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RELATIONSHIP OF COGNITIVE APPRAISAL AND COPING WITH SUBJECTIVE HAPPINESS IN JAPANESE COLLEGE STUDENTS

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***Abstract*:** Cognitive appraisal refers to the perception of a stressor, while coping refers to the cognitive and behavioral efforts to deal with the effects of the stressor. Subjective happiness refers to a subjective global evaluation of one's happiness. This study examined whether cognitive appraisals of threat and control, and coping strategies are related to subjective happiness. The participants were 328 Japanese college students, who completed questionnaires on (a) threat and control appraisals, (b) problem-solving coping (aimed at changing situations), (c) emotion-focused coping (aimed at managing emotions), (d) avoidant coping (aimed at escaping from stressors) and (e) subjective happiness. Path analysis was conducted to test whether cognitive appraisals and coping are related to subjective happiness, with sex and social support as exogenous variables. Threat appraisal was found to be negatively associated with subjective happiness. Control appraisal was demonstrated to be positively associated with subjective happiness both directly and indirectly through emotion-focused coping. Social support was also predictor of subjective happiness both directly and indirectly via control appraisals and emotion-focused coping.

***Keywords*:** Cognitive appraisal, Emotion-focused coping, Subjective happiness.

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INTRODUCTION

Stress management and happiness enhancement are two important issues in one's life. Guided by the transactional model of stress and coping (Lazarus & Folkman, 1984), this study defines stress as the relationship between the quality of a potentially stressful situation (stressor) and an individual's ability to cope with the stressor. Stress management typically includes changing one's cognitive appraisals and coping choices. Cognitive appraisal refers to the perception of stressors and their controllability. It includes threat (how threatening is a stressor to one's self) and control appraisals (how controllable it is). Individuals who appraise an experimental stressor as less threatening and more controllable show weakened emotional and/or physiological responses compared to those who appraise the stressor as more threatening and less controllable (Dickerson & Kemeny, 2004; Maier, Waldstein, & Synowski, 2003).

Coping refers to the cognitive and behavioral efforts to deal with stressors. Although there are many conceptualizations of coping, this study follows the conceptualization of Ozeki, Haraguchi, and Tsuda (2004) that distinguishes problem-solving coping (aimed at solving problems), emotion-focused coping (aimed at reducing emotional reactions caused by stressors), and avoidant coping (aimed at escaping from stressors). Examples of problem-solving coping include collecting information, exploring the causes of problems, seeking help from others, or making an effort to change the situation. Emotion-focused coping includes, for instance, looking at the positive aspects of a problem and self-encouragement. Avoidant coping includes, for instance, waiting until the problem becomes urgent, not thinking about the future, and thinking that problems are not important. Ozeki et al. (2004) reported that levels of stress response (emotional, cognitive-behavioral, and physical symptoms caused by stress) were lower in individuals who chose problem-solving and emotion-focused coping more frequently than avoidant coping. Because stress has been associated with increased risk of chronic diseases such as cardiovascular diseases and Type 2 diabetes (McEwen, 2007), managing stress has become an important social issue.

Happiness has also been studied extensively, and various definitions have been suggested (Schiffrin & Nelson, 2010). One of the most widely accepted definitions of happiness comes from Diener (1984), who defined happiness as the presence of positive affect, life satisfaction, and absence of negative affect. However, Diener (1984) preferred to use the term "subjective well-being" rather than happiness. Over the three decades since this definition, the terms happiness and subjective well-being have been used interchangeably. While it has been found that individuals are able to

evaluate whether they are happy, these self-evaluations do not always correspond to Diener's three components of subjective well-being. Subjective happiness refers to a subjective, global evaluation of happiness (Lyubomirsky & Lepper, 1999). This construct enables us to analyze happiness directly (Horiuchi, Tsuda, Toyoshima, Aoki, & Sakano, 2013). The enhancement of subjective happiness is considered an important human goal (Lyubomirsky, 2001).

Several studies have found significant relationships among cognitive appraisal, coping, and subjective happiness. For example, Lyubomirsky and Tucker (1998) reported that college students who were more likely to focus on the positive aspects of negative events were happier than those who did not. Furthermore, Lyubomirsky, Tkach, and DiMatteo (2006) reported that individuals who had a strong sense of control over daily events were happier than those with low sense of control. Zhang, Wu, and Pan (2013), on the other hand, reported that individuals who were more likely to choose active coping, which corresponds to problem-solving and emotion-focused coping, showed higher levels of subjective happiness. These results suggest that individuals who appraise stressors as less threatening and more controllable, and/or choose problem-solving and emotion-focused coping more frequently than avoidant coping tend to show higher levels of subjective happiness.

No study to our knowledge, however, has concurrently examined cognitive appraisal, coping choices and subjective happiness. As a result, it remains unclear as to how cognitive appraisal, coping choices and subjective happiness are related to each other. Furthermore, although social support and sex have been found to be associated with subjective happiness in Japan (Cabinet Office of Japan, 2008), these variables have not been assessed in previous studies (Lyubomirsky & Tucker, 1998; Lyubomirsky et al., 2006; Zhang et al., 2013). More research is required to clarify the way in which cognitive appraisal and coping choices are related to subjective happiness with the variables of sex and social support considered concurrently.

This study investigated the relationship among cognitive appraisals, coping, and subjective happiness. The significant contribution of this study is the development and testing of a hypothetical model that explains how cognitive appraisal and coping choices are associated with subjective happiness when the two exogenous variables, namely sex and social support, are taken into consideration. This can provide an initial but important step toward increasing our understanding of these relationships.

The basic hypothetical model

The model proposed posits relationships between cognitive appraisal and coping strategies with subjective happiness. Figure 1 presents the basic hypothetical model that this study set out to test. We hypothesized not only direct effects of cognitive appraisals on subjective happiness but also indirect effects via coping strategies. In this model, threat appraisal is assumed to affect subjective happiness negatively and directly as well as indirectly via facilitating avoidant coping and decreasing problem-solving and emotion-focused coping. Control appraisal is assumed to enhance subjective happiness positively and directly; also, indirectly via decreasing avoidant coping and facilitating problem-solving and emotion-focused coping. There are no specific predictions about the effects of the exogenous variables, namely sex and social support, because there is no information whether these variables affect subjective happiness indirectly through cognitive appraisals and coping choices or directly. Therefore, based on correlations observed in this study, modifications will be made to the model in an exploratory manner.

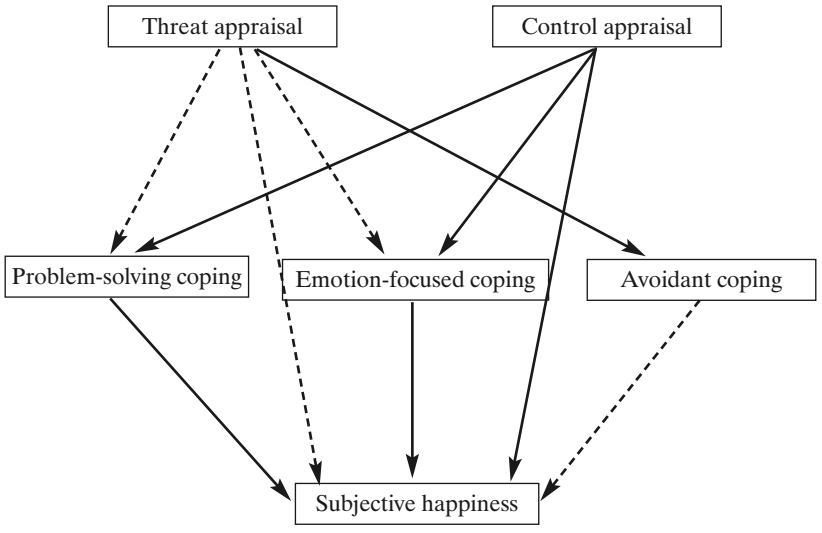

Figure 1. The basic hypothetical model for the relationships among cognitive appraisal, coping, and subjective happiness.
Solid lines represent positive correlations and dashed ones negative ones.

METHOD

Participants

In total 392 Japanese college students participated in the study. Sixty four of them were excluded because of missing data. The remaining sample consisted of 166 male and 162 female students. Their mean age was 20.09 years (SD = 2.11). Participants included 46.04% freshmen, 10.98% sophomores, 15.85% juniors, and 27.13% seniors.

Measures

Subjective happiness

Subjective happiness was measured using the Japanese version of the Subjective Happiness Scale (Shimai, Otake, Utsuki, Ikemi, & Lyubomirsky, 2004). It consists of four items, each rated on a 7-point scale. A sample item is: "In general, I consider myself: ". For this item, each participant responds on a 7-point rating scale, ranging from "1: not a very happy person" to "7: a very happy person" to represent the level of happiness. The scores are summed, with higher scores reflecting higher levels of subjective happiness. The internal consistency reliability of the scale in the Shimai et al. (2004) study was sufficiently high, with Cronbach's alpha being .84. In the present sample Cronbach's alpha coefficient was .77. The 5-week test-retest reliability in the original study was also high, Pearson r = .86 (Shimai et al., 2004). The scale's discriminant validity in the original study was examined against mental health and self-esteem. Subjective happiness significantly correlated with mental health, measured with the General Health Questionnaire 28 (Goldberg & Hillier, 1979), r = -.51 to -.27, and self-esteem, r = .52 (Shimai et al., 2004).

Cognitive appraisals and coping

Cognitive appraisal and coping strategies were measured using the Cognitive Appraisal and Coping subscales of the Stress Assessment Scale for university students (Ozeki et al., 2004).This scale is a comprehensive tool for assessing stress in terms of stressor responses, stressors, cognitive appraisals, coping choices, social support, and humor. Respondents were asked how they appraised and coped with the most intense stressor they had experienced in a recent situation.

The Cognitive Appraisal scale, a subscale of the Stress Assessment Scale for university students (Ozeki et al., 2004), consists of two subscales: *Threat appraisal* (eight items) and *control appraisal* (seven items). An example of an item in the threat appraisal subscale is: "It will alter my life." Items were rated on a 4-point Likert scale, ranging from "0: Not agree" to "3: I agree," to represent how participants appraised a most stressful situation. The scores for the eight items were summed, with the total score ranging from 0 to 24. Higher scores indicated that participants appraised the stress as more threatening. The internal consistency reliability of the Threat Appraisal subscale for the present sample was Cronbach's alpha = .85.

The Control Appraisal scale consists of seven items. An example item of the control subscale is "Do you think that you can afford this situation?" Items were rated on a 4-point Likert scale, ranging from "0: I do not think so" to "3: I think I can afford it," to represent how participants appraised a most stressful situation. The scores for the seven items were summed; the total score ranged from 0 to 21, with higher scores indicating that participants appraised the stressor as more controllable. The internal consistency reliability of this subscale for the present sample was high, Cronbach's alpha = .81.

The Coping Scale (Ozeki et al., 2004) consists of three subscales: Problem-solving coping (five items), emotion-focused coping (three items), and avoidant coping (six items). Sample items are: "I will make an effort to change the situation" (problem-solving coping); "I will try to look at positive aspects of the situation" (emotion-focused coping); and "I will give up, saying to myself that that's life" (avoidant coping). Participants were asked to evaluate how frequently they chose each coping strategy on a 4-point Likert scale, ranging from "0: Never" to "3: Always." A higher score on each subscale implies a more frequent choice of that coping strategy. The factor structure of the scale was confirmed by an exploratory factor analysis (Ozeki et al., 2004). The internal consistency reliability of each subscale in the Ozeki at al. (2004) study was good, with Cronbach's alpha ranging from .74 to .88. Cronbach's alpha was .61, .62, and.69 for the present sample, for problem-solving, emotion-focused, and avoidant coping, respectively.

Social support

The level of social support was measured using the Social Support subscale of the Stress Self-rating Scale (Ozeki et al., 2004). The subscale comprises 10 items that load one single factor. It measures the number of people who provide instrumental and emotional support to a person (e.g., those with whom they enjoy spending

time). Participants were asked to rate how many such supporters they had on a 4-point scale, ranging from "0: None" to "4: Considerable number." A higher score indicates that there is a greater number of people who provide support. The internal consistency reliability of the subscale for the present sample was high, Cronbach's alpha = .91.

Procedure

The study protocol was approved by the Institutional Review Board of Kurume University, Japan. From April to July 2009, paper-and-pencil surveys were conducted during introductory or health psychology classes at a private college in Fukuoka, Japan. The purpose of the study was thoroughly explained. In addition, the following rights were explained to the participants: (1) Participation in the survey was voluntary, and (2) any participant could drop out at any point before completing the survey. The questionnaires were distributed among those who agreed to participate and were collected after approximately 20 min. The presentation order of the scales was standard for all participants. The presentation order of the scales was as follows: (1) demographics; (2) coping choices; (3) cognitive appraisals; (4) social support; (5) subjective happiness.

Statistical analyses

Data analyses were conducted using SPSS for Windows version 22. The hypothetical model was tested using path analysis. To evaluate how well the model fit the data, the following four indices were used: Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). Values of GFI, AGFI, and CFI range from zero to 1.00. Values of GFI and AGFI closer to 1.00 represent better fit. For CFI, values of .90 or above and .95 or above indicate an adequate and good fit, respectively (Hu & Bentler, 1999). For RMSEA, values of less than .06, those between .06 and .08, and those of .10 represent a good, moderate, and poor fit, respectively (Hu & Bentler, 1999).

RESULTS

The descriptives of the variables of the study are given in Table 1. Mean subjective happiness score was 4.35. Although the Japanese version of the Subjective Happiness Scale has not been standardized in the past, this mean score is comparable to scores from previous studies in which Japanese college students were examined (Horiuchi, Tsuda, Hashimoto, Kai, & Wenjie, 2008; Shimai et al., 2004). In this study, the participants' subjective happiness levels were within the range of scores of previous studies.

Table 1. The descriptives of the study variables as a function of sex

Variables		Males	Females
	M(*SD*)	*M*(*SD*)	*M*(*SD*)
Threat appraisal	11.76 (6.16)	11.17 (6.43)	12.36 (5.83)
Control appraisal	10.56 (4.78)	11.26 (4.90)	9.90 (4.58)
Problem-solving coping	6.11 (3.27)	5.69 (3.29)	6.54 (3.19)
Emotion-focused coping	4.55 (2.54)	4.10 (2.53)	5.02 (2.47)
Avoidant coping	4.23 (3.11)	7.48 (3.92)	8.72 (4.00)
Social support	20.46 (7.54)	20.57 (8.46)	20.35 (6.49)
Subjective happiness	4.35 (1.08)	4.45 (1.11)	4.25 (1.01)

The correlations among threat appraisal, control appraisal, problem-solving coping, emotional-focused coping, avoidant coping, social support, and subjective happiness are given in Table 2. Threat appraisal and control appraisal were negatively correlated, $r = -.13$, $p < .01$. Threat appraisal significantly and positively correlated with problem-solving coping, $r = .23$, $p < .01$, and control appraisal correlated with problem-solving coping, $r = .23$, $p < .01$, and emotional-focused coping, $r = .31$, $p < .01$. Threat appraisal, $r = -.24$, $p < .01$, control appraisal, $r = .39$, $p < .01$, and emotion-focused coping, $r = .26$, $p < .01$, correlated significantly to subjective happiness. In addition, social support was significantly related to control appraisal, $r = .24$, $p < .01$, problem-solving coping, $r = .12$, $p < .05$, emotion-focused coping, $r = .19$, $p < .01$, and avoidant coping, $r = -13$, $p < .05$, as well as subjective happiness, $r = .36$, $p < .01$.

Based on the correlations shown in Table 2, modifications were made to the basic hypothetical model in order to include the effects of the exogenous variables. The major differences between the basic and final model were as follows: Paths indicating correlations between cognitive and control appraisals and between problem-solving and emotion-focused coping were added; (2) Social support and sex (being male) were assumed to affect subjective happiness directly as well as

Table 2. Pearson correlation coefficients between the study variables

	1	2	3	4	5	6	7
1. Threat appraisal	-						
2. Control appraisal	-.13**	-					
3. Problem-solving coping	.23**	.23**	-				
4. Emotion-focused coping	.05	.31**	.46**	-			
5. Avoidant coping	-.03	.00	.00	.06	-		
6. Social support	-.05	.24**	.12*	.19**	.15*	-	
7. Subjective happiness	-.24**	.39**	.04	.26**	.02	.36**	-

*$p < .05$; **$p < .01$

indirectly via control appraisal and coping strategies; (3) The direction of some of the relationships were modified (e.g., threat appraisal to problem-solving coping); (4) Some relationships were removed (e.g., the path from problem-solving coping to subjective happiness). The model confirmed is given in Figure 2. The indices of the model were satisfactory except for RMSEA that indicated a marginal fit to the data: χ^2 (10) = 33.45, $p < .01$, GFI = .98, AGFI = .91, CFI = .93, RMSEA = .09, and Confidence Interval (90%) = .05 to .12.

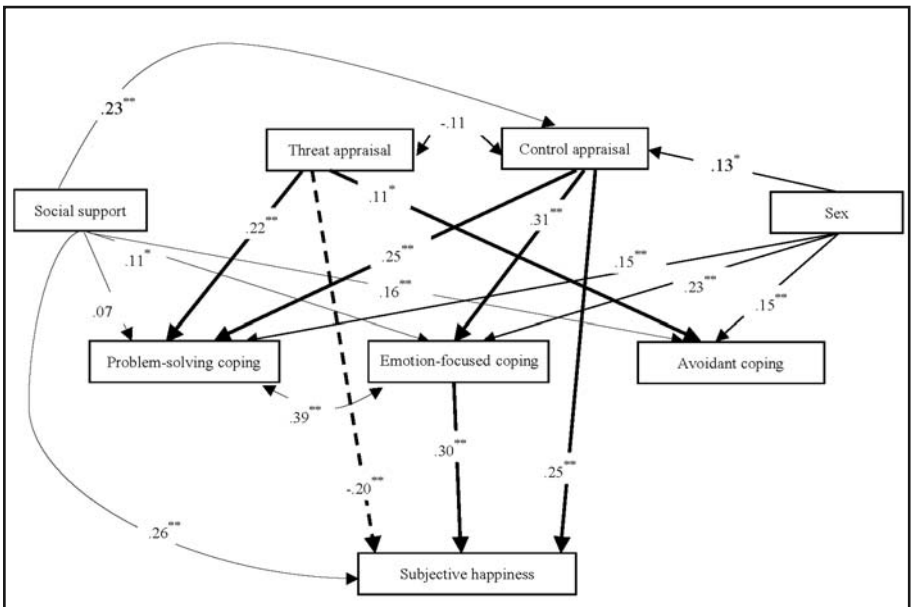

Figure 2. The final model on subjective happiness.
All path coefficients are standardized. Error terms are not shown.
Solid lines represent positive correlations and dashed ones negative ones.

The model confirmed that threat appraisal directly predicted subjective happiness, and this relationship was negative. Control appraisal predicted subjective happiness both directly and indirectly via emotion-focused coping. Gender was not directly related to subjective happiness. However, there were indirect effects via control appraisal and emotion-focused coping. Male students were more likely than their female counterparts to appraise a stressor as more controllable and to use emotion-focused coping, which enhances subjective happiness. Social support was directly related to subjective happiness as well as indirectly. There were indirect effects via control appraisals and emotion-focused coping. Social support was found to increase subjective happiness directly, or through facilitating control appraisal and emotion-focused coping.

DISCUSSION

This study investigated the relationship among cognitive appraisals, coping, and subjective happiness. We tested a theoretical model that predicted how cognitive appraisals (threat and control appraisals), coping, social support and gender are related to subjective happiness. In the following we will discuss the effects of each of the variables included in the model.

According to the model that was confirmed, threat appraisal was found to be directly related to subjective happiness. Lyubomirsky and Tucker (1998) reported that college students who were more likely to focus on the positive aspects of negative events were happier than those who focused on negative aspects. However, their study did not directly examine threat appraisals. The inclusion of threat appraisals in our study corroborated Lyubomirsky and Tucker's (l998) finding because it showed that subjective happiness is enhanced if an individual appraises intense stressors as less threatening.

Control appraisal was found to enhance subjective happiness indirectly, through facilitating emotion-focused coping as well as directly. This is a new finding and extends the literature on the following two points: First, the mediating role of emotion-focused coping between control appraisal and subjective happiness was demonstrated. A study by Zhang et al. (2013) had explored the relationships between coping and subjective happiness, but had not explored whether coping mediated the relationships between control appraisal and subjective happiness. Concurrent examination of control appraisal and coping enabled us to highlight this mediating role.

Second, a particular coping strategy, namely emotion-focused coping, was found to be significantly associated with subjective happiness. There was no significant

relationship between subjective happiness and the other two coping strategies. These results are partly consistent with those of Zhang et al. (2013) in that individuals with higher levels of subjective happiness were more likely to choose active (i.e., problem-solving and emotion-focused) coping. Separate measures of problem-solving and emotion-focused coping strategies in our study revealed that it is only emotion-focused coping, of the two active types of coping that is specifically related to subjective happiness. This specificity can be explained by a potential relationship between subjective happiness and one's current mood. Lyubomirsky et al. (2006) examined the psychological correlates of subjective happiness by examining the relationships among numerous psychological variables such as domain-specific satisfaction, energy level, extraversion, hopelessness, loneliness, mood state, need satisfaction, and negative affect. Current mood was found to be among the strongest correlates of subjective happiness. These results indicated that current mood was closely related to subjective happiness. Problem-solving and avoidant coping are coping choices that do not necessarily result in mood alteration; on the contrary, emotion-focused coping does have this effect. Based on our study, it can be assumed that emotion-focused coping is related to subjective happiness since its use is directly related to an alteration of mood.

Furthermore, interestingly, sex and social support were found to affect relationships between control appraisals, emotion-focused coping, and subjective happiness. Sex did not directly affect subjective happiness, but was found to have the potential to affect it through altering control appraisals and emotion-focused coping. It was also found that social support affects subjective happiness directly and indirectly through enhancing control appraisal and facilitating emotion-focused coping. It should be noted, however, that sex and social support did not have any effect on threat appraisal. This can be due to the fact that participants were allowed to select the stressor they considered most threatening. Future research should explore whether there are sex differences in the kind of stressors females and males consider most threatening and if control appraisals are specific to the stressors.

These findings suggest that sex and social support play complex roles in the relationships among control appraisal, coping, and subjective happiness. The Cabinet Office of Japan (2008), based on univariate analyses, reported that sex and social support are significantly related to subjective happiness. By adopting a multivariate analysis, this study shed new light on the potential roles of sex and social support on subjective happiness.

Despite these contributions, there were three limitations in this study. First, because of the cross-sectional nature of the study, it was impossible to examine the long-term effects of cognitive appraisals and coping choices on subjective happiness.

Longitudinal research can provide a more robust insight into this causality. Despite the strength of such a longitudinal study, a cross-sectional examination of the relationship among subjective happiness, cognitive appraisal, and coping choice is still warranted. Although there is still a debate (Schiffrin & Nelson, 2010), it has been suggested that these relationships may be bidirectional rather than unidirectional, as it is suspected that experiencing stress inversely affects subjective happiness, which in turn increases the personal impact of stressors. Therefore, it is necessary to establish significant relationships among the three types of variables that can be tested in a longitudinal design.

Second, only Japanese college students were examined. It remains unclear whether the results of this study can be generalized to other student populations and to nonstudent populations. Moreover, there was a design flaw, namely that the presentation order of the various measures was not counterbalanced. This might have created response biases. Despite these limitations, these results provide useful information for future studies. Replication studies are needed to examine the extent to which the findings can be generalized.

It is important to note that the model established in this study is an initial one that enables the examination of how cognitive appraisal, coping, and subjective happiness are related to each other. Future research should examine the role of mood in these relations. Mood levels after engaging in emotion-focused coping may vary among individuals, and the inclusion of mood levels into the model might increase the model's explanatory value. Using the model established in this study as a basic framework, it would be possible to examine relationships among cognitive appraisal, coping, mood and subjective happiness.

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