

Culture, Emotion Regulation, and Adjustment

David Matsumoto
San Francisco State University

Seung Hee Yoo
Yale University

Sanae Nakagawa
San Francisco State University

37 Members of the Multinational Study of Cultural
Display Rules

This article reports differences across 23 countries on 2 processes of emotion regulation—reappraisal and suppression. Cultural dimensions were correlated with country means on both and the relationship between them. Cultures that emphasized the maintenance of social order—that is, those that were long-term oriented and valued embeddedness and hierarchy—tended to have higher scores on suppression, and reappraisal and suppression tended to be positively correlated. In contrast, cultures that minimized the maintenance of social order and valued individual Affective Autonomy and Egalitarianism tended to have lower scores on Suppression, and Reappraisal and Suppression tended to be negatively correlated. Moreover, country-level emotion regulation was significantly correlated with country-level indices of both positive and negative adjustment.

Keywords: culture, emotion regulation, suppression, reappraisal, adjustment

The 37 coauthors of this article, in alphabetical order by last name, are as follows: Jose Alexandre, Unicapital, São Paulo, São Paulo, Brazil; Jeanette Altarriba, Department of Psychology, University at Albany, State University of New York; Ana Maria Anguas-Wong, Department of Psychology, San Francisco State University; Monica Arriola, Department of Psychology, University of Fribourg, Fribourg, Switzerland; Lisa M. Bauer, Department of Psychology, Pepperdine University; Michael Harris Bond, Department of Psychology, Chinese University of Hong Kong, Shatin, China; Rosa Cabecinhas, Department of Psychology, University of Minho, Braga, Portugal; Jeeyoung Chae, Korea Culture and Tourism Policy Institute, Seoul, Korea; Anna Laura Comunian, Department of General Psychology, University of Padua, Padova, Italy; Dawn N. DeGere, Department of Psychology, University of Washington; Luciana de Melo Garcia Bley, Department of Psychology, San Francisco State University; Hung Kit Fok, Department of Psychology, Chinese University of Hong Kong, Shatin, China; Wolfgang Friedlmeier, Department of Psychology, Grand Valley State University; Fabiano Melo Garcia, Open English School, São Bernardo do Campo, São Paulo, Brazil; Anjali Ghosh, Psychology Research Unit, Indian Statistical Institute, Calcutta, India; Juliana V. Granskaya, Department of Psychology, St. Petersburg State University, St. Petersburg, Russia; Elvair Grossi, Fundacao de Santo André, Santo André, São Paulo, Brazil; Renuka Joshi, Department of Psychology, D.A.V. (PG) College, Dehradun, India; Hisako Kakai, School of International Politics, Economics and Business, Aoyama Gakuin University, Tokyo, Japan; Emiko Kashima, School of Psychological Science, La Trobe University, Victoria, Australia; Waheeda Khan, Department of Psychology, Jamia Millia Islamia (Central University), New Delhi, India; Jenny Kurman, Department of Psychology, University of Haifa, Haifa, Israel; Shamsul H. Mahmud, Department of Psychology, University of Dhaka, Dhaka, Bangladesh; Andrew Mogaji, Department of Psychology, University of Lagos, Lagos,

Nigeria; Feggy Ostrosky-Solis, Department of Psychology, National University Mexico, Mexico City, Mexico; Dona Papastylianou, Department of Social Administration, Democritus University of Thrace, Komotini, Greece; Saba Safdar, Department of Psychology, University of Guelph, Guelph, Ontario, Canada; Eri Shigemasu, Department of Law, Yamanashi Gakuin University, Yamanashi, Japan; Erika Spieß, Department of Psychology, Ludwig-Maximilians-University Munich, Munich, Germany; Stanislaw Sterkowicz, Department of Combat Sports, Academy of Physical Education, Krakow, Poland; Piotr Szarota, Department of Psychology, Warsaw School of Social Psychology, Warsaw, Poland; Berta Vishnivetz, Department of Psychology, The National School for Social Workers, Frederiksberg, Denmark; Neharika Vohra, Department of Organizational Behavior, Indian Institute of Management, Ahmedabad, India; Colleen Ward, School of Psychology, Victoria University of Wellington, Wellington, New Zealand; Sowan Wong, Department of Psychology, Brunel University, Uxbridge, United Kingdom; Rongxian Wu, Department of Psychology, Suzhou University, Suzhou, China; Alfred Zengeya, Department of Psychology, Bindura University of Science Education, Bindura, Zimbabwe.

David Matsumoto and Sanae Nakagawa, Department of Psychology, San Francisco State University; Seung Hee Yoo, Department of Psychology, Yale University.

We thank Sholeh I. Miresghhi for her assistance with the compilation of the adjustment data and Marija Drezgic, Shannon Lee Pacaoan, Devon McCabe, Aaron Estrada, and Janice Cheung for their assistance in the general laboratory program.

Correspondence concerning this article should be addressed to David Matsumoto, Department of Psychology, San Francisco State University, 1600 Holloway Avenue, San Francisco, CA 94132. E-mail: dm@sfsu.edu

Emotion regulation has become an important concept in personality and social psychology. It refers to the ability to manage and modify one's emotional reactions in order to achieve goal-directed outcomes. Gross (1998; Gross & John, 2003) identified two aspects of emotion regulation: *Reappraisal*—the way in which individuals construe an emotion-eliciting situation to change its impact on emotional experience—and *Suppression*—the inhibition of emotional expressive behavior. Reappraisal refers to the regulation of emotional experience by changing the contents of one's thoughts after an emotion has been elicited or by re-evaluating the emotion-eliciting stimuli; Suppression refers to regulating emotional expression by controlling or neutralizing emotional behavior.

Gender and ethnic-group differences on emotion regulation (Gross & John, 2003), and a small but growing literature on its interpersonal effects (below), suggest that there are cultural differences on it as well. This article reviews the relevant literature concerning the interpersonal effects of emotion regulation and concerning culture and cultural values. We then provide a theoretical framework based on cultural values to explain cultural variation in emotion regulation and offer evidence for that framework.

The Interpersonal Effects of Emotion Regulation

A number of studies have demonstrated the *intrapersonal* effects of emotion regulation on affect and cognition related to healthy adaptation and adjustment (Gross & Levenson, 1993, 1997; Richards & Gross, 2000). A small but growing literature, however, has begun to demonstrate its *interpersonal* functions as well. Emotion regulation has been found, for instance, to be associated with sympathy and prosocial behaviors (Eisenberg, 2000) and with morally relevant behavior and general social competence (Eisenberg, Fabes, Guthrie, Murphy, & Maszk, 1996). Suppression has been associated with less social closeness and support and avoidant attachments, whereas Reappraisal has been associated with greater sharing of emotions, closer relationships, and greater social support (John & Gross, 2004). Butler et al. (2003) found that Suppression disrupted communication, reduced rapport, and inhibited relationship formation among pairs of unacquainted women who discussed an unsettling topic.

The ability to regulate emotion, both by reappraising the nature of eliciting events and regulating expressive behavior, therefore, is learned within a developmental context, such as family situations and relationships (Bell & Calkins, 2000; Miller, McDonough, Rosenblum, & Sameroff, 2002; Volling, McElwain, & Miller, 2002), and is crucial to successful social interactions and social competence (Bell & Calkins, 2000) and the maintenance and regulation of interpersonal relationships. This makes sense because emotions themselves serve as motivators of behavior and have important social functions, such as informing others of one's internal states and intentions, evoking responses in others, and providing incentives for other's behaviors (Keltner, Ekman, Gonzaga, & Beer, 2003).

Culture and Cultural Values

Human social life is complex. Individuals are members of multiple groups, with multiple social roles, norms, and expecta-

tions, and people move rapidly in and out of the multiple groups of which they are members. This creates the enormous potential for social chaos, which can easily occur if individuals are not coordinated well and relationships not organized systematically.

One of the important functions of culture is to provide this necessary coordination and organization. Doing so allows individuals and groups to negotiate the social complexity of human social life, thereby maintaining social order and preventing social chaos. Culture does this by providing a meaning and information system to its members, which is shared by a group and transmitted across generations, that allows the group to meet basic needs of survival, pursue happiness and well-being, and derive meaning from life (Matsumoto, 2007a).

Cultural transmission of the meaning and information system to its members is, therefore, a crucially important aspect of culture. One of the ways in which this transmission occurs is through the development of values, which are guiding principles that refer to desirable goals that motivate behavior (Rokeach, 1973; Schwartz, 2006). They also serve as important benchmarks with which to evaluate individual and group behavior.

Although culture facilitates the development of values related to all aspects of life, two types of values are especially pertinent to an understanding of emotion regulation—values related to interpersonal relationships and to emotions themselves. The former provide guidelines for preferred modes of relationship styles. One interpersonal problem that all groups need to solve, for example, concerns the relationship between the individual and the ingroup. Cultures can be differentiated according to the values they facilitate in order to solve problems concerning this relationship; in the literature, this value orientation is known as Individualism versus Collectivism (Hofstede, 1980; Triandis, Bontempo, Villareal, Asai, & Lucca, 1988) or Embeddedness versus Autonomy (Schwartz, 2004). Four attributes define this value orientation: self, goals, relationship, and determinants of behavior (Triandis, 1995). Individualistic cultures tend to foster the development of independent construals of self, whereas collectivistic cultures tend to foster interdependent selves (Markus & Kitayama, 1991). Individualistic cultures foster personal goals over ingroup goals, whereas collectivistic cultures foster ingroup goals (Yamaguchi, 1994). They foster rationality and interpersonal exchange, whereas collectivistic cultures encourage relatedness and communal relationships (Kim, Triandis, Kagitcibasi, Choi, & Yoon, 1994). And attitudes and emotions are relatively more important determinants of behavior in individualistic cultures, whereas norms are relatively more important in collectivistic cultures (Suh, Diener, Oishi, & Triandis, 1998).

Another interpersonal problem that cultures need to solve concerns relationships among people in a hierarchy. The cultural value orientation that addresses this fundamental social problem is known as Power Distance (Hofstede, 1980) or Egalitarianism versus Hierarchy (Schwartz, 2004). Cultures high on Power Distance or Hierarchy tend to afford higher-status individuals with more power and accept the unequal distribution of power within society (Hofstede, 1980). These cultures discourage assertiveness and encourage self-regulation when interacting with people of higher status (Matsumoto, 2007b). Cultures low on Power Distance or high on Egalitarianism tend to minimize power and status differentials among individuals and attempt to distribute power and status more evenly within society. They tend to encourage

assertiveness and discourage self-regulation when interacting with people of higher status (Matsumoto, 2007b).

Values related to emotions provide guidelines for desirable emotions that facilitate norms for emotion regulation and interpersonal relationships. Tsai, Knutson, and Fung (2006) recently showed that cultures were more closely associated with ideal rather than real affect, which is consonant with our notion of cultural values related to emotions. Three cultural value orientations relate directly to emotions. Uncertainty Avoidance refers to the degree to which people feel threatened by the unknown or ambiguous situations and have developed beliefs, institutions, or rituals to avoid them (Hofstede, 1980). Cultures high on this value orientation are associated with greater levels of anxiety among its members from unknown or ambiguous situations and develop more institutions and rules to deal with this anxiety. Long- versus Short-Term Orientation refers to the degree to which cultures encourage delayed gratification of material, social, and emotional needs among its members (Hofstede, 2001). Cultures high on this value orientation take a long-term perspective to relationships and, thus, are more likely to regulate emotional reactions to preserve the possibility of future good relationships. Affective Autonomy refers to the degree to which cultures emphasize the promotion and protection of people's independent pursuit of positive experiences. It includes pleasure and an exciting or varied life (Schwartz, 2004).¹

Cultural Values and Emotion Regulation Norms and Dynamics

Because one of the major functions of culture is to maintain social order, cultures create rules, guidelines, and norms concerning emotion regulation because emotions serve as primary motivators of behavior and have important social functions (Keltner et al., 2003). Previous studies, in fact, have documented a number of cultural differences in processes related to emotion regulation, such as emotion-related appraisals (Matsumoto, Kudoh, Scherer, & Wallbott, 1988; Mauro, Sato, & Tucker, 1992; Roseman, Dhanwan, Rettek, & Naidu, 1995; Scherer, 1997a, 1997b); coping, which is related to Reappraisal (Morling, Kitayama, & Miyamoto, 2003; Taylor, Sherman, Kim, Jarcho, & Takagi, 2004; Tweed, White, & Lehman, 2004; Yeh & Inose, 2002); and display rules, which are related to Suppression (Matsumoto, 1990, 1993; Matsumoto, Takeuchi, Andayani, Kouznetsova, & Krupp, 1998; Matsumoto, Yoo, Hirayama, & Petrova, 2005).

Cultural value orientations concerning interpersonal relationships and emotions help to create and enforce norms concerning emotion regulation, and norms concerning emotion regulation in all cultures serve the purpose of maintaining social order (Figure 1). Cultural differences in value orientations, therefore, should be associated with differences in mean levels of emotion-regulation norms. Individualism, Egalitarianism, and Affective Autonomy, for instance, should be associated with more Reappraisal and less Suppression because these cultures value emotions more and encourage their freer and open expression.² Cultures high on Power Distance, Embeddedness, and Hierarchy, however, should be associated with less Reappraisal and more Suppression because these cultures value emotions less and require individual-level Suppression for the maintenance of ingroup cohesion and harmony. Cultures high

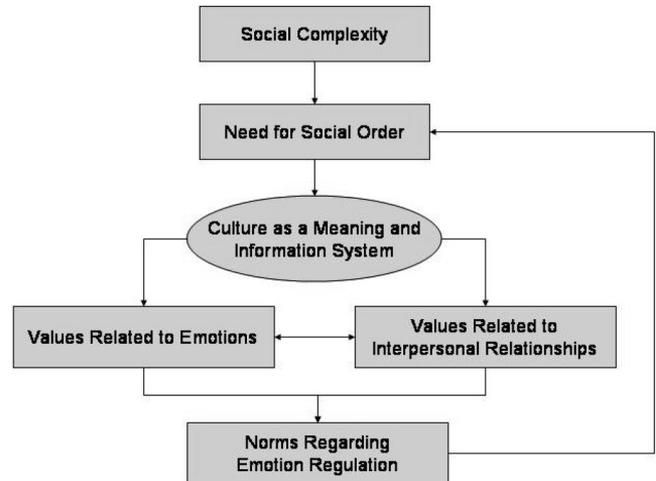


Figure 1. A functional view of the relationship between cultural value orientations and emotion regulation.

on Uncertainty Avoidance and Long- versus Short-Term Orientation should be associated with less Reappraisal and more Suppression because these cultures generally regard emotions as dangerous and threatening to a longer-term perspective on interpersonal relationships. These cultural differences in emotion regulation norms should serve the function of maintaining social order in a culturally appropriate fashion.

Cultures can differ not only in the strength of the norms (evidenced by means) but they can also facilitate different

¹ These perspectives of culture are not mutually exclusive of each other. Individualism, for instance, refers to a constellation of qualities that involve values related to Autonomy and Egalitarianism. Power Distance involves values related to the primacy of ingroups, the maintenance of hierarchies, situational beliefs, and long-term time perspectives. These links have been supported by country-level correlations; Hofstede's (2001) Individualism is positively correlated with Schwartz's Affective and Intellectual Autonomy and Egalitarianism (Schwartz, 2004). Power Distance is positively correlated with Long-Term Orientation, Embeddedness, and Hierarchy (Schwartz, 2004). And Individualism, Affective and Intellectual Autonomy, and Egalitarianism tend to be negatively correlated with Power Distance, Long-Term Orientation, Embeddedness, and Hierarchy.

At the same time, there are important differences among the dimensions. Individualism, for instance, refers to the relationships between individuals and ingroups, whereas Power Distance refers to the differentiation of power and status within groups. (Although Hofstede, 2001, reported a strong, negative correlation between Individualism and Power Distance, they were orthogonal when country-level Gross National Product was controlled.) The same distinction can be made concerning Hierarchy and Embeddedness. Although these dimensions are conceptually and empirically related to each other, they reflect different conceptualizations about the psychological contents of culture. Thus, in this study we analyzed data separately for each of the cultural dimensions introduced above. Another reason for doing that is because there is not perfect overlap in the cultural data for all countries in this study. These missing data pose problems for attempts to reduce the number of dimensions.

² This prediction is based on the idea that Reappraisal focuses on a cognitive restructuring of the emotion-eliciting event (Gross & John, 2003), not the emotion itself. Reappraising events, therefore, should facilitate further emotional responses.

functional relationships between them. In Gross and John's (Gross & John, 2003; John & Gross, 2004) research, Reappraisal and Suppression were orthogonal factors in American students. This may or may not be the case in other cultures. There is ample theoretical reason to believe so. Suppression and Reappraisal are two (of many possible) strategies that individuals may engage in in order to regulate emotions. For instance, on the individual level, it may be that Suppression, at least initially, may provide individuals with the time to reappraise the events that elicited emotion in the first place and to evaluate the "proper" response, given the cultural meaning of the particular context in which the emotion is elicited. Alternatively, it could very well be that Reappraisal occurs first, thus driving Suppression. Clearly a correlation between these two variables cannot determine causal paths. But Suppression may be positively associated with Reappraisal in cultures with a greater need to maintain social order; these would include cultures high on Power Distance, Embeddedness, Hierarchy, Uncertainty Avoidance, and Long-Term Orientation. A positive relationship may also suggest greater overall need for emotion regulation as a whole. The relationship between Reappraisal and Suppression may be lower or even negative in cultures high on Individualism, Egalitarianism, or Affective Autonomy. In these contexts, reappraising emotion-eliciting situations should lead to greater expression, congruent with cultural norms related to the importance and expression of emotion. Thus, cultures high on Individualism, Affective Autonomy, and Egalitarianism should be associated with a negative relationship between reappraisal and suppression. This relationship may also be indicative of these cultures' overall needs to regulate emotions less.

Culture, Emotion Regulation, and Adjustment

Emotion regulation has been linked to many different types of adjustment. Gross and John (2003), for example, demonstrated that individuals high in Reappraisal and low in Suppression experienced more positive and less negative emotions, shared emotions more with others, were more well-liked, had better social support, had lower scores on depression, and higher scores on happiness, life satisfaction, self-esteem, optimism, and well-being. Experimental studies have also highlighted the particular importance of Suppression (Butler et al., 2003). Essentially, Reappraisal has been associated with positive outcomes, whereas Suppression has been associated with negative outcomes (John & Gross, 2004).

Emotion regulation also contributes to intercultural adjustment (Matsumoto et al., 2001, 2003; Matsumoto, LeRoux, Bernhard, & Gray, 2004). Immigrants (those who immigrate to another culture permanently) and sojourners (temporary migrants who intend to return to their home culture) with better emotion regulation experience less depression, anxiety, culture shock, and homesickness, and report higher levels of happiness, well-being, marital satisfaction in international marriages, language proficiency, and income. Emotion regulation can predict adjustment concurrently and in the future, before traveling abroad (Matsumoto et al., 2003) and after sojourners have been in a host country for an extended period of time (Yoo, Matsumoto, & LeRoux, 2006).

On the country level, Individualism has been found to be positively related to well-being, and Power Distance negatively related (Diener, Diener, & Diener, 1995), suggesting that cultures more heavily invested in the maintenance of social order are associated with lower aggregate adjustment, whereas cultures that value individual emotions more are associated with higher adjustment. If the individual-level relationships between emotion regulation and adjustment described immediately above occur on the country level as well, we would predict that countries with higher emotion regulation should be associated with higher indices of positive adjustment (e.g., well-being, life satisfaction) and lower indices of maladjustment (e.g., depression, anxiety). In this study, we include measures of both positive and negative adjustment on the country level to test this hypothesis.

Overview of the Current Study

Respondents in 23 countries completed the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003). These data allowed us to test the following specific hypotheses regarding Reappraisal and Suppression.

Hypothesis 1: Reappraisal should be (a) positively correlated with Individualism, Egalitarianism, and Affective Autonomy, and (b) negatively correlated with Power Distance, Hierarchy, Embeddedness, Long-Term Orientation, and Uncertainty Avoidance.

Hypothesis 2: Suppression should be (a) positively correlated with Power Distance, Long-Term Orientation, Embeddedness, Hierarchy, and Uncertainty Avoidance, and (b) negatively correlated with Individualism, Affective Autonomy, and Egalitarianism.

Hypothesis 3: The relationship between Reappraisal and Suppression should be (a) positively correlated with Power Distance, Long-Term Orientation, Embeddedness, Hierarchy, and Uncertainty Avoidance, and (b) negatively correlated with Individualism, Affective Autonomy, and Egalitarianism.

Hypothesis 4: Country differences on (a) Reappraisal should be positively correlated with positive adjustment and negatively correlated with maladjustment indices, whereas (b) Suppression should be negatively correlated with positive adjustment and positively correlated with maladjustment.

Method

Participants

The initial sample included 3,386 university students from 23 countries who were recruited by each of the collaborators in their respective countries. All participated voluntarily or in partial fulfillment of class requirements. The sample was limited to only those individuals who were born and raised in their respective countries, which resulted in a final sample of 3,018 respondents from 23 countries on 5 continents (Table 1). The final sample was 57.6% women, 42.3% men; mean age = 22.91 years; 76.5% were single; 2.9% were Buddhist, 38.4% were Christian, 7.7% were Hindu, and 4% were Muslim (others unspecified). They repre-

Table 1
Sample Characteristics, Descriptive Statistics for the Emotion Regulation Questionnaire, Alphas, and Correlations Between Reappraisal and Suppression

| Country | N | | | Age | | Reappraisal | | | Suppression | | | r |
|--------------------|-------|-------|-----|---------------|-------|-------------|------|----------|-------------|------|----------|-------|
| | Total | Women | Men | M | SD | M | SD | α | M | SD | α | |
| Australia | 112 | 91 | 21 | 22.80 | 7.84 | 4.58 | 0.99 | .83 | 3.39 | 1.17 | .76 | -.07 |
| Bangladesh | 96 | 44 | 52 | 23.65 | 1.88 | 5.03 | 1.04 | .54 | 4.29 | 1.20 | .46 | .04 |
| Brazil | 115 | 54 | 61 | 24.21 | 5.84 | 4.81 | 1.00 | .56 | 3.28 | 1.23 | .56 | -.01 |
| Canada | 121 | 63 | 58 | 19.17 | 1.46 | 4.88 | 0.81 | .72 | 3.15 | 0.98 | .65 | -.04 |
| China ^a | 83 | 43 | 38 | 21.01 | 0.99 | 4.80 | 0.97 | .64 | 3.80 | 1.10 | .50 | .01 |
| Denmark | 46 | 36 | 10 | 31.43 | 10.43 | 4.91 | 1.12 | .76 | 3.16 | 1.06 | .64 | .10 |
| Germany | 110 | 65 | 45 | 23.93 | 3.69 | 4.48 | 1.01 | .68 | 3.53 | 1.05 | .72 | .08 |
| Greece | 85 | 70 | 15 | 20.59 | 1.67 | 4.79 | 0.97 | .74 | 3.34 | 0.98 | .45 | -.01 |
| Hong Kong | 102 | 53 | 49 | Not available | | 4.59 | 1.10 | .91 | 4.72 | 1.15 | .86 | .90** |
| India | 246 | 132 | 114 | 21.79 | 2.79 | 4.60 | 1.06 | .58 | 4.10 | 1.70 | .35 | .15* |
| Israel | 67 | 33 | 34 | 23.58 | 2.94 | 4.91 | 1.18 | .84 | 3.41 | 1.24 | .74 | .07 |
| Italy | 107 | 54 | 53 | 23.97 | 2.49 | 4.48 | 1.27 | .83 | 3.19 | 1.18 | .68 | .09 |
| Japan | 277 | 125 | 152 | 20.33 | 2.98 | 4.63 | 1.07 | .75 | 3.96 | 1.16 | .65 | .13* |
| Korea | 153 | 65 | 88 | 21.27 | 2.43 | 4.63 | 0.80 | .69 | 3.84 | 0.98 | .63 | .12 |
| Mexico | 231 | 164 | 67 | 30.23 | 13.29 | 4.48 | 1.29 | .80 | 3.85 | 1.41 | .69 | -.14* |
| New Zealand | 90 | 48 | 42 | 19.40 | 2.39 | 4.76 | 0.90 | .67 | 3.71 | 1.05 | .61 | -.08 |
| Nigeria | 73 | 37 | 36 | 22.16 | 2.88 | 4.80 | 1.30 | .69 | 4.20 | 1.22 | .40 | .29** |
| Poland | 162 | 91 | 71 | 26.30 | 6.45 | 3.24 | 1.00 | .70 | 4.40 | 1.37 | .71 | -.17* |
| Portugal | 120 | 55 | 65 | 20.29 | 3.69 | 4.24 | 1.06 | .65 | 3.17 | 1.14 | .60 | .12 |
| Russia | 38 | 34 | 4 | 22.97 | 4.37 | 4.55 | 1.06 | .75 | 3.90 | 0.92 | .57 | .09 |
| Switzerland | 64 | 44 | 20 | 22.22 | 5.84 | 4.58 | 0.91 | .66 | 3.05 | 1.21 | .75 | -.12 |
| U.S. | 458 | 292 | 166 | 22.32 | 5.95 | 4.77 | 0.98 | .77 | 3.27 | 1.19 | .74 | .14** |
| Zimbabwe | 61 | 33 | 28 | 23.95 | 4.21 | 4.58 | 1.03 | .63 | 3.56 | 1.10 | .40 | .02 |

^aTwo participants did not provide their gender.

* $p < .05$. ** $p < .01$, all one-tailed.

sented 32 language groups, with 47.7% reporting proficiency in at least one other language. Additionally, 47.8% self-classified their economic backgrounds in the middle income range, as defined within their national context.³

Instruments and Procedures

The ERQ was used to assess emotion regulation. It has high temporal and internal reliability and convergent and discriminant validity in the United States (Gross & John, 2003). Participants rated the 10 items using a 7-point scale anchored at 1 (*strongly disagree*) and 7 (*strongly agree*). In addition, the Display Rule Assessment Inventory (Matsumoto et al., 1998, 2005, 2008) and a brief questionnaire about relationship quality were also administered. These measures were not directly related to this article, and no further mention of them will be made.

Collaborators in each country managed the translation of the measures and data collection in their country into the official language of their country. For countries that had multiple official languages, collaborators decided which of them to use, given the languages dominant in their particular samples and area. (For example, the Canadian data were obtained in the English-predominant part of this country.) This limitation should be taken into account when interpreting the data. Translation accuracy was verified using a committee consensus approach (van de Vijver, 2001), in which each collaborator worked with a team of other native language-proficient assistants to translate the original English version of the ERQ. This work was done in close collabora-

tion with the home research team in the United States, who provided clarification into the meanings of the items when requested. Each collaborator ensured minor modifications necessary

³The countries included were determined by convenience sampling, and not surprisingly, across them the samples were confounded by a number of demographic characteristics, including gender, age, ethnicity, and languages. We examined whether some of these characteristics were associated with the dependent variables in two ways. First, we computed within-country correlations between gender, age, years living in the birthplace, years living in the place of upbringing, and self-reported income with Reappraisal and Suppression on the individual-level data. Respectively, 13, 9, 3, 3, and 3 of the 46 (23 countries \times 2 variables) effects were significant. These findings suggested that within-country differences on gender and age may have confounded the country means used in the country-level analyses reported in this article. Thus, we computed the country means on Reappraisal and Suppression, adjusting for the within-country correlations between these variables and gender and age (using an analysis of covariance) and recomputed all analyses below utilizing the adjusted means. The findings were exactly the same as those reported here using raw means and suggested that these within-country differences could not account for the country-level findings reported.

Second, we computed country-level correlations between the country means on Reappraisal and Suppression with each country's percentage of women, single individuals, Christians, individuals supported by their families, psychology majors, and country means on age, years living in the place of birth, self-reported economic background, number of hours worked per week, and self-reported annual income. None of the correlations was significant, indicating that, despite the differences across the samples in these demographic variables, these demographic differences did not confound the country-level results reported in this article.

for local dialect issues in their country. Data collection did not occur until all collaborators were satisfied that they had produced a linguistically equivalent version of the instrument.

The procedures were the same in all countries. Participants were provided with one of eight versions of the Display Rule Assessment Inventory, the relationship quality measure, and the ERQ in their native language, in random order. Participants were instructed to complete the instruments in class or return them within 1 week. Collaborators either entered their data according to a standardized format or sent the raw data to the home research team in San Francisco, California, for processing.

Scoring the ERQ

Two scales are typically scored: Reappraisal (6 items) and Suppression (4 items). Because the ERQ was developed in the United States, it was important to establish the structural equivalence of the instrument across the countries sampled. This was done in several ways. First, we computed a confirmatory factor analysis on the entire data set, fitting the 10 items to the two scales. This produced a significant fit, $\chi^2(43, N = 3,018) = 55.96, p < .01$, but other indices of relative fit indicated support for the two-factor model: CMIN/df (relative chi-square representing the minimum sample discrepancy divided by the degrees of freedom) = 2.54, Tucker-Lewis Index = .990, comparative fit index = .995, and the root-mean-square error of approximation = .021.

Second, we computed a multigroup confirmatory factor analysis across all countries using AMOS 5.0. A totally unconstrained model produced a significant fit, $\chi^2(1359, N = 3,108) = 6518.15, p < .01$. But other indices indicated acceptable fit across countries: CMIN/df = 4.80, root-mean-square error of approximation = .035. A constrained model produced similar fit.

Third, there is debate concerning whether confirmatory factor analysis would be the preferred procedure in the case of our data because its results are typically misinterpreted to support one structural solution over all others and because replicating a structure through successive unconstrained exploratory procedures may be stronger evidence of structure than an unreplicated constrained confirmatory procedure would be. Poor fit in confirmatory factor analysis can occur because of reasons not related to the cross-cultural structural equivalence in a measure, especially when analyzing item-level data, including differences in properties of distributions (normality, kurtosis, skew). Thus, we computed an exploratory factor analysis on the 10 ERQ items across the entire sample. The exploratory factor analysis extracted two factors using the Kaiser criterion that accounted for 48.99% of the total variance. Normal varimax rotation indicated that the six items for Reappraisal loaded on Factor 1, and the four items for Suppression loaded on Factor 2. Exploratory factor analyses computed separately for each country also produced the two-factor model, with the lone exception of Hong Kong, which produced a single factor.

We thus interpreted the two-factor structure to be stable across countries and created scores for Reappraisal and Suppression, averaging the items loading on them. Alphas for both scales across the entire sample were acceptable (.75 and .68, respectively). Alphas computed separately for each country resulted in generally acceptable values for both scales across all countries (Table 1). Alphas for Suppression tended to be lower, but this may have been

because of fewer items.⁴ These analyses provided evidence for the structural equivalence of the measure across the countries in the sample.

Culture Data

Data on the Hofstede dimensions (i.e., Individualism, Power Distance, Long-Term Orientation, and Uncertainty Avoidance) came from Hofstede (2001). There are index and rank data on the original four dimensions from 50 countries and 3 regions; data on Long-Term Orientation exist in 29 countries and 2 regions. Additionally, index-score estimates for another 16 countries were available (those were used for China and Poland). Data were available for 21 countries in this study for the original four Hofstede dimensions and for 17 countries for Long- versus Short-Term Orientation.⁵

Data on the Schwartz values (i.e., Egalitarianism, Affective Autonomy, Hierarchy, and Embeddedness) came from Schwartz and Ros's (1995) study of the values of school teachers of 46 cultural groups in 42 nations and college student samples in 41 cultural groups in 40 nations. Data were available for 15 countries in this study.⁶ Country means on the value types were used.

Adjustment Data

Positive adjustment—happiness. There have been several large scale surveys of happiness around the world, using a variety of measures. These include Diener et al.'s (1995) measure of subjective well-being, the World Values Survey happiness index (World Values Survey Group, 1994), Inglehart's (1998) measure of subjective well-being, Bradburn's Positive and Negative Affect Scale (Bradburn, 1969; MacIntosh, 1998), Veenhoven's (1993) measure of subjective appreciation of life, and Veenhoven's (2000b) *World Database of Happiness*. We utilized nine measures of happiness: the standardized mean of the World Values Survey II Life Satisfaction data and Veenhoven's happiness index reported by Diener and Oishi (2000; 15 countries); two overall measures of happiness reported by Diener et al., (1995; 19 and 15 countries); three measures (happiness, life satisfaction, and subjective well-being) reported by Inglehart and Klingeman (2000; 18 countries); and three measures (happiness, opportunity, and capability) reported by Veenhoven (2000a; 19 countries).

Maladjustment. We compiled data on incidence rates of depression (lifetime and 12 months, 10 and 12 countries, respectively) and anxiety disorders (overall anxiety disorders for 12 months and impulse control disorders for 12 months, in 9 and 8 countries, respectively) from multiple sources (Andrade et al., 2003; Angst, 1995; Bijl et al., 2003; Chan, 1993; Chiu, 2004; Lee

⁴ Lower reliabilities would tend to reduce correlations. In fact, Suppression produced many of the strongest findings reported below. Correcting for the unreliability in the measurement of Suppression would result in even stronger findings than those reported.

⁵ Hofstede (2001) reported data only for a combined mean of "East Africa," which was used for Zimbabwe.

⁶ Schwartz and Ros (1995) only reported the combined mean for Canada, Australia, and New Zealand. They also only reported combined means for East Asian countries, which were used for Hong Kong, Japan, China, and India.

et al., 2004). Country rates of suicide (20 countries), alcohol consumption (20 countries), and average pain felt (17 countries) were obtained from the World Health Organization (2005). Data on tobacco use (22 countries) came from Corrao, Guindon, Sharma, and Shokoohi (2000). Data on overall crime rates (20 countries); drug abuse of opiates, cocaine, cannabis, amphetamines, and ecstasy (22, 16, 22, 20, and 15 countries, respectively); and unemployment (21 countries) were obtained from reports by the United Nations (UNESCO Institute for Statistics, 2004; United Nations Office on Drugs and Crime, 2005; United Nations, Statistics Division, 2005).

There are advantages and disadvantages to the compilation and analysis of country-level data collected at different times by different authors. On one hand, because of the lack of coordination in data collection procedures, there is always the possibility that data for one construct obtained at one time by one researcher could be inconsistent with data for another construct. Also, country-level psychological variables change across time (Matsumoto, 2002), sometimes drastically because of political or economic changes (e.g., Hong Kong, Russia). On the other hand, country-level data are relatively stable across time (Hofstede, 2001), and much of the country-level data, despite being obtained by different researchers at different time periods, are generally correlated with each other. Nevertheless, the findings reported below, as well as those from many other studies using the same country-level data sets (e.g., Bond et al., 2004; Hofstede, 2001; McCrae et al., 2005; Schwartz, 2004), should be interpreted with the caveat that they may have been derived using some culture scores that may not accurately reflect cultural value orientations associated with the same time period as the emotion regulation assessment.

Results

Preliminary Analyses

We computed two-way analyses of variance on Reappraisal and Suppression using country and gender as factors. For Reappraisal,

the country main effect was significant, $F(22, 2969) = 15.83, p < .001, \eta_p^2 = .11$. The gender main effect was also significant, $F(1, 2969) = 6.96, p < .01, \eta_p^2 = .002$, but the effect size was negligible ($M_s = 4.76$ and 4.54 for women and men, respectively). The Country \times Gender interaction was not significant. On Suppression, the analysis of variance produced a significant country main effect, $F(22, 2969) = 18.14, p < .001, \eta_p^2 = .12$. The gender main effect ($M_s = 3.55$ and 3.82 for women and men, respectively) and the Country \times Gender interaction were also significant, $F(1, 2969) = 24.64, p < .001, \eta_p^2 = .008$, and $F(22, 2969) = 3.02, p < .001, \eta_p^2 = .02$, respectively, but their effect sizes were negligible. Means for each country are provided in Table 1.

We computed within-country correlations between Reappraisal and Suppression, which were germane to Hypothesis 3 (Table 1). The within-country correlation pooled across all countries was near zero (.076). But seven correlations were statistically significant (chance would predict one would be significant), and there were substantial country differences. In Mexico and Poland, the correlation was weak and negative, indicating that individuals who reappraised more suppressed less. In India, Japan, the United States, and Nigeria, the relationship was weak to moderate and positive, indicating that individuals who reappraised more also suppressed more. In Hong Kong, the correlation was very high and positive, indicating that Reappraisal was typically associated with Suppression. For the other countries, there was no relationship. These findings suggest that the two variables functioned differently in the different countries.

Hypotheses 1 and 2: Country-Level Relationships Between Emotion Regulation and Culture

We computed correlations between the ERQ means and the culture data (Table 2). As predicted, Reappraisal was negatively correlated with Uncertainty Avoidance and marginally negatively correlated with Power Distance. None of the other effects for Reappraisal, however, was significant, indicating only very modest

Table 2
Country-Level Correlations Between the Emotion Regulation Questionnaire Scores and Cultural Dimensions

| Cultural dimension | N | Reappraisal M | Suppression M | r between Reappraisal and Suppression |
|------------------------------------|----|-------------------|------------------|--|
| Interpersonal values | | | | |
| Power Distance | 22 | -.28 [†] | .55** | .18 |
| Embeddedness | 15 | .18 | .71** | .48* |
| Hierarchy | 15 | .20 | .69** | .34 |
| Individualism/collectivism | 22 | .01 | -.48** | -.33 [†] |
| Egalitarianism | 15 | -.26 | -.74** | -.33 |
| Emotion-related values | | | | |
| Uncertainty Avoidance | 22 | -.38* | -.08 | -.32 [†] |
| Long- vs. Short-Term Orientation | 18 | .17 | .40* | .40* |
| Affective Autonomy | 15 | .19 | -.64** | -.52* |
| Cultural values with no prediction | | | | |
| Masculinity/femininity | 22 | -.17 | .19 | -.12 |
| Intellectual Autonomy | 15 | -.22 | -.35 | -.25 |
| Mastery | 15 | .09 | .24 | .02 |
| Harmony | 15 | -.38 | -.27 | -.12 |

[†] $p < .10$. * $p < .05$. ** $p < .01$, all one-tailed.

support for Hypothesis 1. Suppression was positively correlated with Power Distance, Embeddedness, Hierarchy, and Long-Term Orientation and negatively correlated with Individualism, Affective Autonomy, and Egalitarianism. These findings provided strong support for Hypothesis 2.

For comparison purposes, we also computed the correlation between the ERQ means and the other Hofstede and Schwartz cultural value dimensions for which we had no theoretical prediction. Interestingly, none of them was significant (Table 2).

To control for the intercorrelations among the cultural dimensions, we computed stepwise regressions separately for the Hofstede and Schwartz data. (It was impossible to merge all the data because of the small sample sizes and different countries on which the respective data existed.) The results were similar to those involving zero-order correlations. Reappraisal was correlated with Uncertainty Avoidance; Suppression was correlated with Power Distance and Egalitarianism (Table 3).

Hypothesis 3: Cultural Differences in the Relationship Between Reappraisal and Suppression

To examine Hypothesis 3, we first correlated each of the culture dimensions with the correlations between Reappraisal and Suppression (Table 2). As predicted, Long-Term Orientation and Embeddedness were positively correlated with this relationship, and Affective Autonomy was negatively correlated. The same dimensions emerged in regression analyses (Table 3). These findings were also obtained when Hong Kong was dropped from the analysis because of its extremely high correlation between Reappraisal and Suppression.

Hypothesis 4: Country-Level Relationships Between Emotion Regulation and Adjustment

We first computed zero-order correlations between the ERQ means and the various adjustment indices (Table 4). As predicted, Suppression was negatively correlated with 9 of the 10 happiness variables, indicating that countries with higher mean Suppression had significantly lower means on citizen happiness. Moreover, the same pattern of findings was obtained when Egalitarianism was controlled (this dimension was partialled because it was signifi-

cantly correlated with Suppression). Reappraisal was not associated with happiness.

The findings for maladjustment were contrary to prediction. Suppression was negatively correlated with depression and anxiety disorders, crime, alcohol consumption, female tobacco use, and abuse of cocaine and cannabis. Moreover, many of these correlations survived when Egalitarianism was partialled. These results indicate that countries with more Suppression tend to have *lower* rates of citizen maladjustment (Table 4).

Why would countries with higher means on Suppression have lower rates of maladjustment *and* happiness? Part of the answer lies in the fact that happiness levels and maladjustment may be positively correlated on the country level. To test this notion, we correlated three of the happiness indices with each of the maladjustment variables that were correlated with Suppression (Table 5). The correlations were positive: Countries with higher rates of citizen happiness also had higher rates of depression, anxiety disorders, crime, female tobacco use, and cocaine and cannabis drug abuse.

Discussion

Cultural values were related to country differences on Reappraisal, Suppression, and the relationship between them, and country-level emotion regulation was correlated with multiple indices of country-level adjustment. The findings provided evidence in support of the theoretical model proposed earlier, in which we posited that one of the functions of culture is to create and maintain social order by creating value systems that facilitate norms for regulating emotions. Consonant with this model, values related to interpersonal relationships, especially Egalitarianism, Embeddedness, and Hierarchy, were highly correlated with norms concerning suppression. This suggested that cultures that value the facilitation of status and power differentials, demand greater social order, and emphasize the maintenance of the status quo, propriety, and restraint of actions or inclinations that might disrupt the solidarity of the group or the traditional order, were associated with higher means on suppression. In these cultures, suppression of emotional responses may be necessary in order to allow individuals to consider the most appropriate manner of emotional responding given the social context. That the relationship between

Table 3
Results of Stepwise Regressions of Culture Predicting Emotion Regulation

| Dependent variable and culture dimension | Final <i>R</i> | Significant predictors | β |
|---|----------------|------------------------|----------|
| Reappraisal | | | |
| Hofstede (2001) | .56* | Uncertainty Avoidance | -0.56* |
| Schwartz (1995) | N/A | None | N/A |
| Suppression | | | |
| Hofstede (2001) | .57** | Power Distance | 0.57** |
| Schwartz (1995) | .81*** | Egalitarianism | -1.07*** |
| Correlation between Reappraisal and Suppression | | | |
| Hofstede (2001) | .41* | Long-Term Orientation | 0.41* |
| Schwartz (1995) | .52* | Affective Autonomy | -0.52* |

* $p < .05$. ** $p < .01$. *** $p < .001$, all one-tailed.

Table 4
Country-Level Correlations Between Emotion Regulation and Adjustment

| Adjustment variable | N | Reappraisal | Suppression | Suppression controlling for Egalitarianism |
|---------------------------------------|----|-------------------|-------------------|--|
| Depression | | | | |
| Lifetime | 10 | .021 | -.723** | -.375 |
| 12 months | 12 | -.197 | -.560* | -.287 |
| Pain | 17 | .332 [†] | -.104 | |
| Anxiety disorders–12 months | 9 | .257 | -.691* | -.974*** |
| Impulse control–12 months | 8 | .346 | -.373 | |
| Crime rates | 20 | .160 | -.442* | -.048 |
| Suicide | | | | |
| Men | 20 | -.125 | .212 | |
| Women | 20 | .153 | .345 [†] | |
| Alcohol consumption | 20 | -.194 | -.465* | .402 [†] |
| Tobacco use | | | | |
| Men | 22 | -.070 | .163 | |
| Women | 22 | .035 | -.578** | -.108 |
| Drug abuse | | | | |
| Opiates | 22 | .008 | -.141 | |
| Cocaine | 16 | .321 | -.490* | -.895*** |
| Cannabis | 22 | .225 | -.381* | -.137 |
| Amphetamines | 20 | .155 | -.153 | |
| Ecstasy | 15 | .270 | -.270 | |
| Unemployment rates | 21 | -.675*** | .145 | |
| Happiness | | | | |
| Subjective well-being | 15 | .189 | -.651** | -.471 [†] |
| Diener et al. (1995) measures | | | | |
| Subjective well-being | 19 | .234 | -.589** | -.430 [†] |
| Last national survey | 15 | .398 [†] | -.570* | -.590* |
| Inglehart & Klingeman (2000) measures | | | | |
| Happiness | 18 | .125 | -.251 | -.300 |
| Life satisfaction | 18 | .227 | -.620** | -.318 |
| Subjective well-being | 18 | .197 | -.497* | -.337 |
| Veenhoven (2000a) measures | | | | |
| Happiness | 19 | .121 | -.473* | -.298 |
| Opportunity | 17 | .117 | -.706** | -.590* |
| Capability | 19 | .059 | -.632** | -.503* |
| Sum of Veenhoven measures | 19 | .173 | -.449* | -.327 |

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$, all one-tailed.

Reappraisal and Suppression was positively correlated with Long-Term Orientation, Embeddedness, and Affective Autonomy is also supportive of this interpretation. We conjecture that an initial suppression→reappraisal link in these cultures allows individuals

to select the “proper” emotion to express (or simulate) in order to preserve social order. Suppression may also be necessary as a cultural norm so that emotions do not disrupt interpersonal relationships and social bonds.

Table 5
Correlations Between Selected Happiness Variables and Maladjustment Variables Correlated With Suppression

| Maladjustment variable | Subjective well-being | Life satisfaction (Inglehart & Klingeman, 2000) | Sum of Veenhoven (2000a) measures |
|-----------------------------|-----------------------|---|-----------------------------------|
| Depression–lifetime | .733* | .583* | .856*** |
| Depression–12 months | .357 | -.071 | .606* |
| Anxiety disorders–12 months | .533 | .358 | .772** |
| Crime rates | .676** | .613** | .687*** |
| Total alcohol consumption | .379 | .184 | .203 |
| Female tobacco consumption | .338 | .222 | .527* |
| Cocaine | .623* | .596** | .726*** |
| Cannabis | .480* | .334 | .505* |

* $p < .05$. ** $p < .01$. *** $p < .001$, all one-tailed.

Suppression was also negatively correlated with values related to emotion, especially Long-Term Orientation and Affective Autonomy. This suggested that cultures that valued the promotion and protection of people's independent pursuit of positive experiences and that encouraged the delayed gratification of its members' emotional needs facilitated lower suppression norms. Previous work (Schwartz, 2004) has indicated that the values related to interpersonal relationships, such as Embeddedness and Hierarchy, are associated with values related to emotions, such as Affective Autonomy, which further highlights how these values commingle in affecting emotion-regulation norms.

These findings provide an interesting spin on our understanding of the social effects of emotion regulation. As mentioned earlier, Suppression has been associated with negative consequences on the individual level, including less social closeness and social support, avoidant attachments (John & Gross, 2004), and disrupted communication, reduced rapport, and inhibited relationship formation (Butler et al., 2003). Our findings suggest, however, that Suppression may have positive consequences on the social level, playing a major cultural function in maintaining cultural systems related to hierarchies or ingroups. This phenomenon may also be at work in our findings related to adjustment, with lower means on Suppression associated with higher rates of both happiness and maladjustment. If this is true, this idea juxtaposes the negative consequences of Suppression to the individual against the positive consequences to the culture, and future research and theory should examine this complex interplay.

For the most part, hypotheses concerning the relationship between cultural values and Reappraisal were not supported. On the surface, this nonfinding is somewhat at odds with previous studies reviewed earlier that have demonstrated cultural differences in emotion-appraisal processes (Matsumoto et al., 1988; Mauro et al., 1992; Roseman et al., 1995; Scherer, 1997a, 1997b). But this apparent contradiction may be resolved by the fact that Reappraisal refers to processes that occur *after* an emotion has occurred, whereas previous studies on appraisal have examined the stimulus evaluation process *before* an emotion occurs. The nonfinding may also be related to the fact that, as mentioned in the introduction, Reappraisal is a cognitive process that is internal to an individual, unobservable to others, and focused on emotional experience, whereas Suppression is focused on observable behaviors. Our data suggest, therefore, that the effects of culture on emotion regulatory processes are more directly seen on observable, expressive behaviors. This idea is consonant with studies that have demonstrated cultural differences in expression (Ekman, 1972; Matsumoto & Kupperbusch, 2001) and display rules (Matsumoto, 1990; Matsumoto et al., 1998, 2005). It may very well be that other cultural variables not measured here, such as cultural worldviews and belief systems, affect more directly the Reappraisal process, and future studies should examine this possibility.

Country-level emotion regulation was positively correlated with both positive and negative indices of adjustment. Thus the nature of emotion regulation on the country level vis-à-vis its relationship with adjustment is clearly different than it is on the individual level. Part of the reason for this difference is the unexpected positive correlation between positive and negative indices of adjustment on the country level. This may be possible on the country level but not on the individual level because the former deals with

populations, and it is entirely possible for some segment of the population to be happier than the norm while a different segment of the population is more maladjusted than the norm, thus producing a positive correlation between these two types of data. On the individual level, however, such an effect would be difficult if not impossible. It may be that one of the consequences of high Affective Autonomy, which is associated with Individualism, is the promotion of high levels of both positive and negative adjustment or a wide range of adjustment on both extremes. That emotions are relatively more important indicators of happiness in individualistic cultures (Diener et al., 1995; Diener & Suh, 2000; Oishi & Diener, 2001) may be one side of a double-edged sword.

Alternatively, it may very well be that cultures high on Suppression also suppress their emotion-related reports as well, which would attenuate mean ratings of happiness and incidence rates of maladjustment. The data, however, do not entirely support such an interpretation because some of the (mal)adjustment indices obtained did not rely on self-report, such as crime rates and drug usage rates, and these variables produced the same findings in the same direction. Nevertheless, future studies should examine the degree to which the correlations we reported were influenced by response styles associated with high Suppression.

These findings were not generated without limitation, one of which concerns the method of assessing emotion regulation. We relied on the ERQ, which is one of the few validated measures of emotion regulation available. Other aspects of emotion regulation need to be identified, and measures of these processes should be developed, validated, and tested. For example, although we focused on Suppression, there are many ways that emotional responses can be modulated. Ekman and Friesen (1969), for instance, outlined six ways in which expressive behavior can be displayed: (a) as is with no modification; (b) deamplified, or with reduced intensity; (c) amplified, or with increased intensity; (d) neutralized or eliminated; (e) qualified in combination with other emotions or emblems that make a statement about the original emotion; and (f) masked or concealed by another emotion. Individuals can also simulate an emotion when none exists. Cultural differences, therefore, could exist not only on Suppression but also on these other expressive modes.

Moreover, there is no reason not to suspect the existence of cultural differences on the other aspects of regulation that Gross (2001) identified. Individual and cultural differences may exist on the situations selected in which to engage. Individualistic cultures, for instance, are correlated on the country level with extraversion and openness (Hofstede & McCrae, 2004); thus members of individualistic cultures may seek out more emotion-eliciting situations that produce more varied emotions relative to members of collectivistic cultures. Cultural differences may exist in the degree to which individuals modify situations in order to regulate emotions as opposed to modifying their own emotional reactions (similar to cultural differences in internal vs. external locus of control). One characteristic of collectivistic cultures, for example, is the promulgation of an ideology that individuals should adjust their behaviors to the group or context. If so, one may expect that members of collectivistic cultures would modify situations to regulate their emotions less than members of individualistic cultures would. And cultural differences may exist in the degree of vigilance for displays of certain emotions in certain contexts, which should lead to cultural differences in attentional deployment. For instance, mem-

bers of collectivistic cultures may be more sensitive to displays of anger relative to members of individualistic cultures because these may threaten ingroup harmony. Members of highly status-differentiating cultures may be more sensitive to displays of contempt relative to members of less status-differentiating cultures because these may be more threatening to status differentials. These ideas, and others, can be pursued in future work.

Although one contribution of this article has been the empirical linkage of an operationalized measure of culture with a target dependent variable (Matsumoto & Yoo, 2006), this linkage may have been limited because the cultural data did not come from the same participants who provided the emotion-regulation scores. To be sure, there are disagreements about this issue. On one hand, some modelers, especially in the multilevel random coefficient modeling tradition (Nezlek, in press), argue that it would be best for the data at multiple levels to come from the same participants. On the other hand, it may be argued that the independence of the cultural data from the individual-level data provides more conservative tests of their relationship; this is indeed the approach that many in the field have taken with regard to the use of culture-level data (Bond et al., 2004; Hofstede, 2001). And some argue against the use of self-report-based cultural data at all (Heine & Norenzayan, 2006). This is, of course, an issue that can be settled with data, and future studies should examine how different types of cultural data obtained from different sources may affect the findings reported here.

Another potential limitation related to the data concerns the possibility that the data are influenced either by sampling error and/or response styles. The Schwartz and Hofstede cultural value orientations have been replicated across multiple samples from the same countries and while controlling for response styles (Hofstede, 2001; Schwartz, 2004); the ERQ data, however, have not, and they may be influenced by these factors. It may be, for example, that members in cultures high on Suppression also tend to suppress their happiness ratings, contributing to the effects reported above. Future studies involving multiple samples from the same countries will need to examine the degree to which the Reappraisal and Suppression means, and the correlations between them, are robust across different samples within the same culture. Future studies will also need to examine the degree to which response styles affect the responses to the ERQ in different cultures.

A final limitation of our findings concerns the fact that we based our study of culture on countries, and we did so for several reasons. Cross-national comparisons involving cultural variables are one of the most common forms of cross-cultural research and serve as the backbone for most findings related to culture. Second, the only data related to measured cultural variables, such as the values we used in our study, are based on countries and country-level analyses. Both the Schwartz and Hofstede data sets have been analyzed extensively, and their cross-cultural scalar equivalence has been demonstrated numerous times (Hofstede, 2001; Schwartz, 2004). Moreover, the Schwartz value orientations are structurally different on the individual level, and there are no other data sets, to our knowledge, that operationalize cultural values in a comprehensive way with demonstrated cross-cultural equivalence. Yet, country is not necessarily culture, and there are ample reasons to believe that many countries, including those in our sample, include many different cultures, not just one. These different cultural samples may be delineated by other social variables,

such as language groups, ethnicities, immigration status, and the like, and future studies should examine the degree to which the findings generated in this study replicate in other cultural groups based on different delineations.

References

- Andrade, L., Caraveo-Anduaga, J. J., Berglund, P., Bijl, R. V., de Graaf, R., Vollebergh, W., et al. (2003). The epidemiology of major depressive episodes: Results from the International Consortium of Psychiatric Epidemiology (ICPE) surveys. *International Journal of Methods in Psychiatric Research*, *12*, 3–21.
- Angst, J. (1995). The epidemiology of depressive disorders. *European Neuropsychopharmacology*, *5*, 95–98.
- Bell, K. L., & Calkins, S. D. (2000). Relationships as inputs and outputs of emotion regulation. *Psychological Inquiry*, *11*, 160–209.
- Bijl, R. V., de Graaf, R., Hiripi, E., Kessler, R. C., Kohn, R., Offord, D. R., et al. (2003). The prevalence of treated and untreated mental disorders in five countries. *Health Affairs*, *22*, 122–133.
- Bond, M. H., Leung, K., Au, A., Tong, K. K., Reimel de Carrasquel, S., Murakami, F., et al. (2004). Culture-level dimensions of social axioms and their correlates across 41 cultures. *Journal of Cross-Cultural Psychology*, *35*, 548–570.
- Bradburn, N. M. (1969). *The structure of psychological well-being*. Chicago: Aldine.
- Butler, E. A., Egloff, B., Wilhelm, F. H., Smith, N. C., Erickson, E. A., & Gross, J. J. (2003). The social consequences of expressive suppression. *Emotion*, *3*, 48–67.
- Chan, K. F. (1993). Caring and its meaning: Views from schizophrenic patients and their careers. In N. R. V. Peterson, L. Barker, J. B. Shone, & M. Philips (Eds.), *Psychiatric rehabilitation: The Asian experience* (pp. 91–109). Hong Kong: University of Hong Kong.
- Chiu, E. (2004). Epidemiology of depression in the Asian Pacific region. *Australasian Psychiatry*, *12*, 4–10.
- Corrao, M. A., Guindon, G. E., Sharma, N., & Shokoohi, D. F. (2000). *Tobacco control country profiles*. Retrieved May 17, 2005, from <http://www1.worldbank.org/tobacco/countrybrief.asp>
- Diener, E., Diener, M. L., & Diener, C. (1995). Factors predicting the subjective well-being of nations. *Journal of Personality and Social Psychology*, *69*, 851–864.
- Diener, E., & Oishi, S. (2000). Money and happiness: Income and subjective well-being across nations. In E. Diener & E. Suh (Eds.), *Culture and subjective well-being* (pp. 185–218). Cambridge, MA: MIT Press.
- Diener, E., & Suh, E. M. (Eds.). (2000). *Culture and subjective well-being*. Cambridge, MA: MIT Press.
- Eisenberg, N. (2000). Emotion, regulation, and moral development. *Annual Review of Psychology*, *51*, 665–697.
- Eisenberg, N., Fabes, R. A., Guthrie, I. K., Murphy, B. C., & Maszk, P. (1996). The relations of regulation and emotionality to problem behavior in elementary school children. *Developmental Psychopathology*, *8*, 141–162.
- Ekman, P. (1972). Universal and cultural differences in facial expression of emotion. In J. R. Cole (Ed.), *Nebraska symposium on motivation: 1971* (pp. 207–283). Lincoln, NE: Nebraska University Press.
- Ekman, P., & Friesen, W. V. (1969). The repertoire of nonverbal behavior: Categories, origins, usage, and coding. *Semiotica*, *1*, 49–98.
- Gross, J. J. (1998). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology*, *74*, 224–237.
- Gross, J. J. (2001). Emotion regulation in adulthood: Timing is everything. *Current Directions in Psychological Science*, *10*, 214–219.
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, *85*, 348–362.

- Gross, J. J., & Levenson, R. W. (1993). Emotional Suppression: Physiology, self-report, and expressive behavior. *Journal of Personality and Social Psychology, 64*, 970–986.
- Gross, J. J., & Levenson, R. W. (1997). Hiding feelings: The acute effects of inhibiting positive and negative emotions. *Journal of Abnormal Psychology, 106*, 95–103.
- Heine, S. J., & Norenzayan, A. (2006). Why cross-cultural research is central to scientific progress in psychology. *Perspectives on Psychological Science, 1*, 251–269.
- Hofstede, G. H. (1980). *Culture's consequences: International differences in work-related values*. Beverly Hills, CA: Sage.
- Hofstede, G. H. (2001). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations* (2nd ed.). Thousand Oaks, CA: Sage.
- Hofstede, G. H., & McCrae, R. R. (2004). Personality and culture revisited: Linking traits and dimensions of culture. *Cross-Cultural Research, 38*, 52–88.
- Inglehart, R. (1998). *Modernización y postmodernización: El cambio cultural, económico y político en 43 sociedades* [Modernization and postmodernization: Cultural, economic and political change in 43 societies]. Madrid, Spain: CIS.
- Inglehart, R., & Klingeman, H.-D. (2000). Genes, culture, democracy, and happiness. In E. Diener & E. M. Suh (Eds.), *Culture and subjective well-being* (pp. 165–184). Cambridge, MA: MIT Press.
- John, O., & Gross, J. J. (2004). Healthy and unhealthy emotion regulation: Personality processes, individual differences, and life span development. *Journal of Personality, 72*, 1301–1333.
- Keltner, D., Ekman, P., Gonzaga, G. C., & Beer, J. (2003). Facial expressions of emotion. In R. J. Davidson, K. G. Scherer, & H. H. Goldsmith (Eds.), *Handbook of affective sciences* (pp. 415–432). New York: Oxford University Press.
- Kim, U., Triandis, H. C., Kagitcibasi, C., Choi, S. C., & Yoon, G. (Eds.). (1994). *Individualism and collectivism: Theory, method, and applications*. Thousand Oaks, CA: Sage.
- Lee, S., Heeringa, S., Pennell, B. E., Zaslavsky, A. M., Bedirhan, T. U., & Chatterji, S. (2004). Prevalence, severity and unmet need for treatment of mental disorders in the World Health Organization world mental health surveys. *The Journal of the American Medical Association, 291*, 2581–2590.
- MacIntosh, R. (1998). A confirmatory factor analysis of the affect balance scale in 38 nations: A research note. *Social Psychology Quarterly, 61*, 83–91.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review, 98*, 224–253.
- Matsumoto, D. (1990). Cultural similarities and differences in display rules. *Motivation & Emotion, 14*, 195–214.
- Matsumoto, D. (1993). Ethnic differences in affect intensity, emotion judgments, display rule attitudes, and self-reported emotional expression in an American sample. *Motivation & Emotion, 17*, 107–123.
- Matsumoto, D. (2002). *The new Japan*. Yarmouth, ME: Intercultural Press.
- Matsumoto, D. (2007a). Culture, context, and behavior. *Journal of Personality, 75*, 1285–1320.
- Matsumoto, D. (2007b). Individual and cultural differences in status differentiation: The Status Differentiation Scale. *Journal of Cross-Cultural Psychology, 38*, 413–431.
- Matsumoto, D., Kudoh, T., Scherer, K., & Wallbott, H. (1988). Antecedents of and reactions to emotions in the United States and Japan. *Journal of Cross-Cultural Psychology, 19*, 267–286.
- Matsumoto, D., & Kupperbusch, C. (2001). Idiocentric and allocentric differences in emotional expression and experience. *Asian Journal of Social Psychology, 4*, 113–131.
- Matsumoto, D., LeRoux, J. A., Bernhard, R., & Gray, H. (2004). Personality and behavioral correlates of intercultural adjustment potential. *International Journal of Intercultural Relations, 28*, 281–309.
- Matsumoto, D., LeRoux, J. A., Iwamoto, M., Choi, J. W., Rogers, D., Tatani, H., et al. (2003). The robustness of the Intercultural Adjustment Potential Scale (ICAPS). *International Journal of Intercultural Relations, 27*, 543–562.
- Matsumoto, D., LeRoux, J. A., Ratzlaff, C., Tatani, H., Uchida, H., Kim, C., et al. (2001). Development and validation of a measure of intercultural adjustment potential in Japanese sojourners: The Intercultural Adjustment Potential Scale (ICAPS). *International Journal of Intercultural Relations, 25*, 483–510.
- Matsumoto, D., Takeuchi, S., Andayani, S., Kouznetsova, N., & Krupp, D. (1998). The contribution of Individualism-collectivism to cross-national differences in display rules. *Asian Journal of Social Psychology, 1*, 147–165.
- Matsumoto, D., & Yoo, S. H. (2006). Toward a new generation of cross-cultural research. *Perspectives on Psychological Science, 1*, 234–250.
- Matsumoto, D., Yoo, S. H., Fontaine, J., Anguas-Wong, A. M., Ariola, M., Ataca, B., et al. (2008). Mapping expressive differences around the world: The relationship between emotional display rules and individualism v. collectivism. *Journal of Cross-Cultural Psychology, 39*, 55–74.
- Matsumoto, D., Yoo, S. H., Hirayama, S., & Petrova, G. (2005). Validation of an Individual-Level Measure of Display Rules: The Display Rule Assessment Inventory (DRAI). *Emotion, 5*, 23–40.
- Mauro, R., Sato, K., & Tucker, J. (1992). The role of appraisal in human emotions: A cross-cultural study. *Journal of Personality and Social Psychology, 62*, 301–317.
- McCrae, R. R., Terracciano, A., Leibold, N. B., Schmidt, V., Shakespeare-Finch, J., Neubauer, A., et al. (2005). Personality profiles of cultures: Aggregate personality traits. *Journal of Personality and Social Psychology, 89*, 407–425.
- Miller, A. L., McDonough, S. C., Rosenblum, K. L., & Sameroff, A. J. (2002). Emotion regulation in context: Situational effects on infant and caregiver behavior. *Infancy, 3*, 403–433.
- Morling, B., Kitayama, S., & Miyamoto, Y. (2003). American and Japanese women use different coping strategies during normal pregnancy. *Personality and Social Psychology Bulletin, 29*, 1533–1546.
- Nezlek, J. (in press). Multilevel modeling. In D. Matsumoto & F. J. R. Van de Vijver (Eds.), *Cross-cultural research methods*. New York: Oxford University Press.
- Oishi, S., & Diener, E. (2001). Goals, culture, and subjective well-being. *Personality and Social Psychology Bulletin, 27*, 1674–1682.
- Richards, J. M., & Gross, J. J. (2000). Emotion regulation and memory: The cognitive costs of keeping one's cool. *Journal of Personality and Social Psychology, 79*, 410–424.
- Rocheach, M. (1973). *The nature of human values*. New York: Free Press.
- Roseman, I. J., Dhawan, N., Rettke, S. I., & Naidu, R. K. (1995). Cultural differences and cross-cultural similarities in appraisals and emotional responses. *Journal of Cross-Cultural Psychology, 26*, 23–48.
- Scherer, K. R. (1997a). Profiles of emotion-antecedent appraisal: Testing theoretical predictions across cultures. *Cognition & Emotion, 11*, 113–150.
- Scherer, K. R. (1997b). The role of culture in emotion-antecedent appraisal. *Journal of Personality & Social Psychology, 73*, 902–922.
- Schwartz, S. H. (2004). Mapping and interpreting cultural differences around the world. In H. Vinken, J. Soeters, & P. Ester (Eds.), *Comparing cultures, dimensions of culture in a comparative perspective* (pp. 43–73). Leiden, The Netherlands: Brill.
- Schwartz, S. H. (2006). Value orientations: Measurement, antecedents, and consequences across nations. In R. Jowell, C. Roberts, R. Fitzgerald, & G. Eva (Eds.), *Measuring attitudes cross-nationally: Lessons from the European social survey* (pp. 161–193). London, England: Sage.
- Schwartz, S. H., & Ros, M. (1995). Values in the West: A theoretical and

- empirical challenge to the Individualism-collectivism cultural dimension. *World Psychology*, 1, 91–122.
- Suh, E., Diener, E., Oishi, S., & Triandis, H. C. (1998). The shifting basis of life satisfaction judgments across cultures: Emotions versus norms. *Journal of Personality and Social Psychology*, 74, 482–493.
- Taylor, S. E., Sherman, D. K., Kim, H. S., Jarcho, J., & Takagi, K. (2004). Culture and social support: Who seeks it and why? *Journal of Personality and Social Psychology*, 87, 354–362.
- Triandis, H. C. (1995). *New directions in social psychology: Individualism and collectivism*. Boulder, CO: Westview Press.
- Triandis, H. C., Bontempo, R., Villareal, M. J., Asai, M., & Lucca, N. (1988). Individualism and collectivism: Cross-cultural perspectives on self-ingroup relationships. *Journal of Personality and Social Psychology*, 54, 323–338.
- Tsai, J. L., Knutson, B., & Fung, H. H. (2006). Cultural variation in affect valuation. *Journal of Personality and Social Psychology*, 90, 288–307.
- Tweed, R. G., White, K., & Lehman, D. R. (2004). Culture, stress, and coping: Internally- and externally-targeted control strategies of European Canadians, East Asian Canadians, and Japanese. *Journal of Cross-Cultural Psychology*, 35, 652–668.
- UNESCO Institute for Statistics. (2004, November). School life expectancy, percentage of repeaters and survival rates to grade 4 and 5 by country and gender. Retrieved May 17, 2005, from <http://www.uis.unesco.org>
- United Nations Office on Drugs and Crime. (2005). *World drug report 2005*. Retrieved May 17, 2005, from <http://www.unodc.org/unodc/en/data-and-analysis/WDR-2005.html>
- United Nations, Statistics Division. (2005). *Social indicators: Indicators on unemployment*. Retrieved May 17, 2005 from <http://unstats.un.org/unsd/demographic/products/socind/unemployment.htm>
- van de Vijver, F. J. R. (2001). Evolution of research methods. In D. Matsumoto (Ed.), *Handbook of culture and psychology* (pp. 77–97). New York: Oxford University Press.
- Veenhoven, R. (1993). *Happiness in nations: Subjective appreciation of life in 56 nations, 1946–1992*. Rotterdam, The Netherlands: Erasmus University, Department of Social Sciences.
- Veenhoven, R. (2000a). Freedom and happiness: A comparative study in forty-four nations in the early 1990s. In E. Diener & E. M. Suh (Eds.), *Culture and subjective well-being* (pp. 257–288). Cambridge, MA: MIT Press.
- Veenhoven, R. (2000b). *World database of happiness: Happiness in nations*. Retrieved May 17, 2005, from www.eur.nl/fsw/research/happiness
- Volling, B. L., McElwain, N. L., & Miller, A. L. (2002). Emotion regulation in context: The jealousy complex between siblings and its relations with child and family characteristics. *Child Development*, 73, 581–600.
- World Health Organization. (2005). *Country data on alcohol: Adult per capita alcohol consumption*. Retrieved May 17, 2005, from http://www3.who.int/whosis/menu.cfm?path=whosis,topics,alcohol,alcohol_apc&language=english
- The World Value Survey Group. (1994). *World values survey, 1981–1984 and 1990–1993*. Ann Arbor, MI: Institute for Social Research.
- Yamaguchi, S. (1994). Collectivism among the Japanese: A perspective from the self. In U. Kim & H. C. Triandis (Eds.), *Individualism and collectivism: Theory, method, and applications* (Vol. 18, pp. 175–188). Newbury Park, CA: Sage.
- Yeh, C., & Inose, M. (2002). Difficulties and coping strategies of Chinese, Japanese and Korean immigrant students. *Adolescence*, 37, 69–82.
- Yoo, S. H., Matsumoto, D., & LeRoux, J. A. (2006). Emotion regulation, emotion recognition, and intercultural adjustment. *International Journal of Intercultural Relations*, 30, 345–363.

Received October 25, 2005

Revision received August 7, 2007

Accepted August 31, 2007 ■