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The Effects of Trust in Food Label Information and Negative Emotions about Food on Safety Behavior among Adult South Korean Consumers

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Abstract

This study set out to investigate the effects of consumers' emotions about food safety and their trust in food labeling as one of the government policies affecting safety behavior. It is found that consumers' trust in label information and their negative emotions turned out to be important factors influencing their food safety behaviors. In addition, their food safety attitudes and negative emotions turned out to have huge impacts on their food safety behavior. Substantial levels of negative emotions and label checking behaviors were also reported. The findings raised a need for the government to manage and monitor food label information in a regular and efficient manner, develop an effective labeling system, and identify factors to control consumers' negative emotions.

Key words: trust in label information, negative emotion, food safety perception, food safety attitude, food safety behavior

Ⅰ. Introduction

Every year the press media deliver coverage on a good number of life safety accidents to consumers and report on marketed goods in current affairs programs. In South Korea with especially low food independence and high percentage of imported foods, consumers have taken considerable interest in food safety after food safety accidents year after year. They have increasingly greater expectations for food safety due to the rising economic level, but the reality has failed to meet their expectations. Consumer complaints and mistrust are more prevalent in the food industry than others.

Food accidents have huge influences on consumers, corporations, and the government. Consumers get to have psychological anxiety about food. Corporations get a blow including a lower recognition level and dropping sales. The government is bombarded with criticisms from people that develop a doubtful attitude toward the government policies. In a food environment that

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does not guarantee 100% food safety, information about harmful food is very beneficial to consumers and their safe food life. Since there are limitations with making an inquiry into a vast amount of information about harmful foods for themselves, consumers get to depend on the label information marked on the product package or container(Yoo, Hwang, & Song, 2014) for the efficiency and implication of label information. Consumers are easily exposed to label information at the time of purchase and can obtain a large amount of information within a short period of time through the diagrams and keywords of labels.

A series of labeling violations took place recently: some packed lunch manufacturers offered wrong manufacturing dates on the package(Newsis, November, 2014), and stores selling adulterated food were uncovered in the Green Food Zone designated for food safety protection(JoongAng Ilbo, November, 2014). Based on the data about the crackdown performance and action regarding the place of origin for the last five years obtained by Kim Jong-hoi, a member of National Assembly on the Agriculture, Food, Rural Affairs, Oceans, and Fisheries Committee, from the Ministry of Agriculture, Food and Rural Affairs, it was found that the government cracked down on 19,425 companies between 2014 and July, 2018 and reported that 12,104 were arrested for criminal charges regarding a false origin mark, 475 were reported to the police, and 6,846 were fined for not offering an origin mark(Chonbuk Domin Ilbo, October, 2018). There have been cases of false labeling and advertising regarding additives (Financial News, February, 2017) such as "vitamins made of 100% natural ingredients" and "There is not even 0.1% of chemical additive in this product." These cases indicate that consumer trust is labeling information is threatened. Positive expectations, one of fundamental elements of trust, have impacts on risk perceptions(Kim, Lee, & Kim, 2003), which indicates that consumers' trust in label information makes a critical factor of their food safety life.

Consumers' anxiety, a negative emotion, about food safety accidents causes negative consequences including social confusion, but the Cognitive-Functional Model maintains that when people are threatened for their physical safety, they have fear and are motivated to engage in protective acts. The theory is worth noticing in that it argues negative emotions motivate people to protect themselves and thus facilitate their safe acts. All emotions can be a motive to cause certain acts(Lazarus, 1991), which raises a need to pay attention to consumers' negative emotions as an antecedent of safe acts.

It is thus estimated that consumers' trust in food label information and their negative emotions will have effects on their safety behavior. The present study thus investigated the effects of their trust in food labels and negative emotions about food safety on their safety behavior, identified the factors to facilitate their food safety behavior, and provided some data that would serve as grounds for consumers' safe dietary life.

II. Literature Review

1. Trust in Labeling Information and Understanding of Emotions and Safety Awareness and Behavior

1) Trust in Labeling Information

Labeling refers to characters or figures made by corporations on product containers or packages

(including supplements and contents) to inform consumers of information about the content and trade conditions of a product or service and about the corporations themselves(Act 2 of Fair Labeling and Advertising Act). Labeling information helps consumers choose a product fit for themselves on their own(Lee & Lee, 2014), thus providing them with very important information. How much consumers trust labeling information has huge impacts on their decision-making. Their mistrust in food labeling information(e.g. nutrition information and origin marks) becomes a threat to food safety(Yoo & Joo, 2012).

From a psychological perspective, trust is defined as a generalized expectation that one can rely on what other individuals or groups have promised in language or sentences. From an economic perspective, trust is defined as a personal prediction or expectation tendency for outcomes in a risky situation. From a social perspective, trust is defined as confidence in the relations of actors whose trust formation is in exchange and the general conditions around them including social rules, norms, conventions, and history understood as the characteristics of social relationships(Ma & Lee, 2012).

In advertising, trust has been measured on a binary system in most cases: whether consumers trust the given item or not(Menon, Deshpande, Perri & Zinkhan, 2002). Measuring consumer trust in sources of information, Kim, Yoo, & Song(2017) measured the trust level of an object on a 5-point Likert scale.

2) Negative Emotions

In a risky situation, consumers have such emotions as fear and anxiety. Consumer anxiety derives from the uncertainty of outcomes of a choice when they are in a situation of choosing goods(Taylor, 1974; Bauer, 1960). Fischer(1970) reported that consumers made free choices in the market but had anxiety in a situation where they had to be responsible for all the outcomes of their choices. That is, negative emotions are fear and anxiety that consumers have in a risky situation.

Investigating the optimistic inclination and anxiety of consumers, Yoo & Song(2016) measured the anxiety level of an object on a 5-point Likert scale. There are several researches on consumer anxiety about food(Song & Yoo, 2016; Kim, Yoo, & Song(2017) that measured the consumer anxiety levels of objects.

3) Safety Awareness

Safety awareness is mainly divided into subjective and objective awareness. Objective awareness of risk(safety) understands risk based on the combination of probability of a harmful result and its severity. Subjective awareness of risk, on the other hand, starts with the idea that the old approach to risk awareness is too scientific and objective and thus far from proper. Subjective awareness of social safety is measured on the personal subjective awareness of objective sources of risk(Short, 1984; Seol, 1998), which is based on a finding that danger was objective reality, whereas risk was created socially. Safety awareness is a matter of science essentially and, at the same time, matter of subjective judgment based on the combination of psychological, social, cultural, and political factors(Slovic, 1999).

Food safety awareness is a subjective evaluation of the overall safety level of an environment in

which consumers are exposed to food. Hwang (2009), Park & Kim(2011), and Choe, *et. al.*(2005) measured the judgment level of food safety on a 5-point Likert scale to figure out consumers' food safety awareness.

4) Safety Attitude and Behavior

Attitude is an inclination of making consistent favorable or unfavorable reactions to a certain object based on past experiences and represents the overall evaluation of the object as well as its positive or negative feelings(Aaker, 1991). That is, attitude is measured as an overall positive or negative assessment of a certain object(Lee, Ahn, & Ha, 2012). Attitude causes behavior or is closely related to it(Park, 1991). Safety behavior refers to a series of action that individuals take to secure their safety(Neal, Griffin, & Hart, 2000; Garavan & O'Brien, 2001). Lee & Kim(1998) defined consumer safety behavior as a series of action that consumers took across the entire consumption process from consideration before purchase to use after purchase to secure their safety and measured consumer behavior by the purchase stages. Based on these definitions in previous studies, consumer safety behavior can be defined as a series of action that consumers take to secure their personal safety in certain consumption activities. The level of safety behavior that they can perform before, during, and after purchase can be measured.

2. Relations among Trust in Labeling Information, Emotions, and Consumers' Perception and Action

1) Trust in Labeling Information and Consumers' Perception and Action

It has been reported that trust has positive effects on consumer behavior(Cook & Wall, 1980; Kanter & Mirvis, 1989; Podsakoffetal, 1990; Pillaietal, 1999; Wagner & Rush, 2000; Ma & Lee, 2012). Positive expectations, one of fundamental elements of trust, have impacts on risk perceptions(Kim, Lee, & Kim, 2003). Trust increases consumers' expected profits, thus affecting their recognition, perception and safety behavior(Gwon, 2005; Park, 1999). Williamson(1993) categorized consumer behavior according to trust and mistrust and reported that they engaged in risk-avoiding, risk-neutral, and risk-taking behavior according to their expected profits and that trust had influences on people's safety behavior. Song & Yoo(2014) reported that consumers' trust in food safety information had decisive effects on their food safety behavior. Those reports suggest that people's expectations based on trust can cause subsequent emotions and have influences on their risk perception and behavior.

Consumers need to have access to information about the right safety behavior to conduct acts in pursuit of safety in daily life, but the reality depicts a different picture of very low accessibility to safety information most of which is provided by providers(Song & Yoo, 2014). Consumers are directly exposed to label information at the point of purchase, and a label offers the most accessible information to consumers and is their most favorite source of information(Song & Yoo, 2014), which suggests that consumers' trust in label information can be an important motivator of their safety behavior. The present study thus set a hypothesis that consumers' trust in label information would have effects on their emotions and safety perception and behavior.

2) Consumers' Negative Emotions, Safety Perception, Attitude and Behavior

Many researches have demonstrated that emotions not only have impacts on human cognition and decision making, but also affect their risk assessment and acceptance(Fischhoff, *et. al.*, 1978; Slovic, *et. al.*, 1991). Consumers' emotions have impacts on their safety behavior, which is explained with the Cognitive-Functional Model of Navi (2003), the Protection Motivation Theory of Roger(1975), and the Extended Paralleled Process Model of Witte(1996). The Cognitive-Functional Model explains that when human beings are threatened for their physical safety, they feel fear and are thus motivated to engage in protective behavior, which indicates that emotions can have influences on consumers' safety behavior.

The Protection Motivation Theory maintains that when a message of fear appeal makes people vulnerable to a serious threat and believe that the recommended response will protect them from the threat, it means they are motivated to engage in certain behavioral changes. The argument is in line with Lazarus(1991) who argued that all emotions are associated with a tendency of motivating certain acts and that when some emotions are caused, they can be translated into certain acts right away.

The Extended Paralleled Process Model explains that when people experience their fear going away after certain acts to reduce or eliminate the fear, the acts will become a reward for the fear. If such a reward happens on an ongoing basis, the acts will become a learned habitual response to the health threat(Witte, *et. al.*, 1996).

In addition, Janis(1967) argued that an anxious emotion of possible exposure to a risk due to certain acts should affect the behavioral intention of avoiding the acts or conducting them carefully, explaining that negative emotions had impacts on safety behavior.

Those previous studies report that negative emotions about something can have effects on human cognition, risk assessment, decision making, and self-protective behavior. Lazarus (1991) reported that emotions have direct influences on human behavior. The present study thus set another hypothesis that consumers' negative emotions would have effects on their safety perception, attitude, and behavior. This theory demonstrates that emotions have influences on the perceptions, attitudes, and acts of consumers. Investigating relations among the emotions, attitudes, and intentions of consumers by applying Plutchik(1980)'s multi-dimensional model of emotions, Song, *et. al.*(2011) divided human emotions into positive and negative ones and argued that the directionality of emotions' impacts should vary according to this distinction. Negative emotions have positive effects on the negative awareness of risk, but the present study has found that negative emotions are connected to the positive awareness of safety, thus having negative(-) directionality.

3) Consumers' Safety Perception, Attitude, and Behavior

There are many studies that investigated connections among the perceptions, attitudes, and behaviors of consumers. The present study decided to focus on their connections only in the field of food.

Song & Yoo(2008) conducted a behavioral

research on food safety and reported that perceived risks and safety awareness had effects on safety pursuit behavior, dividing safety awareness into safety orientation and perception of safety issues. The present study defined safety orientation as a value tendency of consumers granting interest and value to general safety. Kim(2007) reported that when consumers had much perception or interest in food-related risk factors, they had an active attitude toward food safety. Those two previous studies show that consumers' safety perception affect their safety orientation and behavior and that their safety orientation affects their safety attitude.

Yoo & Joo(2012) identified consumers' food safety attitude as an element to drive their subjective emotions, perceptions, and actions and demonstrated that their food safety attitude had effects on their safety behavior through structural equation modeling analysis.

Ⅲ. Methods

1. Research Hypotheses and Models

Under the goal of investigating the effects of consumers' emotions about food safety and their trust in food labels on their safety behavior, the investigator set the following research hypotheses and developed a research model of 〈Figure 1〉 according to the hypotheses:

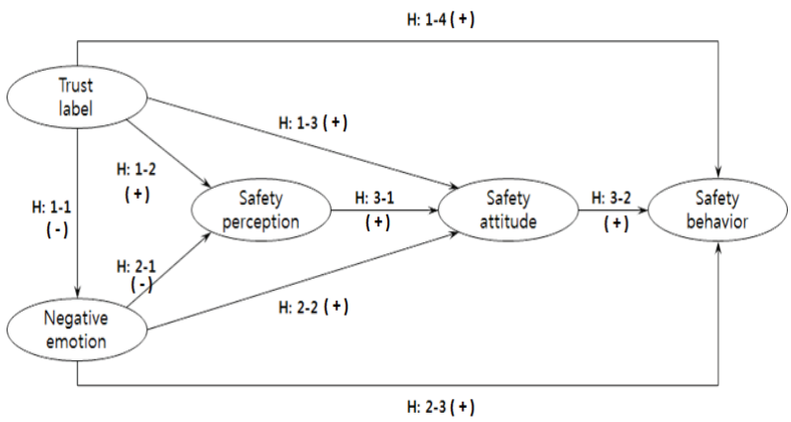

Figure 1. Research model

2. Methodology

An online survey was conducted with 1,000 food consumers in the nation to figure out consumers' trust in food labels, their negative emotions, and their safety perception, attitude, and behavior.

Research Hypothesis 1. Influences of consumers' trust in label information
[1-1] Consumers' trust in label information will have negative effects on their negative emotions.
[1-2] Consumers' trust in label information will have positive effects on their food safety perception.
[1-3] Consumers' trust in label information will have positive effects on their food safety attitude.
[1-4] Consumers' trust in label information will have positive effects on their food safety behavior.

Research Hypothesis 2. Influences of consumers' negative emotions
[2-1] Consumers' negative emotions will have negative effects on their food safety perception.
[2-2] Consumers' negative emotions will have positive effects on their food safety attitude.
[2-3] Consumers' negative emotions will have positive effects on their food safety behavior.

Research Hypothesis 3. Influences among the safety perception, attitude, and behavior of consumers
[3-1] Consumers' safety perception will have positive effects on their safety attitude.
[3-2] Consumers' safety attitude will have positive effects on their safety behavior.

Macromill Embrain, an online survey specialist, was commissioned to conduct the survey in October and November, 2012. Analysis was performed with the SPSS 18.0 and AMOS 18.0 programs. Data was provided by a survey specialist after primary data cleaning. Once it was confirmed that there was no missing data or outlier, all of 1,000 samples were used in analysis.

3. Descriptive statistics for demographics variables

〈Table 1〉 shows the descriptive statistics for demographic variables. Purposive quota sampling was carried out according to gender, area, and age based on the population ratio of South Korea to represent the entire adult population of the nation. The final group of subjects consisted of men at 52.0% and women at 48.0%. The age distribution was even as the age groups from the former half of the twenties to the latter half of the forties were in the range of 13~19%. The subjects from Gyeonggi/Incheon accounted for the biggest portion at 26.6%, being followed by those from Gyeongsang at 26.0%. The subjects with an office occupation accounted for the biggest percentage at 37.8%. The subjects that were married and single accounted for 55.6% and 44.4%, respectively. The subjects that graduated from a four-year college accounted for the biggest

Table 1. Descriptive statistics for demographic variables

variables	frq	%	variables	frq	%
total	1,000	100.0	-	-	-
gender			marriage		
men	520	52.0	married	556	55.6
women	480	48.0	single	444	44.4
age			education		
20-24	135	13.5	≤ high school	3	.3
25-29	165	16.5	high school graduate	253	25.3
30-34	173	17.3	2-year college graduate	192	19.2
35-39	180	18.0	4-year college graduate	466	46.6
40-44	190	19.0	master	65	6.5
45-49	157	15.7	doctor	21	2.1
area			health status		
Seoul	203	20.3	very healthy	72	7.2
Gyeonggi/Incheon	266	26.6	generally healthy	501	50.1
Chungcheong/Daegeon	143	14.3	normal	354	35.4
Jeonla, Jeju	128	12.8	weak	69	6.9
Gyeongsang	260	26.0	unhealthy	4	.4
job			annual salaries		
specialized job	94	9.4	s 〈 10 million won	43	4.3
office accupation	378	37.8	10 ≤ s 〈 30 millilon won	258	25.8
technical position	87	8.7	30 ≤ s 〈 50 millilon won	388	38.8
sales and service	63	6.3	50 ≤ s 〈 70 millilon won	199	19.9
self-employment	50	5.0	70 ≤ s 〈 100 millilon won	101	10.1
housewife	140	14.0	100 millilon won ≤ s	11	1.1
studuent	136	13.6			
etc	52	5.2			

percentage at 46.6%, being followed by the subjects that graduated from high school at 25.3%. As for health status, 50.1% said that they were generally healthy. As for annual salaries, 38.8% and 25.8% said they earned 30~50 million won and 10~30 million won, respectively.

4. Elaboration of Inventories

Parts of Inventory on Consumers' Food Safety Perceptions and Capabilities by Yoo & Joo(2012) were revised and supplemented to develop an inventory for the study. The inventories are found in 〈Table 2〉. The trust inventory consisted of items based on the eight types of food label information that consumers usually checked when making a food purchase in daily life. The negative emotions inventory consisted of total eight items of consumer anxiety according to the food categories. The safety perception inventory consisted of total six items on whether food was produced and distributed in a safe manner for consumers. The food safety attitude inventory consisted of total five items to measure the levels of education, avoidance, interest, information search, and harmful effects confirm. Finally, the food safety behavior inventory consisted of total 13 items on acts to avoid harmful food, safety behavior before purchase, and safety behavior before cooking, and so on. All the measurements were based on a 5-point Likert scale.

Exploratory factor analysis was conducted to

Table 2. Development of variable

code	scale	code	scale
trust label		safety attitude	
a1	expiration date	d1	education
a2	manufactured date	d2	avoidance
a3	homemade		
a4	area of product	d3	interest
a5	nutrition element		
a6	additives	d4	information search
a7	GMO		
a8	advertisement	d5	harmful effects confirm
consumers' negative emotion(anxiety)		food safety behavior	
b1	imported food	e1	avoiding hazardous food
b2	fast food	e2	checking expiration date before purchasing
b3	meat product	e3	checking safety recipe
b4	frozen food	e4	checking the hygiene of the cooker
b5	instant food	e5	checking expiration date before cooking
b6	processed food		
b7	food eating out	e6	checking of the state of packing
b8	chemicultivation	e7	checking of the area of product
safety perception		e8	checking ot he organic food
c1	livestock products	e9	checking of the nutrition
c2	agricultural food	e10	checking of the food addictives
c3	processed food	e11	direct dealing
c4	food eating out	e12	self-sufficing
c5	food circulation	e13	checking of the low hazardous food
c6	providing meals		

※ Source: Yoo & Joo(2012).

Table 3. Exploratory analysis and reliability analysis

latent variable	code	factor1	factor2	factor3	factor4	factor5	factor6	h^2	Cronbach's α	remove
trust the label	a6	.837	−.025	.048	.022	.079	.126	.726	.918	
	a5	.820	−.076	.114	.036	.164	.051	.723		
	a3	.783	−.068	.084	.070	.182	−.017	.664		
	a4	.775	−.030	.113	.098	.184	.021	.658		
	a2	.767	−.056	.155	.030	.144	−.209	.680		
	a7	.765	−.042	.013	−.016	.099	.175	.628		
	a1	.753	−.045	.106	.041	.146	−.215	.650		
	a8	.702	−.042	−.013	−.074	.176	.232	.585		
negative emotions (anxiety)	b3	−.051	.818	.140	.114	−.144	.071	.731	.907	
	b6	−.053	.817	.144	.115	−.124	.037	.721		
	b5	−.041	.795	.139	.142	−.110	.033	.687		
	b4	−.076	.781	.101	.051	−.142	.168	.676		
	b2	−.005	.752	.130	.150	−.077	−.031	.612		
	b7	−.036	.748	.004	.119	−.140	.121	.609		
	b1	−.018	.670	.105	.149	−.038	−.129	.500		
	b8	−.104	.616	.092	.165	−.045	.142	**.448**		b
act of checking the label	e2	.109	.118	.795	.130	.018	−.038	.677	.852	
	e5	.125	.075	.793	.137	−.028	−.141	.689		
	e6	.053	.126	.784	.157	.011	.045	.660		
	e4	.065	.122	.684	.213	.001	.134	.551		
	e1	.041	.069	.662	.058	.055	−.113	**.464**		b
	e3	.097	.159	.587	.155	.066	.184	**.441**		b
	e7	.121	.232	.580	.320	−.004	.354	.632		
safety attitude	d3	−.034	.211	.204	.800	.021	.025	.729	.866	
	d2	.043	.203	.105	.759	.057	.108	.645		
	d4	−.021	.179	.139	.740	−.006	.285	.681		
	d5	.113	.162	.268	.731	−.054	.244	.708		
	e13	.057	.165	.315	.546	.052	.210	**.474**		b
	d1	−.036	.300	.260	**.369**	−.011	−.303	**.387**		ab
safety perception	c3	.175	−.154	−.029	−.004	.794	.078	.693	.862	
	c4	.127	−.193	.008	−.017	.771	.081	.655		
	c5	.147	−.162	−.028	−.041	.768	.173	.671		
	c2	.276	−.068	.092	.055	.753	−.072	.664		
	c6	.121	−.169	−.023	.052	.662	.121	.500		
	c1	.249	.013	.116	.018	.655	−.121	.519		
act of checking the ingredient	e12	−.031	.017	−.201	.088	.118	.676	.520	.826	c
	e11	.007	.090	.050	.324	.114	.660	.564		
	e8	.088	.222	.308	.355	.106	.590	.637		
	e10	.131	.161	.347	.455	−.069	.535	.662		
	e9	.207	.119	.349	.428	−.007	.511	.623		
eigen−value		8.913	7.002	2.969	2.532	2.085	1.242	−	−	−
% variance		22.282	17.504	7.424	6.330	5.213	3.106	−	−	−

a. factor loading 〈 .5
b. h^2〈 .5
c. lower Cronbach's α

classify those inventories(〈Table 3〉). The factors of eigen value of 1 or higher were identified. Analysis was carried out in the principle component analysis method and Varimax. As a result, an inventory of total six factors was classified. The factors were as follows:

First, Factor 1 contained all the items about trust in labels. Second, Factor 2 was classified into the items about consumers' negative emotions. 'b8' was eliminated as it was under the commonness threshold. Third, Factor 3 was classified into total seven items of safety behavior. Since the items of Factor 3 were related to consumers checking a food label, it was called the act of checking the label(act of L). 'e1' and 'e3' were eliminated as they were under the commonness threshold. Fourth, Factor 4 was classified into the items of safety attitude. 'e13' on safety behavior was eliminated as it was under the commonness threshold. 'd1' was eliminated as it was under the factor load and commonness threshold. Fifth, Factor 5 contained items of safety perception. Finally, Factor 6 consisted of some safety behavior items. Since the items were related to consumers checking the ingredients including additives and nutrients, the factor was called the "act of checking the ingredients(act of I)."

The reliability coefficient of Cronbach's α was examined to test the reliability of each factor. Only the "e12" item about the act of checking the ingredients turned out to lower reliability and was thus eliminated. Except for that one, all the factors recorded a reliability coefficient of 0.8 or higher, which means that the reliability of inventory was guaranteed.

Finally, confirmatory factor analysis was conducted to test the reliability and validity of inventory. The analysis result show that 'a1', 'b1', and 'e7' lowered the fitness of the model and were thus eliminated. After their elimination, the χ^2 value was 1366.871, which was statistically significant and thus proved the fitness of the model. The RMR index was .035 under .5, GFI(.916), AGFI(.900), CFI(.948), and IFI(.948) were all over .9. In addition, construct reliability(CR) and average variance extracted(AVE) were examined to check the convergent validity of inventory. The results show that CR was over .8 in all the cases and that AVE was over .5, thus meeting the threshold requirement(〈Table 4〉). Finally, SMC and AVE were compared to examine the discriminant validity of inventory. As SMC was lower than AVE in all the potential factors, the discriminant validity of inventory was secured.

Table 4. Construct Reliability(CR) and Average Variance Extracted (AVE)

latent variable	CR	AVE	latent variable	CR	AVE
trust label	.915	.609	safety attitude	.894	.679
negative emotion	.938	.686	act of L	.883	.656
safety perception	.906	.661	act of I	.818	.538

Ⅳ. Results

The mean of each potential factor was analyzed to examine consumers' food safety levels(〈Table 5〉). The analysis results show that they recorded a relatively good level of trust in label information at 3.328, a relatively high level of emotions at 3.747, a low level of safety perception at 2.767, an average level of safety attitude at 3.190, a very high level of act of checking the label at 4.147, and an average level of act of checking the

Table 5. The mean of each latent variable

latent variable	mean	s.e	var	latent variable	mean	s.e	var
trust label	3.328	.766	.587	safety attitude	3.190	.747	.557
negative emotion	3.747	.650	.423	act of L	4.147	.700	.490
safety perception	2.767	.640	.410	act of I	3.079	.823	.677

ingredients at 3.079.

Under the goal of investigating the effects of consumers' trust in label information and their negative emotions on their safety behavior, the present study set a research model according to the research hypotheses and conducted structural modeling analysis(〈Figure 2〉 and 〈Table 6〉). As for the fitness of the research model, its χ^2 value was 1369.095 and statistically significant; its RMR, GFI and AGFI were 0.035, .916, and .900, respectively; and the other fitness indexes were all over .9. As a result, the research model was judged to be statistically fit.

The findings of the research model were as

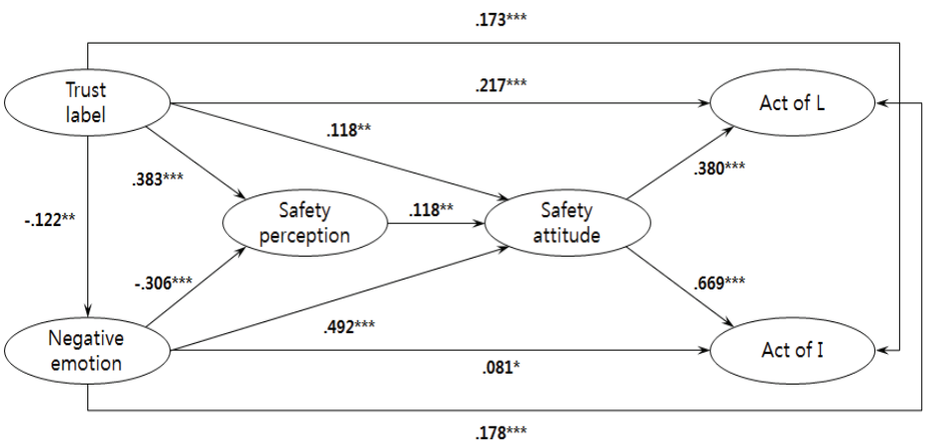

Figure 2. Result of path analysis

Table 6. Result of path analysis

path				est	st.est	S.E.	t-value
[1-1]	trust label	→	negative emotion	-.088	-.122	.025	-3.487***
[1-2]		→	safety perception	.319	.383	.031	10.289***
[1-3]		→	safety attitude	.137	.118	.043	3.21**
[1-4-1]		→	act of L	.214	.217	.034	6.373***
[1-4-2]		→	act of I	.189	.173	.032	5.926***
[2-1]	negative emotion	→	safety perception	-.356	-.306	.042	-8.515***
[2-2]		→	safety attitude	.796	.492	.068	11.787***
[2-3-1]		→	act of L	.246	.178	.052	4.721***
[2-3-2]		→	act of I	.124	.081	.048	2.549*
[3-1]	safety perception	→	safety attitude	.164	.118	.056	2.954**
[3-2-1]	safety attitude	→	act of L	.325	.380	.034	9.563***
[3-2-2]		→	act of I	.632	.669	.039	16.021***

Table 7. Decomposition of correlation

latent variable	trust label			negative emotion			safety perception			safety attitude	
	D	I	T	D	I	T	D	I	T	D	T
negative emotion	−.122	−	−.122	−	−	−	−	−	−	−	−
safety perception	.383	.037	.420	−.306	−	−.306	−	−	−	−	−
safety attitude	.118	−.011	.107	**.492**	−.036	.456	.118	−	.118	−	−
act of L	.217	.019	.236	.178	.173	**.352**	−	.045	.045	.380	**.380**
act of I	.173	.062	.235	.081	.305	**.386**	−	.079	.079	.669	**.669**

D: standardized direct effect
I: standardized indirect effect
T: standardized total effect

follows: first, the more trust consumers had in label information, the less negative emotions they had about food safety. Second, consumers' trust in label information had positive effects on their safety perception, attitude, and behavior(acts of checking the label and ingredients). Third, consumers' negative emotions had negative effects on their social food safety perception. Fourth, consumers' negative emotions had positive effects on their safety attitude and behavior(acts of checking the label and ingredients). Finally, consumers' safety perception had positive effects on their safety attitude, which in turn had positive effects on their safety behavior. Those results indicate that all the research hypotheses set in the study were adopted.

There are various previous studies that demonstrated the effects of consumers' safety perception and attitude on their food safety behavior. The present study demonstrated that consumers' trust in label information and negative emotions were important factors to influence their food safety behavior.

The investigator examined direct and indirect effects and total effects between the latent variable to identify the factors of the greatest effects on consumers' food safety behavior(〈Table 7〉), finding that consumers' food safety attitude had the biggest effects on their safety behavior. Their food safety attitude especially had high impacts on their act of checking the ingredients. In addition, consumers' negative emotions also had great direct and indirect effects on their safety behavior and high direct impacts on their safety attitude. Those findings indicate that consumers' safety attitude and negative emotions are very important factors to lead to their food safety behavior.

V. Conclusions and Implications

Every year the press media deliver coverage on a good number of life safety accidents to consumers and report on marketed goods in current affairs and refinement programs. Food safety accidents, in particular, become an issue year after year, which has raised consumer anxiety to the highest level. Consumers tend to depend on the label information on the product packages or containers to get food safety information and thus protect themselves from harmful foods. The present study thus set out to investigate the effects of consumers' emotions about food safety and their trust in food labels on their safety behavior.

The findings led to the four following implications:

First, consumers' trust in label information and their negative emotions about food turned out to be important factors to influence their food safety behavior, which raises a need for efforts to facilitate their food safety behavior including plans to increase their trust in label information and follow-up studies to help them regulate their negative emotions. There is a special need to introduce a system of managing and supervising the origin marks and GMO labeling that have been a problem in order to ensure trust in labeling information.

Second, consumers' food safety attitude and negative emotions turned out to have huge effects on their food safety behavior. Their negative emotions especially had great direct effects on their food safety attitude, which reconfirms the importance of negative emotions. And the study examined the mean of each potential factor and found that negative emotions recorded a high mean. Considering that consumers' negative emotions have positive effects on their food safety behavior and attitude, it seems that consumers tend to show a higher level of safety attitude and behavior according to increasing negative emotions because they are motivated to protect themselves by distancing themselves from the stimuli leading to negative emotions. It is in line with the Negative State Relief(NSR) model, which argues that people are urged to reduce negative emotions essentially (Carlson & Miller, 1987), and Nabi(2003), who argued that when people are threatened for their physical safety, they feel fear and thus are motivated to protect themselves. That does not mean, however, that consumers should maintain a high level of negative emotions to facilitate their food safety behavior since it can impose emotional labor on individual consumers and cause social costs due to social confusion. It is necessary to distinguish beneficial negative emotions from harmful ones like in the Anger Activism Model in order to keep the proper level of negative emotions. Additional researches are needed to identify factors to distinguish beneficial negative emotions from harmful ones and control harmful negative emotions.

Finally, consumers scored very high mean 4.147 points on the act of checking the label. Considering Yoo, Hwang, & Song(2014), which reported that consumers regarded the label information on the product packages and containers as their favorite source of information, and the level of act of checking the label reported in the present study, consumers seem to have a very high degree of dependence on label information. Their trust in label information was average 3.328, which calls for efforts to improve their trust in label information including the government's regular and efficient management and monitoring of label information and the development of labels to have consumers exposed to label information effectively.

The present study shed light onto the effects of consumers' trust in label information and their negative emotions about food to facilitate their food safety behavior, thus contributing to their safe food life. As mentioned above, however, the implementation of safe food society demands follow-up researches on consumer education and promotion about food labeling, development of an efficient label, and factors to control negative emotions.

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