

Published in final edited form as:

Cultur Divers Ethnic Minor Psychol. 2010 October ; 16(4): 517–525. doi:10.1037/a0020655.

Anger Suppression, Interdependent Self-Construal, and Depression among Asian American and European American College Students

Rebecca Y. M. Cheung and Irene J. K. Park

Department of Psychology, University of Notre Dame

Abstract

The present study tested a theoretical model of emotion regulation (Yap, Sheeber, & Allen, 2007) in a sample of Asian American and European American college students ($N = 365$). Specifically, the mediating role of anger suppression in the effect of temperament and family processes on depressive symptoms was tested across race and levels of interdependent self-construal (a culturally based self orientation emphasizing connectedness with others). Next, the moderation of the suppression—depression relation was tested by race and interdependent self-construal. Results indicated that the hypothesized model fit well across Asian American and European American students as well as those with high vs. low levels of interdependent self-construal. Anger suppression was a significant mediator of the hypothesized indirect effects on depressive symptoms. Moreover, race and interdependent self-construal moderated the suppression—depression link, such that Asian American status and a stronger interdependent self-construal *attenuated* the relation between anger suppression and depressive symptoms. Understanding both universal and culture-specific aspects of emotion regulation in the development of depressive symptoms will be essential for sound theory, future research, and effective prevention and intervention efforts across diverse populations.

Keywords

emotion regulation; anger suppression; depressive symptoms; Asian American college students; interdependent self-construal

Emotion dysregulation is a central feature of psychological disorders and has gained increasing scientific attention in attempts to better understand the development of psychopathology (P. M. Cole, Martin, & Dennis, 2004). Emotion suppression is one common form of “unhealthy emotion regulation” (John & Gross, 2004). Habitual suppressors experience more negative emotions, less positive emotions, and feelings of inauthenticity (Gross & John, 2003). In terms of psychological maladjustment and well-being, suppression is associated with higher levels of depressive symptoms and lower levels of life satisfaction (Gross & John, 2003). Suppression is also associated with less social support (Gross & John, 2003), decreased cognitive resources (Gross & Levenson, 1997),

Correspondence Commenting this article should be addressed to Irene J. K. Park, Department of Psychology, University of Notre Dame, Notre Dame, IN 46556. ikim1@nd.edu.

Publisher's Disclaimer: The following manuscript is the final accepted manuscript. It has not been subjected to the final copyediting, fact-checking, and proofreading required for formal publication. It is not the definitive, publisher-authenticated version. The American Psychological Association and its Council of Editors disclaim any responsibility or liabilities for errors or omissions of this manuscript version, any version derived from this manuscript by NIH, or other third parties. The published version is available at www.apa.org/pubs/journals/cdp.

and greater sympathetic activation of electrodermal and cardiovascular systems (Gross, 1998). Thus, despite its common use, emotion suppression contains psychological, social, cognitive, and physiological costs.

At the same time, several gaps exist in the current literature. First, scholars (e.g., John & Gross, 2004) have called for “deepening” research that focuses on the regulation of discrete emotions (e.g., anger or sadness), moving beyond emotion regulation in general terms. Second, there are relatively few theory-driven studies examining how emotion regulation serves as an explanatory mechanism in the etiology of specific psychological disorders such as depression. Third, there is a paucity of research examining potential between-group variations incorporating race, ethnicity, and culture, particularly in terms of meaningful underlying psychological processes (Betancourt & Lopez, 1993) or “active cultural ingredients” (Matsumoto & Yoo, 2006). The present study aimed to address these gaps by: 1) honing in on the regulation of anger; 2) testing anger suppression as a mediating explanatory mechanism in the relation between family processes, temperament, and depression; and, 3) investigating racial and cultural variations in the anger suppression—depression link among Asian American and European American college students.

Anger Suppression

Anger suppression refers to the frequency with which angry feelings are experienced but not expressed (Spielberger, 1999). It is associated with conflict avoidance, guilt, irritability, decreased life satisfaction, rumination, and depressive symptoms (e.g., Bridewell & Chang, 1997; Gross & John, 2003; Kopper & Epperson, 1996; Martin & Dahlen, 2007). Individuals who suppress their anger also have a stronger perception of lacking social support (Palfai & Hart, 1997). Thus, like emotion suppression in general, anger suppression is associated with psychological costs and maladjustment.

But, does suppression entail the same kinds of costs for everyone? Some research is beginning to show that the consequences of emotion suppression are dependent upon cultural context. That is, emotion suppression may *not* have detrimental consequences for everyone, and may occur more frequently in some groups and cultural contexts than others. For instance, Butler, Lee, and Gross (2007) found that women who held more Asian values (as measured by the Asian Values Scale; Kim, Atkinson, & Yang, 1999; e.g., interdependence) used emotion suppression more frequently in daily life than those holding predominantly European American values (as measured by the European American Values Scale; Wolfe, Yang, Wong, & Atkinson, 2001; e.g., independence). Moreover, they found that cultural values moderated the relation between emotion suppression and negative social outcomes; suppression did not elicit as negative responses from social partners for women holding more Asian values, compared to those who held more European values. The present study also raised this question about the moderating effect of cultural values on suppression's impact, but now in the domain of depression. Moreover, the focus of the present study was on the discrete emotion of anger, because anger has been theorized to be especially threatening to individuals with an interdependent self-construal that prioritizes relational harmony (Markus & Kitayama, 1991).

Theoretical Model for the Present Study

Theoretical frameworks incorporating emotion regulation as an explanatory mechanism in the development of psychological disorders are just beginning to emerge. One such model was proposed by Yap, Allen, and Sheeber (2007) to show how emotion regulation is the critical mechanism through which temperament and family processes operate to increase vulnerability to depression. Guided by this framework, we hypothesized that emotion regulation would mediate the influence of temperament and family processes on depression.

The focus on depression is significant as it is a major public health concern and projected to become one of the leading causes of illness-related disability affecting the world's population (Murray & Lopez, 1996). Two important innovations were incorporated into this model. First, we examined anger suppression as one particular form of emotion regulation. Second, we tested two moderators of the suppression—depression link: race and interdependent self-construal. We also made three modifications to the model: family processes were examined more generally (vs. those specifically focused on emotion socialization), the interaction term (temperament \times family process) was excluded, and the model was tested on college students, which extends the age range of the original framework from adolescence into young adulthood. Figure 1 illustrates the theoretical model tested in the present study with the new components of anger suppression as a mediator and race and interdependent self-construal as moderators.

The Mediating Role of Anger Suppression

In applying Yap et al.'s (2007) theoretical model, we first present our rationale for why anger suppression is expected to mediate the influence of temperament and family processes on depression. Although temperament may be broadly construed, for the purpose of the present study, we operationalized this construct by focusing on *trait anger* which has been defined as the general propensity towards experiencing intense angry feelings over time (Spielberger, 1999). Previous research has documented that individuals with higher (vs. lower) levels of trait anger tend to experience more intense angry feelings. In addition, they tend to display negative biases when processing semantic anger-related stimuli (Parrott, Zeichner, & Evces, 2005) and engage in more dysfunctional coping, such as frequent suppression or less controlled anger expression (Deffenbacher et al., 1996), which may in turn increase their vulnerability for psychological maladjustment.

Family processes also play an important role in shaping emotion regulation strategies (e.g., Morris, Silk, Steinberg, Myers, & Robinson, 2007). In the present study, we operationalized family processes as family cohesion, family adaptability, and parent-adolescent communication, all of which contribute to the general emotional climate within a family context. A negative emotional climate within a family, as manifested by a lack of parent-child communication and emotional bonding among family members, has been associated with emotion dysregulation (see Repetti, Taylor, and Seeman, 2002 for an extensive review) which may in turn be associated with depressive symptoms (e.g., Brody, Haaga, Kirk, & Solomon, 1999). A negative emotional climate within the family has been associated with elevated depressive symptomatology among Asian American families as well (see Park, Kim, Cheung, & Kim, in press, for a review), although there is some work by Ruth Chao (e.g., Chao, 1994) indicating that authoritarian parenting practices may be associated with positive outcomes such as high academic achievement.

Finally, emotion suppression has been shown to be positively associated with depressive symptomatology in multiple non-clinical, undergraduate samples. For instance, Gross and John (2003) found that habitual suppressors tend to report more depressive symptoms vs. those who use reappraisal as an emotion regulation strategy. Anger suppression in particular has also been positively associated with depressive symptoms (Bridewell & Chang, 1997; Kopper & Epperson, 1996). Thus, the rationale for the present study's hypothesis regarding anger suppression as a mediator has been supported by theoretical and empirical evidence. To date, there have been no empirical tests of this model across racial or cultural groups; thus, one purpose of the present study was to test the cross-cultural applicability of this model.

Culture, Anger Suppression, and Depression

Within the broader literature on the influence of culture on emotion (e.g., Ekman, 1972; Matsumoto, 1993; Mesquita & Frijda, 1992; Soto, Levenson, & Ebling, 2005; Tsai, 2007), the importance of cultural context with regard to emotion regulation is beginning to be empirically and theoretically established (e.g., Butler, Lee, & Gross, 2007; Kitayama, Karasawa, & Mesquita, 2004; Mesquita & Albert, 2007). Although some research has identified racial and cultural differences (and similarities) in *mean levels* of emotion regulation strategies (e.g., Butler, Lee, & Gross, 2007; Gross & John, 2003; Matsumoto et al., 2008), there is much less empirical research that tests the *association* between emotion regulation and psychological adjustment across cultures. Moreover, prior research has often neglected to explicitly measure culture (despite making cultural attributions) or has utilized crude proxies for culture (e.g., assuming that race, ethnicity, or nation labels represent culture). Thus, one major aim of the present study was to address these gaps in the literature by testing the moderating effects of race and cultural values (via an interdependent self-construal) in the association between anger suppression and depression.

There is emerging evidence suggesting that the consequences of suppression are moderated by cultural context. For example, Butler, Lee, and Gross (2007) demonstrated that the negative social impact of suppression was attenuated among female undergraduates who adhered to more Asian (vs. predominantly European) values. For individuals who held more Asian values, suppression was thought to serve prosocial goals (vs. a self-protective function, for those holding more Western values). In theoretical terms, Kitayama, Karasawa, and Mesquita (2004) have posited that culture shapes emotional experience through collective and personal processes. Specifically, they propose that cultural models of self (independent vs. interdependent self-construals) critically shape the ways in which individuals regulate their emotions. Further, they assert that emotion regulation strategies are culturally reinforced to serve either interdependent or independent goals.

As defined by Markus and Kitayama (1991), the interdependent model of self emphasizes connectedness with other people; the self becomes meaningful only in the larger context of social relationships. Individuals with a stronger interdependent self-construal tend to suppress or avoid angry feelings in order to maintain social harmony, as indicated by data from Asian and Asian-heritage samples (Markus & Kitayama, 1991). Thus, anger suppression may be one form of emotion regulation that promotes social engagement and psychological well-being for interdependent individuals. In the present study, we expected that a strong interdependent self-construal (regardless of one's race) would attenuate the relation between anger suppression and depression.

The Present Study

In sum, the purpose of the present study was to examine both etic (universal) and emic (culture-specific) dimensions of emotion regulation and its association with depression. We sought to achieve this dual purpose by testing the cross-cultural applicability of an etic model of emotion regulation on a sample of Asian American and European American college students. We also incorporated an emic element into this model by examining differential associations between anger suppression and depression by testing race and interdependent self-construal as moderators. Specifically, the present study tested two hypotheses. First, we hypothesized that anger suppression would mediate the effects of trait anger and family processes on depressive symptoms. We explicitly tested the previously held assumption that this model would apply across racial and cultural groups. Second, we hypothesized that race and an interdependent self-construal would moderate the anger suppression—depression link, such that the relation between anger suppression and

depressive symptom would be attenuated for Asian Americans and for individuals with a relatively strong (vs. weak) interdependent self-construal.

Method

Participants and Procedures

Participants were 365 college students (165 self-identified Asian Americans and 200 self-identified European Americans) at a private, Midwestern university. They ranged in age from 18 to 28 years ($M = 19.3$; $SD = 1.3$). The sample was 55.9% female. The largest proportions of Asian Americans were Chinese (29.1%) and Korean (25.5%), followed by: Vietnamese (11.5%), Filipino (10.9%), Asian Indian (6.7%), "Other Asian" (5.5%), biracial/multiracial (3.6%), Native Hawaiian or other Pacific Islander (2.4%), and Japanese (1.8%), with 5% missing this data. The vast majority (90%) of European Americans identified as "European American," "White," or "Caucasian,"; the remaining 10% identified with more specific European ancestries (e.g., "German, Irish, Swedish"). Participants were recruited through: a) the psychology department subject pool; b) on-campus student organizations; c) student listerves; and, d) mass-mailings. Participants either received research credit in psychology courses or were entered into a drawing for \$15, \$25, or \$50 bookstore gift certificates. The study was approved by the Institutional Review Board prior to implementation. Informed consent was obtained from all participants prior to the survey administration.

Measures

Trait anger—Trait anger was measured by a 10-item Trait Anger scale of the State-Trait Anger Expression Inventory (STAXI-2; Spielberger, 1999). The scale is divided into two components: Angry Temperament (i.e., a disposition towards experiencing anger without specific anger provocation) and Angry Reaction (i.e., the frequency of experiencing angry feelings in situations involving negative evaluations/frustration). Participants rated each item on a 4-point Likert scale from (1) *almost never* to (4) *almost always*. The Trait Anger scale has demonstrated good internal consistency in non-clinical adult samples (alphas = .84 – .86; Spielberger, 1999) and in Asian samples (alphas = .82 – .85; Bishop & Quah, 1998). In the current study, the Angry Temperament and Angry Reaction subscales demonstrated acceptable internal consistency with Cronbach's alphas of .85 and .74, respectively.

Family adaptability and cohesion—The Family Adaptation and Cohesion Evaluation Scales II-Family version (FACES-II; Olson, McCubbin, Barnes, Larsen, Muxen, & Wilson, 1982) was used to measure family adaptability and cohesion. The Adaptability and Cohesion subscales contain 14 and 16 items, respectively. Participants were asked to rate each item on a 5-point Likert scale ranging from 1 (*Almost Never*) to 5 (*Almost Always*). A sample item from the Adaptability subscale is: "Each family member has input regarding major family decisions." A sample item from the Cohesion subscale is: "Family members are supportive of each other during difficult times." The composite scores were calculated using a weight summation procedure, which accounted for both positive and negative items (Olson et al., 1982). Both the Cohesion and Adaptability subscales have previously demonstrated good internal consistency among Asian American college students, with alpha coefficients of .84 and .91, respectively (Lee, Choe, Kim, & Ngo, 2000). Good internal consistency was also obtained in the current study for the Cohesion (alpha = .80) and Adaptability (alpha = .82) subscales.

Parent-adolescent communication—The Parent and Adolescent Communication Scale (PAC; Barnes & Olsen, 1985) was used to measure college students' perceptions of the overall quality of communication with their father and mother, respectively. The PAC is

comprised of two subscales: Openness and Problems with Communication. A sample item for the Openness subscale is: "I find it easy to discuss problems with my [father/mother]." A sample item for the Problems with Communication subscale is: "There are topics I avoid discussing with my [father/mother]." Participants were asked to rate each item on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*), with higher scores indicating a higher quality of communication. The PAC has demonstrated good internal consistency in prior research, with $\alpha = .88$ for the total scale (Barnes & Olsen, 1985), and $\alpha = .76$ for a Cambodian youth sample (Daley, 2006). Because the mother-child and father-child communication subscales were significantly correlated ($r = .38, p < .001$), they were averaged to form one composite measure reflecting quality of communication with both parents. The combined PAC demonstrated excellent internal consistency in the current study ($\alpha = .94$).

Anger suppression—Anger suppression was measured by the Anger Expression-In subscale of the State-Trait Anger Expression Inventory (STAXI-2; Spielberger, 1999). The subscale contains eight items assessing the frequency with which individuals suppress the angry feelings that they experience. Participants were asked to rate each item on a 4-point Likert scale from (1) *almost never* to (4) *almost always*. The Anger Expression-In subscale has demonstrated adequate internal consistency with reliability alphas of .78 (female) and .74 (male) in non-clinical, adult samples (Spielberger, 1999). The STAXI-2 has also been successfully administered in Asian American adults (e.g., Kim & Zane, 2004). The subscale demonstrated acceptable internal consistency in the current study ($\alpha = .75$).

Self-construal—The 24-item Self-Construal Scale (SCS; Singelis, 1994) contains two 12-item subscales assessing interdependent and independent self-construals, respectively, on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The current study focused on the interdependent self-construal subscale. One sample item is: "It is important for me to maintain harmony within my group." The SCS has demonstrated adequate internal consistency in prior research, with alpha coefficients ranging from .71 to .73 (Sato & McCann, 1998; Singelis & Sharkey, 1995; Singelis, Triandis, Bhawuk, & Gelfand, 1995). The SCS has been administered to Asian samples (e.g., Kwan, Bond, & Singelis, 1997). The interdependent self-construal subscale demonstrated acceptable internal consistency in the current study ($\alpha = .73$).

Depressive symptoms—The Beck Depression Inventory (BDI; Beck, Ward, Mendelsohn, & Erbaugh, 1961) is a 21-item measure assessing cognitive, affective, behavioral, and somatic aspects of depression. Respondents were asked to rate each item on a scale from 0 to 3 to reflect the intensity of a symptom during the past week (e.g., degree of sadness), with higher scores indicating a higher level of depression. Previous meta-analyses of the BDI have demonstrated good reliabilities with psychiatric and non-psychiatric samples, with alpha coefficients of .86 and .81, respectively (Beck, Steer, & Garbin, 1988). The BDI demonstrated good internal consistency in the current study ($\alpha = .87$).

Results

Preliminary Analyses

Table 1 shows the zero-order correlations, means and standard deviations for all study variables. The correlations supported the theorized associations from trait anger and family processes to anger suppression ($ps < .001$), as well as between anger suppression and depressive symptoms ($r = .47; p < .001$). Gender and age were not associated with the study variables ($ps > .05$) and thus were not included in the subsequent analyses.

Mean level racial and cultural differences in emotion suppression were examined using independent sample t-tests. Results indicated that Asian Americans ($M = 20.13$; $SD = 4.39$) reported significantly higher levels of anger suppression than European Americans ($M = 18.31$; $SD = 4.22$), $t(363) = -4.02$, $p < .001$. Individuals who were high vs. low on interdependent self-construal did not differ significantly on anger suppression, $t(363) = -1.27$, $p = .21$, although the means were in the expected direction with more interdependent individuals reporting more anger suppression ($M = 19.43$; $SD = 4.38$) than those who were less interdependent ($M = 18.85$; $SD = 4.38$).

Anger Suppression as a Mediator

Testing the theorized model across race—Multisample CFA (as recommended by Anderson and Gerbing, 1988; Kline, 2005) showed an acceptable fit of the measurement model to the data among Asian Americans and European Americans, $\chi^2(76) = 147.29$, $p < .001$, CFI = .96, NNFI = .94, RMSEA = .07. Multisample SEM was then used to test the proposed model. Acceptable model fits were obtained for the configural invariance [$\chi^2(76) = 147.28$, $p < .001$; CFI = .96, NNFI = .94, RMSEA = .07] and factorial invariance [$\chi^2(83) = 159.68$, $p < .001$; CFI = .96, NNFI = .94, RMSEA = .07] models across Asian Americans and European Americans. The chi-square difference between the models for configural (Model 1.1) and factorial invariance (Model 2.1) was non-significant, $\Delta\chi^2(7) = 12.39$, $p > .05$, indicating factorial invariance across racial groups. Significant indirect effects from trait anger and family processes to depressive symptoms demonstrated the mediating role of anger suppression for both racial groups ($ps < .05$), providing support for our first hypothesis (see Table 2).

Testing the theorized model across levels of interdependent self-construal

Using a median split, the total sample was divided into two groups (low vs. high) by interdependent self-construal. Multisample CFA showed an acceptable fit of the measurement model to the data across these two groups, $\chi^2(76) = 130.26$, $p < .001$, CFI = .97, NNFI = .96, RMSEA = .06. Multisample SEM was then used to test the proposed model. Satisfactory model fits were obtained for configural and factorial invariance across groups (see Table 3). The chi-square difference between the models for configural (Model 1.1) and factorial invariance (Model 2.1) was non-significant, $\Delta\chi^2(7) = 2.07$, $p > .05$, indicating factorial invariance across groups. Indirect effects from trait anger and family processes to depressive symptoms for both groups were significant, indicating the mediating role of anger suppression ($ps < .05$), with the exception of the family processes \rightarrow depression effect for the high interdependent self-construal group. Thus, our first hypothesis was generally supported (see Table 2).

Moderation by Race

To test for moderation by race (see Table 3), a single constraint was introduced on the anger suppression—depression path (Model 3.1) and compared to the model for factorial invariance (Model 2.1). As shown in Table 3, this added constraint led to a significant chi-square difference, $\Delta\chi^2(1) = 679.52$, $p < .001$, and poorer model fits, indicating a moderating effect by race. In other words, the strength of the association between anger suppression and depressive symptoms appeared to be different across Asian Americans and European Americans. Specifically, in Model 2.1, the suppression—depression relation was *attenuated* for Asian Americans (unstandardized $B = .22$, $SE = .08$, $p < .01$) vs. European Americans (unstandardized $B = .23$, $SE = .06$, $p < .001$). These results supported our second hypothesis.

Cultural Moderation by Interdependent Self-Constraint

To test for moderation by self-construal (see Table 4), a single constraint was introduced on the anger suppression—depression path (Model 3.1) and compared to the model for factorial invariance (Model 2.1). As shown in Table 4, results indicated that this added constraint led to a significant chi-square difference, $\Delta\chi^2(1) = 88.38, p < .001$, and poorer model fits. In other words, moderation could be inferred, given meaningful differences across the low vs. high interdependent self-construal groups in the strength of the association between anger suppression and depressive symptoms. Specifically, in Model 2.1, the suppression—depression relation was *attenuated* for individuals with *high* (unstandardized $B = .15, SE = .06, p < .05$) vs. low (unstandardized $B = .25, SE = .09, p < .01$) interdependent self-construal, indicating a moderating effect by cultural orientation. Thus, the results provided evidence in support of our second hypothesis.

Discussion

The present study tested a theoretical model of emotion regulation and its association with depressive symptoms among college students. From an etic perspective, we tested the generalizability of a mainstream model of emotion regulation (Yap et al., 2007) among two racial groups (Asian American and European American) and two culturally-defined groups (those who were relatively high vs. low on interdependent self-construal). From an emic perspective, we tested the racial and cultural moderation of the anger suppression—depression link in the model. This integrated approach allowed us to examine the external validity of a theoretical model as well as the culture-specific boundary conditions for this model.

The study's main findings are unique in that they represent the first attempt to not only test this emotion regulation model cross-culturally, but also, to test the cultural moderation of the relation between anger suppression and depressive symptoms among college students. The SEM results showed that anger suppression was a significant mediator of the effects of trait anger and family processes on college students' depressive symptoms, regardless of their race and level of interdependent self-construal. The present results also indicated that the model must be considered in light of race and cultural context because the anger suppression—depression link was attenuated by an Asian American status and higher levels of interdependent self-construal.

These novel findings build upon, and are consistent with, some emerging research in the area of emotion regulation. First, the test of Yap et al.'s (2007) model of emotion regulation extends this theoretical work by providing initial empirical evidence of the applicability of the model to Asian Americans and European Americans with varying levels of interdependent self-construal; the results also extend the potential age range of the model to include emerging adults. Second, the generally good fit of the mediation model demonstrated that anger suppression does contain costs with regard to mental health outcomes, specifically, depressive symptomatology. This is consistent with prior findings that emotion suppression is often associated with negative psychosocial consequences (e.g., Gross & John, 2003). Third, the results make an important contribution towards building the empirical knowledge base on how race and culture may moderate the relation between emotion regulation and psychological adjustment. The finding that anger suppression was less detrimental vis-à-vis depressive symptoms among individuals who were highly interdependent is similar to that of a prior study (Butler et al., 2007) which indicated that the negative consequences of expressive suppression in social interactions was reduced for women who held bicultural Asian-European values. In addition, the relation between anger regulation and adolescents' adjustment problems has also been found to be moderated by self-construal (Park & Kim, 2009). The current study is noteworthy because it is the first to

show cultural moderation of the emotion suppression—outcome link with regard to depressive symptoms among college students.

Methodologically, the study addressed some gaps in the current emotion regulation literature. Given prior recommendations (e.g., John & Gross, 2004), we closely examined the regulation of one discrete emotion (namely, anger) rather than studying emotion regulation in a global manner. The focus on anger was also advantageous from a cultural perspective, in that this emotion has demonstrated great variability across cultures in terms of psychological and social impact (Kitayama et al., 2004; Markus & Kitayama, 1991). Very little empirical research in this area has investigated the role of cultural context, and this study was designed to do exactly that. Finally, the study tested mediation and moderation using SEM which captures measurement error and afforded the use of multiple measures for some constructs (e.g., family processes).

Limitations and Future Directions

The present study's findings must be interpreted in light of its limitations which also point to directions for future research. First, the study was cross-sectional in design and thus, neither causality nor direction of effects can be inferred. Future studies should examine the constructs longitudinally to establish their temporal sequence (e.g., D. A. Cole & Maxwell, 2003). Second, given the present sample of undergraduates, it is uncertain the degree to which the family processes construct was salient, since most students did not typically live with their families. At the same time, the significance of family processes in impacting the affective and psychological state of young adults should not be downplayed, as demonstrated in prior studies (e.g., Hwang & Wood, 2009). Third, this college student sample may not be representative of the general population of emerging adults whose educational levels may vary. Future studies should test the generalizability of these results across diverse groups and settings (e.g., community-based and clinical samples, different age ranges, across genders, acculturation levels, other racial/ethnic populations). Fourth, the present study examined cultural influences via self-construal; however, there are numerous ways in which cultural context may be operationalized. Future research should capitalize on other important cultural constructs associated with emotion regulation and its consequences, such as acculturation, face concern (Zane & Yeh, 2002), and power distance (Hofstede, 1980). Finally, the study assessed the variables of interest via self-report, and future research should explore multiple methods of assessment (e.g., behavioral and physiological indicators of emotion suppression).

Implications for Theory, Research, and Clinical Practice

The current findings also point to some implications for theory, research, and clinical practice. The results offer empirical support for Yap et al.'s (2007) model, particularly for the central mediating role of emotion regulation as an important explanatory mechanism linking temperament and family processes with depression. However, the universality of this theoretical model is limited by certain cultural parameters (e.g., levels of interdependent self-construal). With regard to future research then, there are at least two implications. Theory-driven models of emotion regulation should continue to be empirically tested in order to verify or falsify their applicability across diverse populations and settings. At the same time, cultural context must also be thoughtfully considered, and emic dimensions of models should be tested as well. For instance, future research can consider whether and how culture may moderate other linkages in this model. Finally, in terms of practice, clinicians who are engaged in intervention and prevention efforts aimed at reducing depression among college students should consider targeting an individual's emotion regulation strategies as one malleable mechanism that may be associated with depressive symptomatology. Clinicians should also be aware of their clients' self-construals, which may differentially

influence the negative impact of an emotion regulation strategy such as anger suppression on mental health outcomes such as depressive symptoms. More simply put, some emotion regulation strategies may not have as negative an impact on some individuals as others, depending on their self-construal.

In conclusion, the present study integrated etic and emic approaches to test a theoretical model of emotion regulation (Yap et al., 2007) in a sample of Asian American and European American college students. The study findings are one of the first of its kind in testing the cross-cultural applicability of this model. Moreover, the results highlighted the importance of cultural context in demonstrating the moderation of the anger suppression—depression link by interdependent self-construal. Understanding both universal and culture-specific aspects of the role of emotion regulation in the development of depression and other forms of psychopathology will be essential in effective prevention and intervention efforts across diverse populations.

Acknowledgments

The second author was supported in this research in part by the Asian American Center on Disparities Research (National Institute of Mental Health grant: 1P50MH073511-01A2). We would like to thank members of the Culture and Family Processes Lab for assistance in data collection and data entry. We would also like to thank Scott E. Maxwell, Robert Perera, and Ke-Hai Yuan for their statistical consultation.

References

- Anderson JC, Gerbing DW. Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*. 1988; 103:411–423.
- Barnes HL, Olson DH. Parent-adolescent communication and the circumplex model. *Child Development*. 1985; 56:438–447.
- Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. *Archives of General Psychiatry*. 1961; 4:561–571. [PubMed: 13688369]
- Beck AT, Steer RA, Garbin MG. Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review*. 1988; 8(1):77–100.
- Bentler, PM. EQS for windows (version 6.1) [computer software]. Encino, CA: Multivariate Software; 2003.
- Betancourt H, López SR. The study of culture, ethnicity, and race in American psychology. *American Psychologist*. 1993; 48:629–637.
- Bishop GD, Quah S. Reliability and validity of measures of anger/hostility in Singapore: Cook & Medley Ho Scale, STAXI and Buss-Durkee Hostility Inventory. *Personality and Individual Differences*. 1998; 24(6):867–878.
- Bridewell WB, Chang EC. Distinguishing between anxiety, depression, and hostility: Relations to anger-in, anger-out, and anger control. *Personality and Individual Differences*. 1997; 22(4):587–590.
- Brody CL, Haaga DAF, Kirk L, Solomon A. Experiences of anger-in people who have recovered from depression and never-depressed people. *The Journal of Nervous and Mental Disease*. 1999; 187:400–405. [PubMed: 10426459]
- Butler EA, Lee TL, Gross JJ. Emotion regulation and culture: Are the social consequences of emotion suppression culture-specific? *Emotion*. 2007; 7(1):30–48. [PubMed: 17352561]
- Byrne, BM. Basic concepts, applications, and programming. Thousand Oaks, CA: Sage Publications; 1994. Structural equation modeling with EQS and EQS Windows.
- Chao RK. Beyond parental control and authoritarian parenting style: Understanding Chinese parenting through the cultural notion of training. *Child Development*. 1994; 65:1111–1119. [PubMed: 7956468]

- Cole DA, Maxwell SE. Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology*. 2003; 112:558–577. [PubMed: 14674869]
- Cole PM, Martin SE, Dennis TA. Emotion regulation as a scientific construct: Methodological challenges and directions for child development research. *Child Development*. 2004; 75:317–333. [PubMed: 15056186]
- Daley TC. Perceptions and congruence of symptoms and communication among second-generation Cambodian youth and parents: A matched-control design. *Child Psychiatry and Human Development*. 2006; 37:39–53. [PubMed: 16736382]
- Deffenbacher JL, Oetting ER, Thwaites GA, Lynch RS, Baker DA, Stark RS, et al. State-trait anger theory and the utility of the trait anger scale. *Journal of Counseling Psychology*. 1996; 43(2):131–148.
- Ekman, P. Universals and cultural differences in facial expressions of emotion. In: Cole, J., editor. *Nebraska Symposium of Motivation*, 1971. Vol. 19. Lincoln: University of Nebraska Press; 1972.
- Gross JJ. Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology*. 1998; 74(1):224–237. [PubMed: 9457784]
- Gross JJ, John OP. Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*. 2003; 85(2):348–362. [PubMed: 12916575]
- Gross JJ, Levenson RW. Hiding feelings: The acute effects of inhibiting negative and positive emotion. *Journal of Abnormal Psychology*. 1997; 106(1):95–103. [PubMed: 9103721]
- Hofstede, GH. *Culture's consequences: International differences in work-related values*. Beverly Hills, CA: Sage; 1980.
- Hwang W-C, Wood JJ. Acculturative family distancing: Links with self-reported symptomatology among Asian Americans and Latinos. *Child Psychiatry and Human Development*. 2009; 40:123–138. [PubMed: 18663569]
- John OP, Gross JJ. Healthy and unhealthy emotion regulation: Personality processes, individual differences, and lifespan development. *Journal of Personality*. 2004; 72:1301–1334. [PubMed: 15509284]
- Kim BSK, Atkinson DR, Yang PH. The Asian values scale: Development, factor analysis, validation, and reliability. *Journal of Counseling Psychology*. 1999; 46:342–352.
- Kim IJ, Zane NWS. Ethnic and cultural variations in anger regulation and attachment patterns among Korean American and European American male batterers. *Cultural Diversity and Ethnic Minority Psychology*. 2004; 10:151–168. [PubMed: 15099181]
- Kitayama, S.; Karasawa, M.; Mesquita, B. Collective and personal processes in regulating emotions: emotion and self in Japan and the United States. In: Philippot, P.; Feldman, RS., editors. *The regulation of emotion*. Mahwah, NJ, US: Lawrence Erlbaum Associates; 2004. p. 251–273.
- Kline, RB. *Principles and practice of structural equation modeling*. 2nd ed.. New York: Guilford; 2005.
- Kopper BA, Epperson DL. The experience and expression of anger: Relationships with gender, gender role socialization, depression, and mental health functioning. *Journal of Counseling Psychology*. 1996; 43(2):158–165.
- Kwan VSY, Bond MH, Singelis TM. Pancultural explanations for life satisfaction: Adding relationship harmony to self-esteem. *Journal of Personality and Social Psychology*. 1997; 73:1038–1051. [PubMed: 9364759]
- Lee RM, Choe J, Kim G, Ngo V. Construction of the Asian American Family Conflicts Scale. *Journal of Counseling Psychology*. 2000; 47(2):211–222.
- Markus HR, Kitayama S. Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*. 1991; 98(2):224–253.
- Martin RC, Dahlen ER. Anger response styles and reaction to provocation. *Personality and Individual Differences*. 2007; 43(8):2083–2094.

- Matsumoto D. Ethnic differences in affect intensity, emotion judgments, display rule attitudes, and self-reported emotional expression in an American sample. *Motivation and Emotion*. 1993; 17:107–123.
- Matsumoto D, Yoo SH. Toward a new generation of cross-cultural research. *Perspectives on Psychological Science*. 2006; 1:234–250.
- Matsumoto D, Yoo SH, Nakagawa S. Multinational Study of Cultural Display Rules. Culture, emotion regulation, and adjustment. *Journal of Personality and Social Psychology*. 2008; 94(6):925–937. [PubMed: 18505309]
- Mesquita, B.; Albert, D. The cultural regulation of emotions. In: Gross, JJ., editor. *Handbook of emotion regulation*. New York: The Guilford Press; 2007. p. 486-503.
- Mesquita B, Frijda NH. Cultural variations in emotions: A review. *Psychological Bulletin*. 1992; 112:179–204. [PubMed: 1454891]
- Morris AS, Silk JS, Steinberg L, Myers SS, Robinson LR. The role of the family context in the development of emotion regulation. *Social Development*. 2007; 16(2):361–388. [PubMed: 19756175]
- Murray, C.J.L.; Lopez, A.D. *The global burden of disease*. Cambridge, MA: Harvard University Press; 1996.
- Olson, D.; McCubbin, H.I.; Barnes, H.; Larsen, A.; Muxen, M.; Wilson, M. *Family Inventories: Inventories used in a national survey of families across the family life cycle*. Minnesota: Family Social Science Press; 1982.
- Palfai TP, Hart KE. Anger coping styles and perceived social support. *Journal of Social Psychology*. 1997; 137(4):405–411. [PubMed: 9248354]
- Park IJK, Kim PY. Family processes, anger regulation, and adjustment problems in Korean American adolescents: Moderation by self-construal. 2009 Unpublished manuscript.
- Park, IJK.; Kim, SY.; Cheung, RYM.; Kim, M. Family socialization in the development of Asian American child psychopathology. In: Leong, F.; Juang, L.; Qin, DB.; Fitzgerald, HE., editors. *Child Psychology and Mental Health: Cultural and Ethno-Racial Perspectives: Vol 2: Asian American and Pacific Islander Children's Mental Health: Prevention and Treatment*. CA: Praeger/ABC-CLIO; in press
- Parrott DJ, Zeichner A, Evces M. Effect of trait anger on cognitive processing of emotional stimuli. *Journal of General Psychology*. 2005; 132(1):67–80. [PubMed: 15685960]
- Repetti RL, Taylor SE, Seeman TE. Risky families: Family social environments and the mental and physical health of offspring. *Psychological Bulletin*. 2002; 128:330–366. [PubMed: 11931522]
- Sato T, McCann D. Individual differences in relatedness and individuality: An exploration of two constructs. *Personality and Individual Differences*. 1998; 24:847–859.
- Singelis TM. The measurement of independent and interdependent self-construals. *Personality and Social Psychology Bulletin*. 1994; 20:580–591.
- Singelis TM, Sharkey WF. Culture, self-construal, and embarrassability. *Journal of Cross-Cultural Psychology*. 1995; 26:622–644.
- Singelis TM, Triandis HC, Bhawuk DS, Gelfand M. Horizontal and vertical dimensions of individualism and collectivism: A theoretical and measurement refinement. *Cross-Cultural Research*. 1995; 29:240–275.
- Soto JA, Levenson RW, Ebling R. Cultures of moderation and expression: Emotional experience, behavior, and physiology in Chinese Americans and Mexican Americans. *Emotion*. 2005; 5:154–165. [PubMed: 15982081]
- Spielberger, CD. *State-Trait Anger Expression Inventory -2*. Odessa, FL: Psychological Assessment Resource Inc; 1999.
- Tsai J. Ideal affect: Cultural causes and behavioral consequences. *Perspectives on Psychological Science*. 2007; 2:242–259.
- Wolfe MM, Yang PH, Wong EC, Atkinson DR. Design and development of the European American Values Scale for Asian Americans. *Cultural Diversity and Ethnic Minority Psychology*. 20010; 7:274–283. [PubMed: 11506073]

- Yap MBH, Allen NB, Sheeber L. Using an emotion regulation framework to understand the role of temperament and family processes in risk for adolescent depressive disorders. *Clinical Child and Family Psychology*. 2007; 10(2):180–196.
- Zane, N.; Yeh, M. The use of culturally-based variables in assessment: Studies on loss of face. In: Kurasaki, KS.; Okazaki, S.; Sue, S., editors. *Asian American mental health: Assessment theories and methods*. New York: Kluwer Academic/Plenum Publishers; 2002. p. 123-138.

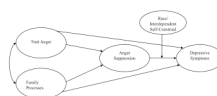


Figure 1.
Hypothesized model of anger suppression and moderating effects of race and cultural orientation.

Table 1

Zero-order Correlations, Means, and Standard Deviations of the Study Variables (N=365)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Gender	-									
(2) Age	-.15 **	-								
(3) Interdependent self-construal	.01	.08	-							
(4) Angry temperament	-.06	.00	-.06	-						
(5) Angry reaction	-.01	-.10	-.12 *	.44 ***	-					
(6) Parent adolescent communication	.02	.02	-.03	-.20 ***	-.24 ***	-				
(7) Family adaptability	-.01	.02	-.03	-.11 *	-.22 ***	.71 ***	-			
(8) Family cohesion	.05	.00	.05	-.16 **	-.18 **	.73 ***	.70 ***	-		
(9) Anger suppression	-.03	-.02	.09	.24 ***	.45 ***	-.45 ***	-.34 ***	-.31 ***	-	
(10) Depressive symptoms	.02	.00	.06	.33 ***	.38 ***	-.27 ***	-.27 ***	-.28 ***	.47 ***	-
<i>M</i>	N/A	19.30	5.15	6.45	9.31	70.83	44.08	60.13	19.13	7.33
<i>SD</i>	N/A	1.27	.64	2.42	2.55	13.23	8.69	10.80	4.40	6.03

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

Table 2

Unstandardized Path Coefficients for Mediation Model By Race and Interdependent Self-Constraint

Model 2.1—Factorial Invariance Parameter Estimates (Structural Model)	Race		Interdependent Self-Constraint	
	AA	EA	Low	High
Covariance				
Trait Anger and Family Processes	−4.95 ** (1.59)	−3.09 ** (1.20)	−4.89 ** (1.61)	−5.15 ** (1.58)
Direct effects				
Trait Anger → Anger Suppression	.20 *** (.05)	.23 *** (.04)	.22 *** (.04)	.21 *** (.05)
Family Processes → Anger Suppression	−.02 *** (.004)	−.01 ** (.004)	−.01 *** (.004)	−.01 ** (.004)
Trait Anger → Depressive Symptoms	.05 (.03)	.02 (.02)	.03 (.03)	.05 * (.02)
Family Processes → Depressive Symptoms	.001 (.002)	−.005 ** (.002)	.00 (.002)	−.003 (.002)
Anger Suppression → Depressive Symptoms	.22 ** (.08)	.23 *** (.06)	.25 ** (.09)	.15 * (.06)
Indirect Effects				
Trait Anger → Depressive Symptoms	.04 * (.02)	.05 *** (.02)	.06 ** (.02)	.03 * (.01)
Family Processes → Depressive Symptoms	−.003 * (.002)	−.002 * (.001)	−.003 * (.001)	−.002 (.001)

Note Standard errors are in parentheses. AA = Asian Americans; EA = European Americans

*
 $p < .05$;

**
 $p < .01$;

 $p < .001$.

Summary Statistics for Models Tested across Asian Americans vs. European Americans

Table 3

Model	χ^2	df	p	CFI	NNFI	RMSEA	$\Delta\chi^2$	Δdf	p
Configural invariance (1.1)	147.28	76	<.001	.96	.94	.07			
Factorial invariance (2.1)	159.68	83	<.001	.96	.94	.07	12.40	7	ns
Path equivalence (3.1)	839.20	84	<.001	.57	.44	.22	679.52	1	<.001

1.1 Baseline model

2.1 All factor loadings constrained to be equal

3.1 Path coefficient from Anger Suppression to Depressive Symptoms constrained to be equal

Table 4
Summary Statistics for Models Tested across Individuals with Low vs. High Interdependent Self-Construct

Model	χ^2	df	p	CFI	NNFI	RMSEA	$\Delta\chi^2$	Δdf	p
Configural invariance (1.1)	130.26	76	<.001	.97	.96	.06			
Factorial invariance (2.1)	132.33	83	<.001	.97	.96	.06	2.07	7	ns
Path equivalence (3.1)	220.71	84	<.001	.92	.90	.10	88.38	1	<.001

1.1 Baseline model

2.1 All factor loadings constrained to be equal

3.1 Path coefficient from Anger Suppression to Depressive Symptoms constrained to be equal