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Interindividual Differences and Intraindividual Variability in Emotional Well-being: an Examination of Gender, Time Perspective and Emotion Regulation

Abstract

This study examined Taiwanese undergraduates' trajectories of emotional well-being, positive affect, and negative affect over a 16-week period within one semester. The effect of their differences in gender and time perspective profiles on intraindividual variability of weekly affect and associations between time trends of affects and use of two emotional regulation strategies, i.e., reappraisal and suppression, were also investigated. Longitudinal data from 96 undergraduates were analyzed by hierarchical linear modeling (HLM). With time passing, the habitual use of reappraisal was related to the increase of emotional well-being and positive affect and related to the decline of negative affect. By contrast, habitually using suppression was related to an increase of negative affect over time. The main findings also indicated that individuals with balanced time perspective had higher levels of emotional well-being compared to those without balanced time perspective at the baseline of the study. Gender and time perspective profiles were also demonstrated as moderators in the relationship between changes in using emotional regulation strategies on emotional well-being.

Keywords: emotional well-being, time perspective, emotional regulation, Taiwan

Międzyosobnicze różnice i wewnątrzosobnicza zmienność emocjonalnego dobrostanu: płeć społeczna, perspektywa czasowa i regulacja emocji

Streszczenie

Badaniem objęte zostały trajektorie emocjonalnego samopoczucia u tajwańskich studentów obejmujące afekt pozytywny i negatywny przez okres 16 tygodni w ciągu jednego semestru. Zbadano także wpływ różnic płci i profili perspektyw czasowych na wewnątrzosobniczą zmienność tygodniowego afektu, a także powiązania między trendami czasowymi afektów a zastosowaniem dwóch strategii regulacji emocji (*powtórnej analizy* oraz *tłumienia*). Dane podłużne pochodzące od 96 studentów zostały zanalizowane za pomocą hierarchicznych modeli liniowych (HLM). Z upływem czasu zwyczajowe stosowanie strategii regulacji

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emocji, jaką jest powtórna analiza, związane było ze wzrostem samopoczucia emocjonalnego i z afektem pozytywnym, z jednoczesnym spadkiem afektu negatywnego. Odwrotnie, regularne stosowanie strategii tłumienia miało związek ze wzrostem afektu negatywnego w czasie. Główne wnioski wskazały również, że osoby o zrównoważonej perspektywie czasowej charakteryzowały się wyższym stopniem samopoczucia emocjonalnego niż te, które nie wykazywały w początkowej fazie badania zrównoważonej perspektywy czasowej. Płeć i profile perspektywy czasowej zostały ukazane również jako moderatory relacji między zmianami w stosowaniu strategii regulacji emocji w odniesieniu do samopoczucia emocjonalnego.

Słowa kluczowe: dobrostan emocjonalny, perspektywa czasowa, regulacja emocjonalna, Taiwan

Introduction

The pursuit and improvement of well-being are crucial life goals and regulating emotion is a key factor in well-being (Gross & John, 2003). Numerous emotion regulation strategies have been categorized into behavioural or cognitive and engagement or avoidance super-ordinate categories (Parkinson & Totterdell, 1999), or into need-, goal-, and person-oriented strategies (Koole, 2009). Augustine and Hemenover (2009) conducted a meta-analysis to evaluate the relative effectiveness of various emotion regulation strategies and determined reappraisal and distraction strategies to be the most effective means of regulating affects. Cognitive reappraisal and expressive suppression are two common goal-oriented emotion regulation strategies. Previous studies have shown that using reappraisal is positively related to positive-emotion experience and negatively related to negative-emotion experience. People using suppression experience fewer positive emotions and more negative emotions (Balzarotti, John, Gross, 2010; Gillander, Wild, Deighan, Gillanders, 2008; Gross & John, 2003; Haga, Kraft, Corby, 2009; Moore, Zoellner, Mollenholt, 2008). However, most of these studies were cross-sectional rather than longitudinal.

In longitudinal studies involving a short time period, such as a few minutes or days, individual differences in reappraisal and suppression have been treated as stable trait variables. The consequences of these trait variables on the mean level and changes in affective experiences over time have been investigated (Kuppens, Oravecz, Tuerlinckx, 2010; Meyer, Smeets, Giesbrecht, Merckelbach, 2012). Considerably less evidence exists regarding how within-individual differences, the use of reappraisal and suppression strategies influence changes in affective experiences over time. The main finding of the aforementioned studies is that reappraisal is related to an increase in positive affect and suppression is related to a negative affect (Nezlek & Kuppens, 2008). When conducting longitudinal studies for a long time period, such as several weeks or months, the use of reappraisal and suppression can be observed continually to determine which emotional strategies people use habitually. The use of various time intervals and sampling schemes should be considered to explore which interval or scheme can be used to capture distinct affective fluctuations precisely.

Based on the line of inquiry regarding the effect of individual difference patterns on the dynamics of emotional well-being over time, we incorporated certain key predictors into our study. Cross-sectional studies have indicated that people with a balanced time perspective possess more positive emotions, subjective happiness, and life satisfaction than those without a balanced time perspective (Boniwell, Osin, Linley, Ivanchenko, 2010; Boniwell & Zimbardo, 2004; Drake, Duncan, Sutherland, Abernethy, Henry, 2008; Gao, 2011). It has been hypothesized that people who flexibly shift time perspectives to achieve balanced states show a pattern of stronger well-being than those who do not. A balanced time-perspective state involves higher future, present-hedonistic, and past-positive orientations, whereas a non-balanced time-perspective state involves lower present-fatalistic and past-negative orientations (Boniwell & Zimbardo, 2004; Boyd & Zimbardo, 2005). Although people excessively focus on particular time perspectives, they may encounter dysfunction. For example, people who have a highly past-negative time perspective, a highly present-fatalistic time perspective, or a highly present-hedonistic time perspective tend to have lower self-esteem and more emotional problems, such as aggression, anxiety, and depression, than those who do not (Holman & Zimbardo, 2009; Zimbardo & Boyd, 2008). By employing various conceptualizations of a balanced time perspective, Webster (2011) found that people with a balanced time perspective possess greater happiness. However, knowledge of whether emotional well-being is more persistent over time for people with a balanced time perspective compared with people without a balanced time perspective is limited. People with a balanced time perspective may also be more likely to use different emotion-regulation strategies to maintain their emotional well-being because they can adaptively shift their states depending on various situations. Hence, we incorporated time-perspective profiles as a moderator in this study.

Gender differences also have substantial effects on various dimensions of psychological well-being (for a meta-analysis, see Roothman, Kirsten, Wissing, 2003), and these effects on affective experiences often result from biological influences and gender-stereotypic socialization (Bagozzi, Wong, Yi, 1999; Fischer, Mosquera, van Vianer, Manstead, 2004; Roothman et al., 2003; Simon & Nath, 2004). In socialization processes, women are encouraged to express their emotions (Bagozzi, Wong, Yi, 1999; Fischer et al., 2004; Roothman et al., 2003; Simon & Nath, 2004). Regarding emotion regulation strategies, women use venting and express affect more than men do (Lipovčan & Prizmić, 2009). When women adopt suppression strategies, inhibiting their emotions may increase negative affect. For example, Nezlek and Kuppens (2008) found that the relationship between suppressing positive emotion and increasing negative consequences was stronger for women than for men. Emotion regulation strategies play a mediating role in the relationship between gender differences and emotional experience.

The purpose of this study was to examine the moderating effects of gender and two time-perspective profiles (balanced and non-balanced) on initial states and fluctuations of emotional well-being and positive and negative affects over time by

using reappraisal and suppression. We assumed that habitually employing cognitive reappraisal increases emotional well-being and positive affect, and decreases negative affect over time, and that participants who hold a balanced time perspective demonstrate greater emotional well-being and positive affect. We contribute to previous studies by exploring the moderating effects of individual differences in time-perspective profiles and gender on the relationship between using regulation strategies and emotional experiences over time.

Method

Participants

The participants were 135 undergraduates majoring in psychology at a Taiwanese university (62 men and 73 women). While attending their statistics or psychological testing courses, they were invited to complete a self-report emotional experience and regulation questionnaire weekly for 16 weeks in return for one grade point. We excluded 39 participants from the final sample because they did not complete the initial time-perspective measures in the first week of the semester. The final sample of 96 participants provided 1.193 valid assessments during the 16-week period. The sample consisted of a higher percentage of women than of men (62.5% and 37.5%), and ranged in age from 18 to 26 years.

Measures

Time was coded as the number of weeks during one semester for each measurement, beginning with Time 1 in Week 2 and ending Time 16 in Week 17.

Ambulatory repeated measures

Emotional well-being, positive and negative affect

Emotional well-being is the presence of positive affect and the absence of negative affect (Diener, Oishi, Lucas, 2003; Jovanovic, 2011; Keyes, 2000; Schimmack, Schupp, Wagner, 2008; Spence, Oades, Caputi, 2004). Hence, emotional well-being in this study was assessed using a composite score from typical levels of positive affect minus negative affect. Affective experiences were assessed using a Chinese translation of the Positive and Negative Affect Schedule (PANAS; Lai, 2007; Watson, Clark, Tellegen, 1988), which comprises 10 positive and 10 negative items. Participants indicated the extent of their feelings during the previous week on a 4-point scale where 1 = *not at all* and 4 = *very strong*. Cronbach's Alphas of the Positive Affect (PA) scale ranged from .63 to .82, and those of the Negative Affect (NA) scale ranged from .82 to .90; both ranges were calculated across 16 weeks. In addition, Positive Affect and Negative Affect were treated as two separate constructs because emotional well-being tends to be bi-dimensional when people perceive little change in their lives (Keyes, 2000).

Emotional regulation

The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003), translated into a Chinese version (Liang, 2009), comprises 10 items that ask participants about the extent of their habitual use of emotion regulation strategies endorsed on a 4-point scale from 1 (*disagree strongly*) to 4 (*agree strongly*) and is divided into two sub-scales: reappraisal and suppression. Cronbach's Alphas of the reappraisal scale ranged from .81 to .85, and those of the suppression scale ranged from .62 to .83; both ranges were calculated across 16 weeks.

Between-person measures

Time perspectives

The 20-item Zimbardo Time Perspective Inventory – Chinese version (ZTP; Tu, 2004; Zimbardo & Boyd, 1999), was used to assess five time perspectives: Past-Positive (PP), Past-Negative (PN), Present-Hedonistic (PH), Present-Fatalistic (PF), and Future (F). Each of the five dimensions was measured according to the four items with the highest factor loadings from the original ZTP (Zimbardo & Boyd, 1999). Cronbach's Alphas indicated that the reliability of five dimensions was acceptable (.77 for PP, .76 for PN, .50 for PH, .71 for PF, and .68 for F).

Two approaches to operationalizing balanced time perspective have been applied in relevant studies: cut-off point and person-oriented approaches (Boniwell et al., 2010; Drake et al., 2008; Gao, 2011). Boniwell et al. (2010) suggested that the person-oriented approach is more suitable than the cut-off point approach is for distinguishing among participants with different time perspective profiles. Gao (2011) identified two types of time perspective profiles among young adults in Taiwan by using a two-stage cluster analysis, which is a person-oriented approach. One cluster fits the configuration of balanced time perspective proposed by Boniwell and Zimbardo (2004), and the other was characterized by an entirely different pattern compared with the balanced time perspective. We conducted a non-hierarchical k-means cluster analysis by using simple Euclidean distance as the similarity measure, specifying a two-cluster solution according to Gao (2011). One profile was labelled as a balanced time perspective, because PP, PH, and F were characterized by relatively high scores, whereas the PN and PF scores were considered relatively low. The other profile was labelled as a non-balanced time perspective because it was characterized by relatively low scores in PP, PN, and F and a relatively high level of PN and PF. We separated all participants into two groups according to their configurations of time perspectives: 55 were in the balanced time perspective group, and 41 were in the non-balanced time perspective group.

Time perspective profile was coded as 0 = *balanced time perspective group* and 1 = *non-balanced time perspective group*. Gender was coded as 0 = *male* and 1 = *female*.

Statistical analysis

Data were analysed using HLM 6.03 (Raudenbush, Bryk, Congdon, 2005) to explore unconditional analysis of variance (ANOVA) models and linear, quadratic, and cubic-growth models. Each analysis yielded estimates of fixed effects describing the average mean level (intercept) and within-individual trajectories. The full model specified the trajectory of emotional well-being, positive affect, and negative affect, and a set of latent growth parameters as follows:

$$Y_{ti} = \pi_{0i} + \pi_{1i}(\text{TIME}) + \pi_{2i}(\text{TIME})^2 + \pi_{3i}(\text{TIME})^3 + \varepsilon_{ti}$$
$$\pi_{0i} = \beta_{00} + r_{0i}$$

where Y_{ti} is Person *i*'s self-rated emotional well-being or affective experience scores at a given time *t*, π_{0i} is Individual *i*'s estimated emotional well-being or affect scores at the baseline, π_{1i} is the effect of the linear trajectory for each individual, π_{2i} is the quadratic effect of time for each individual, π_{3i} is the cubic effect of time for each individual, ε_{ti} is a residual, β_{00} is the average of emotional well-being or affect experiences at the baseline, and r_{0i} is a residual around the mean emotional well-being or affect experiences at the baseline.

The full model is a cubic model. The parameters of quadratic and linear models were calculated after sequentially removing the cubic term and the slope term. The unconditional linear, quadratic, and cubic models were chosen according to their relative fit to the data, with smaller deviances indicating better model fit. We then examined whether within-individual changes in using reappraisal and suppression as time-varying covariates predicts changes in weekly emotional well-being and affect experiences. We modelled between-individual differences of gender and time-perspective profiles in these estimated underlying growth parameters. Individual mean-centred reappraisal and individual mean-centred suppression were added as time-varying covariates into a set of linear growth models (for a discussion on centring, see Raudenbush & Bryk, 2002). For example, for Model 3, in which the time-varying covariates were added to between-individual predictors, we used the following equation:

Level-1 Model

$$Y_{ti} = \pi_{0i} + \pi_{1i}(\text{TIME}) + \pi_{2i}(\text{Individual mean-centred REAPPRAISAL}) + \pi_{3i}(\text{Individual mean-centred SUPPRESSION}) + \varepsilon_{ti}$$

Level-2 Model

$$\pi_{0i} = \beta_{00} + \beta_{01}(\text{GENDER}) + \beta_{02}(\text{TP}) + r_{0i}$$
$$\pi_{1i} = \beta_{10} + \beta_{11}(\text{GENDER}) + \beta_{12}(\text{TP}) + r_{1i}$$
$$\pi_{2i} = \beta_{20} + \beta_{21}(\text{GENDER}) + \beta_{22}(\text{TP}) + r_{2i}$$
$$\pi_{3i} = \beta_{30} + \beta_{31}(\text{GENDER}) + \beta_{32}(\text{TP}) + r_{3i}$$

where π_{2i} is the effect of within-individual changes in reappraisal; π_{3i} is the effect of within-individual changes in suppression; β_{01} is the effect of gender on π_{0i}; β_{02} is the

effect of time perspective on π_{0i}; β_{11}, β_{21}, and β_{31} are the moderating effects of gender on π_{1i}, π_{2i}, and π_{3i}; and β_{12}, β_{22}, and β_{32} are the moderating effects of time perspective on π_{1i}, π_{2i}, and π_{3i}.

Results

The intraclass coefficients (ICCs) for emotional well-being, positive affect, and negative affect were estimated as ratio values of between-individual variance to total variance after performing an unconditional ANOVA model with random effects. The ICCs were .4392, .4690, and .5946 for emotional well-being, positive affect, and negative affect, respectively. These indicated that 43.92% of the total variance of emotional well-being, 46.90% of the total variance of positive affect, and 59.46% of the total variance of negative affect were caused by between-individual components, and 56.08%, 53.10%, and 40.54% of the total variance of emotional well-being, positive affect, and negative affect, respectively, were caused by within-individual components.

The results of chi-square difference tests of models embedded with different time trend (i.e. linear, quadratic, and cubic) effects compared with their unconditional ANOVA models are shown in Tables 1 and 2. The results showed that the unconditional linear growth model had a significantly better fit compared with the unconditional ANOVA model for emotional well-being ($\Delta\chi^2$ (2) = 29.17, $p < .001$) and positive affect ($\Delta\chi^2$ (2) = 31.98, $p < .001$). The unconditional linear growth models also provided a better fit than quadratic and cubic models did in emotional well--being, positive affect, and negative affect.

Tab. 1. Parameters estimates and fit indices of linear, quadratic, and cubic growth models for emotional well-being and PA

	Linear model		Quadratic model		Cubic model
	Coefficient (*SD*)	*t*	Coefficient (*SD*)	*t*	Coefficient (*SD*)
Emotional Well-being					
Intercept	.45*** (.05)	8.29	.52*** (.06)	8.43	.53*** (.07)
Linear Change	-.02*** (.00)	-4.34	-.05*** (.01)	-3.75	-.06* (.03)
Quadratic Change			.00* (.00)	2.59	.00 (.00)
Cubic Change					-.00 (.00)
Deviance	1978.33		1984.58		1997.89
Chi-square	29.17***		22.92***		9.61*
DF	1		2		3
Positive Affect					
Intercept	2.53*** (.04)	71.97	2.55*** (.04)	65.32	2.56*** (.04)

Linear Change	-.01*** (.00)	-4.64	-.02* (.01)	-2.59	-.03 (.02)
Quadratic Change			.00 (.00)	1.23	.00 (.00)
Cubic Change					-.00 (.00)
Deviance	958.93		972.41		986.28
Chi-square	31.98***		18.50***		4.63
DF	1		2		3

Note: *$p < .05$; **$p < .01$; ***$p < .001$

Tab. 2. Parameters estimates and fit indices of linear, quadratic, and cubic growth models for NA

	Linear model		**Quadratic model**		**Cubic model**
	Coefficient (*SD*)	***t***	**Coefficient (*SD*)**	***t***	**Coefficient (*SD*)**
Negative Affect					
Intercept	2.08*** (.04)	48.51	2.03*** (.05)	43.51	2.03*** (.05)
Linear Change	.01* (.00)	2.10	.03*** (.01)	3.21	.028* (.02)
Quadratic Change			-.00** (.00)	-2.98	-.00 (.00)
Cubic Change					-.00 (.00)
Deviance	903.93		908.83		923.23
Chi-square	.79		-4.11[a]		-18.51[a]
DF	1		2		3

Note. *$p < .05$; **$p < .01$; ***$p < .001$

a. Negative values reflect that deviances of the quadratic and cubic models are larger than that of the unconditional ANOVA models indicating poor model fit

Based on the results, linear growth models were adopted in this study. Significant parameter estimates of the linear slope of time were observed in emotional well-being, positive affect, and negative affect (π_{1i} = -.02, $p < .001$; π_{1i} = -.01, $p < .001$; π_{1i} = .01, $p < .05$). The results indicated a slightly decreasing trend in emotional well-being and positive affect and a slightly increasing trend in negative affect over time. Chi-square tests of the variance component for emotional well-being, positive affect, and negative affect indicated a significant variation in initial levels ($\chi^2(95) = 432.61$, $p < .001$; χ^2 (95) = 429.95, $p < .001$; χ^2 (95) = 700.38, $p < .001$) and in time slope (χ^2 (95) = 219.00, $p < .001$; χ^2 (95) = 210.36, $p < .001$; χ^2 (95) = 235.34, $p < .001$). Hence, between- and within-individual predictors of variation in emotional well-being, positive affect, and negative affect were explored in subsequent models.

Regarding emotional well-being (see Tab. 3), Models 2 and 3 exhibited a significantly better fit than Model 1 and the unconditional linear growth model did ($\Delta\chi^2$ (2) = 58.27, $p < .001$; $\Delta\chi^2$ (10) = 49.43, $p < .001$). In Models 2 and 3, the parameter

estimates of the linear time trend were negative and statistically significant, which is consistent with the previously reported results. The results from Models 2 and 3, in which the time-varying covariates were added, showed that changes in using reappraisal across 16 weeks were positively associated with changes in emotional well-being (β_{20} = .37, p < .001, for Model 2; β_{20} = .47, p < .001, for Model 3). In Model 3, in which between-individual predictors were added, the results indicated that participants without a balanced time perspective were associated with lower emotional well-being at the baseline than were those with a balanced time perspective (β_{02} = -.26, p < .05). Individual differences in gender also moderated the relationship between changes in using reappraisal and changes in emotional well-being (β_{21} = -.23, p < .05) indicating that the magnitude of the effect of within-individual changes in using reappraisal on emotional well-being within female participants was lower than that within male participants.

Tab. 3. Parameters estimates of within- and between-individual predictors and fit indices of multilevel models

	Emotional Well-being			**Positive Affect**			**Negative Affect**	
	M 1	**M 2**	**M 3**	**M 1**	**M 2**	**M 3**	**M 1**	**M 2**
Intercept	.45*** (.05)	.42*** (.05)	.58*** (.10)	2.53*** (.04)	2.51*** (.04)	2.65*** (.07)	2.08*** (.04)	2.09*** (.04)
Female			-.08 (.11)			-.12 (.07)		
Non-BTP			-.26* (.10)			-.16* (.07)		
Linear Slope	-.02*** (.00)	-.01*** (.00)	-.01* (.01)	-.01*** (.00)	-.01*** (.00)	-.01* (.00)	.01* (.00)	.01* (.00)
Female			.00 (.01)			-.00 (.00)		
Non-BTP			-.01 (.01)			-.01 (.00)		
Reappraisal Slope		.37*** (.04)	.47*** (.09)		.20*** (.06)	.32*** (.06)		-.17*** (.03)
Reappraisal* Female			-.23* (.10)			-.21*** (.06)		
Reappraisal* Non-BTP			.10 (.10)			.02 (.06)		
Suppression Slope		-.04 (.04)	.04 (.08)		.02 (.03)	.10 (.05)		.06* (.03)
Suppression* Female			-.04 (.09)			-.05 (.06)		
Suppression* Non-BTP			-.15 (.09)			-.12* (.06)		
Deviance	1978.33	1920.06	1928.90	958.93	922.61	931.25	903.93	874.69
Chi-square		58.27***	49.43***	–	36.32***	27.68***	–	29.24***
DF	–	2	10	–	2	10	–	2

Note. *p < .05; **p < .01; ***p < .001

The results for positive affect were similar to those for emotional well-being (see Tab. 3). In Model 3, the time-perspective profile significantly negatively predicted the initial level of positive affect (β_{02} = -.16, $p < .05$), indicating that participants with a balanced time perspective possessed more positive affect than did those without a balanced time perspective at the baseline. The critical test involved the interaction between time and the use of a reappraisal strategy, which were both positive and significant (β_{20} = .32, $p < .001$), indicating that the within-individual slope relating reappraisal to positive affect increased in magnitude across the 16-week period. Gender moderated the effect of within-individual changes in using reappraisal on positive affect (β_{21} = -.21, $p < .001$), and the magnitude of the effect within male participants was stronger than that within female participants. Time-perspective profiles moderated the relationship between changes in using suppression on positive affect (β_{32} = -.12, $p < .05$). The magnitude of using suppression related to positive affect across time for those without a balanced time perspective was lower than that for those having a balanced time perspective.

Regarding negative effect, Table 3 shows that Model 2, in which reappraisal and suppression strategies were added as time-varying covariates, exhibited a significantly better fit over other models (deviance = 874.69, $p < .001$). Consistent with Model 1, the linear effect of time was positive (π_{1i} =.01, $p < .05$), and participants frequently using a reappraisal strategy showed decreasing negative affect over time (β_{20} = -.17, $p < .001$). The results also showed that the tendency to use suppression was associated with increasing negative affect within individuals across weeks (β_{30} = .06, $p < .05$). Between-individual predictors did not have significant effects on initial state, rate of change, and association with time-varying covariates for negative effect.

Discussion

This study contributes to preliminary evidence clarifying the role of gender, time-perspective profiles, and emotional-regulation strategies in emotional well-being trajectories. We observed a slightly decreasing trend in the emotional well-being and positive affect and a slightly increasing trend in the negative affect of Taiwanese undergraduates over a 16-week period. The results of using a longitudinal design suggest that the increased use of reappraisal is associated with higher emotional well-being (specifically, an increase in positive affect and a decline in negative affect), whereas increased use of suppression is associated with increasing negative affect over time. These findings are consistent with those of previous studies that used a cross-sectional design, demonstrating that people who habitually reappraise have more positive and less negative emotional experiences than those who do not, whereas habitual suppression involves negative emotional experiences (Balzarotti et al., 2010; Gillander et al., 2008; Gross & John, 2003; Nezlek & Kuppens, 2008).

However, an increase in using suppression was not associated with decreases in emotional well-being and positive affect over time in this study. Koole (2009)

indicated that reappraisal is more effective than suppression in goal-oriented emotion regulation. Nezlek and Kuppens (2008) indicated that the use of distinct regulation strategies is derived from various regulation goals. With the goal of improved emotional well-being, people may reappraise positive affect and negative affect to increase their positive affect and reduce their negative affect. However, the effect of suppression on emotional well-being is confounded because of various types of regulated affects (i.e. suppressing negative affect may reduce experienced negative affect, but suppressing positive affect may reduce experienced positive affect). Quoidbach, Berry, Hansenne, and Mikolajczak (2010) determined that the use of suppression did not significantly predict positive affect and life satisfaction. Compared with the effect of reappraisal, the effect of suppression on positive affect and well-being was not sufficiently large to be detected. Regarding emotion regulation, we did not distinguish between the reappraisal and suppression of positive and negative affect in this study. It was unclear which types of affects participants suppressed more frequently. Future studies could divide regulation strategies into more comprehensive subcategories to identify various emotion regulation effects.

Time-perspective profiles were a significant between-individual predictor of initial status in emotional well-being and positive affect. People with a balanced time perspective possessed more emotional well-being and positive affect at the baseline of the study than those without a balanced time perspective. The pattern of the time perspective profiles of young adults in Taiwan, an Eastern society, is similar to those identified in previous studies in Western societies when people experienced psychological well-being (Boniwell et al., 2010; Drake et al., 2008; Zhang, Howell, Stolarski, 2012). The time-perspective profile was also a moderator in the relationship between changes in using suppression and positive affect over time. People with a balanced time perspective had a stronger association between positive affect and using suppression as an emotional regulation approach than those without a balanced time perspective. People who have a balanced time perspective, a psychological mechanism proposed by Zimbardo and Boyd (1999), possess a positive attitude about their past, enjoy the present, focus on future goals, and are more adaptive across situations than those who have a bias toward a particular time perspective. People with balanced time perspective use various emotion regulation strategies flexibly to sustain their positive affect. For those with an unbalanced time perspective profile, suppressing feelings may be an inappropriate approach to responding to external emotional stimuli, and the lack of using multiple regulation strategies may reduce their positive affect over time.

We also observed that gender has a moderating effect on the relationship between using reappraisal and emotional well-being and positive affect over time. For male participants, the magnitude of the effect of changes in using reappraisal on emotional well-being and positive affect over time was larger than that for females. McRae, Ochsner, Mauss, Gabrieli, and Gross (2008) used functional magnetic resonance imaging (fMRI) to test gender differences in emotion regulation and found that men exhibited less prefrontal region activity and greater down-regulation of

amygdala activity than women during reappraisal. They suggested that men use reappraisal more efficiently than women and that women use positive emotion more than men when down-regulating their negative emotion. The result of this investigation suggests that men regulate their emotion by using reappraisal more efficiently than women.

However, there was no evidence showing that gender and the time-perspective profile have effects when participants experienced and recalled negative affect. Wirtz, Chiu, Diener, and Oishi (2009) indicated that the meaning of positive and negative affect differs between Easterners and Westerners. Based on culturally implicit theories, Westerners focus and recall positive affect and life satisfaction as positive components of subjective well-being more than Easterners. Easterners have greater recall of negative affect than Westerners. Affective structure may also differ according to cultural identification (Perunovic, Heller & Rafaeli, 2007). Cultural contexts should be explored in future studies.

In conclusion, the frequent use of reappraisal may be an effective strategy for enhancing emotional well-being over time. Young Taiwanese men use reappraisal to regulate emotion more efficiently than young women, and people with a balanced time perspective profile are more positive in their affects than those without. Gender and time perspective profiles are also significant moderators in the relationship between changes in using emotional regulation strategies and the emotional well-being of young adults in Taiwan.

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