Article

Cultural Factors, Depressive and Somatic Symptoms Among Chinese American and European American College Students

Zornitsa Kalibatseva[1] and Frederick T. L. Leong[2]

Abstract

This study seeks to fill a gap in the existing empirical literature about the relationship between somatic and depressive symptoms and their associations with cultural factors among Chinese American and European American college students. In particular, the study examined how three culturally relevant psychological constructs, self-construal, loss of face, and emotion regulation, associate with depressive and somatic symptoms among Chinese American and European American college students and if they can explain possible group differences in depressive symptoms. The sample consisted of 204 Chinese American and 315 European American college students who completed an online survey. Based on multiple regression analyses, European American students reported higher levels of somatic symptoms on the Patient Health Questionnaire–15 (PHQ-15) than Chinese Americans. There was no initial group difference in depressive symptoms based on Center for Epidemiologic Studies–Depression Scale (CES-D) scores. Correlations between depressive and somatic symptoms, independent and interdependent self-construal, and cognitive reappraisal and independent self-construal were stronger for European Americans than Chinese Americans. Somatic symptoms, loss of face, and expressive suppression were positively associated with depressive symptoms, whereas independent self-construal and cognitive reappraisal were negatively associated with depressive symptoms for both groups. When controlling for gender and somatic symptoms, being Chinese American and male was significantly and positively associated with depressive symptoms measured with the CES-D. These ethnic and gender differences in depressive symptoms were explained by independent self-construal, loss of face, cognitive reappraisal, and expressive suppression. Clinical implications include the incorporation of specific culturally relevant constructs and avoidance of race-, ethnicity-, and gender-based stereotypes to reduce health disparities in depression treatment.

Culture, Depression, and Somatization

Depression is the leading cause of disability worldwide and the single largest contributor to non-fatal health loss (World Health Organization, 2017). Major depressive disorder is among the most

[1]Stockton University, Galloway, NJ, USA
[2]Michigan State University, East Lansing, MI, USA

Corresponding Author:
Zornitsa Kalibatseva, Stockton University, 101 Vera King Farris Drive, H-233, Galloway, NJ 08205, USA.
Email: zornitsa.kalibatseva@stockton.edu

common and taxing psychological disorders on U.S. college campuses (Eisenberg, Hunt, & Speer, 2013). Close to 30% of male and 36% of female college students in the United States reported experiencing one of the main depressive symptoms, "feeling so depressed that it was difficult to function," at least once over the past year (American College Health Association, 2015).

Cultural factors can play an important role in the experience, presentation, diagnosis, and treatment of depressive symptoms (e.g., Chentsova-Dutton & Tsai, 2009; Kirmayer & Jarvis, 2006). Although depression has been found across cultures, cross-cultural presentations of depressive symptoms may vary (Kalibatseva & Leong, 2011; Ryder & Chentsova-Dutton, 2012). In particular, the literature has proposed that somatic symptoms of depression may be more heavily emphasized among non-Western populations resulting in higher rates of somatization compared with Western populations (Kleinman & Good, 1985).

Somatization may be defined in various ways. A widely accepted definition of somatization is the presentation of somatic symptoms in the absence of organic findings or an adequate medical explanation (De Gucht & Fischler, 2002). As an idiom of distress, somatization refers to "complaints about, or the appearance of, physical symptoms such as headaches, stomach pains, inability to concentrate, chronic fatigue, sleep difficulties, loss of sensory functioning, and so on that have a strong psychological basis" (Chun, Enomoto, & Sue, 1996, p. 348). A common pattern proposed in cross-cultural psychopathology is that people of Asian descent somatize psychological distress, and depression, in particular, by reporting high levels of somatic symptoms. Kleinman (1977, 1982) reported that Chinese patients presented with somatic symptoms without reporting depressed mood. However, despite an abundance of theoretically oriented works that propose Asians somatize psychological distress (e.g., Kleinman & Kleinman, 1985; Parker, Gladstone, & Chee, 2001), empirical findings on this topic have been mixed and/or equivocal (Dere et al., 2013; Kalibatseva, Leong, & Ham, 2014; Mak & Zane, 2004; Parker, Cheah, & Roy, 2001; Ryder et al., 2008). Therefore, the first goal of this study is to provide further empirical evaluation for the relationship between depressive and somatic symptoms among Chinese American and European American college students. In particular, based on the theoretical literature, this study hypothesizes that Chinese Americans will somatize by reporting more physical symptoms and more depressive somatic symptoms than European Americans.

In a major review of the literature, Katon, Kleinman, and Rosen (1982) examined the relationship between depression and somatization with an emphasis on the misdiagnosis of depression in primary care as a result of somatization. The authors defined depression as a syndrome that involved mood, vegetative, and cognitive symptoms, and somatization in depressed patients was characterized as "selective perception and focus on the somatic manifestations of depression with denial or minimization of the cognitive changes" (p. 127). Katon et al. (1982) viewed somatization as an expression of social and emotional distress. They identified somatization as a serious issue that primary care physicians encountered because it may lead to misdiagnosis and mistreatment. Moreover, there is significant overlap among depression, anxiety, and somatization, especially in primary care settings (Kroenke, Spitzer, Williams, & Löwe, 2010). Therefore, physicians may be unable to conceptualize a patient's complaints as depression unless the patient perceived and reported affective symptoms (Katon et al., 1982). Thus, the somatization of depression may result in reporting a higher level of physical symptoms in general and depressive somatic symptoms, in particular.

Katon et al. (1982) acknowledged the affective, cognitive, and somatic components of depression and suggested that patients experience symptoms on a dimension, ranging from primarily somatic on one side to mixed somatic and psychological in the middle and primarily psychological on the other side. Similarly, Marsella (1987) proposed to measure depression along five different dimensions: affective, somatic, interpersonal, cognitive, and existential. In addition, Katon et al. suggested a model of depression and somatization, which presented depression as

influenced by culture, past family experience, cognitive coping mechanisms, and social environment (e.g., medical care, work/disability, social network, and sociopolitical system).

Informed by Katon et al.'s (1982) model and the integration of cross-cultural research methods in racial/ethnic minority research (Leong, Leung, & Cheung, 2010), this study builds on the existing literature by moving from group comparisons based on race and ethnicity to incorporating relevant psychological factors that may explain proposed racial and ethnic differences in self-reported symptoms of depression (Betancourt & Lopez, 1993; Helms, Jernigan, & Mascher, 2005; Leong, Park, & Kalibatseva, 2013). Thus, this study identifies and examines three culturally relevant psychological factors that may be related to depressive and somatic symptoms: self-construal, loss of face, and emotion regulation.

Self-Construal

The notion of the self has been central in the field of psychology for over a century (Kitayama, Duffy, & Uchida, 2007). Independent self-construal refers to placing the individual over the group, as individuals seek independence, separateness, and uniqueness from others. Interdependent self-construal refers to prioritizing the group over the individual as individuals try to fit in and maintain the group's harmony (Cross, Hardin, & Gercek-Swing, 2011; Markus & Kitayama, 1991). Given the findings of differences in independence and interdependence in East Asian and Western societies, self-construal is a good candidate to provide a bridge between culture and distress (Marsella, 1985).

Previous findings regarding self-construal and ethnic differences in depression have been mixed. For instance, Mak, Law, and Teng (2011) tested a cultural model of vulnerability to distress, which examined the relationship between interdependent/independent self-construal, sociotropy, anxiety, and depression among Asian American and European American college students. Sociotropy refers to a cognitive style associated with high levels of dependence and excessive need to please others (Mak et al., 2011). The authors found that "interdependent self-construal predisposes a person to develop sociotropy and consequent depression via a heightened level of anxiety" (p. 75). The model was a good fit for both Asian American and European American participants. Conversely, Lam (2005) found that interdependent self-construal was positively associated with family cohesion, which increased the adolescents' self-esteem and resulted in lower scores of depression among Vietnamese American adolescents. The first model (Mak et al., 2011) examined sociotropy as an undesired characteristic in a context of independence, whereas the second model (Lam, 2005) presented family cohesion as a desired attribute in a context of interdependence (the Vietnamese American family unit). Thus, in a context where independence is valued, independent self-construal will be negatively related to depression and interdependent self-construal will be positively related to depression.

In support of this statement, previous studies of U.S. college students showed a positive association between interdependence and depression and a negative association between independence and depression (Norasakkunkit & Kalick, 2002; Okazaki, 1997, 2000, 2002). Thus, it is hypothesized that in the United States, where independence is valued, independent self-construal serves as a protective factor against depression. Conversely, it is hypothesized interdependent self-construal serves as a risk factor for depression in an individualistic society, along with other culturally salient constructs, such as loss of face.

Loss of Face

Following Betancourt and Lopez' (1993) recommendation to deconstruct culture into specific psychological elements that allow the formulation of testable hypotheses, Zane and Yeh (2002) reviewed the construct of face as a candidate to explain ethnic differences in symptom presentation and help-seeking behavior. Face is defined as

a person's set of socially-sanctioned claims concerning one's social character and social integrity in which this set of claims or this "line" is largely defined by certain prescribed roles that one carries out as a member and representative of a group. (Zane & Yeh, 2002, p. 126)

This study focused on loss of face as it has been theorized as an important relational construct, which may negatively affect well-being and help-seeking (Leong, Kim, & Gupta, 2011; Zane & Yeh, 2002). Loss of face (LOF) has a positive association with depressive symptoms and general psychological distress among both Asian Americans and European Americans (Leong, Byrne, Hardin, Zhang, & Chong, 2018). Moreover, losing face may be associated with lower levels of seeking mental health services (Cheang & Davis, 2014). Thus, it is hypothesized that an elevated level of concern with losing face has a positive association with somatic and depressive symptoms.

Emotion Regulation

Another psychological construct that may be associated with mental health is emotional regulation (ER) defined as "the processes by which we influence which emotions we have, when we have them, and how we experience and express them" (Gross, 2002, p. 282). Specifically, Matsumoto and colleagues found cultural differences in two processes of emotion regulation: reappraisal and suppression (Matsumoto, Yoo, & Nakagawa, 2008). Suppression was higher in cultures that valued embeddedness and hierarchy, and lower in cultures that valued affective autonomy and egalitarianism.

Regulating one's affective and behavioral reactions in social situations seems an important prerequisite for maintaining the harmony of interpersonal relationships and group functioning in Asian cultures (Chen & Swartzman, 2001). Whereas sharing one's emotions may be viewed more favorably in Western societies, in some Asian countries the suppression of strong positive or negative emotions may prevail (Chang & Lim, 2007). This may be an important distinction when examining somatic and depressive symptoms because it may suggest that somatizing distress serves a social function in Asian cultures.

Expressive suppression (ES) and cognitive reappraisal (CR) are two ER strategies that have been evaluated with the Emotion Regulation Questionnaire (ERQ, Gross & John, 2003). Research suggests that ES is a maladaptive, response-focused strategy, whereas CR is an adaptive, antecedent-focused strategy (Gross & John, 2003). ES has been positively associated with depressive symptoms and CR has been negatively associated with depressive symptoms (D'Avanzato, Joormann, Siemer, & Gotlib, 2013; Larsen et al., 2013). Yet, most of the research informing these associations was with Western samples and some research with Chinese samples suggested there was no relationship between ES and depressed mood (Soto, Perez, Kim, Lee, & Minnick, 2011). Given the paucity of empirical studies that test directly the relationship between emotion regulation and somatic and depressive symptoms, the current study tries to fill this gap. Based on the previous research in the United States, it is hypothesized that ES will be positively associated and CR will be negatively associated with depressive and somatic symptoms.

Rationale and Hypotheses

To summarize, the current study examines the relationship between self-construal, loss of face, and emotion regulation, and depressive and somatic symptoms among Chinese American and European American students. It seeks to make a contribution to the existing literature in three ways: (a) provide an empirical test of the relationship between depressive and somatic symptoms among Chinese American and European American college students; (b) examine depressive symptoms, somatic symptoms, self-construal, loss of face, and emotion regulation using a comparative framework; and

(c) provide a bridge between group comparisons based on demographic variables and comparisons based on culturally relevant psychological variables (Helms et al., 2005). Thus, the study poses the following hypotheses:

Hypothesis 1: Chinese American students will somatize by reporting more physical symptoms on the PHQ-15 and the Center for Epidemiologic Studies–Depression (CES-D) somatic subscale than European American students.
Hypothesis 2: Interdependent self-construal, loss of face, and expressive suppression will be positively associated with depressive and somatic symptoms and independent self-construal and cognitive reappraisal will be negatively associated across both groups.
Hypothesis 3: Self-construal, loss of face, and emotion regulation will predict depressive symptoms among Chinese American and European American students above and beyond ethnicity as a predictor.

Method

Participants

The sample consisted of 519 participants predominantly from two large Midwestern universities. There were 204 (39.3%) participants who self-identified as Chinese American. Almost two thirds of the Chinese American sample (64.2%, $n = 131$) were female and 35.8% ($n = 73$) were male. The mean age for the Chinese American sample was 20.65 ($SD = 2.95$). There were 315 participants (60.7%) who self-identified as European American. Sixty-two percent ($n = 196$) identified as female and 38% ($n = 120$) as male. The mean age was 19.87 ($SD = 2.88$).

Procedure

Participants were recruited through the university participant pool, targeted emails from the Registrar's Office, campus organizations of Asian American students, and a posting on the listserv of the Asian American Psychological Association. To facilitate the recruitment of Chinese American students at one of the universities, participants received US$10 as an incentive for their participation. At the second university, students voluntarily entered a raffle to win one of eight US$10 gift certificates. Participants read and signed the consent form and took a 30-min online survey in English. The study was approved by the university's institutional review board.

Measures

Demographic questionnaire. Demographic information was collected on age, gender (0 = *male*, 1 = *female*), race (0 = *Chinese American*, 1 = *European American*), class standing, income (rated on a Likert-type scale from 1 to 11, where 1 = US$0 to US$14,999 and 11 = US$105,000 or more), and generational status. The generational status variable had three levels: first generation (being born in another country and having moved to the United States), second generation (one or both of your parents were born in another country), third generation (grandparents born in another country), or later generation (U.S. Census Bureau, 2016).

Center for Epidemiological Studies Depression Scale (CES-D). The CES-D measures the frequency of 20 symptoms of depression over the past week. It uses a 4-point Likert-type scale ranging from 0 (*rarely or none of the time*) to 3 (*most or all of the time*) and higher scores indicate higher levels of depression. The CES-D has four subscales: affective, somatic, positive, and interpersonal (Hales et al., 2006). Sample items include "I felt depressed" (affective), "My appetite was poor"

(somatic), "I was happy" (positive), and "I felt that people disliked me" (interpersonal). The CES-D was chosen instead of the PHQ-9 (Kroenke, Spitzer, & Williams, 2001) to reduce item overlap with the PHQ-15 (Items 14 and 15 in PHQ-15 are the same as Items 3 and 4 in the PHQ-9 assessing fatigue and sleep difficulties). In addition, the CES-D has been frequently used with European American and Asian American college students (Okazaki, 2000) and has detected racial differences in depression scores. Moreover, it demonstrated good internal consistency with coefficient alphas of .90 or above for both community and clinical samples (Radloff, 1977) in the original psychometric studies. The CES-D was reliable and valid in measuring depression in a Chinese American college student sample (Ying, Lee, Tsai, Yeh, & Huang, 2000). In the current study, Cronbach's alpha was .89 for both the Chinese American and European American samples.

Patient Health Questionnaire-15 (PHQ-15). The PHQ-15 is a self-report questionnaire that measures the severity of 15 somatic symptoms over the past 4 weeks (Kroenke, Spitzer, & Williams, 2002). It is a widely used screening instrument for somatization syndromes. The prompt asks, "During the past 4 weeks, how much have you been bothered by any of the following problems" and lists different types of pain (e.g., stomach, back, chest, headache) along with dizziness, shortness of breath, and nausea among others. Each item is scored on a 3-point Likert-type scale from 0 (*not bothered at all*) to 2 (*bothered a lot*). The PHQ-15 has been used successfully in medical settings and family practice clinics to screen for somatization. The items demonstrated good internal consistency of $\alpha = .80$ or higher (Kroenke et al., 2002). It is valid and reliable in assessing somatization in the general population (Kocalevent, Hinz, & Brähler, 2013). The Chinese version was also found reliable and valid (Zhang et al., 2016) but no prior studies were found with Chinese Americans. In this study, the Cronbach's alpha was .74 for the Chinese American sample and .81 for the European American sample.

The Self-Construal Scale (SCS). The SCS (Singelis, 1994) assesses independent and interdependent self-construal. It consists of two scales with 12 items, each rated on a 7-point Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*). A sample Independent item is "I am comfortable with being singled out for praise and rewards." A sample Interdependent item is "I will sacrifice my self-interest for the benefit of the group I am in." Prior research demonstrated adequate validity and reliability with Cronbach's alpha coefficient for the Independent and Interdependent subscales ranging between .69 and .74, respectively (Singelis, 1994). The measure is also reliable and valid in measuring self-construal among Asian American college students (Cheung & Park, 2010; Park et al., 2011). In this study, the Cronbach's alpha coefficients for the Interdependent self-construal subscale were .71 for Chinese Americans and .78 for European Americans. Similarly, the Cronbach's alpha coefficients for the Independent self-construal subscale were .75 for Chinese Americans and .78 for European Americans.

Loss of Face (LOF) Scale. Participants completed the LOF scale (Zane, 2000; Zane & Yeh, 2002) that contains 21 items measuring a person's self-assessment of sensitivity to face loss in different situations. A sample item includes "I try not to do things which call attention to myself." Items are scored on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Total scores may range from 21 to 147, with higher scores indicating greater concerns toward losing face. Cronbach's alpha ranged from .84 to .92, which suggests high internal consistency (Zane & Yeh, 2002). The items demonstrated good internal consistency in the current study for both the Chinese American ($\alpha = .90$) and European American ($\alpha = .88$) samples.

Emotion Regulation Questionnaire (ERQ). This 10-item self-report scale was designed to measure respondents' tendency to regulate their emotions (Gross & John, 2003). It consists of two

subscales that measure CR and ES with both positive and negative tone items. Some sample items include "When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about" (CR), "When I want to feel more negative emotion (such as sadness or anger), I change what I am thinking about" (CR), and "I keep my emotions to myself" (ES). Respondents score items on a 7-point Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The scale was valid in measuring emotion regulation and Cronbach's alpha coefficients ranged from .68 to .76 in the original study (Gross & John, 2003). The four samples in the original validation studies were racially and ethnically diverse ranging from 28% to 56% European American, 24% to 41% Asian American, 9% to 16% Latino, and 2% to 5% African American (Gross & John, 2003). The scale was also validated with East Asian American samples (Eng, 2012). Alpha coefficients in the current study for CR and ES were .86 and .76 for Chinese Americans and .86 and .79 for European Americans, respectively.

Results

Demographics, descriptives, and group comparisons for the Chinese American and European American samples are presented in Table 1. The mean CES-D scores seem consistent with other college student samples (e.g., Herman et al., 2011) but lower than community-dwelling Chinese American samples (Li & Hicks, 2010; Ying, 1988). Using Radloff's (1991) proposed CES-D cutoffs of 16 or higher, 29.3% of European Americans and 31.2% of Chinese Americans reported mild to moderate depressive symptoms.

Based on independent *t* tests and chi-square tests, the two samples differed in generation status, age, class standing, and income (see Table 1). Whereas the two samples were comparable in terms of gender distribution, there were gender differences in one of the outcome variables. In particular, women ($M = 6.19$, $SD = 4.08$) had higher levels of somatic symptoms on the PHQ-15 than men, $M = 4.03$; $SD = 3.92$; $t(516) = -5.93$, $p < .001$, consistent with previous research (Kroenke & Spitzer, 1998). There was no ethnic difference in depressive symptoms on the CES-D alone. To disentangle the role of gender and ethnicity on the outcome variables further, a 2×2 MANOVA examined the effects of gender and ethnicity on somatic symptoms (PHQ-15) and depressive symptoms (CES-D) together (Table 2). Results revealed significant main effects for gender and ethnicity and a significant interaction (Gender $\times$ Ethnicity) for somatic symptoms (PHQ-15) and depressive symptoms (CES-D). In particular, post hoc Tukey tests showed that European American females reported higher somatic symptom (PHQ-15) scores than any of the other three groups ($p < .01$). Chinese American males reported the highest CES-D scores compared with the other three groups. However, post hoc Tukey tests revealed that this difference did not reach statistical significance ($p = .057$). Generational status was not controlled because the study proposed to test the incremental value of ethnicity as a demographic predictor along with culturally relevant predictors in Hypothesis 3.[1]

Hypothesis 1 was tested with multiple regressions controlling for gender, age, class, and income. The results revealed that European Americans reported higher somatic symptom (PHQ-15) scores than Chinese Americans (Table 3) and there was no difference in total CES-D scores or the somatic depressive CES-D subscales (Tables 4 and 5). The subscale CES-D analyses were performed because of possible response style bias on the CES-D positive subscale (e.g., Li & Hicks, 2010). Indeed, there was a significant difference in the CES-D positive subscale with Chinese Americans reporting higher scores than European Americans after the items were reverse-coded.

For Hypothesis 2, Pearson's correlations for each sample and comparisons using Fisher *r*-to-*z* transformation and two-tailed significance tests (Meng, Rosenthal, & Rubin, 1992) showed that four correlations significantly differed between the two samples (see Table 6). In particular, the relationship between (a) depressive and somatic symptoms, (b) independent and interdependent

Table 1. Demographics, Descriptives, and Group Comparisons.

Variable	Chinese American M (SD) or %	European American M (SD) or %	t(df), F(df) or χ²	d	p
Gender					
Male	35.8%	38%	.28	—	.643
Female	64.2%	62%			
Generation					
First	30.1%	3.9%	325.20	—	<.001**
Second	62.1%	6.8%			
Third and later	7.8%	89.3%			
Age	20.65 (2.95)	19.87 (2.87)	−2.98 (511)	.27	.003**
Class standing	2.84 (1.45)	2.44 (1.12)	−3.53 (517)	.31	<.001**
Income	7.21 (3.58)	8.42 (2.75)	4.26 (501)	.38	<.001**
CES-D Total	14.01 (8.72)	13.62 (8.73)	−.48 (514)	.04	.63
Male	15.65 (10.09)	13.32 (9.04)	1.50 (3,512)		.22
Female	13.09 (7.74)	13.81 (8.56)			
CES-D Som	5.56 (3.40)	5.71 (3.46)	.96 (504)	.04	.63
CES-D Aff	3.57 (3.50)	3.49 (3.49)	−.28 (505)	.02	.78
CES-D Pos	4.22 (2.70)	3.59 (2.59)	−2.64	.24	<.001**
CES-D Int	.76 (1.17)	.86 (1.15)	.93	.09	.35
PHQ-15	4.63 (3.58)	5.87 (4.42)	3.43 (516)	.31	.001**
Male	3.88 (3.54)	4.12 (4.15)	18.14 (3,514)		<.001**
Female	5.05 (3.55)	6.95 (4.24)			
SCS-Inter	60.45 (8.18)	59.26 (8.94)	−1.52 (515)	.14	.13
SCS-Indep	57.83 (9.62)	58.06 (9.67)	.26 (516)	.02	.79
LOF	95.67 (18.77)	92.63 (16.20)	−1.96 (515)	.17	.05*
CR	29.26 (6.53)	29.80 (5.87)	.98 (517)	.09	.33
ES	16.14 (5.04)	15.33 (5.04)	−1.79 (517)	.16	.07

Note. CES-D = Center for Epidemiological Studies–Depression; CES-D Som = CES-D somatic; CES-D Aff = CES-D affective; CES-D Pos = CES-D positive; CES-D Int = CES-D interpersonal; PHQ-15 = Patient Health Questionnaire–15; SCS-Inter = Self-Construal Scale–Interdependent; SCS-Indep = Self-Construal Scale–Independent; LOF = loss of face; CR = cognitive reappraisal; ES = expressive suppression.
*p ≤. 05. **p ≤ .01.

Table 2. 2 × 2 MANOVA Results of Ethnicity and Gender as Predictors of Depressive (CES-D) and Somatic (PHQ-15) Symptoms.

Variable	Wilks' Λ	F	df	p	Partial η²
Ethnicity	.97	7.32	2, 510	.001	.03
Gender	.92	22.66	2, 510	.001	.08
Ethnicity × Gender	.99	3.18	2, 510	.04	.01

Note. CES-D = Center for Epidemiologic Studies–Depression Scale; PHQ-15 = Patient Health Questionnaire–15.

self-construal, and (c) CR and independent self-construal were stronger among European Americans and the relationships between loss of face and ES was stronger among Chinese Americans.

To test Hypothesis 3, a hierarchical linear regression was used with demographics (gender, age, class, and income) and ethnicity entered in Step 1, somatic symptoms in Step 2, and self-construal,

Table 3. Multiple Regression Results of Ethnicity Predicting Somatic Symptoms (PHQ-15) Controlling for Demographic Variables.

Variable	B	SE	β	t	p
Gender	−2.40	.37	−.28	−6.42	<.001**
Age	−.02	.08	−.01	−.19	.85
Class standing	−.10	.19	−.03	−.55	.58
Income	.01	.06	.01	.09	.93
Ethnicity	1.13	.38	.13	2.97	.003**

Note. $R^2 = .098$, $F(5, 491) = 10.847$, $p < .001$. Ethnicity: *Chinese American* = 0; *European American* = 1. PHQ-15 = Patient Health Questionnaire–15.

Table 4. Multiple Regression Results of Ethnicity Predicting Depressive Symptoms (CES-D) Controlling for Demographic Variables.

Variable	B	SE	β	t	p
Gender	.46	.82	.03	.56	.58
Age	.04	.18	.01	.23	.82
Class standing	−.30	.41	−.04	−.74	.46
Income	.01	.13	.01	.09	.93
Ethnicity	−.49	.84	−.03	−.59	.56

Note. $R^2 = .003$, $F(5, 489) = .257$, $p = .937$. Ethnicity: *Chinese American* = 0; *European American* = 1. CES-D = Center for Epidemiologic Studies Depression–Scale.

Table 5. Multiple Regression Results of Ethnicity Predicting Somatic Depressive Symptoms (CES-D Somatic Subscale) Controlling for Demographic Variables.

Variable	B	SE	β	t	p
Gender	−.31	.33	−.04	−.96	.34
Age	−.07	.07	−.06	−.95	.34
Class standing	−.04	.16	−.02	−.27	.79
Income	.01	.05	.01	.14	.89
Ethnicity	−.06	.33	−.01	−.17	.86

Note. $R^2 = .006$, $F(5, 485) = .604$, $p = .697$. Ethnicity: *Chinese American* = 0; *European American* = 1. CES-D = Center for Epidemiologic Studies–Depression Scale.

loss of face, and emotion regulation in Step 3. Table 7 shows the results, indicating that the predictors explained 31.8% of the variance in depressive symptoms. Somatic symptoms, loss of face, and ES were positively associated with depressive symptoms, whereas independent self-construal and cognitive reappraisal were negatively associated with depression. Ethnicity and gender predicted depressive symptoms in Step 2 but this was no longer the case when the psychological constructs (i.e., self-construal, loss of face, and emotion regulation) were added in Step 3.[2]

Discussion

This study examined the association of self-construal, loss of face, and emotion regulation with depressive and somatic symptoms among Chinese American and European American college students. The study's first goal was to investigate further whether Chinese Americans were likely to somatize distress by reporting more somatic symptoms in general and more somatic

Table 6. Correlations of the Main Measures for the Chinese American Sample (Above the Diagonal) and European American Sample (Below the Diagonal).

	CES-D	PHQ-15	SCS Inter	SCS Ind	LOF	CR	ES
CES-D	I	.30**a	−.09	−.40**	.25**	−.21**	.24**
PHQ-15	.47**a	I	.02	−.07	.04	−.02	−.04
SCS Inter	−.15*	.02	I	.20**b	.29**	.23**	.08
SCS Ind	−.25**	−.07	.52**b	I	−.27**	.26**c	−.16*
LOF	.19**	.16**	.29**	−.11	I	.14*	.46**d
CR	−.18**	−.06	.34**	.45**c	.11*	I	.14*
ES	.22**	−.04	−.03	−.07	.30**d	.11*	I

Note. CES-D = Center for Epidemiologic Studies–Depression Scale; PHQ-15 = Patient Health Questionnaire–15; SCS-Inter = Self-Construal Scale–Interdependent; SCS-Ind = Self-Construal Scale–Independent; LOF = loss of face; CR = cognitive reappraisal; ES = expressive suppression.
Fisher *r*-to-*z* transformations:
[a]CESD and PHQ15, $z = -2.21$, $p = .027$.
[b]SCS Independent and SCS Interdependent, $z = -4.04$, $p < .001$.
[c]Cognitive Reappraisal and SCS Independent, $z = -2.34$, $p = .0193$.
[d]Loss of Face and Expressive Suppression, $z = 2.15$, $p = .0316$.
*p ≤. 05. **p ≤ .01.

Table 7. Hierarchical Linear Regression Predicting Depressive Symptoms (CES-D).

	Step 1		Step 2		Step 3	
Predictor	B (SE)	β	B (SE)	β	B (SE)	β
Gender	−.42 (.83)	−.02	−2.67 (.78)**	.15**	−1.08 (.76)	−.06
Age	.04 (.18)	.02	0.06 (.16)	.02	0.14 (.15)	.05
Class	−.32 (.41)	−.05	−0.20 (.37)	−.03	−0.36 (.35)	−.05
Income	.02 (.13)	.01	0.02 (.12)	.01	0.05 (.11)	.02
Ethnicity	−.50 (.84)	−.03	−1.62 (.77)*	−.09*	−0.91 (.72)	−.05
PHQ-15			0.95 (.09)**	.45**	0.86 (.08)**	.41**
SCS-Inter					−0.05 (.05)	−.05
SCS-Indep					−0.15 (.04)**	−.17**
LOF					0.05 (.02)*	.11*
CR					−0.18 (.06)**	−.13**
ES					0.35 (.08)**	.20**

Note. Step 1: $R^2 = .003$, $F(5, 484) = .26$ (*ns*); Step 2: $\Delta R^2 = .187$, $F(6, 483) = 18.50$**; Step 3: $\Delta R^2 = .131$, $F(11, 478) = 20.27$**. Ethnicity: *Chinese American* = 0; *European American* = 1. Gender: *male* = 0; *female* = 1. CES-D = Center for Epidemiologic Studies–Depression Scale; PHQ-15 = Patient Questionnaire Health-15; SCS-Inter = Self-Construal Scale–Interdependent; SCS-Ind = Self-Construal Scale–Independent; LOF = loss of face; CR = cognitive reappraisal; ES = expressive suppression.
*p ≤. 05. **p ≤ .01.

depressive symptoms in particular compared with European Americans. There was no evidence that somatization defined in this way was more prominent among Chinese American college students. These findings go against the proposition that Chinese Americans may somatize distress more than European Americans by reporting somatic symptoms in place of affective depressive symptoms. The present results are consistent with the relatively scarce literature that Chinese Americans are not more likely to report higher levels of somatic complaints than European Americans (Mak & Zane, 2004; Ryder et al., 2008). In fact, in the current study, identifying as European American and female was associated with more somatic complaints. It is important to

note that Chinese Americans reported lower levels of positive affect than European Americans, which has previously been discussed as a potential explanation for elevated CES-D scores for this group (Li & Hicks, 2010; Ying, 1988). Yet, in this study, there was no difference in overall depressive symptom scores.

The second goal of the study was to examine three psychological constructs—self-construal, loss of face, and emotion regulation—and their relationship with depressive and somatic symptoms among Chinese American and European American college students. Only loss of face was endorsed more strongly by Chinese American college students compared with European American college students and this difference had a small effect size ($d = .17$). Although ES had a similar effect size ($d = .16$) and the Chinese American sample endorsed it at a higher level than the European American sample, this difference did not reach statistical significance ($p = .07$).

Correlations among the tested variables were largely similar. Significance testing showed there were four correlation coefficients that were significantly different between the two samples. First, the relationship between depressive and somatic symptoms was stronger among European Americans ($r = .47$) than Chinese Americans ($r = .30$). This correlation further supported our finding that Chinese Americans did not somatize more than European Americans. One possible explanation is that European Americans in this sample actually have more physical complaints along with depressive symptoms compared with Chinese Americans, which goes against the existing literature on Asian somatization of depression (e.g., Kleinman & Kleinman, 1985). A less plausible alternative explanation could be that Chinese Americans are underreporting symptoms of depression at the expense of somatic symptoms, which results in a weaker correlation (Kleinman, 1977, 1982). The latter explanation seems less likely as Chinese Americans reported similar levels of depressive symptoms as European Americans. Yet, the samples of this study consisted of college students, whereas previous research on somatization examined patients in primary care and psychiatric settings (Katon et al., 1982).

Interestingly, whereas CES-D was significantly related to all of the psychological construct variables among European Americans and almost all (except interdependent self-construal) among Chinese Americans, PHQ-15 was not. The observed patterns suggest that depression as a psychological construct is indeed associated with self-construal, loss of face, and emotion regulation, whereas somatic complaints have little or no relationship with those. As predicted, independent self-construal and cognitive reappraisal were negatively associated with depression and loss of face and ES were positively associated with depression. However, interdependent self-construal was negatively related to depression among European Americans and there was no relationship among Chinese Americans contrary to the hypothesis. Similarly, somatic symptoms were unrelated to any of the measures (except loss of face for European Americans). Thus, Hypothesis 2 was only partially supported.

A secondary goal of the study was to compare the interconstruct relationships between samples. Whereas most of the correlations were similar for the two groups, one difference was that independent and interdependent self-construal correlated more strongly in European Americans ($r = .52$) than Chinese Americans ($r = .20$). This finding suggests that there may be a different relationship between the two types of self-construal, such that European Americans may not differentiate between the two or do not find them conflicting in the same way Chinese Americans might. However, for Chinese Americans, independent and interdependent self-construal may be less connected and more differentiated (Markus & Kitayama, 1991).

Furthermore, there was a stronger relationship between cognitive reappraisal and independent self-construal among European Americans and a stronger relationship between loss of face and ES among Chinese Americans. These findings may indicate that emotion regulation strategies, such as reinterpreting the meaning of emotion stimuli and suppressing emotions have different associations with how one defines oneself and protects oneself from losing respect and status in one's group. Previous research found that Asian Americans may rely on emotional suppression to

regulate negative emotions (Matsumoto et al., 2008). Moreover, another study showed that Asian Americans were "culturally trained" to suppress emotions by revealing a decrease in parietal late positive potential in comparison with European Americans (Murata, Moser, & Kitayama, 2013).

The third goal of the study was to explore possible ethnic differences in depressive and somatic symptoms that can be explained by culturally relevant psychological constructs. Several previous studies found that Asian American college students reported higher depression scores than European American college students (e.g., Okazaki, 1997; Young, Fang, & Zisook, 2010). Still, a few studies did not find such differences (e.g., Hardin & Leong, 2005; Yen, Robins, & Lin, 2000). Initially, this study did not replicate depression score differences. One possibility is that the sample for this study was unusual in that it was relatively less depressed than other college samples based on the CES-D average scores. In addition, it is possible that the higher physical distress of European Americans compared with Chinese Americans masked a potential difference in depression. The results further support this proposition as European American females reported higher mean scores on several of the somatic CES-D items as well as the PHQ-15. A hierarchical regression analysis revealed that when somatic symptoms were accounted for, a difference in depressive symptoms was evident with Chinese Americans scoring higher than European Americans. This ethnic difference disappeared in the third step after self-construal, loss of face, and emotion regulation were added. Gender and ethnicity were no longer significant predictors of depressive symptoms in Step 3, suggesting that the culturally relevant variables explained existing demographic differences.

Gender, ethnicity, and their interaction played an important role on somatic and depressive symptoms among Chinese American and European American college students. In particular, this study found that European American females reported the highest levels of somatic symptoms compared with all other groups. There was also a significant interaction of gender and ethnicity in depressive symptoms. This interaction needs to be interpreted with caution and further research is needed.

This study contributes to the existing literature on culture, depression, and somatization in several ways. First, it adds to the mounting empirical evidence that Chinese Americans may not report more somatic symptoms than European Americans in an attempt to mask depression. As the Chinese somatization of depression may have gained popularity in the psychopathology literature as a cross-cultural phenomenon mostly based on research with primary care and psychiatric patients in China (Kleinman, 1977, 1982; Parker et al., 2001), it is important to accumulate a body of empirical literature that tests this hypothesized phenomenon with other samples. Further empirical tests with various methodology may help to understand the overlap and distinction between depressive and somatic symptoms. Second, the study addresses the issue of ethnic gloss by examining a specific ethnic group, Chinese Americans, and not a mixed group of Asian Americans from different ethnic subgroups (Trimble & Dickson, 2005). Third, this is among the first studies to use a comparative framework to examine the culturally relevant factors of self-construal, loss of face, and emotion regulation among Chinese Americans and European Americans. Fourth, building upon the comparative framework and the disentangling approach, this study combines cross-cultural and racial and ethnic psychology methodology to examine how culturally salient variables explain racial and ethnic group differences (Helms et al., 2005; Leong et al., 2013). In particular, the study found that ethnic and gender differences in depression were explained by physical symptoms, independent self-construal, loss of face, cognitive reappraisal, and expressive suppression.

Clinical Implications

This study's findings suggest that health professionals need to pay attention to specific culturally relevant constructs and refrain from using stereotypes (e.g., people of Chinese descent somatize) based on ethnicity, gender, or other demographic variables. Specifically, loss of face and emotion suppression may be important constructs to assess during the initial interview for depressed

clients of any racial and ethnic background or gender. Moreover, independent self-construal and cognitive reappraisal were negatively associated with depression for both groups. It is possible that they serve as effective coping strategies or protective factors due to the emphasis on independence in a mainstream American context. At the same time, health professionals need to avoid overpathologizing expressive suppression, as it may be a culturally appropriate coping strategy in other cultural contexts (Yuan, Liu, Ding, & Yang, 2013).

Limitations and Future Directions

This study has a few shortcomings with implications for the generalizability and interpretations of the findings. First, the sample consisted of college students from two large Midwestern universities. Thus, the results may be more relevant to European and Chinese American college students in the Midwest and caution is required before making generalizations to other populations. Future research can address this issue by examining depression and culturally relevant variables in a nationally representative sample of a number of Asian American ethnic groups. Second, the set of culturally relevant psychological variables tested in this study explained 34% of the variance in depressive symptoms. Although these variables explain a good portion of variance in depressive symptoms, future studies need to focus on additional culturally relevant psychological variables to expand our understanding of cultural influences on depression. Another limitation is the use of self-report measures for all of the assessed variables. The use of mixed methods (i.e., qualitative and quantitative methods) may address this limitation. Finally, whereas it was found that Chinese Americans did not somatize as much as European Americans, future research will need to examine a possible moderation by acculturation such that it is the low acculturation Chinese Americans who may have a higher somatization tendency. This study did not collect information on acculturation and although there was generation status data, there were no differences between generations in depression and somatization.

In conclusion, this study contributes to a growing literature on depression and somatization among Chinese American and European American college students. There was no evidence for somatization among Chinese Americans and ethnic differences in depressive symptoms appeared only after controlling for somatic symptoms and gender. However, these differences were explained by culturally salient variables for Chinese Americans and European Americans and ethnicity was no longer a significant predictor of depressive symptoms. Independent self-construal and cognitive reappraisal predicted lower depressive symptom scores, whereas loss of face and expressive suppression predicted higher depressive symptom scores among Chinese American and European American college students.

Declaration of Conflicting Interests

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Notes

1. When generational status was examined as a predictor of depressive (Center for Epidemiologic Studies–Depression Scale [CES-D]) and somatic (Patient Health Questionnaire-15 [PHQ-15]) symptoms among the Chinese American participants only in a MANOVA, there were no statistically significant differences, $F(4, 372) = 1.18$, $p = .32$; Wilks's $\Lambda = .98$, partial $\eta^2 = .01$.

2. The hierarchical regression was also performed with CES-D without including the positive affect sub-scale as it has been problematic with Chinese and Chinese American participants. The results were similar to those reported in Table 7: Step 1: $R^2 = .004$, $F(5, 466) = .38$ (*ns*); Step 2: $\Delta R^2 = .19$, $F(6, 465) = 18.99^{**}$; Step 3: $\Delta R^2 = .09$, $F(11, 460) = 16.68^{**}$.

References

American College Health Association. (2015). *American College Health Association-National College Health Assessment II: Reference group executive summary Spring 2015*. Hanover, MD: Author.

Betancourt, H., & Lopez, S. R. (1993). The study of culture, ethnicity, and race in American psychology. *American Psychologist*, *48*, 629-637. doi:10.1037/0003-066X.48.6.629

Chang, W. C., & Lim, L. L. (2007). Resilience and well-being in an Asian context—Singapore. *Journal of Psychology in Chinese Societies*, *8*, 47-69.

Cheang, S. I., & Davis, J. M. (2014). Influences of face, stigma, and psychological symptoms on help-seeking attitudes in Macao. *PsyCh Journal*, *3*, 222-230. doi:10.1002/pchj.61

Chen, X., & Swartzman, L. C. (2001). Health beliefs and experiences in Asian cultures. In S. Kazarian & D. Evans (Eds.), *Handbook of cultural health psychology* (pp. 389-410). San Diego, CA: Academic Press.

Chentsova-Dutton, Y. E., & Tsai, J. L. (2009). Understanding depression across cultures. In I. H. Gotlib & C. L. Hammen (Eds.), *Handbook of depression* (2nd ed., pp. 363-385). New York, NY: Guilford Press.

Cheung, R. Y. M., & Park, I. J. (2010). Anger suppression, interdependent self-construal, and depression among Asian American and European American college students. *Cultural Diversity & Ethnic Minority Psychology*, *16*, 517-525.

Chun, C., Enomoto, K., & Sue, S. (1996). Health care issues among Asian Americans: Implications of somatization. In P. M. Kato & T. Mann (Eds.), *Handbook of diversity issues in health psychology* (pp. 347-365). New York, NY: Plenum Press.

Cross, S. E., Hardin, E. E., & Gercek-Swing, B. (2011). The what, how, why, and where in self-construal. *Personality and Social Psychology Review*, *15*, 142-179. doi:10.1177/1088868310373752

D'Avanzato, C., Joormann, J., Siemer, M., & Gotlib, I. H. (2013). Emotion regulation in depression and anxiety: Examining diagnostic specificity and stability of strategy use. *Cognitive Therapy Research*, *37*, 968-980. doi:10.1007/s10608-013-9537-0

De Gucht, V., & Fischler, B. (2002). Somatization: A critical review of conceptual and methodological issues. *Psychosomatics*, *43*, 1-9.

Dere, J., Sun, J., Zhao, Y., Perssons, T. J., Zhu, X., Yao, S., . . . Ryder, A. G. (2013). Beyond "somatization" and "psychologization": Symptom-level variation in depressed Han Chinese and Euro-Canadian outpatients. *Frontiers in Psychology*, *4*, Article 377. doi:10.3389/fpsyg.2013.00377

Eisenberg, D., Hunt, J., & Speer, N. (2013). Mental health in American colleges and universities: Variation across student subgroups and across campuses. *The Journal of Nervous and Mental Disease*, *201*, 60-67. doi: 10.1097/NMD.0b013e31827ab077

Eng, J. S. (2012). *Emotion regulation and culture: The effects of cultural models of self on Western and East Asian differences in suppression and reappraisal* (Doctoral dissertation). Retrieved from http://escholarship.org/uc/item/3fg3k1p0

Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology*, *39*, 281-291. doi:10.1017/S0048577201393198

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. doi:10.1037/0022-3514.85.2.348

Hales, D. P., Dishman, R. K., Motl, R. W., Addy, C. L., Pfeiffer, K. A., & Pate, R. R. (2006). Factorial validity and invariance of the Center for Epidemiologic Studies–Depression (CES-D) scale in a sample of Black and White adolescent girls. *Ethnicity & Disease*, *16*, 1-8.

Hardin, E. E., & Leong, F. T. L. (2005). Optimism and pessimism as mediators of the relations between self-discrepancies and distress among Asian and European Americans. *Journal of Counseling Psychology*, *52*, 25-35. doi:10.1037/0022-0167.52.1.25

Helms, J. E., Jernigan, M., & Mascher, J. (2005). The meaning of race in psychology and how to change it: A methodological perspective. *American Psychologist*, *60*, 27-36. doi:10.1037/0003-066X.60.1.27

Herman, S., Archambeau, O. G., Deliramich, A. N., Kim, B. S. K., Chiu, P., & Frueh, C. (2011). Depressive symptoms and mental health treatment in an ethnoracially diverse college student sample. *Journal of American College Health*, *59*, 715-720.

Kalibatseva, Z., & Leong, F. T. L. (2011). Depression among Asian Americans: Review and recommendations. *Depression Research and Treatment*, *2011*, Article ID 320902. doi:10.1155/2011/320902

Kalibatseva, Z., Leong, F. T. L., & Ham, E. H. (2014). A symptom profile of depression among Asian Americans: Is there evidence for differential item functioning of depressive symptoms? *Psychological Medicine*, *44*, 2567-2578. doi:10.1017/S0033291714000130

Katon, W., Kleinman, A., & Rosen, G. (1982). Depression and somatization: A review, Part I. *The American Journal of Medicine*, *72*, 127-135.

Kirmayer, L. J., & Jarvis, G. E. (2006). Depression across cultures. In D. J. Stein, D. J. Kupfer, & A. F. Schatzberg (Eds.), *The American Psychiatric Publishing textbook of mood disorders* (pp. 699-715). Arlington, VA: American Psychiatric Publishing.

Kitayama, S., Duffy, S., & Uchida, Y. (2007). Self as a cultural mode of being. In S. Kitayama & D. Cohen (Eds.), *Handbook of cultural psychology* (pp. 136-174). New York, NY: Guilford Press.

Kleinman, A. (1977). Depression, somatization and the new cross-cultural psychiatry. *Social Science & Medicine*, *11*, 3-19. doi:10.1016/0037-7856(77)90138-X

Kleinman, A. (1982). Neurasthenia and depression: A study of somatization and culture in China. *Culture, Medicine, and Psychiatry*, *6*, 117-190.

Kleinman, A., & Good, B. (1985). *Culture and depression*. Berkeley: University of California Press.

Kleinman, A., & Kleinman, J. (1985). Somatization: The interconnections in Chinese society among culture, depressive experiences, and the meanings of pain. In A. Kleinman & B. Good (Eds.), *Culture and depression* (pp. 429-480). Berkeley: University of California Press.

Kocalevent, R., Hinz, A., & Brähler, E. (2013). Standardization of a screening instrument (PHQ-15) for somatization syndromes in the general population. *BMC Psychiatry*, *13*, Article 91. doi:10.1186/1471-244X-13-91

Kroenke, K., & Spitzer, R. L. (1998). Gender differences in the reporting of physical and somatoform symptoms. *Psychosomatic Medicine*, *60*, 150-155.

Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, *16*, 606-613.

Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2002). The PHQ-15: Validity of a new measure for evaluating the severity of somatic symptoms. *Psychosomatic Medicine*, *64*, 258-266.

Kroenke, K., Spitzer, R. L., Williams, J. B. W., & Löwe, B. (2010). The Patient Health Questionnaire Somatic, Anxiety, and Depressive Symptom Scale: A systematic review. *General Hospital Psychiatry*, *32*, 345-359. doi:10.1016/j.genhosppsych.2010.03.006

Lam, B. T. (2005). Self-construal and depression among Vietnamese-American adolescents. *International Journal of Intercultural Relations*, *29*, 239-250. doi:10.1016/j.ijintrel.2005.05.007

Larsen, J. K., Vermulst, A. A., Geenen, R., van Middendorp, H., English, T., Gross, J. J., . . . Engels, R. (2013). Emotion regulation in adolescence a prospective study of expressive suppression and depressive symptoms. *Journal of Early Adolescence*, *33*, 184-200. doi:10.1177/0272431611432712

Leong, F. T. L., Byrne, B. M., Hardin, E. E., Zhang, H., & Chong, S. (2018). A psychometric evaluation of the Loss of Face Scale. *Psychological Assessment*, *30*, 396-409. doi:10.1037/pas0000492

Leong, F. T. L., Kim, H. H. W., & Gupta, A. (2011). Attitudes toward professional counseling among Asian American college students: Acculturation, concept of mental illness, and loss of face. *Asian American Journal of Psychology*, *2*, 140-153.

Leong, F. T. L., Leung, K., & Cheung, F. M. (2010). Integrating cross-cultural psychology research methods into ethnic minority psychology. *Cultural Diversity & Ethnic Minority Psychology*, *16*, 590-597. doi:10.1037/a0020127

Leong, F. T. L., Park, Y. S., & Kalibatseva, Z. (2013). Disentangling immigrant status in mental health: Psychological protective and risk factors among Latino and Asian American immigrants using the NLAAS. *American Journal of Orthopsychiatry*, *83*, 361-371. doi:10.1111/ajop.12020

Li, Z., & Hicks, M. H. (2010). The CES-D in Chinese American women: Construct validity, diagnostic validity for major depression, and cultural response bias. *Psychiatry Research*, *175*, 227-232.

Mak, W. W. S., Law, R. W., & Teng, Y. (2011). Cultural model of vulnerability to distress: The role of self-construal and sociotropy on anxiety and depression among Asian Americans and European Americans. *Journal of Cross-Cultural Psychology*, *42*, 75-88. doi:10.1177/0022022110361713

Mak, W. W. S., & Zane, N. W. S. (2004). The phenomenon of somatization among community Chinese Americans. *Social Psychiatry and Psychiatric Epidemiology*, *39*, 967-974. doi:10.1007/s00127-004-0827-4

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, *98*, 224-253.

Marsella, A. J. (1985). Culture, self, and mental disorder. In A. J. Marsella, G. DeVos, & F. L. K. Hsu (Eds.), *Culture and self: Asian and Western perspectives* (pp. 281-307). New York, NY: Tavistock.

Marsella, A. J. (1987). The measurement of depressive experience and disorder across cultures. In A. J. Marsella, R. M. A. Hirschfeld, & M. M. Katz (Eds.), *The measurement of depression* (pp. 376-397). New York, NY: Guilford Press.

Matsumoto, D., Yoo, S. H., & Nakagawa, S. (2008). Culture, emotion regulation, and adjustment. *Journal of Personality and Social Psychology*, *94*, 925-937.

Meng, X.-L., Rosenthal, R., & Rubin, D. B. (1992). Comparing correlated correlation coefficients. *Psychological Bulletin*, *111*, 172-175.

Murata, A., Moser, J. S., & Kitayama, S. (2013). Culture shapes electrocortical responses during emotion suppression. *Social Cognitive and Affective Neuroscience*, *8*, 595-601. doi:10.1093/scan/nss036

Norasakkunkit, V., & Kalick, S. M. (2002). Culture, ethnicity, and emotional distress measures: The role of self-construal and self-enhancement. *Journal of Cross-Cultural Psychology*, *33*, 56-70. doi:10.1177/0022022102033001004

Okazaki, S. (1997). Sources of ethnic differences between Asian American and White American college students on measures of depression and social anxiety. *Journal of Abnormal Psychology*, *106*, 52-60. doi:10.1037/0021-843X.106.1.52

Okazaki, S. (2000). Asian American and White American differences on affective distress symptoms: Do symptom reports differ across reporting methods? *Journal of Cross-Cultural Psychology*, *31*, 603-625. doi:10.1177/0022022100031005004

Okazaki, S. (2002). Cultural variations in self-construal as a mediator of distress and well-being. In K. S. Kurasaki, S. Okazaki, & S. Sue (Eds.), *Asian American mental health: Assessment theories and methods* (pp. 107-121). New York, NY: Kluwer Academic/Plenum. doi:10.1007/978-1-4615-0735-2_8

Park, I. J. K., Sulaiman, C., Schwartz, S. J., Kim, S. Y., Ham, L. S., & Zamboanga, B. L. (2011). Self-construal and social anxiety among Asian American college students: Testing emotion suppression as a mediator. *Asian American Journal of Psychology*, *2*, 39-50. doi:10.1037/a0023183

Parker, G., Cheah, Y.-C., & Roy, K. (2001). Do the Chinese somatize depression? A cross-cultural study. *Social Psychiatry and Psychiatric Epidemiology*, *36*, 287-293. doi:10.1007/s001270170046

Parker, G., Gladstone, G., & Chee, K. T. (2001). Depression in the planet's largest ethnic group: The Chinese. *American Journal of Psychiatry*, *158*, 857-864. doi:10.1176/appi.ajp.158.6.857

Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, *1*, 385-401. doi:10.1177/014662167700100306

Radloff, L. S. (1991). The use of the Center for Epidemiological Studies Depression Scale in adolescents and young adults. *Journal of Youth and Adolescence*, *20*, 149-166.

Ryder, A. G., & Chentsova-Dutton, Y. E. (2012). Depression in cultural context: "Chinese somatization," revisited. *Psychiatric Clinics of North America*, *35*, 15-36. doi:10.1016/j.psc.2011.11.006

Ryder, A. G., Yang, J., Zhu, X., Yao, S., Yi, J., Heine, S., & Bagby, R. M. (2008). The cultural shaping of depression: Somatic symptoms in China, psychological symptoms in North America? *Journal of Abnormal Psychology*, *117*, 300-313. doi:10.1037/0021-843X.117.2.300

Singelis, T. M. (1994). The measurement of independent and interdependent self-construals. *Personality and Social Psychology Bulletin*, *5*, 580-591. doi:10.1177/0146167294205014

Soto, J. A., Perez, C. R., Kim, Y.-H., Lee, E. A., & Minnick, M. R. (2011). Is expressive suppression always associated with poorer psychological functioning? A cross-cultural comparison between European Americans and Hong Kong Chinese. *Emotion*, *11*, 1450-1455. doi:10.1037/a0023340

Trimble, J. E., & Dickson, R. (2005). Ethnic gloss. In C. B. Fisher & R. M. Lerner (Eds.), *Encyclopedia of applied developmental science* (Vol. I, pp. 412-415). Thousand Oaks, CA: SAGE.

U.S. Census Bureau. (2016). *Foreign born: Frequently asked questions (FAQ)*. Retrieved from https://www.census.gov/topics/population/foreign-born/about/faq.html

World Health Organization. (2017). *Depression and other common mental disorders: Global health estimates*. Geneva, Switzerland: Author.

Yen, S., Robins, C. J., & Lin, N. (2000). A cross-cultural comparison of depressive symptom manifestation: China and the United States. *Journal of Consulting and Clinical Psychology*, *68*, 993-999. doi:10.1037/0022-006X.68.6.993

Ying, Y. (1988). Depressive symptomatology among Chinese-Americans as measured by the CES-D. *Journal of Clinical Psychology*, *44*, 739-746.

Ying, Y., Lee, P. A., Tsai, J. L., Yeh, Y., & Huang, J. S. (2000). The conception of depression in Chinese American college students. *Cultural Diversity & Ethnic Minority Psychology*, *6*, 183-195. doi:10.1037//1099-9809.6.2.183

Young, C. B., Fang, D. Z., & Zisook, S. (2010). Depression in Asian American and Caucasian undergraduate students. *Journal of Affective Disorders*, *125*, 379-382. doi:10.1016/j.jad.2010.02.124

Yuan, J., Liu, Y., Ding, N., & Yang, J. (2013). The regulation of induced depression during a frustrating situation: Benefits of expressive suppression in Chinese individuals. *PLoS ONE*, *9*, e97420. doi:10.1371/journal.pone.0097420

Zane, N. (2000). *Loss of Face Scale*. Retrieved from http://www.columbia.edu/cu/ssw/projects/pmap/docs/zaneloss.pdf

Zane, N., & Yeh, M. (2002). The use of culturally based variables in assessment: Studies on loss of face. In K. S. Kurasaki, S. Okazaki, & S. Sue (Eds.), *Asian American mental health: Assessment theories and methods* (pp. 123-137). New York, NY: Kluwer. doi:10.1007/978-1-4615-0735-2_9

Zhang, L., Fritzsche, K., Liu, Y., Wang, J., Huang, M., Wang, Y., & Leonhart, R. (2016). Validation of the Chinese version of the PHQ-15 in a tertiary hospital. *BMC Psychiatry*, *16*, Article 89. doi:10.1186/s12888-016-0798-5