

# **Situational and Dispositional Factors Moderating Three Types of Framing Effects: Mortality Salience and Regulatory Focus**

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# Situational and Dispositional Factors Moderating Three Types of Framing Effects: Mortality Salience and Regulatory Focus<sup>1</sup>

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The present study examined how situational (mortality salience) and dispositional (chronic regulatory focus) factors interact to moderate the effect of framing on decision-making. We classified 236 participants according to chronic regulatory focus and randomly assigned them to a different framing valence (i.e., positive and negative) and a different uncertainty level (i.e., mortality salience vs. control). Participants finished all three framing task types: attribute, goal, and risky-choice frames. Results showed significant three-way interactions in which uncertainty and regulatory focus interact to predict the occurrence of framing effects. The findings indicated that the framing effects varied according to uncertainty evoked by mortality salience and dispositional regulatory focus. The present research highlights the necessity to consider the situational and dispositional factors in order to understand the process in which the effects of framing become apparent.

**Keywords:** decision-making, framing effect, mortality salience, regulatory focus

## Introduction

An extensive body of research has been conducted in the last few decades on the influences of various types of decision framing on an individual's responses. The framing effect is known as a robust psychological phenomenon that people choose different decision-making strategies according to the way a problem is presented to them. Mere changes in the presentation of a problem requiring a decision may influence individual's preference and judgment even if the conditions/parameters are really not changed (Kuhberger, 1998; McElroy & Seta, 2003). People's preference changes when the same decision scenario is framed in different — positive vs. negative — ways (e.g., Tversky&Kahneman, 1981).

In an attempt to better understand the framing effect, Levin, Schneider, and Gaeth (1998) analyzed the various kinds of decision frame that scholars have used to influence participants' decisions and identified three typologies: risky-choice, goal, and attribute framing. The risky-choice framing effect represents that people are inclined to be risk-taking or risk-averse, depending on whether the outcomes or problems are framed either positively or negatively. The attribute framing effect means that people tend to evaluate some characteristics more positively or negatively depending on whether the attribute is framed in positive or negative

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terms. The goal framing effect is that acceptance of a persuasive message depends on whether the message emphasizes the positive consequences or the negative ones of a particular goal.

Numerous studies have shown that the framing effect occurs in a wide variety of contexts including advertising (e.g., Pervan&Vocino, 2008), taxes (e.g., McCaffery& Baron J, 2004), accounting decisions (e.g., Chang, Yen, & Duh, 2002), and medical decisions (e.g., Almashat, Ayotte, Edelstein, & Margrett, 2008). Thus, the accumulation of empirical evidence indicates that the framing effect is a very robust psychological phenomenon. However, not all individuals may be equal within the valence of framing. A meta-analytic study conducted by Kühberger (1998) argued that, although risky-choice framing is generally robust, the size of the effect differs (see also Highhouse & Paese, 1996; Miller & Fagley, 1991; Schneider, 1992; Wang, Simons, & Bredart, 2001). This implies the possibility that some unspecified variables may moderate the magnitude of the framing effects (Simon, Fagley, & Halleran, 2004).

Therefore, an approach to the framing effect is to identify the conditions under which the effects of different types of framing become influential. The present study attempts to examine two factors that moderate the framing effects: situational and dispositional factors. The situational factors the uncertainty elicited by mortality salience, based on the terror management theory (Greenberg, Pyszczynski, & Solomon, 1986). The dispositional factor is regulatory focus.

### *Mortality Salience*

Much research on decision making has argued that an uncertain situation has a critical influence on one's judgment and decision making (see Weber & Johnson, 2009 for a review). Under an uncertainty condition, people rely on an intuitive decision-making style (Kahneman & Tversky, 1979). Such an intuitive judgment often deviates from a rational principle posited by the utility theory (Von Neumann & Morgenstern, 1947). For example, those who are presented with the alternatives of either positive or negative valence exhibit different patterns between the negative and positive. People generally prefer a sure gain to a risky gamble, whereas under loss conditions, they tend to seek a higher expected utility despite the risks.

In the current article, we expand this argument by focusing on an as-yet-unidentified but even more basic kind of uncertainty — namely, people's fear of death. Hart, Schwabach, and Solomon (2010) found that participants exposed to mortality preferred a risky decision making and consequently showed poor performance at the Iowa-gambling task. Similarly, DeWall and Baumeister (2007) revealed that mortality salience urged a coping response involved orienting to positive information. Both studies suggested a similar psychological strategy, seeking emotionally pleasant information, by which people attempt to avoid a sense of uncertainty activated by mortality salience.

In a similar vein, it can be expected that the preference in negative or positive framing will be susceptible to a sense of insecurity derived from mortality salience. Huang & Wang (2010) indirectly estimated the impact of anxiety activated by mortality salience on the framing effect in three different task domains (i.e., life-death vs. money vs. time). The results

indicated that participants preferred the risky choice in life-death domains rather than either in monetary or time domains.

### *Regulatory Focus*

As a dispositional factor influencing the framing effect, the present research focuses on regulatory focus, including promotion focus and prevention focus, which influences individuals' thought processes and behavioral tendencies (Higgins, 1998). Promotion focus, which is concerned with ideals or aspirations, enhances sensitivity to the presence or absence of positive outcomes. In contrast, prevention focus, which is concerned with safety or responsibility, enhances sensitivity to the presence or absence of negative outcomes.

Theoretically, the concept of regulatory fit provides a framework to understand the relationship between regulatory focus and framing. Aaker and Lee (2006) have defined regulatory fit as the motivational intensity that arises from a match between an individual's goal pursuit strategy (eager for positive outcomes vs. vigilant for negative outcomes) and his/her goal orientation (promotion focus vs. prevention focus). The basic premise of regulatory fit is that promotion-focused individuals are more sensitive to the presence or absence of positive outcomes (i.e. positively framed message), whereas prevention-focused individuals are more sensitive to the presence or absence of negative outcomes (i.e. negatively framed message). From this perspective, it is suggested that the magnitude of goal framing changes by regulatory fit. Consistent with this suggestion, some scholars found that the match between regulatory focus and the overall valence of the frame increased persuasion, such that a positively valenced frame is more persuasive when promotion focus is salient whereas a negatively valenced frame is more persuasive when prevention focus is salient (Cesario, Grant, & Higgins, 2004; Lee & Aaker 2004; Yi & Baumgartner, 2009).

### *Present Study*

This study considers situational and dispositional factors that expected to enhance the effect of framing. We regard mortality salience as a situational factor strengthening the effect of framing. The previous work examining the relationship between uncertainty and framing effect focused on only a certain type of framing, that is goal framing (Morton, Rabinovich, Marshall & Bretschneider, 2011). We, however, expect that insecurity from mortality salience might also affect other type of framing: risky-choice and attribute.

At the same time, we regard regulatory focus as a dispositional factor moderating the effect of framing. The previous works on regulatory fit (e.g., Cesario, Grant, & Higgins, 2004) mainly have focused on only a certain type of framing, that is, goal framing (cf. Levin et al., 1998). We, however, contend that regulatory fit, which is derived from congruence between chronic regulatory focus (promotion or prevention) and the valence of framing (positive or negative), can also be applicable to the other types of framing: risky-choice and attribute.

Accordingly, we hypothesized that mortality salience and regulatory focus would moderate the three types of framing effects:

*Hypothesis 1a:* The effect of each type of framing will be more pronounced when participants are exposed to mortality salience.

*Hypothesis 1b:* The effect of each type of framing will be more pronounced when there exist match between regulatory focus and the overall valence of the frame.

In addition, as an exploratory research question, we examine a three-way interaction in which uncertainty and regulatory focus interact to predict the occurrence of the framing effect.

## Method

### *Participants*

Participants included 236 undergraduate students (156 women, 79 men, and 1 unidentified) recruited from psychology classes at one university ( $n = 89$ ) and colleges ( $n = 147$ ) in Japan. They ranged in age from 18 to 31 years, with a mean age of 19.3 years ( $SD = 2.4$ ). All students were told that participation in this study was voluntary and anonymous, and that they would receive extra credit for their participation. Independent sample  $t$  tests for each variable revealed no significant differences between the two samples. Thus, we combined the two samples into one before analyses.

### *Design and Procedures*

The present study used a  $2 \times 2 \times 2$  between subjects experimental design: mortality salience (mortality and control), decision frame (positive and negative), and individual differences in regulatory focus. Mortality salience was manipulated by questionnaire scales: a half of participants were given the Death Anxiety Scale (Templer, 1970) consisting of 15 items designed to induce thoughts about one's own death (e.g., "I am very much afraid to die" and "The thought of death seldom enters my mind"); the other half of the participants received a 15-item scale on television viewing (e.g., "Time flies very rapidly when I watch television" and "I can watch shopping channels on television for hours"; cf. Miller & Mulligan, 2002).

Decision-making tasks followed either the mortality-salience or television-viewing scales. The participants completed five decision-making problems: two risky-choice framing tasks, two attribute-framing tasks, and one goal-framing task. An equal number of participants were randomly assigned to the positive- and negative-frame groups. Participants in the positive-frame group responded to the positive version of each framing task throughout the five problems, whereas those in the negative-frame group received the negative versions of the decision-making problems. The five decision-making problems are presented in the Appendix.

### *Measures*

The risky-choice framing tasks required participants to respond to a typical monetary

problem and the so-called “Asian disease problem.” In either problem, participants chose between a risky option and an option with a certain outcome that has the same expected value. The positively framed options were described in positive terms (i.e., gain, saved) while the negatively framed ones were described in negative terms (i.e., lose, die). Thus, the responses were measured as the categorical variable.

The attribute-framing tasks asked the participants to respond to a problem describing situations in terms of either surgery or an employment test. The framing manipulations were accomplished by presenting success versus failure rates of the surgery or the employment test. The participants’ motivations to undergo the surgery or employment test were evaluated on a 9-point scale, ranging from absolutely not (1) to absolutely (9).

The goal-framing task gave the participants a persuasive message about the flu vaccine. Positive versus negative framing were manipulated by showing that the goal (i.e., influenza prevention) was attained with the flu vaccine or not attained without the vaccine. The participants’ motivations to have the vaccination were evaluated on a 9-point scale, ranging from absolutely not (1) to absolutely (9).

### *Assessment of Chronic Regulatory Focus*

A week before the experiment, we administered a personality scale, the Regulatory Focus Questionnaire (Lockwood, Jordan, & Kunda, 2002), which has been validated in Japanese (Ozaki & Karasawa, 2011). It comprises 16 items designed to assess personality concerning strength of promotion and prevention strategy styles. Responses for all items were obtained on a 7-point scale ranging from strongly disagree (1) to strongly agree (7). Cronbach’s alpha for the measures of promotion focus and prevention focus were .76 and .80, respectively. On the basis of a median split, we classified participants as either high or low based on the relative strength of their promotion goals ( $Mdn = 35$ ) and prevention goals ( $Mdn = 35$ ).

## **Results**

Before inspection of each framing effect, relationships among the three types of framing were tested. Levin, et al. (1998) assumed the independence of these variables based on literature review, but Levin, Schneider, Gaeth, and Lauriola (2002) only demonstrated the independent relationships between types of framing by using a within-subjects design. We attempted to replicate the independence of the framing effect using a between-subjects design.

We computed the correlation between scores for each pair of tasks, assuming that a non-significant correlation between the types of framing supports independence of variables (Levin, et al., 2002). As shown in Table 1, none of the correlations between the different types of framing was significant. On the other hand, the correlations between the same framings with different tasks were significant. The correlation between two risky-choice framing approached the significant level,  $r = .12$ ,  $p = .057$ , while that between two attribute framings was more strongly significant,  $r = .20$ ,  $p < .05$ .

**Table 1** Correlations of risky-choice framing, attribute framing, and goal framing.

Types of Framing	1	2	3	4	5
1 Risky-choice (Monetary Decision)	1.000				
2 Risky-choice (Asian Disease)	.124 <sup>†</sup>	1.000			
3 Attribute(Surgery Decision)	-.067	-.015	1.000		
4 Attribute(Employment Test)	.070	.006	.200 <sup>**</sup>	1.000	
5 Goal(Flu Vaccine)	-.071	-.024	.048	-.029	1.000

*Note.*  $N = 236$ . <sup>†</sup>  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$  (2-tailed). Risky-choice framing was coded as -1 = certain choice, 1 = risky choice. Words in parentheses indicate the task contents to manipulate framing.

Separately for each framing effect, ANOVA was used to analyze decision making based on the  $2 \times 2 \times 2$  design; mortality salience, framing, and regulatory focus as between-subject independent variables.

### *Risky-choice Framing*

For the analysis of categorical measurement, the proportions of risky-choices were transformed using an arcsine transformation (Kempthorne, 1952) prior to ANOVA. With regard to the monetary problem, the main effects for framing were significant for both dispositional regulatory foci,  $\chi^2(1, n = 236) > 59.74, p < .01$ , Cramer's  $V > .50$ . There were no two-way interaction effects between framing and mortality salience,  $\chi^2(1, n = 236) < 0.002, ns$ , providing no support for Hypothesis 1.

A three-way interaction among mortality salience, decision frame, and dispositional regulatory focus was significant for promotion focus,  $\chi^2(1, n = 236) = 5.23, p < .05$ , Cramer's  $V = .14$ , but not for dispositional prevention,  $\chi^2(1, n = 236) = 0.08, ns$ . For individuals with high promotion goal strength, there was a simple-simple main effect for mortality salience in the negatively framed, such that mortality salience led the participants to take more risks,  $\chi^2(1, n = 236) = 4.47, p < .05$ , Cramer's  $V = .14$  (see Figure 1, left). Moreover, the simple-simple main effects of framing appeared in both control and mortality-salience conditions, with an effect size greater in the mortality-salience condition than in the control condition,  $\chi^2(1, n = 236) = 28.01, p < .01$ , Cramer's  $V = .34$ , and  $\chi^2(1, n = 236) = 8.85, p < .05$ , Cramer's  $V = .19$ , respectively (see Figure 1, left). At the same time, among individuals with low promotion goal strength, the study indicated a marginal simple-simple main effect for mortality salience in the positive framing condition, such that mortality salience led the participants to take fewer risks,  $\chi^2(1, n = 236) = 3.29, p < .1$ , Cramer's  $V = .12$  (see Figure 1, right). The simple-simple main effects of framing appeared in the control condition and in the mortality-salience condition, with an effect size greater in the control condition than in the mortality-salience condition,  $\chi^2(1, n = 236) = 7.64, p < .05$ , Cramer's  $V = .18$ , and  $\chi^2(1, n = 236) = 25.18, p < .01$ , Cramer's  $V = .33$ , respectively (see Figure 1, right).

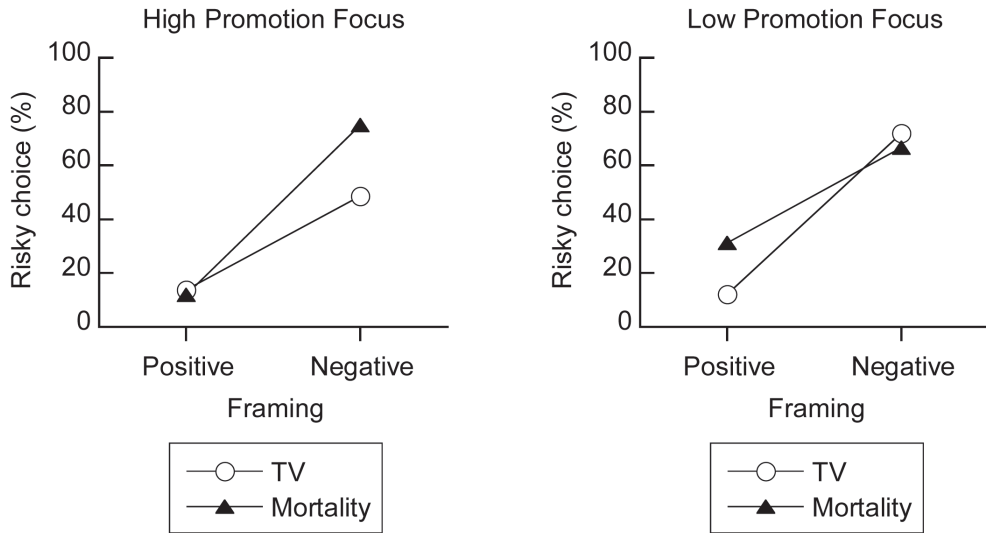


Figure 1. Risky-choice as a function of mortality salience, promotion focus, and decision frame (risky-choice framing, monetary decision).

Regarding the Asian disease problem, the main effects of framing were significantly demonstrated for both dispositional regulatory foci,  $\chi^2(1, n = 236) > 30.60, p < .01$ , Cramer's  $V > .36$ . However, neither two-way nor three-way interaction effects emerged for either dispositional regulatory foci,  $\chi^2(1, n = 236) < 2.09, ns$ .

#### Attribute Framing

With regard to the surgery scenario, the results showed significant main effects of framing for both dispositional regulatory foci,  $F_s(1, 228) > 19.72, p < .01, \eta_p^2 > .07$ , while there were no two-way interaction effects between framing and mortality salience  $F_s(1, 228) < 0.03, ns$ . A three-way interaction was significant for dispositional prevention,  $F(1, 228) = 4.24, p < .05, \eta_p^2 = .02$ , but not for dispositional promotion,  $F(1, 228) = .00, ns$ . Among individuals indicating high prevention goal strength, a simple-simple main effect for framing in the control condition was significant, such that positive framing led higher numbers of participants to choose surgery for pets,  $F(1, 228) = 10.05, p < .01, \eta_p^2 = .04$  (Figure 2, left). In addition, for those with high prevention goal strength, a marginally significant simple-simple main effect of mortality salience in the negatively framed condition indicates that mortality salience increased participants' motivation,  $F(1, 228) = 3.78, p = .053, \eta_p^2 = .02$ . At the same time, individuals low in prevention goal strength indicated a simple-simple main effect for framing in the mortality-salience condition, such that positive framing increased participants' motivation,  $F(1, 228) = 11.09, p < .01, \eta_p^2 = .05$  (Figure 2, right).



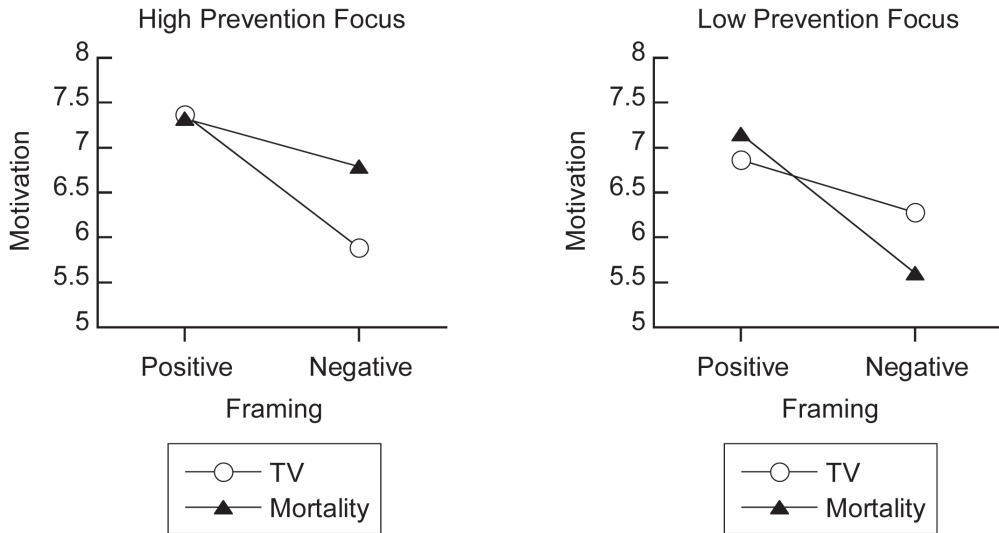


Figure 2. Motivation as a function of mortality salience, prevention focus, and decision frame (attribute framing, surgery decision).

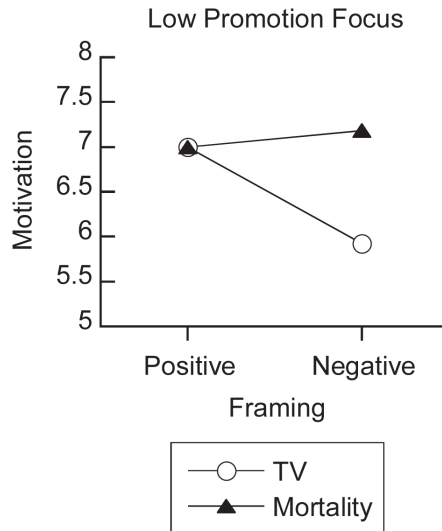
The employment test scenario demonstrated neither main effects of framing nor two-way interactions nor three-way interaction effects with both dispositional regulatory foci,  $F_s(1, 228) < 1.09, ns$ .

### Goal Framing

The goal framing type indicated no main effects for both dispositional regulatory foci,  $F_s(1, 228) < 2.62, ns$ . There were no two-way interaction effects between framing and mortality salience,  $F_s(1, 228) < 0.30, ns$ , providing no support for Hypothesis 1. A three-way interaction was significant for dispositional promotion,  $F(1, 228) = 4.52, p < .05, \eta_p^2 = .02$ , but not for dispositional prevention,  $F(1, 228) = 0.57, ns$ . Among individuals with low promotion goal strength, a simple-simple main effect of framing was significant in the control condition, such that positive framing motivated more participants to agree to receive the flu vaccine,  $F(1, 228) = 5.89, p < .05, \eta_p^2 = .03$  (Figure 3). In addition, a simple-simple main effect of mortality salience was significant in the negatively framed condition, such that mortality salience increased participants' motivation,  $F(1, 228) = 8.09, p < .01, \eta_p^2 = .03$ .

## Discussion

In this study, the roles of situational and dispositional factors in the emergence of framing effects were investigated among Japanese participants. To explore the effects of



*Figure 3.* Motivation as a function of mortality salience, promotion focus, and decision frame (goal framing, flu vaccine).

these two factors, we applied Levin, et al.'s (1998) typology of framing effects and presented participants with three types of decision-making problems. As expected, the results indicated that uncertainty driven by mortality salience (i.e., situational factor) and regulatory focus orientations (i.e., dispositional tendencies) interacted to influence the effects of framing on decision making. We believe that this study is arguably the first attempt to estimate the relationship between regulatory focus and the three types of framing effects.

First, the main effects of framing were found in risky-choice and attribute framing, but not in goal framing. In addition, the relatively low correlations across types of framing reveal the independence of each type of framing. Both the lack of a goal framing effect and the independence of framing effects replicate the previous study results of Levin, et al. (2002) with Western participants. Therefore, the present study confirms that Levin, et al.'s (1998) typology of framing effects is also seen as valid with non-western people, as seen here with Japanese participants.

According to Levin, et al. (1998), goal framing effects are eliminated or even reversed by a variety of characteristics within the situation or disposition. In our study, the issue of the scenario used in the goal framing task — the new flu spreading — might affect the lack of a goal framing effect. At the time of this study, people faced the spread of a new flu and should have been quite cautious about information regarding this new flu. Hence, greater attention to the new flu may have overshadowed and masked the effect of goal framing.

In addition, any two-way interaction between framing and mortality salience was insignificant, thereby not supporting Hypothesis 1a and 1b. There are some plausible reasons

for the absences of two-way interactional effect between framing and mortality salience.

The first is that framing effect is powerful enough to obscure the effect of mortality salience. The second reason is provided by terror management theory (TMT). According to TMT, mortality salience creates an existential anxiety. Individuals exposed by mortality salience adhere to a cultural worldview and self-esteem to buffer the potential for death anxiety. Put differently, those with mortality salience focus on buffering their existential anxiety and thus do not rely on intuitive decision-making. Uncertainty invoked by mortality salience may be different from uncertainty directing individual to rely on intuitive decision-making. The third and perhaps most important reason is that the moderating effects of personality traits negated the main effects of framing and counterbalanced the interactional effects between framing and mortality salience.

Our basic prediction of three-way interactions arises from the notion of regulatory fit, which emphasizes a match between the individual orientations of regulatory focus and the valence of framing. People with a high promotion focus could be anticipated to be more responsive to positive framing (i.e., the absence or presence of positive outcome), whereas individuals with a high prevention focus would tend to be more susceptible to negative framing (i.e., the absence or presence of negative outcome). The regulatory fit is therefore qualified by the two-way interaction between individual regulatory focus and framing. In our study, the assumption was that the inclination of regulatory fit, shown by a two-way interaction between regulatory focus and framing, would be pronounced or obscured depending on the level of insecurity invoked by mortality salience. However, the results of the three-way interaction differed by the type of framing, as we will now discuss.

With risky-choice framing, a significant three-way interaction was found in the promotion focus. Although no significant difference was noted in the magnitude of the framing effect between TV and mortality conditions when participants were predisposed to be low in promotion focus, the framing effect of the mortality condition was significantly stronger than the TV condition when participants were predisposed to have a high promotion focus. This result indicates that those who have a high promotion focus are more likely to be sensitive to the effect of framing.

A preference for risky options in the negative framing condition was significantly higher for the mortality group than for the control group when participants showed a high promotion focus. However, such a significant difference was not observed among those low in promotion focus. This relationship between the goal orientation and the manner in which one pursues the goal is in contrast to the concept of regulatory fit. Hence, individuals with a high promotion focus may experience a sense of misfit or discomfort in the face of negative framing (Aaker & Lee, 2006; Cesario, Grant, & Higgins, 2004; Cesario, Higgins, & Scholer, 2008). The negative feelings from misfit would be amplified by the uncertainty engendered by mortality salience. This uncomfortable psychological state would urge individuals to prefer risky choices (see also Lauriola & Levin, 2001).

In regard to attribute framing, a significant three-way interaction was found with

dispositional prevention, which supports the associative process model of attribute framing (Levin & Gaeth, 1988; Levin, et al., 1998). According to the associative process model, the positive and negative labeling of an attribute elicits information encoding that leads to favorable and unfavorable associations, respectively. Under the mortality condition, the effect of attribute framing was effective for those who were less prevention-focused. Mortality salience may focus attention on the more unfavorable possibilities associated with the negatively framed attribute than the favorable conditions associated with the positively framed attribute. However, for individuals with a high prevention focus, the impact of mortality salience would override the effect of attribute framing. Uncertainty provoked by mortality salience may likely be more relevant or psychologically threatening for those high in prevention focus, and thus they may have preferred the more vigilant option, namely undergoing surgery in this case, regardless of whether the task statement was framed in negative or positive terms.

Goal framing, on the other hand, demonstrated a significant three-way interaction in the dispositional promotion focus. The effect of goal framing was found among participants low in promotion focus who were assigned to the control condition, such that a positively framed message was perceived as a more persuasive message than a negatively framed one. As a result, the positively framed message motivated individuals low promotion focus more to get a flu shot. This pattern of results opposes the prediction of goal framing based on the negativity bias (Fiske & Taylor, 1991; Rozin & Royzman, 2001). Meanwhile, Levin, et al. (1998) pointed out that goal-framing effects occasionally disappear or reverse for situations in which it is relatively easy to discount the negative frame in order to avoid facing adverse possibilities (e.g., Maheswaran & Meyers-Levy, 1990). Therefore, the goal framing effect may more strongly depend on contextual or dispositional factors than the other types of framing. More systematic research is needed to explain the variants of goal framing.

Our study does not fully support the prediction drawn from the idea of regulatory fit. This may be due to some limitations and unsolved problems, discussed below, which need to be addressed in future research. First, the findings of this study may have been under the influence of a specific culture. Although the previous findings on the framing effect obtained in Western countries were replicated with this data from Japanese participants (e.g., Sasaki & Hayashi, 2011; Sasaki & Kanachi, 2005; Takehashi & Karasawa, 2007, 2008), it remains doubtful that our findings can be generalized to non-Japanese samples from other cultures. In a similar vein, mortality salience may also depend on culture. Wakimoto (2006) argued that the reaction to mortality salience would be different between Western and Eastern cultures. In response to the threat of esteem after mortality salience, Western people tend to express their positive internal self, or a self-enhancement strategy. On the other hand, Eastern people, and especially East Asians, behave modestly, displaying a self-effacement strategy. These psychologically different mechanisms rooted in cultural aspects might have played a crucial role in obtaining the present results.

Second, we applied only one or two scenarios for each framing type, and these scenarios have been commonly used in framing research. More scenarios should be used to rule out the

possibility that the present results are due to the specific scenarios selected in the present studies. In the pursuit of proper scenarios for a framing study, for example, Yi & Baumgartner (2009) proposed a useful taxonomy to organize various types of goal framing. They identified three perspectives for framing persuasive messages either negatively or positively: (a) the outcome focus of the message (i.e., gain vs. loss anchor), (b) the overall valence of the message (i.e., positive vs. negative valence), and (c) the type of benefit or harm emphasized (i.e., achievement vs. security). It would be interesting to use scenarios based on their taxonomy for testing situational and dispositional factors in framing effects.

In conclusion, the current study explored the situational and dispositional factors that may moderate the effect of framing. We focused on the uncertainty elicited by mortality salience as a situational factor and regulatory focus as a dispositional factor that would have an impact on the emergence of the framing effect. The results confirmed our predictions and indicated that the magnitude of the framing effect varied by the type of regulatory focus and the level of uncertainty. We hope these findings will stimulate interesting and important future research that systematically investigates various types of situational and dispositional factors moderating the framing effects.

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### References

- Aaker, J. L., & Lee, A. Y. (2006). Understanding Regulatory Fit. *Journal of Marketing Research*, *43*, 15-19.
- Cesario, J., Grant, H., & Higgins, T. (2004). Regulatory Fit and Persuasion: Transfer from "Feeling Right". *Journal of Personality and Social Psychology*, *86*, 388-404.
- Cesario, J., Higgins, E. T., & Scholer, A. A. (2008). Regulatory fit and persuasion: Basic principles and remaining questions. *The Social and Personality Psychology Compass*, *2*, 444-463.
- De Wall, C. N., & Baumeister, R. F. (2007). From terror to joy: Automatic tuning to positive affective information following mortality salience. *Psychological Science*, *18*, 984-990.
- Fagley, N. S., & Miller, P. M. (1997). Framing effects and arenas of choice: Your money or your life? *Organizational Behavior and Human Decision Processes*, *71*, 355-373.
- Fiske, S. T., & Taylor, S. E. (1991). *Social cognition* (2nd ed.). New York: McGraw-Hill.
- Greenberg, J., Pyszczynski, T., & Solomon, S. (1986). The causes and consequences of a need for self-esteem: A terror management theory. In R. F. Baumeister (Ed.), *Public self and private self* (pp.189-207). New York: Springer-Verlag.
- Hart, J., Schwabach, J. A., & Solomon, S. (2010). Going for broke: Mortality salience increases risky decision making on the Iowa gambling task. *British Journal of Social Psychology*, *49*, 425-432.
- Higgins, E. T. (1998). Promotion and prevention: Regulatory focus as a motivational principle. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 30, pp. 1-46). New York: Academic Press.
- Highhouse, S., & Paese, P. W. (1996). Problem domain and prospect frame: Choice under opportunity versus threat.

- Personality and Social Psychology Bulletin*, 22, 124-132.
- Huang, Y., & Wang, L. (2010). Sex differences in framing effects across task domain. *Personality and Individual Differences*, 48, 649-653.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47, 263-291.
- Kempthorne, O. (1952). *The Design and Analysis of Experiments*. pp. 156-157, New York: Wiley.
- Kuhberger, A. (1998). The influence of framing on risky decision: A meta-analysis. *Organizational Behavior and Human Decision Processes*, 75, 23-55.
- Lauriola, M., & Levine, I. P. (2001). Personality traits and risky decision making in a controlled experimental task: An exploratory study. *Personality and Individual Differences*, 31, 215-226.
- Levin, I. P., & Gaeth, G. J. (1988). How consumers are affected by the framing of attribute information before and after consuming the product. *Journal of Consumer Research*, 15, 374-378.
- Levin, I. P., Schneider, S. L., & Gaeth, G. J. (1998). All frames are not created equal: A typology and critical analysis of framing effects. *Organizational Behavior and Human Decision Processes*, 76, 149-188.
- Levin, I. P., Schneider, S.L., Gaeth, G. J., & Lauriola, M. (2002). A new look at framing effects: Distribution of effect sizes, individual differences, and independence of types of effects. *Organizational Behavior and Human Decision Processes*, 88, 411-429.
- Lockwood, P., Jordan, C. H., & Kunda, Z. (2002). Motivation by positive or negative role models: Regulatory focus determines who will best inspire us. *Journal of Personality and Social Psychology*, 83, 854-864.
- Maheswaran, D., & Meyers-Levy, J. (1990). The influence of message framing and issue involvement. *Journal of Marketing Research*, 27, 361-367.
- McElroy, T., & Set, J. J. (2003). Framing effects: An analytic-holistic perspective. *Journal of Experimental Social Psychology*, 39, 610-617.
- Miller, P. M., & Fagley, N. S. (1991). The effects of framing, problem variations, and providing rationale on choice. *Personality and Social Psychology Bulletin*, 17, 517-522.
- Miller, R. L., & Mulligan, R. D. (2002). Terror management: The effects of mortality salience and locus of control on risk-taking behaviors. *Personality and Individual Differences*, 33, 1203-1214.
- Morgenstern, O., & von Neumann, J. (1947). *The Theory of Games and Economic Behavior*. Princeton University Press.
- Morton, T., Rabinovich, A., Marshall, D., & Bretschneider, P. (2011). The future that (or may not) come: How framing changes responses to uncertainty in climate change communications. *Global Environmental Change*, 21, 103-109
- O'Connor, A. M., Pennie, R. A., & Dales, R. E. (1996). Framing effects on expectation, decisions, and side effects experienced: The case of influenza immunization. *Journal of Clinical Epidemiology*, 49, 1271-1276.
- Ozaki, Y., & Karasawa, K. (2011). Valence of self-evaluation and approach-avoidance tendency: Research based on regulatory focus theory. *Japanese Journal of Psychology*, 82, 450-458. (In Japanese with English abstract.)
- Pervan, S. J., & Vocino, A. (2008). Message framing: Keeping practitioners in the picture. *Marketing Intelligence & Planning*, 26, 634-648.
- Rozin, P., & Royzman, E. B. (2001). Negativity bias, negativity dominance, and contagion. *Personality and Social Psychology Review*, 5, 296-320.
- Sasaki, H., & Hayashi, Y. (in press). Moderating the interaction between procedural justice and decision frame: The counterbalancing effect of personality traits. *Journal of Psychology: Interdisciplinary and Applied*.
- Sasaki, H., & Kanachi, M. (2005). The effects of trial repetition and individual characteristics on decision making under uncertainty. *Journal of Psychology: Interdisciplinary and Applied*, 139, 233-246.
- Schneider, S. L. (1992). Framing and conflict: Aspiration level contingency, the status quo, and current theories of risky choice. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 18, 1040-1057.
- Simon, A. F., Fagley, N. S., & Halleran, J. G. (2004). Decision framing: Moderating effects of individual differences

- and cognitive processing. *Journal of Behavioral Decision Making*, 17, 77-93.
- Takehashi, H., & Karasawa, K. (2007). The effect of goal framing on the activation of affective representations. *Japanese Journal of Psychology*, 78, 372-380. (In Japanese with English abstract.)
- Takehashi, H., & Karasawa, K. (2008). The effect of goal framing on the automatic processing of affective information. *Japanese Journal of Social Psychology*, 24, 50-57. (In Japanese with English abstract.)
- Templer, D.I. (1970). The construction and validation of a death anxiety scale. *Journal of General Psychology*, 82, 165-177.
- Tversky, A., & Kahneman, D. (1981). The framing of decisions and the rationality of choice. *Science*, 221, 453-458.
- Wakimoto, R. (2006). Mortality salience effects on modesty and relative self-effacement. *Asian Journal of Social Psychology*, 9, 176-183.
- Wang, X. T., Simons, E., & Bredart, S. (2001). Social cues and verbal framing in risky choice. *Journal of Behavioral Decision Making*, 14, 1-15.
- Weber, E. U., & Johnson, E. J. (2009). Mindful judgement and decision making. *Annual Review of Psychology*, 60, 54-85.
- Yi, S., & Baumgartner, H. (2009). Regulatory focus and message framing: A test of three accounts. *Motivation and Emotion*, 33, 435-443.

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## Appendix

### Decision Problems

Words/sentences in parentheses are manipulated in terms of the framing of decision making. The sentences before the slash depict the positive frame. The sentences after the slash depict the negative frame.

#### *Risky-Choice Framing*

Q1. Which do you prefer between the following two options?

A. a 100% chance to [gain/lose] 750 yen.

B. a 75% chance to [gain/lose] 1,000 yen and a 25% chance to [gain/lose] nothing.

(One dollar was equivalent to approximately 90 yen at the time of this research.)

Q2. Imagine that the outbreak of an unusual Asian disease is expected to kill 600 people. Two alternative treatment programs to deal with the disease have been proposed. Which would you choose between the following two programs?

A. 200 people will surely be saved/400 people will surely die.

B. There is a one-third probability that 600 people will be saved, and a two-thirds probability that no people will be saved/There is a one-third probability that nobody will die, and a two-thirds probability that 600 people will die.

#### *Attribute Framing*

Q3. Assume that without surgery your pet will be dead. The doctor informs you that the surgery will [succeed with a probability of 80%/fail with a probability of 20%.] To what extent would you like to entrust that doctor with your pet's operation?

Q4. Assume that you find a part-time job with good pay. If you take an employment test, you will be [employed with a probability of 80%/rejected with a probability of 20%.] To what extent would you like to apply for this part-time job?

#### *Goal Framing*

Q5. Imagine that the flu is going around. [If vaccinated, you will have no fear of influenza infection/If not vaccinated, you will have a fear of influenza infection.] To what extent would you like to be vaccinated?