

## **Technology ease of use through social networking media**

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### **Abstract**

This research looks at the perceived ease of use and usefulness of social media by university students in the U.S. Also assessed was the students' view of the technological complexity of social networking (SN) media. Business students at a regional university were surveyed using a measure of the concepts of perceived usefulness and ease of use of technology for SN media such as Facebook and MySpace and asked about their intensity of use of it.

With regard to the ease of use and usefulness technology dimensions, more autonomous students seemed to find the social networking platform more difficult to use. Higher perceived ease of use led to higher perceived usefulness and ultimately greater intensity of use of the social networking media. This research provides a preliminary foundation for understanding the use of social networking media by those with stronger versus weaker sense of autonomy. This will help in determining how this technology might be used more effectively in business applications.

Technology Acceptance Model, Social Networking, Ease of Use

## **INTRODUCTION**

The advance of the use of social networking systems is rapid and compelling. People are continually connected to each other on their blackberries, i-phones, netbooks and computers. People are texting, talking, e-mailing and in general, communicating through electronic rather than face-to-face methods at an accelerating pace. The 18 to 24 year old age group is a predominant user of these communication methods (Licoppe & Smoreda, 2008). At the same time, the pursuit of the use of social media for business purposes continues to grow, as do the educational programs that address this growth. Therefore, this research is directed toward addressing these areas of growth and the interconnection between student traits such as autonomy and their use of social networking media.

This research explores the relationship between the technology acceptance by the user and the use of social networking media. Social networking (SN) media are a web-based means for people to share information in an online community with approved followers. There have been significant increases in the use of SN media such as Facebook, MySpace, LinkedIn and Twitter for both business and personal reasons in the past couple of years. It has been used to increase business presence on the web, to allow for announcements to selected followers, both business and personal, and to promote new ideas and products. This research is aimed at examining the users and their perceptions of the usefulness and ease of use of the technology. These technology measures have been used often in technology research and were developed through the often cited technology acceptance model (Davis, 1989; Malhotra, Heine, & Grover, 2001). The purpose of this research is to test hypotheses related to the use of SN media and to examine how each is correlated with the perceived usefulness and actual use of technology. The uses and frequency of SN media will be compared to the perceived ease of use of the users and to their view of its usefulness, thus examining the following research question: "Does ease of use and usefulness of technology impact the intensity of use of social networking media?"

## **THEORY DEVELOPMENT AND HYPOTHESES**

### **Social Networking**

The use of technological advancements to enhance performance has been researched extensively in the entrepreneurial field as well as with traditional firms. The most recent technological advancements have been in the proliferation of information available in wireless technologies. Web-based information is used to obtain both business and personal information in the immediate seconds after something new has occurred. Specifically, SN media such as Facebook, MySpace, and Twitter are used to transfer immediate information to users via Blackberries, i-phones and laptops. Businesses use these for communication, advertising and transaction activities, as well as to show their expertise and legitimacy. Students, also use these systems for legitimacy as well as for socializing (Ross, Sisic, Arseneault, Simmering, & Orr, 2009).

In this application of the use of SN media it seems to be a logical extension that one's personal traits may be related to one's perceptions of technology usefulness and ease of use, and ultimately how intensely the SN platforms are used. Perhaps a person that is strong on innovativeness might be a reflection of open-mindedness for new applications, including social networks, deeming them easy to use (Venkatesh & Bala, 2008). Someone that prefers to work more autonomously may, likewise, be drawn to social media as an alternative to dealing with

others face-to-face (Li and Bernhoff, 2008). Due to the logical relationships that are represented by SN media as technology to accomplish a task, it is logical that technology perception may play an important role.

Social networking, first appearing in the 1990's, engages the user with one or more social connections that allows one to bond with the outside world (Wink, 2010). This connection allows private conversations for both work and play but with the advent of MySpace and what is now one of the world's largest SN sites, Facebook, these conversations are now public. In 2008, the Pew Internet and American Life Project reported that over 35% of the adult population routinely engages these sites, up from under 8% in 2005 (Wink, 2010). In Facebook, the privacy settings, and the ease in setting them, has changed since Facebook first appeared because of a 2008 legal case involving privacy issues (Ellison, Steinfield, & Lampe, 2007).

"Social networks exist because humans are societal and require relationships in order to survive" (Coyle & Vaughn, 2008, p. 13). Additionally, Durden, Hill, and Angel (2007), suggest that social networks are critical to the well-being of human beings. Licoppe and Smoreda (2008), state that technology-mediated communication creates a "presence" that is not offered offline in that Internet users have a larger social network than nonusers. This presence is adapted into cyberspace social accounts.

Social networking sites allow users to create a profile and then view, visit, and share their experiences with one or more social contacts (Boyd & Ellison, 2007), as well as maintaining pre-existing social connections (Ellison et al, 2007). These experiences, multimedia in nature, allow people to express themselves without having to "say it" in words (Park, 2010). The question comes to mind, "is this conveying information or is this entertainment?" Park (2010) responded that younger individual use this as entertainment while older individuals use SN sites for communication.

Facebook, created by Harvard's Mark Zuckerberg, derived its notoriety by allowing students to interact, flirt, and network (Hirschorn, 2007). Facebook's engine queries the user for data such as school(s) attended, places lived, along with dates, so that it can suggest contacts (friends) to form social networks. These data, called a *profile* allows the user to share information with select individuals or with the world (McMahon, 2010).

The success of Facebook though, as well as any SN site depends on users creating content that will build relationships with community members. McDonald (2009), suggested that strategies required for powerful networking include giving users what they want, contain active content, but most of all, it creates an experience for the user. This experience should be meaningful, familiar, and competent (Ross et al, 2009). The user must not only view this experience as transparent and without thinking about it (Lewis & Fabos, 2005), but it should be perceived as viable and complete (Ross et al, 2009).

Not only do the Facebook users want practicality but they strive for autonomy (Steeves, 2008). Hargitti (2007), surveyed a diverse group of young adults and found that people with more experience and autonomy of use were likely to use the SN sites more often. Lee, Miller, and Newnham (2008), even found that a close cousin to Facebook, Really Simple Syndication (RSS), promoted a 'high degree of learner personalization, choice and autonomy' (p. 311) for the user in an academic setting.

## **The Technology Acceptance Model**

The concepts of usefulness and ease of use of technology have evolved from the original research on the technology acceptance model by Davis (1989). The technology acceptance

model (TAM) demonstrates that the perceptions of technology and its perceived ease of use and usefulness have a significant impact on its use and ultimately on performance. There has been an extensive amount of research on these variables that has evolved out of the theory of reasoned acceptance whereby users accept or reject the use of information technology based on its perceived ease of use and usefulness (Malhotra, Heine & Grover, 2001; Saade, 2007; Venkatesh & Bala, 2008).

The practicality of this experience can be related to the TAM in that this model has been widely used to predict user acceptance and use based on perceived usefulness and ease of use (Davis, 1989). Ndubisi, Gupta, and Ndubisi (2005), add to the research by implying that “innovativeness, risk taking propensity, perservance, and the flexibility between users’ ease of use are important constructs” (p. 27). However, while the TAM has been acclaimed for predicting acceptance, Venkatesh (2000), suggests that the TAM does not help to understand and explain acceptance in ways that promote development from meaningful predictive analysis. Nevertheless, Venkatesh (2000), posits that the TAM’s “perceived usefulness will be influenced by perceived ease of use, because the easier a technology is to use, the more useful it can be” (p. 343). Devaraj, Easley, and Crant (2008), cobborate this with their research model and imply that with personality as an external variable, it can lead to beliefs and then to behavior. The authors complete their study by proposing that “future research move beyond the technology acceptance model” (p. 103). (Venkatesh, 2000), adds a slight twist to Devaraj, Easley, and Crant’s model by imposing emotion as a major determinant in the TAM.

### **The Proposed Model**

Social networking is not a new concept, but SN sites take this concept one step further in that electronic networking takes place in the privacy of one’s home or office. This electronic networking assumes autonomy and isolation, but can be sometimes ambivalent for the user because of the background communications. Users in this setting, operate asynchronously, and sometimes give little thought to what is being said, regardless of what is being addressed.

While some preliminary research has been conducted (Ross et al, 2009) there has been no academic examination of the use of these systems by college students regarding their perceptions of the usefulness and ease of use or the reasons for their use. There has been some research; however, that examines the link between EO and technology. The technology acceptance model has been found to have a significant impact on technology use caused by the automony and experience of individuals using this technology (Steeves, 2008). This leads to the following hypotheses:

H1: Students with higher autonomy will strengthen the ease of use score for SN media.

Vankatesh (2000), concluded in his study that the technology acceptance model will be useful because it is perceived by the user to be easy. Therefore, it stands to reason that a higher ease of use score will be positively coorelated with a higher usefulness score. This relationship has been supported by other studies as well (Devaraj, et al, 2008; Venkatesh, 2000).

H2: Students with a higher ease of use score will have a stronger usefulness score for SN media.

Davis’ technology acceptance model (1989) has evolved from perceived ease of use and usefulness of technology to using this technology to build relationships on social media sites (McDonald, 2009). If it is viable and complete (Ross et al, 2009), suggests that it will also be

meaningful, familiar and competent. This leads to hypothesis three, where the perception of usefulness will result in actual use of the social media.

H3: Higher perceived usefulness will result in higher social media use.

Hargitti (2007), surveyed a diverse group of young adults and found that people with more experience and autonomy of use were likely to use the SN sites more often. Therefore, hypothesis four represents this relationship.

H4: Higher autonomy will result in higher social media use

Perception can lead to behavior thus it follows that TAM's "usefulness will be influenced by ease of use because the easier a technology is to use the more beneficial it will be (Devaraj, et al, 2008). This behavior requires relationships to sustain it and these relationships can be nurtured by social networks (Coyle & Vaughn, 2008).

H5: Higher perceived ease of use will result in higher social media use

Figure 1 (Appendix) depicts the research model based on the previous discussion and hypotheses proposed. It presents commonly used relationships between perceived ease of use and usefulness, and stated use of the social media (technology) based on the technology acceptance model (Davis, 1989). There are also two additional relationships reflecting that autonomy influences the perceived use of the social media (H1) or perhaps influences social media use directly (H4).

## **METHODOLOGY**

This research was conducted in two major steps. First the literature was studied for relationships between technology use and user perceptions to determine the appropriate model and validated constructs, when available. These construct items were then tested using a q-sort to establish convergent validity and a pretest of the instrument using 94 respondents was used to establish the reliability and validity of the instrument items.

### **Instrument Design**

The instrument (Appendix) was created using the popular 5 point Likert scale (strongly disagree=1, disagree=2, neither agree nor disagree=3, agree=4, strongly agree=5).

### **Data Collection**

The respondents were comprised of 1100 students from a south central mid-sized university. The respondents included students from all colleges in the university at all levels including MBA students and regional campus students. Table 1 (Appendix) shows the demographics of the respondents. The respondents were 66% female and 70% were under the age of 25.

The respondent's primary social media was Facebook, with 85% using this site. Thirty-eight percent also indicated that they used MySpace and 14% used twitter while only 6% used

LinkedIn. Due to the predominance of Facebook users, the survey questions then were specifically about the use of Facebook.

### **Development of Measures**

The measures development involved designing the questions for three areas, technology ease of use and usefulness, autonomy, and actual use measures for SN media. The technology measures were adopted from the validated measures for ease of use and usefulness used by Malhotra, et al (2001). The questions on the actual uses of SN technology were developed from knowledge of the technology by the authors and by pretesting the questions with a sample of students. The autonomy measure was developed from a validated instrument designed to measure individual autonomy by Bolton and Lane (2011). A q-sort was conducted on these with acceptable results for validity on all items exploratory factor analysis was used to establish reliability of the constructs. The multiple items for measurement of technological complexity were factor analyzed with an oblimin rotation. Measures of Usefulness and Ease of Use, accounted for 77% of the total variance (See Table 2 - Appendix) with Cronbach alphas of .854 and .822, respectively.

### **Data Analysis and Results**

The model was tested using Structural Equation Modeling (SEM). The constructs in this model all had multiple indicators which are needed to reduce the impact of bias on the results (Anderson & Gerbing, 1988). Correlations were examined to establish discriminate validity and the two step process for examining latent variables was undertaken. Following the two step process recommended by Anderson and Gerbing (1988) the measurement model was run to establish the discriminate and convergent validity and then the structural model was run to examine the proposed relationships (Figure 1 – Appendix). These results are shown in Table 2 (Appendix) and will be discussed in the subsequent sections.

The measurement model has an overall goodness of fit  $\chi^2/df$  of .81 which is well below the maximum of 3.0 recommended by Bagozzi and Yi (1988). The goodness of fit index (GFI=.99) and the comparative fit index (CFI=1.0) far exceeded recommended levels of .90 (Alwin & Hauser, 1975). The root means square error was also far below the maximum at 0.0 where a maximum is prescribed as .06 (Brown & Cudeck, 1992). Exploratory factor analysis of all of the test items showed convergent and discriminate validity of the measures with low cross-loadings. The percent variance explained by autonomy was 15%, usefulness was 49%, and ease of use was 125 for a cumulative explained variation of 75%. All factor loadings were above .7 meeting the minimum requirements (Hair, et al, 1998).

The correlations of the constructs and the reliabilities are shown in Table 3 (Appendix). Correlations between ease of use and usefulness are significant as would be expected from previous research. Autonomy is not correlated with performance or usefulness but it is negatively correlated with ease of use as would be expected based on the proposed hypotheses.

### **Test of the Structural Model**

The model proposed in Figure 1 (Appendix) is tested using Lisrel examining the covariance matrix of the construct variables in the relationship proposed. The results of this analysis are shown in Figure 2 (Appendix) and summarized in Table 3 (Appendix). The impact

of autonomy ( $b=.21$ ,  $p<.01$ ) on perceived ease of use is significant, supporting hypothesis 1. The impact of perceived ease of use on perceived usefulness ( $b=.23$ ,  $p<.01$ ) and usefulness on SM impact ( $b=.25$ ,  $p<.01$ ) are also significant, supporting hypothesis 2 and 3. The proposed relationship between autonomy and ease of use (Hypothesis 1) was supported with a t-ratio of 5.82 and significance of more than 99%. Perceived ease of use had an impact on perceived usefulness (Hypothesis 2) with T ratio of 4.59 also significant at greater than 99%. Usefulness subsequently had an impact on social media use with a T ratio of 5.33 and over 99% significance, supporting Hypothesis 3. Refer to Table 4 (Appendix) for a summary. The relationship proposed that autonomy had an impact on social media use was not found to be significant. The lack of correlation between the two constructs could be observed in the correlation matrix, so this relationship was eliminated. The proposed impact of perceived ease of use on SM use was also not significant so hypothesis 5 was also not supported.

As expected, those with high ease of use found SN media more useful. The influence of autonomy on the perceived ease of use of the social media had a negative influence, meaning those who are more autonomous found the social media less easy to use and those who prefer to work less autonomously found social media easier to use. As was expected, the more useful the social media was perceived to be, the more it was used.

## CONCLUSIONS AND RECOMMENDATIONS

This research represents exploration into new areas and has provided some interesting results. With regard to the ease of use and usefulness technology dimensions, more autonomous students seem to be the ones who perceive the SN media to be more difficult to use and ultimately value the SN platform less for its usefulness. There is validation for the TAM model that represents the relationship whereby higher perceived ease of use leads to higher perceived usefulness and more intensity in the use of the social media. This research supports this claim. The autonomy of the respondent did not directly impact their perceived usefulness of the SM technology. Autonomy was also not a direct contributor to the intensity of SM use. Autonomy was shown to relate only to the perceived ease of use in the model, supporting hypothesis one in the opposite direction of that proposed but failing to support hypotheses four and five. This indicates that how independently a person perceives themselves may impact their perception of technological complexity, the more independent they are, it is more likely they will not view the technology as easy to use. Perhaps this is indicative that their independence leads them to sort things out for themselves rather than relying on others to help them. They are more prone to struggle along without seeking guidance.

This research contributes to the field of entrepreneurship research in two ways. This research looks at technology use and usefulness and its influence with the use of SN media. It also reflects the influence of the autonomy of an individual and how this improves the perceived ease of use of the technology. This in turn, is predictive because students that perceive usefulness of a product or service will indeed use that product or service. Additionally, this usefulness, as well as the ease of use could be exacerbated by the massive propagation of wireless.

Recommendations include further research that will measure social media as a predictor for learning at the university level. One could duplicate this research and simply analyze both the course grade as well as the student's GPA in order to see the impact that social networking media has on specific disciplines that include technology degrees (information systems and technology management), as well as disciplines within a business college. Another study might be to research older students and then compare the results with this study. The more we learn

about how the traits and demographic factors impact social media use, the better we will understand how businesses can use social media to target specific groups of potential customers.

## REFERENCES

- Alwin, D. F. & Hauser, R.M. (1975). The decomposition of effects in path analysis. *American Sociological Review*, 40(1), 37-47.
- Anderson, J. & Gerbing, D. (1988) Structural equation modeling in practice. *Psychological Bulletin*, 103, 411-423.
- Bagozzi, R.P. & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Market Science* 16(1), 74-94.
- Brown, M.D. & Cudeck, R. (1992). Alternative ways of assessing model fit. Testing Structural Equation Models, R. A. Bollen & J.S. Long, editors, UK Sage, London.
- Bolton, D. & Lane, M. (2011). Individual entrepreneurial orientation: Development of a measurement instrument, Working Paper.
- Boyd, D., & Ellison, N. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, 13(1).
- Coyle, C., Vaughn, H. (2008). Social networking: Communication revolution or evolution? *Bell Labs Technical Journal*, 13(2), 13-18.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.
- Devaraj, S., Easley, R., & Crant, J. (2008). How does personality matter? Relating the five-factor model to technology acceptance and use. *Information Systems Research*, 19 (1), 93-105.
- Durden, E., Hill, T., & Angel, R. (2007). Social demands, social supports, and psychological distress among low-income women. *Social and Personal Relationships*, 24 (3), 343-361.
- Ellison, N., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends:" Social capital and college student's use of online social network sites. *Journal of Computer-Mediated Communication*, 12 (4), 1143-1168.
- Hargitti, E. (2007). Whose space? Differences among users and nonusers of social network sites. *Journal of Computer-Mediated Communication*, 13(1), 276-297.
- Hirschorn, M. (2007, October). About Facebook. *The Atlantic*, pp. 2-5.
- Lee, M., Miller, C., & Newnham, L. (2008). RSS and content syndication in higher education: subscribing to a new model of teaching and learning. *Educational Media International*, 45 (4), 311-322.



- Lewis, C., & Fabos, B. (2005). Instant messaging, literacies, and social identities. *Reading Research Quarterly*, 40 (4), 470-501.
- Li, C. & Bernoff, J. (2008). *Groundswell: Winning in a world transformed by social technologies*, Boston, MA, Harvard Business Press.
- Licoppe, C., & Smoreda, Z. (2008). Are social networks technologically embedded? How networks are changing today with changes in communication technology. *Social Networks*, 27(4), 317-335.
- Malhotra, M, Heine, M. & Grover, V. (2001). An evaluation of the relationship between management practices and computer aided design technology. *Journal of Operations Management*, 19(3), 307-333.
- McDonald, F. (2009). Five steps to developing a powerful social networking strategy. *University Business*, 12(5), 43-46.
- McMahon, F. (2010). Use social media. *Sound and Video Contractor*, 28(3), 50-53.
- Ndubisi, N., Gupta, O., & Ndubisi, G. (2005). The mogul's model of computing: Integrating the moderating impact of users' persona into the Technology Acceptance Model. *Journal of Global Information Technology Management*, 8(1), 27-47.
- Park, J. (2010). Differences among university students and faculties in social networking site perception and use. *Electronic Library*, 28 (3), 417-431.
- Ross, C. O., Sisic, M., Arseneault, J., Simmering, M. G., & Orr, R. R. (2009). Personality and motivations associated with Facebook use. *Computers in Human Behavior*, 25, 578-586.
- Saade, R. G. (2007). Dimensions of perceived usefulness: Toward enhanced assessment. *Decision Sciences Journal of Innovative Education*, 5(2), 289-310.
- Steeves, V. (2008). If the Supreme Court were on Facebook: Evaluating the reasonable expectation of privacy test from a social perspective. *Canadian Journal of Criminology & Criminal Justice*, 50 (3), 331-347.
- Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the Technology Acceptance Model. *Information Systems Research* (11), 342-365.
- Venkatesh, V. & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences*, 39(2), 273-315.
- Wink, D. (2010). Social networking sites. *Nurse Educator*, 35 (2), 49-51.

## APPENDIX

### Survey Instrument

#### Autonomy:

- I prefer group members to explore options after checking with the team (as compared to exploring options on their own without justifying their actions).
- In groups I prefer individuals to make decisions on their own without constantly referring to team leadership for approval.
- In group work, I prefer the leadership to supervise and be responsible for coordinating the project rather than me.

#### Perceived Ease of Use:

- It is easy to become skillful at using this social networking site.
- Interacting with this social networking site is clear and understandable.
- Learning to use this social networking site is easy.

#### Perceived Usefulness:

- This social networking site allows me to do everything that I need to do.
- Using this social networking site has improved my ability to communicate with others.
- Using this social networking site has made communicating in my life easier.
- Overall I find using this site very useful to me.

#### SM use :

- Facebook is part of my everyday activity.
- I am proud to tell people I am using Facebook.
- About how many total Facebook friends do you have?

### Figures and Tables

Figure 1: The Research Model

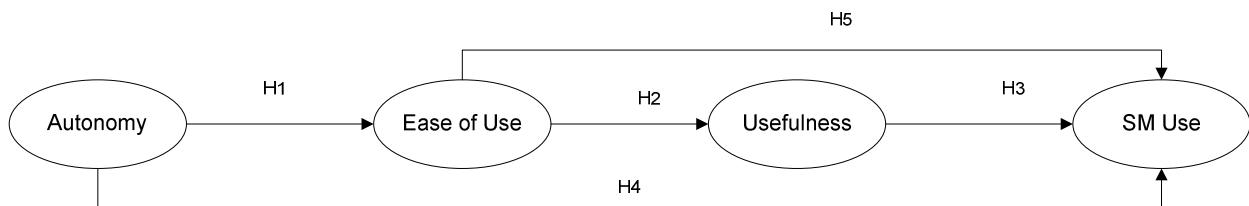


Figure 2: Lisrel Model Results

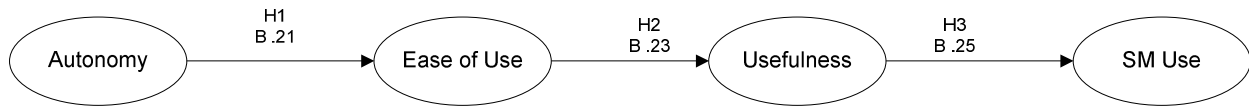


Table 1: Demographic Information on Respondents

Demographic Genre	Categories	Number	Percentage
Gender	Male	358	34%
	Female	684	66%
Age	Under 20	374	35%
	20 to 25	261	34%
	26 to 33	151	14%
	34 and above	205	19%
Use of Facebook (per day)	Under 30 min.	585	55%
	30 min – 1 hour	257	24%
	1 to 2 hours	152	15%
	More than 2 hours	69	7%

Table 2: Lisrel Summary Statistics

Statistic	Measurement Model	Aggregate Model
X <sup>2</sup>	38.69	40.65
df	48	62
RMSEA	0.0	0.0
Goodness-of-fit-index	.99	.99
Adjusted Goodness-of-fit-index	.99	.99
Normed Fit Index	.96	.94
Parsimony NFI	.61	.75
Comparative Fit Index	1.00	1.0
Incremental Fit Index	1.01	1.03
Relative Fit Index	.94	.93

Table 3: Means, Standard deviations, Intercorrelations of Latent Variables and Cronbach’s Alpha n=1066

Latent Variable	Mean	SD	1	2	3	4
1. Social Media Use	3.21	.98	.70			
2. Autonomy	3.32	.61	.00	.42		
3. Ease of Use	3.86	.68	.39**	-.18**	.91	
4. Usefulness	3.71	.91	.54**	.01	.55**	.87

\*\* indicates significance at p<.01

Table 4: Parameter Estimates for Structural Equations

Parameter Path	Aggregated ( $N = 1066$ )	
	Statistic	$t$ -ratio
Autonomy $\rightarrow$ EOU	.95	5.82**
EOU $\rightarrow$ Usefulness	1.03	4.59**
Useful $\rightarrow$ SM Use	.87	5.33**

*Note:* These values are based on the causal model run on the covariance matrix.

\*  $p < .05$ . \*\*  $p < .01$ . (two-tailed)