined to PU, and needs to be investigated more comprehensively. Therefore, we need to identify what is the nature of social influence whose existence has been presumed in MIS studies.

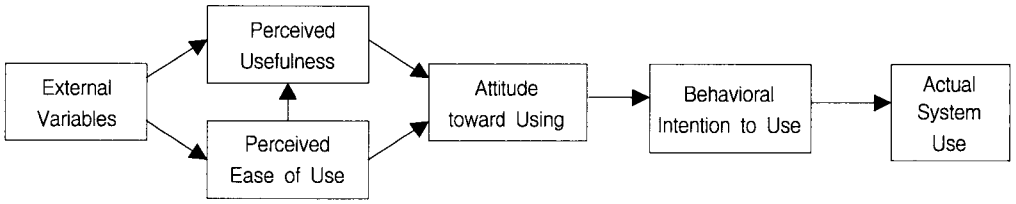
Our study attempts to clarify the understanding of the social influence construct and its role in user's information technology acceptance. We particularly focus on TAM and add a comprehensive construct of social influence adapted from other IS adoption theories mentioned above. Quite a few studies combined TAM with other IS adoption theories to balance with the parsimony of TAM. For example, Lucas & Spitler [26] added social norm from TRA ; Chen, Gillenson & Sherrell [10] and Venkatesh & Davis [46] combined with IDT (Innovation Diffusion Theory)[1] ; Chau & Hu ([8, 9]) integrated

1) Moore & Benbasat (1991) developed an instrument to measure the perceptual factors influencing information technology innovation, and identified eight important factors : voluntariness, relative advantage, compatibility, image, ease of use, result demonstrability, visibility, and trialability.

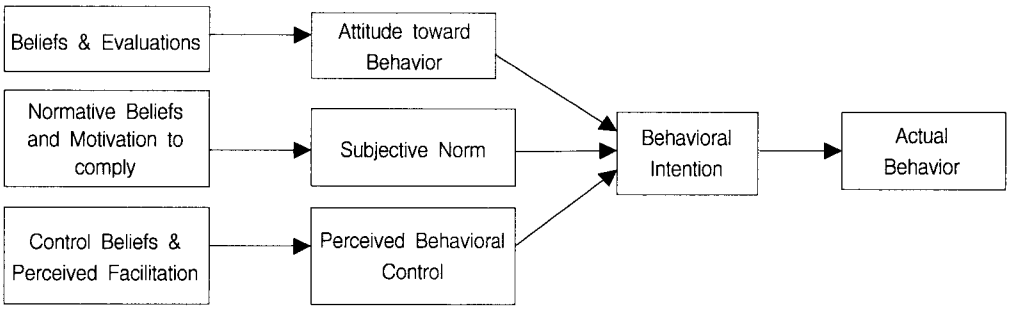
TRA (Theory of Reasoned Action, [18])



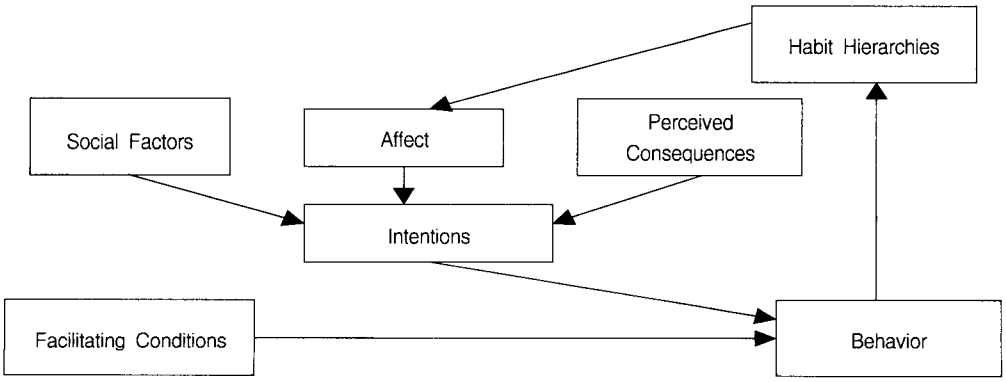
TAM (Technology Acceptance Model, [15])



TPB (Theory of Planned Behavior, [3])



Triandi's Attitude Theory [43]



[Figure 1] IS Adoption Theories

with TPB ; Jiang, Hsu, Klein & Lin [23] and Teo, Lim & Lai [39] combined with Triandi's model ; and, Moon & Kim [30] added Webster & Martocchio's microcomputer playfulness. In these studies, the significance of social influence (subjective norm) on IS use has not been in consensus. Due to its unstable path coefficient on IS use, we tapped the possibility that social influence antecedes to PU and PEU in TAM.

We test this model with the comprehensive operationalization of social influence for an office automation system (spreadsheet). Office automation softwares such as spreadsheet and word processor has been the popular domains of TAM model research (e.g., [1, 7, 15, 22, 28, 45]). These products have diverse alternatives, providing the customer with a variety of choices. We will compare the results of structural equation models according to how social influence is operationalized in TAM.

Our paper consists of six sections. After introduction, our proposed operationalization of social influence, the perceived social influence (**PSI**), is introduced and discussed for its nature. In this section, we hypothesize that it is a second-order multi-dimensional latent variable formed by three first-order latent variables (subjective norm, image, and visibility), which are the frequently referred psychological indicators in numerous IS adoption studies. Next, the nomologi al network between PSI and other constructs in TAM is introduced with hypotheses. Research methodology is explained in the next section, followed by the empirical analyses. Finally, the conclusive remarks and discussions appear.

2. Social Influence

As Pare & Elam [33] pointed out, social context has not received enough attention in the studies of information system adoption. Social influence can be defined as "an individual's internalization of the reference group's subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations" [43]. In IS studies, however, social influence has been treated identical to subjective norm (social norm) of Theory of Reasoned Action [18]. Subjective norm is defined as "the individual's perception of a referent other's opinion about the individual's performance of the behavior" ([18] : 302).

This tradition has been taken for granted too long. Davis *et al.* [15] dropped the subjective norm from the original TAM model due to its uncertain theoretical and psychometric status. We believe social influence is a more comprehensive construct than subjective norm. Social interactions are affected passively by, and/or produce and modify actively three fundamental elements of social structure (i.e. social influence) : meaning, power, and norms [20]. Therefore, traditional confinement of social influence only to subjective norm ignores two other important aspects of it : meaning and power.

For the sake of comprehensive understanding of social influence, we propose to pay special attention to the following three issues. First, aligned with other psychological models regarding IS adoption, we insist that social influence should be perceived prior to causing any impact on individual's own IS usage. A common theme underlying the various streams of research in technology adoption is the inclusion of per-

ceptions of an innovation as key independent variables [2]. So, the appropriate name for this construct would be the perceived social influence (**PSI**).

Second, we can identify the components of PSI from other IS adoption theories : TAM, TRA, TPB [3], Triandi's attitude theory [43], and IDT [31]. By content validity, three constructs are judged associated with PSI : subjective norm (social norm), visibility, and image. The subjective norm of TRA, TPB, and Triandis [43] is the representative construct in this regard (e.g., the decomposed theory of planned behavior of Taylor & Todd [38] ; TAM 2 of Venkatesh & Davis [46]). It relates to internalization and expert power of the influencing agents ([46] : 189). The social influence of subjective norm in IS adoption means that significant other's use of a certain IS can influence user's usage and perception of it.

Two other dimensions of PSI come from IDT [31] : image and visibility. Image is defined as "the degree to which adoption/usage of the innovation is perceived to enhance one's image or status in one's social system." ([31] : 195). This is close to Chau's [7] long-term PU and Tornatzky & Klein's [42] social approval. Chau [7] distinguished between short-term PU and long-term PU, stating the former relates to functionality of computer systems on improving job performance or enhancing job satisfaction, whereas the latter relates to improving one's social status. Tornatzky & Klein [42] identified social approval as one of the ten characteristics addressed most frequently in over 100 innovation studies. In Gidden's [20] three elements of social structure, image relates more to meaning. Social interaction theories have delved into the mechanisms by which social influence happens and shared meaning is created in organizations [32]. From the perspective of institutionalized properties, meaning (i.e., interpretive schemes) represent organizational structures of significance, which represent the organizational rules that inform and define interaction ([32] : 404). Most of these organizational rules relate to the roles in organizations that affect organizational identification and images. In sum, the social influence of image implies that visualization of self-images on using a certain IS influences user's perception and usage of it.

The third dimension of PSI is visibility. Visibility means "the degree to which the innovation is visible in the organization" : i.e., the more a potential adopter can see an innovation, the more likely she/he is to adopt it ([31] : 195). Visibility is a closely related concept to "critical mass" [27] and "network externality" [34] that asserts the usefulness of a network is primarily a function of the number of participants in the network. Compared to other PSI dimensions, visibility is related to non-significant others because of the nature of critical mass theory. In Gidden's [20] taxonomy, visibility relates more to power. Power is defined as "transformative capacity" and constitutes organizational structure of domination. In software industry, popularity sets the standard that absorbs the late users [17]. Therefore, the number of users connotes the power of transforming usage of a certain IS. In other words, the social influence of visibility denotes that the dominant number of users in organization influences user's perception and usage of a certain IS.

Third and lastly, those three constructs (subjective norm, visibility, and image) are the "for-

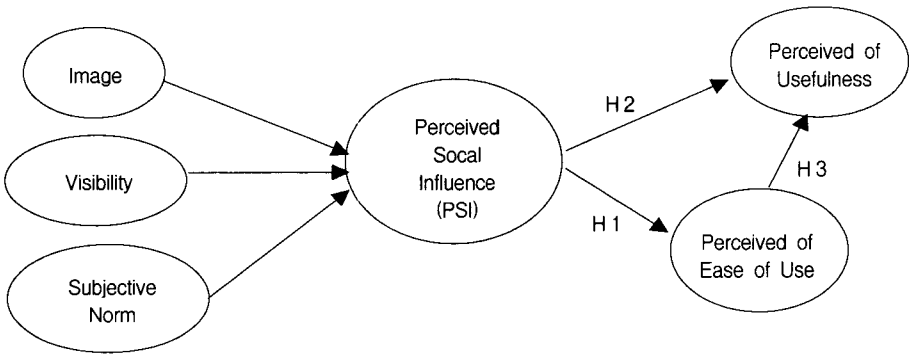
mative" indicators of PSI. The following are the conditions for the observed variables to be regarded as the reflective indicators of the multidimensional latent variable ([12, 25]) : 1) multi-dimensional construct causes indicators, 2) any indicator can represent multi-dimensional construct, 3) there is high correlation among indicators, and 4) fitness indices are high. The first condition is not applicable to our study because social influence is perceived by external factors (i.e., subjective norm, image, and visibility), not vice versa. The second condition stands at odds with our position that all those three factors cause people to perceive social influence (i.e., they are the sources of PSI). We decline the argument that any one of those three indicators alone can represent PSI. The third condition is not applicable because it is not clear why visibility necessarily moves in the same direction as subjective norm and image. Lastly, number four is a necessary condition when the multi-dimensional construct is a reflective latent variable [12].

Therefore, we contend that PSI is a multi-dimensional construct formed by subjective norm, image, and visibility. Statistically speaking, PSI is the second-order latent variable formed by the three first-order latent factors (subjective norm, image, and visibility). In layman's words, user's perception and usage of IS can be affected not only by the information system's technical features, but also by other people's usage and perception of an IS. Technical features are regressed on PU and PEU according to TAM. Social influence cannot necessarily be confined to significant other's usage (i.e., subjective norm). When a large number of users are observed and when self-image is believed to be improved by using a certain IS, people must be inclined to use it.

3. Research Model

[Figure 2] depicts the research model of this study.

Numerous TAM studies repeatedly confirmed the relationship between PU and PEU (e.g., [7, 14-16, 28, 37, 38, 45]). So, this path is adopted in our research model without any theoretical recount. However, the significance of social influence on IS use has not been in consensus. <Table 1> summarizes the IS adoption studies that tested the role of subjective norm on IS usage or the intention to use IS. Due to its



[Figure 2] Research Model

〈Table 1〉 Subjective Norm & IS Adoption

Studies	Operationalization	Results
Chau & Hu [8]	Taylor & Todd [38]	Non-significant path coefficient to behavioral intention
Chau & Hu [9]	Taylor & Todd [38]	Non-significant path coefficient to behavioral intention
Cheung, Chang & Lai [11]	Triandis [43]	Significant regression coefficient to current usage
Davis, Bagozzi & Warshaw [15]	Ajzen & Fishbein [4]	Non-significant regression coefficient to behavioral intention
Karahanna, Straub & Chervany [24]	Ajzen & Fishbein [4]	Significant path coefficient to behavioral intention. Non-significant path coefficient to behavioral intention
Lucas & Spitler [26]	Fishbein & Ajzen [18]	Significant regression coefficient to both behavioral intention & use
Mathieson [28]	Ajzen & Fishbein [4]	Non-significant regression coefficient to behavioral intention
Taylor & Todd [38]	Ajzen & Fishbein [4]	Significant path coefficient to behavioral intention
Thompson, Higgins & Howell [40]	Pavri (1988)	Significant path coefficient to utilization
Thompson, Higgins & Howell [41]	Pavri (1988)	Significant path coefficient to utilization (both experienced & inexperienced users)
Venkatesh & Davis [46]	Taylor & Todd [38]	The effect on behavioral intention gets weak as time proceeds
Venkatesh & Morris [47]	Davis *et al.* [15]	Significant path coefficient for women, non-significant for men

unstable significance, the path from social influence on IS use is eliminated in our research model. Instead, we tapped another possibility regarding the antecedent role of this comprehensive construct onto PU and PEU in TAM. Thus, the paths around perceived social influence (PSI) need illustration.

TAM is focused on the individual psychological status. Moving beyond a concern with one user and an interface, the socio-technical perspective alerts that a network of social relationships surrounds all working practices (e.g., [32, 48]). Technology historian Carl Mitcham [29] recognizes the "unintended intentions" (symbolic import) in individual's adoption of technology artifacts, which address various styles and usage. This perspective insinuates that individual's beliefs are socially constructed through interactions with other members. With empirical evidence, Venkatesh & Davis [46] found that subjective norm is an external factor for PU. Meanwhile, psychological studies on TRA found that the social norm has a positive impact on a person's feeling toward behavior ([6, 35, 44]). Relatedly, Cheung, Chang & Lai [11] verified that social factors influence affect toward computer usage. Provided that PEU is associated with affective appeal such as feeling comfortable [45], we can assume that PSI must have significant impact not only on the individual PU but also on PEU regarding the characteristics of computer systems. In sum, our research model generates the following three hypotheses.

H1 : Perceived social influence has significant impact on PEU of a system.

H2 : Perceived social influence has significant impact on PU of a system.

H3 : PEU of a system has significant impact on PU of a system.

Hypothesis 3 may not sound new because this hypothesis was verified by numerous previous TAM studies. Structural equation modeling estimates a series of separate, but interdependent, multiple regression equations simultaneously [21]. Therefore, the inclusion of the social influence factors onto TAM must influence the strength of paths surrounding PU and PEU. So far, I could identify three studies that included the social influence construct in TAM (i.e., [15, 26, 46]), but all of them used the multiple regression method.

4. Methodology

We will run the Partial Least Squares (PLS) and test the robustness of our model in regards to the use of spreadsheet that has been the most popular research domain in TAM. We will run another TAM model that contains only subjective norm instead of PSI.

4.1 Data Collection

Data was collected from under-graduate students majoring in MIS (management information systems) in a New England area. Samples were regarded as homogeneous in terms of demographic features such as age, class and major. Students who were surveyed already took or were taking the MIS courses such as introduction to computers, database management, business network, and programming languages. The questionnaires were purposely handed out on late November, so that the students would already be familiar with the MIS courses that they were taking. Students were asked to fill out both spreadsheet and Internet usage surveys anonymously and submit them to the class instructors on a voluntary basis. It took 9 weeks to finish collecting the surveys. In total, 211 valid questionnaires were returned out of 420 handouts, recording 50.2% of return ratio.

4.2 Questionnaire

Most of the measurement items were taken from the relevant studies. The measurement items regarding PU and PEU were taken from Davis, Bagozzi & Warshaw [15]. Measurement items of subjective norms came from Mathieson [28] and Taylor & Todd [38]. Measurement items of visibility and image came from Moore and Benbasat [31]. In Moore and Benbasat's [31] measurement model, there are four items for the visibility scale, while this research deals with 3 items. The item "PWS are not very visible in my organization" has been excluded because of the redundancy of the "visible" in measuring "visibility." PSI, 2nd order factor in the model, is measured by the factor scores of those three components (image, visibility, and subjective norm).

4.3 Assessment of Reliability and Validity

The reliabilities for each scale are shown in <Table 2>. The measurement scales used in the

study show high levels of reliability-Cronbach's alpha is above 0.80.

〈Table 2〉 Reliability Estimates

Construct	Items	Cronbach's alpha
PU	4	.9428
PEU	4	.8967
Image	4	.8636
Visibility	3	.8205
Subjective Norm	2	.8717

Convergent validity is assessed by factor analysis of the scales. The factor loadings are shown in <Table 3>. Through Varimax rotation, the 17 items are cleanly loaded onto 5 factors - PEU, PU, image, visibility, and subject norm.

We assess the discriminant validity by testing if all items load more highly on their associated construct than on any other constructs. The square root of the average variance extracted for each construct was compared to the correlations between each construct and other constructs. All the values of the square root of the average variance (i.e., the diagonals) were greater than the correlations between constructs (i.e., the off-diagonals) in <Table 4>, indicating that all the constructs in the model exhibited the discriminant validity.

〈Table 3〉 Factor Analysis of Scales

	1	2	3	4	5
PU 1	.875	.181	.127	.160	.126
PU 2	.884	.174	.107	.112	.143
PU 3	.887	.200	.130	9.439E-02	.139
PU 4	.869	.214	.133	.102	7.997E-02
PEU1	.167	.885	8.760E-02	8.984E-02	6.584E-02
PEU 2	.159	.769	6.814E-02	.167	.191
PEU 3	.196	.837	5.377E-02	.165	2.777E-02
PEU 4	.214	.835	5.249E-02	.193	.129
IMG 1	.160	-2.234E-02	.810	.137	.149
IMG 2	.125	9.960E-02	.870	5.887E-02	8.414E-02
IMG 3	9.583E-02	6.263E 02	.735	6.448E 02	.154
IMG 4	5.679E-02	9.981E-02	.852	.125	.127
VS 1	.153	.169	4.004E-03	.843	1.346E-02
VS 2	.131	.157	.153	.843	.147
VIS 3	9.297E-02	.205	.227	.767	.117
SN 1	.206	.211	.246	.154	.840
SN 2	.211	.145	.288	.115	.853

Extraction Method : Principal Component Analysis. Rotation Method : Varimax with Kaiser Normalization. Rotation converged in 5 iterations.

Notes) PU = Perceived Usefulness, PEU - Perceived Ease of Use, IMG = Image, VS = Visibility
SN = Social(Subjective) Norm

〈Table 4〉 Discriminant Validity

	PU	PEU	IMG	VS	SN
PU	.926				
PEU	.446	.878			
IMG	.302	.207	.852		
VS	.336	.418	.306	.869	
SN	.424	.379	.470	.347	.940

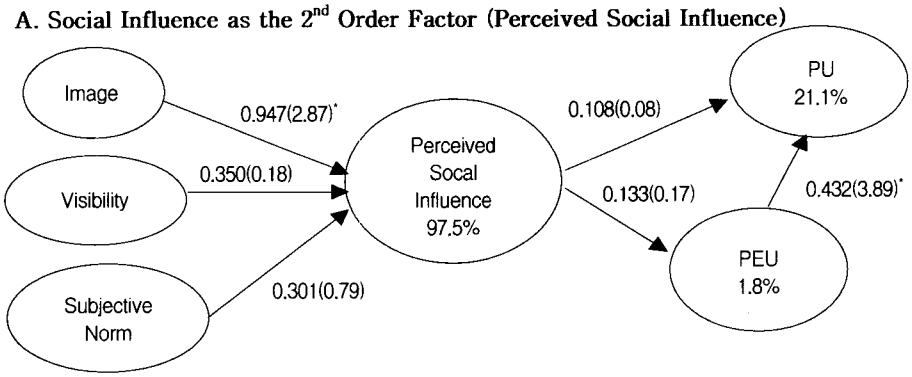
Note) Diagonal elements are the square roots of the average variance extracted and off-diagonal elements are correlations between constructs.

5. Test Results

[Figure 3] demonstrates the analysis results of PLS for two different operationalization of social influence.

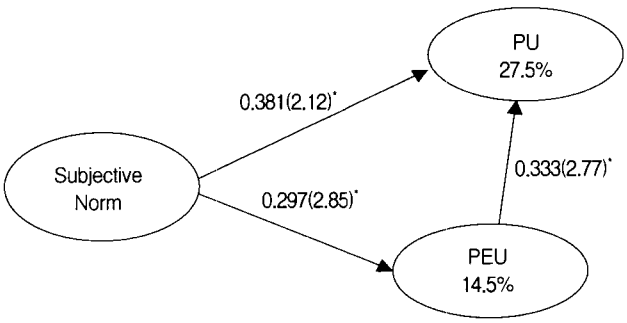
When social influence is measured as the comprehensive construct (PSI), its antecedent role to PU and PEU is not significant. PEU significantly influenced PU, taking up the majority of variance in PU. Therefore, hypothesis 1 and 2 are rejected, whereas the hypothesis 3 is supported. In this measurement, 97.5% of PSI's variance is explained by three drivers. Among those three components, image is the only significant driver for PSI, whereas visibility and subjective norm are not such significant drivers for PSI. However, when social influence is measured only by the subjective norm, it significantly influences both PU and PEU. Still in this

A. Social Influence as the 2nd Order Factor (Perceived Social Influence)



주) * $p < 0.05$

B. Social Influence as Subjective Norm



주) * $p < 0.05$

[Figure 3] PLS Results

case, PEU significantly influences PU. Therefore, when social influence is measured by subjective norm, all the three hypotheses are supported. Those two results clearly demonstrate that the influence of social influence on individual's technology acceptance is susceptible to how it is operationalized and measured. Therefore, to better understand the role of social influence, we need to have a strong theoretical rationale about its nature. In sum, according to our theoretical posture, we take the results when social influence is measured by PSI, so that we reject the hypothesis 1 and 2, accepting only hypothesis 3.

6. Discussion & Conclusion

In our analysis, we found that different ways of operationalizing social influence end up with different path coefficients on PU and PEU. When social influence was measured only by the subjective norm (as traditional studies have done), it had significant influence on both PU and PEU. Meanwhile, when social influence was measured by PSI, it did not have any significant influence on either PU or PEU. We made hypotheses based on previous studies that considered only subjective norm, and identified that all of our three hypotheses are confirmed when only the subjective norm was used. However, according to our theoretical foundation on the nature of social influence, we concluded that hypothesis 1 and 2 are rejected, whereas hypothesis 3 is supported.

The finding that social influence does not have significant impact on PU and PEU means individual's perception about the characteristics of information systems comes only from direct experience not from other people's influence. People use information systems for their own needs or recognition, but not to comply with other people. This finding cast serious doubts about social construction of information system's usefulness and ease-of-use. People share their experience and may be influenced by other's attitude temporarily. But, if their direct experience does not comply with such social atmosphere, users may not be affected and stick to their own experiences and recognition. Therefore, this study insists on paying more attention to user's direct experience and recognition of information systems, and also wonders whether social influence in regards to IT acceptance has been unfairly overvalued.

We argue that the inappropriate way of operationalizing social influence takes some responsibility for such an exaggeration of social influence, and misleads the understanding of the mechanisms of individual's usage of information systems. Subjective norm is only one of the components of comprehensive social influence. When social influence is operationalized only by subjective norm, its impact on individual's technology acceptance tends to be overvalued. The explanatory power on the variance of PU was bigger (27.5% vs. 21.1%) than when PSI was used. Subjective norm had significant impact on both PU and PEU of individual users when it represented social influence. However, social influence is such a comprehensive construct driven and forged by multiple constructs such as image, visibility, as well as subjective norm. Such a theoretical rationale proposes to use PSI instead of subjective norm as a measure of social influence, and led to the finding that social influence does not have such a serious impact

on individual's perception on computer system's characteristics. Moreover, subjective norm is not as a significant factor for PSI as image.

No matter how social influence is operationalized, we confirmed that PEU steadily influences PU as other TAM studies have found. We added a supplementary support for the importance of PEU on PU because its relative influence on PU overwhelmed that of PSI. This finding reasserts that PU is not the product of other people's influence but stems from user's appreciation of ease-of-use. Our findings may sound identical to that of Venkatesh & Morris [47] that the influence of subjective norm on behavioral intention dissipates as time passes by. However, our study provides the reason why such phenomenon occurs especially when computer systems are at mature stage (such as spreadsheet) : i.e., social influence does not lead to individual's PU and PEU that determine IS usage intention.

We had a cross-sectional study regarding the influence of PSI on PU and PEU. Future studies may well take more complicated approaches to investigate the roles of PSI in technology acceptance. For example, user's demographic profiles (such as the computer skillfulness, absorptive capacity, gender, etc.) and maturity of computer usage may come to influence the path coefficients of PSI on other constructs in TAM. Especially, the chronological changes in the influence of PSI on PU and PEU could be the strong agenda for the next study. Such dynamic and conditional approaches can provide the detailed and practical implications in understanding the mechanisms of information system acceptance.

Like other social studies, we had some limitations. First, our sample was from undergraduate MIS majors. The MIS students would be more likely knowledgeable (therefore, spoiled) about computer features than the average people. Therefore, it may be difficult to apply the result of this study to inexperienced end users. Future studies could investigate the influence of end-user's different computer skill levels regarding the influence of social influence. Second, no organizational setting is considered in our data. IS implementation studies have emphasized the importance of organization issues (such as structure, size, industry, support, change management, etc.). These issues were not addressed in this study. Future studies need to investigate which component of social influence is valid or salient in various organizational context (such as knowledge worker group, cross-cultural studies, etc.). Third, since we used a cross-sectional data set, with both independent and dependent variables collected contemporaneously, the results are susceptible to same method bias. That is, the correlation between independent and dependent variables, and the explained variance of the dependent variable, might have been inflated because these were all measured simultaneously within the same questionnaire. More rigorous approach for the issues we raised would be a chronological study to chase the changes in social influence as time passes.

〈부록〉 Measurement Instrument

• Perceived Usefulness (4 items)

1. Using a spreadsheet software would increase my productivity in my work.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

2. Using a spreadsheet software would improve my performance in my work.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

3. Using a spreadsheet software would enhance my effectiveness in my work.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

4. I would find a spreadsheet software useful in my work.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

• Perceived Ease of Use (4 items)

5. Learning to operate a spreadsheet software is easy for me.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

6. I find it easy to get a spreadsheet software to do what I want it to do.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

7. It would be easy for me to become skillful at using a spreadsheet software.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

8. I would find a spreadsheet software easy to use.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

• Subjective Norms (2 items)

9. People who influence my behavior (i.e., faculties, employers, significant others, etc.) would think that I should use a spreadsheet software.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

10. People who are important to me would think that I should use a spreadsheet software.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

• **Visibility (3 items)**

11. In my school, I see a spreadsheet software on many computers.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

12. A spreadsheet software is very commonly used in my school.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

13. It is easy for me to observe others using a spreadsheet software in my school.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

• **Image (4 items)**

14. People in my school who use a spreadsheet software are more desirable than those who do not.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

15. People in my school who use a spreadsheet software have a higher capability than those who do not.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

16. Using a spreadsheet software is an indicator of advanced level in MIS.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

17. Because of my use of a spreadsheet software, others in my school see me a more valuable student than those who do not.

Agree _____ : _____ : _____ : _____ : _____ : _____ : _____ Disagree
Extremely Quite Slightly Neither Slightly Quite Extremely

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