Original Article

A Model for Predicting Attitudes toward Foodstuffs Produced in Radioactively Contaminated Areas: An Examination Based on the Fundamental Motive Framework [1) 2)]

HANITA Kenji (*Tokyo Future University*)

The reputational risk associated with foodstuffs produced in Fukushima, an area contaminated by radiation due to the Fukushima Daiichi Nuclear Power Station accident, remains unresolved even more than a decade after the accident. Previous research has demonstrated that purchase intentions for agricultural and fishery products from Fukushima are directly influenced by "anxiety over radiation and nuclear power" and "support for quake-hit areas," which are associated with System 1 in dual-process theories. This study examines whether evolved motive systems are involved in these factors. The results of an online survey (N = 526) revealed that Disease Avoidance motive increased anxiety over radiation and nuclear power and reduced purchase intentions for agricultural products from Fukushima, while Affiliation motive increased support for quake-hit areas and promoted purchase intentions. Moreover, Kin Care motive had a similar effect as Affiliation motive. Finally, the roles of evolutionarily shaped motives in either perpetuating or mitigating reputational risk were discussed.

Keywords: **reputational risk, Fukushima Daiichi nuclear accident, fundamental motive, disease avoidance, affiliation**

The Fukushima Daiichi Nuclear Power Station accident that occurred in March 2011 caused reputational risk for foods produced in Fukushima Prefecture and adjacent areas. Even in 2023, the prices of some Fukushima foods remained below the nationwide average and had yet returned to pre-disaster levels (Ministry of Agriculture, Forestry, and Fisheries, 2024). More than a decade after the disaster, reputational risk still significantly affects Fukushima foods. Social psychological research has revealed the role of aversive attitudes toward Fukushima foods in the reputational risk (e.g., Hori et al., 2017; Kudo & Nakayachi, 2014; Miura et al., 2016). The present study examines whether evolutionarily shaped motives are involved in these attitudes.

Reputational Risk and Dual-Process Theory

Reputational risk is defined as the economic harm resulting from media coverage of incidents, accidents, or disasters, which can lead individuals to view otherwise safe foods or areas as unsafe, subsequently avoiding these products or sightseeing destinations (Sekiya, 2003).Reputational risk may be caused by two factors: the reaction of companies to reduce transactions on the assumption that consumers will not buy their products due to anxiety and the reaction of consumers who avoid purchasing products due to concerns about the place of production (Sekiya, 2003). Most social psychological studies that have examined the reputational risk of Fukushima foods have focused on the latter aspect and explored consumers' attitudes and purchasing behaviors. A key theoretical framework for these studies is the dual-process theory.

Dual-process theories assume that there are two modes of information processing in decision making and social judgments (Chaiken & Trope, 1999; Sloman, 1996; Strack & Deutsch, 2004). One is System 1, which is emotional, intuitive, and automatic, and allows for quick and simplified decisions. The other is System 2, which is logical, rational, and conscious, and allows for reflective and deliberative decisions (Evans, 2008). System 1 requires fewer cognitive resources and is more likely to influence instantaneous actions and behaviors that are difficult to control consciously (e.g., nonverbal behaviors, Dovidio et al., 2002). In contrast, System 2 monitors and controls the judgments made by System 1 (Evans, 2008; Nakayachi, 2010).

Kudo and Nakayachi (2014) explored the psychological processes that lead consumers to restrain their purchases of agricultural products from Fukushima based on the dual-process theory. First,

1) Correspondence concerning this article should be sent to: Kenji Hanita, School of Motivation and Behavioral Sciences, Tokyo Future University, Senjuakebono-machi, Adachi-ku, Tokyo 120-0023, Japan. (E-mail: hanita-kenji@tokyomirai.jp)

2) This study was presented at the 15th Biennial Conference of the Asian Association of Social Psychology held in Hong Kong.

they extracted factors influencing purchase intentions from open-ended descriptions of impressions of agricultural products from Fukushima. Then, they identified two factors, "Anxiety over Radiation and Nuclear Power" and "Support for Quake-Hit Areas," as those involved in System 1, and another two factors, "Knowledge-Based Judgment" and "Rational Judgment," as those involved in System 2. Through structural equation modeling, they found that Anxiety over Radiation and Nuclear Power (hereafter, referred to as "RNP anxiety") reduced the purchase intention for agricultural products from Fukushima, while Support for Quake-Hit Areas (hereafter, referred to as "QHA support") increased the purchase intention. They also found that each of the two factors involved in System 2 controlled System 1 responses and promoted purchase intention indirectly. Hori et al. (2017) reported that a similar process was observed in attitudes toward marine products from Fukushima, and they also found that QHA support mitigated RNP anxiety.

From these findings, it can be said that System 1 responses have a direct effect on the purchase intention for Fukushima foods. Which factors, then, influenced RNP anxiety and/or QHA support in System 1? As shown in previous studies, System 2 is one of them. In addition, if the fundamental factors causing System 1 responses are clarified, it would be expected to provide a better understanding of the maintenance and suppression of the reputational risk of Fukushima foods. Thus, the present study examined the factors that lead to RNP anxiety and QHA support, taking into account the findings of evolutionary psychology.

Evolutionarily Shaped Motives

In recent years, there has been much research in evolutionary psychology that investigates human behaviors and psychological mechanisms from the perspective that the human mind has evolved to cope with the adaptive problems of survival and reproduction in evolutionary adaptive environments (Buss, 2012). In their fundamental motive framework, Griskevicius and Kenrick (2013) argued that motivational mechanisms were evolutionarily selected to cope with the various adaptive problems that arise in group life. In addition, they proposed that such motives include: 1) Self-Protection motive to manage the threat of physical violence, 2) Disease Avoidance motive to manage the threat of infectious diseases, 3) Affiliation motive to form relationships with others in their group, 4) Status Seeking motive to attain a higher position within their group, 5) Mate Seeking motive to attain a reproductive partner, 6) Mate Retention motive to protect their reproductive partner, and 7) Kin Care motive to protect their relatives.

Although RNP anxiety and QHA support affect purchase intentions for Fukushima foods, among the seven motives in the fundamental motive framework, Disease Avoidance motive is assumed to be related to RNP anxiety. Since the Fukushima nuclear accident, the negative impact of radiation exposure on human health has been frequently reported in the media, and so many people have become aware of this. For this reason, concerns about the radioactive contamination of foods are assumed to reflect the motivation to avoid disease. Related to this view, Higuchi and Hanita (2017) demonstrated that reading leaflets explaining the safety of Fukushima foods in terms of radioactive contamination activated the behavioral immune system, a psychological mechanism that has evolved to help individuals avoid disease (Schaller et al., 2010; Schaller & Duncan, 2007).

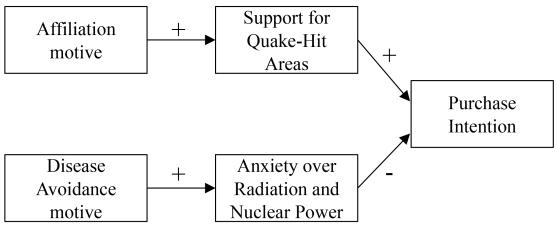
Meanwhile, Affiliation motive is assumed to be related to QHA support. In situations of social exclusion, people try to fulfill their affiliation motive by engaging in greater prosocial behavior (Maner et al., 2007) and working harder on collective tasks (Williams & Sommer, 1997). In other words, the Affiliation motive leads to behaviors aimed at gaining acceptance from others and fitting into social groups. Since QHA support can be seen as a form of helping behavior or prosocial behavior, it is assumed that those who are high in Affiliation motive will be more likely to try to support quake-hit areas.

Purpose of the Present Study

It has been shown that the purchase intention for Fukushima foods, which was affected by the radiation disaster due to the Fukushima nuclear accident, is influenced by factors involved in System 1, such as RNP anxiety and QHA support, and factors involved in System 2, such as Knowledge-Based Judgment and Rational Judgment (Hori et al., 2017; Kudo & Nakayachi, 2014). Focusing on the factors involved in System 1, this study examined how evolved motives can affect these factors. As discussed above, it is assumed that the Disease Avoidance motive would suppress purchase intentions for Fukushima foods through increasing RNP anxiety. Meanwhile, the Affiliation motive would be expected to promote

purchase intensions for Fukushima foods through increasing QHA support. Taken together, the model shown in Figure 1 is proposed. The present study would confirm this model by measuring attitudes toward agricultural products among foods produced in Fukushima as in Kudo and Nakayachi (2014).[3)]

Figure 1
The Hypothetical Model



Although this study focused on Disease Avoidance and Affiliation, other motives in the fundamental motive framework may also be related to attitudes toward Fukushima foods. For example, Miura et al. (2016) reported that people with children had more negative attitudes toward Fukushima foods. If parents avoid food from radiation-contaminated areas to protect their children, Kin Care motive may affect their purchase intention. Thus, this study employs the Fundamental Social Motives Inventory (Neel et al., 2016) to assess individual differences in fundamental motives and examine the relationship between each fundamental motive and attitudes toward Fukushima foods.

Method

Participants

Participants were recruited from monitors registered with "Freeasy," an online survey service operated by iBridge Corporation. The survey was conducted on February 26, 2023, targeting those living in the southern Kanto region (Tokyo, Saitama, Kanagawa, and Chiba) aged between 30 and 59 years. A total of 720 responses were obtained. The participants received reward points for completing the survey.

Procedure

Participants were informed that the survey was about social life and social issues, in which they were asked about their romantic relationships, impressions of Fukushima crops, and so on. Participants were also informed that their responses would be kept anonymous, that the results of the survey would be published academically, that their participation was voluntary, and that they could withdraw their participation at any time. They were then asked whether they agreed to participate in the survey, and only those who agreed proceeded to answer the following questions.

Questionnaire

Personal attributes. Participants were asked whether they had a spouse or romantic partner, and whether they had any children. If they had children, they were also asked how many children they had and whether they had any children in each age group (preschool, elementary school, junior high school, etc.).

Fundamental Motives. Participants completed the Japanese-translated version of the Fundamental Social Motives Inventory (Neel et al., 2016), which was developed to assess individual differences in fundamental motives. This inventory includes seven motives: Self-Protection, Disease Avoidance, Affiliation, Status Seeking, Mate Seeking, Mate Retention, and Kin Care. There are three sub-motives for Affiliation: Group, Exclusion Concern, and Independence; two sub-motives for Mate Retention: General and Breakup Concern; and two sub-motives for Kin Care: Family and Child. Each motive and sub-motive consists of six items (66 items in total), and responses are given on a 7-point scale (1 = *not at all* to 7 = *very much*). Items assessing Mate Retention (General and Breakup Concern) were presented only to those who had a spouse or romantic partner, and items assessing Kin Care (Child) were presented only to those who had children. To detect participants who were unlikely to respond sincerely, a "satisfice item" (Miura & Kobayashi, 2016) was also included, which instructed participants to choose a specific response.

Attitudes toward Fukushima crops. Participants completed a set of questions used by Kudo and Nakayachi (2014). These included 12 items on RNP anxiety, 4 items on QHA support, and 4 items on purchase intentions[4)]. Participants responded to each

3) Among the six key products produced in Fukushima, the prices of four products (rice, beef, peaches, and dried persimmons) remained below the nationwide average and had yet returned to pre-disaster levels (Ministry of Agriculture, Forestry and Fisheries, 2024). Since most of the low-priced products were agricultural products, the Fukushima foods examined in this study were limited to them.

item on a 7-point scale (1 = *strongly disagree* to 7 = *strongly agree*).

Result

Analysis Sample and Descriptives

One hundred and eighty-four participants did not respond correctly to the satisfice item. Another 10 participants gave contradictory responses to the questions about their children (e.g., although they had one or more children, they answered "no" to all questions about whether they had a child in each age group). These 194 participants were excluded from subsequent analyses, and the final sample consisted of 526 participants (265 men [50.4%], mean age 45.7, *SD* age 8.35). Among them, 301 (57.2%) participants had a spouse or romantic partner, and 175 (33.3%) had one or more children.

The internal consistency of each subscale was sufficiently high (αs > .75). The scores for each subscale were calculated as the averages of the responses to the corresponding items. Table 1 shows the means and standard deviations of these scores.

Model Validation

Before testing the hypothetical model shown in Figure 1, correlations among the variables in the model were confirmed. Among the subscales of attitude toward Fukushima crops, RNP anxiety correlated negatively with QHA support and purchase intension (r = -.651, -.780, respectively), while QHA support positively correlated with purchase intention (r = .828). Correlations between fundamental motives and attitudes toward Fukushima crops were shown in Table 2. Disease Avoidance motive was positively correlated with RNP anxiety (r = .292) but was not correlated with QHA support (r = -.078). For Affiliation motives, Group and Exclusion Concern were positively correlated with QHA support (rs > .144), while Independence was negatively correlated with RNP anxiety (r = -.166). These results generally confirmed the relationships among the variables assumed in the hypothetical model.

Then, a structural equation modeling (SEM) was conducted to test the hypothetical model. In doing so, Affiliation motive was defined as a latent variable consisting of three sub-motives (Group, Exclusion Concern, Independence). The goodness-of-fit indices were GFI = .859, AGFI = .717, CFI = .754, and RMSEA = .220, indicating that the initial model did not fit well.

Hori et al. (2017) examined purchase intentions for marine products from Fukushima and reported that their model was improved by adding a path in which QHA support affected RNP anxiety. The present study also found a strong negative correlation between QHA support and RNP anxiety (r = -.651). However, while QHA support influences RNP anxiety, it also seems that the opposite is true. Thus, a correlation rather

Table 1
Descriptive Statistics for Each Score

	α	*M*	*SD*
Fundamental Social Motives			
Self-Protection	.797	4.54	0.95
Disease Avoidance	.770	4.61	1.00
Affiliation (Group)	.800	3.91	0.95
Affiliation (Exclusion Concern)	.845	3.94	1.11
Affiliation (Independence)	.866	5.02	1.09
Status Seeking	.756	3.62	0.98
Mate Seeking	.897	2.95	1.37
Mate Retention (General)	.850	4.93	1.18
Mate Retention (Breakup Concern)	.918	3.34	1.33
Kin Care (Family)	.932	5.11	1.34
Kin Care (Child)	.811	5.42	0.99
Attitude toward Agricultural Products from Fukushima			
Anxiety over Radiation and Nuclear Power	.953	3.02	1.31
Support for Quake-Hit Areas	.847	5.05	1.22
Purchase Intention	.942	4.73	1.44

4) Kudo and Nakayachi (2014) also included items on Knowledge-Based Judgments and Rational Judgments, but these items were not employed in this study.

Table 2
Correlations between Fundamental Social Motives and Attitudes toward Agricultural Products from Fukushima

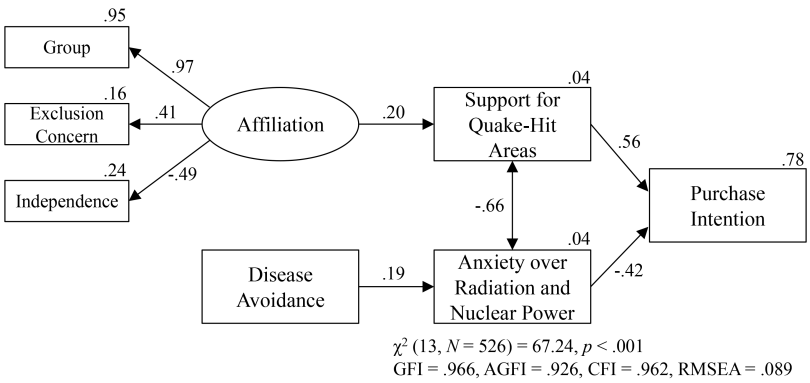
	Anxiety	Support	Purchase Intention
Self-Protection	.170 ***	.045	.006
Disease Avoidance	.292 ***	-.078	-.097 *
Affiliation (Group)	-.002	.211 ***	.164 ***
Affiliation (Exclusion Concern)	.030	.144 ***	.117 **
Affiliation (Independence)	-.166 ***	.067	.104 *
Status Seeking	.117 **	.025	.008
Mate Seeking	.051	-.093 *	-.074
Mate Retention (General)	-.006	.162 **	.096
Mate Retention (Breakup Concern)	.068	-.022	-.018
Kin Care (Family)	-.012	.323 ***	.250 ***
Kin Care (Child)	.120	.222 **	.133

Note . Anxiety = Anxiety over Radiation and Nuclear Power; Support = Support for Quake-Hit Areas
*** $p < .001$, ** $p < .01$, * $p < .05$

than a causal relationship was assumed between these two variables, and the structural equation modeling was conducted again. As a result (see Figure 2), the goodness-of-fit indices were GFI = .966, AGFI = .926, CFI = .962, and RMSEA = .089, indicating that the modified model was acceptable. The AIC also decreased from 396.60 to 97.24, confirming that the model had improved.

As predicted by the hypothetical model, Disease Avoidance motive increased RNP anxiety (β = .192), while Affiliation motive increased QHA support (β = .196). It was also confirmed that RNP anxiety restrained the purchase intention (β = -.416) and QHA support promoted the purchase intention (β = .559). The coefficient of determination for purchase intention was high (R^2= .783), indicating that this model adequately predicted purchase intention for Fukushima crops. The added correlation between RNP anxiety and QHA support showed a strong negative correlation (r = -.665), suggesting a suppressive influence of one on the other.

Figure 2
Effects of Fundamental Motives on Attitude toward Agricultural Products from Fukushima



Note. Values in the upper right corner of each variable are the coefficient of determination (R^2). All path coefficients $p < .001$.

Relationship between Fundamental Motives and Attitudes toward Fukushima Crops

In addition to Disease Avoidance and Affiliation motives, some other fundamental motives were also correlated with attitudes toward Fukushima crops (see Table 2). In particular, Kin Care (Family and Child) motives were positively correlated with QHA support ($rs > .222$), and Kin Care (Family) motive was also positively correlated with purchase intention ($r = .250$). These results suggest that the motive to protect one's family promotes purchase intention for Fukushima foods through increasing QHA support. Indeed, a mediation analysis revealed that the direct effect of Kin Care (Family) on purchase intention ($\beta = .250$, $p < .001$) was no longer significant when the mediation of QHA support was assumed ($\beta = -.021$, $p = .446$), while the indirect effect mediated by QHA support was significant (Sobel $Z = 7.59$, $p < .001$, bootstrapping 95% CI = [.200, .374]). Thus, the effect of Kin Care (Family) on purchase intention was completely mediated by QHA support.

Discussion

This study examined whether evolved motives affect two factors associated with System 1— anxiety over radiation and nuclear power (RNP anxiety) and support for quake-hit areas (QHA support)— which determine purchase intentions for foodstuffs from areas contaminated by radiation due to the Fukushima nuclear accident. As predicted, RNP anxiety was enhanced by Disease Avoidance motive and suppressed purchase intention for Fukushima foods, while QHA support was enhanced by Affiliation motive and promoted purchase intention. In addition, a strong negative correlation was observed between these two factors that directly influenced purchase intention, suggesting a reciprocal relationship in which one suppressed the other.

Disease Avoidance motive was found to reduce purchase intention by increasing RNP anxiety. Higuchi and Hanita (2017) showed that explanations regarding the safety of Fukushima foods serve as cues to activate the behavioral immune system. The behavioral immune system is a psychological mechanism that has evolved to avoid disease, which is related to the Disease Avoidance motive (Griskevicius & Kenrick, 2013). Considering these findings, including the present study, it can be said that negative emotional reactions such as anxiety and concerns about Fukushima foods are largely related to psychological mechanisms designed to avoid disease. The behavioral immune system helps prevent pathogens from infecting the body by evoking a sense of disgust toward others or objects that may carry pathogens and motivating aversive behaviors toward them (Miller & Maner, 2011; Neuberg et al., 2011). It is also believed that evolved psychological mechanisms tend to bias judgments in a manner that prevents people from making errors with a higher risk of survival and reproduction (Haselton & Buss, 2000). For example, errors in mistaking an infected person for a non-infected person are more survival threatening than errors in mistaking a non-infected person for an infected person. Therefore, people are more likely to make errors in identifying non-infected persons as infected (Schaller et al., 2010). Such psychological mechanisms to avoid disease may lead people to perceive Fukushima foods as “unsafe” (even though they are not actually contaminated by radiation) and to induce anxieties and aversions, which in turn may lead to restrained purchases.

Affiliation motive has promoted purchase intentions by increasing QHA support. Participants in this study could see the people in the disaster areas as “fellows” because they lived in the same Japan as themselves, so it was possible to perceive them as in-group members. In addition, Affiliation motive promotes prosocial behaviors that lead to acceptance by others and groups. Reflecting on these psychological processes, it is likely that individuals with a high degree of Affiliation are more likely to support disaster areas and people in those areas.

The effect of QHA support on purchase intention was relatively strong. Also, Affiliation motive, which was a latent variable in the model, had the highest loading on Affiliation (Group) among the three sub-motives. These results indicate that to promote purchases of Fukushima foods, it is effective to enhance the Affiliation motive by considering people in disaster areas as in-group members. Furthermore, it is expected that making the Affiliation motive salient can inhibit the Disease Avoidance motive. There is a trade-off relationship between these two motives, and in situations where the Affiliation motive is pursued (e.g., being socially excluded), responses caused by the Disease Avoidance motive or the behavioral immune system are inhibited (Sacco et al., 2014). Hanita et al. (2017) also demonstrated that in situations where the Affiliation motive was salient, activation of the behavioral immune system did not occur even when

participants read explanations regarding the safety of Fukushima foods. Given these findings, it is likely that activation of the Affiliation motive will increase the willingness to support people in disaster areas as well as weaken anxieties or concerns caused by the Disease Avoidance motive, thus promoting purchases of Fukushima foods.

Among fundamental motives other than Disease Avoidance and Affiliation, Kin Care motives were related to attitudes toward Fukushima foods. Notably, Kin Care (Family) motive was found to promote the purchase intention for Fukushima foods through increasing QHA support. Since Kin Care and Affiliation motives are both related to bonding with others, a similar effect may have emerged regarding attitudes toward Fukushima foods. Nevertheless, each fundamental motive has evolved to cope with different adaptive problems related to survival and reproduction (Griskevicius & Kenrick, 2013). Consequently, even if the Kin Care and Affiliation motives have a similar effect on attitudes toward Fukushima foods, the psychological mechanisms behind them must be distinct. Future research should investigate the factors that moderate or mediate the effects of both motives, and explore the psychological mechanisms involved.

Focusing on agricultural products among Fukushima foods that have suffered from reputational risk, this study revealed that evolutionarily shaped motives are related to two factors, RNP anxiety and QHA support, which directly affect consumers' purchase intentions. The explanatory power for purchase intention in the model presented here is quite high, suggesting that emotional decision-making in System 1 strongly determines the willingness to purchase Fukushima foods. Furthermore, while emotional decision-making in System 1 is controlled by logical decision-making in System 2 (Kudo & Nakayachi, 2014), this study found that it is also affected by motives acquired through evolutionary history, such as Disease Avoidance, Affiliation, and Kin Care. However, the coefficients of determination for RNP anxiety and QHA support in the presented model are small, indicating that other factors (e.g., trait anxiety, empathy) that determine these factors should also be considered in future studies.

Despite these limitations, the findings of this study suggest that not only providing accurate information about radioactive contamination in foods (e.g., Consumer Affairs Agency, 2024), but also presenting messages that intervene in the motives eliciting emotional responses to foods would be effective in reputational risk management and risk communication. As discussed above, messages that make the Affiliation motive salient are thought to be particularly effective, and for example, emphasizing that the people in the disaster area are “fellow Japanese” may prove beneficial. Given the difficulties in decommissioning the Fukushima Daiichi Nuclear Power Station, there is a possibility that new challenges that could flare up reputational risks may arise. Therefore, further clarification of the psychological mechanisms and processes involved in reputational risk, including the effectiveness of the countermeasures suggested in this study will be necessary.

References

Buss, D. M. (2012). *Evolutionary psychology: The science of the mind* (4th ed.). Allyn and Bacon.

Chaiken, S., & Trope, Y. (Eds.) (1999). *Dual-process theories in social psychology.* Guilford Press.

Consumer Affairs Agency (2024). *Q&A on foods and radioactivity*. Consumer Affairs Agency, Japan. Retrieved November 4, 2024 from https://www.caa.go.jp/policies/policy/consumer_safety/food_safety_portal/radioactive_substance/assets/consumer_safety_cms203_240701_01.pdf (In Japanese, translated by the author of this article.)

Dovidio, J. F., Kawakami, K., & Gaertner, S. L. (2002). Implicit and explicit prejudice and interracial interaction. *Journal of Personality and Social Psychology, 82,* 62-68. https://psycnet.apa.org/doi/10.1037/0022-3514.82.1.62

Evans, J. St. B. T. (2008). Dual-processing accounts of reasoning, judgment, and social cognition. *Annual Review of Psychology, 59,* 255-278. https://doi.org/10.1146/annurev.psych.59.103006.093629

Griskevicius, V., & Kenrick, D. T. (2013). Fundamental motives: How evolutionary needs influence consumer behavior. *Journal of Consumer Psychology, 23,* 372-386. https://doi.org/10.1016/j.jcps.2013.03.003

Hanita, K., Higuchi, O., Komori, M., & Takeda, M. (2017). Affiliation goals can buffer against concerns for Fukushima-produced foods. *Japanese Journal of Motivational Studies, 6,* 29-40. (In Japanese with English abstract.)

Haselton, M. G., & Buss, D. M. (2000). Error management theory: A new perspective on biases in cross-sex mind

reading. *Journal of Personality and Social Psychology, 78,* 81-91. https://psycnet.apa.org/doi/10.1037/0022-3514.78.1.81

Higuchi, O., & Hanita, K. (2017). Do the explanations regarding the safety of Fukushima-produced foods ease consumer's concerns about disease? *Japanese Journal of Psychology, 88,* 43-50. https://doi.org/10.4992/jjpsy.88.16004 (In Japanese with English abstract.)

Hori, J., Makino, M., & Horii, T. (2017). The structure of consumer's buying intentions regarding fishery products made in Fukushima Prefecture after the 2011 earthquake off the Pacific coast of Tohoku. *Japanese Journal of Experimental Social Psychology, 57,* 42-50. https://doi.org/10.2130/jjesp.1610 (In Japanese with English abstract.)

Kudo, D., & Nakayachi, K. (2014). Reputational risk caused by The Great East Japan Earthquake: A study on consumer factors leading to restrained buying. *Japanese Journal of Social Psychology, 30,* 35-44. https://doi.org/10.14966/jssp.30.1_35 (In Japanese with English abstract.)

Maner, J. K., DeWall, C. N., Baumeister, R. F., & Schaller, M. (2007). Does social exclusion motivate interpersonal reconnection? Resolving the "porcupine problem." *Journal of Personality and Social Psychology, 92,* 42-55. https://doi.org/10.1037/0022-3514.92.1.42

Miller, S. L., & Maner, J. K. (2011). Sick body, vigilant mind: The biological immune system activates the behavioral immune system. *Psychological Science, 22,* 1467-1471. https://doi.org/10.1177/0956797611420166

Ministry of Agriculture, Forestry and Fisheries (2024). *Report on survey on distribution of agricultural products produced in Fukushima prefecture in Fiscal Year 2023.* Ministry of Agriculture, Forestry and Fisheries, Japan. Retrieved November 4, 2024 from https://www.maff.go.jp/j/shokusan/ryutu/attach/pdf/R5kekka-10.pdf (In Japanese, translated by the author of this article.)

Miura, A., & Kobayashi, T. (2016). Exploring tips to detect "satisficing" in an online survey: A study using university student samples. *Japanese Journal of Social Psychology, 32,* 123-132. https://doi.org/10.14966/jssp.0932 (In Japanese with English abstract.)

Miura, A., Kusumi, T., & Ogura, K. (2016). Four-wave panel survey on attitudes toward foodstuffs from areas contaminated by the Fukushima Daiichi nuclear disaster. *Japanese Journal of Social Psychology, 32,* 10-21. https://doi.org/10.14966/jssp.0928 (In Japanese with English abstract.)

Nakayachi, K. (2010). The theoretical depth and the weight of continuity: Reply to comments from Dr. Nagano. *Japanese Journal of Risk Analysis, 20,* 303-305. https://doi.org/10.11447/sraj.20.303 (In Japanese, translated by the author of this article.)

Neel, R., Kenrick, D. T., White, A. E., & Neuberg, S. L. (2016). Individual differences in fundamental social motives. *Journal of Personality and Social Psychology, 110,* 887-907. https://doi.org/10.1037/pspp0000068

Neuberg, S. L., Kenrick, D. T., & Schaller, M. (2011). Human threat management systems: Self-protection and disease avoidance. *Neuroscience & Biobehavioral Reviews, 35,* 1042-1051. https://doi.org/10.1016/j.neubiorev.2010.08.011

Sacco, D. F., Young, S. G., & Hugenberg, K. (2014). Balancing competing motives: Adaptive trade-offs are necessary to satisfy disease avoidance and interpersonal affiliation goals. *Personality and Social Psychology Bulletin, 40,* 1611-1623. https://doi.org/10.1177/0146167214552790

Schaller, M., Conway, L. G., III, & Peavy, K. M. (2010). Evolutionary processes. In J. F. Dovidio, M. Hewstone, P. Glick, & V. M. Esses (Eds.), *The Sage handbook of prejudice, stereotyping, and discrimination* (pp. 81-96). Sage.

Schaller, M., & Duncan, L. A. (2007). The behavioral immune system: Its evolution and social psychological implications. In J. P. Forgas, M. G. Haselton, & W. von Hippel (Eds.), *Evolution and the social mind: Evolutionary psychology and social cognition* (pp. 293-307). Psychology Press.

Sekiya, N. (2003). Social psychology of "image contamination": The fact of "image contamination" and its mechanism. *Journal of Disaster Information Studies, 1,* 78-89. https://doi.org/10.24709/jasdis.1.0_78 (In Japanese with English abstract.)

Sloman, S. A. (1996). The empirical case for two systems of reasoning. *Psychological Bulletin, 119,* 3-22. https://doi.org/10.1037/0033-2909.119.1.3

Strack, F., & Deutsch, R. (2004). Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review, 8,* 220-247. https://doi.org/10.1207/s15327957pspr0803_1

Williams, K. D., & Sommer, K. L. (1997). Social ostracism by coworkers: Does rejection lead to loafing or compensation? *Personality and Social Psychology Bulletin, 23,* 693-706. https://doi.org/10.1177/0146167297237003

Acknowledgements

This study was supported by JSPS KAKENHI Grant Number 18K13281. I would like to thank Editage (www.editage.jp) for English language editing.

和文要約

福島第一原子力発電所の事故に起因する福島県産食品の風評被害は，発生から10余年が経過した現在でも収束したとは言い難い状況である。先行研究では，福島県産の農作物や水産物に対する購買意図には，二重過程理論におけるシステム1に関連する「放射線・原発不安」と「被災地支援」が直接的に影響していることが示されている。本研究では，これらの要因に進化的に備わった動機システムが関わっているかを検討した。オンライン調査（N = 526）の結果，感染症回避動機は「放射線・原発不安」を高め，福島県産農作物に対する購買意図を抑制する一方で，親和動機は「被災地支援」を高め，購買意図を促進していた。加えて，血縁者保護動機にも親和動機と同様の効果が見られた。これらの研究結果に基づき，進化的に備わった動機が風評被害の維持や抑制に寄与する可能性について議論した。

—2024.11.8 受稿，2024.12.27 受理—