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Cross-sectional Research Using New Measures on the Effects of Positive and Negative Affect (PA and NA) and Emotional Suppression on Depression and Short-term Life Satisfaction: Considering the Activation Dimension of Affect and Suppression of PA and NA

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(Keywords: emotional suppression, positive affect, negative affect, depression, short-term life satisfaction)

Introduction

In recent years, the number of studies on emotion regulation has been drastically increasing. When we experience emotions, we usually attempt to regulate them. Such emotional regulation influences the effects of emotional experiences on health and adjustment (e.g., Gross & John, 2003; Haga, Kraft, & Corby, 2009; Keenan, Hipwell, Hinze, & Babinski, 2009). Unless emotional regulation is considered in studies, the ultimate effects of emotional experiences will most likely not be understood precisely. Among the many known strategies of emotion regulation, Gross (2001) previously focused on two widely used strategies, i.e., reappraisal and suppression. In the current study, we elaborated on emotional suppression (ES) since Gross (2001) considers ES a response-focused emotional regulation strategy that develops after emotions are initially evoked.

The target emotions (or affect) for ES are varied. However, before focusing on discrete emotions such as anger and grief, we need to consider that emotions (or affect) are divided into several upper categories. In general, affect has two big dimensions, valence and activation (Larsen & Diener, 1992; Russell, 1980). So, when considering these dimensions, we have four kinds of affect, activated positive affect (PA), deactivated PA, activated negative affect (NA), and deactivated PA. It is likely that when it comes to emotional suppression, previous measures have focused on suppression of negative emotions or has not discriminated between suppression of negative and positive emotions. For example, one of the widely used measures, Emotion Regulation Questionnaire (ERQ) (Gross and John, 2003), includes four items to assess global emotional suppression, among which only one item of positive emotions is included. Regarding emotional expression per se, a few prior measures differentiated between expressions of positive and negative emotions in their subscales (e.g., Gross & John, 1995; King & Emmons, 1990).

Thus, it is clear that we need to assess emotional suppression in terms of these four types of affect, because it is highly possible that emotional suppression would be different in its effects on health / adjustment depending on what type of affect is suppressed. In the present study, to start to examine the effects of emotional suppression by the types of affect, we focused on emotional suppression of PA and NA without discriminating activated and deactivated affect.

Taken together, the present study aimed to examine whether the effects of activated and deactivated PA and NA on health / adjustment are different depending on the extent of emotional suppression of PA and NA.

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Methods

Participants and Procedure

In addition to the incomplete data from 107 participants, the ages of three participants were outliers (over seven standard deviations, *SD*s from the mean age). Their data were therefore excluded, so the final sample included the data collected from 496 undergraduate and graduate students (240 men and 256 women). The mean ages and *SD*s for this sample were 20.97 ± 2.56 yrs for men and 20.49 ± 3.89 yrs for women. Participants answered a battery of seven questionnaires three of which were used for another study. All of the questionnaires were Japanese versions, answered in terms of experiences over the past week.

Participants were recruited after their university or graduate school classes. Only the students who agreed to participate in this study completed the questionnaires. The authors explained the purpose and details of the study after they completed the questionnaires.

Measures

Activated and Deactivated PA and NA

The Activated and Deactivated Affect Questionnaire (ADAQ; Yamasaki, Sasaki, & Uchida, 2011) was utilized for assessing activated and deactivated PA and NA. The ADAQ is a self-report questionnaire that includes 20 items, answered on a 7-point Likert-type format (1 = "never true" to 7 = "very true"). Each of activated and deactivated PA and NA is measured using four items (the score range = 4 to 24). Item samples include "happy", "relaxed", "angry", and "tired" for activated and deactivated PA and activated and deactivated for NA, respectively. The content and concurrent validities were confirmed by Yamasaki et al. (2011). In this study, the alphas for activated and deactivated PA and NA were .87, .86, .83, and .70 for men and .85, .85, .84, and .70 for women, respectively.

Emotional Suppression (ES)

The Emotional Suppression Scale for Positive and Negative Affect (ESS) was utilized for measuring suppression of PA and NA (Yamasaki et al., 2011). Although the ESS was developed referring to Gross and John (1995, 2003) and King and Emmons (1990), it was also an original self-report questionnaire that includes eight items, answered on a 7-point Likert-type format (1 = "never true to 7 = "very true"). Item examples are: "I tried not to express my joy in front of others" for suppression of PA; and "Others easily noticed my feeling when I felt unpleasant for suppression of NA." In this study, the alphas for suppressions of PA and NA were .69 and .73 for men and .69 and .76 for women, respectively.

Depression

The Japanese version of the CES-D (Center for Epidemiologic Studies Depression Scale; Shima, Shikano, Kitamura, & Asai, 1985), which was originally developed by Radloff (1977), was utilized to measure depression. The CES-D is a 20-item self-report scale inquiring about the participant's experiences of negative mood states during the previous week. Each response is graded on a 4-point scale from 0 = "rarely or none of the time" to 3 = "most or all of the time." Item samples include "I felt sad" and "I felt depressed." The alphas was .89 and .88 for men and women, respectively, in this study. Shima et al. (1985) demonstrated the reliability of CES-D using correlations by test-retest and split-halves methods, and demonstrated validity by comparing scores between normal participants and depressed patients.

Short-term Life Satisfaction

Life satisfaction was assessed by means of the Short-term Life Satisfaction Scale (SLSS), which was developed based on the Satisfaction with Life Scale (SWLS; Pavot & Diener, 1993). Although the SLSS in-

cludes similar instructions and contains five items similar to the SWLS, these elements were revised to allow for asking about the past week instead of the whole past life. Participants answered the five items pertaining to life during the past week on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Item examples include: "If I could relive the past week again, I would change almost nothing." The alpha was. 87 in this study. The original scale (SWLS) has high reliability and both convergent and discriminant validity (Pavot & Diener, 1993).

Results & Discussion

Table 1 shows the correlations between all measures for both men and women, along with the means and *SD*s of each measure. Regardless of activation, short-term LS revealed significantly positive correlations with PA and significantly negative correlations with NA for both men and women. Likewise, regardless of activation, depression showed significantly negative correlations with PA and significantly positive correlations with NA for both men and women. In particular, it is likely that the absolute values of the correlations with PA were higher in activated affect, while those with NA were higher in deactivated affect. Depression and short-term LS showed significantly positive and negative correlations with suppression of PA, respectively, for both men and women. Also, Table 1 shows that activated PA was significantly higher in women than in men, $t(494) = 3.94$, $p < .01$, while suppression of PA and NA was significantly higher in men than in women, $t(494) = 7.87$, $p < .01$; $t(494) = 2.51$, $p < .05$, respectively.

Table 1. Correlations Between All Measures with Means and Standard Deviations (*SD*s) for Men and Women

									Men		Women	
	1	2	3	4	5	6	7	8	*Mean*	(*SD*)	*Mean*	(*SD*)
1. Depression		-.55**	-.52**	.47**	-.38**	.51**	.27**	-.01	19.18	(10.90)	18.49	(9.55)
2. Life Satisfaction	-.46**		.62**	-.30**	.46**	-.47**	-.29**	-.07	14.71	(6.61)	15.47	(6.68)
3. Activated Positive Affect	-.44**	.61**		-.25**	.48**	-.29**	-.33**	-.00	17.26	(5.42)	19.09	(4.95)††
4. Activated Negative Affect	.36**	-.35**	-.20**		-.44**	.43**	.09	-.22**	13.32	(5.84)	14.16	(5.75)
5. Deactivated Positive Affect	-.29**	.29**	.47**	-.26**		-.28**	-.07	-.01	16.03	(5.56)	16.83	(5.28)
6. Deactivated Negative Affect	.46**	-.36**	-.14*	.42**	-.11		.15*	-.01	19.81	(4.62)	20.52	(4.13)
7. Emotional Suppression (PA)	.29**	-.20**	-.25**	.17**	-.15*	.13*		.29**	13.00	(4.59)	10.00	(3.90)††
8. Emotional Suppression (NA)	.03	.04	.02	-.22**	.05	-.09	.16*		16.77	(4.62)	15.75	(4.43)†

N = (240 men and 256 women). Correlations shown above the diagonal are for men, and those shown below the diagonal are for women. $^{*}p < .05$. $^{**}p < .01$. Sex differences: $^{\dagger}p < .05$. $^{\dagger\dagger}p < .01$.

In order to investigate the effects of affect and ES on depression, hierarchical regression analyses were conducted with depression regressed on PA, NA, ES of PA, ES of NA, PA x ES of PA, and NA x ES of NA for activated affect (Table 2) and deactivated affect (Table 3). Following the recommendation of Aiken and West (1991), the predictor variables were standardized to avoid multicollinearity between the predictors and the interaction terms. In the regression analyses, PA and NA were entered on the first step, followed by ES of PA and ES of NA on the second step and then PA x ES of PA and NA x ES of NA on the third step.

Regarding activated affect (Table 2), PA and NA had significantly negative and positive associations with depression, respectively, along with significant R^2s in both men and women. ES of PA showed a significantly positive association with depression, along with a significant R^2 change in women. Moreover, the interaction between NA and ES of NA was significantly negative, along with a significant R^2 change in women. Regarding deactivated affect (Table 3), as in Table 2, PA and NA had significantly negative and positive associations with depression, respectively, along with significant R^2s in both men and women. ES of PA showed significantly positive associations with depression, along with significant R^2 changes in both

Table 2. Predicting Depression via Activated Positive and Negative Affect and Emotional Suppression

	Steps and Variables Entered	Step 1 β	Step 2 β	Step 3 β	R^2	R^2 change
Men						
Step 1	Positive Affect (PA)	-.43**	-.39**	-.40**	.39**	
	Negative Affect (NA)	.36**	.37**	.37**		
2	Emotional Suppression_PA (ESPA)		.10	.10	.40**	.01
	Emotional Suppression_NA (ESNA)		.04	.03		
3	PA x ESPA			-.05	.41**	.00
	NA x ESNA			-.02		
Women						
Step 1	Positive Affect (PA)	-.38**	-.35**	-.36**	.27**	
	Negative Affect (NA)	.28**	.28**	.27**		
2	Emotional Suppression_PA (ESPA)		.14*	.15**	.30**	.03**
	Emotional Suppression_NA (ESNA)		.08	.06		
3	PA x ESPA			-.04	.32**	.02*
	NA x ESNA			-.14**		

N = (240 men and 256 women). *p < .05. **p < .01.

Table 3. Predicting Depression via Deactivated Positive and Negative Affect and Emotional Suppression

	Steps and Variables Entered	Step 1 β	Step 2 β	Step 3 β	R^2	R^2 change
Men						
Step 1	Positive Affect (PA)	-.26**	-.25**	-.27**	.32**	
	Negative Affect (NA)	.44**	.41**	.43**		
2	Emotional Suppression_PA (ESPA)		.22**	.21**	.37**	.04**
	Emotional Suppression_NA (ESNA)		-.08	-.08		
3	PA x ESPA			-.13*	.38**	.02
	NA x ESNA			.03		
Women						
Step 1	Positive Affect (PA)	-.24**	-.22**	-.22**	.27**	
	Negative Affect (NA)	.44**	.42**	.42**		
2	Emotional Suppression_PA (ESPA)		.20**	.19**	.31**	.04**
	Emotional Suppression_NA (ESNA)		.05	.05		
3	PA x ESPA			-.01	.31**	.02
	NA x ESNA			-.02		

N = (240 men and 256 women). *p < .05. **p < .01.

men and women. Moreover, the interaction between PA and ES of PA was significantly negative, but the R^2 change was not significant. The significant interaction of activated NA and ES with the significant R^2 change is plotted using the procedure proposed by Aiken and West (1991) in Fig. 1. The predicted values on depression were computed on the basis of the scores for NA and ES of NA of 1 *SD* below the mean and 1 *SD* above the mean. Both slopes were significant, *t*s(252) = 3.93 for high ES and 5.68 for low ES, *p*s < .01. These results show that although deactivated NA had a significantly positive association with LS regardless of ES, the association was more positive when ES was lower.

The effects of affect and ES on short-term LS were examined using the same methods as in the dependent variable of depression. Table 4 shows the results of the hierarchical regression analyses for activated affect. PA and NA had significantly positive and negative associations with short-term LS, respec-

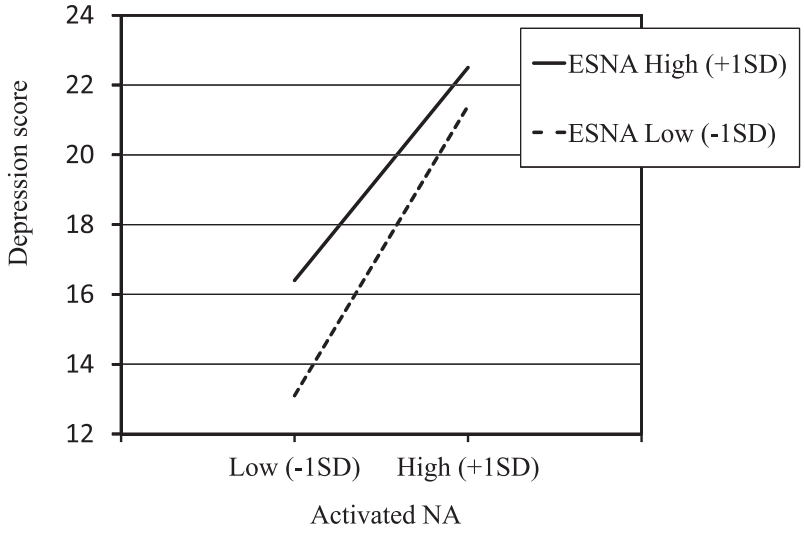

Fig. 1. Scores on depression as a function of activated negative affect (NA) and emotional suppression of negative affect (ESNA) in women.

Table 4. Predicting Short-term Life Satisfaction via Activated Positive and Negative Affect and Emotional Suppression

Steps and Variables Entered	Step 1 β	Step 2 β	Step 3 β	R^2	R^2 change
Men					
Step 1 Positive Affect (PA)	.58**	.55**	.54**	.41**	
Negative Affect (NA)	-.16**	-.17**	-.18**		
2 Emotional Suppression_PA (ESPA)		-.07	-.07	.42**	.01
Emotional Suppression_NA (ESNA)		-.08	-.10		
3 PA x ESPA			-.10*	.44**	.02*
NA x ESNA			-.11*		
Women					
Step 1 Positive Affect (PA)	.56**	.55**	.59**	.42**	
Negative Affect (NA)	-.23**	-.24**	-.22**		
2 Emotional Suppression_PA (ESPA)		-.02	-.04	.42**	.00
Emotional Suppression_NA (ESNA)		-.02	-.03		
3 PA x ESPA			-.12*	.45**	.03**
NA x ESNA			.14**		

N = (240 men and 256 women). *p < .05. **p < .01.

tively, along with significant R^2s in both men and women. ES did not have any significant βs, while the interactions between affect and ES were all negatively significant. With regard to deactivated affect in Table 5, PA and NA showed similar associations with short-term LS as in Table 4. Regarding ES and the interaction, no significant R^2 changes were found, although the βs of ES of PA and NA x ES of NA were significant for men.

The four significant interactions in Table 4 are plotted in Fig. 2 to 5 using the same methods as in Fig. 1. In Fig. 2 for the interaction between PA and ES of PA in men, both slopes were significant, ts (236) = 6.08 for high ES and 9.65 for low ES, ps < .01. These results show that although activated PA had a significantly positive association with LS regardless of ES, the association was more positive when ES was lower. In Fig. 3 for the interaction between PA and ES of PA in women, both slopes were significant, ts(252) = 8.00 for high ES and 10.29 for low ES, ps < .01. Also in women, these results show that although activated PA had a significantly positive association with LS regardless of ES, the association was more positive when ES was lower.

Table 5. Predicting Short-term Life Satisfaction via Deactivated Positive and Negative Affect and Emotional Suppression

	Steps and Variables Entered	Step 1 β	Step 2 β	Step 3 β	R^2	R^2 change
Men						
Step 1	Positive Affect (PA)	.36**	.35**	.37**	.34**	
	Negative Affect (NA)	-.37**	-.34**	-.35**		
2	Emotional Suppression_PA (ESPA)		-.21**	-.20**	.39**	.05
	Emotional Suppression_NA (ESNA)		-.00	-.02		
3	PA x ESPA			.00	.40**	.02
	NA x ESNA			-.13*		
Women						
Step 1	Positive Affect (PA)	.26**	.24**	.25**	.19**	
	Negative Affect (NA)	-.33**	-.31**	-.32**		
2	Emotional Suppression_PA (ESPA)		-.13*	-.11	.21**	.02
	Emotional Suppression_NA (ESNA)		.02	.02		
3	PA x ESPA			.08	.21**	.01
	NA x ESNA			.04		

N = (240 men and 256 women). *p < .05. **p < .01.

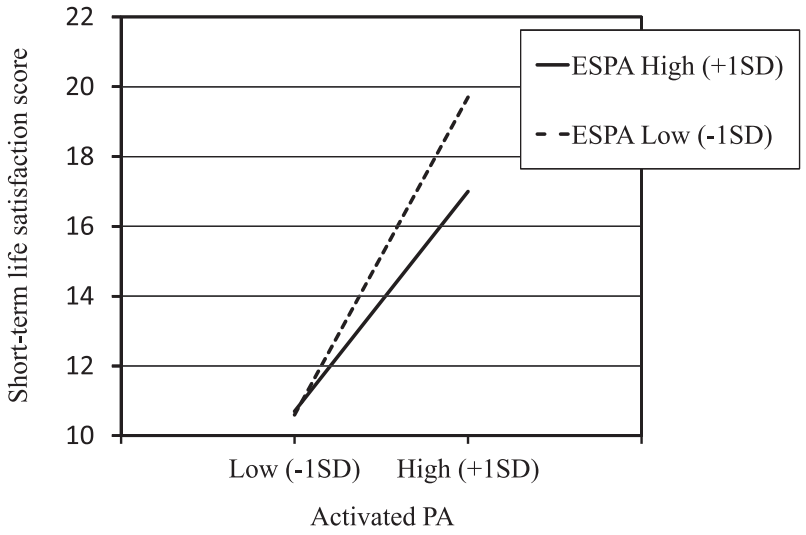

Fig. 2. Scores on short-term life satisfaction as a function of activated positive affect (PA) and emotional suppression of positive affect (ESPA) in men.

In Fig. 4, the content of the interaction between NA and ES of NA in men is depicted. Both slopes were significant, ts(236) = 5.32 for high ES and 2.68 for low ES, ps < .01. These results show that although activated NA had a significantly negative association with LS regardless of ES, the association was more negative when ES was higher. Moreover, in Fig. 5, the content of the interaction between NA and ES of NA in women is shown. Both slopes were significant, ts(252) = 3.81 for high ES and 4.94 for low ES, ps < .01. These results show that although activated NA had a significantly negative association with LS regardless of ES, the association was more negative when ES was lower.

Taken together, higher activated PA is associated with higher short-term LS when suppression of PA is lower, which suggests that if activated PA is suppressed, its beneficial effects on adjustment are decreased. However, these phenomena were not found in depression and deactivated PA. Regarding suppression of NA, the findings were inconsistent. Although it was predicted that if NA is suppressed, its detrimental effects would increase. This prediction was supported only in activated NA in men, but not in ac-

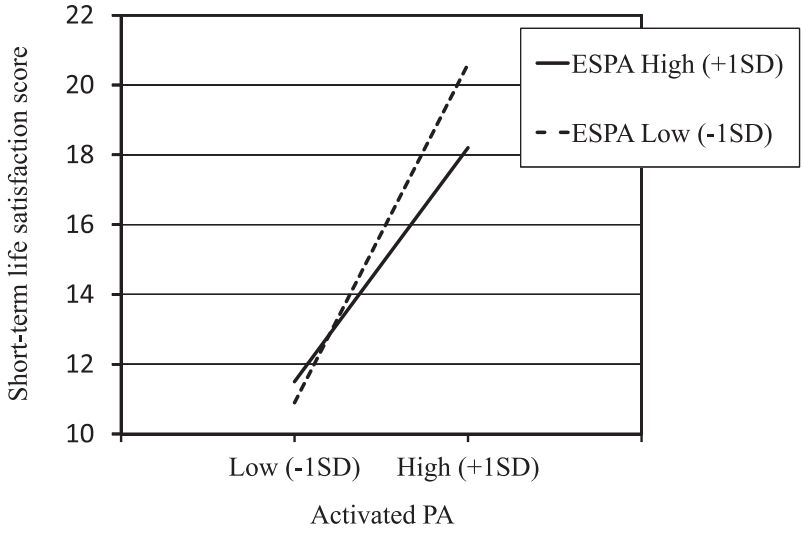

Fig. 3. Scores on short-term life satisfaction as a function of activated positive affect (PA) and emotional suppression of positive affect (ESPA) in women.

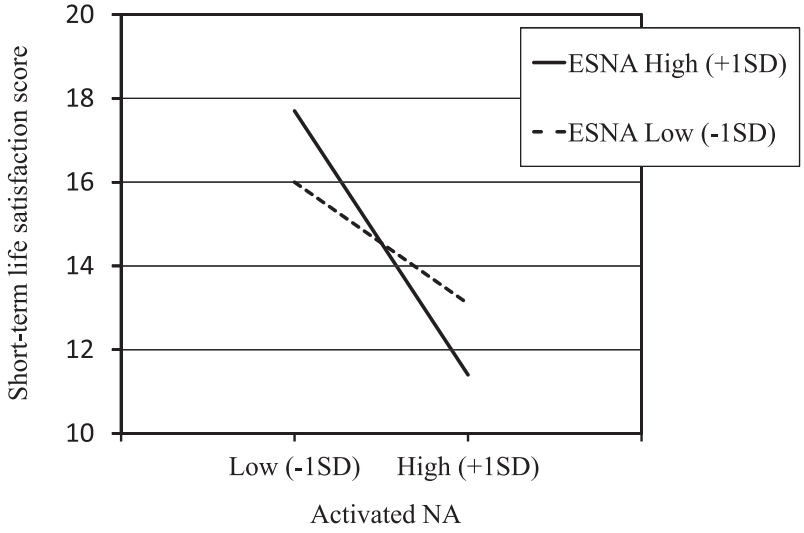

Fig. 4. Scores on short-term life satisfaction as a function of activated negative affect (NA) and emotional suppression of negative affect (ESNA) in men.

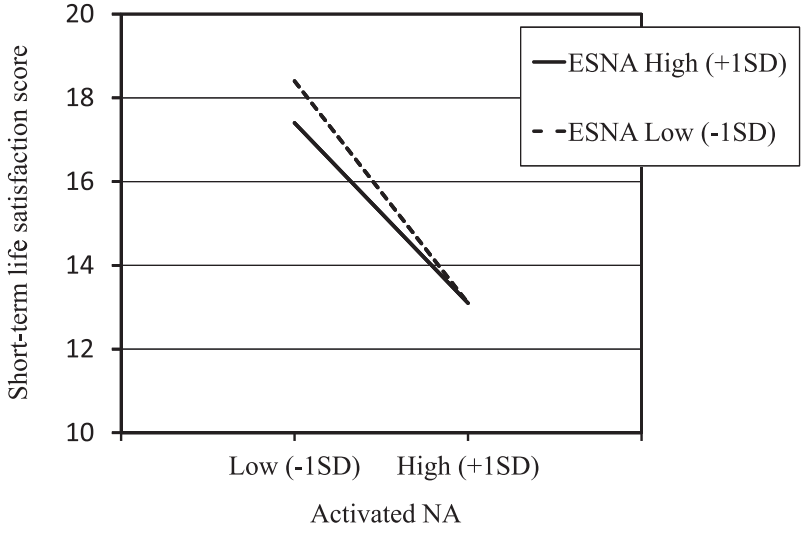

Fig. 5. Scores on short-term life satisfaction as a function of activated negative affect (NA) and emotional suppression of negative affect (ESNA) in women.

tivated NA in women for both depression and short-term LS. More interestingly, deactivated affect showed no interaction with its suppression, but suppression of deactivated PA showed independent positive associations with short-term LS in both men and women.

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Cross-sectional Research Using New Measures on the Effects of Positive and Negative Affect (PA and NA) and Emotional Suppression on Depression and Short-term Life Satisfaction : Considering the Activation Dimension of Affect and Suppression of PA and NA

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Keywords: emotional suppression, positive affect, negative affect, depression, short-term life satisfaction

In the current study, we examined the effects of affect and emotional suppression (ES) on depression and short-term life satisfaction (LS) that were measured over the previous week. We also considered the dimension of activation status for both positive affect (PA) and negative affect (NA). Regarding ES, we separately considered suppression of PA and NA. The final sample included data collected from 496 undergraduates and graduate students (240 men and 256 women). Participants answered seven questionnaires, three of which were used for another study. The Activated and Deactivated Affect Questionnaire was utilized for assessing activated and deactivated PA and NA, the Emotional Suppression Scale for Positive and Negative Affect for measuring ES of PA and NA, the Center for Epidemiologic Studies Depression Scale for gauzing depression, and the Short-term Life Satisfaction Scale for determining short-term LS. All of the tests were Japanese versions, and were answered with regard to the previous week's experiences. Results showed that PA and NA were negatively and positively associated with depression, and positively and negatively with short-term LS, respectively. Suppression of PA was positively associated with depression, and negatively with short-term LS. Moreover, a number of significant interactions between affect and its suppression were found, especially suggesting that suppression of PA reduces PA's beneficial effects on health and adjustment. In addition, deactivated affect did not show any interactions with its suppression.

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