

A Socio-Cultural Instrumental Approach to Emotion Regulation: Culture and the Regulation of Positive Emotions

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We propose a sociocultural instrumental approach to emotion regulation. According to this approach, cultural differences in the tendency to savor rather than dampen positive emotions should be more pronounced when people are actively pursuing goals (i.e., contexts requiring higher cognitive effort) than when they are not (i.e., contexts requiring lower cognitive efforts), because cultural beliefs about the utility of positive emotions should become most relevant when people are engaging in active goal pursuit. Four studies provided support for our theory. First, European Americans perceived more utility and less harm of positive emotions than Japanese did (Study 1). Second, European Americans reported a stronger relative preference for positive emotions than Asians, but this cultural difference was larger in high cognitive effort contexts than in moderate or low cognitive effort contexts (Study 2). Third, European Americans reported trying to savor rather than dampen positive emotions more than Asians did when preparing to take an exam, a typical high cognitive effort context (Studies 3–4), but these cultural differences were attenuated when an exam was not expected (Study 3) and disappeared when participants expected to interact with a stranger (Study 4). These findings suggest that cultural backgrounds and situational demands interact to shape how people regulate positive emotions.

Keywords: emotion regulation, culture, positive emotion, instrumental approach, context

People typically want to savor rather than dampen their positive emotions¹ (Bryant & Veroff, 2007; Larsen, 2000; Wegener & Petty, 1994; Westen, 1994). However, there are cultural and individual differences in how much individuals engage in such emotion regulation (e.g., Miyamoto & Ma, 2011; Wood, Heimpel, & Michela, 2003; Wood, Heimpel, Newby-Clark, & Ross, 2005). For example, Asians are less likely than European Americans to savor rather than dampen positive emotions after experiencing a positive event and feeling positive emotions, partly due to Asians' dialectical beliefs about negative aspects of positive emotions (Miyamoto & Ma, 2011). In addition, some studies have shown that there are situational variations in how much people try to savor positive emotions because people often regulate emotions to attain instrumental goals (e.g., Erber, Wegner, & Theriault, 1996; Tamir, Chiu, & Gross, 2007; Tesser, Rosen, & Waranch, 1973). For example, even Americans preferred to feel less happiness and more sadness, when trying to elicit help from others to handle their loss (Hackenbracht & Tamir, 2010).

Despite the growing bodies of research on cultural differences in emotion regulation, on the one hand, and on the instrumental value

of emotion, on the other hand, there has been little attempt to bridge the two lines of work. Here, building on the previous studies on cultural differences in emotion and emotion regulation (Chow & Berenbaum, 2012; De Leersnyder, Boiger, & Mesquita, 2013; Ford & Mauss, 2015; Mesquita & Albert, 2007; Miyamoto & Ma, 2011; Sims et al., 2015; Tsai, Knutson, & Fung, 2006), we argue that beliefs and ideas about emotions underlie cultural differences in emotion regulation. At the same time, in line with the instrumental approach to emotion regulation (e.g., Tamir, 2005; Tamir & Ford, 2012; Tamir, Mitchell, & Gross, 2008), we also suggest that people often regulate their emotions to achieve instrumental benefits. Specifically, people tend to regulate their emotions in a way that matches beliefs about the instrumental value of emotions shared in their own culture, especially when they are engaging in effortful goal pursuit, which can be facilitated by the instrumental values of emotions. Accordingly, cultural differences in the regulation of positive emotions may vary as a function of the degree of cognitive effort required in each context.

Cultural Differences in the Regulation of Positive Emotions

Different cultures have different beliefs about emotions. The dialectical thinking style, historically rooted in East Asian cultural

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¹ Here, we refer to the emotion regulation strategy where people try to maintain or increase their positive emotions rather than decrease their positive emotions either consciously or nonconsciously.

contexts (Peng & Nisbett, 1999), is likely to have influenced East Asians' beliefs about positive emotions. East Asians' dialectical thinking style follows three principles (Peng & Nisbett, 1999; Spencer-Rodgers, Williams, & Peng, 2010): The principle of change states that reality is a process that constantly changes and never stands still, suggesting that happiness and experiences of positive emotions may be a temporary state that will likely change; the principle of contradiction states that reality is full of contradictions and contradictions are natural and acceptable, suggesting that roots of negative events may reside within positive emotions; while the principle of holism states that everything is connected and nothing can be isolated, suggesting that current positive emotions may be connected to negative emotions later (Peng & Nisbett, 1999; Spencer-Rodgers et al., 2010). Taken together, the dialectical thinking style may make East Asians more likely to perceive positive emotions as fleeting and unstable, with potential negative consequences, as is in the saying "misery hides in happiness" (*Tao Te Ching*, Chapter 58).

Supporting this notion, cross-cultural studies have shown that East Asians are more likely than Westerners to perceive negative aspects of happiness (Joshanloo et al., 2014; Uchida & Kitayama, 2009). For example, Japanese were more likely than Americans to think that happiness may elicit envy in others or make one inattentive to the surroundings, and thus disrupt harmonious social relationships, leading to undesirable consequences. In addition, Japanese were more likely to mention avoidance of reality and elusiveness as features of happiness (Uchida & Kitayama, 2009; see also Uchida, 2010). Since avoidance of reality is maladaptive in the long run, happiness may eventually lead to negative consequences. This suggests that dialectical cultural beliefs may make East Asians perceive more negative consequences of positive emotions, in general.

In contrast, a very different cultural script exists in the U.S., where desirable aspects of positive emotions are highlighted. Since the Age of Enlightenment and especially after the American Revolution, there has been a growing emphasis on seeking happiness and avoiding misery (Held, 2002). Feeling positive emotions is a sign of independence, as it shows that one has control and is able to take care of oneself (cf., Oishi, Graham, Kesebir, & Galinha, 2013). Positive emotions, particularly cheerfulness, have been considered to be important across different domains of life (Kotchemidova, 2005), including even in a work setting, to promote productivity and good ambience (Hochschild, 2003; Wierzbicka, 1994). From the perspective of American culture, therefore, feeling happy is an important goal, as it reflects the cultural value of independence and personal success. Failure to feel happy, in turn, is viewed as a failure or a personal weakness (Kotchemidova, 2010; Mauss, Tamir, Anderson, & Savino, 2011). Such beliefs about the importance of experiencing positive emotions took roots and are continuously shaping emotion norms in individualistic nations like the U.S., where positive emotions are considered highly desirable (Eid & Diener, 2001) and ideal, compared to negative emotions (Sims et al., 2015).

Reflecting such cultural differences in beliefs about positive emotions, we should expect Americans to savor rather than dampen their positive emotions more than East Asians do. Miyamoto and Ma (2011) provided evidence for this argument. Americans were less likely than East Asians to report dampening their positive emotions after experiencing a positive event in their daily

lives. For example, compared to Asian students, American students generated more plans to savor their positive emotions on the day they received a good grade on a midterm exam, and their positive emotions showed less of a decline the day after receiving the good grade.

An Instrumental Approach to the Regulation of Positive Emotions

According to the instrumental approach to emotion regulation (e.g., Tamir, 2005, 2016), what people want to feel depends, in part, on their beliefs about the instrumental value of emotions. People should be motivated to experience emotions that they believe have an instrumental value in a given context, whether these emotions are positive or not (e.g., Erber & Erber, 1994; Erber et al., 1996; Tamir, 2005; Tamir & Ford, 2012). For example, when expecting to interact with a stranger, American participants who were feeling happy chose to read more negative news stories than positive ones (Erber et al., 1996). Thus, when American participants prepared to interact with a stranger, they chose to dampen their positive feelings, presumably because positive feelings could impair the quality of the interaction. Similarly, when American participants had to convey bad news to another person, they dampened their positive feelings, presumably to promote the quality of the social interaction (Tesser et al., 1973). Also, when expecting to engage in a threatening task, American participants chose to increase their negative feelings, and they did so the more they expected these feelings to promote performance on the task (Tamir & Ford, 2009, 2012). Therefore, depending on the nature of the situation, even Americans may choose to decrease positive emotions when they expect them to be harmful (and increase negative emotions when they expect them to be useful).

A Socio-Cultural Instrumental Approach

Putting these two independent lines of literature on emotion regulation together, we propose a sociocultural instrumental approach. This approach emphasizes the importance of taking both cultural beliefs about emotions and the nature of the situational context that contributes to the instrumental value of emotions into consideration to understand cultural and situational variations in emotion regulation. In particular, this approach entails two ways in which sociocultural contexts and instrumental value work together to shape emotion regulation. First, cultural meaning systems influence the perceived utility of emotions. Second, how cultural beliefs about utility of emotions manifest in emotion regulation depends on whether the situation highlights particular instrumental value.

First, building on and extending the literature on cultural differences in beliefs and ideas about emotions (Eid & Diener, 2001; Miyamoto & Ma, 2011; Sims et al., 2015; Uchida & Kitayama, 2009), we argue that there are cultural differences in beliefs about the utility of positive emotions. In American cultural contexts, where positive emotions are viewed as unambiguously good and ideal, people are likely to perceive positive emotions as having high utility and little, if any, harm. On the other hand, in Asian cultural contexts, where positive emotions are viewed more ambivalently, people are likely to perceive positive emotions as having less utility and more harm than in American cultural contexts.

Second, cultural beliefs about the utility of positive emotions are likely to influence how people regulate positive emotions. According to the instrumental approach, the feature of the situational context is also a crucial determinant of emotion regulation (e.g., Parrott, 1993; Tamir et al., 2008; Tamir & Ford, 2009). Thus, how cultural beliefs about the utility of positive emotions manifest in emotion regulation may depend on the nature of the task at hand. Specifically, we focus on cognitive effort—namely, the extent to which a situation demands cognitive effort to achieve successful performance (Tamir, 2005, 2009). Thus, high cognitive effort situations require people to engage in cognitively effortful goal pursuit and to regulate themselves to achieve the goal more than low cognitive effort situations do.

In situations that demand high cognitive effort (e.g., taking a test, interviewing for a job), people may, consciously or nonconsciously, be motivated to experience emotions that help them perform better on the task. As a result, in this context, they likely prefer to feel and try to increase emotions that are perceived to have beneficial effects, and prefer not to feel and try to decrease emotions that are perceived to have harmful effects. Because cultural contexts shape the perceived utility of emotions, emotional preferences and emotion regulation may be particularly likely to be in line with the culturally shared perceived utility of emotions in such contexts.

On the other hand, when people are anticipating to engage in tasks that demand lower cognitive effort (e.g., washing dishes or going shopping with a friend), people may be less motivated to experience emotions that have high perceived utility as they are not engaging in active goal pursuit, or they may not be motivated enough to regulate their emotions to match the demand of the task (Forgas & Ciarrochi, 2002). In such contexts, perceived utility of positive emotions may be less likely to influence emotion regulation. Cultural differences in emotional preferences or emotion regulation may thus be smaller or nonexistent.

Although regulating emotions in accordance with the perceived utility of emotions in high cognitive effort situations could happen consciously, automatic processes are also likely to play a role (Mauss, Bunge, & Gross, 2007). Even though emotion regulation may involve conscious controlled processes at the beginning or when things are not going well, by repeatedly being engaged in certain patterns of emotion regulation in high cognitive effort situations, such emotion regulation patterns may become more automatic and habitual processes that are activated when one faces similar situations. This may be particularly helpful because in high cognitive effort situations, where people need to engage in effortful goal pursuit, people's cognitive resources are mostly devoted to the task at hand.

In sum, by incorporating sociocultural and instrumental approaches to emotion regulation, we predict that in American culture, where positive emotions are perceived to have high utility, people should prefer to feel and try to increase positive emotions, especially in high cognitive effort situations, whereas in Asian culture, where positive emotions are perceived to have less utility, people should be less likely to prefer to feel or try to increase positive emotions, especially in high cognitive effort situations. The cultural difference in the tendency to savor rather than dampen positive emotions may thus be particularly large in high cognitive effort contexts. In contrast, such cultural differences should be smaller or nonexistent in low cognitive effort contexts.

Overview of Studies

We present four studies to test our hypotheses. In Study 1, we first sought to establish cultural differences in beliefs about the instrumental value of positive emotions. We asked Americans and Japanese to freely generate up to five situations or tasks where positive emotions have desirable effects and up to five situations or tasks where positive emotions have undesirable effects. We predicted that compared to Japanese, Americans would generate more situations or tasks in which positive emotions are considered to have desirable effects and fewer situations or tasks in which positive emotions are considered to have undesirable effects.

Such beliefs about the utility of positive emotions should influence how people want to feel, especially when they are engaging in active goal pursuit. In Study 2, we thus examined whether cultural differences in relative preferences for positive emotions are moderated by the cognitive effort required in the contexts. Using a scenario-based procedure, we presented 12 contexts that require varying levels of cognitive effort to American and Asian participants and asked them to rate how much they would prefer to feel positive and negative emotions in each context. We predicted that although Americans, in general, would show a stronger relative preference for positive emotions compared to Asians (Eid & Diener, 2001; Miyamoto & Ma, 2011; Uchida & Kitayama, 2009), this cultural difference would be particularly large in contexts that require high cognitive effort.

In Studies 3 and 4, we examined whether cultural differences in relative preferences for positive emotions are reflected in cultural differences in how people regulate their positive emotions when they are anticipating to engage in tasks requiring varying levels of cognitive effort. Asian and American participants were first led to feel happy, and then informed about an upcoming task. In Study 3, we compared two conditions: one condition in which participants were informed about an upcoming task that required high cognitive effort, and the other condition (control) in which participants were not informed about any upcoming task. In Study 4, we included three conditions in which participants were informed about upcoming tasks that required varying levels of cognitive effort. Subsequently, in both Studies 3 and 4, we assessed participants' emotion regulation online. We expected to find larger cultural differences in the regulation of positive emotions in a context that requires high cognitive effort, compared to contexts that require lower cognitive effort.

Study 1

First, we examined whether there are cultural differences in people's beliefs about the utility of positive emotions. We asked people from an East Asian culture (i.e., Japan) and people from American culture to list situations or tasks in which they think positive emotions have good or bad effects.

Method

Participants and procedure. Seventy-nine European American undergraduate students in the U.S. (33 males and 46 females) and 61 Japanese undergraduate students in Japan (33 males and 28 females) participated in the study.

The questionnaire was presented in the participants' native language (i.e., English for American participants and Japanese for Japanese participants). To help participants think about various effects of positive emotions, they were first asked to list up to five effects or consequences that they believed feeling positive emotions may have, in general.² After that, participants were asked to list up to five specific situations or tasks in which they think positive emotions have *good* effects or consequences. Subsequently, they were asked to list up to five specific situations or tasks in which positive emotions have *bad* effects or consequences. Five blank lines were provided for each prompt. Participants were told they could leave lines blank if they could not come up with five situations or tasks.

Results

We first examined the number of specific situations and tasks in which positive emotions were considered beneficial. American participants ($M = 3.76$, $SD = 1.20$) listed more such tasks than Japanese participants did, in general ($M = 2.80$, $SD = 1.31$), $t(138) = 4.59$, $p < .001$, Cohen's $d = 0.76$. Examples included "test taking," "studying," and "job interview." Next, we examined the number of specific situations and tasks that participants listed as ones in which positive emotions are harmful. Japanese participants ($M = 1.66$, $SD = 1.30$) listed more such tasks than American participants did ($M = 1.06$, $SD = 1.31$), $t(138) = 2.66$, $p = .009$, Cohen's $d = 0.45$. Examples included "studying" and "when someone else is upset."

To explore the nature of contexts and tasks in which participants perceived positive emotions to be beneficial or harmful, three English speakers (one native, two Chinese-English bilingual) coded American participants' responses, while two Japanese speakers (one native, one English-Japanese bilingual) coded Japanese participants' responses. For each participant, coders determined whether each of the categories specified in the coding scheme was mentioned. Intercoder reliability coefficient kappa ranged from 0.54 to 1 ($M = 0.68$) for Japanese coders, and ranged from 0.77 to 1 ($M = 0.86$) for English coders. Discrepancies were resolved through discussion. The percentages of participants who mentioned each of the categories were submitted to chi-square tests to determine whether there were cultural differences in how often a certain type of context was assumed to benefit or suffer from positive emotions. The results of the chi-square tests are shown in Table 1.

Positive emotions were most frequently perceived as beneficial in social contexts (e.g., talking to people) and in study/work contexts. Cultural differences were the largest in the exam context, where almost half of American participants considered positive emotions as beneficial, whereas less than 10% of Japanese participants did so. Positive emotions were most frequently mentioned as harmful across cultures in study/work contexts, social contexts (e.g., hurting others' feelings), and situations where there is a clear expectation to feel sad (e.g., funeral). Across both beneficial and harmful situations, Japanese were more likely than Americans to mention idiosyncratic contexts that do not fit the other categories, such as "positive emotions help one sleep better, which puts one in good shape the next day" or "while riding a bike, feeling positive emotions can be dangerous."

Table 1

Percentages of American and Japanese Participants Mentioning Each Category as (a) a Situation in Which Positive Emotions Have Positive Effects or as (b) a Situation in Which Positive Emotions Have Negative Effects

Category	Americans	Japanese	Chi-square	p-Value	Effect size [†]
(a) Situations in which positive emotions can have positive effects					
Exam	48.1%	8.2%	25.757	.000	.429
Study/Work	53.2%	49.2%	0.219	.640	.040
Self presentation	15.2%	11.5%	0.405	.525	.054
Sports	41.8%	24.6%	4.510	.034	.179
Social	77.2%	49.2%	11.892	.001	.291
Other	22.8%	54.1%	14.574	.000	.323
(b) Situations in which positive emotions can have negative effects					
Exam	0%	1.6%	1.304	.253	.096
Study/Work	13.9%	27.9%	4.183	.041	.173
Social	20.3%	26.2%	0.697	.404	.070
Funeral	16.5%	18.0%	0.060	.806	.021
Other	5.1%	47.5%	34.475	.000	.496

[†] Effect size is reported as ϕ .

Discussion

Study 1 showed that, compared to Japanese participants, Americans came up with more situations and tasks for which positive emotions are useful and fewer situations and tasks for which positive emotions are harmful. These findings suggest that there are cultural differences in the perceived utility of positive emotions. Americans tend to perceive greater utility and less harm in positive emotions than Japanese do. These culturally divergent beliefs about the utility of positive emotions are likely to result in cultural differences in emotions that individuals prefer to feel, especially when they are engaging in goal pursuit, because the perceived utility of emotions should become most relevant when people are engaging in active goal pursuit. From this perspective, the exploratory analyses of the contexts in which participants perceived positive emotions to have effects are revealing. We found the largest cultural differences for positive effects of positive emotions (excluding the "other" categories) in the "exam" context, which requires considerable cognitive effort. We proceeded to test the hypothesis that cultural differences in preferences for emotions would be larger in situations requiring cognitive effort in Study 2.

Study 2

Building on Study 1, we examined whether cultural differences in relative preferences for positive emotions were moderated by contextual cognitive effort. Using a scenario-based procedure, we presented American and Asian participants with 12 contexts varying in the amount of cognitive effort required, and asked them how much they would prefer to feel positive and negative emotions in each context. We predicted that although Americans, in general, would show a stronger relative preference for positive emotions

² Because this was a warm-up exercise and it was hard to determine whether each described effect was construed as beneficial or harmful, responses to this task were not analyzed.

compared to Asians (Eid & Diener, 2001; Miyamoto & Ma, 2011; Uchida & Kitayama, 2009), this cultural difference would be particularly large in contexts requiring high cognitive effort.

In addition, previous literature has demonstrated that extraversion is related to preferences for positive emotions (Tamir, 2009), whereas neuroticism is related to preferences for negative emotions (Tamir, 2005). Therefore, we also measured extraversion and neuroticism to examine whether potential effects of culture would persist after controlling for these personality traits.

Method

Participants. We recruited 41 European Americans (10 male and 31 female; average age = 18.95 years) and 40 Asian/Asian Americans in total (15 male and 25 female; average age = 18.95 years; 16 Asian Americans and 24 Asians, who were from China, South Korea, Vietnam, Malaysia, or India; for simplicity's sake, we refer to Asian Americans and Asians both as Asians, hereafter). Participants received extra credit for their introduction to psychology class as compensation.

Design. The study design was a 3 (Cognitive Effort: High vs. Medium vs. Low) \times 2 (Nature of context: Private vs. Social) \times 2 (Culture: American vs. Asian) mixed design, with the first two factors being within-subject, and Culture as a between-subjects factor. For each combination of the within-subject factors (Cognitive Effort, Nature of context), there were two contexts. Specific contexts were chosen based on a pilot study, to ensure the distinction between high versus medium versus low cognitive effort and the private versus social nature of situations across cultures.³ The 3 \times 2 combinations yielded six categories. As a result, 12 contexts were presented to participants in a random order. Examples include taking a multiple-choice test, cleaning one's room, interviewing for a job, and going shopping at a mall with a friend (see Appendix A for all the contexts used).

Procedure. The study was conducted online. After giving consent to participate, participants were presented with the 12 contexts, in a random order. Each context was presented on a separate page. For each context, participants were asked to rate how much positive emotions and negative emotions they would prefer to feel in that context, on an 8-point scale (1 = *Not at all*, 8 = *A lot*). After they finished rating all 12 contexts, they completed a personality questionnaire (the Extraversion and Neuroticism dimensions of the Big Five personality scale; John, Donahue, & Kentle, 1991) and a demographic questionnaire.

Results

Data preparation. Preferences for positive emotions were highly negatively correlated with preferences for negative emotions in the overall sample, $r(79) = -0.84$, $p < .001$, as well as separately among Asians, $r(38) = -0.80$, $p < .001$, and among Americans, $r(39) = -0.85$, $p < .001$. This suggests that, with the type of measures we used, preferences for positive emotions and preferences for negative emotions were judged to be opposite sides of a continuum and thus were not independent of each other. Therefore, for each context, each participant's preference for negative emotions was subtracted from his or her preference for positive emotions, resulting in an index of how much this participant relatively preferred positive emotions to negative emotions in

that specific context. This approach is in line with the previous research that examined the valuation of positive and negative emotions (Sims et al., 2015), where cultural differences in emotion valuation were most parsimoniously captured by taking the difference between positive and negative emotions. For each category (e.g., High Cognitive Effort Private contexts), the emotional preference indices of the two contexts in that category were averaged together.⁴

Main analysis. The emotional preference scores were submitted to a 3 (Cognitive Effort: High vs. Medium vs. Low) \times 2

³ For the pilot-study, a total of 70 participants (46 Americans, 24 Asians) rated the cognitive effort required ("How cognitively demanding is this situation for you? That is, how much cognitive effort does it require?") in each of 24 situations on an 8-point rating scale (1 = *Not at all*, 8 = *Very demanding*). Participants also rated how private/social each situation is on an 8-point rating scale (1 = *Highly private*, 8 = *Highly social*). We selected 12 situations that had little cultural differences in their ratings of cognitive effort. For the 12 situations selected to be used in Study 2, we ran a 3 (Cognitive Effort of Situations) \times 2 (Nature of Situations: Private vs. Social) \times 2 (Culture) ANOVA separately for the ratings of cognitive effort and private/social nature.

We found the expected main effect of Cognitive Effort of Situations on participants' ratings of cognitive effort (for Low, Medium, High, $M_s = 3.33, 4.91, 6.70$, $SD_s = 1.55, 1.28, 0.85$, respectively), $F(2, 136) = 223.01$, $p < .001$. Importantly, simple effect analyses showed that the effect of Cognitive Effort was significant for both European Americans, $F(2, 67) = 141.87$, $p < .001$, and Asians, $F(2, 67) = 45.79$, $p < .001$, although the effect was somewhat stronger for European Americans, $F(2, 136) = 2.94$, $p = .06$. No other effect involving culture was significant.

For the rating of private/social, there was a main effect of Nature of the situations, such that all the social situations ($M = 6.09$, $SD = 0.93$) were rated as more social than the private situations ($M = 2.69$, $SD = 1.02$), $F(1, 68) = 341.84$, $p < .001$. There was no main effect of Culture, $F(1, 68) = 0.006$, $p = .94$, although there was a Nature \times Culture interaction: $F(1, 68) = 6.17$, $p = .015$. Importantly, simple effect analyses showed that both European Americans and Asians rated social situations as more social than private situations, $F(1, 68) = 320.76$, $p < .001$ for European Americans and $F(1, 68) = 97.44$, $p < .001$ for Asians, although the difference was smaller for Asians than for European Americans.

In summary, the pilot test showed that both European Americans and Asians clearly distinguished between three different levels of cognitive effort and between social and private situations, although the distinctions tended to be stronger among European Americans than Asians.

⁴ Although the ratings of positive and negative emotions were strongly negatively correlated with each other across cultures, thus suggesting that the two were not perceived to be independent from each other, we also analyzed them separately to explore if the effects were stronger for either emotion. The ratings of preferences for positive emotions and negative emotions were analyzed separately using a 3 (Cognitive Effort: High vs. Medium vs. Low) \times 2 (Nature of context: Private vs. Social) \times 2 (Culture: American vs. Asian) mixed ANOVA. With preferences for positive emotions, although there was a significant main effect of Culture, $F(1, 79) = 5.74$, $p = .019$, $\eta_p^2 = 0.068$, no significant Culture \times Cognitive Effort interaction was found, $F(2, 158) = 0.85$, $p = .43$, $\eta_p^2 = 0.011$. With preferences for negative emotions, there were a main effect of Culture, $F(1, 79) = 6.25$, $p = .014$, $\eta_p^2 = 0.073$, and the Culture \times Cognitive Effort interaction, $F(2, 158) = 6.36$, $p = .002$, $\eta_p^2 = 0.075$. In High Cognitive Effort context, there was a large cultural difference in preference for negative emotions, such that Asians ($M = 3.21$, $SD = 1.50$) showed stronger preferences for negative emotions than Americans did ($M = 2.09$, $SD = 1.50$), $t(79) = 4.76$, $p < .001$, Cohen's $d = 1.02$. In Medium and Low Cognitive Effort contexts, there was a smaller cultural difference (In Medium Cognitive Effort contexts, $M = 2.56$, $SD = 1.14$ for Asians, $M = 2.12$, $SD = 1.14$ for Americans, $t(79) = 2.41$, $p = .018$, Cohen's $d = 0.38$; in Low Cognitive Effort contexts, $M = 2.62$, $SD = 1.29$ for Asians, $M = 2.21$, $SD = 1.29$ for Americans, $t(79) = 2.03$, $p = .046$, Cohen's $d = 0.32$). We return to this finding in the General Discussion.

(Nature of context: Private vs. Social) \times 2 (Culture: American vs. Asian) mixed ANOVA.

There was a significant main effect of Culture, $F(1, 79) = 6.54$, $p = .012$, $\eta_p^2 = 0.076$, such that on average, Americans ($M = 4.38$, $SD = 2.38$) had stronger relative preferences for positive emotions than Asians ($M = 3.03$, $SD = 2.38$). There was also a significant main effect of Cognitive Effort, $F(2, 158) = 3.25$, $p = .041$, $\eta_p^2 = 0.039$. Most importantly, the hypothesized Culture \times Cognitive Effort interaction was significant, $F(2, 158) = 3.49$, $p = .033$, $\eta_p^2 = 0.042$. In High Cognitive Effort contexts, there was a large cultural difference in emotional preferences, such that Americans ($M = 4.39$, $SD = 3.05$) showed stronger relative preferences for positive emotions than Asians did ($M = 2.42$, $SD = 3.05$), $t(79) = 4.33$, $p < .001$, Cohen's $d = 0.65$. In Medium and Low Cognitive Effort contexts, the cultural difference was smaller (in Medium Cognitive Effort contexts, $M = 4.35$, $SD = 2.33$ for Americans, $M = 3.38$, $SD = 2.33$ for Asians, $t(79) = 2.13$, $p = .034$, Cohen's $d = 0.42$; in Low Cognitive Effort contexts, $M = 4.41$, $SD = 2.38$ for Americans, $M = 3.29$, $SD = 2.38$ for Asians, $t(79) = 2.12$, $p = .037$, Cohen's $d = 0.47$). These results are depicted in Figure 1.

In addition, there was a main effect of Nature of context, $F(1, 79) = 33.77$, $p < .001$, $\eta_p^2 = 0.30$, such that on average, participants had stronger relative preferences for positive emotion in Social contexts ($M = 4.14$, $SD = 2.30$) than in Private contexts ($M = 3.27$, $SD = 2.64$). There was no significant interaction between Nature of context and Culture, $F(1, 79) = 0.006$, $p = .94$. Furthermore, there was a significant interaction between Cognitive Effort and Nature of context, $F(2, 158) = 21.00$, $p < .001$, $\eta_p^2 = 0.21$. In High and Medium Cognitive Effort contexts, there were no differences in participants' relative preferences for positive emotions between Private and Social contexts (High Private: $M = 3.23$, $SD = 3.45$; High Social: $M = 3.58$, $SD = 3.19$; $t(80) = 1.68$, $p = .097$; Medium Private: $M = 3.80$, $SD = 2.54$; Medium Social: $M = 3.93$, $SD = 2.48$; $t(80) = 0.70$, $p = .49$). In Low Cognitive Effort contexts, participants showed stronger relative preferences for positive emotion in Social contexts ($M = 4.90$, $SD = 2.37$) than in Private contexts ($M = 2.79$, $SD = 3.18$), $t(80) = 6.78$, $p < .001$, Cohen's $d = 0.75$. There was no significant Cognitive

Effort \times Nature of context \times Culture three-way interaction, $F(2, 158) = 1.76$, $p = .18$.

Personality analysis. We first examined whether there were cultural differences in extraversion and neuroticism. The scores of extraversion and neuroticism were submitted to an independent t test, respectively. There was a significant cultural difference in extraversion, $t(79) = 3.40$, $p = .001$, Cohen's $d = 0.76$. Americans ($M = 5.07$, $SD = 1.00$) had higher levels of extraversion than Asians ($M = 4.25$, $SD = 1.17$) did. There was no significant cultural difference in neuroticism, $t(79) = 1.40$, $p = .16$, Cohen's $d = 0.31$.

Next, to examine whether the Culture \times Cognitive Effort interaction persisted when controlling for personality, we conducted a 3 (Cognitive Effort: High vs. Medium vs. Low) \times 2 (Culture: American vs. Asian) mixed ANCOVA on emotional preference scores, controlling for extraversion and neuroticism. Most importantly, the hypothesized Culture \times Cognitive Effort interaction remained significant even after controlling for extraversion and neuroticism, $F(2, 154) = 4.00$, $p = .02$, $\eta_p^2 = 0.049$. This suggests that trait differences in extraversion and neuroticism do not account for the interaction between Culture and Cognitive Effort observed in this study.

Discussion

Study 2 showed that cultural differences in relative preferences for positive emotions were moderated by the cognitive effort required by the task. Although Americans, in general, showed stronger relative preferences for positive emotions, compared to Asians, this cultural difference was particularly large in contexts requiring high cognitive efforts. In contexts requiring moderate or low cognitive effort, cultural differences were smaller. As preferences for emotion shape how people actually try to regulate emotions, in Studies 3 and 4, we examined how people regulate their positive emotions when they anticipate engaging in a certain task. By building on previous research that examined individual differences in the regulation of positive emotions by inducing a positive event (Wood et al., 2005), we induced a positive event and examined how participants tried to regulate their positive emotions when anticipating tasks requiring varying cognitive efforts.

Study 3

Study 2 found that Americans have stronger relative preferences for positive emotions compared to Asians, especially in high cognitive effort contexts, such as taking an exam. Therefore, we expected that when anticipating an upcoming exam, Americans would try to savor rather than dampen positive emotions more than Asians. However, this cultural difference may be attenuated in other contexts. For instance, when the upcoming task is ambiguous, there may be less cultural difference in their perceived utility of positive emotions, and subsequently, in how they try to regulate their positive emotions.

Based on such reasoning, we conducted an experiment in which we manipulated the anticipation for an upcoming task (e.g., Tamir & Ford, 2012), while varying the required cognitive effort of the task (Tamir, 2005, 2009). Following the previous research that examined regulation of positive emotions (Wood et al., 2005), we first induced positive emotions in all participants by providing

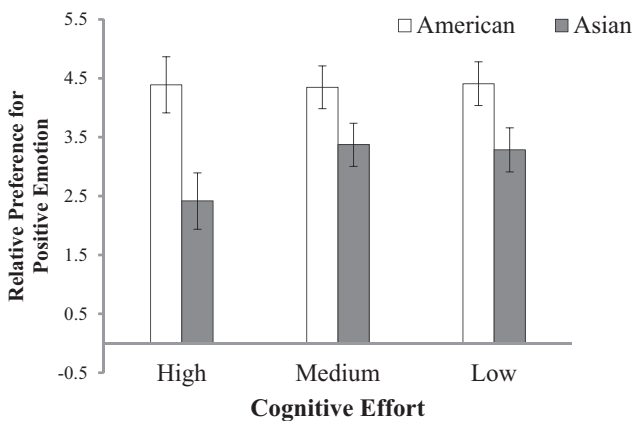


Figure 1. Emotional Preference as a function of cognitive effort of the task and culture (Study 2). Higher scores indicate stronger preference of positive emotions to negative emotions. Y-axis values indicate estimated marginal means; error bars indicate standard errors.

them positive feedback on an allegedly challenging cognitive puzzle solving task. Subsequently, all participants were told that they would complete an ostensible study on aesthetics. In addition, participants in the exam condition were told that after the aesthetics study, they would be taking a multiple-choice test about the rules of the cognitive puzzles they just learned in the first part, whereas those in the control condition were told nothing. We then assessed their attempts at emotion regulation.

In addition, previous research found that people with high self-esteem tend to savor their happiness whereas people with low self-esteem tend to dampen it (Wood et al., 2003, 2005). Given that Americans have higher self-esteem than Asians (Heine, Lehman, Markus, & Kitayama, 1999), we measured self-esteem to test if any cultural difference we find would remain after controlling for self-esteem.

Method

Participants. Fifty-two European American undergraduate students (19 male and 33 female; average age = 19.18 years) and 58 Asian students (17 male and 41 female; average age = 19.36 years; 5 Asian Americans and 53 Asians, who were from China, South Korea, Vietnam, or Singapore) at the University of Wisconsin-Madison participated in the study. Participants received extra credit for their introduction to psychology class as compensation.

Measures.

Emotion regulation. Following the previous study that found cultural differences in the regulation of positive emotions (Miyamoto & Ma, 2011), we used the Emotion Regulation scale (which was adapted and modified from Wood et al., 2003). It included four items to measure the tendency to savor positive emotions (e.g., “I want to engage in activities to enhance my good feelings”; $\alpha = .71$), two items to measure the tendency to dampen positive emotions (e.g., “I want to think about things to dampen my good feelings—to make myself feel not as good”; $\alpha = .68$). There was also one additional filler item (“I want to distract myself”). Participants rated the extent to which they agreed with each item on an 8-point Likert scale (see Appendix B). The tendency to savor rather than dampen positive emotions was calculated by subtracting the dampening score from the savoring score.

Emotions. Besides measures of emotion regulation, we used emotion scales based on the Positive Affect and Negative Affect Scale (PANAS, Watson, Clark, & Tellegen, 1988) modified to fit the study (10 positive emotions, such as *active*, *excited*, and *smart*, and 10 negative emotions, such as *nervous*, *ashamed*, and *unconfident*) as a manipulation check for our positive emotion induction, and as a control variable. The responses were made on a 7-point Likert rating scale (1 = *No emotion*, 7 = *Very much*). The Cronbach’s alpha was 0.90 for positive emotion items and 0.83 for negative emotion items.

Self-esteem. We measured self-esteem using the Rosenberg self-esteem scale (Rosenberg, 1965; Cronbach’s alpha = .88) with a 7-point Likert rating scale (1 = *Strongly disagree*, 7 = *Strongly agree*).

Procedure. Participants were tested one at a time. After signing a consent form, participants were randomly assigned to the Exam or Control condition. All of the participants were told that they would work on a cognitive ability test, followed by an

aesthetics study. Those in the Exam condition were additionally told that, after the aesthetics study, they would move to another room to take a multiple-choice test on the rules of the three games that they learned in the cognitive ability test. Those in the Control condition were not told anything about the multiple-choice test.

The cognitive ability test was designed to induce positive emotions. It included a SET game, a seven-coincidence puzzle, and a hidden-ball game (see Appendix C). The experimenter gave specific instructions on how to play each game, and told participants that their overall cognitive ability score would depend on their performance on these games and the time it took them to finish the games. Using a timer and a clipboard, the experimenter made it obvious that participants were timed during each game. Throughout the games, the experimenter provided scripted encouraging verbal feedback, such as “good job” and “you’re so fast.” After participants finished all the games, the experimenter went to another room to allegedly analyze their score. Before leaving the room, the experimenter reminded those in the exam condition of the upcoming multiple-choice test

Let me remind you what will happen after I return: While you are still in this room, you will work on the aesthetics preference task. Then, you will move to another room and answer some multiple-choice questions about the rules of the cognitive tasks that you were just taught. So, please wait for a few minutes.

After the experimenter returned, each participant received a personalized cognitive ability test report, indicating that they scored in the 95th percentile among all the test takers at their university. Right after participants received their cognitive ability test report, they rated their current emotion as a manipulation check.

All participants then went on to the ostensible aesthetics study, for which they were told that they would listen to a musical piece of their choice and watch a video clip of their choice then answer some questionnaires. After rating their preferences for various music pieces and video clips,⁵ participants filled out the Emotion Regulation scale, self-esteem scale, and demographic information, while the experimenter allegedly left the room to get the CD for music and DVD for video clip. Upon returning, the experimenter told participants that someone mistakenly locked the cabinet that stored all the CDs and DVDs, so the rest of the session would be canceled. Participants were probed for suspicion, then debriefed and sent home. No participant expressed suspicion related to the content of the experiment, so all the participants’ data were included in the analyses.

⁵ For an exploratory purpose, we examined their preferences for music and video as potential behavioral measures of emotion regulation, following the procedure of previous studies (e.g., Tamir et al., 2008; Wood, Heimpel, Manwell, & Whittington, 2009). However, no significant effects were found, except for a marginal cultural main effect on preferences for savoring video (i.e., comedy), such that on average a higher percentage of Americans (61.54%) preferred to watch the comedy, compared to Asians (46.27%), $\beta = -1.01$, $SE = 0.57$, $p = .078$. A potential reason of the main effect of culture and the lack of culture and task interaction might be that comedies are a more common and popular genre among Americans than among Asians in general, regardless of their emotion or the context.

Results

Manipulation check. To make sure that participants felt positive emotions, as we intended, and that there were no cultural differences in the extent of positive emotions induced, we ran a 2 (Culture: Asian vs. American) \times 2 (Task: Exam vs. Control) ANOVA, using the average of all positive emotion items and that of all negative emotion items as separate dependent variables. There was no main effect of culture. Americans and Asians felt positive emotions equally strongly ($M = 5.18$, $SD = 1.00$ for Americans and $M = 5.04$, $SD = 1.03$ for Asians), $F(1, 105) = 0.49$, $p = .49$, Cohen's $d = 0.14$, and felt negative emotions equally weakly ($M = 1.44$, $SD = 0.59$ for Americans and $M = 1.45$, $SD = 0.46$ for Asians), $F(1, 105) = 0.003$, $p = .95$, Cohen's $d = 0.02$. In addition, there was no main effect of Task, nor was there interaction of Culture and Task, meaning that all participants felt equally happy after receiving positive feedback, regardless of their culture or assigned task condition. We computed the difference between average positive emotion and average negative emotion to obtain the measure of emotional reactions. In all analyses below, we used this measure as a covariate to control for individual differences in emotional reactions (Miyamoto & Ma, 2011). All of the results remained unchanged when positive and negative emotions were not controlled for.

Regulation of positive emotions. We performed a 2 (Culture) \times 2 (Task) ANCOVA on participants' tendency to savor rather than dampen positive emotions, using the difference between average positive emotion and average negative emotion as a covariate. There was a main effect of culture, $F(1, 104) = 13.56$, $p < .001$, Cohen's $d = 0.68$, such that Americans ($M = 3.49$, $SD = 1.43$) reported a higher tendency to savor than to dampen positive emotions than Asians did ($M = 2.46$, $SD = 1.59$). Most importantly, there was also a significant interaction between Culture and Task, $F(1, 104) = 4.18$, $p = .044$. As expected, Americans ($M = 3.99$, $SD = 1.49$) reported higher tendency to savor than to dampen positive emotions than Asians ($M = 2.49$, $SD = 1.36$) did when they were told about an upcoming exam task, $t(53) = 3.90$, $p < .001$, Cohen's $d = 1.05$, whereas no such difference was found in the control condition ($M = 3.03$, $SD = 1.22$ for Americans and $M = 2.42$, $SD = 1.83$ for Asians), $t(53) = 1.44$, $p = .16$, Cohen's $d = 0.39$ (see Figure 2).

Self-esteem. There was a cultural difference in self-esteem, $t(108) = 3.64$, $p < .001$, Cohen's $d = 0.70$, such that in general, Asians ($M = 5.08$, $SD = 1.00$) reported lower self-esteem than Americans ($M = 5.74$, $SD = 0.88$) did. To examine if the cultural difference in attempted emotion regulation was partly due to the cultural difference in self-esteem, we reran our analyses, using self-esteem as a covariate. Both the Culture main effect, $F(1, 103) = 5.08$, $p = .026$, and Culture \times Task condition interaction, $F(1, 103) = 6.15$, $p = .015$, remained significant after controlling for self-esteem. These findings suggest that our cultural differences in the regulation of positive emotions were not driven by differences in self-esteem.

Discussion

Study 3 provided some empirical support for our hypotheses. When expecting a task requiring high cognitive effort (vs. not), Americans reported trying to savor rather than dampen positive emotions more than Asians did. Together with the findings of

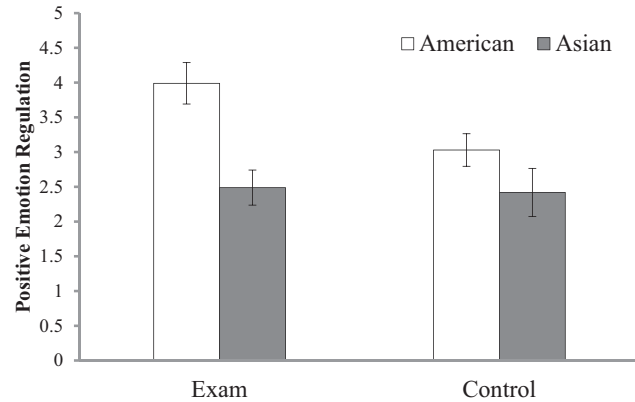


Figure 2. Regulation of positive emotions as a function of task condition manipulation and culture (Study 3). Higher scores indicate higher tendency to savor rather than dampen positive emotions. Y-axis values indicate estimated marginal means; error bars indicate standard errors.

Study 2, the findings of Study 3 suggest that Americans, who tend to perceive more positive effects of positive emotions, want to savor their positive emotions particularly when expecting to engage in a high cognitive effort task compared to Asians. Building on the findings of Study 3, we conducted Study 4 to further clarify the effects of contexts.

Study 4

There was a potential confound in the control condition in Study 3. In the control condition, participants were not told about a subsequent task. Therefore, the effects of Study 3 may have been due to expecting another task (vs. not), rather than expecting a task that requires high cognitive effort, in particular. To rule out this alternative account, participants in Study 4 were led to expect one of three tasks. As in Study 3, in one condition participants expected to take an exam. Unlike Study 3, participants in the second condition (Interaction) expected to interact with a stranger in an experimental setting, and participants in the third condition (Neutral) expected to fill out some personality questionnaires. A pilot test ensured that Americans and Asians view both contexts as less cognitively demanding than taking an exam.⁶ We thus expected the cultural differences in the regulation of positive emotions to be

⁶ In the same pilot test we did in Study 2, we found that interacting with a stranger ($M = 5.01$, $SD = 1.63$) and filling out a personality questionnaire ($M = 4.74$, $SD = 1.70$) are perceived to be less cognitively demanding than taking an exam ($M = 6.70$, $SD = 1.22$), $t(69) = 7.67$, $p < .0001$, and $t(69) = 8.66$, $p < .001$, respectively. Also, we found no cultural differences in how cognitively demanding Americans and Asians viewed interacting with a stranger in an experimental setting ($M = 5.02$, $SD = 1.63$ for Americans; $M = 5.00$, $SD = 1.67$ for Asians); $t(68) = 0.05$, $p = .96$, and filling out a personality questionnaire ($M = 4.80$, $SD = 1.73$ for Americans; $M = 4.63$, $SD = 1.66$ for Asians); $t(68) = .42$, $p = .68$). There was a cultural difference in perceived cognitive effort in taking an exam ($M = 6.96$, $SD = 0.92$ for Americans; $M = 6.21$, $SD = 1.56$ for Asians); $t(68) = 2.53$, $p = .01$), although both Americans and Asians viewed taking an exam as more cognitively demanding than interacting with a stranger in an experimental setting and filling out a personality questionnaire, and the latter two did not differ from each other.

larger in the exam condition than in the interaction and neutral conditions.

We used a 2 (Culture: American vs. Asian) \times 3 (Task: Exam vs. Interaction vs. Neutral) design. Both factors were between-subjects, so this yielded six cells, with about 25 participants in each cell. American and Asian participants were classified based on participants' self-identified ethnicity on a prescreen test given at the beginning of the semester.

Method

Participants. Seventy-two European American undergraduate students (24 males and 48 females; average age = 19.21 years) and 71 Asian American/Asian students (19 males and 51 females, 1 unspecified; average age = 19.08 years; 19 Asian Americans and 52 Asians from China, South Korea, Vietnam, or Malaysia) at the University of Wisconsin—Madison participated in the study. Participants received extra credit for their introduction to psychology class as compensation.

Measures.

Emotion regulation. The Emotion Regulation scale was the same as in Study 3 (adapted and modified from Wood et al., 2003; Cronbach's alpha was 0.74 for savoring items, and 0.78 for dampening items).

Emotions. We also used the modified Positive Affect and Negative Affect Scale (PANAS, Watson et al., 1988) as we did in Study 3. The Cronbach's alpha was 0.92 for positive emotion items and 0.85 for negative emotion items.

Procedure. Participants were tested one at a time. The emotion manipulation procedure was the same as in Study 3. Participants finished the "cognitive ability test" then got a report stating that they scored in the 95th percentile among all the test takers at their university. Right after participants received their cognitive ability test report, they filled out the PANAS to indicate their current emotion. Unlike Study 3, participants in Study 4 were not told about the existence of the exam at the beginning of the session. Although the experimenters were blind to our hypotheses, it is ideal to also keep them blind to the task condition as much as possible (Aronson, Ellsworth, Carlsmith, & Gonzales, 1990). Therefore, in Study 4, participants were not assigned to task conditions (and thus the experimenter was blind to the task condition) until later.

Right before moving to the next task, participants were randomly assigned to one of the three conditions: Exam, Interaction, and Neutral. All participants were told that the next task would be a study on college students' opinions of media. They were told that they would read an article of their choice and answer questions about the article. In addition, those in the exam condition were told that after the study on media, they would be taking a multiple-choice test to test their understanding of the rules of the games that they learned in the cognitive ability test. Those in the interaction condition were told that after the study on media, they would meet another participant in the next lab room and they would have five minutes to get to know each other, then answer some questionnaires for a communication study (adapted and modified from Erber et al., 1996). Those in the neutral condition were told that after the study on media, they would fill out some personality questionnaires that the lab is pilot-testing.

All participants then moved on to the ostensible study on college students' opinions of media, where they were given titles of news articles and chose one article to read from each pair of articles.⁷ They were then left alone to fill out the Emotion Regulation scale, and demographic information, while the experimenter left the room to allegedly retrieve the article from another lab room. As in Study 3, after returning to the room, the experimenter explained that the rest of the session would be cancelled and probed participants for suspicion, then debriefed them. No participant expressed suspicion related to the content of the experiment, so all the participants' data were included in the analyses.

Results

Manipulation check. To make sure participants felt positive emotions and that there was no cultural differences in the effect of the emotion manipulation, we ran 2 (Culture: Asian vs. American) \times 3 (Task: Exam vs. Interaction vs. Neutral) ANOVAs, using the average of all positive emotion items and that of all negative emotion items as separate dependent variables. There were no main effects of culture. Americans and Asians felt positive emotions equally strongly ($M = 5.14$, $SD = 1.10$ for Americans and $M = 4.92$, $SD = 0.97$ for Asians), $F(1, 137) = 1.40$, $p = .24$, Cohen's $d = 0.21$, and felt negative emotions equally weakly ($M = 1.33$, $SD = 0.44$ for Americans and $M = 1.45$, $SD = 0.51$ for Asians), $F(1, 137) = 2.30$, $p = .13$, Cohen's $d = 0.25$. In addition, there was no main effect of Task, nor was there an interaction of Culture and Task, meaning that all participants felt equally happy after receiving the positive feedback, regardless of their culture or assigned task condition. In all analyses below, we used the difference between average positive emotion and average negative emotion as a covariate to control for individual differences in emotional reactions. All of the results remained the same when positive and negative emotions were not controlled for.

Regulation of positive emotions. We performed a 2 (Culture) \times 3 (Task) ANCOVA on participants' tendency to savor rather than dampen positive emotions, using the difference between average positive emotion and average negative emotion as a covariate. There was a main effect of culture, $F(1, 136) = 8.14$, $p = .005$, Cohen's $d = 0.44$, such that on average, Americans ($M = 2.74$, $SD = 1.49$) reported a higher tendency to savor rather

⁷ We explored preferences for happy news articles as another behavioral measure of emotion regulation. We only found a main effect of culture, such that on average, Americans ($M = 2.04$ out of 4 news article pairs, $SD = 0.86$) chose to read more happy articles (as opposed to emotionally ambiguous articles) than Asians ($M = 1.58$ out of 4 news article pairs, $SD = 0.94$) did, $F(1, 136) = 9.29$, $p = .003$, Cohen's $d = 0.91$. No other effects were significant, $p > .43$.

This means that the behavioral measures we used in Studies 3 and 4 failed to show significant results. A closer look at the results suggests that, whereas Americans were changing their behaviors to match the nature of the context in the way we hypothesized, Asians tended to show less change in their behavioral choices across contexts. One potential reason is that Asians may not be choosing music/video/news articles based on how these items influence their feelings. Instead, they may use different activities to regulate their emotions (e.g., feeling connected to others, taking a walk; Kan, Karasawa, & Kitayama, 2009). In order to detect differences in emotion regulation using behavioral measures, it may be necessary to find activities that are perceived as influencing feelings to a similar extent in both cultures. Such behavioral measures need to be explored in future research.

than dampen positive emotions than Asians did ($M = 2.01$, $SD = 1.82$). There was no significant main effect of Task, but as expected, we found a significant interaction between Culture and Task, $F(2, 136) = 3.58$, $p = .031$. As expected, Americans ($M = 3.01$, $SD = 1.37$) reported higher tendency to savor rather than dampen positive emotions than Asians ($M = 1.47$, $SD = 1.78$) did when they were told about an upcoming exam task, $t(46) = 3.34$, $p = .002$, Cohen's $d = 0.97$. Such cultural difference was marginally significant when participants were told about an upcoming task of filling out personality questionnaires ($M = 3.11$, $SD = 1.39$ for Americans and $M = 2.22$, $SD = 1.75$ for Asians), $t(46) = 1.99$, $p = .053$, Cohen's $d = 0.56$. When participants were told about an upcoming social interaction with a stranger, there were no significant cultural differences in the attempted regulation of positive emotions ($M = 2.10$, $SD = 1.56$ for Americans and $M = 2.40$, $SD = 1.87$ for Asians), $t(45) = 0.59$, ns , Cohen's $d = 0.17$ (see Figure 3).

Discussion

Study 4 replicated and expanded our findings in Study 3. In both studies, when anticipating an exam, Americans wanted to savor rather than dampen positive emotions more than Asians did. The cultural difference was smaller when participants were anticipating a neutral task, and did not exist when people were anticipating an interaction with strangers.

Study 4 provided stronger evidence for the contextual specificity of cultural differences in the regulation of positive emotions. When told about an upcoming interaction with a stranger, Americans and Asians did not differ in their regulation of positive emotions. This finding is in line with the existing literature. Erber et al. (1996) found that even Americans decreased their positive emotions in anticipation of an upcoming social interaction with strangers, instead of maintaining positive emotions, presumably because positive emotions would prevent them from adjusting to the unknown interaction partner.

General Discussion

Taken together, the present paper examined cultural differences in the perceived utility of positive emotions (Study 1),

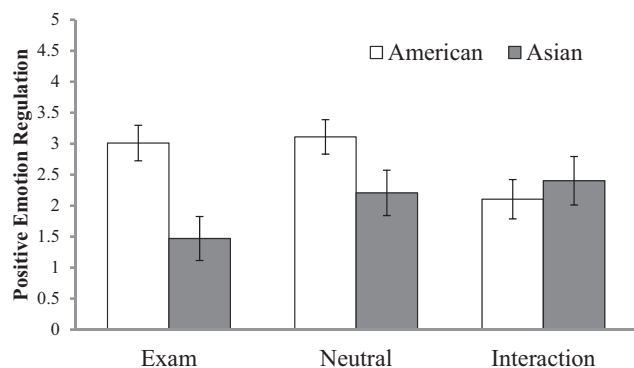


Figure 3. Regulation of positive emotions as a function of task condition manipulation and culture (Study 4). Higher scores indicate higher tendency to savor rather than dampen positive emotions. Y-axis values indicate estimated marginal means; error bars indicate standard errors.

relative preferences for positive emotions in different contexts (Study 2), and the regulation of positive emotions in anticipation of different tasks (Studies 3 and 4). Study 1 showed that Americans tend to perceive greater utility and less harm in positive emotions than Japanese do. Study 2 showed that cultural differences in relative preferences for positive emotions were moderated by the cognitive effort required of the task. Although Americans in general showed stronger relative preferences for positive emotions, compared to Asians, this cultural difference was particularly large in contexts that require high cognitive efforts. In contexts requiring moderate or low cognitive efforts, the effect sizes of cultural differences were smaller. Study 3 demonstrated that after being induced to feel happy, Americans want to savor rather than dampen positive emotions more than Asians do when anticipating an upcoming exam, a context requiring high cognitive effort, but no cultural difference was observed when no such anticipation existed. Replicating Study 3, Study 4 showed significant cultural differences when anticipating an exam. Such a cultural difference was marginal when anticipating filling out a personality questionnaire and was absent when anticipating an interaction with a stranger.

Our findings have important theoretical and applicable implications. Theoretically, our results show that the feature of the upcoming task plays a moderating role in how Americans and Asians want to regulate their positive emotions. This is in line with both the sociocultural and the instrumental approaches to emotion regulation. Instead of rigidly adhering to the type of emotion regulation generally emphasized within each culture, people are motivated to experience emotions that they believe would be useful to them. This instrumental motivation in emotion regulation exists across cultures. However, cultural differences exist in beliefs about the utility of positive emotions, and such cultural differences are likely partly shaping the manner in which Americans and Asians regulate their positive emotions.

A direct inference from our findings and the instrumental approach of emotion regulation in general, is that cultural differences in emotion regulation may be context-dependent, depending on the feature of the upcoming task. Even though the tendency to savor rather than dampen positive emotions may differ by cultures on average (Miyamoto & Ma, 2011), this cultural difference may vary substantially by context (e.g., appear when people prepare for an exam, but disappear when people expect to interact with strangers). Because people are particularly motivated to be emotionally prepared for tasks requiring cognitive effort, how they want to feel and regulate their emotions may be more in line with their general cultural beliefs about the utility of emotions in cognitively effortful contexts. The present findings thus suggest the importance of taking into account both the current context and the beliefs people from different cultures may have about the utility of their positive emotions.

Another important implication of our findings is that cultural differences in the regulation of positive emotions may be driven by both hedonic (i.e., the motivation to feel good) and instrumental (i.e., the motivation to succeed in an upcoming task) motivation. Although cross-cultural studies tended to highlight Americans' tendency to want to feel or savor positive emotions (e.g., Miyamoto & Ma, 2011; Sims et al., 2015), our findings suggest that such emotion regulation may not be driven only by

immediate hedonic motives. Consistent with the predictions of the instrumental approach, people from different cultures increase positive emotions when they expect them to be useful in a given context (see Tamir, 2009; Tamir, Bigman, Rhodes, Salerno, & Schreier, 2015). Therefore, it is important to distinguish the hedonic motivation to feel good in the moment from the instrumental motivation to up-regulate positive emotions for their utility. Although people may often up-regulate positive emotions to meet both hedonic and instrumental goals and both goals can be correlated (Luong, Wrzus, Wagner, & Riediger, 2016), present findings, as well as the literature on the instrumental approach (Tamir, 2005; Tamir & Ford, 2012; Tamir et al., 2008), suggest that hedonic and instrumental goals are separable (see also Tamir, 2016).

This distinction between hedonic and instrumental motives to feel/savor positive emotions is especially informative when considering how the effects of contexts varied by culture. For European Americans, as discussed above, it is likely that both the utility and the hedonic value of positive emotions contribute to their preferences to feel/savor positive emotions. In many situations, the two values work in the same direction (i.e., positive emotions have both high utility and hedonic values). In some situations (e.g., situations requiring high cognitive effort), utility may be more relevant, whereas in other situations, hedonic value may be more relevant. As a result, Americans may prefer to feel/savor positive emotions in many situations, unless there is a direct conflict between the utility and the hedonic value of positive emotions (e.g., feeling positive emotions may not be useful when they need to interact with a stranger). Consistent with this reasoning, in Studies 2 and 4, European Americans were generally not affected by the situation, with the exception of the interaction context in Study 4. In Study 3, the control condition was ambiguous as to what participants were expecting, and it is possible that some European Americans may have expected situations in which feeling positive emotions would be harmful.

For Asians, on the other hand, although both the utility and the hedonic value of positive emotions matter, they are not congruent with each other. In other words, although Asians may still acknowledge the hedonic value of positive emotions, they tend to perceive less utility in positive emotions. Thus, in situations in which the utility of positive emotions is relevant (e.g., situations requiring high cognitive effort), Asians prefer to feel/savor *less* positive emotions. However, since Asians still see the hedonic value of positive emotions (i.e., Asians want to feel good unless feeling good interferes with their goal pursuit in the immediate context), in situations requiring lower cognitive effort, Asians would show increased preference for positive emotions (Study 2 and 4). The control condition in Study 3 was ambiguous, so Asians may have considered situations that require high cognitive effort. Future research should separate the different motives of European Americans and Asians for regulating their positive emotions in various situations.

Throughout the current paper, we have focused on cultural differences in the regulation of positive emotions to highlight the importance of considering cultural contexts when investigating emotion experiences. Nevertheless, there are likely also cultural similarities in emotional experiences. In both Studies 3 and 4, we found no cultural differences in participants' experienced positive and negative emotions after our emotion manipulation, suggesting

that Americans and Asians felt equally happy after learning that they did well. This is consistent with previous research (e.g., Miyamoto & Ma, 2011; cf. for a similar argument, see Tsai et al., 2006) showing that the *immediate* emotional response following a successful event tends to be similar across cultures, but how people want to regulate their emotions after the initial emotional response might be different (e.g., savoring vs. dampening), likely leading to diverging patterns of emotion experiences in the long term (e.g., Miyamoto & Ma, 2011; Oishi, 2002). This cultural similarity in induced positive emotions allowed us to zoom in on testing potential cultural influences on the emotion regulation process that followed, without confounding different starting points of emotion. In addition, we argue that the framework of instrumental emotion regulation is shared in different cultures, in that people everywhere can be motivated to regulate their emotions according to what they perceive to be helpful in a certain context (see Tamir, 2016). The cultural difference lies in the *content* of people's emotion beliefs (e.g., which emotions are helpful; how beneficial positive emotions are in this context), which is influenced and shaped by cultural contexts.

Limitations and Future Directions

It is worth noting that our samples come from the college student population. To make the experimental procedure relevant to them, we included contexts and tasks prevalent in college student life (e.g., taking a multiple-choice test, participating in a group discussion in class) in addition to more general contexts (e.g., interviewing for a job, attending a dance/aerobics class, washing some dishes; see Appendix A). We argue that as long as a context involves active goal-pursuit and is viewed as requiring cognitive effort, people would be motivated to prefer emotions that they perceive to be beneficial according to their cultural beliefs, and that they would also try to regulate their emotions in line with such cultural beliefs, thereby leading to larger cultural differences in emotion regulation. Thus, even though we found cultural differences in the exam context among college students in Studies 3 and 4, we would not expect to see the same effect in a population that does not view the exam context to be highly cognitively demanding or even relevant to their lives (e.g., community population or people who have retired). Future work should look into contexts that are relevant and viewed as requiring cognitive effort by different populations (e.g., managing one's finances for the community population) to examine the generalizability of our theory. At the same time, the high cognitive effort situations may potentially differ from the low cognitive effort situations in other ways, such as perceived threat or the nature of the goal. Future research should examine these possibilities. For example, it would be informative to include contexts that require high cognitive effort in active goal pursuit but not threatening (e.g., playing a cognitively challenging game for fun such as Pandemic) to explore threat as a boundary condition. In addition, future studies could directly manipulate cognitive effort while holding the goal constant (e.g., comparing situations where people take a GRE test for graduate school admissions with situations in which they search the Internet to learn about graduate programs for graduate school admissions) to further clarify the mechanism.

Most of the Asian participants we had in the study were Asians from Asia, and the majority of these participants have been in the

U.S. for less than a year. Our sample size was not large enough to compare Asians to Asian Americans, but an analysis with only Asians (excluding Asian Americans) showed the same results. In Study 4, although no cultural differences were found when participants were anticipating an interaction with a stranger, Asians did not try to savor positive emotions more than when they were anticipating filling out personality questionnaires, so the null cultural difference was unlikely driven by Asians trying to boost their emotions before interacting with a stranger, possibly a European American (at least compared to filling out a personality questionnaire). Nonetheless, it would be informative in future research to examine whether the same pattern can be observed when Asians are tested in Asia.

For the sake of parsimony, in Studies 3 and 4, we used the difference between savoring and dampening to form an index of savoring over dampening positive emotions. While savoring and dampening positive emotions are related concepts, they may not be exactly the opposite of each other. In both Studies 3 and 4, there was no main effect of Culture for savoring, but a significant main effect of Culture for dampening emerged with medium to large effect sizes (Study 3: $F(1, 104) = 18.78, p < .001$; Study 4: $F(2, 136) = 20.01, p < .001$). Consistent with Miyamoto and Ma (2011), on average, Asians wanted to dampen positive emotions to a larger extent than Americans did, and the cultural differences in regulating positive emotions seemed larger for dampening than for savoring positive emotions. The pattern of savoring and dampening for the interaction between culture and cognitive effort was less clear. In Study 3, the Culture \times Cognitive Effort interaction was mainly driven by savoring (the interaction was not significant for dampening, $F(1, 104) = 0.103, p = .75$, but significant for savoring, $F(1, 104) = 5.07, p = .026$, meaning Americans wanted to savor more than Asians for exam context, but no cultural difference for control context). However, in Study 4, the same interaction was mainly driven by dampening (the interaction was not significant for savoring, $F(2, 136) = 0.56, p = .57$, but marginally significant for dampening, $F(2, 136) = 2.58, p = .079$, such that Asians wanted to dampen more than Americans in the exam and neutral contexts, but no cultural difference was found in the interaction context). Thus, the interaction effect seems to be limited to the difference score and not driven by one of the emotion regulation measures.

It would also be important to examine how our theory may generalize to different types of positive emotions. Building on previous studies (e.g., Wood et al., 2005), we induced positive emotions by providing positive feedback, which was successful in inducing general positive emotions in both Americans and Asians. However, the emotion induction method could have also induced positive emotions related to self-esteem and self-efficacy (such as confidence). Other methods of inducing positive emotions (such as feeling socially accepted; e.g., Westermann, Spies, Stahl, & Hesse, 1996) may differentially influence how people try to regulate their emotions. We believe that our theory has explanatory power for positive emotions in general, but we acknowledge that not all positive emotions are the same, and that the finer distinctions among different types of positive emotions, such as interpersonally connected versus disconnected (e.g., Chow & Berenbaum, 2012; Kitayama, Mesquita, & Karasawa, 2006) and low versus high arousal positive emotions (Tsai et al., 2006), may also play a role

in affecting the extent to which people savor positive emotions in various contexts.

Because Asians perceive more utility of negative emotions than Americans do (Miyamoto, Ma, & Petermann, 2014; Sims et al., 2015), our sociocultural instrumental approach suggests that it is likely that the interaction between culture and situation can also be found for preferences for/regulation of negative emotions. Asians may be more likely than Americans to prefer to feel negative emotions, especially in high cognitive effort situations. It is thus important in future research to identify the extent to which the interaction between culture and situation found in the present study pertains to positive emotions per se, or also applies to negative emotions. In the current Studies 3 and 4, where participants were asked about their emotion regulation when actually anticipating certain situations, the culture and situation interaction was found for the regulation of positive emotions. However, in Study 2, where participants were asked about their emotional preferences in imagined situations, the culture and situations interaction was larger for preferences for negative emotions than for preferences for positive emotions. It is possible that the interactive effect of culture and situation for positive emotions may be stronger for online responses than for hypothetical responses. At the same time, preferences for negative emotions and preferences for positive emotions were highly negatively correlated with each other in Study 2, which indicates a possibility that positive and negative emotions work in tandem.

Although cultural differences tended to be larger when participants were expecting to take an exam, there were small to medium-size cultural differences even when an upcoming task was unspecified in Study 3 ($d = 0.39$) and when they were expecting to fill out a personality questionnaire in Study 4 ($d = 0.56$). These results indicate a possibility that cultural differences in the regulation of positive emotions are driven not only by the perceived utility of positive emotions in specific contexts, but also by other factors, especially hedonic motivation (Larsen, 2000) since both instrumental and hedonic motivations are likely to underlie positive emotion regulation. For example, American participants might have wanted to feel good for a hedonic reason when expecting to fill out a personality questionnaire. It would be important for future research to examine potential cultural differences in such hedonic motivation.

Our investigation focused on how people across cultures regulate positive emotions when expecting tasks that require high cognitive effort, and taking an exam was used as a typical high cognitive effort task. We found that Americans want to savor rather than dampen positive emotions more than Asians do before an exam. One important question involves the actual implications of such attempted regulation. Prior research suggests that what people want to feel can influence how they feel and how they behave. A critical direction for future research involves the downstream effects of such forms of emotion regulation. In particular, it would be important to examine whether savoring positive emotions influences performance of Americans and Asians on subsequent exams. Although some literature suggests that induced positive emotions may lead to better performance on certain academic tasks in Western cultures (Bryan & Bryan, 1991; Kirschenbaum, Tomarken, & Humphrey, 1985), controversy remains as to whether the effect exists for different positive emotion induction methods, as well as for different types of academic performance

tasks (e.g., Ozkaragoz, 1988; Schwarz & Clore, 2007). It is also unclear how induced (vs. measured) positive emotions influence exam performance in Asian cultural contexts (Tao & Hong, 2014). Future research should utilize a multimethod approach to study the effects of positive emotions on exam performance in different cultural contexts.

Conclusion

Taking the sociocultural instrumental approach, we have demonstrated that cultural differences in the regulation of positive emotions are context-dependent. Americans wanted to savor rather than dampen positive emotions more than Asians did when expecting tasks that require high cognitive effort, such as taking an exam, but cultural differences tended to be smaller in other contexts that require lower cognitive efforts. Our research underscores the essential role of context in shaping what people want to feel in different cultures. Our research also highlights the importance of cultural beliefs in emotion regulation. Together, our findings highlight the importance of examining both cultural and contextual effects in understanding emotion regulation.

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(Appendices follow)

Appendix A

Contexts Used in Study 2

Nature of context	Cognitive effort		
	High	Medium	Low
Private	Writing a final paper for a class; Taking a multiple-choice test	Filling out a personality questionnaire; Following a recipe to cook a dish	Cleaning one's room; Washing some dishes
Social	Interviewing for a job; Participating in a group discussion in a class	Getting to know another participant in an experiment; Attending a dance or aerobics class	Going to a sports game; Going shopping at a mall with a friend

Appendix B

Emotion Regulation Scale (Adapted and Modified From Wood et al., 2003)

To what extent do you experience each of the following reactions right now? (8-point Likert Scale, from 1 *Not at all* to 8 *A very great deal*)

- a. I want to engage in activities to enhance my good feelings.
- b. I want to distract myself.
- c. I want to think about things to “dampen” my excitement—to calm down.

- d. I want to savor my current feelings.
- e. I want to think about things to help me feel even better.
- f. I want to bask in this moment for some time.
- g. I want to think about things to “dampen” my good feelings—to make myself feel not as good.

Appendix C

Description of Games in Study 3 and Study 4

SET game: A set is made up with three cards with four features—color, symbol, shade, and the number of symbols on each card. Each feature has three possible values (e.g., color can be red, green, or purple). The three cards can be considered as a set only when each feature either has the same value (e.g., three cards are all red) on all three cards, or has all different values on each card (e.g., the colors of the three cards are red, green, and purple). Participants are asked to find out two sets out of nine cards provided.

Seven-Coincidence puzzle: a jigsaw game that uses seven geometric figures to form a certain shape. Participants need to

rotate and rearrange the figures to fill the outline of the shape.

Hidden ball puzzle: a game in which balls are hidden under some tiles in a 5-by-5 matrix. Participants are asked to locate all the hidden balls according to the numeric clues given by each row and each column.

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