A STUDY ON CONSUMERS' PURCHASING INTENTION ACCORDING TO MESSAGE FRAME REGARDING FOOD SAFETY ISSUES

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A Study on Consumer's Purchasing Intention According to

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ABSTRACT

Three cases of food safety issue occurred in South Korea were chosen to test whether message frames influence on consumers' purchasing intention. In addition, this study not only investigates the relationships among constructs, but also evaluates the path coefficients of relationships. Empirical Results indicates that consumers' intention to purchasing was negatively affected by message frames including negative headline, negative information and less amount of information. Also, knowledgeable group was more sensitive to prior-knowledge with respect to their attitude than other group when there are food risks around. Group received negative message reacted more sensitively to trust than group received relatively positive message.

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CHAPER 1. INTRODUCTION

1.1. A Need for Study

Consumer awareness in terms of food safety issue in South Korea has rapidly improved. Simultaneously, concerns about food safety issues also have emerged as a result of the recent food crisis. It is not difficult to remember the issues extensively reported by the media, such as BSE (bovine spongiform encephalopathy), AI (avian influenza), Japanese food contaminated by radioactivity, foot-and mouth disease and so on. As well-eating and maintaining health are becoming a significant value, there are several actions taken in the society—more active researches on both food and health are conducted, food makers try to produce foods in good-quality, a great amount of food safety issues are handled in newspapers or on TV—and the role of the government as a regulator keeps getting complicated while making it difficult for the consumers to make a decision as well.

According to the WHO (World Health Organization), the risk in terms of food refers to "A function of the probability of an adverse health effect and the severity of that effect, consequential to a hazard(s) in food"[1]. Food risk is generally related to scientific technologies since ordinary people cannot recognize any risks in food. For example, consumers are not able to make a clear distinction through their senses between a common chicken and a chicken that may have AI virus. Thus, scientists play a crucial role when risks become social problems (Beck, 1997). However, consumers are not only limited in receiving the entire existing information, but also restricted to fully understanding them. In this sense,

[1] Procedural Manual of the Codex Alimentarius Commission - Twelfth Edition

information tends to be asymmetric and imperfect. For these reasons, the role of the media became very important. Generally, consumers can solve this problem by acquiring information from the media (Lupton, 2004). They receive information in regard to food safety issues and general information from the media. This implies that the media plays a vital role as a delivery medium of information to consumers. Also, the information reported by the media varies consumers' behavior regardless of its reliability. For example, the frequency of media reports affects consumers' responses (Verbeke, 2000). However, this is reinterpreted and selected by the media itself. Therefore, it is necessary to shed a new light on the role of the media and experts (Hannigan, 2006).

1.2. Purpose of Study

Recently, Korean consumers react more sensitively and rapidly to food safety issues and the media acts as an intermediary between consumers and the government or scientists. Not only the government and scientists give information to the media, but also the food makers and civil groups can influence a lot to the reports from the media. Even though the media is recognized by the character of a public institute, it does not belong to the government and is one of the private companies. Thus it sometimes focuses on its own purposes or benefits rather than the task to maximize public interests (Mccluskey & Swinnen, 2004). In the perspective of food safety, this may give rise to produce asymmetric and imperfect information which would make consumers feel anxious about some sensitive issues and may lead food makers to go bankrupt.

The present study investigates how message frame affects consumer's perception via experimental manipulation of news story—three different cases related to food safety

issues which are explained by the intention of purchasing—and identifies the fact that different message frame can change people's thoughts. By doing this, it suggests the importance of delivering information which may involve risks safely.

In addition, it not only identifies what factors may influence consumers' intention to purchase, but also draws a comparison between groups when there are food risks around. Respondents are divided into two sections; i) knowledgeable group (who majoring in food science or nutrition) and common group (who majoring in others), ii) survey participants received A type of message (negative negative information) and those who received B type of message (positive information). This suggests social implications to the main agents such as the government, media and food makers, on establishing a strategy before or after food safety issues actually occur.

CHAPTER 2. LITERATURE REVIEW

2.1. Food Safety Issues in South Korea

Consumers' interest in food safety in South Korea has been increasing rapidly along with economic development. Due to the increase in one's income and education level, reports made by the media about the food safety are presented frequently. Although the consumers have expressed serious concerns about food risks, a number of food safety issues are occurring constantly. The consumers were strongly agitated when the food safety issues occurred—the typical examples of them were BSE (bovine spongiform encephalopathy), AI (avian influenza), Japanese food contaminated by radioactivity, foot-and mouth disease. This study selected three food safety issues; i) non-edible(industrial) beef tallow issue, ii) MSG (monosodium glutamate) debate and iii) issue related to quality of milk(called as pus-milk issue in Korea) as experimental methods. First of all, the non-edible beef tallow issue occurred in 1989 and five food makers were arrested for the crime of using industrial beef tallow to make instant noodle. They imported beef tallow which in detail were "Top white tallow" and "Extra Fancy tallow" from United States, and those two kinds were classified as an inedible food in U.S. However, it was proved that foods containing those beef tallow are not harmful for human health by the Korea National Institute of Health in 1989, all after when the five food makers went bankrupt, downsized its scale of production and lost the consumers' faith. A controversy on MSG issue was also on the rise in Western countries. It is an acute matter that the media and consumers group asserting its hazard but scientist arguing its harmlessness in South Korea (Lee, 1999). The issue regarding quality of milk became acknowledged to the consumers in 1995 through a media report

of “Milk cow suffering from breast cancer produces pus-milk”. At that time, there was no acceptable standard on the antibiotic remaining in the milk. This issue was used as to make mutual conflict among milk companies and eventually had left economic losses. These three issues are relatively old considering its time. The reason for the present study to have chosen these issues as examples is to avoid the recency effect[2].

2.2. Message Framing Effect

2.2.1. Framing Effect and Prospect Theory

The principle premise of message framing effect is that an event can be interpreted variously by individuals using positive or negative rhetoric. This is theoretically based on the prospect theory which is developed by Kahneman & Tversky (1979). The prospect theory is a representative of psychological model that is provided to explain consumers’ actual decision making behavior as an alternative of expected utility theory developed by Von Neumann & Morgenstern (1944). The core of the expected utility theory is that consumers make decision based on expected utility, not expected profit. This assumes that consumers understand not only all given conditions, but also future alternatives (Simon, 1978). In practice, consumers may not understand all conditions and evaluations and may have ambiguous attitude on many topics (Chong & Druckman, 2007). Thus, this premise shows many weak points since it does not accommodate psychological decision-making. As a consequence to exposure of expected utility theory’s weak points, Kahneman & Tversky

[2] Recency effect is a psychological phenomenon that people tend to remember well recent issue rather than old issue. In this case, it is assumed that participants react more sensitively to issues that they still negatively remember.

developed the prospect theory assuming that the consumers do not always make rational decision.

Prospect theory can be explained by two main functions which are value function and weighting function. Firstly, the value function has three main features—a curve of value function is divided by gain part and loss part which are symmetrical from the reference point; convex for loss part and concave for gain part; steeper for loss part rather than gain part (Kahneman & Tversky1979).

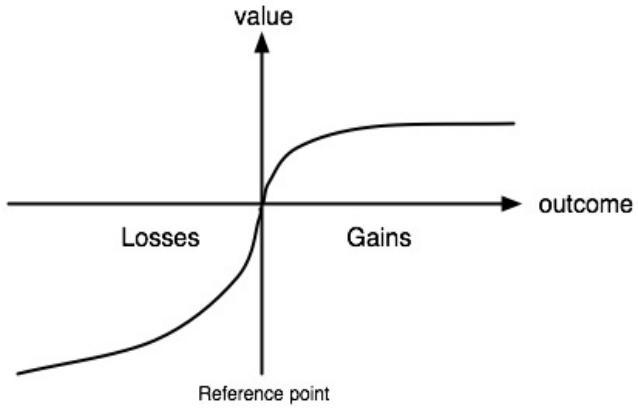

Figure 1.1 A Hypothetical Value Function
Source: Prospect Theory: An Analysis of Decision under Risk, Kahneman and Tversky, 1979

Secondly, in the expected utility theory, expected utility is estimated by multiplying probability by utility of outcomes (Von Neumann & Morgenstern, 1944). Thus, expected utility caused by utility x is following;

$$\text{Expected utility} = \text{u(utility of } x) \times \text{p(probability of } x)$$

Probabilities applying to the expected utility are objective. And interaction between probability and expected utility is called linearity since the estimated expected utility is in proportion to probability.

However, the value of outcomes is multiplied by a decision weight in the prospect theory (Kahneman & Tversky, 1979). Subjective probability is applied for prospect theory, not objective probability. The total value in prospect theory is calculated by multiplying subjective probability by value. Thus, total value caused by utility x is following;

$$\text{Total value} = v(x) \times \pi(p)$$

Where $v(x)$ is value and $\pi(p)$ is subjective probability which can be called weighting probability. Weighting function reflecting weighting probability in prospect theory assumes the form of curved line unlike linearity of expected utility theory. It shows several characteristics with respect to low probabilities p, which are (i) weighting probability is greater than objective probability ($\pi(p) > p$); (ii) high probabilities are underweighted ($\pi(p) + \pi(1-p) < 1$). In addition, weighting function shows diminishing sensitivity that sensitivity of value regarding variation diminishes as the size of gain and loss bigger.

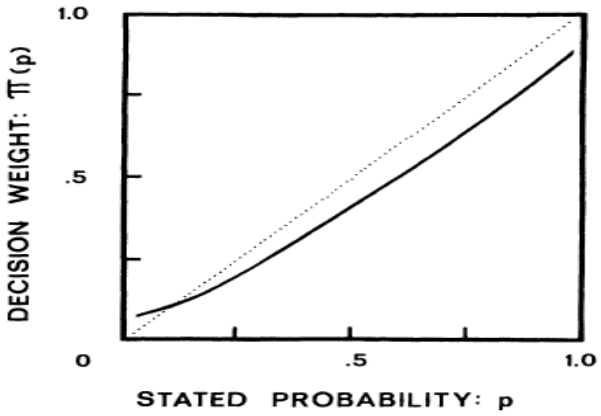

Figure 1.2 A Hypothetical Weighting Function
Source: Prospect Theory: An Analysis of Decision under Risk, Kahneman and Tversky, 1979

Framing effect is defined as the explanation of individuals' decision making can be

different according to the manners of suggestion. This implies that consumers represent risk averse inclination by choosing an expected pay-off under certainty when faced gain situation and show risk seeking tendency to prevent potential loss under loss situation. This fact can be a theoretical basis of framing theory. Since the value function and weighting function of prospect theory represent a curved line, different from a straight line of expected utility theory, consumers' preference can be distinguished by means of framing. A great number of studies have been investigated in the manner of this assumption by conducting scientific experiments. An experiment 'Asian disease problem' conducted by Tversky & Kahneman (1981) identified the people's reactions in gain part and loss part and the result came out as they expected.

2.2.2. Media Frame and Framing Effect

When framing is associated with media, media framing can be a pattern which lay a course of general interpretation, cause and effect, finding solutions of social phenomenon that are delivered from media language. And this might delimit the scope of people's idea by choosing and characterizing a specific viewpoint (Song *et al.*, 2005). Concepts and definitions of media framing are different by inches depending upon researchers.

Early researches on framing begin with Goffman's study which the frame can be seen as "frame of interpretation", "viewpoint" (1974). He used "frame" as concept of cognitive device that makes people to be aware of the social existence easier. This indicates that people may perceive the social phenomenon arbitrarily and the meaning of the issue can be different depending on the way they perceive. Thus, the media using the framing does not only reflect the reality itself, but also proposes the composed reality. This implies

that the media plays a very important role as a stipulator. Similarly, the news is a window as to see the world and people learn about their surrounding social environments through the frame of this window. Thus news is not a simple set of facts, but is a constructed reality (Tuchman, 1978). This kind of news frames not only can narrow down the range of political alternatives by providing the frames that draw people's attention, but also can be a place where people discuss the social problems. In addition, they construct the social reality through inclusive and exclusive way.

Kahneman & Tversky (1984) explain how framing works by choosing and stressing a certain characteristic social phenomenon and emphasizing the power of framing. Also, some features of reality can be highlighted by omitting others. Therefore, many researchers test the framing effect by including and omitting the potential problems, explanation, assessment and these attempts are important to draw the consumers' intention (Entman, 1993). He also defines the frame through the sentences which are intensified by emphasizing the keyword, expression, stereo type image and the source.

The ways to show the framing in news story can be divided into two ways-thematic and episodic news frames (Iyengar, 1990). He used those two ways of framing to investigate how television news frames handles the issue of poverty. In the thematic part, news includes information with respect to general trends and public policy. The "abstract" and "impersonal" thematic TV news are actually extracted from the whole situation. On the other hand, new personal viewpoint towards poverty and the specific examples were provided in the episodic frame. In his research, he had defined that audiences who learned thematic frame tend to think that social institutes are responsible for success or failure of

policies and others who learned episodic frame think that individuals should be answerable for success or failure of policies.

Price & Tewksbury (1997) define the framing as the way to make the issues wrapped by journalists which can influence on readers' understanding. They investigated on how the format of the news story influences on the readers' perception in the research. They focused on political phenomenon and assumed that the news story may incite people's way of thought by vitalizing the ideas, feelings and values. Thereby, the reader's behavior became predictable. This indicates that different message framing may encourage the consumers to think differently.

Recent studies regarding framing effects of media maintain the fundamental concept of framing as previous studies had discovered. Holt & Major (2010) also define the framing as the way to draw consumers' response by stressing a specific aspect of issue and disregarding or devaluating the others. They showed who has the responsibilities and what can be the solutions by giving a Jena Six controversy as an example. Also, the public opinions are mediated by media framing and the dependence on official information sources leads to disputes that are likely to be controlled by elite (Harp *et al*., 2010).

From a view on health, consumer's cognition associated with the health is a part of socially shared knowledge system and is affected by the expression of media (Radley, 2004). In addition, the media has an effect on public attitude, behavior and policy by choosing agenda and framing (Cohen *et al*., 2008; Dorfman, 2003). Yanovitzky & Blitz (2000) discovered that the effects of media can be different depending on the characteristics of group. For instance, the effects and roles of media are more important to groups that have

specific features; small income, aged, non-medical insurance subscriber and racial minority.

Meanwhile, as scientific issues came to the fore recently, this stimulates the researches to study scientific issues (Cobb & Macoubrie, 2004). Scientific researches that define the risks are accompanied by its uncertainty. Controversial scientific researches commonly have characteristics of post-normal science which "solution can be more than one, sometimes there is no solution" (Ravetz, 1999). In the three cases covered in this study, each of the issues also has scientific uncertainty. However, even though the scientific opinion provides some reasonable evidence, there may be difference among visions of the issue by the society or groups. This implies that the media may be able to disallow the uncertainty of risks. On the other hand, scientists have a chance of receiving criticism for the interpretation that is produced by themselves since the scientific evidence can be interpreted in many other ways. Thus, the media should be careful by having objective perspective when it reports the issues related to scientific risks. It is evident that the consumer's behavior would greatly vary according to how the information is reported. That is why the way of message framing is important.

2.2.3. Framing Effects in Gain- and Loss Part

With reference to the health behavior, many of the previous studies had examined the relative effects of framing between gain- and loss message frames. The quantitative measurement of message framing effect is dominated by comparing the effectiveness between gain-framed message and loss-framed message. People's decision makings and preferences vary with how message frame is constructed (Kahneman & Tversky, 1979). People tend to avoid risks when given conditions appeal to the situation. On the other hand, they

react to seek risks when potential loss is given under a decision-making situation. Message framing based on the prospect theory has been widely applied to many different fields such as marketing, politics, finance, law and so on. It also has approached to inquire how message containing health information has influence on consumers' behavior (Rothman *et al.*, 2006). However, the previous studies that had investigated the efficacy of message framing on health behavior have been inconsistent (Maheswaran & Meyers-Levy, 1990).

There are many studies which contend that gain-framed messages are more effective than loss-framed messages. A recent meta-analytic review in terms of health message framing effect shows gain-framed message is more likely to influence on consumers to promote prevention behaviors than loss-framed message (Gallagher & Updegraff, 2012). Also, respondents participated in an experiment that investigated the effect of message framing in organ donation and reading gain-framed messages showed more favorable responses than reading loss-framed messages (Reinhart *et al*., 2007). Furthermore, the fact that gain-framed message is more effective than loss-framed message is represented in many other areas. For example, Levin & Gaeth (1988) estimated the efficacy of message framing by comparing gain-framed and loss-framed message with beef consumption. Gain-framed message was more effective in the research. In a recent study, gain-framed messages attracted positive behavioral changes (Grady *et al*., 2011).

On the other hand, a number of researches showed that loss-framed messages are more successful than gain framed messages. Hypotheses of Nan's recent study (2012) which the loss-framed message would bring more favorable attitude and greater intention to receive HPV vaccine could support the idea. Although these results are only for low-

relevance participants, loss-framed information was more persuasive than gain-framed information when health promoting messages are given to university students (Riet *et al.*, 2011). Also, according to Meyerowitz & Chaiken's study (1987), a pamphlet emphasizing negative result with regard to BSE (breast self-examination) is more effectual than that of stressing the positive consequences. This indicates loss-framed messages draw more intention from the participants to perform BSE.

However, there were many cases which gain-framed message and loss-framed message do not have effect in people's decision making. Framing effects did not appeal to consumer' perceived fairness when health care resource allocation issue was framed as both positive and negative (Gamliel & Peer, 2010). Similarly, in a study investigating the framing effects in persuading consumers of eating habits and exercise motivation from some college students, there was no significant difference in the consumers' attitude or intention when positive and negative conditions were given (Assema *et al*., 2001; Jones *et al*., 2004).

As stated above, studies that investigated the effect of message framing, specifically, gain-framed versus loss-framed message have shown inconsistent results. According to O'Keefe & Jensen's meta-analytic review of 93 studies that inquire the effects of framing on consumers' disease-prevention behavior, two types of message made no significant differences except dental hygiene behaviors between gain- and loss-framed messages associated with their preventive behavior such as safer sex, skin cancer prevention and diet (2007). This indicates that it has not identified the framing effects consistently in studies related to health behaviors. Likewise, the inconsistent results observed in general gain- and loss framing studies are not associated with health behaviors. Therefore, a large number of

studies concerning the effect of message framing have avoided the dichotomous way of reasoning and have been appeared to inquire its effects with the moderators which put involvement, prior-knowledge, risk perception, self-efficacy, etc.

CHAPTER 3. METHODOLOGY

The purpose of this study is to identify how consumers' purchasing intention varies with three different message framing cases that headline the differences—positive/negative information difference and the difference of the amount of information. Moreover, the present study not only inquires what kind of factors influence on the consumers' purchase intention, but also makes a comparison between groups. The experiments were conducted to test the hypotheses.

3.1. Research Design

Firstly, the present study conducted three quasi-experiments (different headlines, positive/negative information difference and difference of the amount of information) to test whether message frames influence on consumer's purchasing intention and their risk perception(Figure 3.1). The independent variables for the investigation were comprised of three message frames that explain the food safety issues in South Korea respectively. The dependent variable was the purchasing intention towards the food safety issues and change of consumer's risk perception toward issues.

The manipulation of message frames in this study is assumed in the form of a news article that explains the past food safety issues in South Korea. The issues which are contained in the questionnaire are non-edible beef tallow issue, MSG (monosodium glutamate) dispute and issue with respect to quality of milk (Table 3.1). To remove the external variables that may affect persuasive effect, all conditions in both types of questionnaire such as message arrangement, font, size, background and style of writing were equally set.

Secondly, SEM was estimated twice to test; (i) knowledge difference: knowledgeable/less knowledgeable, (ii) message difference: respondents received negative message/those received positive message. From the previous review of the literature, many researchers have shown that consumers' prior-knowledge, trust, risk perception and attitude influence on their purchasing intention (Costa-Font and Gil, 2009; Magistris and Gracia, 2008; Chen and Li, 2007; Lobb *et al*., 2007). As shown in Figure 3.2, consumers' prior-knowledge, trust, risk perception and attitude were set as latent variables and dependant variable was set as purchasing intention. By establishing these facts, it is expected to identify how consumers' intention to purchase changes depends on whether they are knowledgeable or not and whether they received relatively positive message or negative message.

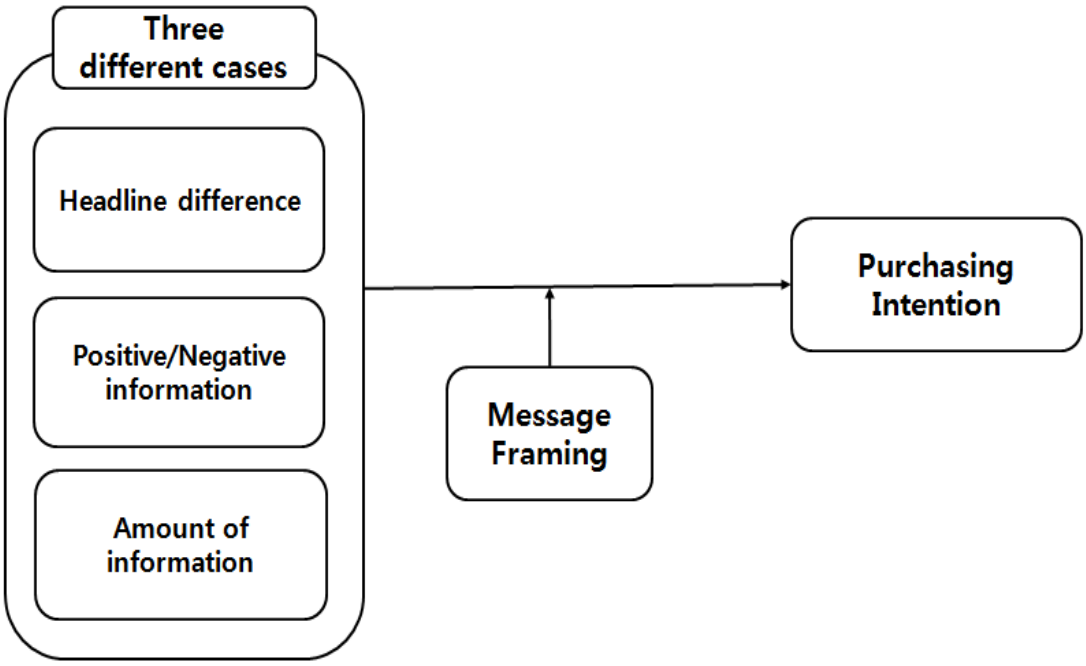

Figure 3.1 Research Model for Message Framing

Table 3.1 Composition of Experiment Message

			Contents	A type	B type
Case1	Headline difference	Non-edible beef tallow issue	Explain an issue that food companies used industrial beef tallow	Headline contains a word that "Industrial"	Headline does not contain the word that "Industrial"
Case2	Negative/ Positive Information difference	MSG(monosodium glutamate) debate	Explain a debate about MSG(monosodium glutamate)	Negative information	Positive information
Case3	Difference of the amount of information	Issue related to quality of milk	Explain an issue related to quality of milk	Less information	More information

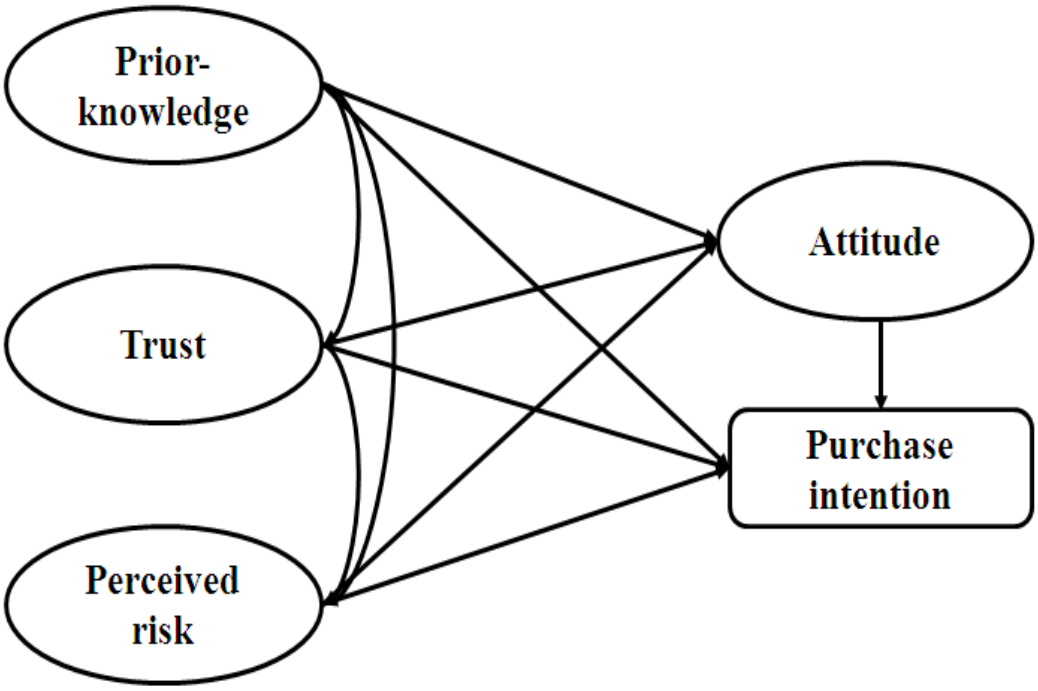

Figure 3.2 Structural Equation Modeling for Present Study

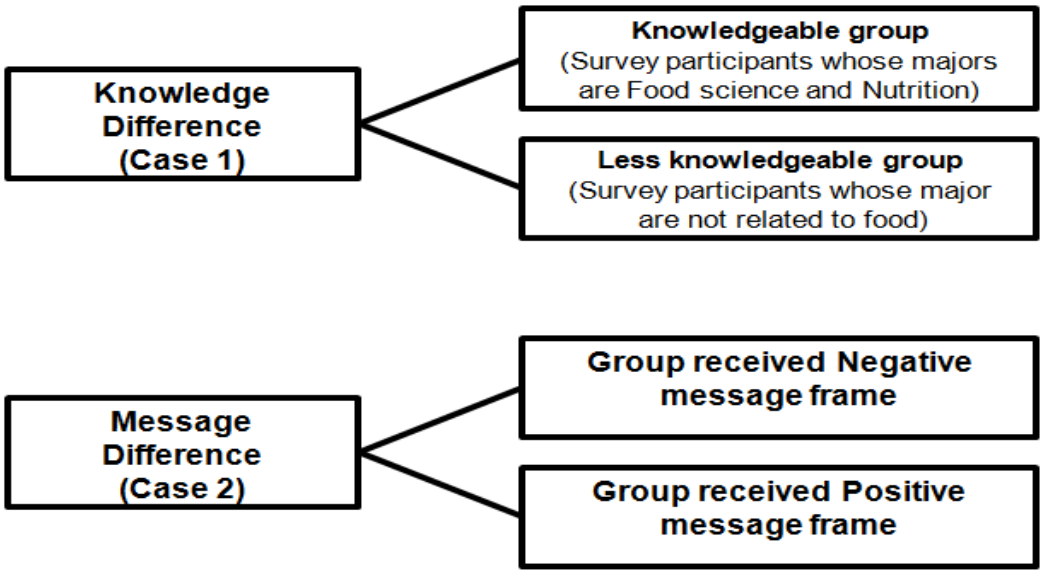

Figure 3.3 Two Estimations for Structural Equation Modeling

3.2. Research Subjects and Hypotheses

Research subjects and hypotheses of the present study are divided into two parts. First subject is designed to test whether or not the framing effect influences on consumers' decision making. For this, a subject and related hypotheses to test the effect of message framing are discussed as below.

Subject1: Does message framing have an effect on consumers' purchasing intention when food safety issues are associated with it?

H1a: Different headline of article would vary consumer's purchase intention and risk perception. (Case 1)

H1b: According to the positive/negative information, consumer's purchase intention and

risk perception would vary. (Case 2)

H1c: Different amount of information would vary consumer's purchase intention and risk perception. (Case 3)

Through the test of hypotheses in subject 1, it can be identified how three different cases of message frame affect consumers' purchase intention. It is expected that participants who read the article that includes the word "Industrial" (another article does not includes "industrial"), presents negative information and has less information would show negative purchase intention.

Second subject is designed to identify what factors have influence on consumers' attitude and purchase intention when food safety issues are related. Structural equation models were used twice (major difference/message type). For this, subject 2 and relevant hypotheses to identify the affecting factors are discussed as follow.

Subject2: What factors influence on consumers attitude and intention in purchasing?

H2a: There would be difference of affecting factors in purchase intention and the attitude between knowledgeable group and less knowledgeable group.

H2b: There would be difference of affecting factors in purchase intention and the attitude between group received a negative message and those who received a positive message.

3.3. Measurement of Variables

Questions for survey in this study are statements in questionnaire except purchasing intention and change of risk perception. Survey participants were asked to choose one

of scores ranged from strongly agree (5) to strongly disagree (1).

3.3.1. Prior-knowledge

The statement in questionnaire which asked prior-knowledge about food safety issues refer to the questions developed by Flynn & Goldsmith (1999). And these questions were adjusted for the present study. This part consists of three different questions—(i) compared to most of the other people, I know more about industrial beef tallow incident/MSG debate/pus-milk incident, (ii) among the group of my friends, I am one of the "experts" on industrial beef tallow incident/MSG debate/pus-milk incident, (iii) I can explain about industrial beef tallow incident/MSG debate/pus-milk incident to other people. In detail, all questions which asked consumers' prior-knowledge were questioned on a five-point Likert scale that ranged from strongly agree (5) to strongly disagree (1).

3.3.2. Risk Perception

Consumers' risk perception associated with food safety issues—non-edible beef tallow issue/MSG debate/issue regarding quality of milk—are measured from four questions; (i) I think industrial beef tallow/MSG/pus-milk would have negative effect to human health and organic function, (ii) I may feel psychologically anxious if I eat food containing industrial beef tallow/MSG/pus-milk (iii) if I purchase food containing industrial beef tallow/MSG/pus-milk, my family members would dislike it due to food safety problems, (iv) the reason for the industrial beef tallow/MSG/pus-milk to become major social issues are because they have food safety problems included. Responses to this are measured on a five-point Likert scale, anchored at the ends with the terms "strongly agree" and "strongly disa-

gree".

3.3.3. Attitude toward Food Safety Issues

Consumers' attitudes toward food safety are measured from six detail questions. Three of those are composed of negative questions and the rest are positive ones. The way of this measurement had been used by previous research (Kraus *et al*., 1992; Dickson-Spillmann *et al*., 2011). Those questions adjusted to fit for the present study were (i) I am scared of food related to safety issues and the associated risks, (ii) I do not purchase food that has any risks, (iii) I am positively willing to pay more to buy safer food, (iv) Even if there is no conclusive evidence for a certain food, I buy that food as usual, (v) I do not care about food safety issues because every food has risks and it is a matter of degree, (vi) although there was a controversy over certain food, I buy that food if its safety is certified by an authorized institutes. Positively designed questions were scored in a reverse way. All questions for the consumer attitudes were measured by five-point Likert scale.

3.3.4. Trust for Food Safety

To measure consumers' trust for food safety, it is necessary to decide who would be objects (Mohr *et al*., 2006). It is because the objects of trust may influence differently on decision makers' risk perception. Thus, the present research classifying objects of trust and all the questions were measured by five-point Likert scale. To put these in concrete, (i) I trust in the safety of domestic food, (ii) I trust in the announcement of the government and media's reports regarding food safety issues, (iii) I trust in the government and public institutes that supervise food manufacturers overall, (iv) I think that the food companies pro-

duce and distribute food safely enough, (v) I believe the consumer groups' opinion.

3.3.5. Purchasing Intention

Intention of purchasing is expected as a strong predictor upon future and is considered as the most exact, variable indicator which shows the consumers' behavior (Eagly, 1992). Purchasing intention and the change of risk perception were also measured at each of the points on the five-point Likert scale after reading the articles.

3.4. Econometric Tool

Two phases of analyses were conducted in this study. Firstly, t-test is employed in the first phase. Independent samples of t-test are used to identify how consumers' purchase intention and level of risk perception vary according to the types of message frame. IBM SPSS Statistics version 19.0 is used for estimation.

In the second phase, SEM (structural equation model) was employed not only to investigate the relationships among constructs, but also to evaluate the path coefficients of relationships via tests of goodness of fit. SEM provides researchers with comprehensive methods for analyzing models. At the same time, it shows the relationship between dependent variables and independent variables as regression model does. This is a major advantage of SEM, which provides the path analysis showing the complicated relationships among variables and simultaneous equation displaying casual relationships in one model (Kline, 2005). For these reasons, SEM has become an important mean for analyzing social phenomenon and has been employed in many fields (Hair *et al*., 1998). Therefore, structural equation modeling was an appropriate method for this study since it showed what factors

would have influence on consumers' purchasing intention statistically and visually.

Two different SEM models were estimated to identify how consumer's attitude and purchasing intention change according to where they belong to and what message they receive. These analyses include the CFA (confirmatory factor analysis), test for goodness of fit and path-analysis. IBM SPSS AMOS version 19 is used.

CHAPTER 4. EMPIRICAL RESULT

4.1. Data Collection

Students do not take great attention when purchasing food in South Korea. This study, however, university student groups were selected as participants instead of housewives or general public. A preliminary survey for the consumers in Seoul city was conducted before the main experiment had been implemented. This represents that the students relatively show more coherent response rather than elder people who are not familiar with reading article. Moreover, university students are also the current food consumers and can be regarded as potential buyers even if they do not purchase food at the moment. Thus, students were chosen as the subjects to progress the experiment. The experiment was conducted from 12th of March in 2012 to 16th of March in 2012 at Chung-Ang University, located in South Korea. Two types of questionnaire were given to students each of whom responded one-hundred and eighty. Eighteen unfaithful responses were removed. Therefore, three hundred forty two responses in total were used in the analysis.

4.2. Demographic Variables

Demographic characteristic of participants are summarized as in the following (Table 4.1). In detail, 342 students (145 males, 42.4%; 197 females, 57.6%) were recruited to participate in the experimental survey during the classes at Chung-Ang University in South Korea. Students under 25 years old were 70.8% and over 25 were 29.2%, aged between 20-29 years. Junior (45.6%) and senior (36.3%) take the largest number of participation among students since the experimental survey was focused on higher grades of student. The num-

ber of students who have taken food related classes before (52.6%) were little more than who have not (47.4%). It is expected that students are properly mixed who have higher prior-knowledge of food safety and who have lower prior-knowledge. An allowance between 200 dollars to 499 dollars per month take possession of more than half of the respondents, however, 4.7% of them do not earn their own pocket money. 40% of students spend almost half of their money for food. The majority of students' family income ranges $3000-$4999 (31.6%) compared to under $1000 accounting for 2%. Most of the students had no patients or children aged under 14 in their family and no illness-experience related to food problems.

Table 4.1 Participant Characteristics

		No.	%			No.	%
Sex	Male	145	42.4	Pocket money per month	Under $200	30	8.8
	female	**197**	**57.6**		$200-499	**233**	**68.1**
	sum	342	100		Over $500	79	23.1
Age	Under 25	**242**	**70.8**		Sum	342	100
	Over 25	100	29.2	Expense for food among pocket money	Less than 20%	15	4.4
	Sum	342	100		20-39%	85	24.9
Grade	Freshman	0	0		40-59%	**136**	**39.8**
	Sophomore	62	18.1		60-79%	87	25.4
	Junior	**156**	**45.6**		More than 80%	19	5.6
	Senior	124	36.3		Sum	342	100
Experience for taking food related classes	Sum	342	100	Monthly household income	Under $1000	7	2.0
	Yes	**180**	**52.6**		$1000-$2999	63	18.4
	No	162	47.4		$3000-$4999	**108**	**31.6**
	Sum	342	100		$5000-$6999	85	24.9
Patient among family	Yes	102	29.8		$7000-$8999	47	13.7
	No	**240**	**70.2**		Over $9000	32	9.4
	Sum	342	100		Sum	342	100
Children under 14 among family	Yes	15	4.4	Illness experience with respect to food	Yes	49	14.3
	No	**327**	**95.6**		No	**293**	**85.7**
	Sum	342	100		Sum	342	100

NOTE. It is assumed that 1 dollar is equal to 1000 won.

4.3. Test of Framing Effect

Research subject1 is to identify the framing effects that influence on consumers' purchase intention and risk perception. To investigate this, Independent Samples of t-test

was used for three different cases.

4.3.1. Headline Difference

It is hypothesized that different headline of article would vary consumer's purchase intention and risk perception (H1a). Average and standard deviation of purchasing intention and change of risk perception are represented in Table 4.2. Also, t-value, degree of freedom and p-value are shown in Table 4.3. Higher average of intention to purchase indicates that consumers show higher purchasing intention. Also, higher average of change of risk perception implies that their risk perception goes higher after reading article. t-value and p-value are criterion that identify whether variables are statistically significant or not.

Table 4.2 Average and Deviation for Case1(Headline difference)

		Average	SD
Intention to purchase	A type	2.67	1.026
	B type	2.90	1.069
Change of risk perception	A type	3.48	.761
	B type	3.31	.857

Table 4.3 Statistic Results for Case1(Headline difference)

		t	*df*	p-value
Intention to purchase	Assuming equal variance	-2.042	340	.042*
	Not assuming equal variance	-2.041	339.051	.042*
Change of risk perception	Assuming equal variance	1.951	340	.052**
	Not assuming equal variance	1.949	334.316	.052**

NOTE. $p < 0.05$.*, $p < 0.10$**

Both types of article that explain the non-edible beef tallow issue consist of the same contents except headline. The headline of message A was "Industrial beef tallow" and that of message B was "Beef tallow". Thus, it is expected that purchase intention would be

increased when message B was read because the word that "industrial" has a negative meaning when it is associated with food. As expected, intention to purchase of B type (Average 2.90, SD 1.069) is higher than that of A type (Average 2.67, SD 1.026). In addition, the change of risk perception of B type (Average3.31, SD 0.857) is lower than that of A type (Average 3.48, SD 0.761). However, numerical gap of purchase intention and the change of risk perception are small. Also, the number 2.90 which is the intention to purchase (B type) is below median (five point Liker-scale) and the number 3.31 which is the change of risk perception is above median. This implies that the way of message framing on consumers' intention and risk perception are not quite effective in this case. Nevertheless, the hypothesis (H1a) is supported by the results since there was a numerical gap between both types.

Although purchasing intention of B type is greater than that of A type, standard deviation of B type is also little larger than that of A type in terms of purchasing intention. Standard deviation represents the variability in values. Higher standard deviation indicates higher risk since the value has a wide range of fluctuation. Change of risk perception of both groups can be interpreted in the same way. Thus, participants received B type not only show higher purchasing intention, but also presenting higher possibility of variability.

4.3.2. Positive/Negative Information Difference

Next hypothesis (H1b) of subject1 is that the consumer's purchasing intention and risk perception would vary according to positive/negative information. Statistical results such as average, standard deviation, t-value, degree of freedom and p-value are stated as in the following (Table 4.4, Table 4.5).

Table 4.4 Average and Deviation for Case2(Information difference)

		Average	SD
Intention to purchase	A type	2.98	1.020
	B type	3.33	.953
Change of risk perception	A type	3.48	.067
	B type	3.04	.737

Table 4.5 Statistic Results for Case2 (Information difference)

		t	*df*	p-value
Intention to purchase	Assuming equal variance	-3.303	340	.001*
	Not assuming equal variance	-3.304	338.940	.001*
Change of risk perception	Assuming equal variance	6.130	340	.000*
	Not assuming equal variance	6.123	326.471	.000*

NOTE. $p < 0.05$.*, $p < 0.10$**

Both types of article have the same headline, “Is MSG truly detrimental for our health?”, but have different explanations. Message A includes the negative information that emphasizes on the side effects of MSG when it is absorbed into human body. To support this, the official announcement of WHO (World Health Organization), FAO (Food and Agriculture Organization), and many reports which studied the effect of MSG were exemplified. On the other hand, Message B consists of the positive information that stress on harmlessness of MSG. Similarly, the official announcements of WHO and FAO are given to the readers. Since the B type of message includes the positive information, it is expected that the purchase intention of the B type of message would be higher than that of the A type message.

As stated in table 4.4, purchasing intention of B type (Average 3.33, SD 0.953) is higher than that of A type (Average 2.98, SD 1.020). Also, the change of risk perception of

B type (Average 3.04, SD 0.737) is lower than that of A type (Average 3.48, SD 0.067). Thus, the hypothesis (H1b) is confirmed. The number 3.33 that is intention to purchase (B type) is above average (five point Liker-scale) and the number 2.98 that is intention to purchase (A type) is below average. This indicates that the message frame was designed effectively in this case. However, both changes of risk perception were greater than average overall.

While purchasing intention of B type is greater than that of A type, standard deviation of A type is greater than that of B type in terms of purchasing intention. This indicates that participants received type A showed higher possibility of variability which means risk. Thus, participants received A type not only show lower purchasing intention, but also presenting higher possibility of variability.

4.3.3. The Amount of Information

The last hypothesis of subject1 is that different amount of information would vary consumer's purchase intention and risk perception (H1c). Statistical results are stated in the following Table 4.6 and Table 4.7.

Table 4.6 Average and Deviation for Case3(Amount of Information)

		Average	SD
Intention to purchase	A type	2.23	1.093
	B type	2.98	1.138
Change of risk perception	A type	3.69	.881
	B type	3.09	.966

Table 4.7 Statistic Results for Case3(Amount of Information)

		t	*df*	p-value
Intention to purchase	Assuming equal variance	-6.263	340	.000*
	Not assuming equal variance	-6.262	339.064	.000*
Change of risk perception	Assuming equal variance	6.040	340	.000*
	Not assuming equal variance	6.037	336.386	.000*

NOTE. $p < 0.05$.*, $p < 0.10$**

Both types of article have the same headline of "What is the pus-milk reported by the media?", but include different amount of information. Message A explains the issue related to quality of milk, which was embroiled in controversy in 1995 in South Korea. This message described the beginning and development of the issue rather roughly and gave an account of what the pus-milk is. On the other hand, Message B not only showed the information in message A, but also gave more information on how the pus naturally extinct even if little amount of pus exist in the milk. Since the B type of message includes more information that may be considered in a positive way, it is expected that purchasing intention of B type of message would be higher than that of A type message.

Intention to purchase of B type (Average 2.98, SD 1.138) is higher than that of A type (Average 2.23, SD 1.093). In addition, the change of risk perception of B type (Average 3.09, SD 0.966) is lower than that of A type (Average 3.69, SD 0.881). Therefore, the hypothesis (1c) is supported. Even though both numbers 2.98 (intention to purchase: B type) and 2.23 (intention to purchase: A type) is below average, the numerical difference (0.75) is not small. This implies that the message frame is designed effectively in this case. However, both changes of risk perception are above average.

Although purchasing intention of B type is greater than that of A type, standard deviation of B type is also greater than that of A type regarding purchasing intention. This indicates that participants received type B showed higher possibility of variability. Thus, participants received B type not only show higher purchasing intention, but also presenting higher possibility of variability.

4.4. Results of Structural Equation Model

4.4.1. Reliability Analysis

Cronbach (1957) alpha internal consistency reliability coefficients were estimated for independent variables—trust, prior-knowledge, perceived risk and attitude. As shown in Table 4.8, all coefficients were above 0.70 indicating an acceptable reliability coefficient (Nunnaly, 1978). Also, as a result of reliability analysis for dependent variables which are purchasing intention and change of risk perception, all reliability coefficients were above 0.70. Thus, the reliability of this study seems appropriate.

Table 4.8 Summary of Standardized Cronbach Alpha Reliability Coefficients

Measures	Alpha Coefficient
Trust	0.728
Prior-Knowledge (MSG)	0.892
Perceived Risk (MSG)	0.858
Attitude	0.700
Purchasing Intention	0.711
Change of Risk Perception	0.744

Data fitness of prior-knowledge, trust, risk perception and attitude variables were verified through CFA (confirmatory factor analysis) in advance of the structural equation

model estimated. Two estimations depending on majority and message types were conducted. In this case, only the MSG issue was dealt with simplicity in estimations. Confirmatory factor analysis is to identify the validity of research design. Table 4.9 shows the results of CFA.

Table 4.9 Reliability of Confirmatory Factor Analysis (CFA) for Both Estimations

	GFI	AGFI	RMR	RMSEA	x^2/df	NFI
Knowledge difference	.870	.827	.062	.048	1.785	.803
Message difference	.860	.815	.066	.052	1.927	.797

As the results of CFA for the first estimation represented in Table 4.9, observed variables of trust, which is one of the latent variables, were not statistically significant and thus trust was removed from the estimation. x^2/df was below 3 (Carmines & McIver, 1981) and RMSEA was below 0.05 (Hair *et al.,* 1998) which implies that fitness of this model is appropriate. Even though other indices such as GFI, AGFI and NFI were not above 0.9, but were acceptable.

According to CFA results for second estimation, every path-coefficients of observed variables was statistically significant. Similarly, x^2/df was below 3, RMSEA was about 0.05 and other indices were also in the acceptable range.

4.4.2. Knowledge Difference

Goodness of fit measures for the overall confirmatory model implies that the conceptual model satisfactory fits the data for the case of major difference group. In this case, as stated on the following table 4.9, x^2/df was 2.207, which is below 3 and RMSEA is 0.06, which was under 0.5, in addition, other indices were in an acceptable range.

Table 4.10 Goodness-of-Fit for the Structural Regression Model

GFI	AGFI	RMR	RMSEA	x^2/df	NFI
.885	.833	.062	.060	2.207	.826

Table 4.11 SEM Estimation Results for Knowledgeable Group

Path	Path-coefficient	C.R.	p-value
Prior-knowledge → Attitude	-.071	-1.663	.096**
Risk perception → Attitude	.169	2.493	.013*
Risk perception → Purchasing intention	-.413	-3.312	.002*
Attitude → Purchasing intention	-.552	-2.367	.018*

NOTE. $p < 0.05$.*, $p < 0.10$**

Table 4.11 and Figure 4.1 showed the SEM estimation results for knowledgeable group. Firstly, consumers' attitude was influenced by their prior-knowledge (-0.071) and risk perception (0.169). This is statistically significant and it implies that consumers' attitudes are more sensitive as prior-knowledge level is lower and risk perception is higher. Secondly, purchasing intention is affected by risk perception (-0.413) and attitude (-0.552). This is statistically significant within five percent level and indicates that consumers' purchasing intention is lower as their risk perception is higher and their attitude toward food safety issue is more sensitive.

As a result of SEM estimation for less knowledgeable group (Table 4.12 and Figure 4.2), it is identified that consumer's risk perception has influence on their attitudes (0.248) and attitude affects the purchasing intention (-0.723). This is statistically significant within five percent level and it shows that the consumers react more sensitively as the risk perception goes up and purchasing intention and attitude have negative interaction.

To sum up, it seems that there are differences in affecting factors to purchase inten-

tion and the attitude between food-majored group and others, since there are more affecting factors for food-related major group than other major group. Therefore, hypothesis 2a that there would be differences in affecting factors to purchase intention and the attitude between food majored group and others is fully supported.

Table 4.12 SEM Estimation Results for Less Knowledgeable Group

Path	Path-coefficient	C.R.	p-value
Risk perception → Attitude	.248	3.561	.000*
Attitude → Purchasing intention	-.723	-2.731	.006*

NOTE. $p < 0.05$.*, $p < 0.10$**

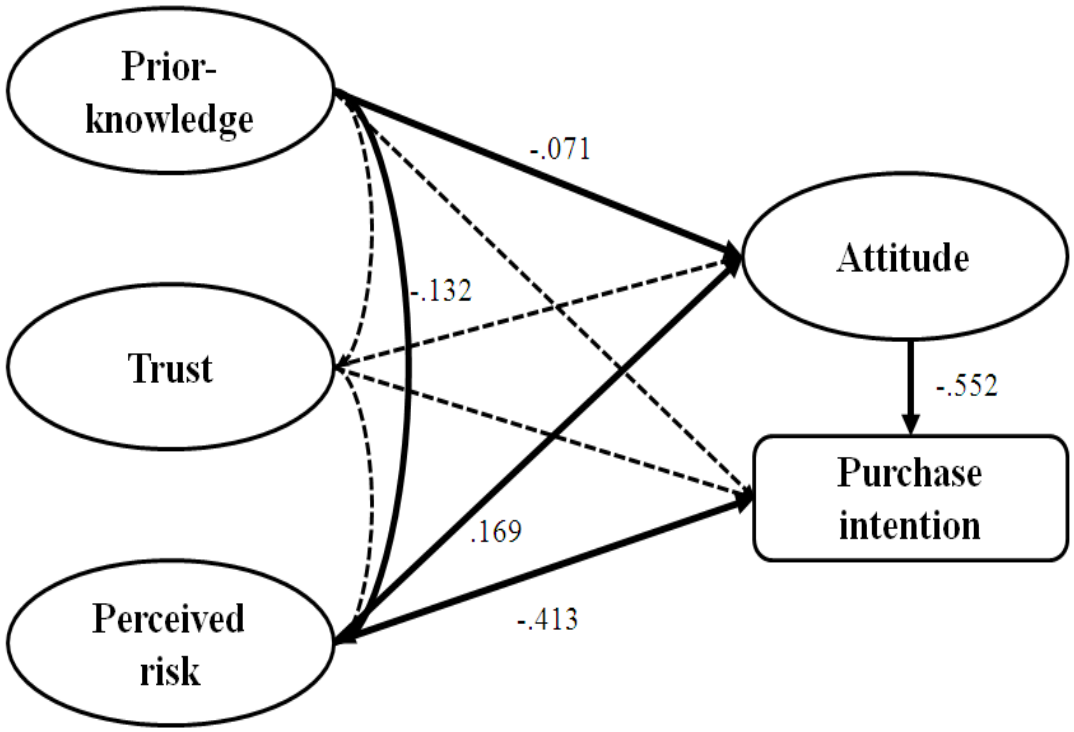

Figure 4.1 Path Diagram Results for Knowledgeable Group
NOTE. Higher number indicates stronger relationship between variables

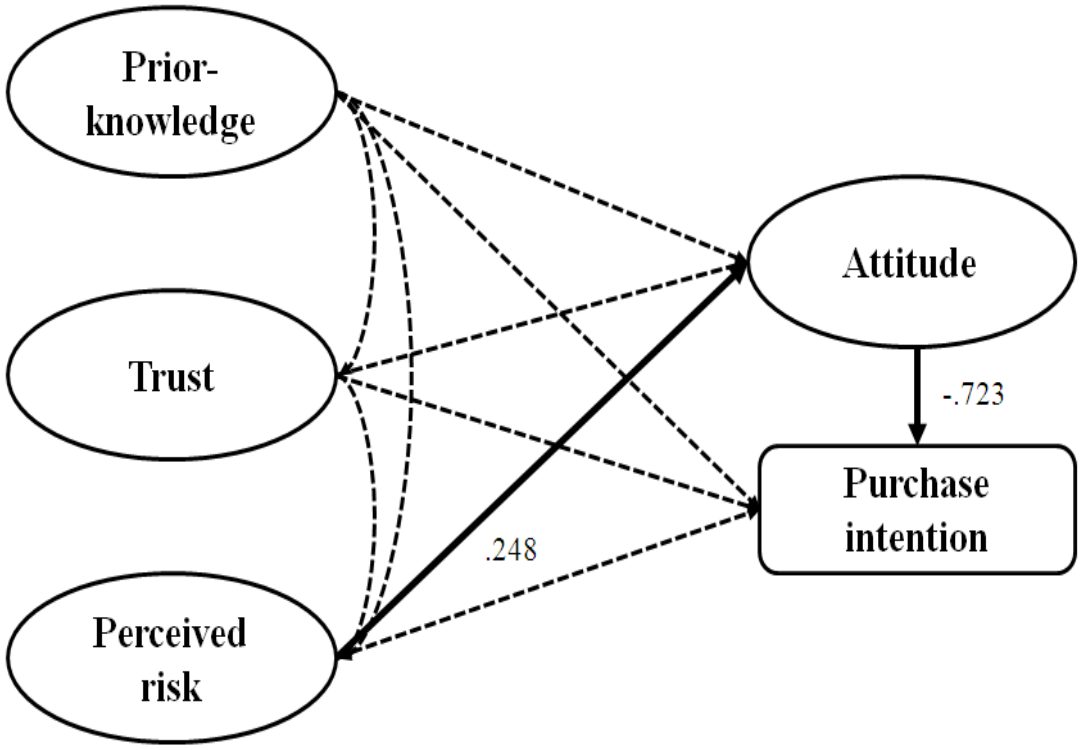

Figure 4.2 Path Diagram Results for Less Knowledgeable Group
NOTE. Higher number indicates stronger relationship between variables

4.4.3. Message Difference

In case of groups of received different messages, as stated following table 4.13, goodness of fit are relatively high; x^2/df was 1.936, which is below 3 and RMSEA is 0.052, which was around 0.05, in addition, other indices were in the acceptable range as previous SEM model was.

Table 4.13 Goodness-of-Fit for the Structural Regression Model

GFI	AGFI	RMR	RMSEA	x^2/df	NFI
.854	.905	.065	.052	1.936	.784

Table 4.14 SEM Estimation Results for Group Received Negative Message

Path	Path-coefficient	C.R.	p-value
Risk perception → Attitude	.124	1.808	.071**
Risk perception → Purchasing intention	-.327	-2.568	.010*
Trust → Purchasing intention	1.251	1.676	.094**
Attitude → Purchasing intention	-.775	-3.157	.002*

NOTE. $p < 0.05$.*, $p < 0.10$**

Table 4.14 and Figure 4.3 showed the SEM estimation results for group received negative message. According to the estimated results, consumers' attitude was influenced by risk perception (0.124). This is statistically significant within ten percent level and implies that consumers' attitudes are more sensitive when their risk perception is higher. Next, purchasing intention is affected by risk perception (-0.327), trust (1.251) and attitude (-0.775). This is statistically significant and indicates that consumers' purchasing intention is lower when their risk perception is higher, trust is lower and attitude toward food safety issue is more sensitive.

As a result of SEM estimation for group received positive message (Table 4.15 and Figure 4.4), it is identified that consumer's risk perception has influence on their attitude (0.255) and risk perception (-0.318) and attitude (-0.559) affects the intention of purchasing. This is statistically significant within five percent level and shows that the consumers are more susceptible when their risk perception is higher and purchasing intention goes higher when their risk perception is lower, attitude is less sensitive.

In sum, it seems that there are differences of affecting factors to purchasing intention and attitude between group who received negative message and those who read posi-

tive message because there are more affecting factors for group received negative message. Thus, hypothesis 2b that there would be differences of affecting factors to purchase intention and attitude between students who received message type A and those who received message type B is fully supported.

Table 4.15 SEM Estimation Results for Group Received Positive Message

Path	Path-coefficient	C.R.	p-value
Risk perception → Attitude	.255	3.698	.000*
Risk perception → Purchasing intention	-.318	-2.292	.022*
Attitude → Purchasing intention	-.559	-2.137	.033*

NOTE. $p < 0.05$.*, $p < 0.10$**

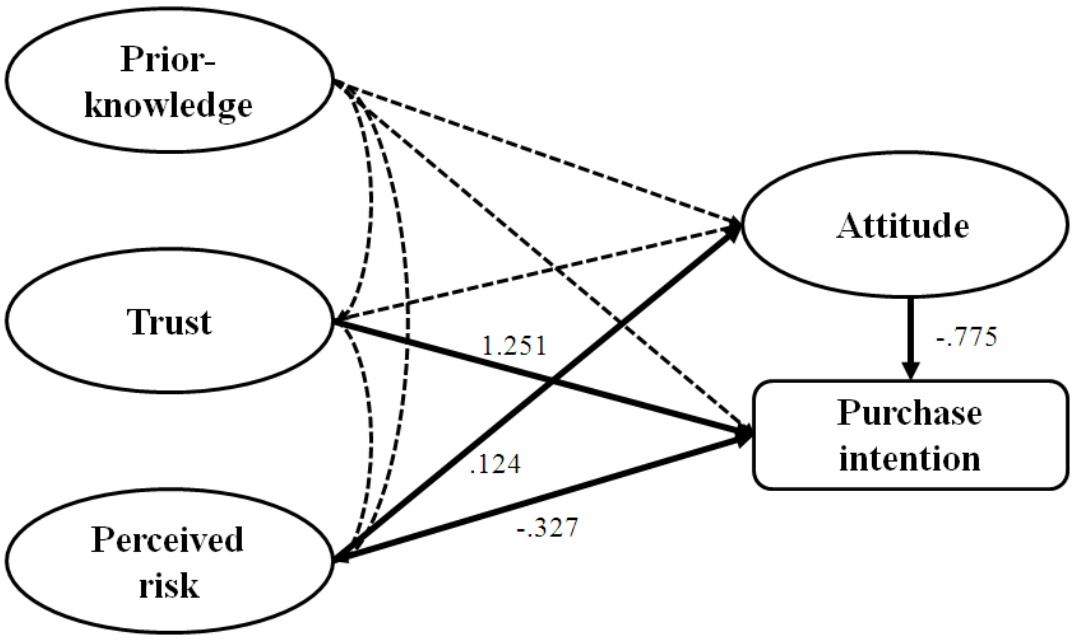

Figure 4.3 Path Diagram Results for Group Received Negative Message
NOTE. Higher number indicates stronger relationship between variables

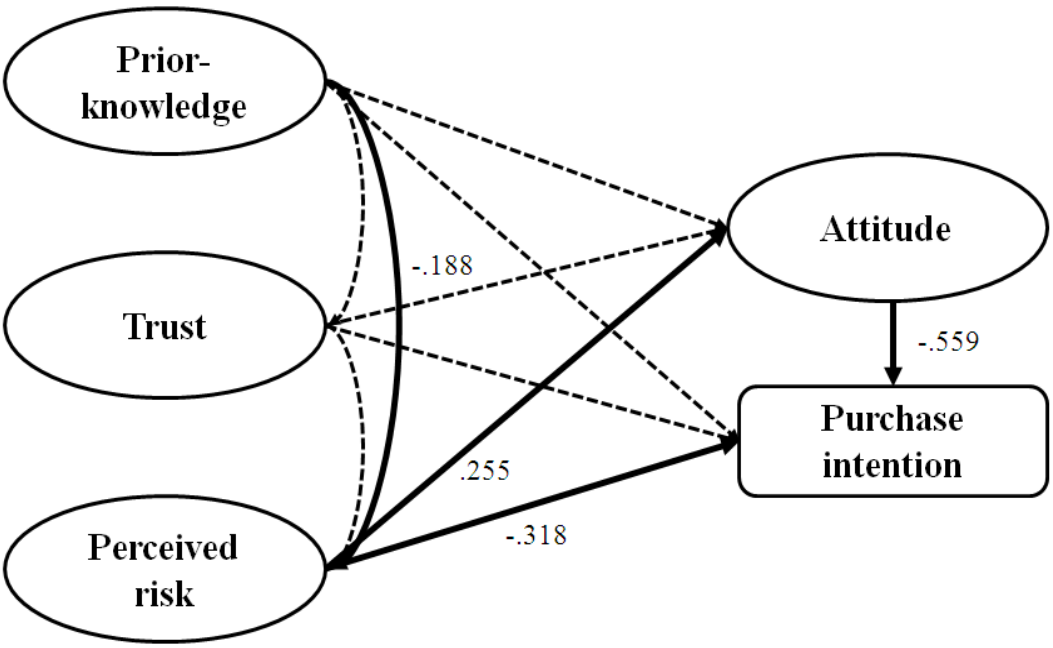

Figure 4.4 Path Diagram Results for Group Received Positive Message
NOTE. Higher number indicates stronger relationship between variables

CHAPTER 5. CONCLUSION & DISCUSSION

As people's quality of life has been improved, how to eat well for one's own health came into the picture rather than what to eat to survive. Since people's interest in food safety issues are increasing, a number of news, food maker's advertisements and announcement of the government are overflowing everywhere. These, of course, influence not only on consumers' behavior such as purchasing intention, knowledge, risk perception and attitude, but also on social problems such as consumers' reaction of panic, related manufacturer's bankruptcy, unreliability for related institutions. When it comes to approaching the food safety issues in South Korea, there are some factors which should be aware of; sensitivity of consumers and needs for deliberation from the media (Jin, 2006). Thus, the present study identifies how information message such as news and announcements should be framed in order to reduce consumers' unnecessary disturbance. Furthermore, the elements affecting the consumer's behavior were identified by conducting comparative analysis.

To avoid the recency effect, old but relatively well-known food safety issues; i) non-edible beef tallow, ii) MSG, iii) issue related to quality of milk were chosen and analyzed. A summary of estimation results and implications for those concerned such as the government, food- makers and media are stated as in follow.

5.1. Summary of Results

Data (N=342) for the estimation is obtained by experimental survey during the classes Chung-Ang university in South Korea. The questionnaire was divided into A type of message and B type of message and also separated into two different groups of food-related majored students (food science, food and nutrition) and others. Two different methods that

t- test, structural equation model were used for estimation.

First, it is identified that message framing of the three cases has influence on consumers' purchasing intention and their risk perception. In other words, consumers' behavior changes according to the different headlines in articles, negative or positive information and the different amount of information. As the headline includes negative words, as negative information is given, as small amount of information are given, consumers tend to behave negatively as well. From a social point of view, the results have crucial meaning in reducing social problems with regard to food safety issues. When a certain issue that is related to food safety is distorted by the media or if the information is biased, it can be corrected by setting up an appropriate way of conveying the information. For example, consumers' risk perception level and purchasing intention of beef tallow could have been better if the headline of the article did not include the word "industrial". In the case of MSG, even though it is still controversial, consumers' reaction of panic also could have been reduced by providing not only the negative information, but also the opposite information like the maleficence of MSG was denied by FAO and WHO. Consumers' concern about milk quality could also have been decreased if enough information of the beginning, development and the end of the issue were fully given to consumers by the media.

Second, as the result of estimation used in structural equation model, only MSG issue covered, prior-knowledge and risk perception have effect on consumers' attitude. The risk perception and attitude influence on consumers' purchasing intention in a knowledgeable (food related major) group. On the other hand, risk perception has influence on consumers' attitude and this attitude affects the consumers' intention of purchasing in a normal

(other major) group. As the prior-knowledge becomes lower while the risk perception gets higher, the consumers' attitude is more likely to be sensitive and as their purchasing intention gets higher as risk perception gets lower, the attitude is less sensitive. This corresponds with the transcendental expectation. However, there were more affecting factors such as the prior-knowledge in the expert group. This implies that experts use their knowledge when they perceive risks regarding food safety issue. And knowledge is interacted negatively with sensitivity. It is considered that the non-food majored students need to receive food-related education since they react by experience and habits rather than by professional knowledge compared students majoring food science or nutrition.

Meanwhile, risk perception influences on consumers' attitude and risk perception, trust and attitude have effect on their purchasing intention in group receiving A type (relatively negative) of message. Similarly, these affect consumers' attitude and intention of purchasing except the trust in group receiving B type (relatively positive) of message. Attitude is less sensitive when risk perception is low and purchasing intention is higher when the risk perception is low, trust is high and attitude is less sensitive. They are also consistent to transcendental results. There is another affecting factor which is trust. This indicates that the trust for the government, food makers and media has implications to respondents receiving relatively negative messages. Since food safety is generally negative, it seems that the trust from people under negative circumstances react more sensitively.

5.2. Implication

Once consumers have preconception and their own opinion, they do not change their attitude easily even if they are exposed to more information. (Jin, 2006). The government, media and food makers play an important role for the consumers when establishing their perception. Thus, it is very important to investigate their roles to reduce social problems such as the consumer's reaction of panic and consecutive bankruptcy among food manufacturers.

Even though food makers produce primary information, it is for the sake of benefit. Because of its feature that food makers need to be loyal to consumers since their survival of maintaining their status depends on the consumer's choice, they should provide consumers the proper, actual information. It is obvious that the consumers would turn their backs later on those companies which show partial or biased information. Consumers' trust for food makers can be increased not only by delivering information correctly, but also by extending the range of open information. At the same time, the government must be able to control them to help consumers make better decision.

It is a common knowledge that the government plays a role as a messenger which sort of has objective feature. Most of other information messengers such as food makers, advertisers and media tend to deliver particular information and modify it for only their interests. Therefore, the government must have a responsibility of delivering information objectively as possible. By doing this, asymmetric and imperfect information for the consumers is likely to be removed in some degree. In addition, expeditious actions are required for the government. When food safety secure problems occur, many institutions that are related

are confused because it is not easy to clarify who is responsible for them. Thus, the tasks considering the food control need to be integrated to improve the effectiveness in management and take fast response.

There may be difference between scientific risk and perceived risk of consumers. In this case, media plays a role as a bridge between those two kinds of risk. If media reports exaggerate the meaning of the risk or make an impatient decision, the consumers may react more sensitively and behave irrationally which are unnecessary. To properly pass the information to the consumers, media needs to diversify the way of selecting the basis which can be the government's announcement or opinion of scientists and experts.

Meanwhile, the fact that 'trust' has positive relationship with consumers' purchase intention in a group received negative message frame, of course, has a significant meaning. Consumer's trust varies depending on the situation of when and where they are and the matter of trust which can be more important when the situation is more negative. As food safety problem is directly related to human health, consumers tend to be dependent on specialized information. On the contrary, the matter of trust becomes less important when the given situation is positive. The government, media and food makers can gain consumers' trust by providing them with reasonable information. If they provide limited information, they will lose confidence in the long term. Thus, those three should be intimately connected to one another when food safety issue occurs and help consumers to access to more information

From the consumer's point of view, there are several implications indicated through the results of this study. First of all, it seems that group responses by experts are

less sensitive to food safety issues compared to ordinary group of people considering the results of SEM model aiming for groups of food-related major and others. The only difference in factors which influence on consumer attitudes between the two groups was prior-knowledge that has a reverse relationship with the consumer's attitude. This indicates that the normal consumers are recommended to receive an education on food safety issues in order to reduce their unnecessary panic of reaction. Increase in public service advertisement can be a good example. This may also solve asymmetric and imperfect information problem between the experts and common people in some sense. Thus, not only the consumer should try to receive appropriate information, but also the government and media should make an effort to be good messengers.

All the more, the consumers should obtain proper information announced from experts when food safety issue occurs. Once again, the government and media should confirm the information which is to be delivered by themselves and whether it is trustworthy or not.

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APPENDIX A

QUESTIONNAIRE (Type A)

Please choose the appropriate answers to the following questions:

Section I: Background Questions

1. What is your gender?

a. Male b. female

2. What is your age? _____

3. What is your class rank?

a. Freshman b. Sophomore c. Junior d. Senior

4. Have you ever taken a class related to food?

a. Yes b. no

5. How much money do you spend per month? _____

6. How much money do you spend on food? (Percentage)

a. Less than 20% b. 20-39% c. 40-59% d. 60-79% e. More than 80%

7. Monthly Household income:

a. Less than $1000 b. $1000-2999 c. $3000-4999% d. $5000-6999%

e. $7000-8999 f. More than $9000

8. Is there a child under age 14 in your family?

a. Yes b. no

9. Are there any patients with serious illness (cancer, diabetes, and hypertension) in your family?

a. Yes b. no

10. Have you or any member of your family been sick related to food additives, environmental hormone, and pesticide residue?

a. Yes b. no

Table A.1 Trust

	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
I trust in the safety of domestic food					
I trust in the announcement of the government and media's reports regarding food safety issues					
I trust in the government and public institutes that supervise food manufacturers overall					
I think that the food companies produce and distribute food safely enough					
I believe the consumer groups' opinion					

Table A.2 Prior-knowledge

		1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
Industrial Beef Tallow	Compared to most of the other people, I know more about Industrial beef tallow issue					
	Among the group of my friends, I am one of the "experts" on industrial beef tallow issue					
	I can explain about industrial beef tallow issue to other people					
MSG	Compared to most of the other people, I know more about MSG issue					
	Among the group of my friends, I am one of the "experts" on MSG issue					
	I can explain about MSG issue to other people					
Pus-milk	Compared to most of the other people, I know more about Pus-milk issue					
	Among the group of my friends, I am one of the "experts" on Pus-milk issue					
	I can explain about Pus-milk issue to other people					

Table A.3 Risk Perception

		1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
Industrial Beef Tallow	I think industrial beef tallow would have negative effect to human health and organic function					
	I may feel psychologically anxious if I eat food containing industrial beef tallow					
	If I purchase food containing industrial beef tallow, my family members would dislike it due to food safety problems					
	The reason for the industrial beef tallow to become major social issues are because they have food safety problems included					
MSG	I think MSG would have negative effect to human health and organic function					
	I may feel psychologically anxious if I eat food containing MSG					
	If I purchase food containing MSG, my family members would dislike it due to food safety problems					
	The reason for the MSG to become major social issues are because they have food safety problems included					
Pus-milk	I pus-milk would have negative effect to human health and organic function					
	I may feel psychologically anxious if I eat food containing pus-milk					
	If I purchase food containing pus-milk, my family members would dislike it due to food safety problems					
	The reason for the pus-milk to become major social issues are because they have food safety problems included					

Table A.4 Attitude

	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
I am scared of food related to safety issues and the associated risks					
I do not purchase food that has any risks					
I am positively willing to pay more to buy safer food					
Even if there is no conclusive evidence for a certain food, I buy that food as usual					
I do not care about food safety issues because every food has risks and it is a matter of degree					
Although there was a controversy over certain food, I buy that food if its safety is certified by an authorized institutes					

Table A.5 Purchasing Intention.

Read articles and answer the questions.

<Case 1>

Industrial beef tallow issue

In 1989, five food manufacturers were placed under arrest since they used "industrial beef tallow" to produce instant noodles. This imported "industrial beef tallow" from U.S. was obtained from healthy beef identified by USDA's inspection. Although it was classified as non-edible food in U.S., it was refined to food standards of South Korea. In addition, Japan was importing this to eat at that time.

* Beef tallow is refined tallow obtained from a bovine animal to eat

	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
I am willing to purchase the food including industrial beef tallow after reading above article					
The level of my risk perception about industrial beef tallow increased after reading above article					

<Case2>

Is MSG truly detrimental for our health?

Artificial flavor enhancer, MSG, has been a controversial issue for a long time. In 1987, according to Joint FAO/WHO Codex Alimentarius Commission, the safety of MSG at normally consumed levels for the general population was proved, but it still should be used at minimum level of amount. And The Federation of American Societies for Experimental Biology(FASEB) admits that certain people may develop short-term reactions(chest pain, headache, nausea).

	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
I am willing to purchase the food containing MSG after reading above article					
The level of my risk perception about MSG increased after reading above article					

<Case 3>.

What is the "Pus Milk" reported by media?

In 1995, not only consumers got into a panic, but also milk consumption dropped off sharply since TV news reported "Gargety cows were producing milk containing pus". However, it was reported by experts that as normal milk, not "*Pus milk*". Generally, the number of somatic cells in milk from healthy dairy cows is around 100,000-200,000/ml and is comprised of 60% of epithelial cells and 40% of white corpuscles. White blood cell classified as a part of somatic cell plays a role as a protector against invasion of virus and exists in meet we eat every day.

	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
I am willing to purchase the food including Pus-milk after reading above article					
The level of my risk perception about Pus-milk increased after reading above article					

APPENDIX B

QUESTIONNAIRE (Type B)

Please choose the appropriate answers to the following questions:

Section I: Background Questions

1. What is your gender?

b. Male b. female

2. What is your age? _____

3. What is your class rank?

b. Freshman b. Sophomore c. Junior d. Senior

4. Have you ever taken a class related to food?

b. Yes b. no

5. How much money do you spend per month? _____

6. How much money do you spend on food? (Percentage)

b. Less than 20% b. 20-39% c. 40-59% d. 60-79% e. More than 80%

7. Monthly Household income:

a. Less than $1000 b. $1000-2999 c. $3000-4999% d. $5000-6999%

e. $7000-8999 f. More than $9000

8. Is there a child under age 14 in your family?

b. Yes b. no

9. Are there any patients with serious illness (cancer, diabetes, and hypertension) in your family?

b. Yes b. no

10. Have you or any member of your family been sick related to food additives, environmental hormone, and pesticide residue?

b. Yes b. no

Table B.1 Trust

	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
I trust in the safety of domestic food					
I trust in the announcement of the government and media's reports regarding food safety issues					
I trust in the government and public institutes that supervise food manufacturers overall					
I think that the food companies produce and distribute food safely enough					
I believe the consumer groups' opinion					

Table B.2 Prior-knowledge

		1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
Industrial Beef Tallow	Compared to most of the other people, I know more about Industrial beef tallow issue					
	Among the group of my friends, I am one of the "experts" on industrial beef tallow issue					
	I can explain about industrial beef tallow issue to other people					
MSG	Compared to most of the other people, I know more about MSG issue					
	Among the group of my friends, I am one of the "experts" on MSG issue					
	I can explain about MSG issue to other people					
Pus-milk	Compared to most of the other people, I know more about Pus-milk issue					
	Among the group of my friends, I am one of the "experts" on Pus-milk issue					
	I can explain about Pus-milk issue to other people					

Table B.3 Risk Perception

		1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
Industrial Beef Tallow	I think industrial beef tallow would have negative effect to human health and organic function					
	I may feel psychologically anxious if I eat food containing industrial beef tallow					
	If I purchase food containing industrial beef tallow, my family members would dislike it due to food safety problems					
	The reason for the industrial beef tallow to become major social issues are because they have food safety problems included					
MSG	I think MSG would have negative effect to human health and organic function					
	I may feel psychologically anxious if I eat food containing MSG					
	If I purchase food containing MSG, my family members would dislike it due to food safety problems					
	The reason for the MSG to become major social issues are because they have food safety problems included					
Pus-milk	I pus-milk would have negative effect to human health and organic function					
	I may feel psychologically anxious if I eat food containing pus-milk					
	If I purchase food containing pus-milk, my family members would dislike it due to food safety problems					
	The reason for the pus-milk to become major social issues are because they have food safety problems included					

Table B.4 Attitude

	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
I am scared of food related to safety issues and the associated risks					
I do not purchase food that has any risks					
I am positively willing to pay more to buy safer food					
Even if there is no conclusive evidence for a certain food, I buy that food as usual					
I do not care about food safety issues because every food has risks and it is a matter of degree					
Although there was a controversy over certain food, I buy that food if its safety is certified by an authorized institutes					

Table B.5 Purchasing Intention.

Read articles and answer the questions.

<Case 1>

Beef tallow issue

In 1989, five food manufacturers were placed under arrest since they used "industrial beef tallow" to produce instant noodles. This imported "industrial beef tallow" from U.S. was obtained from healthy beef identified by USDA's inspection. Although it was classified as non-edible food in U.S., it was refined to food standards of South Korea. In addition, Japan was importing this to eat at that time.

* Beef tallow is refined tallow obtained from a bovine animal to eat

	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
I am willing to purchase the food including industrial beef tallow after reading above article					
The level of my risk perception about industrial beef tallow increased after reading above article					

<Case2>

Is MSG truly detrimental for our health?

Artificial flavor enhancer, MSG, has been a controversial issue for a long time. Korea Food & Drug Administration explained that "MSG can causes side effects if we eat a lot, but it is not dangerous for human health since the side effects are transient responses disappearing with two hours". In addition, Joint FAO/WHO Codex Alimentarius Commission abolished an existing permissible amount since its toxicity is low.

	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
I am willing to purchase the food containing MSG after reading above article					
The level of my risk perception about MSG increased after reading above article					

<Case 3>

What is the "Pus Milk" reported by media?

In 1995, not only consumers got into a panic, but also milk consumption dropped off sharply since TV news reported that "Gargety cows were producing milk containing pus". However, it was reported by experts that as normal milk, not "*Pus milk*". Generally, the number of somatic cells in milk from healthy dairy cows is around 100,000-200,000/ml and is comprised of 60% of epithelial cells and 40% of white corpuscles. White blood cell classified as a part of somatic cell plays a role as a protector against invasion of virus and exists in meet we eat every day. Also, a small quantity of pus in milk becomes extinct automatically by self-purification of milk. Although milk contains pus at the first time of production process, pus is eliminated during the processes that collecting and filtering. Therefore, milks come on the market do not contain pus.

	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
I am willing to purchase the food including Pus-milk after reading above article					
The level of my risk perception about Pus-milk increased after reading above article					