

HABIT, NEGATIVE EMOTIONS, AND INTENTION TO CONTINUE TO USE A CELL PHONE

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I investigated the relationship between the negative emotions of anger and anxiety in relation to cell phones, and intention to continue to use the phones, which I labeled continuity intention. In addition, I examined the moderating role of habit in the relationship between the two variables. I collected 222 responses to a survey from people who had used cell phones in their work as employees of organizations in Korea. The results showed that the effects of negative emotions on continuity intention were only marginally significant. Instead, when employees perceived their cell phone use as a deeply ingrained habit, they tended to reduce their continuity intention as their negative emotions increased. However, the level of continuity intention was high.

Keywords: technostress, anger, anxiety, continuity intention, habit, cell phone use, negative emotions.

Cell phones have been penetrating organizational life for more than a decade and their use as part of organizational routine has become quite pervasive (Hung, Chen, & Lin, 2015). Employees and their employers praise enhanced productivity and ease of communication as the positive aspects of cell phone use within organizations (Garba, Armarego, Murray, & Kenworthy, 2015). However, a negative aspect is that employees frequently complain about encountering stressful situations, such as information overload and blurring of boundaries between home and workplace (Tarafdar, Tu, & Ragu-Nathan, 2010). Researchers have described this situation as *technostress* (Fuglseth & Sørøbø, 2014), which is defined as “stress caused by an inability to cope with the

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demands of organizational computer usage” (Tarafdar et al., 2010, p. 304). For instance, particularly in Korea, cell phones and the software applications on these devices have been intensively used in an official role in organizations. Personal and private messenger phone applications (e.g., KakaoTalk, Line) that were developed with the intention of supporting private group chatting with families and friends, are being used for team communication in Korean organizations. This situation has caused Korean workers stress because they need to stay in the chat room and check their messages even when they are home (Job Korea, 2015).

Despite these negative aspects, it has been found (see, e.g., Perlow, 2012) that using a cell phone has become a habit for some individuals, for example, they cannot resist checking their emails and messages. This is an interesting phenomenon in that, although Korean employees may have negative emotions toward cell phones because of technostress, they seem to have increased their use of these devices. Current statistics for cell phone use within organizations show that 51.2% of employees in Korea feel that they are addicted to their phones (Job Korea, 2015). This is a counterintuitive phenomenon, as researchers have identified that positive emotions tend to increase intention to adopt and continuance intention (Beaudry & Pinsonneault, 2010).

In this study, my aim was to identify the effects of negative emotions about cell phone use on continuity intention, and to investigate the role of habit in this relationship. The topic is worthy of consideration in that previous researchers (e.g., Beaudry & Pinsonneault, 2010; Turel, 2015) of technology adoption and continuance, have mainly focused on, and identified, the role of positive emotions, such as user satisfaction, for creating behavioral outcomes. However, there are fewer studies in which researchers have examined how negative emotions may influence continuity intention under the conditions that users need to use the technology for their job (*quasimandatory situations*), and that they have been using the technology for some time (*habit situations*). To examine the aspect of how negative emotions influence continuity intention, I built a research model based on information systems and psychology, and collected responses from employees in three Korean organizations. I believe that in this study I can bridge the gap between technology acceptance research and the real-world situation by revealing the relationships between negative emotions, habit, and intention to continue to use a cell phone. In particular, I explored a new avenue by seeking to understand negative emotions combined with habit.

Literature Review and Hypotheses

Technology acceptance researchers have long identified emotions as a strong determinant of technology adoption and use behavior (Beaudry & Pinsonneault, 2010), because emotions can lead to the formation of beliefs and attitudes

and, further, can help guide decision making (Lazarus & Folkman, 1984). For instance, *hedonic motivation*, which, in the context of high-tech devices, is a type of emotion—such as fun or pleasure associated with using technology—plays a significant role in technology acceptance and use in an organizational computing context (Venkatesh, Thong, & Xu, 2012), as well as in the context of general consumer nonbusiness use (Turel, 2015). However, few researchers have focused on the relationship between negative emotions and continuity intention for use of cell phones in organizations.

According to the cognitive–phenomenological–transactional model of stress, individuals tend to evaluate a stressful situation and manage their emotions and behavior to adapt to this situation (Lazarus & Folkman, 1984). Emotions indicate a mental state of readiness for action that can help individuals prioritize and organize their behavior in ways that optimize their adjustment to environmental demands (Lazarus, 1991). Emotions arise when individuals respond to the appraisal of an event (Lazarus, 1991). Specifically, if employees perceive a stressful situation, such as information overload and extended working hours in their private life, they are more likely to experience negative emotions, which will, in turn, lead to them reducing their use of cell phones as a response to their stress (Tarafdar et al., 2010). In this study, I focused on anger and anxiety as two negative emotions that have frequently been addressed in the technostress literature (Tarafdar et al., 2010). I expected that employees' negative emotions would negatively influence continuance intention. Therefore, I proposed the following hypotheses:

Hypothesis 1: Anger will negatively influence intention to continue to use a cell phone.

Hypothesis 2: Anxiety will negatively influence intention to continue to use a cell phone.

However, if employees have negative emotions toward cell phones, why can they not resist the desire to use them and/or avoid using them? I expected that habit could be a critical factor influencing continuity intention in mandatory situations to use in organizations. Researchers have recognized that future technological use is strongly influenced by *habit* (Polites & Karahanna, 2013), which enables individuals to perform a certain behavior automatically because it is a learned response (Limayem, Hirt, & Cheung, 2007). Researchers have identified a mechanism, *habit/automaticity perspective* (HAP), through which habit can guide behavior. According to the HAP, repeating behavior can, of itself, create habituation, and certain environments and/or stimuli directly guide behavior with attitudes and intentions being activated automatically (Ouellette & Wood, 1998). For example, Kim, Malhotra, and Narasimhan (2005) found that when users have a longer experience and create a habit to use information systems, the relationship between behavioral intention and use weakens.

Specifically, after an extended period of sending/receiving messages and checking information, using cell phones may become a habit for some individuals (cf., Kim et al., 2005; Limayem et al., 2007) so that, even if they have negative emotions toward cell phones, they are likely to use them automatically (e.g., check messages) as a habitual behavior. Hence, although negative emotions may negatively affect continuity intention, for employees who have formed a habit of using a cell phone, the influence of negative emotions on their continuity intention should be less salient. That is, although the employees do not like using cell phones, they will keep using them. Therefore, I proposed the following hypotheses:

Hypothesis 3: Habit will moderate the relationship between anger and continuity intention for cell phones such that the negative influence of anger on continuity intention will be weaker, if users have a more deeply ingrained habit compared to a less deeply ingrained habit.

Hypothesis 4: Habit will moderate the relationship between anxiety and continuity intention for cell phones such that the negative influence of anxiety on continuity intention will be weaker, if users have a more deeply ingrained habit compared to a less deeply ingrained habit.

Method

Participants

I collected survey data from employees of three organizations in Korea, all of which had adopted official phone-based mobile messengers (not commercial messengers) and mobile systems to support the employees' work routines, and agreed to participate in the survey. I collected 254 responses during 3 months from November 2014 to January 2015, and, after discarding unanswered and unreliable responses, I had 222 valid surveys. Demographic information of the participants is summarized in Table 1.

Table 1. *Demographic Information of Participants*

	Frequency (%)				
Gender	Male 180 (81.1%)		Female 42 (18.9%)		
Age	20–29 17 (7.7%)	30–34 39 (17.6%)	35–49 38 (17.1%)	40–44 78 (35.1%)	45–59 50 (22.5%)
Level of education	College-level degree (Including Junior College) 169 (76.1%)		Postcollege-level academic qualification (master's or doctorate) 53 (23.9%)		
Rank in the workplace	Entry level 12 (5.4%)	Assistant level 66 (29.7%)		Middle level 144 (64.9%)	

Procedure

I asked participants to answer items based on their overall experience using cell phones only for their current work in the organization where they were employed. To increase the response rate, I ensured that the answers were anonymous and the researcher only (not personnel in the firms) would directly collect and handle the responses.

Measures

I used previously developed measures, some of which I adapted to focus on cell phone use (e.g., emails, messengers, mobile information systems) in an organization. Each item was assessed on a 7-point Likert-type scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*. As the survey was conducted in Korean, an individual fluent in Korean and English, translated the items from English to Korean. The items were then back-translated by another individual proficient in Korean and English. A third expert, fluent in English and Korean, confirmed that there were no semantic differences between the two versions (Brislin, 1980).

I adopted the scale developed by Venkatesh et al. (2012) to measure continuity intention ($\alpha = .93$) and habit ($\alpha = .87$). I adopted the scale developed by Beaudry and Pinsonneault (2010) to measure anger and anxiety associated with cell phone use. I used only one item for each negative emotion (see Appendix).

In addition to these research constructs, I included age and gender as covariates, as used in prior studies. For instance, Morris, Venkatesh, and Ackerman (2005) found that as users get older, they tend to face more difficulty learning new technology, and that men are more willing than women to put more effort into overcoming constraints and difficulties to pursue their goals. In contrast, women tend to focus more on the magnitude of effort involved and the process to achieve their objectives (Morris et al., 2005). I assessed reliability using Cronbach's α . As shown in Table 2, the minimum Cronbach's α was .87, which is greater than the conventional threshold (Nunnally, 1978).

Table 2. *Descriptive Statistics for Study Variables*

	Anger	Anxiety	Habit	Continuity intention	Gender
Anger	–				
Anxiety	.820**	–			
Habit	.411**	.345**	–		
Continuity intention	.124*	.136**	.630**		
Gender	-.011	.044	.063	.042	
Age	-.012	-.004	.025	.064	.447**
<i>M</i>	3.198	3.279	4.198	5.033	–
<i>SD</i>	1.756	1.765	1.487	1.288	–

Note. * $p < .05$, ** $p < .01$.

Data Analysis

To examine the hypotheses, I performed a series of hierarchical regressions. I mean-centered the independent variables (anger and anxiety) and the moderating variable (habit) to reduce the threat of multicollinearity. Although rank can be a factor that influences continuity intention, rank and age were highly correlated with each other ($r = .76$). As the inclusion of both rank and age in the equation caused multicollinearity issues, I did not include rank in the analysis. Furthermore, analysis of variance results indicated that rank did not affect anger, anxiety, or continuity intention ($ps > .10$).

Results

The results of the regression analysis are presented in Table 3. The results for Model 1 indicate that anger positively influenced continuity intention, and the results for Model 2 show that anger had a negative effect when it was included with a moderating variable. In addition, the results for Model 3 show the positive influence of anxiety on continuity intention, and the results for Model 4 show that the positive influence of anxiety became negative when a moderating variable was included. Thus, I concluded that as the effects of anger and anxiety on continuity intention were mixed, Hypotheses 1 and 2 were not supported.

Table 3. *Results of Regression Analysis*

	Dependent variable: continuity intention			
	Model 1	Model 2	Model 3	Model 4
Gender	.018	-.025	.009	-.017
Age	.057	.055	.060	.058
Anger	.125*	-.159**		
Habit		.688**		.658**
Anxiety			.136*	-.099*
Anger \times Habit		-.129*		
Anxiety \times Habit				-.118**
R^2	.008	.425	.013	.408

Note. * $p < .05$, ** $p < .01$.

The results for Models 2 and 4 consistently indicate that the interaction effects between the two negative emotions and habit were significantly negative. In Figure 1, the graph indicates that when users have a deeply ingrained habit, the relationship between anger and continuity intention is negative. In contrast, when users do not have a deeply ingrained habit, the relationship is positive but at a nonsignificant level. Similarly, as shown in Figure 2, only when users have a deeply ingrained habit, is the relationship between anxiety and continuity intention negative. Thus, Hypotheses 3 and 4 were not supported.

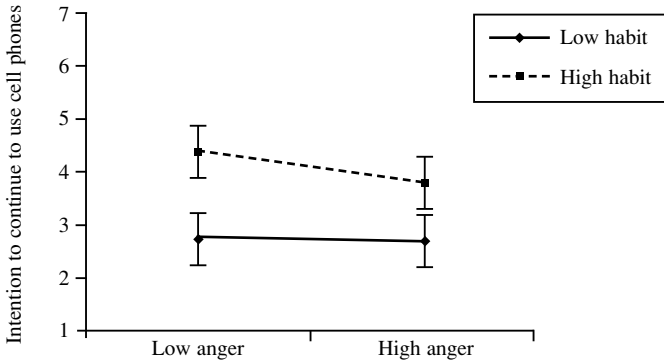


Figure 1. *Interaction effect for anger.*

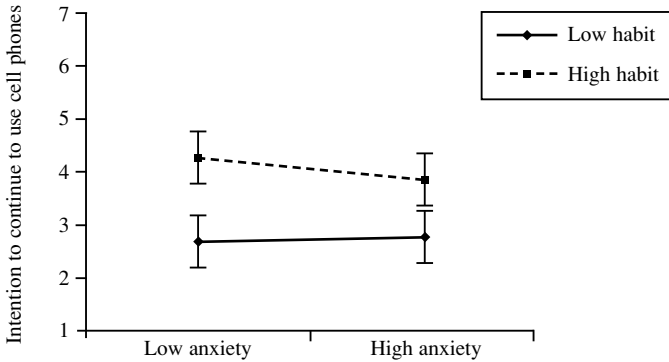


Figure 2. *Interaction effect for anxiety.*

Discussion

In this study, I investigated the effects of negative emotions on continuity intention to use cell phones, and examined the moderating role of habit in these relationships. Although the hypotheses were not supported, the results expand understanding of the roles of negative emotions and habit.

I found it interesting that the results for the effects of negative emotions on continuity intention were equivocal. Furthermore, as the correlations in Table 2 show, the relationships of the two negative emotions with continuity intention were positive. These results are not in line with previous findings on technology acceptance conducted by Brown and Venkatesh (2005) and Beaudry and Pinsonneault (2010), who found that positive emotions tended to increase future

use and continuity intention. I attribute my results to the fact that individuals with high levels of negative emotions may be in situations where they need to use cell phones more than those with low levels of negative emotions. Thus, although these individuals may feel negative emotions toward cell phones, they expect that they will need to use their cell phone more in the near future. As such, although the role of negative emotions in continuity intention is by itself of marginal significance, it is contingent on whether the usage context is mandatory or voluntary. In other words, if users have very negative emotions toward cell phones, they may cease using them in a voluntary context. However, in a mandatory context, they cannot do so as they do not have the authority to choose whether or not they use a cell phone.

My interpretations are further buttressed by the results in this study, which indicate that the interaction between negative emotions and habit negatively influenced continuity intention. More specifically, as individuals develop a deeply ingrained habit to use cell phones, the negative emotions of anger and anxiety are likely to have a negative influence on their continuity intention. In contrast, for individuals with a habit that is not deeply ingrained, these negative emotions do not significantly affect their continuity intention. These results are contrary to previous findings, which suggest that when behavior is habituated, individuals tend to perform this behavior automatically (Fazio, 1990; Limayem et al., 2007). Similarly, as the results in Table 2 show, habit was also strongly correlated with my participants' continuity intention, which supports previous findings on habit (Kim et al., 2005; Limayem et al., 2007). In other words, although the habit of using a cell phone can enhance continuity intention through automaticity, the users' negative emotions that are based on experience may arouse users' consciousness (cf., Ajzen & Fishbein, 2000), and reduce the level of their continuity intention. This new finding can extend understanding of the roles of habit and emotions in continuity intention. According to my results, the above situations did not occur when employees perceived using a cell phone as a habit that was not deeply ingrained, even if their negative emotions became stronger. One reason may be that employees would not experience automaticity because the habit was not deeply ingrained.

In summary, although negative emotions may not affect continuity intention either positively or negatively, they may have the effect of alerting users and making them more conscious of habitually using a cell phone.

There are limitations in this study that should be kept in mind when interpreting the results. Because this study was conducted using a cross-sectional design, the limitations inherent in using this method are present. In addition, my interpretation of the results was that individuals with strongly negative emotions toward cell phones may have been in a mandatory setting, where their emotions would be positively correlated with continuity intention. However, I did not

empirically measure the usage context. Thus, future researchers need to examine the differences in mandatory and voluntary settings in regard to the relationship between negative emotions and continuity intention for cell phone use.

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Appendix Scales Used in the Study

Construct	Reference	Item
Habit	Venkatesh et al. (2012)	The use of a cell phone has become a habit for me. I am addicted to using a cell phone. I must use a cell phone.
Negative emotions (anger and anxiety)	Beaudry and Pinsonneault (2010)	Indicate the extent to which you experienced each of the following emotions when you used a cell phone for your work in the organization. Anger (<i>Not at all–A great deal</i>) Anxiety (<i>Not at all–A great deal</i>)
Continuity intention	Venkatesh et al. (2012)	I intend to continue using a cell phone in the future for my work. I will always try to use a cell phone for my work. I plan to continue to use a cell phone frequently for my work.

