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Elaborative Processing that Matters

A Study on Factors Influencing Perceived Risks of Food and Medicine Safety*

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Objectives
This study explores the role of the media, interpersonal communication, and elaborative processing in shaping the public's perceived risks of food and medicine safety in South Korea.
Methods
Data for this study came from a national online survey with an interview of 1,001 respondents in South Korea.
Results
Findings showed that watching television, using Internet news and interpersonal communication increased perceived risks. The impact of media use could be indirect because its effects disappeared after entering interpersonal communication and elaborative processing into the model. We also found the effect of interaction between the media, interpersonal communication, and elaborative processing. Most importantly, elaborative processing moderated the effects of using Internet news and social networking sites and discussing with others.
Conclusions
This study contributes to risk communication literature by empirically testing various factors influencing risk perceptions in South Korea, where was rarely examined.

K E Y W O R D S risk perception, elaborative processing, food and medicine safety

Introduction

In South Korea, there has been growing public concern about food and medicine safety over the recent years. Since the Fukushima disaster in 2011, for example, the Korean consumers have showed fear about the foods imported from Japan (Kim, 2012c). A food contamination scandal in 2005 involving lead found in Kimchi has also caused great fear among the public about commercial food. More recently, contaminated eggs were found in South Korea and some European countries, and the affected eggs were disposed of (Shim, 2017). The food and medicine safety has been a significant issue in South Korea for many decades, and, according to a study (Park, 2006), many scandals involving food and drug safety have significantly affected consumers' food choices.

With the increasing public concern about food and medicine safety, it is important to investigate how South Koreans evaluate risks of certain food and medicine. What factors may affect the way the public perceives a certain risk? Can communicative forces play a key role in shaping risk perceptions? As the primary source from which people receive health information, news media can report detailed explanations about a risk (Fung,

Namkoong, & Brossard, 2011; Morton & Duck, 2001). The media can play an important role in producing, delivering, and distributing health information and knowledge (Chang, 2012). Many studies have examined how the public perceives risks of food safety (e.g., Fleming, Thorson, & Zhang, 2006; Marks, Kalaitzandonakes, Wilkins, & Zakharova, 2007). Without direct experience of health problems, people are more likely to use mass media in order to understand related health risks (Morton & Duck, 2001; Oh, 2012). Mass media have been found to be a contributing factor to the public's risk perceptions (Ho, Brossard, & Scheufele, 2007; Morton & Duck, 2001; Nelkin, 1998; Park, 2003). At the same time, studies have indicated that interpersonal communication can influence the public's risk perceptions (Coleman, 1993; Fleming et al., 2006; Ho, Scheufele, & Corley, 2013; Snyder & Rouse, 1995).

In addition to mass media and interpersonal communication, researchers found that elaborative processing can play an important role in shaping individual perceptions (e.g., Eveland, 2004; Ho et al., 2011). Elaborative processing refers to "the process of connecting new information to other information stored in memory, including prior knowledge, personal experiences" (Eveland, 2001, p. 573). Besides

simply using the media, elaborating process seems to amplify the effects that the media may have on the audience's risk perceptions, knowledge, and behavior (Fleming et al., 2006; Ho et al., 2013; Jensen, 2011; Xenos, Becker, Anderson, Brossard, & Scheufele, 2011). In particular, this elaboration process can moderate the effects of the media on the way the public evaluates potential risks and benefits of certain food and medicine (Ho et al., 2013).

The purpose of this study is to examine how the media can affect perceived risks of food and medicine safety in South Korea. While interpersonal communication can also play a key role, this particular role has been rarely examined in South Korea. In addition to reviewing the effects of media use, we explore the role of interpersonal communication in shaping people's perceived risks of food and medicine safety. Finally, we examine the role of elaborative process in shaping risk perceptions. More specifically, we explore whether one's elaboration of media content or interpersonal discussion can either amplify or attenuate the effects of media use and interpersonal communication on risk perceptions.

This study can make some contributions to the health and risk communication literatures. First, only a few studies have explored the potential link between elaborative processing and risk perception, and interaction effects of communication forces and elaboration on risk perception in South Korea. This study tries to address this literature gap in research. Second, by using data from South Korea, we can improve our intercultural understanding of the role of health and risk communications. Given the public concern about food and medicine safety, South Korea can provide an opportunity to enhance the intercultural validity of the existing findings and theorizing the health and risk communication literature.

Data for this study came from a national survey conducted by the Korea Food and Drug Administration (KFDA) in 2011. The public's risk perceptions were measured with nine specific issues related to food and medicine safety: "food poisoning," "food additives," "agrochemical residues," "heavy metal contamination in food," "medical malpractice," "vaccine accident," "antibiotics in food," "food contaminated by radioactivity," and "side effect in medicine." The effects of mass media were assessed using a variety of media channels, including newspapers, television news, Internet news, and Social Networking Sites (SNS).

Literature Review

Mass Media and Perceived Risks

Food and medicine safety has become increasingly important issue in the media (Berry, Wharf-Higgins, & Naylor, 2007; Marks, Kalaitzandonakes, Allsion, & Zakharova, 2003; Marks et al., 2007; Moyhihan et al., 2000). For example, analyzing news stories about biotechnology in the Washington Post and the London Times between 1990 and 2001, Marks et al. (2007) found that news about food and technology issues, such as food safety, gene therapy, and human cloning, had significantly increased over the years in both newspapers. As food and medicine issues receive attention, it is necessary to look at the role of the media. News media are one of the most important sources regarding food and medicine safety (Nelkin, 1989; Rogers, 1999). At the same time, the public can learn the information of which foods are healthier from the media (Lupton, 2004).

Studies have shown that the media play the same role in South Korea (e.g., Lee, 2008; National Science Board, 2016; Pew Internet & American Life Project, 2013; Rhee, Lee, & Shim, 2011). A recent survey in South Korea reported that television (40.8%) is the primary source of science and technology information, followed by the Internet (22.6%) and newspapers (10.4%) (Rhee et al., 2011). Another survey indicated that the majority of South Korean consumers (about 60%) received information about food hazards mostly from three major forms of the media, including television, newspapers, and the Internet in South Korea (Lee, 2008).

News stories about food and medicine have been one of the most popular topics in the South Korean media (Lee, 2007; Lee & Park, 2006; Oh, Kim, Kim, & Kim, 2016). The media have begun to report an increasing number of stories about health and food as a healthy lifestyle became one of the most important personal values among South Koreans (Lee & Park, 2006). Analyzing science stories of three major newspapers, for example, Lee (2007) found that news coverage of medical science has considerably increased between 1994 and 2004. From a content analysis of news stories about GM foods in South Korea, Oh et al. (2016) found that coverage of GM foods in television and newspapers has also significantly increased between 1998 and 2008.

In addition, sensational and dramatic news reporting has been prevalent in covering stories about food and medicine safety in South Korea (Lee, 2008; Lee & Park, 2006;

Park, 2006). Analyzing news articles between 1989 and 2005, for example, Park (2006) found that South Korean newspapers frequently highlighted how food safety accidents were severe. Lee and Park (2006) also found that South Korean newspapers tend to emphasize controversies involving a food accident rather than to elaborate on potential causes of the accident. They concluded that the media function to amplify – rather than attenuate – consumers' perceived risks.

In this study, we examine the relationship between media use and perceived risks of food and medicine in South Korea. Studies in the U.S. have shown that the media play a role in shaping the public's perceived risks of a variety of health issues including food and medicine safety (Ho et al., 2007; Morton & Duck, 2001; Snyder & Rouse, 1995). In South Korea, Park (2003) demonstrated a positive relationship between news media and perceived risks. She found that reading and viewing medical news were associated with perceptions of increased risks about a variety of health problems. Cha (2010) also found that media use increased perceived risks of H1N1 flu. In addition, emerging media such as Internet news and SNS can integrate visual images, audio, and video into the textual contents (Kim, 2008), and such technologies

can make news coverage more vivid and sensational. According to a recent survey, about 84% Koreans indicated that they use digital platforms for news (Kim & Kim, 2017). Therefore, digital platforms such as Internet news and SNS as well as traditional news media including newspapers and television news may affect risk perceptions. We predict that media use (newspapers, television news, Internet news, and SNS) will increase people's perceived risks of food and medicine safety in South Korea:

H1a: Reading newspapers will be positively associated with perceived risks of food and medicine safety.
H1b: Watching television news will be positively associated with perceived risks of food and medicine safety.
H1c: Using Internet news will be positively associated with perceived risks of food and medicine safety.
H1d: Using SNS will be positively associated with perceived risks of food and medicine safety.

Interpersonal Discussion

In this study, we investigate interpersonal communication, as a factor that may influence perceived risks of food and medicine safety. People who are involved in talking with others about certain issues (e.g., science and health issues) would tend to look for related

information that they have obtained from the media (Ho et al., 2013). Because discussion with family and friends can increase the influence of mass media (Johnson, 1993), for example, people who are more likely to talk about food and medicine safety may more often retrieve health-related information. Thus, mass media and interpersonal communication can be complementary to each other for the public's shaping of judgments (Chaffee, 1986). If important health and safety issues in the media become salient in people's minds, perceived risks may amplify among the public as they start talking about the issue with other people. Thus, the influence of interpersonal communication can be a two-step process, where the media first present a certain issue prominent and then the members of the public begin to exchange their views, resulting in increased perceived risks (Dunwoody & Neuwirth, 1991).

Numerous studies have shown that interpersonal communication can influence perceived risks (Coleman, 1993; Dunwoody & Neuwirth, 1991; Ho et al., 2013; Morton & Duck, 2001; Snyder & Rouse, 1995). For example, Snyder and Rouse (1995) found that greater engagement in interpersonal communication was associated with greater perceived risks of AIDS. Examining Australian

undergraduate students' risk perceptions of skin cancer, Morton and Duck (2001) indicated that respondents who were more likely to discuss skin cancer with others tended to feel at risk personally. Also in South Korea, interpersonal communication has been examined in the context of risk communication (e.g., Cha, 2010; Kim, 2011; Kim, 2012a). Cha (2010) explored the relationship between interpersonal communication and the public's perceived risk of H1N1 flu. The findings showed that personal communication with the family, relatives, and health care providers were associated with perceived risk. Therefore, those who are more likely to talk about health topics will also perceive risks of food and medicine safety than those who are less likely to talk about them. The following hypothesis is posed:

H2: Engaging in interpersonal communication will be positively associated with perceived risks of food and medicine safety.

Elaborative Processing

In addition to the influences of media use and interpersonal communication, we examine whether an extra effort to elaborate on information can further increase one's perceived risks. That is, this study tests

whether elaborative processing can moderate the influences of media use and interpersonal communication on risk perception. Elaborative processing refers to a behavior that people use to associate new ideas and information with their knowledge, imagine new situations, search for similarities with past experiences, and find out new methods to apply the information (Eveland, 2002). Those who engage in elaborative processing of the information they received from the media and interpersonal communication will tend to perceive greater risks.

The idea of elaborative processing has been applied to understanding the public's perceived risks of food and medicine safety (Fleming et al., 2006; Ho et al., 2010, 2013; Jensen, 2011; Xenos et al., 2011). Fleming, Thorson, and Zhang (2006) found that elaborative processing was positively associated with consumers' concerns about food safety. The results showed that respondents who had more often elaborating processing and active reflection about food safety and agriculture tended to concern in various food safety such as pesticides, additives in processed foods, food preservatives, etc. Ho et al. (2013) also found that elaborative processing was significantly correlated with perceived risks and benefits of nanotechnology. Their

findings indicated that the influence of elaborative processing was even greater than that of mass media use. In this study, thus, we expect that those who are more often elaborating information related with food and medicine safety after they are exposed to news and information tend to perceive risks of food and medicine safety. That is, elaborative processing will play a key role in shaping perceived risks. Thus, we put forth the following hypothesis:

H3: Elaborative processing will be positively associated with perceived risks of food and medicine safety.

In addition, this study examines that elaborative processing will moderate the effect of media use and interpersonal discussion about food and medicine safety. As Ho, Scheufele, and Corley (2010, 2013) pointed out, it is not enough to explain cognitive processing as simply using news media. For example, if people who read news articles about food safety are thoroughly thinking over them, news stories will be more likely to influence their perceived risks of food safety. Likewise, if people who discuss news information about food and medicine safety with others are thinking about it later, they will perceive greater risks of food and

medicine. However, researchers paid little attention to how interactions between media use, interpersonal discussion, and elaborative processing influenced perceived risks of food and medicine safety in South Korea.

Lastly, we expect the moderating role of elaborative processing with the media and interpersonal discussion; people who not only use the media but also elaborately process on the information that they received will perceive greater risks of food and medicine; those who not only discuss food and medicine safety with others but also engage in elaborative processing will perceive higher risks of food and medicine. Thus, the following hypotheses are proposed:

H4a: Elaborative processing will moderate the influence of media use on perceived risks of food and medicine safety.

H4b: Elaborative processing will moderate the influence of interpersonal communication on perceived risks of food and medicine safety.

Methods

Data and Sample

Data for this study were collected in South Korea in August 2011 as a part of the KFDA's project on the public's perceptions regarding various public health issues. Originally the questionnaire was developed by the research team in the School of Media and Communication at Korea University under grant support from the KFDA. This online survey was conducted by a professional research agency (KDN; Korea Data Network). The population of this survey was adult residents aged 20 years old and above from seven national metropolises in South Korea including Seoul, Busan, Incheon, Deagu, Gwangju, Deajeon, and Ulsan. From a panel of approximately 650,000 potential participants, quota sampling was used considering region, age, and gender. The total sample size was 1,001.

Measures

Perceived risks of food and medicine safety

Rather than using a single variable focusing on a specific perceived risk of food and medicine, the survey measured perceived risks of food and medicine safety by adopting a number of issues related to food and medicine as used by previous studies (e.g., Fleming et al., 2006). Using an index of nine items ($M = 5.31$, $SD = .95$, $\alpha = .91$), respondents were asked to indicate how

risky they were to you on a 7-point scale (1 = "not at all risky," 7 = "very risky"): "food poisoning," "food additives," "agrochemical residues," "heavy metal contamination in food," "medical malpractice," "vaccine accident," "antibiotics in food," "food contaminated by radioactivity," and "side effect in medicine."

Media use. Media use was measured into two categories: media exposure and media attention. The survey used four types of media such as newspaper, television news, Internet news, and SNS. Respondents were asked to indicate how much exposure and attention to food and medicine issues through the presented six media channels. Responses were coded on an 11-point scale from 0 ("not at all exposure or attention") to 10 ("very often exposure or very close attention"). These items were averaged to create a composite index, with higher scores indicating greater media use (See Table 1 for means, standard deviations, and correlations).

Interpersonal communication

Interpersonal discussion about food and medicine was measured by asking respondents how often they talked with people around you regarding four items: (a) "heavy metals such as mercury in fish," (b) "food contaminated by radioactivity," (c) "medical malpractice,"

and (d) "antibiotics in food." Responses were coded on a 7-point scale from 1 ("not at all discuss") to 7 ("very often discuss"). The four items were averaged to form an index, with higher scores indicating higher interpersonal discussion about food and medicine safety ($M = 4.02$, $SD = 1.22$, $\alpha = .84$).

Elaborative processing

Elaborative processing was measured by asking respondents how much they agreed with the following statements: (a) "When I encounter news information about food and medicine, I think about it later," (b) "I try to find out additional information about food and medicine from other media outlets," and (c) "I read between the lines in order to understand the truth about food and medicine." Responses were coded on an 11-point scale from 0 ("do not agree at all") to 10 ("agree very much"). The three items were averaged to make a composite index, with higher scores indicating greater amount of elaborative processing ($M = 5.92$, $SD = 1.66$, $\alpha = .79$).

Control variables

In the abundant literature of risk and science communication, gender, age, education, income, ideology, scientific knowledge, and controllability were considered as control

Table 1. Summary of the means, standard deviations, and reliability scores of control, independent, and dependent variables (N = 1,001)

		M	SD	Reliability Test
Control variables	Age	41.49	13.02	
	Gender	50.1% female		
	Education	3.45	.98	
	Income	4.68	1.95	
	Ideology	2.02	.57	
	Scientific knowledge	5.37	1.79	KR-20 = .59
	Controllability	4.01	1.16	α = .90
Independent variables	Newspaper	5.65	1.96	r = .72[*]
	TV	6.72	1.64	r = .73[*]
	Internet news	6.44	1.96	r = .76[*]
	SNS	4.65	2.40	r = .82[*]
	Interpersonal discussion	4.02	1.22	α = .84
	Elaborative processing	5.92	1.66	α = .79
Dependent variable	Risks perception	5.31	.95	α = .91

[*]p < .001

variables (e.g., Fleming et al., 2006; Ho et al., 2010, 2013; Xenos et al., 2011). We included these factors as control variables in the analysis. Age was recorded as years of age reported by respondents (M = 41.19, SD = 13.02) and gender was measured as a dichotomous variable (50.1% female). Education was an ordinal variable with 5 categories ranging from 1 (middle school degree or below) to 5 (graduate degree). Monthly house income was coded from 1 (one million Korean Won or below) to 9 (8 million Korean Won or over). Ideology was measured as self-reported records (1 = conservative, 3 = liberal, M = 2.02, SD = .57). Scientific knowledge was an additive index of eight dichotomous items (1 = True, 2 = False) asking respondents whether (a) "The Sun rotates around the Earth" (False), (b) "When radioactive material was detected in milk, it is safe to boil and then drink it" (False), (c) "Mother's genes determine the sex of baby" (False), (d) "The first humans lived with Dinosaurs" (False), (e) "Antibiotics kill

viruses as well as bacteria" (False), (f) "Lasers work by focusing sound waves" (False), (g) "All radioactivity is man-made" (False), and (h) "The orbital period is one month" (False). For each item, the correct answer was recoded into "1," and the incorrect one was recoded into "0." The scores for the nine items were added, with higher scores indicating greater level of factual scientific knowledge ($M = 4.80$, $SD = .96$, $KR\text{-}20 = .59$). Controllability was measured using an index of nine items ($M = 4.01$, $SD = 1.16$, $\alpha = .90$). On a 7-point scale (1 = not at all possible, 7 = highly possible), respondents were asked to indicate how possible it is to avoid risks through individual behaviors such as washing hands and abstaining from eating regarding the nine items used in perceived risks (i.e., "food poisoning" etc.).

Analytical Procedure

In this study, we used hierarchical multiple regression, in which demographics and ideology were entered first, followed by scientific knowledge in the second block, controllability in the third block, media use in the fourth block, interpersonal communication in the fifth block, and elaborative processing in the sixth block. Finally, the interactions were entered in the last (seventh) block. As Cohen, Cohen, West, and Aiken (2003) pointed out, the basic principles of the hierarchical order for entering variables are causal priority and the exclusion of spurious relationships. In this analysis, the supposed causal order of the independents was according to theoretical reasons and previous studies (e.g., Fleming et al., 2006; Ho et al., 2011).

Results

Table 2 shows the results of the hierarchical multiple regression model predicting perceived risks of food and medicine safety. Among the demographic variables, females presented significantly higher perceived risks of food and medicine ($\beta = .12$, $p < .001$), older respondents showed higher perceived risks ($\beta = .09$, $p < .01$), and income was positively related to perceived risks of food and medicine ($\beta = .07$, $p < .05$). However, education, ideology, scientific knowledge, and controllability were not significantly associated with perceived risks.

Hypothesis 1a-d stated that media use – newspapers, television news, Internet news, and SNS – about food and medicine safety

issues would be positively associated with perceived risks of food and medicine safety. As shown in Table 2, television news (β = .10, p < .05) and Internet news (β = .10, p < .01) were positively related to perceived risks in the Model 4. Thus, H1b and H1c were supported. After interpersonal communication, elaborative processing, and interactions were entered into our model, however, the standardized regression coefficients of TV and Internet news were insignificant. The media block accounted for 4.1% of the total variance in our dependent variable (Model 4).

Hypothesis 2 and Hypothesis 3 posited that each interpersonal communication and elaborative processing would be positively related to perceived risks of food and medicine safety. Interpersonal communication showed significant positive relationship with perceived risks of food and medicine (β = .21, p < .001). Hence, H2 was supported. Interpersonal communication explained 3.3% of the total variance of the criterion variable (Model 5). Likewise, elaborative processing significantly increased perceived risks (β = .13, p < .001). Therefore, H3 was also supported. The cognitive processing block accounted for 1.1% of the total variance in perceived risks of food and medicine (Model 6).

Finally, Hypothesis 4a and 4b postulated that elaborative processing would moderate the influence of media use and interpersonal discussion on perceived risks of food and medicine safety. The interaction between SNS and elaborative processing (β = .09, p < .05) and between interpersonal communication and elaborative processing (β = .09, p < .01) on our dependent variable were significant, even after accounting for all controls. Those who are more likely to use SNS and involve elaborative processing tend to perceive risks of food and medicine. The more people talk about food and medicine safety with others, the more they perceive risks of food and medicine. Thus, H4a was partially supported and H4b was supported. The interaction block explained an additional 2.3% of the total variance (Model 7). Interestingly, the interaction between Internet news and elaborative processing was negatively associated with perceived risks (β = −.14, p < .001). That is, those who more often use Internet news and involve elaborative processing were less likely to perceive risks of food and medicine. The overall hierarchical regression model accounted for 16.9% of the variance in perceived risks of food and medicine.

Table 2. Hierarchical multiple regression predicting perceived risks of food and medicine safety

Block		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Block 1: Demographics & Ideology	Gender (1 = male, 2 = female)	.13***	.12***	.13***	.13***	.11***	.11***	.12***
	Age	.13***	.13***	.12***	.12***	.09**	.09**	.09**
	Education	.00	.01	.01	.00	.00	.00	.00
	Income	.11***	.11**	.11**	.10**	.08**	.08*	.07*
	Ideology (1 = Con, 3 = Liberal)	.06†	.06*	.07*	.06†	.04	.03	.05
	Incremental R^2 (%)	4.7***						
Block 2: Knowledge	Scientific knowledge		−.07*	−.05	−.04	−.03	−.03	−.02
	Incremental R^2 (%)		.4*					
Block 3: Controllability	Controllability			.10**	.08*	.06†	.06†	.06†
	Incremental R^2 (%)			1.0*				
Block 4: Media	Newspaper				.04	.01	−.00	−.01
	TV				.10*	.08*	.07*	.05
	Internet News				.10**	.07†	.06	.06
	SNS				.06	.02	.01	.01
	Incremental R^2 (%)				4.1***			
Block 5: Interpersonal communication	Interpersonal discussion					.21***	.16***	.16***
	Incremental R^2 (%)					3.3***		
Block 6: Cognitive processing	Elaborative processing						.13**	.14***
	Incremental R^2 (%)						1.1***	
Block : Interactions	Newspaper × Elaborative processing							.05
	TV × Elaborative processing							−.01
	Internet News × Elaborative processing							−.14***
	SNS × Elaborative processing							.09*
	Interpersonal × Elaborative processing							.09**
	Incremental R^2 (%)							2.3***
	Total R^2 (%)							16.9***

Note. N = 1,001. Standardized regression coefficients are reported. †p < .1. *p < .05. **p < .01. ***p < .001.

Discussion

This study explored the role of the media, interpersonal communication, and elaborative processing in shaping the public's perceived risks of food and drug safety in South Korea. Our findings indicated that television, Internet news, interpersonal communication, and elaborative processing significantly increased perceived risks of food and medicine safety. In this study, we also found that elaborative processing makes a significant role in how people perceive risks of food and medicine as consistent with the previous study (Ho et al., 2013). In particular, the effects of newspaper, SNS, and interpersonal communication on perceived risks of food and medicine safety were moderated by elaborative processing, even after controlling for all the other variables. Contrary to our expectations, however, the interaction between Internet news and elaborative processing was negatively related to perceived risks of food and medicine safety. We highlight the following four findings.

First, among four media channels analyzed, only television and Internet news had an influence on perceived risks of food and medicine. Basically, newspapers are print media, while television is visual and audio media. As Snyder and Rouse (1995) pointed out, vivid and dramatic media can have a greater influence on risk judgments since they encourage identification and compassion with the described victims. In addition, prior studies also showed that South Korean media tended to present sensationally and dramatically stories related to food and medicine safety (Lee, 2008; Lee & Park, 2006; Park, 2006). Recently, for example, the media highlighted the risk of chicken eggs contaminated with the pesticide fipronil in South Korea. Today, Internet news provides various visual images and video clips on its webpage. SNS is also based on visual images and videos. However, people can receive information about science and health from other postings as well as news contents on SNS. Because information from such postings could be incredible sources, SNS would be not successful in increasing risk perceptions. Thus, it is reasonable that television and Internet news were a significant factor influencing perceived risks in our findings. In addition, television and the Internet is the most frequently used media in South Korea when people look for information about science and health (Rhee et al., 2011). Thus, these two media channels should be significantly examined while looking at the relationship between media use and perceived risks. Additionally, these

findings can help health communication practitioners to consider their media strategies for the public concern about food and medicine safety.

Second, our findings indicated that the impact of media use could be indirect because its effect disappeared after entering interpersonal discussion and elaborative processing into our model. This is consistent with previous studies (i.e., Fleming et al., 2006; Ho et al., 2013). This finding suggests that interpersonal communication and elaborative processing can play key roles in perceiving risks of food and medicine. Consequently, people who are talking about food and medicine safety issues with others or engaging in active elaboration about food and medicine safety issues will recall information from the media and perceive risks of food and medicine better than those who simply use the media without interpersonal communication and elaborative processing. However, this interpretation should be carefully made because the effects of TV and Internet news were significant before interpersonal discussion and elaborative processing were entered in the model (See Model 4 in Table 2).

Third, our finding showed a significant impact of interpersonal communication on

perceived risks of food and medicine. As Dunwoody and Neuwirth (1991) pointed out, people usually use interpersonal sources in order to find out whether their risk judgments are correct if the risk is not in the initial stage. Because food and medicine safety issues have been largely discussed, they are not in the initial stage in South Korea. Thus, many people could talk about food and medicine safety issues with others. Also, we found the significant interaction between interpersonal communication and elaborative processing. Among individuals who discussed food and medicine safety issues with others, those who engage in high elaboration on news contents perceived significantly higher risks of food and medicine safety. Because food and medicine safety topics are not new issues in South Korea any more, it is not surprising that interpersonal communication and elaborative processing had an important role in shaping perceived risks of food and medicine safety.

Forth, another key finding can be pointed out as the effects of interaction between the media, interpersonal communication, and elaborative processing. This seems to be consistent with a previous study (Ho et al., 2013). When it comes to media use and elaboration, the findings showed a significant moderating role of elaborative processing

with SNS, but interaction between Internet news and elaborative processing was significantly negative. Interestingly, the impact of SNS was not significant (see Model 4). However, among people who use SNS to look at information about food and medicine safety, those who highly engage in elaborative processing perceived significantly higher risks of food and medicine safety. Although SNS users may not be experts about food and medicine safety, however, they can actively report their own thoughts or post other contents, including traditional news stories, and also discuss with other users. For example, Twitter users can disseminate prompt reports (e.g., Twitter can quickly spread news about Haiti earthquake in 2010) or provide information (Shirky, 2011). Also, as computer-mediated communication, the use of SNS can be understood as inter-user (or interpersonal) communication on cyber space. In this respect, this result is consistent with that of interpersonal communication. Because of these characteristics of SNS, users who have more often elaborative processing would tend to perceive risks of food and medicine safety. Therefore, it is not surprising that the combined effects of SNS and elaborative processing were significant.

However, the problem is the interaction between Internet news and elaborative processing in our analysis. This result is not consistent with the previous study (i.e., Ho et al., 2013). People who used television about information of food and medicine safety and also engaged in elaborative processing were less likely to perceive risks of food and medicine. As Dunwoody and Peters (1992) pointed out, people may disregard risk information in a channel that includes unreliable information in their points of view. That is, source credibility can be an important ground for judgments. In South Korea, there are many online news media in which the accuracy and credibility of the information provided is somewhat questionable. As readers elaborate on the information they receive from such online news media, that is, as they think further about the information, or as they talk about the information with other people, it is possible that they come to a conclusion that the information is highly unreliable. The online news information, therefore, can function to decrease – or less likely to increase – one's perceived risk among those who engage in the elaboration process.

The findings of this study, however, should be carefully interpreted since it has several limitations. First, as Ho, Scheufele,

and Corely (2013) indicated, the data of this study cannot be sufficient to establish a causal relationship because we did not use a longitudinal data set. For example, it is possible that people who perceived greater risks of food and medicine safety can tend to use television, discuss the risks with others, or process elaboration on media contents. Thus, it is necessary to examine a longitudinal design for future research. Second, some measurements may not be appropriate for this analysis because we used a secondary data set. For example, it can be noted that the reliability of scientific knowledge variables was too low (KR-20 = .59). Although other previous studies also reported low reliability (e.g., Ho et al., 2010, 2013), future research should analyze the relationships by using variables that shows high reliability. Third, representativeness of the sample can be pointed out as a limitation. Though participants were sampled from the Internet panel according to region, age, and gender, this survey did not use a probability sampling method. The members of the Internet panel can be biased. For example, the highly educated or urban residents can be overrepresented (Kim, 2012b).

Despite these limitations, the most important finding of this study is that elaborative processing play a key role in perceiving risks of food and medicine safety. This study contributes to health and risk communication literature by displaying various factors – media use, interpersonal communication, and elaborative processing – influencing risk perceptions. Our analysis includes new media such as Internet news and SNS as well as traditional media such as newspaper and television, as Fleming, Thorson, and Zhang (2006) suggested. In addition, the current study synthesizes interpersonal communication, elaborative processing, and the moderating role of elaboration all together. The findings suggest that if people want to perceive risks of health safety issues, they not only use the media but also discuss the issues that they receive and, more importantly, elaborate on media contents. Additionally, as more people use the Internet to obtain information about health and science, the role of the Internet and SNS should be examined under the various contexts and with diverse variables such as scientific knowledge. When it comes to practical implications, this study can suggest that risk communication practitioners or journalists should pay more attention to the role of elaborative processing in shaping risk perceptions of food and medicine safety.

Particularly, risk communicators should develop effective communication strategies, bearing in mind that the public is not passive audience any more. Journalists also should provide appropriate and enough information when they report food and medicine safety issues, helping the public to elaborate on information from news articles. To present science-based information, thus, health or science reporters need to learn more about their coverage topics.

References

Berry, T. R., Wharf-Higgins, J., & Naylor, P. J. (2007). SARS Wars: An examination of the quantity and construction of health information in the news media. *Health Communication*, *21*, 35‑44.

Cha, D.-P. (2010). The impacts of mass communication, interpersonal communication, and multidimensional health locus of control to health related message on public's risk perception. (Korean) *Humanities Studies*, *58*, 647‑674.

Chaffee, S. H. (1986). Mass media and interpersonal channels: Competitive, convergence or complementary?. In G. Gumpert & R. Cathcart (Eds), *Inter/media: Interpersonal communication in a media world* (pp. 62‑80). New York: Oxford University Press.

Chang, C. (2012). News coverage of health-related issues and its impacts on perceptions: Taiwan as an example. *Health Communication*, *27*, 111‑123.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rded.). Mahwah, NJ: Lawrence Erlbaum Associates.

Coleman, C. L. (1993). The influence of mass media and interpersonal communication on societal and personal risk judgments. *Communication Research*, *20*, 611‑628.

Dunwoody, S., & Neuwirth, K. (1991). Coming to terms with the impact of communication on scientific and technological risks judgments. In L. Wilkins & P. Patterson (Eds.), *Risky business: Communicating issues of science, risks, and public policy* (pp. 11‑30). New York, NY: Greenwood.

Dunwoody, S., & Peters, H. P. (1992). Mass media coverage of technology and environmental risks: A survey of research in the United States and Germany. *Public Understanding of Science*, *1*, 199‑230.

Eveland, W. P. Jr. (2001). The cognitive mediation model of learning from the news: Evidence from nonelection, off-year election, and presidential election contexts. *Communication Research*, *28*, 571‑601.

Eveland, W. P. Jr. (2002). New information processing as mediator of the relationship between motivations and political knowledge. *Journalism & Mass Communication Quarterly*, *79*, 26‑40.

Eveland, W. P. Jr. (2004). The effect of political discussion in producing informed citizens: The role of information, motivation, and elaboration. *Political Communication*, *21*, 177‑193.

Fleming, K., Thorson, E., & Zhang, Y. (2006). Going beyond exposure to local news media: An information-processing examination of public perceptions of food safety. *Journal of Health Communication*, *11*, 789‑806.

Fung, T. K., Namkoong, K., & Brossard, D. (2011). Media, social proximity, and risk: A comparative analysis of newspaper coverage of avian flu in Hong Kong and in the United States. *Journal of Health Communication*, *16*, 889‑907.

Ho, S. S., Brossard, D., & Scheufele, D. A. (2007). The polls-trends: Public reactions to global health threats and infectious diseases. *Public Opinion Quarterly*, *71*, 671‑692.

Ho, S. S., Scheufele, D. A., & Corley, E. A. (2010). Making sense of policy choices: understanding the roles of value predisposition, mass media, and cognitive processing in public attitudes toward nanotechnology. *Journal of Nanoparticle Research*, *12*, 2703‑2715.

Ho, S. S., Scheufele, D. A., & Corley, E. A. (2013). Factors influencing public risk-benefit considerations of nanotechnology: Assessing the effects of mass media, interpersonal communication, and elaborative processing. *Public Understanding of*

Science, *22*, 606‑623.

Iyengar, S. (1991). *Is anyone responsible? How television frames political issues*. Chicago, IL: The University of Chicago Press.

Jensen, J. D. (2011). Knowledge acquisition following exposure to cancer news articles: A test of the cognitive mediation model. *Journal of Communication*, *61*, 514‑534.

Johnson, B. B. (1993). Advancing understanding of knowledge's role in lay risk perception. *Risk*, *4*, 189‑212.

Kim, J.‑H. (2011). Effects of communication channels on nuclear risk perception: Testing impersonal impact hypothesis. *Korean Journal of Journalism & Communication Studies*, *55*, 253‑276.

Kim, I.‑S. (2012a). The impact of risk perception of nuclear power, perception of knowledge, the use of communication channels, the third-person effect about nuclear accident on optimistic bias. *Journal of Communication Science*, *12*, 79‑106.

Kim, S.‑H. (2008). Testing the knowledge gap hypothesis in South Korea: Traditional news media, the Internet, and political learning. *International Journal of Public Opinion Research*, *20*, 193‑210.

Kim, S.‑H. (2012b). Testing fear of isolation as a causal mechanism: Spiral of silence and genetically modified (GM) foods in South Korea. *International Journal of Public Opinion Research*, *24*, 306‑324.

Kim, T.‑G. (2012c, March 9). Aftermath of Fukushima disaster lingers in Korea. *The Korea Times*. Retrieved from http://www.koreatimes.co.kr/www/news/biz/2012/03/123_106634.html.

Kim, S., & Kim, W. (2017). *Digital News Report 2017: Korea*. Seoul: Korea Press Foundation.

Lee, K.‑H. (2008). Study on the empirical analysis and the implications for the effective food risk communication. *Journal of Consumer Policy Studies*,

34, 104‑133.

Lee, G., & Park, J. (2006). A frame analysis of news coverage on the Kimchie risk in 2005. *Korean Journal of Broadcasting & Telecommunication Studies*, *20*, 260‑305.

Lupton, D. (2004). 'A grim health future': Food risks in the Sydney press. *Health, Risk & Society*, *6*, 187‑200.

Marks, L. A., Kalaitzandonakes, N., Allsion, K., & Zakharova, L. (2003). Media coverage of agrobiotechnology: Did the butterfly have an effect?. *Journal of Agribusiness*, *21*, 1‑20. Retrieved from http://purl.umn.edu/14674.

Marks, L. A., Kalaitzandonakes, N., Wilkins, L., & Zakharova, L. (2007). Mass media framing of biotechnology news. *Public Understanding of Science*, *16*, 183‑203.

Morton, T. A., & Duck, J. M. (2001). Communication and health beliefs: Mass and interpersonal influences on perceptions of risk to self and others. *Communication Research*, *28*, 602‑626.

Moyhihan, et al. (2000). Coverage by the news media of the benefits and risks of medications. *The New England journal of Medicine*, *342*, 1645‑1650.

National Science Board (2016). Chapter 7: Science and technology – Public attitudes and understanding. In *Science and Engineering Indicators*. Washington, DC: National Science Foundation. Retrieved from https://www.nsf.gov/statistics/2016/nsb20161/uploads/1/10/chapter-7.pdf.

Nelkin, D. (1989). Communicating technological risk: The social construction of risk perception. *Annual Review of Public Health*, *10*, 95‑113.

Oh, H. J., Hover, T., Paek, H.‑J., Lee, B. K., Lee, H., & Song, S. (2012). Attention cycles and the H1N1 pandemic: A cross-national study of U.S., and Korean newspaper coverage. *Asian Journal of Communication*, *22*, 214‑232.

Oh, S.‑H., Kim, S.‑H., Kim, H., & Kim, S. Y. (2016). Framing Genetically Modified (GM) foods: An analysis of news coverage of how to think about GM foods in South Korea. *Health Communication Research*, *14*, 29‑61.

Park, C.‑Y. (2003). The impact of medical news on the public's attitude regarding health and disease. *Korean Journal of Journalism & Communication Studies*, *47*, 194‑221.

Park, S.‑H. (2006). Frame analysis on risk reporting: Food safety reports from 1989 to 2005. *Korean Journal of Communication & Information Studies*, *35*, 181‑210.

Pew Internet & American Life Project (2013). *Health online 2013*. Retrieved from http://www.pewinternet.org/～/media//Files/ Reports/PIP_HealthOnline.pdf.

Rhee, J. W., Lee, K. O., & Shim, H. Y. (2011). *2011 Media Audience Survey*. Seoul: Korea Press Foundation.

Rogers, C. L. (1999). The importance of understanding audiences. In S. M. Friedman, S. Dunwoody, & C. L. Rogers (Eds.), *Communicating uncertainty: Media coverage of new and controversial science* (pp. 179‑200). Mahwah, NJ: Lawrence Erlbaum Associates.

Shim, W.‑H. (2017, August 15). Korean retailers stop egg sales after fipronil found in some eggs. *The Korea Herald*. Retrieved from http://www.koreaherald.com/view.php?ud=201 70815000109.

Shirky, C. (2011). The political power of social media: Technology, the public sphere, and political change. *Foreign Affairs*, *90*, 28‑41. Retrieved from http://www.jstor.org/stable/25800379

Snyder, L. B., & Rouse, R. A. (1995). The media can have more than an impersonal impact: The case of AIDS risk perceptions and behavior. *Health Communication*, *7*, 125‑145.

Xenos, M. A., Becker, A. B., Anderson, A. A., Brossard, D., & Scheufele, D. A. (2011). Stimulating upstream engagement: Experimental study of nanotechnology information seeking. *Social Science Quarterly*, *92*, 1191‑1214.

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중요한 것은 정교화 과정

식품 및 의약품 안전에 관한 위험 인식에 영향을 주는 요인 연구*

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배경 및 목적
본 연구는 식품 및 의약품 안전에 관한 공중의 위험 인식을 형성하는 데 있어서 미디어, 대인 간 커뮤니케이션, 그리고 정교화 과정의 역할을 탐구하였다.

방법
본 연구에 사용된 자료는 전국 단위의 온라인 패널 설문 조사를 통해 수집되었으며, 샘플 수는 1,001명이었다. 연구 방법은 식품 및 의약품 안전에 관한 위험 인식을 종속 변인으로 하고, 식품 및 의약품과 관련한 미디어 사용, 대인 간 커뮤니케이션, 정교화 과정 등을 독립 변인으로 위계적 회귀 분석을 실시하였다.

결과
연구 결과 텔레비전 시청과 대인 간 커뮤니케이션이 위험 인식을 높여 주는 변인으로 나타났다. 다만, 미디어 사용의 효과는 간접적일 수 있었는데, 이는 위계적 회귀 모형에 대인 간 커뮤니케이션과 정교화 과정을 투입했을 때 그 효과가 사라졌기 때문이다. 또한 미디어 사용, 대인간 커뮤니케이션, 그리고 정교화 과정 사이에 상호작용 효과가 발견되었다. 보다 중요한 연구 결과는 정교화 과정이 인터넷 뉴스 읽기, SNS 사용, 그리고 대인 간 커뮤니케이션의 효과를 조절했다는 점이다.

논의 및 결론
결론적으로, 본 연구는 이전에 연구가 많이 이루어지지 않았던 위험 인식에 영향을 주는 다양한 미디어 및 커뮤니케이션 변인들을 실증적으로 검증한 연구로서, 향후 위험 커뮤니케이션의 관련 분야에 기여할 것으로 기대한다.

K E Y W O R D S 위험 인식, 정교화 과정, 식품 및 의약품 안전