Table of Content

1. Effects of a Personalized Anti-Drinking Mobile Game on College Students’ Responses to Binge Drinking: Mediating Roles of Self-Referencing Effects and Flow
   Joonghwa Lee (Department of Communication, University of North Dakota)

2. Exploring Modal Salient Beliefs Underlying Use of Shared Shaving Tools in Low-Publicity Contexts
   Jean Claude Kwitonda (School of Communication Studies, Ohio University)

3. Effects of Perceived Sensationalism and Susceptibility to the Disease on Cognitive and Emotional Third-Person Perceptions of the MERS News Coverage
   JoonSoo Lim (Department of Public Relations, S. I. Newhouse School of Public Communications, Syracuse University)
   Jiyoung Lee (S. I. Newhouse School of Public Communications, Syracuse University)
   Sonho Kim (Korea Press Foundation)
   Jeongheon JC Chang (Department of Health & Strategic Communication, CHA University)

   Jaehee Cho (School of Media & Communication, Chung-Ang University)
   Jiyeon Chung (School of Media & Communication, Chung-Ang University)
   Chaehwa Chung (School of Media & Communication, Chung-Ang University)
Editor's Foreword

Ghee Young Noh (Hallym University, Korea)

Research Articles

Effects of a Personalized Anti-Drinking Mobile Game on College Students’ Responses to Binge Drinking: Mediating Roles of Self-Referencing Effects and Flow

Joonghwa Lee (University of North Dakota)

Exploring Modal Salient Beliefs Underlying Use of Shared Shaving Tools in Low-Publicity Contexts

Jean Claude Kwitonda (Ohio University)

Effects of Perceived Sensationalism and Susceptibility to the Disease on Cognitive and Emotional Third-Person Perceptions of the MERS News Coverage

JoonSoo Lim (Syracuse University)
Jiyoung Lee (Syracuse University)
Sonho Kim (Korea Press Foundation)
Jeongheon JC Chang (CHA University)

Determinants of the Public’s Perceptions of Telemedicine in Korea: Investigation of the Roles of the Benefits and Costs of Telemedicine and Korean Unique Context in Using Medical Services

Jaehee Cho (Chung-Ang University)
Jiyeon Chung (Chung-Ang University)
Chaehwa Chung (Chung-Ang University)

Instructions for Authors
Editor's Foreword

We are living in a risk society where various health related issues, such as aging, emerging infectious diseases, health inequity, and other problems, are continuously emerging as a potential threat to our well-being and healthy life.

As an academic forum that provides proactive and meaningful responses to these potential health risks, the Healthcare Media Research Institute (HMRI) has a vision for integrating studies on health communication dynamics with community health promotion and health disparities reduction. Bearing new media technologies in mind, our research also focuses on e-health and m-health, aiming to develop new health promotion strategies.

To put it specifically, the emphasis of our research is put on its theoretical modeling of telehealth, developing mobile health, virtual reality platform, and interaction design. We believe that our research has already started to make a meaningful impact by reducing the gap in health knowledge and practical information among local communities, maintaining an appropriate level of risk perception, and promoting community health in general.

The HMRI will continue to provide the collaborative research opportunities and interdisciplinary forums to researchers of communication, public health, medical science, nursing, audiology, psychology, public administration, management, and computer science to fulfill our mission and goals. In so doing, we will be committed to theoretical convergence and methodological innovation.

The outcomes of our interdisciplinary research are to be shared through various ways, including publications, seminars, and symposiums, and special lecture series. Please note that it is our long-term strategic goal to publish an international peer-reviewed research journal in health and media to expand our scholarly contributions into a global stage.

I am very pleased and honored to publish the first issue of International Journal of Health and Media Research (IJHMR). IJHMR is an international and quarterly peer reviewed
academic journal. Bearing in mind WHO’s definition of health, which considers health as “the ability to lead a socially and economically productive life,” IJHMR is interested in exploring the fundamental question of how media are involved in health practices and outcomes. Published articles feature research on, but are not limited to, the following topics:

Global in scope, the journal seeks to advance the integration of public health and media research. With a focus on combining research and practical information, the journal presents research expected to be of informative value for all entities involved in the health communication process, including healthcare beneficiaries, caregivers, health providers, communities, and health policy professionals. The journal pursues the highest quality of social scientific research, based in either quantitative or qualitative orientations. We welcome scholars and practitioners in the fields of communication, psychology, sociology, public health, and allied health professions to submit their original research findings.

I am certain that all our current and future efforts will make IJHMR become an internationally renowned journal of health and media research by seeking, suggesting, and testing innovative solutions to complex health problems. I look forward to continuing to make contributions to improve community and national health and well-being through our collaborating with diverse scholars and practitioners.

Ghee Young Noh, Ph.D.

Editor-in-Chief

International Journal of Health and Media Research
ORIGINAL ARTICLE

Effects of a Personalized Anti-Drinking Mobile Game on College Students’ Responses to Binge Drinking: Mediating Roles of Self-Referencing Effects and Flow

Joonghwa Lee

1 Department of Communication, University of North Dakota

This study suggests that a personalized anti-drinking mobile game can be effective in addressing college students’ binge drinking perceptions, as it can generate higher levels of self-referencing effect and flow. This study conducted a post-test only experiment with the personalized mobile game condition by using a participant’s selfie and name and the control condition by using a default game character. This study found that (1) the personalized mobile game generated a higher level of self-referencing effect than the default mobile game; (2) the self-referencing mediated the positive effect of the personalized mobile game on attitudes toward the game and the negative effect of it on attitudes toward binge drinking; and (3) the personalized mobile game generated higher levels of self-referencing effect and flow than the default mobile game, which in turn resulted in more positive attitudes toward the game. The implications of these results are discussed.

Keywords: Personalized Mobile Game, Anti-Drinking Game, College Binge Drinking

Address correspondence to Joonghwa Lee, University of North Dakota, O’Kelly Hall Room 332, 221 Centennial Drive Stop 7169, Grand Forks, ND 58202, USA
E-mail: joonghwa.lee@und.edu
Introduction

Binge drinking, which refers to more than four drinks per drinking occasion for women and more than five drinks per drinking occasion for men (Laghi, Baiocco, Liga, Lonigro, & Baumgartner, 2014), has been one of the most problematic issues among college students (CDC, 2013; Crosnoe, Kendig, & Benner, 2017; Larimer & Cronce, 2007), resulting in unintentional injuries (e.g., vehicle crashes), alcohol poisoning, and violence. According to the Centers for Disease Control and Prevention (CDC, 2013), among all age periods, the college period (18 to 24 years old) is the critical time when binge drinking frequently occurs. In this respect, the importance of developing health communication strategies, such as anti-binge drinking public service announcements (PSAs), to reduce binge drinking behaviors among college students has received much attention.

Despite various intervention efforts to address the problem of college binge drinking, such as posters and newspaper ads, significant changes in binge drinking behaviors have not been observed among college students (Wechsler et al., 2002; White & Hingson, 2013). To address less successful previous intervention efforts, this study focuses on the strategic use of mobile phone, which is the most popular medium among college students (Klasnja & Pratt, 2012; Pew Research, 2014). In particular, this study seeks to investigate the effects of a personalized anti-drinking mobile game among college students on their attitudinal responses to binge drinking. In addition, in order to better understand the process by which a personalized anti-drinking mobile game produces positive attitudinal effects, this study tests the mediating roles of self-referencing effect (Rogers, Kuiper, & Kirker, 1977) and perceived flow (Csíkszentmihályi, 1990). Playing an anti-binge drinking mobile game with personalized cues (e.g., individuals’ own photos and names on the game character) would help individuals feel more immersed in the game experience, resulting in more positive attitudinal responses (Fastola, Newlon, Pfaff, & Smyslova, 2013).

In doing so, this research will help health communication scholars better understand the strategic use of mobile phones as a tool to reduce binge drinking.
and other risky behaviors. In addition, this study will help communication professionals and health practitioners develop effective anti-binge drinking intervention strategies targeting college students by using mobile phones.

**Literature Review**

**College Students’ Binge Drinking and Mobile Health Intervention Strategies**

College students’ binge drinking may have many undesirable consequences for individuals and communities, such as academic difficulties, unwanted sexual experiences, fighting, and vandalism (CDC, 2013; Crosnoe et al., 2017). Consequently, communication scholars and health practitioners have put an emphasis on the importance of effective intervention strategies to prevent college binge drinking (Wechsler et al., 2002). For example, Kim, Kim, and Lee (2014) found that college students showed more positive responses to anti-binge drinking PSAs emphasizing the benefits of not engaging in binge drinking (e.g., good academic performance) than they did to PSAs highlighting the costs of engaging in binge drinking (e.g., car accident).

Mobile phones are the most frequently used medium among college students in their daily lives. According to the Pew Research (2014), 98 percent of young adults (18 to 29 years old) have mobile phones, and among mobile phone users, 83 percent of young adults have smartphones. Among various mobile phone apps, game apps are the most popular paid apps among young adults (BuzzMedia, 2012). Considering the popularity of mobile phone games, the strategic use of mobile phones and games in developing health intervention strategies targeting college students need to be considered as a way to reduce their risky binge drinking (Carrà et al., 2016; Gajecki, Berman, Sinadinovic, Rosendahl, & Andersson, 2014; Suffoletto et al., 2016).

Young adults tend to positively respond to games incorporating health messages (Peng, 2009). Especially, personalized mobile games can help individuals be more involved in the game situation (Kim et al., 2015). Prior research on self-
referencing effects (Burnkrant & Unnava, 1995) suggests the possibility of personalized mobile games generating better attitudinal outcomes, which will be discussed in the following section.

**Self-Referencing Effects on Personalized Mobile Game**

The self-referencing effect posits that people tend to prefer messages tailored with self-related cues (e.g., one’s own photos, first- or second-person words, and one’s own personal experiences) to messages with other-related cues in the messages (Burnkrant & Unnava, 1995). As the self is a well-organized structure or schema related to memory, interpretation, and processing (Burnkrant & Unnava, 1995; Rogers et al., 1977), self-related cues in messages can activate the elaboration of information processing and favorable attitudes toward the messages (Ahn & Bailenson, 2011; Burnkrant & Unnava, 1995). In other words, self-referencing effects can occur when individuals assimilate the messages to themselves by connecting the cues to the self. In fact, self-referencing effect is a mechanism by which media users tailor messages by using customized functions and in turn make messages more personalized (Lee & Oh, 2012). Prior research on self-referencing effects indicates that personalized messages are more likely to produce positive attitudinal outcomes (Ahn & Bailenson, 2011; Debevec & Romeo, 1992; Lee & Oh, 2012). For example, Debevec and Romeo (1992) found that participants had more positive attitudes toward advertised products when they were exposed to the self-related messages. Similarly, Ahn and Bailenson (2011) demonstrated that using participants’ own photos (vs. others’ photos) and second-person pronoun (vs. third-person pronoun) in soft drink advertisements produced more positive brand attitudes and higher purchase intention.

As the interactive nature of mobile phones and game apps enables users to play personalized mobile games, the self-referencing effect can explain why an anti-drinking mobile game with self-related cues (e.g., personalization options) would generate better attitudinal outcomes than a game without personalized cues (Burnkrant & Unnava, 1995; Rogers et al., 1977). In mobile games, there are several self-related cues available by using personalization options, such as taking selfies to create unique game characters and entering players’ names in game
characters. Those personalized functions on mobile games are expected to enable individuals to relate the game character with themselves, as compared to mobiles games without personalized functions, based on self-referencing effects (Ahn & Bailenson, 2011; Burnkrant & Unnava, 1995; Debevec & Romeo, 1992; Lee & Oh, 2012; Rogers et al., 1977). Therefore, the following hypothesis is posed:

Hypothesis 1: The personalized anti-drinking mobile game condition will generate a higher level of perceived self-referencing than the default anti-drinking mobile game condition.

Previous studies have found that self-referencing effects would serve as an explanatory mechanism by which personalized messages generate positive emotional responses (e.g., Ahn & Bailenson, 2011; Burnkrant & Unnava, 1995; Debevec & Romeo, 1992, Martin, Lee, & Yang, 2004). Likewise, when individuals play a game with personalized characteristics, they would be more attached to the game, which in turn help them focus on the game. In this study, first, it is expected that self-referencing effects generated by personalization functions available in the anti-drinking mobile game would result in individuals’ positive attitudes toward the game. Additionally, self-referencing effects would have a negative impact on attitudes toward binge drinking. Thus, the following two hypotheses are posed:

Hypothesis 2: Perceived self-referencing will mediate the positive effect of the personalized anti-drinking mobile game condition on attitudes toward the game.

Hypothesis 3: Perceived self-referencing will mediate the negative effect of the personalized anti-drinking mobile game condition on attitudes toward binge drinking.

Self-Referencing Effects on Flow

Flow refers to the state where individuals are immersed in a particular experience (Csikszentmihályi, 1990). The flow experience enhances people’s feelings, engagement, and involvement of a given activity (Csikszentmihályi, 1990;
Fang, Zhang, & Chan, 2013; Hoffman & Novak, 2009; Raphael, Bachen, & Hernández-Ramos, 2012). For example, Hoffman and Novak (2009) found that people enhanced their learning, perceptions of control, and positive experiences of the Internet when they had the flow experience.

Moreover, it is found that flow is related to increase positive mental state such as feelings of flourishing and enjoyment, and positive attitudes toward the experience (Cheng, Chieng, & Chieng, 2014; Faiola et al., 2013; Nakamura & Csíkszentmihályi, 2002; Sherry, 2004). Previous studies have suggested that media enjoyment could also be explained as a state of flow experience (Cheng et al., 2014; Faiola et al., 2013; Fang et al., 2013; Sherry, 2004). According to Sherry (2004), media enjoyment is consistent with many of the components of flow, stating that enjoyment of media produces “focused concentration, loss of self-consciousness, a sense that one is in control of the situation, distortion of temporal experience, and the experience of the activity as intrinsically rewarding” (p. 336). When people play mobile games, they feel enjoyment and fun, which helps them generate a flow experience.

In the context of personalized anti-drinking mobile games, the personalization options of mobile games and self-referencing resulting from playing personalized mobile games would lead them to be more immersed in playing the game (i.e., flow). This flow experience would also have a positive impact on people’s attitudinal responses. Consequently, it is expected that the personalized anti-drinking mobile games with self-related cues (e.g., the player’s photo and name) would help college students experience flow. Such flow experience would increase positive attitudes toward the games and negative attitudes toward anti-binge drinking. Therefore, the following two hypotheses are posed:

Hypothesis 4: The personalized anti-drinking mobile game condition will generate higher levels of perceived self-referencing and flow than the default anti-drinking mobile game condition, which subsequently will result in more positive attitudes toward the game.

Hypothesis 5: The personalized anti-drinking mobile game condition will generate higher levels of perceived self-referencing and flow than the default anti-drinking mobile game condition, which subsequently will result in more negative attitudes toward binge drinking.
Method

This study used a post-test only experimental design with two anti-drinking mobile game conditions. The first condition was a personalized anti-drinking mobile game condition using a participant’s own photo and name. The other condition was a control condition using a default game character.

Participants

A total of 143 undergraduate students participated in this study. They were recruited from a research subject pool at a large southern public university in the U.S., and they received extra credits for their participation. The mean age of study participants was 21.30 (SD = 2.79), and 58 percent of the participants were males. Most of the participants were Caucasians (58.7%), followed by African-Americans (24.5%), Hispanics (6.3%), Asians/Asian Americans (4.9%), and others (5.6%). The participants were randomly assigned to one of the two experimental conditions: (1) personalized condition (N = 80) and (2) control condition (N = 63).

Stimuli

All participants in the two conditions played a mobile game promoting anti-drinking. The name of the game is “Done Drinking,” which can be found at the Android App store. Although this study used an existing anti-drinking mobile game, none of the participants reported that they had played the game prior to this experiment. The purpose of the game was to guide a game character who was drunk to walk straight in order for the character not to die.

Experimental Procedure

Upon arriving at a campus computer lab, participants were seated individually at a computer station and asked to provide a written informed consent.

1 The screenshots of the experimental stimuli are available from the corresponding author upon request.
Participants were given smartphones and those in the personalized condition were asked to take a selfie before starting the game and save it on the smartphone. Next, they were asked to open the anti-drinking game app and go to the personalization menu. In the personalization option, they were instructed to use their selfies to create their own game character and enter their own names to name the characters. In contrast, participants in the control condition used the default game character.

Next, participants played the game for five minutes in a lab using a smartphone prepared by the researcher. The game character had three lives. If participants did not successfully guide the game character to walk straight, but instead, had the character fall down, the character would lose a life. If participants lost all three lives within five minutes, they were asked to start the game again. After playing the game for five minutes, they were asked to complete a questionnaire that includes the measurement items of perceived self-referencing, flow, attitudes toward the game, attitudes toward binge drinking, and demographics. On completion of the game and the questionnaire, participants were thanked, debriefed, and dismissed. The overall experiment took about 30 minutes.

Measures

Perceived self-referencing

Perceived self-referencing was measured using five 5-point Likert scales (Martin et al., 2004): “The game character helped me relate myself to the game personally”; “I was able to easily relate myself to the game character”; “The game seemed to be created with me in mind”; “I can easily form similarity judgments between myself and the game character”; and “The character in the game speaks for me.” The inter-item consistency was acceptable, and the responses were averaged across the five items (Cronbach’s $a = .92$, $M = 1.96$, $SD = 1.39$).

Flow

Flow was measured using four 7-point Likert scales (Kim & Han, 2014): “I completely concentrated on the game while I played it”; “When I played the game,
time seemed to pass by very quickly”; “While I played the game, nothing seemed to matter”; and “While I played the game, I felt totally captivated.” The inter-item consistency was acceptable, and the responses were averaged across the four items (Cronbach’s α = .74, M = 4.47, SD = 1.47).

**Attitudes toward the game**

Participants were asked to evaluate the binge drinking behavior based on six 7-point semantic differential scales (Baek, Shen, & Reid, 2013; O’Hara, Harker, Raciti, & Harker, 2008): “bad – good,” “negative – positive,” “not enjoyable – enjoyable,” “not favorable – favorable,” “unpleasant – pleasant,” and “unsatisfying – satisfying.” The inter-item consistency was acceptable, and the responses were averaged across the six items (Cronbach’s α = .94, M = 2.20, SD = 1.30).

**Potential covariates**

Based on flow theory (Csíkszentmihályi, 1990) and relevant prior research (e.g., Lee, Park, & Wise, 2014), an individual’s responses to the game and the promoted behavior in the game might vary by one’s perceived difficulty of the game. Consequently, perceived game difficulty was measured by asking, “please indicate how difficult you felt it was to complete the mobile game you just played.” The response option ranged from 1 (“very easy to play”) to 7 (“very difficult to play”) (M = 2.99, SD = 1.88). In addition, potential covariates included consumer demographics, such as age, gender, and race.

**Results**

**Randomization Check**

Before testing hypotheses, a series of Chi-square tests and ANOVAs were performed to examine differences in covariates and demographic characteristics between the two experimental conditions. As shown in Table 1, none of these variables were significantly different between two experimental conditions. Thus, no covariate was included in testing hypotheses.
Table 1. Results of ANOVAs and chi-square tests of covariates and demographics across two experimental conditions

<table>
<thead>
<tr>
<th>Variables</th>
<th>df</th>
<th>F/ Chi-square</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Game difficulty</td>
<td>1, 141</td>
<td>.38</td>
<td>.54</td>
</tr>
<tr>
<td>Age</td>
<td>1, 140</td>
<td>.53</td>
<td>.47</td>
</tr>
<tr>
<td>Gender*</td>
<td>1</td>
<td>.29</td>
<td>.59</td>
</tr>
<tr>
<td>Race*</td>
<td>5</td>
<td>5.94</td>
<td>.31</td>
</tr>
</tbody>
</table>

*Chi-square test.

Hypotheses Testing

**H1: The positive effect of personalized (vs. default) anti-drinking mobile game on self-referencing.**

A one-way ANOVA was performed to examine the difference in perceived self-referencing between the personalized and the control game conditions. The results demonstrated that the personalized game condition ($M = 2.36, SD = 1.55$) generated a higher level of perceived self-referencing than the default game condition ($M = 1.44, SD = .94$) ($F (1, 141) = 16.93, p < .01, \text{partial } \eta^2 = .11$). The results showed that participants in the personalized game condition were more likely to relate themselves to the game character than those in the default game condition. Thus, H1 was supported.

H2 through H5 examine indirect effects of personalized vs. default anti-drinking mobile game on attitudes toward the game and toward binge drinking mediated through perceived self-referencing and flow. To test these four hypotheses, this study tested a mediation model with two mediators operating in serial (Hayes, 2013). Given that this study included two dependent variables (i.e., attitudes toward the game and attitudes toward binge drinking), this study examined two mediation models. The first model involved the effects of personalized (vs. default) mobile game on attitudes toward the game as mediated by two potential mediators (i.e., perceived self-referencing and flow) operating in serial, and the second model involved the effects of personalized (vs. default) mobile game on attitudes toward binge drinking as mediated by the
H2 and H3: Perceived self-referencing as a mediator.

H2 predicted that perceived self-referencing would mediate the positive effect of the personalized anti-drinking mobile game condition on attitudes toward the game. As shown in Figure 2, the personalized mobile game condition had a direct positive effect on attitudes toward the game ($b = .47, SE = .22, p < .05$), indicating that participants in the personalized game condition, as compared to those in the default game condition, showed more positive attitudes toward the game. Additionally, the personalized mobile game condition had positive effects on perceived self-referencing ($b = .91, SE = .22, p < .01$), which positively influenced attitudes toward the game ($b = .28, SE = .08, p < .01$). As shown in Table 2, the indirect effect of personalized (vs. default) anti-drinking mobile game condition on attitudes toward the game through perceived self-referencing was significant. The result indicates that participants in the personalized anti-drinking mobile game condition are more likely to relate themselves to the game, which results in generating more positive attitudes toward the game. As the direct path from the personalized mobile game condition to attitudes toward the game was statistically significant, the finding provided evidence for partial mediation of perceived self-referencing. Thus, H2 was partially supported.
Figure 1. A mediation model for attitudes toward the game. Unstandardized regression coefficients from a bootstrap analysis are provided along the paths.

Table 2. Indirect effects of personalized mobile game on attitudes toward the game and binge drinking

<table>
<thead>
<tr>
<th>Paths</th>
<th>Beta</th>
<th>SE</th>
<th>95% CI</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>LLCI</td>
<td>ULCI</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Perceived self-referencing as a mediator</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H2: Personalized mobile game → perceived self-referencing → Agame</td>
<td>.25</td>
<td>.11</td>
<td>.07</td>
<td>.51</td>
</tr>
<tr>
<td>H3: Personalized mobile game → perceived self-referencing → Abinge drinking</td>
<td>-.30</td>
<td>.11</td>
<td>-.55</td>
<td>-.12</td>
</tr>
<tr>
<td><strong>Perceived self-referencing and flow as mediators operating in serial</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H4: Personalized mobile game → perceived self-referencing → flow → Agame</td>
<td>.12</td>
<td>.05</td>
<td>.05</td>
<td>.25</td>
</tr>
<tr>
<td>H5: Personalized mobile game → perceived self-referencing → flow → Abinge drinking</td>
<td>-.01</td>
<td>.02</td>
<td>-.05</td>
<td>.05</td>
</tr>
</tbody>
</table>

**Notes:** Agame = Attitudes toward the game; Abinge drinking = Attitudes toward binge drinking; CI = confidence intervals; LLCI = lower level confidence intervals; ULCI = upper level confidence intervals.

The confidence intervals containing zero indicate that the indirect effects are not significant.
H3 predicted that perceived self-referencing would mediate the negative effect of the personalized anti-drinking mobile game condition on attitudes toward binge drinking. As shown in Figure 3, the personalized mobile game condition had a direct negative effect on attitudes toward binge drinking ($b = -0.48$, $SE = 0.22$, $p < 0.05$), indicating that participants in the personalized game condition, as compared to those in the default game condition, showed more negative attitudes toward binge drinking. In addition, the personalized mobile game condition had a positive effect on perceived self-referencing ($b = 0.91$, $SE = 0.22$, $p < 0.01$), which negatively influenced attitudes toward binge drinking ($b = -0.33$, $SE = 0.08$, $p < 0.01$). As shown in Table 2, the indirect effect of personalized (vs. default) anti-drinking mobile game condition on attitudes toward the binge drinking through perceived self-referencing was significant. The result indicates that participants in the personalized anti-drinking mobile game condition tend to relate themselves to the game, which results in generating more negative attitudes toward the unhealthy behavior, namely, binge drinking. As the direct effect of the personalized mobile game condition to attitudes toward the binge drinking was statistically significant, perceived self-referencing was found to be a partial mediator. Thus, H3 was partially supported.

**Figure 2.** A mediation model for attitudes toward binge drinking. Unstandardized regression coefficients from a bootstrap analysis are provided along the paths.
H4 and H5: Perceived self-referencing and flow as mediators operating in serial.

H4 predicted that the personalized anti-drinking mobile game condition would generate higher levels of perceived self-referencing and flow, which would positively influence attitudes toward the game. As shown in Figure 2, the personalized mobile game condition had a positive effect on perceived self-referencing ($b = .91, SE = .22, p < .01$), which positively influenced flow ($b = .32, SE = .09, p < .01$). Additionally, flow positively influenced attitudes toward the game ($b = .42, SE = .07, p < .01$). As shown in Table 2, the indirect effect of personalized (vs. default) anti-drinking mobile game condition on attitudes toward the game through two mediators, namely, perceived self-referencing and flow, was significant. That is, the personalized anti-drinking mobile game condition enabled participants to relate themselves to the game and experience greater flow, which resulted in more positive attitudes toward the game. As the direct effect of the personalized mobile game condition to attitudes toward the game was statistically significant, perceived self-referencing and flow served as partial mediators operating in serial. Therefore, H4 was partially supported.

H5 predicted that the personalized anti-drinking mobile game condition would generate higher levels of perceived self-referencing and flow, which would negatively influence attitudes toward binge drinking. As presented in Figure 3, the personalized mobile game condition had a positive effect on perceived self-referencing ($b = .91, SE = .22, p < .01$), which positively influenced flow ($b = -.01, SE = .08, p = .86$). However, flow did not significantly influence attitudes toward binge drinking ($b = .42, SE = .07, p < .01$). As shown in Table 2, the indirect effect of personalized (vs. default) anti-drinking mobile game condition on attitudes toward binge drinking through two mediators, namely, perceived self-referencing and flow, was not significant. Thus, H5 was not supported.

Discussion

Binge drinking is one of the most serious unhealthy behaviors among college students resulting in negative consequences (e.g., Baek et al., 2013; CDC, 2013; Laghi et al., 2014; Larimer & Cronce, 2007). It is prominently important for health
practitioners and university staffs to develop effective methods to deliver anti-drinking messages to college students and educate them. Considering the pervasiveness of mobile phones and the popularity of mobile games among college students (Klasnja & Pratt, 2012; Pew Research, 2014), this study examined the effects of using an anti-drinking mobile game on college students’ attitudinal responses. Particularly, this study tested whether (1) an anti-drinking mobile game with personalization options would generate higher self-referencing effects (Burnkrant & Unnava, 1995; Rogers et al., 1977); (2) self-referencing effects would explain the positive effects of the personalized anti-drinking mobile game on attitudinal responses; and (3) whether a flow experience (Csíkszentmihályi, 1990) heightened by self-referencing effects would explain the positive effects of the personalized anti-drinking mobile game on attitudes toward the game and the negative effects on attitudes toward binge drinking.

This study found that (1) the personalized anti-drinking mobile game generated a higher level of self-referencing effects than the default mobile game; (2) the self-referencing mediated the positive effect of the personalized anti-drinking mobile game on attitudes toward the game and the negative effect of the game on attitudes toward binge drinking; and (3) the personalized anti-drinking mobile game generated higher levels of self-referencing effects and flow than the default mobile game, which in turn produced more positive attitudes toward the game.

The findings of this study can provide some answers to a question – how to use mobile games more effectively to target college students? More specifically, it is important to develop anti-drinking games with personalization options, such as creating players’ own characters using selfies and names. These personalized mobile games make players feel that they are part of the game promoting anti-binge drinking (i.e., self-referencing effects) and thus they would be more immersed in the game (i.e., flow). These experiences can contribute to college students’ positive responses to the games and the messages in the game (i.e., anti-binge drinking). The findings of this study showed that the personalization option is a key factor to generate self-referencing and flow and ultimately positive attitudinal responses.
This study provides health communication scholars and practitioners with theoretical and practical significances to develop effective intervention strategies in terms of college students’ binge drinking. First, although previous studies examined self-referencing effects in the context of product advertising (e.g., Ahn & Bailenson, 2011; Burnkrant & Unnava, 1995; Debevec & Romeo, 1992), few studies have tested self-referencing effects in the domain of mobile games promoting healthy behaviors. Therefore, this study expands the applicability of self-referencing effects to the contexts of mobile games and health communication, and contributes to advancing the knowledge of the psychological mechanisms by which mobile games change college students’ attitudinal responses to binge drinking and promote anti-binge drinking.

Additionally, this study advances previous research on flow (e.g., Cheng et al., 2014; Csikszentmihalyi, 1990; Fang et al., 2013; Hoffman & Novak, 2009; Raphael et al., 2012), which has mainly put emphasis on new media and technology. In particular, this study examined the role of flow as an antecedent of positive attitudinal responses to the mobile game. The findings of this study suggest that health communication scholars and practitioners should identify the ways in which interactive media messages enable individuals to be immersed in the media use experiences (e.g., using personalization options) as such experience leads to positive attitudinal responses.

Moreover, this study can provide scholars with a useful framework to develop a psychological model of mobile games. Particularly, this study tested the mediating roles of self-referencing effects and flow experiences on individuals’ attitudinal responses to the game and binge drinking. Although self-referencing effects and flow have mainly been tested in the context of product advertising (Ahn & Bailenson, 2011; Burnkrant & Unnava, 1995; Debevec & Romeo, 1992) and new media and technology (Cheng et al., 2014; Csikszentmihalyi, 1990; Fang et al., 2013; Hoffman & Novak, 2009; Raphael et al., 2012), respectively, this study showed that self-referencing effects and flow experience play a mediating role in addressing a public health problem, namely, college students’ binge drinking.

In addition to binge drinking, college students are vulnerable to other risky and unhealthy behaviors, such as binge eating (Halmi, Falk, & Schwartz, 1981).
and smoking (Obermayer, Riley, Asif, & Jean-Mary, 2004). Consequently, it is critical for communication and health practitioners to devise strategies to effectively reach college students. The findings of this study may give the practitioners insights how to leverage self-referencing effects and flow that directly or indirectly have positive impacts on health intervention outcomes.

In sum, from a narrow perspective, this study contributes to developing effective strategies to address college binge drinking issues by taking advantage of personalized mobile phone games. From a broad perspective, this study contributes to incorporating new and interactive media strategies into health intervention messages effectively targeting college students.

Limitations and Suggestions for Future Research

There are some limitations in this study. First, although the mobile game of this study included personalization options, this study used an existing game. Thus, it is difficult to control other factors in the game, such as the ethnicity of default character. Future research needs to develop its own anti-drinking game to control extraneous factors. Second, this study did not examine the degree of the personalization in the mobile game, but compared two conditions only (personalized vs. default condition). Future researchers are encouraged to investigate the effects of different levels of the personalization (e.g., high vs. medium vs. low personalization) in mobile games on attitudinal and behavioral responses. Third, this study did not incorporate participants’ consumption and drinking frequency of alcoholic beverage into the data analysis as a potential covariate. Considering the potential influence of drinking behavior on attitudinal responses, future researchers are encouraged to include them as a covariate. In addition, this study did not include behavioral responses and attitudinal changes due to the sensitivity of the questions. However, to fully understand and predict college students’ reactions to the anti-drinking game, it would be better to include their behavioral responses (e.g., intention to not to be engaged with binge drinking) and attitudinal changes (e.g., pre- and post-attitudes toward binge drinking) in the model.
Acknowledgments

This study was supported by Faculty Research and Creative Activity Committee (FRCAC) Grant at Middle Tennessee State University.

References


ORIGINAL ARTICLE

Exploring Modal Salient Beliefs Underlying Use of Shared Shaving Tools in Low-Publicity Contexts

Jean Claude Kwitonda

1 School of Communication Studies, Ohio University

Media and health psychology have been complementary in increasing publicity or exposure to health information for the purpose of influencing behavioral modifications. To be relevant, health psychology constructs necessitate formative research to elicit and identify salient beliefs from the perspective of the population of interest. This practice generates theoretically sound and culturally appropriate content especially when the research being conducted is international in scope. This study reports results of an elicitation study that explored modal salient beliefs underlying information, motivation and behavioral skills for negotiating hygiene and haircare in low-income and low-publicity contexts. Results indicate that respondents rely on informational heuristics, which compound their low motivation and efficacy in the various hair care negotiations they have to navigate.

Keywords: Modal Salient Beliefs, IMB Model, Media and Health, Sub-Saharan Africa.
Introduction

Most people in Sub-Saharan Africa use barbershops for shaving and styling facial and scalp hair. Barbershop services involve use and reuse of barbershop tools such as brushes, towels, and combs, as well as sharp objects such as clippers. As such, patrons of barbershops may be exposed to biological byproducts that may contain pathogens. Furthermore, a growing body of research conducted by dermatologists and public health researchers (Biadgelegn et al., 2012; Howard, 2016; Khumalo, 2012; Khumalo et al., 2013; Nonhlanhla & Khumalo, 2012) explain that some shaving and styling practices may cause different types of bleeding (e.g., visible and invisible). Previous research (e.g., see Khumalo et al., 2013) suggests that the phenomenon of close-shave is associated with invisible bleeding (i.e., evidence of blood can only be detected using laboratory equipment and procedures). The close-shave styles may cause skin abrasions because they are executed “by pressing the metal of the electric hair clipper directly and firmly onto the scalp without using the manufacturer-supplied clipper combs that determine hair length; the result is similar to that achieved with razor blades” (Khumalo et al., 2013, p.197).

Visible bleeding may be caused by accidental cuts or nicked in-grown hair bumps (also known as Folliculitis Pseudofolliculitis Barbae), acne, barber’s rash or other skin irritations that affect the beard and throat area (Khumalo, Gumedze, & Lehloeny, 2012; Khumalo, 2012) in male populations. Notwithstanding the above-mentioned potential health risks, there are no health communication efforts aimed at addressing the challenge of prevention. Yet, by definition, health communication can cover prevention topics that are of interest in this study including disease control and prevention, injury prevention, and workplace safety and health (Parrot, 2004). Such health communication efforts are even more pressing in low-income contexts because lack of publicity may foster laxity among barbers and barbershop clientele. For example, there are widespread claims that barbers often dilute alcohol (meant for sanitizing and disinfecting purposes) with water (e.g., see Ngoboka, 2015). This laxity may increase the risk that bacterial and
viral illnesses are spread between clients, exacerbating the burden of other communicable diseases such as HIV in Sub-Saharan. Indeed, researchers have suggested that there must be other dynamics besides sexual transmission that account for the disproportionate high prevalence of such communicable diseases in Sub-Saharan-Africa (e.g., see Khumalo, 2012; Sawers & Stillwaggon, 2010). Therefore integrating diseases prevention strategies (Sawers & Stillwaggon, 2010) emerges as a better strategy for mitigating cofactors that underlie blood and skin-borne diseases in the region.

Media and Health Beliefs

Media and health psychology have been complementary in increasing publicity or exposure to health information for the purpose of influencing behavioral modifications (Fishbein & Cappella, 2006; Fishbein & Yzer, 2003; Lutchyn & Yzer, 2011; Morgan, 2009). To maintain relevance, most media and health psychology research necessitate formative research to elicit and identify salient beliefs from the perspective of the population of interest. That is, to change a given health behavior in a given population, one “must go to members of that population to identify salient outcome, normative, and efficacy beliefs” (Fishbein & Yzer, 2003, p. 168). Fishbein and Ajzen (2010) define modal salient beliefs as a “set of beliefs held with greatest frequency in the population of interest” (p. 102). This study identified modal salient beliefs underlying the use of shared shaving tools by applying a health psychology framework known as the information, motivation and behavioral skills (IMB) model. So far, there is no health communication research aimed at promoting information, motivation and behavioral skills to negotiate hygiene and hair care in Sub-Saharan Africa. Thus, the application of this model in health communication is timely because a growing number of public health studies worldwide have raised concerns regarding the potential spread of diseases through shared tools and unsanitary practices in barbershops and other beauty salons (e.g., Ataei, Shirani, Alavian, & Ataie, 2013; Biadgelegn et al., 2012; Chaudhry, Rizvi, Ashraf, Afzal, & Niazi, 2010; Eltayeb & Mudawi, 2013; Garbaccio & Oliveira, 2013; Khaliq & Smego, 2005;
Kwitonda: Use of Shared Shaving Tools In Low-Publicity Contexts

Khumalo, et al., 2013; Nonhlanhla & Khumalo, 2012; Uslu, Uyanik, & Ayyildiz, 2008). This paper reports findings of a formative study aimed at identifying modal salient beliefs in negotiating hygiene and hair care.

Theoretical Framework

Because the issue of public health risks associated with use of shared shaving tools has received low publicity in Sub-Saharan Africa, the health psychology model known as the information, motivation, behavioral skills model (IMB) was applied. According to Fisher and Fisher (1992) who developed this model, the IMB model assists health researchers in asking a number of interrelated questions. For example, the model enables researchers to inquire whether or not people have information required to perform a health promoting behavior (e.g., awareness of relevant facts about how a particular disease is transmitted). Moreover, the model helps researcher assess whether people who have information also have the motivation to perform desired health behaviors. Finally, the model can help researchers ask whether people who have information and motivation also have the necessary behavioral skills to perform desired health behaviors particularly when the health behaviors in question are complex (Fisher & Fisher, 1992).

Salient Beliefs and Cross-Cultural Research

The aim of this study was to identify modal salient beliefs for the IMB constructs outlined above. Developers of health psychology constructs recommend elicitation procedures in order to identify model salient beliefs that are culturally relevant (e.g., see Ajzen & Fishbein, 1980; Fishbein & Yzer, 2003; Fisher & Fisher, 1992; Fisher, Fisher & Shuper, 2009). However, it has been found that the identification of salient beliefs is often ignored in research (Fishbein & Middlestadt, 1995). Curtis, Ham and Weiler (2011) assert that beliefs cannot be “intuited or assumed to be transferable among different populations and behavioral domains” (p. 564). Most importantly, because health psychology models such as IMB model have often been criticized as being western and ostensibly inappropriate in non-western contexts, elicitation of modal salient
beliefs facilitate the process of developing constructs that are culturally appropriate (Fishbein & Cappella, 2006). As such, the elicitation of modal salient beliefs aims to “identify which of a variety of potential determinants are the best ones to target in national and local interventions” (Middlestadt, Bhattacharyya, Rosenbaum, Fishbein & Shepherd, 1996, p. 18). Additionally, elicitation research is useful in developing questionnaire items that are culturally appropriate because modal salient beliefs are derived from the perspectives of relevant populations. Thus, modal salient beliefs have the advantage of generating “terminology and words in the language of the populations of interest” (Middlestadt, Bhattacharyya, Rosenbaum, Fishbein & Shepherd, 1996, p. 19). Fisher and Fisher (1992) who developed the IMB model identified elicitation of salient beliefs as the first step that should be used to understand and promote health-risk reduction in different populations. The results presented in the sections that follow describe salient beliefs emitted by 65 respondents recruited in Rwanda. The data were translated from the Kinyarwanda language into English.

**Elicitation Research Procedures**

In order to elicit salient beliefs, Fishbein and Ajzen (2010) recommend that researchers ask respondents “to list characteristics, qualities and attributes” (p. 100) of particular outcomes. The elicitation research for the present study instructed respondents to list in a free-response format, beliefs regarding the variables in the proposed IMB model.

Due to practical reasons (e.g., limiting the scope of the study in terms of topical coverage) and the fact that men are disproportionately affected by the skin conditions that effect the beard area and other risks associated with the close shaving, participants in this study were exclusively males aged above 18. Also, most women in Sub-Saharan Africa have hairstyling needs that differ from men’s. 65 respondents from Rwanda participated in the elicitation study. 19 respondents came from the capital city and its suburbs, 14 were male respondents in a rural area in the southern province and 32 were recruited through e-mail. Those who were recruited through e-mail responded to the study through Qualtrics.
Participants who did not use Internet responded using printed questionnaires.

Because Fisher and Fisher (1992) explain elicitation as a “technique in which people provide information to researchers in a context in which no correct answer or alternative are provided” (p. 464), the elicitation research questionnaire instructed respondents to list up to 10 outcomes for each elicitation question. Limiting the number of emitted beliefs is consistent with Fisher’s and Fisher’s (1992) recommendation regarding what constitutes salient beliefs or what Fisher and Fisher (1992) call “top-of-the head” (p. 465) beliefs that are spontaneously accessible in real-life settings of health behavior. Research indicates that people are capable of attending to or processing 5 – 9 pieces of information at a time; that is, other beliefs emitted after 9 beliefs may be cognitively less accessible or have less ecological validity (e.g., Fishbein & Ajzen, 2010; Fisher & Fisher, 1992; Miller, 1956).

Analysis of Modal Salient Beliefs

Because elicitation inquiry usually produces sets of beliefs that differ among individual respondents (Fishbein & Ajzen, 2010), the analysis of elicitation data sought to identify modal set of salient beliefs based on the frequency of beliefs emitted by respondents (Fishbein & Ajzen, 2010). Thus analysis of data was done by counting the frequency with which each belief was listed and by grouping together beliefs that refer to similar outcomes (Fishbein & Ajzen, 2010). That is, beliefs were grouped together because they have something in common or because they fall in the same semantic field (Fishbein & Ajzen, 2010). Modal salient beliefs were then tallied and presented in a table in descending order of frequency.

Elicitation Study Results

The results include modal salient beliefs regarding the core constructs of information, motivation as well as self-efficacy related to behavioral skills (i.e., negotiation of hair care needs). As seen in the following sections, negotiation skills constructs were construed as two separate domains. The first domain, public
negotiation skills, is a construct that entails specific skills required in order to negotiate hygiene in the context of the barbershop. The second domain, private negotiation skills, was defined as skills that are required to practice home-based haircare, which include buying personal (hence private) shaving kit that can either be used at home or taken to the barber.

**Informational Heuristics**

To identify beliefs related to relevant information, some interrelated questions were used. The first question asked respondents if there are diseases that could be transmitted through barbershops and hair care practices. With the exception of 3 respondents who did not provide an answer to this question, the remaining 62, that is, about 95% of respondents, believe that there are diseases that may be transmitted.

The second question was a follow-up to the first. It asked to list any disease that can be transmitted. AIDS was mentioned 57 times, ringworm was mentioned 50 times, dandruff was mentioned 37 times, ingrown hair also known as Folliculitis Pseudofolliculitis Barbae was mentioned 37 times, and a skin disease known as pityriasis versicolor (a yeast infection that causes scaly discolored areas on the skin) was mentioned 32 times. There was another generic category called “skin infection” that was mentioned 17 times by respondents. Participants also listed cancer 12 times since some believe rusty clippers can cause cancer. The above mentioned beliefs constituted 85% of all beliefs emitted with respect to diseases that may be transmitted in barbershops. Respondents also listed less salient diseases including scabies (11 times), hepatitis (ten times), Ebola (6 times), skin rashes (5 times), lice (4 times), hair loss or baldness (3 times) and tetanus (2 times).

The third question probed respondents to describe in as many details as possible how transmission of pathogens may happen through haircut practices. Improper disinfection of tools used in public barbershops was the most frequently mentioned cause as it was mentioned 89 times or 55% of all beliefs emitted. Responses related to this category include lack of hygiene in general, lack of disinfection products, dirty hand towels used to clean scalp after a haircut.
Respondents also said that when there are many customers there is no time to think. They also said that the more people barbers shave the more money they make and that all these constraints work against time-consuming hygiene.

Another prominent category (mentioned 89 times) was about injuries as pathways for pathogens. Responses in this category included statements such as shaving and injuring someone who has AIDS and then shaving someone and causing an injury using the same clipper, and other injuries caused by clippers during trimming. Another frequent category highlighted reuse (e.g., reuse of one clipper on different people), and this was mentioned 30 times. Some participants added reuse of tools with no time in between. Respondents also listed flawed tools and products (mentioned 9 times) such as fake alcohol, expired aftershaves, old clippers and brushes.

A follow-up question asked what reassures respondents (since they continue using barbershops). This was the most revealing question because it clarified why respondents accept the use of shared shaving objects despite awareness of contracting skin or blood-borne diseases mentioned above. The responses emphasized trust in disinfection practices that are commonly applied in barbershops, including the use of alcohol. Table 1 presents the main categories of beliefs collected as well as their frequency in a descending order.

<table>
<thead>
<tr>
<th>NO</th>
<th>Belief</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I make sure they use alcohol</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>I have no reassurance</td>
<td>23</td>
</tr>
<tr>
<td>3</td>
<td>I use common sense/appearance of shops and equipment</td>
<td>21</td>
</tr>
<tr>
<td>4</td>
<td>Most of the time I do certain things myself</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>I stick with one barber</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>You hope that you will not catch a disease</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>If you get a disease you can seek treatment</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>You can be infected but will not know it until it is too late</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>Barbers try to be careful and make sure they do not cause injuries</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>The machine gets hot and kills microbes</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>Make sure the clipper has been unused for 5 minutes</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>102</td>
</tr>
</tbody>
</table>
Although research indicates that having information about potential risks correlates poorly with avoidance of the risk behaviors (Fisher & Fisher, 1992), the ritual of using alcohol to disinfect tools may remind people about the possibility of contracting some of the diseases mentioned above (see Odoobo, 2008), while, at the same time providing a heuristic that reassures respondents that alcohol inactivates pathogens. Reliance on heuristics as inferences for alcohol potency (see Table 2) seems to be consistent with the social psychology of disease prevention technologies and decision biases (Linville et al., 1993). However, the second belief about lack of reassurance reported in Table 1 reflects mixed feeling that underlie heavy reliance on palpable cues. It may also suggest high variance in beliefs about alcohol quality because those who stated that they have no assurance might be those who find palpable cues a less reliable measure of alcohol potency.

<table>
<thead>
<tr>
<th>NO</th>
<th>Belief</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alcohol will burn on injured skin</td>
<td>48</td>
</tr>
<tr>
<td>2</td>
<td>You can tell based on smell</td>
<td>27</td>
</tr>
<tr>
<td>3</td>
<td>When the smell burns when you breathe in</td>
<td>17</td>
</tr>
<tr>
<td>4</td>
<td>Good alcohol will evaporate quickly once applied to your skin</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>Good alcohol makes your eyes tearful</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>It just flows like water</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>You compare with how good alcohol usually feels</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>Reputation of the manufacturer</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>I trust it when alcohol is bought in a pharmacy</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Only your barber knows the truth</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>They are in dirty bottles full of hair debris</td>
<td>1</td>
</tr>
</tbody>
</table>

Based on the above findings, it is clear that respondents use heuristics such as appearance of barbershops, smell of alcohol and how alcohol feels on non-intact skin to infer hygiene and safety of barbershops hence the designation of informational heuristics. The use of palpable heuristics is consistent with the original conceptualization of the information constructs in the IMB because, according to developers of IMB model, people tend to rely on (often faulty)
heuristics to make decisions or engage in behaviors because such simple decision rules in health behavior tend to be more consistent with what is usually available to lay people in real-life settings. Fisher and Fisher (1992) describe this cognitive accessibility of information as “top of the head” (p. 465) knowledge.

**Public Negotiation Skills**

In the IMB framework, behavioral skills are generally understood as self-efficacy (Fisher & Fisher, 1992). Thus, to elicit for public negotiation skills, two interrelated prompts were used: (1) list what would make it difficult for you to talk about hygiene related issues with barbers (2) list what you think would make it easy.

Table 3 presents responses to the first question while table 4 presents responses to the second question. In Table 3, respondents emphasized alcohol as this is the centerpiece of hygiene and safety. As seen in table 3, there is a lot of uncertainty surrounding the chemical as respondents said consistently (see first and second beliefs in table 3) that it is not easy to tell what is what and that it is difficult to know how much dilution there is while referring to alcohol.

<table>
<thead>
<tr>
<th>NO</th>
<th>DESCRIPTION</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>It is not easy to tell what is what</td>
<td>45</td>
</tr>
<tr>
<td>2</td>
<td>It is difficult to know how much dilution there is</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>There are issues of how they are used and kept</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>They probably buy cheaper brands</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>They probably add hot pepper to make it burn like alcohol</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Putting trust in your barber</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Some salons do not have disinfection and hygiene products</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>Sometimes fake products are imported</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>They are in dirty bottles full of hair debris</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>They are somehow potent even if that may not be enough</td>
<td>1</td>
</tr>
</tbody>
</table>

Total 90
Furthermore, as shown in Table 4, the majority of efficacy beliefs seems to converge on skills related to reading labels, skills related to perceptions of barber’s training (reflected in the more training of barbers) as well as skills that suggest health literacy (such as being able to identify official quality standards).

<table>
<thead>
<tr>
<th>NO</th>
<th>What would make it easy to talk about hygiene related issues</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reading labels</td>
<td>35</td>
</tr>
<tr>
<td>2</td>
<td>More training of barbers</td>
<td>28</td>
</tr>
<tr>
<td>3</td>
<td>Reference to official quality standards</td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>Good customer relations</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>Proper disinfectants</td>
<td>12</td>
</tr>
<tr>
<td>6</td>
<td>Good hygiene</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>Proper equipment</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>I take my own alcohol (I can trust)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>136</td>
</tr>
</tbody>
</table>

Considered together, however, what makes it difficult to talk about hygiene issues (summarized in Table 3) and what makes it easy (summarized in Table 4) seem to contradict each other. For example, reading labels (in Table 4) seems to reflect little ecological relevance. This is because most shops use mineral water bottles, making the act of checking expiration dates or brand names a behavior that sounds rather hypothetical or at least unrealistic in the context of most shops. This can be verified from Table 3, where the most frequently mentioned difficulties include identifying what is what and difficulties related to where products are kept (i.e., in the wrong containers).

**Relational Motivation**

To elicit beliefs about respondents’ motivation, two questions were asked: (1) please list any way in which barbers are likely to think of you or speak about you if you reminded them about hygiene related issues, and (2) please also list any way
in which other clients are likely to think of you or speak about you if you raise hygiene related issues in barbershops. Responses that were similar from each of the two questions were combined. 260 beliefs were emitted.

As a shown in Table 5, respondents expressed relational concerns. They expressed concerns related to perceptions of exaggeration if hygiene related issues were raised (this is reflected in the belief that voicing issues related to hygiene would be seen as overstepping one’s bounds). Respondents also expressed apprehension through a sarcastic tone reflected in the belief that barbers would say “thank you for the reminder!”

<table>
<thead>
<tr>
<th>NO</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overstepping bounds</td>
</tr>
<tr>
<td>2</td>
<td>They would think I am arrogant</td>
</tr>
<tr>
<td>3</td>
<td>Thank you for the reminder!</td>
</tr>
<tr>
<td>4</td>
<td>They may argue that hygiene is sufficient</td>
</tr>
<tr>
<td>5</td>
<td>If boss could hear these complaints</td>
</tr>
<tr>
<td>6</td>
<td>They would apologize lack of means</td>
</tr>
<tr>
<td>7</td>
<td>They may ask if you are trained to see the issues</td>
</tr>
<tr>
<td>8</td>
<td>Too preoccupied by other concerns to talk</td>
</tr>
<tr>
<td>9</td>
<td>N/A</td>
</tr>
<tr>
<td>10</td>
<td>They would say that customers attitude are totally different</td>
</tr>
<tr>
<td>11</td>
<td>They would say they need to survive (make profits)</td>
</tr>
<tr>
<td>12</td>
<td>They would do what I tell them to get paid</td>
</tr>
<tr>
<td>13</td>
<td>Nothing is harmful to a poor person</td>
</tr>
<tr>
<td>14</td>
<td>He is not afraid to speak his mind</td>
</tr>
</tbody>
</table>

| Total | 260 |

In the current elicitation study, participants’ responses suggest that it is less normative for people to raise issues related to communicable diseases and hygiene in the presence of barbers and clients. Thus, in accord with IMB model and related theoretical and empirical literature (Amico, 2011, Misovich, Fisher, Fisher, 1997; Smith at al., 2012), anticipated lack of social support emerged as an intrapersonal motivational barrier.
Private Negotiation Skills

Another important construct in the current model is private negotiation skills. These skills are important in the sense that they represent an alternative to public negotiation. In other words, although communication efficacy plays an important role in the model, there could be other factors that are not communication skills variables per se but that may nevertheless have important associations with use of shared shaving tools. For example, there is literature that indicates that some men in Nigeria bring personal shaving kits to their barber (Khumalo, Gantsho, Gumede & Mthebe, 2013). The same seems to be true in Rwanda, where some people practice home-based hair-care (Ngoboka, 2015).

Similarly, the elicitation for the content of the construct of private negotiation aimed to elicit efficacy beliefs related to system navigation skills required to practice private hair care. Two questions were used. The first prompt was: list what would make practicing private hair care easy (e.g., buying a personal kit, shaving oneself at home, taking personal kit to a public barbers). Table 6 shows beliefs related to affordability/low cost as a reason why some respondents find it easy. As seen in Table 6, private negotiation efficacy beliefs revolve around low cost that would accrue from practicing private hair care as well as the ability to trust one’s hygiene and prevention practices.

<table>
<thead>
<tr>
<th>NO</th>
<th>WHY PRACTICING HOME-BASED CARE WOULD BE EASY</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Low cost</td>
<td>13</td>
</tr>
<tr>
<td>6</td>
<td>You can trust your own disease prevention/hygiene</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>I have friends who can shave me</td>
<td>2</td>
</tr>
<tr>
<td>16</td>
<td>You get to use your personal equipment</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>Personal kit is not heavy/can be carried to the shop</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>Clippers do not use too much electricity</td>
<td>1</td>
</tr>
<tr>
<td>25</td>
<td>You look good because you can shave yourself whenever you want</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>31</td>
</tr>
</tbody>
</table>

The second question was: list what would make practicing private hair care difficult (e.g., buying one’s kit, shaving oneself at home, taking one’s kit to public
barbers). As shown in table 7, the model salient beliefs are related to lack of affordability, lack of shaving skills while shaving oneself at home, as well as difficulties related to maintaining shaving products (such as alcohol, after shave and the likes).

Table 7. Why practicing home-based care would be difficult

<table>
<thead>
<tr>
<th>NO</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not affordable</td>
</tr>
<tr>
<td>2</td>
<td>Lack of shaving skills</td>
</tr>
<tr>
<td>3</td>
<td>Difficulties related to maintaining products</td>
</tr>
<tr>
<td>4</td>
<td>It is being wasteful</td>
</tr>
<tr>
<td>8</td>
<td>No answer</td>
</tr>
<tr>
<td>10</td>
<td>Products are not available on our market</td>
</tr>
<tr>
<td>17</td>
<td>You can cut yourself</td>
</tr>
</tbody>
</table>

Table 7 present a higher number of (57) beliefs that express lack of efficacy in mobilizing financial resources required to practice private negotiation of hair care needs. Beliefs related to easiness of practicing private hair care are lesser. Nevertheless, they provide entry points for health communicators who might want to reinforce those behaviors among those who practice private hair care or encourage the behaviors among those who do not.

Discussion

The aim of this study was to identify model salient beliefs for the information, motivation and behavioral skills model (IMB) applied to the case of negotiating hair care needs. Negotiation skills constructs emerged as two separate domains. The first domain, public negotiation skills, is a construct that entails specific skills required in order to negotiate hygiene in the context of the barbershop. The second domain, private negotiation skills, includes skills that are required to practice personal care such as buying a personal (private) shaving kit that can either be used at home or taken to the barber.

This study has some important practical and theoretical implications for
media and public health practitioners. In particular, public health communicators need to prime awareness (Fishebein, 2010; Lutchyn & Yzer, 2011) of risks associated with use of shared shaving tools. This in turn will promote skills that increase self-efficacy in negotiating public health and hair care needs.

The crux of respondents’ beliefs seems to reside in not only the technical nature of the information at hand but also the complexity of behaviors to be performed in barbershop negotiation of hygiene and safety. For example, the undyed methylated alcohol used to disinfect shaving tools looks like water, making it almost impossible for lay people to assess its potency. Consequently, respondents rely on informational heuristics such as appearance of barbershops, the smell of alcohol, and how the latter feels on a non-intact skin. Nevertheless, developers of the IMB model caution that informational heuristics are merely “simple rules which permit automatic and cognitively effortless (but often incorrect) decisions” (Fisher, Fisher & Shuper, 2009, p. 27) about whether or not to engage in risk behaviors.

In addition to relevant information, the IMB specifies that information and motivation factors have to work through context-specific behavioral skills in order to enact complex behaviors (Fisher & Fisher, 1992). For example, respondents in the present study pointed out public negotiation skills would entail being able to read labels on bottles that are used to store disinfection products, including the ability to check expiration dates on the packaging of the products used in barbershops. But being able to negotiate hygiene and safety in the context of the barbershop is compounded by the fact that such behavior is both a health communication challenge (e.g., it falls in the realm of health literacy) and public health policy issue. Regarding the latter, respondents’ beliefs expressed lack of efficacy related to quality standards of disinfection products (e.g., the right percentage of chemical concentration as well as expiration dates).

Furthermore, being able to read labels is not the only behavior that would enable negotiation of preventive practices in a public context. From the perspective of health communication literature, reading labels is a behavior that is tied to what is known as the skills-based framework, which entails a whole host of functional health literacy skills (Aldoory, 2016; Guzys, Kenny, Dickson-Swift, &
Threlkeld, 2015; Helitzer, Hollis, Sanders, & Roybal, 2012; Osborn, Paasche-Orlow, Bailey, & Wolf, 2011; Paasche-Orlow & Wolf, 2007; Squiers, Peinado Berkman, Boudewyns, & McCormack, 2012). For example, according to Guzys et al. (2015), the definition of functional health literacy skills is “premised on an individual having the requisite reading and numeracy skills, and interactive health literacy, relating to personal communication skills required to engage effectively with health care professionals” (p. 2). Some respondents expressed literacy skills by mentioning, that it is difficult for someone who did not study chemistry. Although the act of checking labels is already compromised by the fact that alcohol is often stored in mineral water bottles, the enactment of checking numbers (e.g., checking percentages of alcohol concentration) entails efficacy in the relevant health literacy skills. Another complicating factor related to this is that labels are written in two foreign languages, that is, French or English. Language facility is an interpersonal communication skill that plays a central role in functional health literacy (Gee, 1996; Helitzer, Hollis, Sanders, & Roybal, 2012; Nielsen-Bohlman, Panzer, & Kindig, 2004) because it assists people’s “ability to obtain, process and understand basic health information and services needed to make appropriate health decisions” (Nielsen-Bohlman, Panzer, & Kindig, 2004, p.4) and negotiate care in contexts that involve interaction between health service providers and users (Guzys, Kenny, Dickson-Swift, & Threlkeld, 2015; Helitzer, Hollis, Sanders, & Roybal, 2012). In the case of this study, such interaction may involve health literacy related explanations between barbers and their clients or any other person who might be present in the barbershop (e.g., other waiting customers). Language facility may be an issue for people who lack self-efficacy in French and/or English. Most importantly, it may also be an issue with people who have language facility but may be unsure if their barber or other customers are comfortable with talk that may involve foreign languages.

Beliefs related to private negotiation skills suggest that a campaign that seeks to improve skills may include private negotiation. Some respondents suggested that practicing private negotiation of haircare needs may lower the cost and may boost their trust in safety and hygiene of disinfection and other shaving tools.
Although the frequency of these beliefs was lesser than the beliefs that expressed less efficacy, they seem to be consistent with private negotiation behaviors of males in Nigeria (Khumalo, Gantsho, Gumedze & Mthebe, 2013) and Rwanda (Ngoboka, 2015). Most importantly, beliefs that make it easy may be a selling point for health promoters. Similar behavioral skills have been used by researchers who use the IMB model and are often referred to as systems navigation skills — defined as “skills needed to secure/access available resources and to get to and afford care” (Amico, 2011, p. 1074). Public education efforts should therefore promote advantages of private negotiation of hair care needs along with skills to secure personal shaving kit that can be used at home or taken to the barber.

Evidently, any health campaign that promotes more awareness of the need to negotiate hygiene and safety in public health is likely to increase motivation and attention to the issue. In the present study, motivation was expressed in the form of social relationships or as an attitudinal object. Relational motivation beliefs expressed in this study were similar to the construct of social motivation defined in the IMB framework as “attitudes/beliefs about positive and negative consequences (intra-and interpersonally) of negotiating the care task or non-adoption of care task” (Amico, 2011, p. 1073). Thus increasing publicity of health issues associated with sharing shaving tools can result in higher levels of awareness as well as motivation with regard to hygiene and safety negotiation behaviors.

**Conclusion and Future Directions**

The salient beliefs identified in this study indicate that respondents use information that relies on simple decision rules to make inferences about the potency of alcohol, a chemical that seems to be of particular importance with regard to hygiene and safety of shaving practices in barbershops. This study also indicates that respondents are motivated by a desire to maintain good social relationships with barbers and other clients. Considered together, informational heuristics and relational motivation seem to compound lack of self-efficacy in terms of public and private negotiation of hygiene and safety. Therefore, health
communication need to prime information related to brand names and concertation of disinfection products. Such public education efforts will in turn provide language and codes of conduct that will facilitate negotiation between barbers and clients (i.e., public negotiation) or encourage private negotiation of hair care for those who might have efficacy in private negotiation behaviors.

Finally, as this study was based on a small sample (N=65), the following limitations and future directions should be noted. The salient beliefs identified in this study may be used to write survey items that can be administered to a larger sample which may be more representative of the population and can be more adequate in testing statistical hypothesis that underlie the IMB model. Furthermore, this study did not include negotiation of female haircare needs. As Garbaccio and Oliveira (2013) as well as Ataei, Shirani, Alavian and Ataie (2013) did, future research should examine if there are public health concerns in female salons in Sub-Saharan Africa. Findings resulting from such specific studies can be used to tailor health communication messages to the concerns of these two different hair care contexts.

Acknowledgments

Special thanks to Dr. Austin Babrow for his guidance and comments on the present work.

References


conditions. *Journal of health psychology, 16*(7), 1071-1081.


Kwitonda: Use of Shared Shaving Tools In Low-Publicity Contexts


Miller, G. A. (1956). The magical number seven, plus or minus two: some limits on our capacity for processing information. *Psychological review, 63*(2), 81.


ORIGINAL ARTICLE

Effects of perceived sensationalism and susceptibility to the disease on cognitive and emotional third-person perceptions of the MERS News Coverage

Joon Soo Lim1, Jiyoung Lee2, Sonho Kim3, and Jeongheon JC Chang4

1 Department of Public Relations, S. I. Newhouse School of Public Communications, Syracuse University
2 S. I. Newhouse School of Public Communications, Syracuse University
3 Korea Press Foundation
4 Department of Health & Strategic Communication, CHA University

This study takes a deeper look into the third-person perception (TPP), dividing it into the cognitive and emotional domains in the context of news on the Middle East Respiratory Syndrome (MERS). Using survey data from a representative sample of 1,053 South Koreans, we conceptualized cognitive and emotional third-person perceptions, respectively. The exposure to MERS news through mainstream media had a positive impact on both cognitive and emotional TPPs, whereas the exposure through social media negatively influenced both subsets of the TPP. Perceived sensationalism of MERS news widened the perceptual gap of the influence of MERS news on oneself and others in cognitive and emotional domains, whereas susceptibility to MERS yielded the reverse TPP in both cognitive and emotional domains.

Keywords: Emerging Infectious Diseases, Third-Person Effect, Emotional Third-Person Perception, Sensationalism, Susceptibility

Address correspondence to Joon Soo Lim, Syracuse University, 215 University Pl, Syracuse, NY 13210, USA
E-mail: jlim01@syr.edu
Introduction

The outbreak of Middle East Respiratory Syndrome Coronavirus (MERS-CoV; MERS hereafter) in South Korea in 2015 has caused unanticipated impacts on society, economy and national politics as well as on people (see Korea Centers for Disease & Prevention, 2015 for data on human infection). Critics argued that lack of transparency in government communication eventually aggravated the MERS spread and increased the public panic over the emerging infectious disease (EID). The mainstream media (MSM) that curried favor with then-President Park Geun-hye were also criticized for avoiding sufficient information about the disease (Yoo, Choi, & Park, 2016). As the number of suspected and confirmed patients increased under tightly controlled government’s one-way communication, many people actively sought and shared the MERS-related information through social media. Although it is a general belief that the news media exert a substantial impact on people’s risk perceptions during the outbreak of an EID, Korean health communication researchers found that exposure to news and others’ opinions through social networking sites (SNSs) played a great role in shaping the public’s risk perceptions of MERS (Choi, Yoo, Noh, & Park, 2017).

In this study, we examined the impact of news exposure through MSM and SNSs on South Koreans’ risk perceptions of MERS. In line with the premise of third-person effect (TPE) (Davison, 1983) and the influence of presumed influence (IPMI) model (Gunther & Storey, 2003), health communication researchers have suggested that people estimate greater influence of news media on others than on themselves (Han, Zhang, Chu, & Shen, 2014; Kim, 2010; Kim & Kim, 2010; Lee & Park, 2016; Liu & Lo, 2014). Although these studies have revealed the psychological tendency of biased risk estimations, the disparity of risk estimations has been primarily applied to cognitive dimensions. However, Liu and Lo (2014) recently showed how people estimated greater influence of news media on others’ emotions than their own. We aim to further elaborate the perceptual disparity in risk perceptions by delineating emotional third-person perception (TPP) from cognitive TPP. Analyzing nationally representative online panel survey data collected in Korea during the MERS outbreak in 2015, the current
research investigates how news exposure through MSM and SNS, perceived sensationalism of MERS related news and perceived susceptibility to MERS have influenced cognitive and emotional TPPs among people in South Korea.

**Theoretical Background**

**Revisit to Davison’s Proposition of TPE**

Davison (1983) proposed an intriguing psychological tendency in which people generally perceive a greater influence of persuasive communications on others’ attitudes and behaviors than on their own, known as the TPE. In explaining the counter-intuitive theoretical proposition, what Davison exemplified was the effect of negative persuasive communication such as Japanese propaganda leaflets that encouraged desertion of African American soldiers from the white man’s war saying “Don’t risk your life for the white man” (Davison, 1983, p. 1). One notable point made in the anecdotal example was that the propaganda leaflets did not have an effect on the troops, whereas the white officers overestimated its impact such that they undertook substantial reshuffle of the personnel. In the formation of theoretical proposition, therefore, Davison stated that “people will tend to overestimate the influence that mass communications have on the attitudes and behavior of others” (Davison, 1983, p. 3).

In the aforementioned example of Japanese leaflets, the white officers may have believed that the leaflets would have a greater effect on the soldiers’ emotions than they really had in reality. There has been a plethora of research regarding the TPE. Most TPE studies measured the impact of perceived persuasive communication on people in general or specific referent groups in particular. In those studies, the perceived impact was measured in terms of the estimated overall influence on other people or specific target groups without specifying the impact on what others think or what others feel. Indeed, it is hard to find research that has focused on the effects of persuasive communication on estimating others’ emotions. The key to understanding the TPE is individuals' biased projection of
others’ feelings and thoughts into a more undesirable direction when gauging the influence of persuasive communication.

We argue that delineating the emotional TPP from the cognitive TPP is important. Estimating the feelings of others enables individuals to manage desirable social relations since it helps them to predict others’ behaviors (Seger, Smith, Kinias, & Mackie, 2009) and thus to prepare for appropriate coping strategies. In the following section, we review previous research that examined the influence of the EID related news on people’s risk perceptions to themselves and others.

Impact of MERS News on Risk Perceptions

News coverage of new global pandemics such as Ebola, MERS, and SARS makes a huge impact on both personal and societal levels around the world. The relationship between news coverage and publics’ cognitions and emotions related to the risk of global pandemics are well documented in literature (Shim & You, 2015; Young, Norman, & Humphreys, 2008). In general, health professionals and experts believe that sensational, risk-elevating media coverage of an EID often causes overreactions of the public (Sell et al., 2017). For instance, in a sarcastic commentary entitled “SAMS - Severe Acute Media Syndrome?”, David Baltimore (2003), a Nobel laureate in Medicine, argued that careless news coverage on SARS was causing irrational public fear and overreaction for personal safety because of the rapid transmission of 24-hour news channels and social media. One notable point in Baltimore’s commentary is that there is a deep gap in the perceptions of risk between medical professionals/scientists and the public, such that the professionals presume that publics may tend to feel danger not based on statistical probability but based on their media exposures.

The perceptual disparity between experts and the public was pointed out more than 3 decades ago in Davison’s seminal work on the TPE: "[...] experts are particularly likely to overemphasize the effects of the media” (Davison, 1983, p. 8). Davison exemplified the prevalent belief among nuclear power experts that “the public was being misled by biased coverage of nuclear power in the mass media”
(Davison, 1983, p. 9). However, such perceptual disparity in gauging the influence of presumed media influence is also observed among the non-expert publics.

**Cognitive TPP**

Cognitive TPP in this study refers to a traditional TPP (gauging that others will be more influenced by negative messages than themselves) that is illustrated by previous scholars. Several studies have investigated the impact of news coverage on different risk perceptions to self and others within the context of specific health-threatening pandemics such as H1N1 Flu (Han et al., 2014; Kim & Kim, 2010; Lee & Park, 2016; Liu & Lo, 2014) and avian flu (Wei, Lo, & Lu, 2007, 2008). The results of these studies showed robust third-person perceptions in the estimations of EID news on self and on others. Han et al. (2014) found that respondents in both United States and China perceived greater impact of H1N1 flu on others in four levels (personal, group, societal, and global) than on themselves. In an experimental study using televised H1N1 news, Lee and Park (2016) found that college students rated greater perceived influence of the news on other students and other people in the U.S. than on themselves. In a similar line, Wei et al. (2008) found that college students in Taiwan rated greater perceived influence of news about avian flu on others than on themselves, indicating a TPP. In particular, we note that news media have a substantial impact on one’s cognitive risk perception (Griffin, Dunwoody, & Zabala, 1998; Wei et al., 2007).

Based on the findings from previous research regarding the impact of news about EIDs on TPP, the following hypothesis is posited:

**H1.** Individuals will have a greater perceived influence of MERS news on the cognitive risk perceptions of others than themselves.

**Emotional TPP**

Investigating the perceptual disparity in the estimation of one’s versus others’ emotions gains much more importance in research on the impact of EID news,
because of the strong linkage between risks and emotions. Although investigating the emotional disparity between self and others is relatively new to EID research, a growing body of risk and health research attempts to distinguish cognitive risk perceptions from affective risk perceptions. Such a new risk paradigm is greatly affected by Slovic’s (1987) seminal work on the perception of risk. Slovic (1987) has distinguished experts’ risk perception from laypeople’s risk perception: the former is greatly affected by quantifiable estimation in terms of perceived probability of possible consequences from the risk, whereas the latter is formed by irrational fear. Building on Slovic’s (1987) paradigm on risk perception, Loewenstein and his colleagues (2001) proposed the so-called “risk-as-feelings hypothesis” in which they viewed the emotional reactions to risks that are divergent from cognitive evaluations of the risks. Influenced by the risk-as-feeling paradigms, contemporary risk and health researchers have further elaborated the concept of emotional risk perceptions (Ferrer, Portnoy, & Klein, 2013; Shim & You, 2015). Strictly speaking, the cognitive risk perceptions are cognitive appraisals of risk, whereas emotional risk perceptions refer to affective responses to risk. A few researchers viewed the emotional risk perception as feelings of vulnerability to a risk, and measured it by asking the degree to which individuals are worried or anxious about their exposure to a risk (Dunlop, Wakefield, & Kashima, 2008; Ferrer et al., 2013; Shim & You, 2015; Sjöberg, 1998).

The relationship between news coverage and publics’ emotional risk perceptions about the global pandemics are well documented in literature (Dunlop et al., 2008; Shim & You, 2015; Young et al., 2008). As aforementioned in the citation of Baltimore (2003), the perceptual disparity in possessing the feelings of worry has often been pointed out in research on EIDs (Joffe, 2011). In general, health professionals and risk communicators believe that laypeople tend to exhibit more unwarranted level of fear and worry about the EID than themselves. The gap in perceiving the fear and worry is also found among the public such that individuals in general perceive the greater effect of news coverage of an EID worry and anxiety of others than themselves. Factors that cause the disparity in emotional responses to EID include biased optimism (Gunther & Mundy, 1993),
strategic dissociation from vulnerability to the disease (Joffe, 2011), “symbolizing the illness in terms of affected others” (Joffe, Washer, & Solberg, 2011, p. 670), and availability heuristics (Slovic, 1987; Wahlberg & Sjoberg, 2000).

What these studies have in common is that the public perceptions of risk are heavily affected by the process of the symbolizing and amplifying an EID by the media such that sensational news coverage of the EID often elicits negative emotions in spectators unevenly (Balzarotti & Ciceri, 2014; Smith, 2006). In particular, a recent study by Liu and Lo (2014) examined the impact of H1N1 flu on self versus others. In Liu and Lo’s study, the perceived effect of news coverage of H1N1 flu pandemic on self (others) was measured by asking participants to indicate the degree to which “the news coverage made you (others) frightened, concerned about the pandemic, cautious when going out, and nervous when being in crowd” (Liu & Lo, 2014, p. 386). Liu and Lo’s (2014) study obtained the perceived disparity between the impact of media coverage on oneself versus on others, and we believe that their TPP reflects what we refer to as emotional TPP. The results of Liu and Lo (2014) demonstrate that respondents had greater perceived influence of H1N1 news on others than on themselves for all emotions of “frightened, concerned about, and cautious, and nervous.”

On the basis of previous research that demonstrates the source of disparity in the perceptions of others’ emotional responses and one’s own responses to an EID risk, we posit the following hypothesis:

H2. Individuals will have a greater perceived influence of MERS news on the emotional risk perceptions of others than themselves.

Amount of News Exposure and TPP

Discussions on the relationship between exposure to media content and the TPP have been well documented in previous research (Eveland, Nathanson, Detenber, & Mcleod, 1999; Innes & Zeitz, 1988; Salwen, 1998; Shen & Huggins, 2013). Unlike the perceived other exposure that is regarded as a strong predictor
to observe the TPP (Eveland et al., 1999; Lambe & McLeod, 2005; Lim & Golan, 2011), the effect of the amount of self-exposure on TPP yielded inconsistent results (Salwen, 1998). For instance, in McLeod et al.’s (2001) study, self-exposure to anti-social rap lyrics had an effect on neither perceived self-influence nor perceived other-influence, while perceived other exposure had an effect on perceived other-influence. However, some studies suggest that self-exposure often matters when the news stories are highly relevant to personal safety (Liu & Lo, 2014) or to privacy (Lambe & McLeod, 2005). In the domain of health news on EIDs, Liu and Lo’s (2014) study showed that the amount of self-exposure to H1N1 pandemic news had a greater effect on oneself than on others (Liu & Lo, 2014).

A few studies examined the relationship between the amount of news exposure and risk perception to self and others. Kim and Kim (2010) found that one’s exposure to television news about H1N1 had a positive impact on one’s own risk, while it did not make a significant impact on perceived others’ risk. As a result, they found that the self-exposure to television news of MERS yielded a negative standardized coefficient for the perceptual bias in risk perception, which indicates a reverse TPP. Their results, however, need to be read cautiously since news exposure through newspapers and the internet did not make any significant impact on any of risk perception to self and others. As for the role of news exposure to risk perception, Balzarotti and Ciceri (2014) discussed that public exposure to television news during the global outbreaks of pandemic viruses in 2015 increased the public anxiety over the public health in several European Union countries. Choi et al. (2017) noted that Korean mass media outlets including television and newspapers played a substantial role in forming risk perceptions of the public (Choi et al., 2017). Despite the potential impact of news media on risk perceptions, the effect of the amount of one’s exposure to EID news on risk perceptions to self and others is not conclusive. Therefore, we pose the following research question:

RQ1. How will the exposure to MERS news on mainstream media (MSM) predict cognitive and emotional TPP?
In recent years, health communication researchers started to look into the role of social media use in people's risk perception (Choi et al., 2017) and their health-protective behaviors (Yoo et al., 2016) during the outbreaks of EIDs. In particular, Choi et al. (2017) showed that the exposure to news through social media had a positive correlation with risk perceptions. However, little is known about the effects of social media exposure on risk perception to oneself and others. Therefore, we propose the following research questions and see whether the differences exist from the effects of MSM exposure:

RQ2. How will the exposure to MERS news on social media (SNS) predict cognitive and emotional TPP?

**Perceived Sensationalism**

It is known that the TPP is best observed for the media content that is perceived to be socially undesirable. Gunther and Story call it “negative-influence corollary” (Gunther & Storey, 2003, p. 200). Nonetheless, some researchers discuss that message desirability is multifaceted, and the perceptual disparity may not be judged based on anti-socialness of the message (Lambe & McLeod, 2005). For instance, news reports on EIDs can be regarded to be beneficial to the society to the extent that it helps individuals perceive risk and prepare for a potential danger (Lo, Wei, Lu, & Hou, 2015). However, health news coverage on EIDs can be perceived to be socially undesirable if the coverage is sensational and/or not providing reliable information while causing confusion.

Although little research has examined whether health risk news would cause third-person perceptions or reverse TPP, previous research on imminent threat news suggests that news that elicits public anxiety or fear generates a greater perceived impact on others than on themselves (Liu & Lo, 2014; Lo et al., 2015; Tewksbury, Moy, & Weis, 2004). It is partly because individuals exhibit optimistic
bias (Lo et al., 2015), but we also assume that sensational coverage of MERS news will also influence the differential effects of MERS news on self and on others in both cognitive and emotional domains. Thus, we propose the following hypotheses:

H3. As the perceived sensationalism of MERS news increases, so does the perceived influence of MERS news on the cognitive risk perception to others than to oneself.

H4. As the perceived sensationalism of MERS news increases, so does the perceived influence of MERS news on the emotional risk perception to others than to oneself.

Susceptibility to MERS

Researchers have long been interested in the role of susceptibility in the formation of threat perceptions (Morrison & McCornack, 2015). Defined as judgments about the likelihood of risks (Weinstein, 1987), susceptibility has been known as having an association with unrealistic optimism in risky situations such as the spread of diseases. Bränström, Kristjansson and Ullén (2006) noted several theoretical explanations about the relationship between susceptibility and risk perception. In summary, theoretical accounts for individuals’ tendency to estimate the possibility of having diseases lower for themselves than for others include (1) the desire to enhance self-esteem, (2) the optimistic bias, a type of cognitive error, in which people assume that rare diseases are unusual cases that can happen to themselves, (3) a haphazard conclusion based on one’s own prior experiences of similar diseases. In particular, optimistic biases are observed more frequently for health problems perceived to be unknown, unusual (Weinstein, 1982), and life-threatening (Lek & Bishop, 1995).

Previous studies indicate that people’s underestimation of the effect of health diseases on themselves hinges on their subjective perception of possibility of contracting the diseases, which is in line with health belief model (HBM) (Janz & Becker, 1984). One of the key assumptions of HBM is that individuals tend not to engage in health preventive behaviors because they do not have much awareness
on their likelihood of having diseases (i.e., low perceived susceptibility) (Janz & Becker, 1984). The underlying mechanism is that low level of perceived susceptibility to health-related diseases is closely aligned with having optimism about one’s health. Accordingly, the levels of perceived vulnerability to an infectious disease are to influence the magnitude of the self-other perceptual gap in risk perception. In other words, a high level of perceived susceptibility to an infectious disease is likely to increase the estimation of perceived risk of the disease to oneself, therefore decreasing the TPP of news on the disease. The following hypothesis is proposed:

H5. Individuals’ perceived susceptibility to MERS will be negatively correlated with both (a) cognitive TPP and (b) emotional TPP of MERS news coverage.

Method

In order to test the proposed hypotheses and answer the research questions, a cross-sectional web survey was conducted with a representative national sample of 1,053 adults living in South Korea, including an over-sample of adults who have children under 18 years of age in their households. Contents Nicety Rationalization Korea (CNR Korea), a South Korean survey firm, administered the survey. Upon agreement to participate in the survey, participants were led to an encrypted link to an anonymous, web-based survey.

Participants Demographics

The survey was conducted between June 18 and 19, 2015. Of the 8,521 invitations that have been sent out to the panel of CNR Korea, 1,053 (50.3% men and 49.7% women) people completed the survey (response rate of 12%). The age of final sample of the research ranged from 20 to 50: 26.9% for the 20s, 24.6% for the 30s, 24.4% for the 40s, and 24.1% for the 50s. As for the respondents’ education, 16.3% were less than high school or high school graduate, 72.5% were college students or college graduate, and 11.2% of the participants were graduate
students or above. Among the participants, 234 (22.2%) respondents lived in Seoul, 303 (28.8%) in Gyeonggi Province, 106 (10.1%) in Chungcheong province, 267 (25.4%) in Gyeongsang-do, 143 (13.6%) in others, at the times of the survey being conducted. When it comes to the awareness of suspected or confirmed MERS patients in respondents’ residential region, 338 (32.1%) respondents were cognizant of such cases in their residential regions, while 566 (53.8%) were not aware of any reported cases.

**Survey Instrument and Measures**

Questions for this survey were originally asked in Korean and then translated to English for this study.

*Exposure to MERS news via mainstream media (MSM)*

Exposure to MERS news via MSM was measured by asking participants how frequently they received MERS related news or information through mainstream media channels (e.g., network television stations or major cable networks) or via major portal services (DAUM and NAVER). All items were assessed using a 4-point rating scale ranging from 1 (never) to 4 (very often) and averaged ($M = 3.45$, $SD = .50$).

*Exposure to MERS news via social media*

Following Han, Zhang, Chu and Shen (2014), we separately measured exposure to MERS news through social media. Participants were asked to indicate how frequently they received MERS-related news via social networking sites (e.g., Facebook, Twitter, instant messenger, blog, online communities, etc.). The item was measured on a 4-point scale (1 = never, 4 = very often) ($M = 2.63$, $SD = .84$).

*Perceived sensationalism in MERS news coverage*

To assess participants’ perceived sensationalism in MERS news coverage, we asked participants, on a 4-point Likert scale (1: *strongly disagree*, 4: *strongly agree*), to indicate their degree of agreement on the following items: (a) “News
reports on MERS are so careless that they cover stories that are not confirmed as true,” (b) “News media reports on MERS are overly sensational,” and (c) “News reports on MERS are excessively problematic.” The reliability of the items was .76 ($M = 2.66, SD = .69$).

*Perceived susceptibility to MERS*

Perceived susceptibility to MERS was measured on a 4-point scale anchored by 1 (*very low*) and 4 (*very high*) using two items that asked about respondents’ perceived susceptibility of (a) oneself and family members and (b) people in general in South Korea to MERS. The item reliability is .74 ($M = 3.29, SD = .60$).

*Cognitive TPP*

Cognitive TPP was calculated by subtracting the perceived cognitive effects of MERS news on oneself from the perceived cognitive effects on others. As with the perceived cognitive effects of MERS news on oneself, participants were asked how much they agreed with the following statements on a 7-point rating scale from 1 (*strongly disagree*) to 7 (*strongly agree*): “MERS news influenced my thoughts on the severity of MERS,” “MERS news changed my opinion on the severity of MERS,” “MERS news made me think that risk of MERS was more severe than I thought before” ($\alpha = .90, M = 5.16, SD = 1.13$).

The perceived cognitive effects of MERS news on others were measured with the statements on a 7-point scale: “MERS news influenced others’ thoughts on the severity of MERS,” “MERS news changed others’ opinions on the severity of MERS,” “MERS news made others think that risk of MERS was more severe than they thought before.” Cronbach’s $\alpha$ for the items was .84 ($M = 5.48, SD = .95$).

*Emotional TPP*

Emotional TPP was obtained by subtracting the emotional effects of MERS news on oneself from the emotional effects on others. Participants were asked to indicate their level of agreement on a 7 point Likert scale (1=strongly disagree;
7=strongly agree) for the following three items adapted from recent studies of impact of pandemics related news on emotions (Liu & Lo, 2014; Shim & You, 2015): MERS news made me (others) more (1) worried; (2) nervous; (3) anxious about the virus infection.” Reliability α is .93 for the emotional effects of MERS news on oneself (M = 5.0, SD = 1.25) and .90 for the emotional effects on others (M = 5.31, SD = 1.11).

Results

Before performing the main analyses, Pearson partial correlations were computed to examine zero-order associations between all independent and dependent variables to be analyzed in the proposed regression model. Table 1 provides the results of the inter-correlations along with the means and standard deviations of each variables.

Table 1. Means, standard deviations, and bivariate correlations among the analyzed variables

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>MSM</th>
<th>SNS</th>
<th>SEN</th>
<th>SUS</th>
<th>CTPP</th>
<th>ETPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSM</td>
<td>3.45</td>
<td>.50</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SNS</td>
<td>2.63</td>
<td>.84</td>
<td>.30***</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEN</td>
<td>2.67</td>
<td>.69</td>
<td>.10*</td>
<td>-.03</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUS</td>
<td>3.28</td>
<td>.60</td>
<td>.20***</td>
<td>.13***</td>
<td>-.23***</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CTPP</td>
<td>.33</td>
<td>1.00</td>
<td>-.00</td>
<td>-.10*</td>
<td>.17***</td>
<td>-.33***</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ETPP</td>
<td>.31</td>
<td>.99</td>
<td>.02</td>
<td>-.07</td>
<td>.20***</td>
<td>-.38***</td>
<td>.52***</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: MSM=Mass media exposure, SNS=Social media exposure, SEN=Perceived sensationalism of MERS news, SUS=Perceived susceptibility to MERS, CTPP=Cognitive third-person perception, ETPP=Emotional third-person perception.

* p ≤ .05, ** p ≤ .01, *** p ≤ .001

To test the hypotheses H1 and H2, we conducted paired sample t-tests. Overall, respondents of the current study indicated that the MERS reports had a greater effect on others’ cognitions (M = 5.48, SD = .95) than their own (M = 5.16, SD = 1.13). The mean difference was .32 (t = 10.72, df = 1052, p < .001). The results support H1. As for the effects of MERS news on emotions, respondents rated
greater perceived influence of the MERS reports on others’ emotions ($M = 5.31$, $SD = 1.11$) than their own ($M = 5.0$, $SD = 1.25$) ($t = 10.03$, $df = 1052$, $p < .001$). The results corroborate H2.

**Results of Hierarchical Regression on Cognitive TPP**

To test the effects of exposure to MERS news through mainstream media (MSM) and social media (SNS), perceived sensationalism of the MERS news, and the perceived susceptibility to MERS on the cognitive and emotional TPP, we performed hierarchical regression analyses. Table 2 displays the results of hierarchical models regressed on cognitive and emotional TPP, respectively.

| Table 2. Hierarchical regression analysis predicting the cognitive and emotional TPP |
|---|---|---|---|---|
| | Cognitive TPP |  | Emotional TPP |  |
|  | $\beta$ in respective step | $\beta$ in the final model | $\beta$ in respective step | $\beta$ in the final model |
| **Step 1 (Control)** |  |  |  |  |
| Sex (female) | -.07$^*$ | -.02 | -.05 | .00 |
| Age | .03 | .00 | .05 | .01 |
| Reported cases of suspected MERS patients in your region? (Yes) | -.02 | -.07$^*$ | -.02 | -.08$^*$ |
| $\Delta R^2$ | .01 | .00 |  |  |
| **Step 2 (Exposure)** |  |  |  |  |
| MSM | .03 | .08$^*$ | .04 | .10$^{**}$ |
| SNSs | -.11$^{***}$ | -.08$^*$ | -.08$^*$ | -.05 |
| $\Delta R^2$ | .01$^{**}$ | .01$^*$ |  |  |
| **Step 3 (Sensational media coverage on MERS)** |  |  |  |  |
| Perceived sensationalism | .17$^{***}$ | .10$^{**}$ | .20$^{***}$ | .11$^{**}$ |
| $\Delta R^2$ | .03$^{***}$ | .04$^{***}$ |  |  |
| **Step 4 (Susceptibility)** |  |  |  |  |
| Susceptibility to MERS infection | -.32$^{***}$ |  | -.37$^{***}$ |  |
| $\Delta R^2$ | .09$^{***}$ | .16$^{***}$ |  |  |

*Note: M Gender (1= female) and reported cases (1= yes) were dummy coded.

$^*$ $p < .05$; $^{**} p < .01$; $^{***} p < .001$
A hierarchical regression analysis on cognitive TPP was performed entering participants’ exposure to MERS news, perceived sensationalism of the media reports of MERS, and susceptibility to MERS as key predictors. In the first step of the model, two key demographic variables (i.e., sex and age) and the reported case of suspected or confirmed MERS patients in respondent’s region were entered as control variables. While respondents’ sex (dummy coded as female) had a negative correlation with cognitive TPP at the first block of model, the correlation disappeared in the final model. In contrast, the existence of reported cases of suspected MERS patients in the respondents’ region appeared to be significant in the final model, showing a negative correlation with cognitive TPP ($\beta = - .07$, $p < .05$). The result indicate that participants had a reverse TPP when the suspected patients reportedly existed in their region.

Of the exposure variables entered in the second block of the model for cognitive TPP, MERS news exposure through SNSs was negatively correlated with cognitive TPP ($\beta = - .08$, $p < .05$), whereas MERS news exposure through MSM had a positive impact on the cognitive TPP $\beta = .08$, $p < .05$). The variables of the exposure to MERS news explained 1.1% of total variance ($p < .01$).

In the third step, we entered the perceived sensationalism of MERS news. Controlling for other variables, perceived sensationalism of MERS news had a positive impact on cognitive TPP ($\beta = .10$, $p < .01$), which corroborates H3. The perceived sensationalism accounted for 2.9% of total variance explained ($p < .001$).

Lastly, perceived susceptibility to MERS resulted in a strong negative impact on cognitive TPP ($\beta = -.32$, $p < .001$) in the final model. Put differently, the higher respondents felt that they were susceptible to MERS, the more they perceived that the media had influence on others’ risk related thoughts than on their own. The result supports H5a. The final model yielded the most significant $R^2$ change ($R^2 = .10$, $p < .001$).

Second, based on the main findings of previous research, we examined the roles of the two main benefits of telemedicine in increasing the PU and PEOU of telemedicine. Results from the path analysis indicated that facilitation of medical services strongly and positively predicted both the PU ($\beta = .47$, $p < .001$) and
PEOU ($\beta = .32, p < .001$) of telemedicine, fully supporting H3. Moreover, H4 examined the direct effects of reduction of medical costs on the PU and PEOU of telemedicine. Fully supporting H4, the SEM results indicated strong and positive effects of reduction of medical costs on the PU ($\beta = .28, p < .001$) and PEOU ($\beta = .40, p < .001$) of telemedicine.

Third, previous research on telemedicine in Korea has addressed the potential risks from telemedicine. We placed particular attention on three—privacy concerns, abuse of medicine, and information distrust—and proposed three hypotheses accordingly. According to the results from the path analysis, only two variables—abuse of medicine ($\beta = -.09, p < .001$) and distrust about medical information ($\beta = -.05, p = .03$)—significantly and negatively predicted the PU of telemedicine. These results fully support H5 and H6, but reject H7.

Last, because little research has been conducted to examine the roles of the three unique characteristics of Korean medical services in determining the general population’s attitudes toward telemedicine, we explored the potential direct effects of those three factors on the PU and PEOU of telemedicine. Results from the path analysis indicated that only convenient visits to hospital significantly and positively predicted both the PU ($\beta = .07, p = .002$) and PEOU ($\beta = .11, p < .001$) of telemedicine.

In terms of the explained variance of the three indigenous variables—PU, PEOU, and BI in terms of telemedicine—the addition of nine variables into the model explained 65.4% of the variance of PU ($R^2 = .65$). Moreover, by adding five variables into the model, 43.6% of the variance of PEOU was accounted for ($R^2 = .44$). Lastly, 61.6% of the variance of BI was explained through the addition of PU and PEOU into the model ($R^2 = .62$).

**Results of Hierarchical Regression on Emotional TPP**

Another hierarchical regression analysis was performed to test the effects of MERS news on emotional TPP. Results reported in Table 2 indicate that demographic variables did not make any difference in predicting emotional TPP.
Only the reported cases of suspected MERS patients had a negative impact on emotional TPP, indicating a reverse TPP in the presence of known cases of suspected patients in the region where one lives.

When it comes to the effect of exposure, only the exposure to MERS news through MSM was positively correlated with emotional TPP (RQ2) ($\beta = 10$, $p < .05$) in the final model, whereas news exposure through SNSs did not make any significant impact on emotional TPP.

As for the variable entered in the third step, a positive effect of perceived sensationalism on emotional TPP was found ($\beta = 11$, $p < .01$), conditional on the inclusion of all other variables. The results support H4. The variable in Step 3 accounted for 4.5% of total explained variance ($p < .001$).

Susceptibility to MERS entered in the last step of the analysis had a strong negative impact on emotional TPP ($\beta = -.37$, $p < .001$), showing a similar result found in the cognitive TPP model. The explained variance in the final model was the highest ($R^2 = .16$, $p < .001$).

**Discussion**

Revisiting Davison’s (1983) TPE, the current study extended the effect of sensational MERS news coverage on two subsets of TPP: cognitive and emotional third-person perceptions. The first hypothesis predicted that individuals would overestimate the influence of MERS news on others’ risk perceptions than on their own, which we call a cognitive third-person perception hypothesis. Consistent with the hypothesis, participants in this study perceived the impact of MERS news greatly on others’ cognition about the risk than their own. Such results are well aligned with results of the traditional TPE research, particularly the studies that examined the effects of news on health-threatening pandemics (Han et al., 2014; Wei et al., 2008). The second hypothesis on the emotional TPP was also corroborated, demonstrating that respondents perceived greater effect of MERS news on others emotions than theirs. In other words, people in general tended to believe that MERS news made others more worried, nervous and anxious about
the virus infection than themselves. The results are also similar to the findings of Liu and Lo (2014) who measured the perceptual disparity in people’s concern and nervousness.

As noted earlier, despite the important role of emotions in risk perception, most research on health-related TPE, to our knowledge, has not specifically considered the emotional aspect when measuring the influence of media content on themselves and others. One notable exception is Liu and Lo’s research (2014) that included participants’ concerns, fright, and anxiety in the TPE measurement. The lack of research on the emotional aspect of the perceptual gap in estimating the influence on oneself and others is lamentable, considering that risk perception is composed of cognitions and emotions (Slovic & Peters, 2006).

The difference in the perceived feelings of negative emotions in the exposure to health-risk information gives some theoretical implications to health psychologists and health communication researchers. Firstly, the effects of EID-related news coverage on individuals’ risk perceptions are both cognitive and emotional. All things being equal, individuals estimate greater media influence on other’s thoughts and feelings associated with the risk of the EID. We suggest that future researchers replicate the current research in different contexts of risks that go beyond the EIDs. Secondly, in elaborating the media influence of an EID news in two domains, we provided measurement for each domains of risks. In particular, we provided a reliable measure for the emotional influence of EID news coverage. Finally, some readers may wonder why it is needed to measure different domains of perceived risks due to EDI news coverage. We already noted that the emotional impact of persuasive communications was the missing element in TPE research. The measures for the impact of persuasive communication in TPE research were neither consistent nor reliable. We hope that future research in TPE considers the reliable measures for the impact with multiple items in different perceptual domains. Although the current study showed that people’s estimates of the influence of MERS news were greater for others than for themselves in both domains of cognitive and affective risks, future research can
find some conditions that could make the perceptual disparity for cognitions and emotions divergent.

After examining the differential perceptual gaps in the estimates of the presumed media influence on one’s versus others’ cognitions and emotions, the current study investigated the effects of amount of exposure to MERS news through MSM and SNSs, perceived sensationalism, and perceived susceptibility on both cognitive and emotional TPPs. The effects of the amount of MERS news exposure through MSM on both cognitive and emotional TPPs were positive. In other words, the more respondents got exposed to MERS news on MSM, the greater the perceptual disparity existed in estimating the effect of MERS news on their own risk versus on others’ risk in both cognitive and emotional domains. The results are somewhat contradictory to Kim and Kim’s (2010) findings that self-exposure to news through MSM increased one’s own risk perception, yielding a reverse TPP. Answering the second research question, we found that news exposure through social media negatively affected only the cognitive TPP. Put differently, the more people read MERS news via social media, the higher they perceived the risk on themselves, thereby decreasing the TPP.

Taken together, the results of the amount of MERS news exposure on the perceived risks indicate that South Korean people perceived that the news through MSM as more negatively than news through social media. The results are somewhat ironic in that much of MER news on social media included news reported in the MSM. Nonetheless, the results indicate that South Koreans perceived that news mediated through social media were more beneficial and useful than news mediated through MSM.

Another important finding of this study is regarding the positive association between perceived sensationalism of MERS news and the TPP in both domains. These findings are well aligned with the effects of risk-elevating health news coverage on overly raising people's concerns on MERS (Sell et al., 2017). As previously noted, the prevalence of hyperbole and sensationalism in EID news can excessively amplify the public’s concerns but, at the same time, can cause the distrust of the MSM. The interesting point is that such sensational media coverage
increased both cognitive and emotional TPPs. We note that the sensational nature of media coverage during the outbreak of an EID works as something socially undesirable such that individuals tend to believe that they are less vulnerable to the influence of such sensational coverage of an EID.

Lastly, we proposed two hypotheses that perceived susceptibility to MERS would be negatively correlated with both cognitive and emotional TPPs. As predicted, the higher the susceptibility to MERS virus, the narrower the TPP in both domains. In other words, the result indicated that the greater the perceived vulnerability to an infectious disease (i.e., MERS), the higher the perceived media influence on the risk perceptions of oneself than others. Theoretically, this implies the moderating effect of perceived susceptibility on both cognitive and emotional third-person perceptions. To our best knowledge, the results are the first empirical evidence that demonstrates the role of perceived person risk in inducing the reverse third-person perception in the context of an EID.

Despite the aforementioned theoretical contributions, the current research has a critical limitation that needs to be solved in future research.

Firstly, the conceptual and operational definitions of the cognitive risk perceptions in this study were different from the widely used ones from existing research. Risk communication researchers (Freimuth & Hovick, 2012; Griffin et al., 1998; Seale et al., 2010) consider the cognitive risk perceptions in terms of the probability of contracting a disease and the perceived severity of the disease. Since the goals of this study was to compare perceived effects of MERS news on individuals’ cognitions and emotions, we operationally defined it as the level of cognitive effect of MERS news on oneself as opposed to others. However, we still believe that future research rely on more reliable and valid measure of capturing the disproportionate risk perceptions in cognitive and emotional levels.

Another limitation is that the results of this study is obtained from an emerging infectious disease (i.e., MERS) that happened in politically turbulent times in Korea. The public perception of risk about an EID is greatly influenced not just by how the media covered the outbreak of the EID but by how the
government handled the spread of the disease and communicate the disease preventive actions to soothe the public anxiety and concern. In this reason, we cannot exclude the possibility that the public perceptions about the risk were heavily influenced by Korean people’s dreadful experience due to poor handling and non-transparent risk communication from the government authorities that had already faced with public distrust and resistance since the Sewol Ferry disaster in 2014. That being said, we call for future research that replicates the cognitive and emotional TPP in the outbreaks of other EIDs in different countries.

Lastly, the current research did not examine the behavioral consequences of cognitive and emotional TPP. We call for future research that further reveals how cognitive and emotional TPP could influence preventive health behaviors (Shim & You, 2015) as well as public support for regulatory actions (Paek, Hilyard, Freimuth, Barge, & Mindlin, 2008) in the outbreak of an EID.

References


Perceiving emotions felt by outgroups. *Journal of Experimental Social Psychology, 45*(1), 80-89.


Determinants of the Public’s Perceptions of Telemedicine in Korea: Investigation of the Roles of the Benefits and Costs of Telemedicine and Korean Unique Context in Using Medical Services

Jaehee Cho¹, Jiyeon Chung¹, and Chaehwa Chung¹

¹ School of Media & Communication, Chung-Ang University

This study aimed at exploring the influential factors determining the general population’s attitudes toward telemedicine in Korea. This study investigated the effects of multiple predictors related to the benefits and risks of telemedicine on the perceived usefulness (PU) of and perceived ease of using (PEOU) telemedicine. Furthermore, this study explored how three Korea-oriented contextual factors—convenient visits to hospitals, preference for general hospitals, and medical shopping—influenced the general population’s perceptions about telemedicine. Through online survey, 998 usable surveys could be collected. A path analysis was conducted to test multiple hypotheses about relationships among main study variables. Results from the path analysis fully supported the significant roles of the benefit and risk related predictors in determining the PU and PEOU of telemedicine. However, unlike the original prediction, only convenient visits to hospitals as a contextual factor significantly affected the PU and PEOU of telemedicine. This study’s main findings contribute to widening our knowledge about people’s attitudes toward the nationwide implementation of telemedicine in Korea.

Keywords: Telemedicine, Convenient Visits to Hospitals, Medical Shopping, Technology Acceptance Model (TAM)

Address correspondence to Jaehee Cho, Chung-Ang University, #806, bldg. 303, Heukseok-ro 84, Dongjak-gu, Seoul, Korea 156-756
Email: jcho49@cau.ac.kr
Introduction

Supported by the development of mobile communication technologies, medical services through mobile health (mHealth) technologies have garnered increasing attention from scholars, practitioners, and policy-makers (Buis, Hirzel, Turske, Jardins, & Yarandi, 2013; Carter, Burley, Nykjaer, & Cade, 2013; Cho, Lee, Kim, & Park, 2015). South Korea, who boasts high Internet penetration rates and notable advancements in telecommunication networks, has also directed considerable intellectual resources toward mHealth. In particular, there has been much controversial discussion regarding the implementation of telemedicine systems across the country. This is because the implementation of telemedicine is expected to impact many concerned parties including patients, medical service providers, governmental agencies, and so on in different ways (Jung, Kang, Park, & Park, 2015; Jung et al., 2012; Kwon, Noh, & Choi, 2014; Lee et al., 2012; Oh, Park, Jo, & Kim, 2015; Park, 2010; Rho, 2013; Wooton, 2012).

Focusing on the different perspectives of the various concerned parties, previous studies have intensively explored the ways in which telemedicine may affect the quality of medical services, the ways in which specific groups of people (e.g., physicians, patients) perceive the effectiveness of telemedicine, and the issues that policy-makers need to take into consideration to more effectively implement telemedicine (Choi, Lee, & Joe, 2012; Cheong, Lim, Jang, & Jhoo, 2015; Cho, Kwon, & Jeong, 2015; Lee, Lee, & Kim, 2015; Rho & Bae, 2013). However, there has been a lack of research regarding how the general population evaluates about telemedicine, even though the general population’s consensus is a necessary condition for a successful nationwide implementation. Here, it must be noted that previous theoretical models that explain medical service receivers’—especially patients’—attitudes toward telemedicine do not fully or appropriately explain the mechanisms that determine the non-patient population’s attitudes toward telemedicine. Therefore, this present study examined the direct and indirect effects of multiple potential predictors on three main components of technology acceptance model (TAM)—perceived usefulness (PU), perceived ease of use (PEOU), and behavioral intention (BI) in regards to telemedicine. The following
sections introduce the current conditions of telemedicine in Korea and, after a review of previous research, propose the hypotheses and research question of this study.

**Theoretical Framework**

**Telemedicine in Korea**

Like other developed countries, having recognized the potential benefits of ubiquitous health (U-Health) systems, the Korean government has taken significant effort to implement telemedicine (Park, 2010; Rho, 2013; Kim et al., 2015). Particularly, the government places emphasis on the potential advantages that telemedicine hold in terms of providing better healthcare services for people of lower income, lower levels of education, and remote residential areas such as islands and small rural communities. Therefore, the Korean government had already begun to test telemedicine systems in the early 1990s. At that time, telemedicine systems were mainly implemented for residents of remote areas, especially through public health centers. However, there was no further expansion of telemedicine, mainly because of the underdevelopment of infrastructure, in particular telecommunication network systems and mobile technologies that facilitate telemedicine (e.g., videoconferencing tools).

Approximately ten years after the failure of the government’s first attempt to implement telemedicine, Korea experienced considerable development in mobile technologies (e.g., smart devices) as well as telecommunication networks (e.g., 4G, LTE networks). The increased speed of the Internet and the development of innovative technologies for smart devices has significantly changed the environment surrounding mobile support systems for telemedicine (Kim, Oh, Choi, & Kim, 2015). Therefore, in 2014, the Korean government decided to carry out pilot projects in telemedicine, particularly targeting remote communities. However, public announcement regarding the plans for these pilot projects immediately ignited serious conflict between governmental agencies and various associations of medical service providers. Because of those controversies, many
scholars across diverse disciplines embarked on investigations regarding the benefits and risks of telemedicine (Rho, 2013; Kim et al., 2015).

Nevertheless, considering that the implementation of telemedicine systems has not been successful, without governmental support, it is further necessary to obtain national consensus on such medical system. National consensus is especially important in Korea where pilot tests were progressed by governmental agencies with national taxes. Nevertheless, except for a small number of studies, there has not been active examination of how the general population evaluates the potential advantages and disadvantages of telemedicine. Therefore, this study aimed at exploring the potential effects that perceived advantageous and disadvantageous factors have on Koreans’ attitudes toward telemedicine. Further, based on main arguments from TAM, this study examined how such attitudes influence Koreans’ intentions to accept telemedicine.

**Technology Acceptance Model (TAM)**

Previous studies have intensively used the technology acceptance model to explain the processes of adopting new technologies (Holden & Karsh, 2010; Ketikidis, Dimitrovski, & Lazuras, 2012; Legis, Ingham, & Collerette, 2003; Venkatesh & Davis, 2000). Theoretically relying on both theory of reasoned action (TRA) and theory of planned behavior (TPB) (Venkatesh & Davis, 2000), scholars have tried to explain the links among perceptual, attitudinal, and behavioral aspects of adopting new technologies (Ahadzadeh, Ong, Sharif, & Khong, 2015; Gao, Li, & Luo, 2015; Ward, 2013). TAM argues that two perceptual variables—perceived usefulness (PU) and perceived ease of use (PEOU)—are significantly associated with the behavioral intention (BI) to adopt a new technology (Holden & Karsh, 2010; Ketikidis et al., 2012; Legis et al., 2003; Venkatesh & Davis, 2000). Moreover, previous research’s findings support a mediating effect of PEOU on the relationship between PU and BI (Jo, 2012). Based on those findings, this study established the following hypotheses.

**H1.** Perceived usefulness of telemedicine and perceived ease of using telemedicine will positively influence people’s behavioral intention to use telemedicine.
H2. Perceived ease of using telemedicine will positively and indirectly predict behavioral intention to use telemedicine, mediated by the perceived usefulness of telemedicine.

Moreover, previous studies have explored various predictors’ direct effects on the PU and PEOU of a chosen technology (Legis et al., 2003; Venkatesh & Davis, 2000). For instance, UTAUT addresses the critical roles of diverse groups of predictors including personal and contextual factors in determining people’s attitude toward a new technology (Birch & Irvine, 2009; Dunnebeil, Sunyaev, Blohm, Leimeister, & Krcmar, 2012; Gruzd, Stabves, & Wilk, 2012; Kijsanayotin, Pannarunothai, & Speedie, 2009). Therefore, relying on the main findings of previous studies, this study also focused on two groups of factors that can potentially affect Korean general population’s attitudes toward telemedicine. The following section elaborates on each group of specific predictors.

Predictors Associated with the Benefits and Costs of Telemedicine

Based on recognition of the strengths of mHealth, Korean governmental agencies continued to emphasize the multiple benefits that can be obtained from telemedicine (Kwon et al., 2014; Rho, 2013; Lee et al., 2015). In particular, existing research on telemedicine in Korea has commonly addressed the following two main benefits. First, mobile technologies for telemedicine notably improve the transmission of medical information, technically supporting UHealth (ubiquitous health). That is, supported by mobile technologies and telecommunication infrastructures, patients can access medical information anywhere, at any time. Therefore, as the Korean government emphasized, one of the greatest merits of telemedicine lie in UHealth-oriented medical services. Next, another positive aspect of telemedicine is the reduction of medical costs. In particular, when patients are supported by telemedicine, they do not need to make formal visits to hospitals. In Korea, people can visit multiple hospitals and consult with different physicians with relative ease, and many depend on the prestigious general
hospitals that tend to be located in the large, major cities. This culture implies great expenses toward transportation. With telemedicine, patients can save these transportation costs. Considering such positive aspects of telemedicine, this study established the following hypotheses in order to investigate the effects of two predictors—facilitation of medical services and reduction of medical costs—on people’s perceptions of telemedicine.

H3: Facilitation of medical services will positively predict perceived usefulness of telemedicine and perceived ease of using telemedicine.

H4: Reduction of medical costs will positively predict perceived usefulness of telemedicine and perceived ease of using telemedicine.

In spite of the advantages predicted, various associations of medical service providers, especially physicians, voiced strong concern about the multiple disadvantages of telemedicine, such as the demise of local hospitals, threats to personal privacy, and so on (Lee et al., 2015). In particular, Silverman (2003) addressed the major obstacles to successful implementation in terms of medical malpractice, deterioration of doctor-patient relationships, and privacy concerns. Particularly, according to Silverman (2003), a lack of face-to-face (FtF) communication between doctors and patients can create 1) unexpected medical malpractice, especially misuse/abuse of medicine and 2) distrust about medical information transferred through mechanical tools. Furthermore, the difficulty in controlling the medical information that is exchanged through the mobile tools supported by telecommunication systems, is likely to 3) increase privacy concerns. Those three variables are expected to be directly associated with the PU of telemedicine. Therefore, this study established and tested the following hypotheses.

H5. Potential misuse/abuse of medicine will be negatively associated with the perceived usefulness of telemedicine.

H6. Potential mistrust toward medical information will be negatively associated with the perceived usefulness of telemedicine.
H7. Potential increase of privacy concerns will be negatively associated with the perceived usefulness of telemedicine.

**Predictors Related to the Korean Context of Medical Services**

As previous studies have often addressed, the implementation of telemedicine is closely associated with various environmental conditions (Lee et al., 2015). In particular, the unique characteristics and patterns of using medical services in Korea are helpful for identifying the factors that may influence people’s attitudes toward telemedicine. This study focused on three unique patterns that can be identified in the use of medical services in Korea. First, primarily due to the public medical insurance system, routine visits to hospitals tend to be quite affordable. For instance, a person older than 60 years who is covered by public health insurance can receive three different physical treatments at a pain medicine hospital for approximately $1.50. Because of such low costs for hospital visits, Koreans tend not to hesitate to make visits to hospitals even for very light, non-critical symptoms (e.g., colds). Therefore, this study focused on the affordability of visiting hospitals in Korea as a main predictor for perceptions of telemedicine.

Second, many Koreans prefer to visit general hospitals in large cities, especially in Seoul, rather than in smaller towns (Jo, 2012; Kang, 2014). Therefore, because many patients are crowded into a small number of large general hospitals (e.g., Samsung Medical Center, Yonsei University’s Severance Hospital), the physicians of those hospitals can only allocate an extremely small amount of time—less than five minutes—to each patient. In 2015, the average time allocated to a patient consultation was 4.2 minutes in Korea, compared to 26 minutes in the US. (Jeong, 2015). Therefore, in spite of the highly respectful qualifications and professional experience of the physicians at the general hospitals, patients often complain about the low quality of medical services that are offered. Nevertheless, the patient concentration levels of these hospitals continue to grow due to the strong power that these hospitals wield in the medical service market. Thus, this study aims to explore how this particular characteristic of the Korean medical system may
impact Koreans’ attitudes toward telemedicine.

Thirdly, one of the most unique characteristics in Koreans’ use of medical services is that of medical shopping, which can be understood as patients’ visits to multiple hospitals in order to receive second, third, and a larger number of medical opinions. To comprehend the pervasiveness of medical shopping, the rapid spread of MERS (Middle East Respiratory Syndrome) in 2015 serves as a good example. Epidemiologic investigation identified medical shopping as a major cause for the MERS epidemic (Je, Bae, Kim, & Seok, 2015). That is, because patients tend to visit multiple hospitals across the country to gain multiple opinions, the MERS virus was able to spread to a large number of hospitals in different communities nationwide. Consequently, this present study explored how Koreans’ perceptions of telemedicine may be influenced by this unique aspect of medical service use.

In sum, medical service use in Korea is characterized by the convenient visits to hospital, preference for general hospitals, and medical shopping. Regarding these three characteristics as predictors for Koreans’ perceptions of telemedicine, the following research question was proposed and explored.

RQ1: How do the three predictors in regards to the Korean medical context influence the PU and PEOU of telemedicine?

Method

Participants

To collect the data, we conducted an online survey. Data collection was progressed through a research company. For a higher level of sample representativeness, we utilized a proportionate stratified sampling method that took into consideration the gender, age, and residential area of potential participants. A total of 998 questionnaires were obtained through the online survey. The gender distribution was quite even (male 52.4%, female 47.6%), and the average age was 39.4 years. In terms of educational level, the majority of participants held college-level or higher degrees (lower than high school
graduation 28.7%, college degree or higher 71.3%). The median monthly household income of research participants was $3,000–$4,000.

**Instruments**

To measure the main study variables, we used multiple five-point Likert scales, which ranged from 1 = Strongly disagree to 5 = Strongly agree.

**Main components of TAM**

*Perceived usefulness (PU)*

To measure the PU of telemedicine, we used five items created by Davis et al. (1989), modifying each item to reflect telemedicine issues \((M = 3.35, SD = .79, \alpha = .93)\). Examples of those items is “Telemedicine may be useful for improving people’s the quality of medical services by providing reliable medical information” and “Telemedicine may be useful for improving the quality of life.”

*Perceived ease of use (PEOU)*

PEOU was measured with a composite measurement composed of three items proposed by Davis et al. (1989) \((M = 3.28, SD = .81, \alpha = .94)\). Examples of those items are “It may be easy to learn how to use telemedicine” and “It may be easy to use telemedicine”.

*Behavioral intention (BI)*

To measure BI, we reworded three items from Davis et al.’s original scale (1989) so that they corresponded to the telemedicine context \((M = 3.33, SD = .92, \alpha = .96)\). Examples of those items are “Given an opportunity, I may use telemedicine” and “Given an opportunity, I may plan to use telemedicine.”

**Predictors associated with the benefits of telemedicine**

Based on previous studies’ main findings, this study focused on two potential benefits from using telemedicine. The first benefit has to do with the facilitation of relaying medical opinions and examination results to patients. We measured this
facilitation of medical services with three items \((M = 3.50, SD = .79, \alpha=.89)\). Two examples are: a) I can easily receive results from a medical examination through telemedicine; and b) Through telemedicine, I can easily get medical treatment for minor symptoms.

The second main benefit of telemedicine is the reduction of medical costs. This factor was measured through four items \((M = 3.53, SD = .78, \alpha=.87)\), of which two examples are: a) Telemedicine technologies will be helpful for reducing medical expenses by facilitating the early detection of potential illnesses; and b) Telemedicine technologies will be helpful for reducing transportation expenses for visiting hospitals.

**Predictors associated with the risks of telemedicine**

This study paid attention to three main factors related to the potential risks from the use of telemedicine—privacy concerns, abuse of medicine, and information distrust. First, to measure privacy concerns, this study created three items measuring concerns about unwanted disclosure of private information regarding medical conditions \((M = 3.75, SD = .75, \alpha=.94)\). Examples of those items are: a) Through telemedicine, patients’ personal physical attribute information can be leaked; and b) Through telemedicine, patients’ personal identity information can be leaked.

Next, in order to measure abuse of medicine, we newly created three items \((M = 3.45, SD = .85, \alpha=.92)\), of which examples include: a) By using telemedicine technologies, people may abuse medicine; and b) By using telemedicine technologies, the use of unnecessary medicine may increase.

Lastly, another potential risk is related to the quality of information transferred through telemedicine technologies. To measure this variable, distrust about medical information, we created three items \((M = 3.0, SD = .81, \alpha=.92)\). Two examples are: a) I can’t trust medical transcripts that are transmitted through telemedicine systems; and b) I can’t trust prescriptions that are transmitted through telemedicine systems.
Predictors associated with Korean contexts

This study focused on three unique characteristics of medical services in Korea—convenient visits to hospitals, preference for general hospitals, and medical shopping. First, to measure people’s convenient use of medical services, we created four items ($M = 2.46$, $SD = .74$, $\alpha = .82$), of which examples include: a) I tend to immediately visit hospitals even for very minor symptoms (e.g., slight cough); and b) I don’t feel relieved until I receive a diagnosis from a medical doctor.

Next, as elaborated above, it has been observed that Koreans show strong preferences for general hospitals. This variable was measured through four items ($M = 2.42$, $SD = .74$, $\alpha = .78$), and two examples of them are: a) I tend to visit general hospitals, even if they are located far from my residential area; and b) I have more trust in diagnoses from general hospitals than from local ones.

Finally, medical shopping refers to the tendency of gathering medical opinions from multiple physicians. This variable was measured through four items ($M = 2.29$, $SD = .75$, $\alpha = .88$), of which examples include: a) When I need to find a hospital, I tend to ask others to recommend multiple hospitals; and b) I am likely to obtain medical opinions from multiple physicians.

Table 1. Correlations for key study variables

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMS</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMC</td>
<td>.65***</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC</td>
<td>-.01</td>
<td>-.04</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM</td>
<td>-.17***</td>
<td>-.18</td>
<td>.43***</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>-.35***</td>
<td>-.34</td>
<td>.29***</td>
<td>.48***</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CVH</td>
<td>.03</td>
<td>.04</td>
<td>-.14***</td>
<td>-.05</td>
<td>.01</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PGH</td>
<td>.09***</td>
<td>.08</td>
<td>-.14***</td>
<td>-.01</td>
<td>-.01</td>
<td>.40***</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS</td>
<td>.03</td>
<td>.01</td>
<td>-.06</td>
<td>.01</td>
<td>.11***</td>
<td>.41***</td>
<td>.43***</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PU</td>
<td>.75***</td>
<td>.68***</td>
<td>-.09***</td>
<td>-.27***</td>
<td>-.39***</td>
<td>.10***</td>
<td>.12***</td>
<td>.06</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>PEU</td>
<td>.58***</td>
<td>.60***</td>
<td>-.01</td>
<td>-.16***</td>
<td>-.27***</td>
<td>.12***</td>
<td>.14***</td>
<td>.08</td>
<td>.58***</td>
<td>1.00</td>
</tr>
<tr>
<td>BIU</td>
<td>.63</td>
<td>.68</td>
<td>-.09***</td>
<td>-.25***</td>
<td>-.43***</td>
<td>.11***</td>
<td>.14***</td>
<td>.08</td>
<td>.73***</td>
<td>.66***</td>
</tr>
</tbody>
</table>

Note: $N = 371$, *$p<.05$, **$p<.01$, ***$p<.001$.
Facilitation of medical services = FMS; Reduction of medical cost = RMC; Privacy concerns = PC; Abuse of medicine = AM; Information distrust = ID; Convenient visits to hospitals = CVH; Preference for general hospitals = PGH; Medical shopping = MS; Perceived usefulness = PU; Perceived ease of use = PEU; Behavioral intention to use = BIU.
Results

In order to test the proposed hypotheses and explore the research question, we conducted a path analysis—a specific form of structural equation modeling (SEM)—of a model composed of all the main study variables. Three model fit indices—comparative fit index (CFI), infinite fit index (IFI), and standardized root mean square (SRMR)—for this path analysis were reviewed. After removing insignificant paths, the final model for path analysis obtained acceptable model fits ($\chi^2$(df = 7) = 97.8, CFI = .97, IFI = .97, SRMR = .03).

Figure 1. Results from path analysis

Notes: CVH=Convenient visits to hospitals, FMS=Facilitation of medical services, RMC=Reduction of medical costs, MAMD=Misuse/abuse of medicine, MTMI=Mistrust of medical information, PU=Perceived usefulness of telemedicine, PEOU=Perceived ease of using telemedicine, BI=Behavioral intention to use telemedicine

First, based on the technology acceptance model (TAM), we had established hypotheses regarding the relationships among the three main components of TAM—PU, PEOU, and BI—in terms of telemedicine. Specifically, H1 hypothesized the direct and positive effects of the PU and PEOU of telemedicine on the BI to use telemedicine. Results from the path analysis showed that PU ($\beta$
=.61, p < .001) and PEOU (β=.40, p < .001) directly and positively predicted the BI to use telemedicine. These results fully support H1. In addition, H2 tested PEOU’s role of mediating the effect of PU on BI. The SEM results indicated a significant indirect effect of PEOU on BI. Furthermore, the result from a Sobel’s test of PU’s mediating effect also supported PEOU’s significant indirect effect of PEOU on BI (Sobel’s statistic = 5.33, p < .001). This result fully supports H2.

Second, based on the main findings of previous research, we examined the roles of the two main benefits of telemedicine in increasing the PU and PEOU of telemedicine. Results from the path analysis indicated that facilitation of medical services strongly and positively predicted both the PU (β=.47, p < .001) and PEOU (β=.32, p < .001) of telemedicine, fully supporting H3. Moreover, H4 examined the direct effects of reduction of medical costs on the PU and PEOU of telemedicine. Fully supporting H4, the SEM results indicated strong and positive effects of reduction of medical costs on the PU (β=.28, p < .001) and PEOU (β=.40, p < .001) of telemedicine.

Third, previous research on telemedicine in Korea has addressed the potential risks from telemedicine. We placed particular attention on three—privacy concerns, abuse of medicine, and information distrust—and proposed three hypotheses accordingly. According to the results from the path analysis, only two variables—abuse of medicine (β = -.09, p < .001) and distrust about medical information (β = -.05, p = .03)—significantly and negatively predicted the PU of telemedicine. These results fully support H5 and H6, but reject H7.

Last, because little research has been conducted to examine the roles of the three unique characteristics of Korean medical services in determining the general population’s attitudes toward telemedicine, we explored the potential direct effects of those three factors on the PU and PEOU of telemedicine. Results from the path analysis indicated that only convenient visits to hospital significantly and positively predicted both the PU (β=.07, p = .002) and PEOU (β=.11, p < .001) of telemedicine.

In terms of the explained variance of the three indigenous variables—PU, PEOU, and BI in terms of telemedicine—the addition of nine variables into the
model explained 65.4% of the variance of PU ($R^2 = .65$). Moreover, by adding five variables into the model, 43.6% of the variance of PEOU was accounted for ($R^2 = .44$). Lastly, 61.6% of the variance of BI was explained through the addition of PU and PEOU into the model ($R^2 = .62$).

**Discussion**

Noting the shortcomings of previous research on telemedicine in Korea, this study aimed at exploring the influential factors that determine Koreans’ attitudes toward telemedicine. We paid major attention to the general population’s attitudes toward telemedicine. Based on main arguments from TAM, we investigated the direct effects of multiple groups of predictors on the perceived usefulness (PU) and perceived ease of use (PEOU) of telemedicine. Specifically, we examined individuals’ perceptions regarding the benefits and risks of telemedicine as predictors of PU and PEOU. Furthermore, we also explored how three Korea-oriented contextual factors—convenient visits to hospitals, preference for general hospitals, and medical shopping—predicted the general population’s perceptions regarding telemedicine. Although most of the hypotheses regarding the benefits and risks of telemedicine were fully supported, privacy concerns were not found to significantly predict the general population’s attitudes toward telemedicine. In addition, only convenient visits to hospital showed significant, positive effects on the PU and PEOU of telemedicine. These findings are meaningful in several ways.

Unlike the original prediction, this study found that privacy concerns did not significantly predict the perceived usefulness of telemedicine. This finding is quite noteworthy because previous studies have often addressed privacy concerns as one of the main obstacles against the implementation of telemedicine. This is mainly because people cannot control the flow of information that occurs through mobile tools. In particular, associations for medical service providers have emphasized that medical information transmitted through mobile tools is at risk of being hacked or leaked for illegal usage (Rho, 2013). However, as this study shows, the general population’s privacy concerns in regards to telemedicine were not an influential factor in reducing the perceived usefulness of telemedicine. This
may be due to the general population’s lack of experience in exchanging sensitive medical information across long distances. This finding suggests that researchers need to develop theoretical models specified for laypersons in order to more fully understand the more detailed mechanisms involved in the general population’s attitudes toward telemedicine systems. Finally, this study’s findings will be theoretically helpful for thoroughly developing a more realistic model that can explain the implementation process of telemedicine.

In addition, the following practical implication can also be considered. As elaborated above, previous research on telemedicine in Korea had consistently addressed the acute conflict between the medical service provider associations and governmental agencies (Cheong et al., 2015; Cho et al., 2015; Lee et al., 2015; Rho & Bae, 2013). Although provider associations have emphasized the potential problems associated with the deterioration of medical services, another main reason for opposing telemedicine was with the potential reduction of financial benefits, especially for local hospitals. This is mainly because medical service providers worry that telemedicine may replace the existing medical system. However, as this study found, dependence on general hospitals and medical shopping did not significantly affect the general population’s perceptions about telemedicine. Only convenient visits to hospitals significantly and positively influenced the PU and PEOU of telemedicine. That is, people might have recognized some potential connections between offline visits to hospital and telemedicine. We may interpret these results as telemedicine’s potential to complement the existing medical system rather than to significantly replace it. Therefore, such findings of this present study can help mitigate the serious conflicts between governmental agencies and medical service providers.

In spite of such theoretical and practical implications, future research will benefit by considering the following recommendations. First, this study lacks consideration of the actual behaviors of telemedicine adoption. This is due to the present study’s focus on individuals’ intentions to use telemedicine, which are considered to be determined by their perceptions of such new medical system. However, it will be necessary to further pursue longitudinal research that can
explore the entire process leading to actual adoption. Next, extended versions of TAM often address the importance of people’s experiences with existing technologies that are technically related to a new technology. Therefore, in regards to telemedicine, it will be meaningful for future research to investigate how people’s experiences of using diverse existing mobile technologies, especially smart devices, impact their attitudes toward telemedicine. Lastly, it is also recommended for future research to explore the influence of personal factors (e.g., openness to new experiences, eHealth literacy) on the relationships among the main predictor and outcome variables of this study.

**Conclusion**

This present study explored the potential roles of multiple predictors, in terms of the benefits and risks of telemedicine and the Korean context of using medical services, in determining the general population’s perceptions about telemedicine. SEM results fully supported most of the proposed hypotheses involving the benefits and risks of telemedicine’s effects on the PU and PEOU of telemedicine. However, in regards to contextual factors, only one factor—convenient visits to hospitals—significantly predicted the PU and PEOU of telemedicine. The main findings from this study will be helpful for building national consensus in regards to the implementation of telemedicine in Korea by providing a more complete understanding of the general population’s attitudes toward a new medical system.

**References**


Jeong, S. 3 minutes → 15 minutes for medical consultation: Will Seoul National University Hospital’s experiment be successful? Dailymedi., in.


Instructions for Authors

Thank you for choosing to submit your research to the *International Journal of Health & Media Research*.

Authors should read the “Instructions for authors” on the journal’s page before making a submission. Manuscript should be prepared according to the style and specifications of the journal’s policy.

Authors should submit separately the following files: (1) a cover letter file that contains any comments to the editor; (2) a manuscript file with the full text of the article (i.e., abstract, main text, references, figures, tables, footnotes, and appendixes); and (3) a title page that includes the manuscript's title, author(s)’ names, affiliation, emails, postal addresses, the acknowledgement, and declaration of conflict of interest. The manuscript text files will only be accepted in Microsoft Word document format (.doc or .docx). Only original manuscripts submitted to the International Journal of Health & Media Research will be considered for publication. Authors submitting manuscripts to the journal should not simultaneously submit them to another journal.

Any information in the Acknowledgement and Declaration of Conflict of Interest that may lead to the uncovering of the identity of the author is also removed from the manuscript prior to sending it to reviewers.

**Content:** Manuscript should be no longer than 5,000 words, excluding tables, figures, and references. Please refer to the Publication Manual of the American Psychological Association (6th edition) for formatting of tables and other style issues. References need to be double-spaced as well as for the main text. The manuscript file should also include a shortened version of the title (43 characters or less, including spaces) for use as a running head. Define any abbreviations and acronyms the first time they are used.

Please ensure that the manuscript is appropriately blinded. Authors should not contain
any clues to the author’s personal identity or institutional affiliation outside of the title page. Please double-check your manuscript for:

▶ Self-citations "in press";
▶ Self-referential citations including author identity
▶ Institutional affiliation (often in the Methods and Acknowledge sections)
▶ Any indicator of either author(s) or institution(s) in the title of the
▶ manuscript file, eg., "YourName_Manuscript.doc."

**Permission:** Authors are responsible for obtaining permission from copyright owners when using lengthy quotations (500 words or more), tables, or figures published elsewhere. All authors should approve the final version of the manuscript prior to submission. Once a manuscript is submitted, it is therefore assumed that all authors have read and given their approval for the submission of the manuscript.

**Conflict of Interest:** “Conflict of interest (COI) exists when there is a divergence between an individual’s private interests (competing interests) and his or her responsibilities to scientific and publishing activities such that a reasonable observer might wonder if the individual’s behavior or judgment was motivated by considerations of his or her competing interests.” Authors should disclose all financial/relevant interest that may have influenced the development of the manuscript in their title page. Reviewers should disclose any conflict of interest and if necessary, decline to review any manuscript they perceive to have a conflict of interest. Editors should also decline from considering any manuscript that may have conflict of interest. Such manuscripts will be reallocated to other editors.

**Confidentiality:** A submitted manuscript is a confidential material. Academic Journals will not disclose submitted manuscript to anyone except individuals who partake in the processing and preparation of the manuscript for publication (if accepted). These individuals include editorial staff, corresponding authors, potential reviewers, actual reviewers, and editors. However, in suspected cases of misconduct, a manuscript may be revealed to members of Academic Journals’ ethics committee and institutions/organizations that may require it for the resolution of the misconduct. Academic Journals shall follow the appropriate COPE flowcharts wherever necessary.

**Manuscript Submission:** The journal accepts only submitted manuscripts via email. When your files are ready, please email your manuscript to ijhmr@hallym.ac.kr.
Peer Review: The review process is an important aspect of the publication process of an article. It helps an editor in making decision on an article and also enables the author to improve the manuscript. IJHMR operates a double blind review process.

Editorial Procedures: All submitted manuscripts are blind reviewed by at least 2 reviewers. The process may take up to 8 weeks. The managing editor will notify authors of the decision—accept, revise, or reject. Review comments will be returned to the author.

The review reports are sent to the authors. However, reviewers’ identity is removed from the review reports. The author(s) is left with only the review reports/recommendation without any information that might enable him/her uncovers the identity of the reviewers. A minimum of two review reports are required per manuscript.

Only an editor has the authority to “Accept” or “Reject” a manuscript. If a manuscript is “Accepted”, an Acceptance Certificate is issued to the author(s) and the manuscripts are processed for publication.

If a manuscript is rejected, the authors are informed of the decision and no further processing is done on the manuscript. If a manuscript requires revise, it is sent to the author(s) with the editor’s recommendation for further revision. The editor makes a final decision on the revised to “Accept” or “Reject” the manuscript.

Production Procedure: After a manuscript is accepted for publication, authors will be asked to submit a final version of the manuscript. Files are copyedited, typeset into page proofs, and e-mailed to the authors. Authors are responsible for the reading of proofs and for correcting errors and answering editors’ queries.