

# Extending Technology Acceptance Model with Social Influence on Korean College Students' Social Commerce Context

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## 한국 대학생의 소셜 커머스 이용행태 연구: 사회적 영향력으로 확장한 기술수용모형을 중심으로

주지혁

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**Abstract** The social commerce is an innovative and emerging transaction. It is the result of combination with transaction and social media technology. This study analyzes Korean college students' social commerce behavior through extending technology acceptance model(TAM) with social influence(SI). We confirmed all proposed hypotheses are significant and supported by the given data through PLS path modeling method with SmartPLS. It indicates that SI is an important factor influencing intention to use, so SI should be consider for theorists to enhance explanation and prediction of TAM and for practitioners to earn higher performances as well. Finally, based on the findings, suggestions for future studies are discussed.

**Key Words** : Social Commerce, Technology Acceptance Model, Social Influence, PLS Path Modeling, SmartPLS

**요 약** 소셜 커머스는 최근 부상하고 있는 혁신적인 전자상거래로 전통적인 오프라인 상거래의 대안이 될 것으로 보인다. 이는 웹 2.0 기술을 기반으로 하는 소셜 네트워크 서비스에 상거래가 결합한 현상이다. 본 논문은 한국 대학생들의 소셜커머스 행위를 사회적 영향력(Social Influence)으로 확장한 기술수용모형(Technology Acceptance Model)을 통해 분석하였다. 본 연구는 SmartPLS 2.0 M3 패키지를 이용한 PLS Path Modeling 기법을 통해 제안된 모든 가설이 유의하다는 것을 확인하였다. 이러한 결과는 TAM의 설명력과 예측력을 높이기 위해서 SI를 이용하여 이론적으로 확장하는 것이 타당하며, 관련 업계의 성과를 높이기 위해서 SI를 실무적으로도 고려할 필요가 있음을 입증하였다. 마지막으로 미래 연구를 위한 제안을 제시하였다.

**주제어** : 소셜커머스, 기술수용모형, 사회적 영향력, PLS Path Modeling, SmartPLS

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## 1. Introduction

The social commerce is an innovative and emerging transaction, which would be the alternative to traditional off-line commerce. It is the result of combination with transaction and web 2.0 technologies that feature more interactive and collaborative internet, emphasizing social interaction and collective intelligence[1]. Accordingly, social commerce fascinates younger consumer than older because young consumers have comparatively higher internet using skill than old consumers, as well as there is the lower price advantage at social commerce than offline commerce.

According to Korea Communications Commission (KCC) and National Internet Development Agency of Korea (NIDA)[2], 76.8% of collegians (including the graduate student) are SNS users, as college students are most outstanding user of social media in Korea. So, college students could be estimated not only active and heavy users of social commerce, but also the powerful potential customers with purchasing power in online market. Thus, this research explores Korean college students' social commerce behavior through extending the technology acceptance model (hereafter "TAM") with social influence.

The research would have some implications: first, theoretically, traditional TAM is extended with social influence, so we should build the more powerful model regarding explanatory and predictive power; second, practically, somewhat related to the first, if possible of building a more powerful model, it should enable practitioner to earn higher performances.

## 2. Literature Review and Hypotheses

### 2.1 Technology Acceptance Model

TAM is a framework that is applied frequently for explaining of adopting and spreading new technologies. TAM consists of two salient behavioral beliefs:

perceived ease of use (hereafter "PEOU") and perceived usefulness (hereafter "PU")[3]. According to Davis [3], PEOU means "the degree to which a person believes that using a particular system would be free of effort" and PU "the degree to which a person believes that using a particular system would be enhance his or her job performance"(p. 320).

TAM is evaluated as a powerful and robust model to understand and predict adopting of new technologies. TAM, however, has two limitations: First, because the original model aims to generalize and be parsimonious, it pays little attention to identify the antecedents of the two salient factors, PEOU and PU[4,5,6]. Second, even though the model is good at identifying the factors that influence people to adopt and use technology, according to Park [6], the model is poor at full explaining what enable people adopt and use a specific technology. Specifically, according to several researchers [3,7,8], TAM is incomplete in accounting for social influence (hereafter "SI") in the adoption and utilization of new information systems (hereafter "IT"). Davis, Bogozzi and Warshaw [9] emphasized that SI in adopting and using information technology played an important role to understand 'real world' applications of TAM. SI especially is relevant to successful implementation of collaborative systems such as electronic commerce applications, where effective utilization often relies on diverse SI. Therefore, current research extends TAM with SI to overcome the limitations of TAM and to understand better 'real world' applications of TAM.

### 2.2 Social Influence

The perceptions of technology are socially constructed to some extent [10]. The technology is embraced rather than simply accepted by user and the action made possible by technology regards as a behavior embedded in society[11]. In this regard, IT adoption researchers should focus on causal linkage between SI and the adoption[12]. SI is defined as the degree to which an individual perceives that important others believe the

person should use the new system[13].

Since Fishbein and Ajzen [14] introduced subjective norm as a subconstruct of SI in their work, many researches have employed models with the similar concepts or subconstructs of SI, for example as subject norm in TRA[3], TAM2[15], TPB/DTPB(Decomposed TPB)[16], and C-TAM-TPB(Combined TAM and TPB)[17], as social factor in MPCU(Model of PC Utilization)[18], as image in IDT(Innovation Diffusion Theory)[19], as SI in UTAUT(Unified Theory of Acceptance and Use of Technology)[13]. Moreover, Nasution [21] added original Venkatesh, Morris, Davis and Davis [13]'s subconstructs of SI, as subject norm, social factors and image, with external ties, self-identity and power. Malhotra and Galletta [8] also extended TAM with psychological attachment, employing from Kelman [20]'s three mechanism, to account for SI[8].

Since Kelman [20] distinguished between three different processes of SI that have an impact on individual behavior, SI has worked for individual behavior through three mechanism: compliance, internalization, and identification [cf. 8,13,15,22].

Compliance: when an individual adopts the induced behavior not because the person believes in its content but with the expectation of gaining rewards or avoiding punishments.

Identification: when an individual accepts influence because the person wants to establish or maintain a satisfying self-defining relationship to another person or group.

Internalization: when an individual accepts influence because it is congruent with the person's value system.

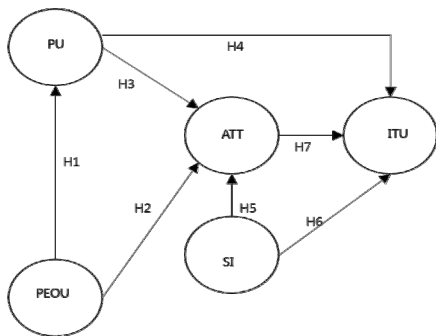
The compliance mechanism enables an individual to simply change his/her intention in response to the social pressure, that is the individual intends to comply with the SI. The latter two relate to changing an individual's belief structure and/or enabling an individual to respond to potential social status gains[13]. When these SI processes is actually applied to use of

a new IT, they determine the individual user's commitment, or more specially, psychological attachment[8, 23], to the use of any new IT. User who perceives use of the IT to be congruent with his/her values is likely to be internalized, or committed and enthusiastic, in his/her technology use. However, individual who perceives such use simply as a means to obtain rewards and avoid punishments seems to be compliant in his or her system use[8, 24]. According to Malhotra and Galletta [8], the processes appear a continuum that ranges from avoidance of use (nonuse) to meager and unenthusiastic use (compliant use) to skilled, enthusiastic and consistent use (committed use). The continuum is affected by user's commitment to the use of the IT: a function of the perceived fit of the technology use to the user's values.

As mentioned above, SI has been employed by IT adoption researches and proved significant to predict IT adoption. Social commerce is a combination social media and shopping[25]. We expect that employing SI on social commerce context should enable researcher and practitioner to be detail and deepen on social commerce phenomenon. Social commerce is a transaction that has more considerable risks than off-line commerce. That is the customers on social commerce purchase products without direct experiences as senses of touch, smell, observe, hear, and taste. Thus, their determination to purchase on social commerce should be affected by and depend on their SI. Based on literature review of previous studies, we hypothesize;

- H1. PEOU will have a positive effect on PU.
- H2. PEOU will have a positive effect on attitude toward using (hereafter "ATT").
- H3. PU will have a positive effect on ATT.
- H4. PU will have a positive effect on intention to use (hereafter "ITU").
- H5. SI will have a positive effect on ATT.
- H6. SI will have positive effect on ITU.
- H7. ATT will have positive effect on ITU.

According to the above hypotheses, we illustrate the research model in [Fig. 1].



[Fig. 1] Proposed research model

### 3. Method

#### 3.1 Sample

The respondents chosen for the current study were 565 Korean college students who had the experience of connecting to or purchasing on social commerce services. To test the hypotheses, this study employed a self-reported survey. Questionnaires were administered by 10 trained interviewers whose major is communication. The survey was administered for two weeks from May 17 to May 29, 2013 in Seoul metropolitan area. We used the convenience sampling for economy of time and cost. The demographic profiles appears in <Table 1>.

As <Table 1> shows, 50.44% of the respondents are female with 49.56% male. As for education, 29.03% of the respondents are freshman; 26.73% are sophomore; 28.85% are junior; and 15.4% are senior. In terms of age, the mean is 22.11 with standard deviation 1.93.

<Table 1> Demographic profile

Demographic	N	%
Male	280	49.56
Female	285	50.44
Freshman	164	29.03
Sophomore	151	26.73
Junior	163	28.85
Senior	87	15.4

#### 3.2 Measurement

For examining the hypotheses, the current study employed a self-reported survey from the respondents. Trained interviewers with majoring in journalism and communication administrated the survey which was taken for two weeks from May 27 through June 10, 2013.

To examine the proposed hypotheses, we measured the constructs which consist of six-part questionnaires from literature review: *demographic*, PEOU, PU, SI, ATT, and ITU. <Table 2> indicates the scales of measurements.

<Table 2> The Scale of Measurement

PEOU (from Davis [3]; Joo & Sang [5])
<ul style="list-style-type: none"> <li>Using social commerce is easy or me.</li> <li>It would be easy for me to become skillful at suing social commerce.</li> <li>My interaction with social commerce is clear and understandable.</li> </ul>
PU (from Venkatesh & Morris [26]; Thong, Hong & Tam [27])
<ul style="list-style-type: none"> <li>I find social commerce useful in my daily life.</li> <li>Using social commerce helps me accomplish things more quickly.</li> <li>Using social commerce increases my productivity.</li> <li>Using social commerce helps me perform many things more conveniently.</li> </ul>
SI (from Venkatesh, Morris, Davis & Davis [13]; Chow, Chen, Yeow & Wong [28])
<ul style="list-style-type: none"> <li>People who influence my behavior think that I should use the social commerce.</li> <li>People who are important to me think that I should use the social commerce.</li> <li>People around me have stimulated me in using the social commerce.</li> <li>People around me think my using the social commerce is a behavior of worth.</li> </ul>
ATT (from Fishbein & Ajzen [14]; Venkatesh, Morris, Davis & Davis [13])
<ul style="list-style-type: none"> <li>Using the social commerce is a good idea.</li> <li>Using the social commerce is a wise idea.</li> <li>I like the idea of using the social commerce.</li> </ul>
ITU (from Agarwal & Karahanna [29]; Joo [25])
<ul style="list-style-type: none"> <li>I plan to use the social commerce in the future.</li> <li>I intend to continue using the social commerce in the future.</li> <li>I expect my use of the social commerce to continue in the future.</li> </ul>

### 3.3 Data Analysis

PLS path modeling is employed to examine structural causalities among constructs of current study because PLS path modeling has more advantages than the covariance-based structural equation modeling(SEM) approach such as LISREL and AMOS[30]. While the SEM approach emphasizes the sample size, PLS is free from it and is more appropriate for small size study[30, 31]. According to Gefen, Straub and Boudreau [31] and Chin [32], the least sample size in PLS path modeling should be 10 times the number of items of the most complex constructs. Then, PLS path modeling is fit for exploratory study[30, 32, 33] because it is available for testing the new model and theory[31]. Accordingly, due to its novelty and lacking the robust theoretical ground, the current study employs the PLS path modeling with the SmartPLS 2.0 M3 package[34].

## 4. Findings

### 4.1 Reliability and Validity of Measurement Scale

For testing the reliability and validity of measurement scales, the current study executes PLS Algorithm on Calculate tap of SmartPLS package to get Cronbach's Alpha ( $\alpha$ ) and composite reliability. <Table 3> indicates the overview of PLS quality criteria. As <Table 3> shows, composite reliability exceeds the minimum criterion, 0.7; consequently, the reliability of measurement scales is fit for analysis. Moreover the Cronbach's  $\alpha$  of constructs surpasses 0.6, the least criterion, and indicates reliable values.

<Table 3> PLS Quality Criteria Overview

	AVE	Composite Reliability	R Square	Cronbach's Alpha
ATT	0.78	0.91	0.397	0.86
ITU	0.80	0.92	0.502	0.87
PEOU	0.76	0.91		0.84
PU	0.69	0.90	0.219	0.85
SI	0.70	0.90		0.85

To test construct validity of the measurement model, current study employs convergent and discriminant validity[35]. The convergent validity refers to AVE(Average Variance Extracted) and over 0.5 of AVE means convergent validity is significant[33]. In <Table 3>, AVE in all constructs is greater than 0.5. Accordingly, the current study achieves the criterion.

To examine discriminant validity, this study compares the inter-correlation within latent constructs with the root square of AVE of latent constructs. Gefen and Straub [36] said the discriminant validity is accepted when the square root of AVE of each construct exceed its correlation with the other latent constructs. <Table 4> shows that the square root of AVE of Construct is appropriate for the criterion respectively.

<Table 4> Latent Construct Correlation

	ATT	ITU	PEOU	PU	SI
ATT	(0.88)				
ITU	0.55	(0.89)			
PEOU	0.40	0.46	(0.87)		
PU	0.59	0.68	0.47	(0.83)	
SI	0.43	0.41	0.22	0.46	(0.83)

Parentheses show the square root of AVE

### 4.2 Test of Structural Model

<Table 5> shows the findings of hypotheses test and path coefficients of the proposed research model. We appraise the model validity with the R square value and the structural paths in PLS path modeling[37]. The current study administered bootstrapping to estimate the statistical significance of the construct's path coefficient by means of t-test.

As shows <Table 5>, all of path coefficients are significant and the hypotheses are supported by the data. In detail, of the proposed hypothesis 1 and 2, PU ( $\beta=0.47$ ,  $t=10.83$ ,  $p<0.005$ , one-tailed test) and ATT ( $\beta=0.16$ ,  $t=3.55$ ,  $p<0.0005$ , one-tailed test) were affected by PEOU respectively. On hypothesis 3 and 4, PU has an effect on ATT ( $\beta=0.42$ ,  $t=8.28$ ,  $p<0.0005$ , one-tailed test) and ITU ( $\beta=0.52$ ,  $t=13.80$ ,  $p<0.0005$ , one-tailed

<Table 5> Hypotheses Test Results

Hypotheses		Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics ( O/STERR )	p	Result
H1	PEOU -> PU	0.47	0.47	0.04	0.04	10.83	p<0.005	supported (one-tailed test)
H2	PEOU -> ATT	0.16	0.16	0.05	0.05	3.55	p<0.005	supported (one-tailed test)
H3	PU -> ATT	0.42	0.42	0.05	0.05	8.28	p<0.005	supported (one-tailed test)
H4	PU -> ITU	0.52	0.52	0.04	0.04	13.80	p<0.005	supported (one-tailed test)
H5	SI -> ATT	0.20	0.20	0.05	0.05	4.42	p<0.005	supported (one-tailed test)
H6	SI -> ITU	0.09	0.09	0.04	0.04	2.29	p<0.025	supported (one-tailed test)
H7	ATT -> ITU	0.20	0.20	0.04	0.04	4.70	p<0.005	supported (one-tailed test)

test). Of hypothesis 5 and 6, SI also predicted ATT ( $\beta=0.20$ ,  $t=4.42$ ,  $p<0.005$ , one-tailed test) and ITU ( $\beta=0.09$ ,  $t=2.29$ ,  $p<0.025$ , one-tailed test) respectively. Finally, on hypothesis 7, ITU was predicted by ATT ( $\beta=0.20$ ,  $t=4.70$ ,  $p<0.0005$ , one-tailed test).

Moreover, the R squares are shown in <Table 2> and explain the variance in constructs respectively. PU is positively predicted by PEOU, resulting in an  $R^2$  of 0.219. Therefore, PEOU explain 21.9% of the variance in PU. ATT, resulting in the  $R^2$  of 0.397, is positively affected by PEOU in direct and indirect, PU and SI in direct which together explain 39.7% of the variance in ATT. ITU is positively predicted by PEOU, PU and SI in direct and indirect and ATT in direct. ITU variance was explained by its determinants in the amount of 50.2%

## 5. Discussion and Conclusion

The social commerce is a latest electronic transaction and a result from the combination of social media and shopping. It has spread into customers rapidly even though it has the critical limitation which is without direct experience at point of purchase. Accordingly, this

study explores what influences Korean college students' adoption of social commerce. We employ extending TAM with SI for the study. Aforesaid, it is transacted on social commerce without direct experience, so that customers could refer to important person for them. This is why we extend TAM with SI. We propose and examine hypothesized paths in the research model. The current study employs PLS path modeling to analyze the causalities on the proposed hypotheses.

In summary, all of hypotheses in proposed research model are significant and supported. The findings mean the model, extended TAM with SI, is valid for understanding Korean college students' social commerce behavior. The hypotheses of traditional TAM, paths of PEOU-PU, PEOU-ATT, PU- ATT, PU-ITU, and ATT-ITU, are supported by data, hypotheses related SI, paths of SI-ATT and SI-ITU, are supported as well.

These findings indicate SI is an important factor influencing intention to use the social commerce and extended TAM with SI is valid to understand adopting the social commerce. These imply theoretically TAM should extend with SI to help enhance explanation and prediction. Accordingly, practitioners for social commerce

industry would consider SI for enhancing their performances in the business. That is, theorist and practitioner should pay attention to Kelman's three processes of SI: compliance, identification, and internalization[20]. Whereas regarding new IT use as means of gaining reward or avoiding punishment results in compliant use, corresponding with users' values for new IT brings committed use. Based on these findings and Kelma's processes[20], practitioners would shift non-users to compliant and committed users with considering SI factors. Therefore, social commerce practitioners would reinforce word-of-mouth which is a important nature of social network. Namely, social commerce industries would devise and revitalize the mechanism for word-of-mouth as such as forum where is available for discussion, reply, invitation, and so on.

Finally, we suggest some advices for future studies. We confirmed the influence of SI on social commerce context through this study. Therefore, future studies should investigate how SI operate toward intention to adopt and use new system in detail, i.e., regarding Kelman's three processes and its operating phases. Moreover, we need to develop new subconstructs of SI for affluent explaining and predicting toward adoption on innovative technology contexts.

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