

## **Cultural influences on the relation between pleasant emotions and unpleasant emotions: Asian dialectic philosophies or individualism-collectivism?**

Ulrich Schimmack

*University of Toronto, Mississauga, Canada*

Shigehiro Oishi

*University of Minnesota, USA*

Ed Diener

*University of Illinois, Urbana-Champaign, USA*

The present study examined the hypothesis that Asian cultures' dialectical way of thinking influences emotion reports. A dialectical way of thinking sees emotions of the opposite valence (e.g., happy, sad) as compatible with each other. In contrast, Western philosophy considers these emotions to be in conflict with each other. We examined correlations between frequency estimates of pleasant emotions (FPE) and frequency estimates of unpleasant emotions (FUE) in Asian, non-Asian collectivistic, and Western cultures. As predicted, FPE-FUE correlations were less negative in Asian cultures than in other cultures. We also observed a tendency for the culture effect to be moderated by gender. The strongest negative correlation was obtained for women in non-Asian cultures.

Subjective well-being increases with the frequency of pleasant emotions and decreases with the frequency of unpleasant emotions. Thus, frequency judgments of emotions are an important indicator of subjective well-being (Diener, 1984; Diener, Sandvik, & Pavot, 1991; Diener, Smith, & Fujita, 1995). One question in subjective well-being research has been the relation between the frequencies of pleasant and unpleasant emotions. Are frequent experiences of

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Correspondence should be addressed to Ulrich Schimmack, Department of Psychology, University of Toronto at Mississauga, Erindale College, 3359 Mississauga Road North, Mississauga, Ontario, Canada, L5L 1C6; e-mail: [uli.schimmack@utoronto.ca](mailto:uli.schimmack@utoronto.ca)

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pleasant emotions inversely related to frequent experiences of unpleasant emotions? Or are frequent pleasant emotions and frequent unpleasant emotions independent indicators of well-being (cf. Diener & Emmons, 1984; Diener et al., 1995)? Previous research demonstrated that the relation is influenced by the response format (Schimmack, Oishi, Diener, & Suh, 2000; Warr, Barter, & Brownbridge, 1983). For example, Schimmack et al. (2000) demonstrated that response formats with vague quantifiers (rarely, often) produce correlations closer to  $-1.00$  than response formats that request absolute frequency estimates (5 times, 20 times). It seems that vague quantifiers lead participants to contrast emotions with each other. For example, the frequency of happiness is contrasted with the frequency of sadness.

Recently, several authors have suggested that culture also influences the relation between pleasant and unpleasant emotions (Bagozzi, Wong, & Yi, 1999; Heine, Lehman, Markus, & Kitayama, 1999). Bagozzi et al. (1999) theorised that in Western cultures pleasant and unpleasant emotions "are conceived as oppositional categories. One is either happy or sad but not both" (p. 646). Hence, Western respondents are likely to perceive frequency judgements of happiness in opposition to frequency judgements of sadness. This should lead to stronger negative correlations between frequency estimates of pleasant emotions and frequency estimates of unpleasant emotions. In contrast, Asian philosophies are dialectic (Bagozzi et al., 1999; Peng & Nisbett, 1999, 2000). Dialectic philosophies do not consider opposites as contradictory. Hence, people in these cultures may feel less compelled to provide opposing ratings for pleasant versus unpleasant emotions. As a consequence, dialectic cultures should produce weaker negative correlations between frequency estimates of pleasant and unpleasant emotions.

Bagozzi et al. (1999) obtained support for the hypothesis in comparisons of South Korean and Chinese samples with US American samples. As predicted, correlations between reports of pleasant and unpleasant emotions were less negative in the Asian samples than in the Western sample, although the effect was stronger for intensity ratings of momentary feelings than for frequency judgements. Kitayama, Markus, and Kurokawa (2000) obtained similar results in a comparison of Japan and the United States. In addition to the main effect of culture, Bagozzi et al. (1999) also hypothesised that culture interacts with gender in the moderation of the relation between pleasant and unpleasant emotions. The authors proposed that women's reports of emotions are more strongly influenced by lay theories about emotions. Because these lay theories are influenced by culture, women's emotion reports should show a stronger effect of culture. In Western cultures, women's emotion reports should produce more negative correlations than men's emotion reports. In Asian cultures, women's emotion reports should produce less negative correlations than men's emotion reports. Bagozzi et al.'s (1999) data supported this predicted interaction between culture and gender.

Our study extends previous investigations by analysing data from 38 different nations that included several Asian, Non-Asian collectivistic, and individualistic Western cultures. As a consequence, we could test several additional hypotheses. First, previous studies compared Asian samples to samples from the United States. The United States are the most individualistic culture (Hofstede, 2001; Triandis, 1989). Hence, it is possible that the obtained differences are influenced by characteristics unique to the United States. Our study included samples from several Western nations. Hence, we could examine whether previous findings generalise to Western cultures in general or whether they are unique to the United States. Second, previous studies compared Western and Asian samples. In contrast, our dataset included several nations from cultures in Africa and Latin America. Hence, we could test the prediction that Asian dialectic philosophies are a better predictor of cultural differences in the frequency of pleasant emotions-frequency of unpleasant emotions (FPE-FUE) correlation than individualism-collectivism. Finally, our dataset allowed us to examine more closely which aspects of Asian cultures may be related to the effect. Peng and Nisbett's (2000) work suggests that dialectic thinking may be a product of Daoism. Daoism is limited to the Chinese culture, and one would expect a stronger effect in our Chinese samples (Hong Kong, Taiwan, People's Republic of China). However, dialectic thinking may be a more pervasive feature of Asian philosophies in general (Buddhism, Hinduism) that influenced most Asian cultures with the exception of a few cultures that are influenced predominantly by Islam (Pakistan). Bagozzi et al.'s (1999) finding that Koreans differed from US Americans suggests that the effect is not limited to Chinese cultures.

Our large sample of nations also enabled us to use rigorous quantitative methods to test cultural effects. We employed multilevel modelling for this purpose (e.g., Kreft & Leeuw, 1998). In multilevel analyses, individuals within a culture represent the first level of analysis, and the different cultures represent the second level of analysis. A simple multilevel model first estimates the relation between pleasant and unpleasant emotions in the total population. Then, it determines whether the relation varies significantly across the cultural samples. More complex multilevel models examine whether variability across cultures is related to specific characteristics of the cultural samples. For example, we examined whether variation in the correlations between frequencies of pleasant and unpleasant emotions across cultures was systematically related to the influence of dialectic philosophies in Asia.

Theoretically, multilevel analyses are similar to traditional two-step analyses in which a researcher first computes the correlation between frequencies of pleasure and displeasure within nations, and then correlates the correlation coefficients with cultural variables (e.g., Suh, Diener, Oishi, & Triandis, 1998). Although both methods yield similar estimates of the effects, multilevel analyses yield better estimates of standard errors (cf. Kreft & Leeuw, 1998). Hence, multilevel analyses are more appropriate for testing statistical significance.

In short, we tested three hypotheses of cultural influences on the relation between pleasant and unpleasant emotions. First, we predicted that the relation varies across cultures. Second, we predicted that only cultures influenced by dialectic Asian philosophies influence the FPE-FUE correlation, whereas non-Asian collectivistic cultures are more similar to individualistic cultures. Third, we tested the hypothesis that the cultural effect is moderated by gender. These hypotheses were tested by means of a series of multilevel models using HLM 5 (Raudenbush, Bryk, Cheong, & Congdon, 2000).

## METHOD

### Participants

The data were obtained in a cross-cultural survey of college students in 40 countries (see Diener & Suh, 1999, Suh et al., 1998 for details). The original sample included 6780 college students. We deleted cases with missing values and extreme outliers (scores 4 standard deviations above or below the nation's mean). We discarded the data of Guam because we were uncertain about the cultural classification of this US American territory in Asia (the correlation between pleasant and unpleasant emotions for this sample was  $-.30$ ). Following recommendations by Kreft and Leeuw (1998), we first examined the correlations between pleasant affect and unpleasant affect in each cultural sample (Table 1). The correlation in the sample from Tanzania was more than three standard deviations above the average correlation in the total sample ( $r = .54$ ). Hence, we excluded Tanzania from our analyses. The final sample included 5886 participants (2233 men, 3653 women) from 38 nations.

### Nations

Ten nations were classified as influenced by Asian dialectic philosophies (ADP) based on the prevalence of Asian religions (Buddhism, Hinduism, Confucianism) in these nations (see Table 1). To examine, whether correlations are influenced by individualism-collectivism, we used Triandis's ratings of cultures on the individualism-collectivism dimension (Suh et al., 1998). These ratings show high convergent validity with Hofstede's (2001) factor analytically derived individualism scores ( $N = 42$ ;  $r = .85$ ), and a reassessment of Hofstede's dimensions in a large cross-cultural survey (Spector et al., 2001; overlapping  $N = 20$ ,  $r = .79$ ). Furthermore, Triandis's ratings have shown predictive validity in cross-cultural studies of emotions (e.g., Schimmack, Radhakrishnan, Oishi, Dzokoto, & Ahadi, in press-b; Suh et al., 1998). We used Asian dialectic philosophies (ADP) and individualism-collectivism (I-C) as two competing predictors of cultural differences in the correlation between frequency judgements of pleasant and unpleasant emotions.

TABLE 1  
Correlations between pleasant and unpleasant emotions in 38 nations

| <i>Nation</i> | <i>ADP</i> | <i>N</i> | <i>Alpha FPE</i> | <i>Alpha FUE</i> | <i>Mean FPE</i> | <i>Mean FUE</i> | <i>Correlation FPE-FUE</i> |
|---------------|------------|----------|------------------|------------------|-----------------|-----------------|----------------------------|
| Hong Kong     | 1          | 140      | .63              | .70              | 3.16            | 2.75            | .09                        |
| Japan         | 1          | 198      | .69              | .56              | 3.60            | 2.83            | .07                        |
| Thailand      | 1          | 89       | .64              | .57              | 4.28            | 2.91            | .03                        |
| Nepal         | 1          | 94       | .28              | .35              | 3.92            | 2.60            | .02                        |
| China         | 1          | 273      | .67              | .68              | 2.32            | 2.49            | .01                        |
| Hungary       | 0          | 72       | .61              | .49              | 3.88            | 2.66            | -.01                       |
| South Korea   | 1          | 276      | .68              | .62              | 3.77            | 2.86            | -.05                       |
| Turkey        | 0          | 99       | .54              | .67              | 4.19            | 3.43            | -.05                       |
| Nigeria       | 0          | 230      | .42              | .53              | 4.26            | 2.40            | -.07                       |
| Denmark       | 0          | 88       | .60              | .49              | 3.91            | 2.53            | -.08                       |
| Indonesia     | 1          | 88       | .83              | .52              | 3.76            | 2.65            | -.08                       |
| Estonia       | 0          | 116      | .46              | .49              | 3.81            | 2.35            | -.09                       |
| Ghana         | 0          | 116      | .31              | .66              | 3.78            | 2.72            | -.10                       |
| Lithuania     | 0          | 100      | .53              | .75              | 3.58            | 2.77            | -.10                       |
| Taiwan        | 1          | 362      | .77              | .66              | 3.54            | 2.51            | -.10                       |
| Slovenia      | 0          | 50       | .80              | .69              | 4.89            | 2.88            | -.11                       |
| Greece        | 0          | 124      | .65              | .54              | 3.91            | 2.96            | -.12                       |
| Zimbabwe      | 0          | 104      | .60              | .65              | 3.83            | 2.56            | -.12                       |
| Italy         | 0          | 284      | .62              | .65              | 4.17            | 3.24            | -.16                       |
| Brazil        | 0          | 111      | .71              | .69              | 4.19            | 2.77            | -.17                       |
| India         | 1          | 95       | .66              | .62              | 3.69            | 2.92            | -.17                       |
| Austria       | 0          | 158      | .67              | .67              | 3.98            | 2.48            | -.20                       |
| Singapore     | 1          | 130      | .69              | .66              | 3.76            | 2.60            | -.20                       |
| Norway        | 0          | 96       | .66              | .53              | 3.99            | 2.34            | -.24                       |
| Argentina     | 0          | 87       | .65              | .55              | 4.12            | 2.85            | -.28                       |
| South Africa  | 0          | 355      | .67              | .67              | 3.90            | 3.02            | -.29                       |
| Spain         | 0          | 316      | .72              | .59              | 4.03            | 2.73            | -.29                       |
| Bahrain       | 0          | 117      | .59              | .48              | 4.03            | 3.20            | -.30                       |
| Germany       | 0          | 101      | .69              | .59              | 3.90            | 2.76            | -.31                       |
| Netherlands   | 0          | 36       | .41              | .73              | 4.44            | 2.37            | -.31                       |
| Pakistan      | 0          | 146      | .65              | .53              | 3.96            | 2.86            | -.31                       |
| Peru          | 0          | 126      | .73              | .60              | 4.53            | 2.81            | -.33                       |
| Colombia      | 0          | 96       | .73              | .67              | 4.62            | 3.08            | -.36                       |
| Finland       | 0          | 88       | .72              | .68              | 4.11            | 2.47            | -.36                       |
| USA           | 0          | 427      | .77              | .65              | 4.12            | 2.77            | -.36                       |
| Australia     | 0          | 284      | .77              | .57              | 3.93            | 2.61            | -.37                       |
| Puerto Rico   | 0          | 97       | .79              | .78              | 4.72            | 2.89            | -.39                       |
| Egypt         | 0          | 117      | .87              | .80              | 3.98            | 2.83            | -.49                       |

*Note:* Samples are arranged from the nation with the highest (closest to 1.00) to the lowest (closest to -1.00) correlations between frequency judgements of pleasant emotions and unpleasant emotions.

## Frequency judgements of emotions

Participants were asked to report how often they experienced four pleasant emotions (joy, contentment, affection, pride) and four unpleasant emotions (sadness, fear, anger, guilt) during the past month. When necessary, the emotion words were translated into the native language by the local collaborators. Although it is ideal to check the validity of the translations by means of back-translations, this method was only used for the Chinese, Japanese, Korean, and Spanish version of the questionnaire (cf. Suh et al., 1998). Hence, at least some questionnaires in ADP cultures and some questionnaires in non-ADP cultures (USA, Great Britain, most Latin American cultures) fulfilled this requirement. Responses were made on a 7-point scale. The response categories were labelled 1-never, 2-slight amount (rare), 3-some of the time, 4-about half of the time, 5-much of the time, 6-almost always, 7-always. Ratings of pleasant emotions and unpleasant emotions were averaged to create scales of the frequency of pleasant and unpleasant emotions, respectively. Table 1 shows the reliabilities of the two scales, which varied across cultures. However, this variability was unrelated to individualism-collectivism or ADP ( $ps > .40$ ).

## RESULTS

We estimated a series of multilevel models to test our hypotheses. In all models, we arbitrarily used frequency of unpleasant emotions (FUE) as the outcome variable, and frequency of pleasant emotions (FPE) as the predictor variable. We used the traditional two-tailed 5% level to test significance.

The first model established the relation between pleasure and displeasure in a world sample of college students and tested whether this relation differs significantly across nations. This model explained FUE as a linear function of FPE and an error term. The intercept was fixed to zero because both variables were standardised. At the second level, the model estimated the random effect of nations' deviations from the population relation between FPE and FUE. The significance test of the error term compares actual variability between nations to the variability that is expected based on sampling error.

$$\text{level 1: FUE} = \beta \text{ FPE} + \text{Error} \quad (1)$$

$$\text{level 2: } \beta = \beta_{\text{Intercept}} + \text{Random Effect}$$

The relation between pleasure and displeasure was slightly negative,  $\beta_{\text{Intercept}} = -.18$ ,  $SE = .02$ ,  $t = 7.44$ ,  $p < .01$ . More important, the Random Effect was significant, indicating that the relation varied significantly across countries,  $\chi^2 (df = 37) = 130$ ,  $p < .01$ . This finding supports our first hypothesis. The standard deviation of the random effect was .12, indicating that 95% of all sample correlations fall into a range from .06 to  $-.40$ .

In model 2, we included standardised individualism-collectivism (I-C) scores as a level 2 variable. The level 1 part of the model remained unchanged. This model tested whether national differences are systematically related to individualism-collectivism. It also tests whether individualism-collectivism (I-C) is sufficient to explain all national differences.

$$\begin{aligned} \text{level 1: } & \text{FUE} = \beta \text{ FPE} + \text{Error} & (2) \\ \text{level 2: } & \beta = \beta_{\text{Intercept}} + \beta_{\text{I-C}} \text{ I-C} + \text{Random Effect} \end{aligned}$$

The intercept of the effect of FPE on FUE was significant,  $\beta_{\text{Intercept}} = -.18$ ,  $SE = .02$ ,  $t = 8.48$ ,  $p < .01$ . In addition, individualism-collectivism explained a significant amount of variability between cultures,  $\beta_{\text{I-C}} = -.03$ ,  $SE = .01$ ,  $t = 3.64$ ,  $p < .01$ . The Random Effect remained significant, indicating that individualism-collectivism explained only some of the cultural differences,  $\chi^2 (df = 36) = 91$ ,  $p < .01$ . The negative direction of the regression weight for individualism-collectivism indicates that the negative correlation between FUE and FPE was stronger in individualistic cultures.

The third model used a dichotomous Asian dialectic philosophy (ADP) variable as predictor of cultural differences. ADP cultures were coded 1, whereas non-ADP cultures were coded 0. Mathematically, the model is equivalent to model 2, only that individualism-collectivism was replaced by ADP as predictor.

$$\begin{aligned} \text{level 1: } & \text{FUE} = \beta \text{ FPE} + \text{Error} & (3) \\ \text{level 2: } & \beta = \beta_{\text{Intercept}} + \beta_{\text{ADP}} \text{ ADP} + \text{Random Effect} \end{aligned}$$

The intercept for the effect of FPE on FUE was significant,  $\beta_{\text{Intercept}} = -.23$ ,  $SE = .02$ ,  $t = 10.26$ ,  $p < .01$ . In addition, ADP explained a significant amount of variability between cultures,  $\beta_{\text{ADP}} = .19$ ,  $SE = .04$ ,  $t = 4.57$ ,  $p < .01$ . The Random Effect was still significant, indicating that ADP explained only some of the cultural differences,  $\chi^2 (df = 36) = 75$ ,  $p < .01$ . The positive regression weight for ADP confirms the hypothesis that the negative FPE-FUE correlation is weaker in ADP cultures than in other cultures.

Individualism-collectivism (I-C) and Asian dialectic philosophies (ADP) are correlated predictors ( $r = -.40$ ). The next model tested which of the two predictors explains unique variance in the relation between FPE and FUE across countries. For this purpose, both variables were included in the model.

$$\begin{aligned} \text{level 1: } & \text{FUE} = \beta \text{ FPE} + \text{Error} & (4) \\ \text{level 2: } & \beta = \beta_{\text{Intercept}} + \beta_{\text{I-C}} \text{ I-C} + \beta_{\text{ADP}} \text{ ADP} + \text{Random Effect} \end{aligned}$$

The intercept of the effect of FPE on FUE remained significant,  $\beta_{\text{Intercept}} = -.22$ ,  $SE = .02$ ,  $t = 9.61$ ,  $p < .01$ . The effect of I-C was no longer significant after controlling for the influence of ADP,  $\beta_{\text{I-C}} = -.02$ ,  $SE = .01$ ,  $t = 1.91$ ,  $p = .06$ . In contrast, ADP remained a significant predictor after controlling for I-C,  $\beta_{\text{ADP}} = .16$ ,  $SE = .04$ ,  $t = 3.71$ ,  $p < .01$ . The Random Effect was still significant,

indicating that individualism-collectivism and Asian dialectic philosophies did not explain all cultural differences,  $\chi^2 (df = 35) = 65, p < .01$ .

The next model examined potential artifacts. For example, responses in ADP cultures may be more strongly influenced by response styles. Fortunately, multitrait-multimethod studies of individual differences in affect ratings revealed that response styles have a negligible influence on ratings of emotional experiences (Diener, Larsen, Levine, & Emmons, 1985; Schimmack, Bockenholt, & Reizenzein, in press-a). Nevertheless, it is possible that affect ratings in ADP cultures are more strongly influenced by response styles. Fortunately, we could test this hypothesis because response styles have two effects. First, they attenuate negative correlations, which could produce weaker negative correlations between FPE and FUE in ADP cultures. Second, response styles inflate positive correlations, leading to inflated estimates of the reliabilities of FUE and FPE. Hence, cultural variation in response styles would produce a positive correlation between nations' reliabilities and nations' correlations between FUE-FPE. If the effect of culture on the FPE-FUE correlation were merely a response style artifact, then the effect should disappear once nations' reliabilities of FPE and FUE are entered as level 2 predictors in a multilevel analysis. For this purpose, we included the alphas of each nation as standardised level 2 variables in the model.

Another possibility could be that the FPE-FUE correlation is attenuated by a modesty bias. If respondents underreport pleasant emotions, it would lower the mean level of FPE and possibly the correlation with FUE. To examine this hypothesis, we also included the nations' mean levels of FPE and FUE as standardised level 2 variables in the model.

$$\text{level 1: FUE} = \beta \text{ FPE} + \text{Error} \quad (5)$$

$$\begin{aligned} \text{level 2: } \beta &= \beta_{\text{Intercept}} + \beta_{\text{I-C}} \text{ I-C} + \beta_{\text{ADP}} \text{ ADP} + \\ &\beta_{\text{AlphaFPE}} \text{ AlphaFPE} + \beta_{\text{AlphaFUE}} \text{ AlphaFUE} + \\ &\beta_{\text{Mean}} \text{ MeanFPE} + \beta_{\text{MeanFUE}} \text{ MeanFUE} + \text{Random Effect} \end{aligned}$$

The intercept of the effect of FPE on FUE remained significant,  $\beta_{\text{Intercept}} = -.23, SE = .02, t = 15.06, p < .01$ . As in the previous model, the effect of I-C was not significant,  $\beta_{\text{I-C}} = .00, SE = .01, t = 0.49, p = .63$ . ADP remained a significant predictor,  $\beta_{\text{ADP}} = .18, SE = .04, t = 4.07, p < .01$ . Of the artifact measures, only the reliabilities of the FPE scale were a significant predictor,  $\beta_{\text{AlphaFPE}} = -.59, SE = .14, t = 4.30, p < .01$  (all other  $t$ s  $< 1.00$ ). An examination of the random effect revealed that this model explained all of the reliable variation in the FPE-FUE correlation across cultures,  $\chi^2 (df = 33) = 38, p = .18$ . The effect for FPE reliabilities indicates that the correlation between FPE and FUE is more negative in nations, in which the pleasant emotions form a homogeneous scale. This finding demonstrates that random error influences the FPE and FUE correlation, but does not reveal cultural differences in response styles. This finding is consistent with other evidence in Western cultures that

response styles have a negligible effect on affect ratings (Diener et al., 1985; Schimmack et al., in press). More important, however, is the finding that the effect of ADP remained significant, even when cultural variations in the reliabilities of the scales were taken into account.

The next model tested the hypothesis that the effect of ADP is moderated by gender. In a multilevel model, ADP is a level 2 variable, whereas gender is a level 1 variable. Hence, we added gender (male = 0, female = 1) as a predictor at level 1, and allowed gender to interact with ADP at level 2. To model the hypothesis that gender and culture influence the *relation* between FPE and FUE, we also had to include an interaction term between FPE and gender. This term was the product between the standardised FPE scores and gender. Model 6 is rather complex. At level 1, it includes FPE, GENDER, and the FPE  $\times$  GENDER interaction as predictors. At level 2, ADP was allowed to moderate all three of the level 1 relations.

level 1: (6)

$$\text{FUE} = \beta_{\text{FPE}} \text{FPE} + \beta_{\text{GENDER}} \text{GENDER} + \beta_{\text{FPE} \times \text{GENDER}} \text{FPE} \times \text{GENDER} + \text{Error}$$

level 2:

$$\beta_{\text{FPE}} = \beta_{\text{FPE Intercept}} + \beta_{\text{FPE ADP}} \text{ADP} + \text{Random Effect FPE}$$

$$\beta_{\text{GENDER}} = \beta_{\text{GENDER Intercept}} + \beta_{\text{GENDER ADP}} \text{ADP} + \text{Random Effect GENDER}$$

$$\beta_{\text{FPE} \times \text{GENDER}} = \beta_{\text{FPE} \times \text{GENDER Intercept}} + \beta_{\text{FPE} \times \text{GENDER ADP}} \text{ADP} + \text{Random Effect FPE} \times \text{GENDER}$$

The intercept of the main effect of FPE on FUE remained significant,  $\beta_{\text{FPE Intercept}} = -.16$ ,  $SE = .03$ ,  $t = 4.81$ ,  $p < .01$ . The effect of ADP on this relation was no longer significant,  $\beta_{\text{FPE ADP}} = .10$ ,  $SE = .06$ ,  $t = 1.60$ ,  $p = .09$ . Gender had a main effect on FUE, indicating that women reported higher frequencies of unpleasant emotions than men,  $\beta_{\text{GENDER FIXED}} = .09$ ,  $SE = .02$ ,  $t = 5.67$ ,  $p < .01$ . This relation was consistent across ADP and non-ADP cultures,  $\beta_{\text{GENDER ADP}} = -.03$ ,  $SE = .04$ ,  $t = 0.97$ ,  $p = .34$ . Furthermore, the random effect of gender revealed no other national differences,  $\chi^2 (df = 36) = 31$ ,  $p > .50$ . The interaction between FPE and GENDER was significant, indicating that the correlation between pleasant and unpleasant emotions is different for men and women,  $\beta_{\text{FPE} \times \text{GENDER FIXED}} = -.12$ ,  $SE = .03$ ,  $t = 3.57$ ,  $p < .01$ . Finally, the interaction between GENDER, ADP, and FPE tested the hypothesis that gender moderates the cultural effect on the relation between frequency judgements of pleasant and unpleasant emotions. This effect approached significance,  $\beta_{\text{FPE} \times \text{GENDER ADP}} = .17$ ,  $SE = .10$ ,  $t = 1.80$ ,  $p = .08$ . To simplify the interpretation of this complex interaction, we computed separate correlations between FPE and FUE for men and women in ADP and non-ADP cultures. As predicted, in Non-ADP cultures the women's correlation was more negative ( $r = -.32$ ,  $N = 2739$ ) than the men's correlation ( $r = -.19$ ,  $N = 1403$ ). However, in ADP cultures, the correlations were identical for women ( $r = -.04$ ,  $N = 915$ ) and men ( $r = -.04$ ,  $N = 829$ ).

TABLE 2  
Correlations between frequency judgements of specific pleasant and unpleasant emotions in ADP and non-ADP cultures

| <i>Unpleasant</i> | <i>Pleasant</i>  |              |                    |            |
|-------------------|------------------|--------------|--------------------|------------|
|                   | <i>Affection</i> | <i>Pride</i> | <i>Contentment</i> | <i>Joy</i> |
| Guilt             | .02/.08*         | -.06/.02*    | -.15/.02*          | -.12/-.01* |
| Fear              | .03/.06          | -.08/-.07    | -.17/-.10*         | -.16/-.10* |
| Anger             | -.04/.08*        | -.04/.05*    | -.22/-.08*         | -.22/-.04* |
| Sadness           | -.06/.07*        | -.15/-.02*   | -.31/-.11*         | -.34/-.13* |

Note: Non-ADP/ADP; \*significantly different at  $p < .05$ .

Finally, we examined the relation between specific pleasant and unpleasant emotions in ADP and non-ADP cultures (Table 2). All 16 correlations were consistently less negative in ADP cultures, and due to the large sample sizes, most differed significantly from each other. However, the pattern of correlations in Table 2 suggests that culture particularly influenced the correlations of joy and contentment with sadness and anger. These correlations were negative in the non-ADP cultures, whereas all other correlations were close to zero (+/- .20) in ADP and non-ADP cultures.

## DISCUSSION

The present study examined cultural differences in the relation between frequency judgements of pleasant and unpleasant emotions. Previous studies in Western cultures obtained slightly negative correlations when vague quantifiers were used in the response format (Diener et al., 1995; Schimmack et al., 2000). The present study tested the predictions that the correlation would be less negative in Asian cultures that are influenced by dialectic philosophies, which perceive emotions of opposite valence as more compatible with each other. An investigation of 38 countries, including 10 Asian dialectic philosophy (ADP) nations, supported this prediction. Furthermore, ADP cultures differed from other collectivistic nations in Africa and Latin America. This finding strengthens the hypothesis that the FPE-FUE correlation is moderated by Asian-dialectic thinking and not by individualism-collectivism. The prediction that cultural effects are moderated by gender received only partial support. As predicted, the strongest negative correlation was obtained for women in non-ADP cultures. However, men and women's responses in ADP cultures yielded identical correlations. Finally, we tested several method-artifact explanation of the cultural effect. We found no evidence that the weaker negative correlations in ADP cultures were due to response styles or modesty biases. The only significant

finding was that random error in the FPE scale attenuated the FPE-FUE correlations.

## Limitations and Future Research

Our study was limited to frequency judgements of emotions. It is important to note the difference between frequency judgements over extended periods and reports of emotional experiences at one moment in time. Diener and Emmons (1984) demonstrated that the correlation between pleasant and unpleasant emotions decreased from momentary reports to aggregates over longer time intervals. The reason is that people do not experience emotions all the time. Hence, even if pleasant and unpleasant emotions were mutually exclusive at one moment in time, some individuals could still experience more pleasant and unpleasant emotions during different moments over a longer time interval (cf. Schimmack et al., 2000). Consistent with this observation, we found relatively weak correlations between PE and UE in all samples, ranging from  $-.49$  to  $.09$ .

As predicted by Bagozzi et al. (1999), these correlations were moderated by culture. This cultural effect may have occurred at different stages from actual emotional experiences to frequency judgements. First, it is possible that a dialectic philosophy influences actual emotional experiences. In support for this assumption, Bagozzi et al. (1999) obtained stronger cultural effects for intensity ratings of current affect than for frequency judgements. It is possible that people in Asian dialectic cultures more readily recognise the pleasant and unpleasant aspects of an event, which produces mixed feelings of pleasant and unpleasant emotions (Schimmack, 2001). A higher number of mixed emotional experiences may in turn produce relatively more positive correlations between frequencies of pleasant and unpleasant emotions; and this cultural effect is accurately reflected in frequency judgements of emotions.

A second explanation could be that culture influences the encoding of emotion memories. It is possible that a dialectic way of thinking maintains pleasant and unpleasant aspects of emotional experiences, whereas Western styles of thinking attempt to resolve the conflict one way or the other. Hence, initially ambivalent experiences are encoded as either pleasant or unpleasant memories. As a result, correlations between frequency judgements of pleasant and unpleasant emotions would be biased in a negative direction in non-ADP cultures. Finally, it is possible that culture influences the frequency-judgement process. Schimmack et al. (2000) proposed that response formats with vague quantifiers (rarely, often) suggest an internal standard of comparison. For example, frequency judgements of happiness rely on the frequency of sadness as a standard of comparison and vice versa. The use of internal standards moves correlations closer to  $-1.00$ . Participants in non-ADP cultures may be more likely to use internal standards of comparisons and contrast frequencies of opposing emotions with each other. In contrast, Asian dialectic cultures consider

pleasant and unpleasant emotions to be compatible, which renders it less likely that frequencies of sadness are contrasted with frequencies of happiness. Instead, respondents in Asian dialectic cultures could rely on absolute estimates of emotion frequencies or they could rely on social comparisons. These judgement strategies avoid the bias that is introduced by internal standards of comparison. This explanation would imply that the correlations obtained in ADP cultures more accurately reflect the actual correlations between frequencies of pleasant and unpleasant emotions (cf. Schimmack et al., 2000).

Future research needs to examine in detail how culture influences the relation between pleasant and unpleasant emotions. Several methods in emotion research can be used for this purpose. First, researchers can obtain other memory-based measures, such as (a) the latency to recall pleasant and unpleasant emotional experiences, (b) the number of recalled memories within a certain time limit (Schimmack et al., 2000), or (c) conditional probability judgements of emotions (Reisenzein, 1995; Schimmack & Reisenzein, 1997). These measures reveal whether culture influences only frequency judgements or more generally representations of emotions in memory.

Other methods can be used to examine whether culture influences appraisals of emotional situations and emotional experiences (Mauro, Sato, & Tucker, 1992; Mesquita, 2001; Roseman, Dhawan, Rettak, Naidu, & Thapa, 1995). One method relies on ratings of hypothetical scenarios (Reisenzein, 1995; Schimmack & Diener, 1997; Schimmack & Hartmann, 1997). In this task, participants receive descriptions of emotional situations and report their emotional experiences if they were in these situations. Oishi (2000) found that concurrent experiences of happiness and sadness (i.e., mixed feelings) were reported more often by Asian American than European American participants. This finding suggests that culture influences the appraisal of emotional situations. The low frequency of mixed experiences was due to the selection of relatively unambiguous scenarios. Future studies with ambivalent scenarios (e.g., leaving old friends to go to university) should elicit reports of mixed feelings more frequently and should produce stronger cultural differences.

It will also be important to study actual emotional experiences. For this purpose, researchers can use the paired-picture paradigm (Schimmack, 2001; Schimmack, Colcombe, & Crites, 2001). In this paradigm, participants see an appealing and an appalling picture at the same time. If culture influences actual emotional experiences, participants from Eastern cultures should report mixed feelings more often than Western participants. To examine actual emotional experiences in everyday life, researchers can use experience-sampling methods (Oishi, 2000; Schimmack & Diener, 1997; Watson & Clark, 1997). Recent evidence indicates that PE-UE correlations were also weaker in an experience sampling study in Japan (Scollon, Diener, E., Oishi, & Biswas-Diener, 2001).

Finally, it will be important to pinpoint more exactly the nature of the cultural effect. The present study shows clearly that it is more fruitful to examine Asian

cultures than collectivistic cultures in general. Furthermore, there is little evidence that the effect is limited to Chinese cultures that are influenced by Daoism. On the other hand, the only Hindu sample that was clearly influenced by Hinduism rather than Buddhism (i.e., India) revealed a relatively strong negative correlation. This pattern of results suggests that the cultural effect may be related to Buddhism.

## Practical implications

From a practical point of view, the variability across countries was relatively small. This finding provides universal support for the notion that frequencies of pleasant and unpleasant emotions are separate components of subjective well-being. People can reduce the frequency of unpleasant emotions such as anxiety, for example by avoiding risks. This behaviour does not ensure experiences of more pleasant emotions such as pride. On the other hand, the achievement of goals can increase the frequency of pride, but does not necessarily decrease the frequency of anxiety. As a consequence, causal factors can influence the two components differently. Some cultures may promote well-being by emphasising the minimisation of displeasure. For example, some Asian philosophies teach detachment to reduce the consequences of negative life events. Modern western culture appears to promote well-being by emphasising the maximisation of pleasure. Ultimately, well-being entails both minimising displeasure and maximising pleasure. However, for a better understanding of cultural influences on well-being, researchers should use separate measures of pleasant and unpleasant emotions.

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