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Family, Peer, and Individual Correlates of Depressive Symptomatology Among U.S. and Chinese Adolescents

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This study examined the correlates of symptoms of depressed mood among adolescents in 2 dramatically different cultures (n = 502 in Tianjin, People's Republic of China; n = 201 in greater Los Angeles). Gender, stressful life events, perceived parental warmth, and conflict with parents were associated in the expected direction with depressive symptoms in each cultural setting. As predicted, regression analyses showed that the quality of family relationships and grades in school had significantly stronger associations with depressive symptoms among Chinese youths than among U.S. youths, whereas gender differences in depressive symptoms were greater among the U.S. youths. Peer warmth moderated the effects of particular risk factors for depressive symptoms in each cultural setting.

Depressive symptoms are a familiar part of the adolescent experience (Steinberg, 1999). Studies of prevalence rates yield varying estimates, because of differences in methods and criteria for assessing symptoms, but there is evidence that about 25% of adolescents regularly experience symptoms of depression (Compas, Ey, & Grant, 1993). Furthermore, the tendency toward depressed mood has been shown to be stable across at least 3 years of adolescence, and an emerging pattern indicates that depressive symptoms in adolescence often lead to adult depression or other adult psychological difficulties (Devine, Kempton, & Forehand, 1994).

Recent research has also revealed cultural and ethnic variations in depressive symptomatology and in attitudes toward seeking treatment (Roberts & Sobhan, 1992; Sue & Morishima, 1982; Uba, 1994). Most cross-cultural or cross-ethnic research focuses on the level of depressive symptomatology or other types of mental health problems in different groups (see, e.g., Roberts & Sobhan, 1992, and Shek, 1991). The objective of this study, in contrast, was to investigate commonalities and differences in the psychosocial correlates of depressed mood among adolescents from two very different cultural backgrounds. Specifically, this study investigated the contributions of gender, stressful life events, perceived parental warmth and acceptance, conflict with parents, perceived warmth

and acceptance of peers, and academic achievement to depressed mood in samples of adolescents in mainland China and the United States.

The selection of these factors was based on several different but complementary theoretical perspectives. It is clear, from the perspective of ecological or systems theory (Bronfenbrenner, 1989), that adolescent development occurs within multiple contexts, such as the family, the peer group, and the school. For this reason, it is important to include variables that reflect young people's experiences in these contexts in any investigation of adolescent outcomes. Especially important for adolescents' psychological well-being are factors such as positive family and peer relationships and good school achievement (see Steinberg, 1999, for a comprehensive review). This study also drew on theories of stress and adaptation—in particular, on the view that exposure to psychosocial stressors (e.g., conflict with parents) and the availability of social support (e.g., peer warmth and acceptance) influence the extent to which adolescents experience depressive symptoms (e.g., Compas, 1987; Compas & Wagner, 1991; Petersen et al., 1993). Finally, the research questions of this study were influenced by a growing understanding of the role that culture plays in moderating the meaning and impact of life experiences. Beginning with the issue of culture, we discuss each of the factors we investigated in this study.

As Bronfenbrenner (1989) has pointed out, development occurs not only in proximal settings such as the family but also within a larger "macrosystem" that consists of cultural rules and values and historically significant events (e.g., the Great Depression or the Cultural Revolution). In general, differences among cultures may affect the average level of depressive symptomatology, the average level of factors that are associated with symptoms (e.g., conflict with parents; see Greenberger & Chen, 1996), and the extent to which these factors are consequential for adolescents' mood. In a collectivist culture such as China, strong values of harmony may make relationships with others more powerful predictors of adolescents' mood than is true in a culture such as the United States that embraces more individualistic values (Ho, 1986; Jing & Wan,

1997; Triandis, 1995; Uba, 1994). In other words, culture may selectively accentuate or lessen the depressive impact of particular psychosocial stressors. The issue of culture resurfaces in the review of other likely psychosocial correlates of depressed mood.

Being female is a significant risk factor for adolescent depression or depressed mood in the United States (Kandel & Davies, 1982; Nolen-Hoeksema & Girgus, 1994; Petersen, Sarigiani, & Kennedy, 1991), and these same gender differences in prevalence rates continue into adulthood (Petersen et al., 1993; Rosenfield, 1980). Similar gender differences in depression or levels of depressive symptoms have been found in other Western nations (Weissman et al., 1993). Although no cross-cultural studies that include mainland Chinese youths appear to have addressed gender differences in symptoms of depression, decades of centralized political and ideological efforts directed toward eliminating gender inequalities might be expressed in a smaller, or even nonexistent, gender gap in depressive symptoms in this cultural setting.

In addition, stress-oriented theories and associated research suggest that an accumulation of disruptive events occurring within the broad ecology of adolescents' lives may take a toll on psychological well-being (Appley & Trumbull, 1986). Studies that examine the effects of both normative and nonnormative events in U.S. adolescents' lives (e.g., a serious falling out with a friend, parental job loss, or a serious parental illness) indicate that greater exposure to such events is associated with higher symptom levels (Compas & Wagner, 1991). It seems plausible that high levels of stressful events should have negative associations with mood in various cultural settings and that the magnitude of effects on symptoms should be similar if the events examined are regarded as stress-inducing across cultures. Indeed, C. Cheng (1997) found direct effects of stressful life events on Hong Kong adolescents' mood. Another study (S. K. Cheng & Lam, 1997), however, found only indirect effects that were mediated through problem-solving strategies and self-esteem. Further research is needed to clarify the relations between stressful life events and depressive symptoms among Chinese youths.

Within the family context, the quality of relationships with parents play a key role in normal adolescent development and in the explanation of depressed mood (Steinberg, 1999), both as a potential source of stress and as a potential source of social support. Several researchers have found higher levels of symptomatology among youths of various U.S. ethnic groups who report low parental warmth and high rates of conflict with parents (e.g., Ge, Lorenz, Conger, & Elder, 1994; Greenberger & Chen, 1996). In the latter study, moreover, the magnitude of associations between depressive symptoms and measures of both parental warmth and adolescent–parent conflict was strikingly similar for Asian American and European American adolescents at two different age levels (junior high school and college). Chiu, Feldman, and Rosenthal (1992) also found that parental warmth had a similar magnitude of association with a composite measure of psychological distress across samples of Hong Kong, Australian, and U.S. youths. However, in a study of elementary school children in China, X. Chen, Rubin, and Li (1995) found no direct relations between depressive symptoms and measures of a construct that is related to parental warmth (i.e., maternal acceptance/rejection). Taken together, these empirical findings contradict the theoretical prediction that relationships with parents should have a greater consequence on Chinese adolescents' psychological well-being

because of cultural values emphasizing the importance of family closeness and harmony (Ho, 1986; Uba, 1994). Further research is needed to replicate such counterintuitive findings and to explicate the reasons for the discrepancy between theory and empirical findings.

In addition to demonstrating the direct effects of parent–adolescent relationships on adolescents' depressive symptoms, researchers have shown that a more positive relationship with parents may act as a buffer against stressful life events and that negative relationships with parents can accentuate the mood-worsening impact of stressful events (cf. Forehand et al., 1990). Similarly, X. Chen et al. (1995) found that maternal rejection predicted more depressive symptoms among those Chinese children who also had academic difficulties and high mother–father conflict—thus serving as an "enhancer" of the effects of these stressors.

Within the peer context, the importance and influence of friends and larger peer groups in the lives of U.S. adolescents has been well documented (Savin-Williams & Berndt, 1990; Steinberg, 1999). Low peer group acceptance is related to a great many psychosocial and behavioral outcomes, including both depression and depressive symptoms in adolescents (Jacobsen, Lahey, & Strauss, 1983). A recent study of Chinese adolescents in Hong Kong (S. K. Cheng & Lam, 1997) also showed a negative association between peer support and symptoms of dysphoria. Because of a lack of comparative studies, however, it is not clear whether the magnitude of peer effects on adolescent depressive mood should be similar or different in the two cultures.

It is possible that peer warmth and acceptance will have differential effects in different cultural settings. In terms of the present study, Chinese culture's collectivist orientation and the fact that China is undergoing rapid social change led to the prediction that peer relationships would be more consequential for depressed affect among Chinese adolescents than among U.S. adolescents. Mead (1928/1978) argued that peer ties increase in importance when societies undergo rapid technological and social change because youths must rely more heavily on peers (compared with elders) for the new skills, attitudes, and social ties that will ensure success in the future.

As is the case with parent–adolescent relationships, recent research also has demonstrated the buffering effects of peer relationships. Petersen et al. (1991) found that although popularity and strong peer relationships during early adolescence did not protect (i.e., buffer) a sample of U.S. youths against depressed mood, the buffering effect of peer group status and related peer variables increased in late adolescence. S. K. Cheng and Lam (1997), in a study of Hong Kong youths, showed that social support from peers helped insulate children from the effects of highly stressful life events.

Finally, the school context is an important contributor to the understanding of depressed mood. Most, but not all, studies of U.S. samples indicate that academic difficulty is associated with depressed affect (Fauber, Forehand, Long, Burke, & Faust, 1987). In a study of young elementary school children from mainland China, X. Chen et al. (1995) also established associations between academic difficulty and depressed mood. Comparing Taiwanese and U.S. youths, other researchers found that Taiwanese adolescents more often linked school-related problems with depressed mood than did U.S. adolescents (Crystal et al., 1994). In light of the core

importance of educational achievement in Chinese culture (Stevenson & Stigler, 1992), the association between academic performance and depressive symptoms should be stronger among Chinese adolescents than among U.S. adolescents.

In summary, we hypothesized that (a) gender, life events, parental warmth and acceptance, conflict with parents, peer warmth, and academic achievement were likely to be associated with depressive symptoms for both mainland Chinese and U.S. youths; (b) gender differences in depressive mood would be greater in the United States than in China; (c) the quality of family and peer relationships, and of academic achievement, might have stronger associations with depressed mood among Chinese adolescents than among U.S. adolescents; and (d) parental and peer warmth would moderate the effects of other psychosocial stressors in both cultural settings.

Method

Participants

Research participants were recruited from the 11th grade of high schools in two major metropolitan areas: an ethnically diverse high school in the greater Los Angeles area and, as part of a larger project in China, four high schools in Tianjin, China. The latter is a rapidly industrializing city that is more typical of China's large metropolitan areas than is Beijing or Shanghai (State Statistical Bureau, People's Republic of China [PRC], 1995). Schools in both locations served a working-class through middle-class population, and students' achievement test scores were about at the average for their respective metropolitan areas.

Eleventh graders were a particularly suitable target of study for two reasons. First, the middle years of adolescence (15–18; see Steinberg, 1999), in which 11th graders fall, have been relatively neglected in recent research in favor of the more changeful early adolescent years. It is important, however, to understand the correlates and potential sources of psychological distress among youths who are on the brink of the transition to young adulthood. Second, because of important cultural differences in youths' experiences during other grade levels during middle adolescence, 11th graders are an especially appropriate target of this cross-cultural study.[1]

As Table 1 indicates, 53% of the U.S. sample was European American, 16% Latino American, 11% Asian American/Pacific Islander, and 11% African American. These demographics reflect the multicultural population of Los Angeles County. The Chinese sample was overwhelmingly of Han ancestry (94%). The mean age of U.S. participants was 16.60 years (SD = 0.57, range = 16–18); the mean age of Chinese participants was 17.60 (SD = 0.60, range = 16–18). (Chinese children begin school 1 year later than U.S. children.) As would be expected, the family structure of adolescents in the two countries differed significantly. Whereas 58% of U.S. adolescents' parents were still married to each other, 94% of parents' marriages were intact in the Chinese sample, $\chi^2(1, N = 699) = 135.54, p < .001$. The modal parental education level for U.S. parents was split across two categories, with about one third of fathers and mothers having completed high school and another one third having had some education beyond high school (but less than a 4-year college degree). In the Chinese sample, parental education as reported by adolescents was more variable. Forty percent of the fathers and 53% of the mothers ended their education after completing junior high school, whereas 60% of the fathers and 47% of the mothers had either a high school education or some post–high school training. Between-culture differences in parental educational attainment were statistically significant, $F(1, 671) = 55.97$ for the fathers and $F(1, 680) = 109.16$ for mothers, both $p < .001$. These differences are to be expected in light of vast differences in educational opportunity in the two countries. Students' parents in the U.S. sample had a level of education

Table 1

Summary Statistics for Demographic Variables

Variable	% U.S. sample ($n = 201$)	% Chinese sample ($n = 502$)
Gender		
Male	47	52
Female	54	48
Participants' ethnicity		
European American	53	
Asian American	12	
Latino American	16	
African American	11	
Other	9	
Parents' marital status		
Married to each other	58	94
Separated	7	0
One or both dead	8	3
Divorced	23	3
Did not marry each other	6	0
Mother's education		
Junior high	8	53
High school	38	21
Some college/vocational school	33	19
4-year college	17	7
Master's or professional degree	4	0
Father's education		
Junior high	8	40
High school	33	18
Some college/vocational school	32	30
4-year college	21	12
Master's or professional degree	6	0
Father employed		
No	8	6
Yes		
Part-time	6	20
Full-time	86	75
Mother employed		
No	22	20
Yes		
Part-time	20	22
Full-time	59	58

Note. Percentages may not equal 100 because of rounding.

similar to the average for adults in the United States; parents' attainment in the Chinese sample was somewhat above the average for urban Chinese (Zhou, Tuma, & Moen, 1997).

Procedure

For U.S. participants, active consent from both parents and students was obtained. Of the 300 enrolled 11th graders, 241 (83%) were present in school on the day of the survey and 201 (83% of those present, 67% of all the 11th graders) had obtained the necessary consent forms and completed the survey. Ninety-three respondents were male, and 108 were female. For Chinese participants, permission for students to participate in research is vested in the school; nearly all the 11th graders present on the day of the

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[1] School transitions are known risk factors for U.S. youths' psychological well-being (Blyth & Simmons, 1983; Steinberg, 1999) but typically occur at different grade levels and ages in China and the United States. The choice of 11th graders for this study essentially controlled for cultural differences in the timing of school changes across cultures. Neither U.S. nor Chinese 11th graders recently had experienced a stressful school transition.

survey completed it (n = 502 [259 men, 243 women]). The survey was described as part of an effort to understand the lives of adolescents in various countries around the world. Surveys were completed during a class period.

Measures

Chinese and U.S. researchers collaborated in the operationalization of concepts and the development of measures. Special attention was paid to the relevance of items in each cultural setting and to nuances of language. Bilingual researchers translated and approved each other's translation of the final survey instrument. Wherever possible, ambiguous and relative terms (e.g., *sometimes*) were avoided in favor of more "objective" terms (e.g., *never, once or twice,* or *once a week* [in the past month]). This type of response scale should reduce cultural differences in response style (see, e.g., C. Chen, Lee, & Stevenson, 1995, and Schwarz, 1999).

Participants in the study responded to a variety of demographic questions (see Table 1). Their experience of depressive symptoms was assessed by the 20-item Center for Epidemiological Studies Depression scale (CES–D; Radloff, 1977). This scale is appropriate for use with adolescents (Radloff, 1991) and has been used previously in research with Chinese samples (Lin, 1989). Respondents reported the frequency of symptoms over the past month on a 5-point scale ranging from 1 (*never*) to 5 (*almost every day*). The CES–D had high internal consistency in both groups: Cronbach alpha was .89 in the U.S. sample and .85 in the Chinese sample.

To examine the cross-cultural equivalence of the CES–D, we conducted multigroup confirmatory factor analyses with Amos (Arbuckle, 1997). Because Radloff (1977) originally identified a four-factor structure (Depressed Mood [seven items], Interpersonal [two items], Somatic [seven items], and Positive Affect [four items]; see also Thorson & Powell, 1993), we first tested whether the U.S. and Chinese samples had the same factor pattern (i.e., whether the same items loaded on the same factor for both samples—although not necessarily with the same error variance or factor loadings). Results showed a reasonable fit, $\chi^2(328, N = 803) = 657.10$, $p = .00$, goodness-of-fit index (GFI) = .92, comparative fit index (CFI) = .91, root-mean-square error of approximation (RMSEA) = .04. This model was improved by allowing the error terms of two items ("I thought my life had been a failure" and "I am hopeful about my future") to correlate (rs = −.17 and −.05 for Chinese and U.S. youths, respectively). The new fit statistics were as follows: $\chi^2(326, N = 803) = 617.50, p = .00$, GFI = .92, CFI = .92, RMSEA = .04.

With that modification, we then tested whether the factor loadings were equivalent for the two samples. When the factor loadings were constrained to be the same for the two groups, the overall model still showed a reasonable degree of fit, $\chi^2(342, N = 803) = 723.39, p = .00$, GFI = .91, CFI = .90, RMSEA = .04. However, the new model did yield a significant change in chi-square, $\Delta\chi^2(16, N = 803) = 105.89, p < .05$.

The subsequent test examined whether the interrelations among the factors were the same. Covariances among factors did not differ significantly between the two groups, $\Delta\chi^2(6, N = 803) = 8.74, p > .05$. Finally, when the variances of the factors and the error terms for each item were constrained to be the same for the two samples, the model did not fit the data, $\chi^2(372, N = 803) = 1,009.09, p = .00$, GFI = .88, CFI = .83, RMSEA = .05.

In summary, tests of several models for which we examined goodness-of-fit statistics and chi-square values indicated that the U.S. and Chinese samples showed the same factor pattern and the same interrelations among factors but differed in specific factor loadings and the variances of individual items. Overall, the structure of the CES–D is sufficiently similar to warrant its use with these two culturally different samples.

Life events were assessed by means of a 24-item scale typical of those used to assess stressful events in the lives of adolescents (e.g., Compas, Davis, Forsythe, & Wagner, 1987). Specific events that were assessed were drawn from the family, peer, and school contexts. Examples include illness

or death of family members and peers, family economic losses, dissolution of friendships, and school problems (e.g., suspension or expulsion). Respondents indicated whether each event had occurred during the past year ($0 = no, 1 = yes$). Coefficient alpha for the scale was .72 in the U.S. sample and .77 in the Chinese sample.

Respondents also completed a measure of perceived parental warmth and acceptance (Greenberger, Chen, & Beam, 1998). They responded on a 6-point scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*) to items such as "My parents like me the way I am; they don't try to 'make me over' into someone else" and "My parents really understand me." Coefficient alpha for the two samples was .88 (United States) and .76 (China).

Conflict with parents was measured on an 11-item scale ranging from 1 (*never*) to 4 (*almost every day*) that covered school-related issues, chores, friends, family relationships, habits and routines, and so on (C. Chen, Greenberger, Lester, Dong, & Guo, 1998). Coefficient alpha for the U.S. and Chinese samples, respectively, was .86 and .82.

Peer warmth and acceptance was assessed by items identical in content to the previously described Parental Warmth and Acceptance scale, except for minor word changes, such as the substitution of the word *friends* for *parents*. The same 6-point response scale described in relation to the Parental Warmth and Acceptance scale was used. Coefficient alpha for this newly developed scale was .85 for the U.S. adolescents and .75 for the Chinese adolescents. Insofar as perceiving friends as warm and accepting may be a precondition for self-disclosure, the finding that the Peer Warmth and Acceptance scale was positively and significantly correlated with a measure of problem disclosure to friends provides some preliminary evidence of the former scale's construct validity (rs = .35 and .30, both $p < .01$, for the U.S. and Chinese samples, respectively).

Participants reported their grades in school during the past year by checking one of seven categories: "mostly As" (scored 7) "half As and half Bs" (scored 6), "mostly Bs" (scored 5), and so on.

Results

Between-Culture Comparisons of Depressive Symptoms and Other Key Measures of the Study

The results of two-way analyses of variance (ANOVAs) with country and gender as grouping factors are shown in Table 2. These analyses indicated that U.S. and Chinese 16- to 17-year-olds did not differ significantly in mean level of depressive symptoms. As predicted, however, there was a significant Country × Gender interaction. Post hoc contrasts revealed that female adolescents reported significantly more symptoms than did male adolescents within each country, especially in the United States: $F(1, 197) = 14.37, p < .001$, in the United States, versus $F(1, 500) = 4.84, p < .05$, in China. U.S. male adolescents scored the lowest of the four Country × Gender groups in self-reported depressive symptoms. On average, study participants experienced each depressive symptom "once or twice per month."

Although not central to the purposes of this study, mean levels on other key measures, and differences between means for the two groups, also were examined (see Table 2). U.S. adolescents reported significantly more stressful life events than did Chinese adolescents. Inspection of items showed that differences in the number of life events occurred across all three domains: family, peer group, and school. Although adolescents in both samples agreed, on average, that their parents were warm and accepting (mean item scores for both samples were greater than 4 [*slightly agree*] on the 6-point scale), Chinese youths perceived their parents as significantly more warm and accepting than did their U.S.

Table 2

Means, Standard Deviations, and F Statistics for Variables of Interest

| Variable | U.S. sample | | | | Chinese sample | | | | $F(1, 683-697)$ | | |
| | Male | | Female | | Male | | Female | | | | Country × Gender |
	M	SD	M	SD	M	SD	M	SD	Country	Gender	
CES–D	1.80	0.45	2.06	0.51	1.94	0.48	2.03	0.49	1.69	19.21***	4.18*
Life events	0.22	0.17	0.21	0.13	0.17	0.15	0.17	0.12	21.63***	1.51	0.26
Parental warmth	4.24	0.85	4.12	1.12	4.34	0.72	4.46	0.71	10.71**	0.00	3.20
Conflict with parents	1.86	0.60	1.88	0.58	1.46	0.41	1.39	0.32	138.48***	0.40	1.42
Peer warmth	4.64	0.62	4.96	0.80	4.45	0.72	4.52	0.70	27.70**	10.06**	4.57*

Note. CES–D = Center for Epidemiological Studies Depression scale.
*p < .05. **p < .01. ***p < .001.

counterparts. Additionally, Chinese adolescents reported substantially and significantly less conflict with their parents.

In contrast to the cross-cultural findings for parental warmth, U.S. adolescents perceived their friends as significantly more warm and accepting than did Chinese adolescents. Mean levels of peer warmth were above the midpoint in both samples (for U.S. adolescents, $M = 4.82$ [*agree*]; for Chinese adolescents, $M = 4.48$ [*slightly agree*]). A significant interaction between country and gender also was detected, and further analyses indicated that U.S. female adolescents reported significantly greater peer warmth and acceptance than did their male counterparts, $F(1, 196) = 4.98$, $p < .05$.

Correlations Among Variables

Preliminary correlational analyses revealed that demographic measures generally were not related to differences in depressive symptoms. Specifically, age of adolescent was unrelated to Chinese and U.S. youths' scores on the CES–D (both *r*s < .09, *ns*), as were mother's and father's educational attainment (all *r*s < .05, *ns*). Family structure (intact vs. other) was unrelated to depressive symptoms among Chinese youths ($r = .03$, *ns*) and only weakly related to symptoms among U.S. adolescents ($r = .14$, $p < .05$). Youths in nonintact families reported more symptoms.

Table 3 presents the zero-order correlations among the major study variables. In the Chinese sample, all family, school, and peer variables were significantly related to scores on the CES–D in the

predicted direction; in the U.S. sample, all variables except perceived warmth of peers and school performance were significantly related to depressive symptomatology. Consistent with the hypotheses advanced earlier, the correlations between peer warmth and CES–D scores, and between grades and CES–D scores, were significantly higher for Chinese adolescents than for U.S. adolescents (zs = 2.61 and 2.19, both ps < .05). These and other between-country differences were examined further in the regression analyses that follow.

Regression Analyses

The main purposes of the regression analyses were (a) to evaluate the unique contributions of experiences in different contexts to the explanation of depressive symptoms, (b) to assess the total amount of variance in symptoms accounted for by our model, and (c) to test for interactions of country with the various "predictors" of depressive symptoms. Variables were entered as follows. Participants' age, parents' education (the average of mother's and father's level of attainment), and family structure (0 = *biological parents currently married*, 1 = *all other family types*) were entered at Step 1 as control variables; country, gender, life events, parental warmth, conflict with parents, peer warmth, and grades were entered simultaneously at Step 2; two-way interaction terms that reflected each of the six interactions of country with another Step 2 variable were entered one at a time at Step 3 (e.g., first the Country × Gender term was tested, then it was removed and the

Table 3

Bivariate Correlations

Variable	1	2	3	4	5	6	7
1. CES–D	—	.26**	.26**	−.38**	.37**	−.14	−.07
2. Gender[a]	.10*	—	−.03	−.06	.02	.22**	.07
3. Life events	.29**	−.08	—	−.15*	.32**	.08	−.37**
4. Parental warmth	−.42**	.09	−.21**	—	−.37**	.19**	.07
5. Conflict with parents	.34**	−.09*	.28**	−.28**	—	−.05	−.26**
6. Peer warmth	−.31**	.04	−.07	.31**	−.08	—	−.07
7. Grades	−.27**	−.03	−.17**	.15**	−.21**	.05	—

Note. Correlations above the diagonal refer to the U.S. sample ($n = 201$); correlations below the diagonal refer to the Chinese sample ($n = 502$). CES–D = Center for Epidemiological Studies Depression scale.
[a] 0 = *male*, 1 = *female*.
*p < .05. **p < .01.

Country × Life Events term was tested); and finally, selected three-way interaction terms were tested individually, with the relevant two-way interaction term also included in the model.

Table 4 summarizes the main results of these analyses. None of the demographic variables that composed Step 1 contributed uniquely to the prediction of depressive symptoms.[2] (Together, these control variables accounted for less than 1% of the variance in depressive symptoms.) As the second block of Table 4 shows, each of the seven hypothesized predictors contributed uniquely to the explanation of depressive symptoms among adolescents. Adjusted R^2 for this seven-variable model was .29, $F(7, 668) = 41.02$, $p < .001$.[3] It is worth noting that although cultural differences in the level of depressive symptoms had not emerged in our earlier ANOVAs, a significant cultural difference did emerge in the regression analysis. Specifically, when the effects of variation in family, peer, and individual variables were controlled, Chinese youths scored higher than their U.S. counterparts. Additionally, youths who reported more stressful life events, lower quality relationships with parents and peers, and poorer school performance had higher symptom scores.

Table 4
Regression of Depressive Symptoms on Contextual and Individual Variables

Variable	B	β	t
Step 1: Control variables			
Age	0.033	0.051	1.22
Parents' education	0.007	0.014	0.34
Family structure	0.074	0.055	1.36
Step 2: Main predictor variables			
Country	0.175	0.158	3.14**
Gender	0.178	0.181	5.51***
Life events	0.605	0.170	4.82***
Parental warmth	−0.155	−0.257	−7.07***
Conflict with parents	0.208	0.201	5.83***
Peer warmth	−0.135	−0.201	−5.83***
Grades	−0.003	−0.091	−2.48*
Step 3: Two-way interactions of country with[a]			
Gender	−0.033	−0.066	−2.00*
Life events	0.013	0.027	0.82
Parental warmth	−0.034	−0.077	−2.25*
Conflict with parents	0.032	0.074	2.00*
Peer warmth	−0.026	−0.054	−1.62
Grades	−0.050	−0.116	−3.27**
Step 4: Three-way interactions of Country × Peer Warmth with[a]			
Life events	0.041	0.092	2.53*
Conflict with parents	−0.029	−0.076	−1.81†
Grades	−0.036	−0.095	−2.33*

Note. The country variable was coded as follows: 0 = *United States*, 1 = *China*. Family structure was coded as follows: 0 = *biological parents currently married*, 1 = *all other family types*.
[a] On Steps 3 and 4, each of the interaction terms shown in the table was entered individually on a given step. For each of the Step 4 interaction terms, the relevant two-way interaction terms also were entered on the prior step.
† $p = .07$. * $p < .05$. ** $p < .01$. *** $p < .001$.

The key analyses of this study, however, pertain to examination of two-way interactions that test cultural differences in the impacts of these predictors on depressed mood (see third block of Table 4 and Figure 1). As indicated earlier, interaction terms were added one at a time to the model described above. The significant Country × Gender interaction effect on depressed mood that was revealed through these analyses and shown in Figure 1A had been detected previously by an ANOVA.

Consistent with the simple correlations reported in Table 2, the effect of stressful life events on depressed mood did not differ in magnitude across cultures when demographic, family relationship, peer, and school measures were controlled (see third block of Table 4 and Figure 1B). In contrast, tests of the two-way interaction terms reflecting Country × Parental Warmth, Country × Conflict With Parents, and Country × Grades each revealed significant country differences in the relative effect of these variables on adolescents' depressive symptoms. As can be seen in Figure 1C, low to moderate perceived parental warmth and acceptance had a stronger negative association with Chinese adolescents' depressed mood than with that of U.S. adolescents. Likewise, high conflict with parents had a more negative impact on Chinese adolescents' mood than on U.S. adolescents' mood (see Figure 1D). However, the significant cultural difference in the strength of correlations between peer warmth and depressive symptoms did not survive controls for other variables (see Figure 1E). Better grades in school were associated with fewer depressive symptoms for Chinese youths but were unrelated to symptom level among U.S. youths (see Figure 1F).

Using a procedure recommended by Aiken and West (1991), we tested whether the simple slopes shown in that graph were significantly different from zero. In the U.S. sample, the slopes were different from zero, at $p < .05$ or better, for gender, life events, parental warmth and acceptance, and peer warmth (but not for grades). In the Chinese sample, all the slopes were significantly different from zero.

Moderating Effects of Parental and Peer Warmth

Selected three-way interactions were tested individually. These analyses were intended to examine the possible moderating effects of perceived parental and peer warmth—two potential buffering factors—when life events were more numerous, conflict with parents was greater, and academic performance was less good. None of the three-way interaction terms involving parental warmth (e.g., Country × Parental Warmth × Life Events) were significant.

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[2] The absence of age effects in this study is consistent with findings of Kandel and Davies (1982), who found no mean age differences in level of depressive symptoms in a large sample of U.S. 14- to 18-year-olds.

[3] The regression analysis were rerun separately by country to permit a comparison of the amount of variance in depressive symptoms accounted for by the major variables examined in this study. After controlling for age, parental education, and family structure (control variables, which together accounted for less than 1% of the variance in symptoms in each country), we found that the effects of gender, life events, parental warmth, conflict with parents, peer warmth, and grades accounted for approximately 28% and 34% of the variance, respectively, in U.S. and Chinese adolescents' symptomatology.
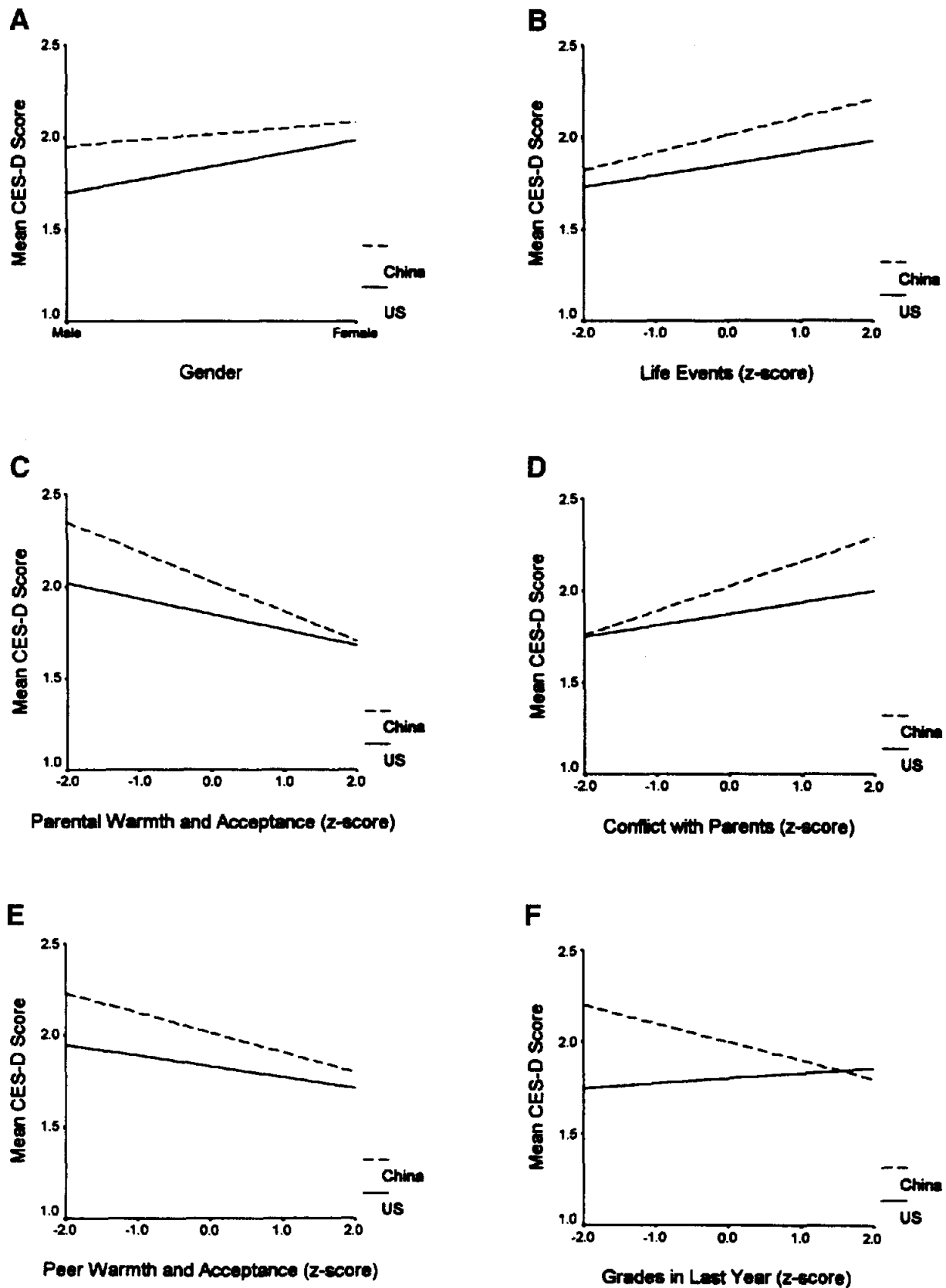
Figure 1. Plots of regression lines for the interactions between culture and predictors of depressive symptoms: (A) Gender, (B) life events, (C) parental warmth and acceptance, (D) conflict with parents, (E) peer warmth and acceptance, and (F) grades in last year. CES–D = Center for Epidemiological Studies Depression scale.

These results do not appear in table or graph form for reasons of economy.

A different story took shape, however, when the moderating effects of perceived peer warmth on life events, conflict with parents, and grades were tested (see fourth block of Table 4 and Figure 2). Following Aiken and West's (1991) procedure, we plotted the regression lines for youths with high (+1 SD) and low (−1 SD) peer warmth. Figures 2A and B show that in the U.S. sample, when a low number of life events was accompanied by high peer warmth, adolescents had fewer depressive symptoms than when peer warmth was low. In contrast, when life events were more numerous, adolescents' mood did not vary as a function of peer warmth and acceptance. For Chinese youths, however, the slopes for the high and low peer warmth groups were virtually identical; that is, peer warmth had the same effect on depressive symptoms at all levels of life events.

Figures 2C and D suggest that low peer warmth tends to exacerbate the effect of conflict with parents on depressed mood among Chinese youths but not among U.S. youths. (The interaction effect had a p value of .07.) The final row of Figure 2 (E and F), which shows the three-way interaction of Country × Peer Warmth × Grades, indicates that for U.S. youths, the effect of good grades on depression depends on peer warmth and acceptance. When perceived peer warmth was low, U.S. students with good grades reported more symptoms than those with poor grades; when peer warmth was high, grades were not related to depressive symptoms. For Chinese adolescents, the positive effect of good grades on mood was independent of perceived peer warmth and acceptance.

Again using Aiken and West's (1991) procedure, we found that, for the U.S. sample, the slope for life events was significantly different from zero under the condition of high peer warmth but not when peer warmth was low. However, for Chinese youths, both slopes departed significantly from zero. The regression slope for conflict with parents was significantly different for high peer warmth and marginally significant ($p = .057$) for low peer warmth in the U.S. group; in the Chinese group, the former difference also emerged and was highly significant ($p < .001$) and the latter difference was not significant. As inspection of Figure 2 (E and F) suggests, the regression slopes for grades were significantly different from zero for U.S. youths with low peer warmth and acceptance but not for those who reported high peer warmth; for Chinese youths, in contrast, slopes for grades differed significantly from zero in the context of both low and high peer warmth.

Discussion

This study examined the correlates of depressive symptoms in adolescents from two very different cultures. Little is known about the family, peer, and individual factors associated with depressive symptoms among mainland Chinese youths, who constitute one fifth of the world's population of adolescents. Thus, the results of this study should be of interest to researchers and practitioners who wish to understand and serve this population. Cross-cultural researchers and practitioners, and scholars with broader interests in adolescents' experience of depressive symptoms, also are likely to be interested in findings of this study that reveal both common and unique factors associated with adolescents' experience of depressed mood. Research of this type contributes to our understanding of the larger context in which psychological distress occurs.

In reviewing the relevant literature for this study, we consistently drew attention to the locations where previous research on Chinese adolescents has been conducted: Hong Kong, Taiwan, or cities within the PRC. These geographic distinctions are important. Mainland Chinese, for example, have had less exposure to the West and its ways. Although core values such as the importance of education are likely to characterize Chinese youths in general, social and political differences in different sites (e.g., Hong Kong vs. Beijing) also may produce variations on other cultural dimensions (e.g., the importance of filial piety). Studies like the present one, which compare mainland Chinese and U.S. youths, thus provide a sharper contrast in cultures than do most studies to date. As a result, the identification of "common" factors in depressive symptomatology takes on special significance. In the remainder of this article, we summarize the results of the study, comment on key findings, draw attention to implications of the findings for researchers and clinicians, and point out the study's limitations.

Results of the present study revealed significant associations, across two distinctly different cultures, between adolescents' experience of depressive symptoms and their reports of exposure to stressful life events, perceived parental warmth, conflict with parents, and peer warmth and acceptance. As predicted, recent exposure to what might be regarded as "culture-general" stressful life events (e.g., a parent's or close friend's illness) had a similar magnitude of association with depressive symptoms for U.S. and Chinese youths. In other instances, predicted differences between groups were found in the magnitude of association between symptoms and measures of individual, family, and peer characteristics—differences that were consistent with our previous exposition of core cultural values. Thus, being female was more of a risk factor for depressive symptoms among U.S. youths than among Chinese youths. Moreover, poorer quality of adolescents' relationships with their parents and poorer academic achievement were more strongly associated with Chinese youths' level of symptoms than that of U.S. youths. In fact, when U.S. adolescents reported low peer warmth and acceptance, their good grades in school were associated with more depressive symptoms.

In contrast, some findings of this study did not confirm, or did not fully confirm, our hypotheses (nor, in some cases, the findings of previous researchers). Perceived parental warmth and acceptance did not buffer either U.S. or Chinese middle adolescents from the depressive "effects" of various stressors; thus, the expected, significant cultural difference—a greater buffering effect of parental warmth and acceptance among family-oriented Chinese youths—did not emerge. Similarly, perceived warmth and acceptance of peers was not more consequential for Chinese youths' symptom level than that of U.S. youths.

Researchers need to explore further the complex relations between adolescents and their close friends in societies that differ in the pace of current social and technological change. Although Mead (1928/1978) argued that peers become more important in one another's lives in rapidly changing societies, their importance may be limited to certain domains (e.g., encouraging acceptance and learning of new technologies). The present study of depressive symptoms, as well as a recent study of the correlates of U.S. and Chinese youths' involvement in misconduct (C. Chen et al., 1998), has failed to support the hypothesis that perceived attributes of friends play a significantly larger role in Chinese (vs. U.S.) youths' mood and problem behavior.
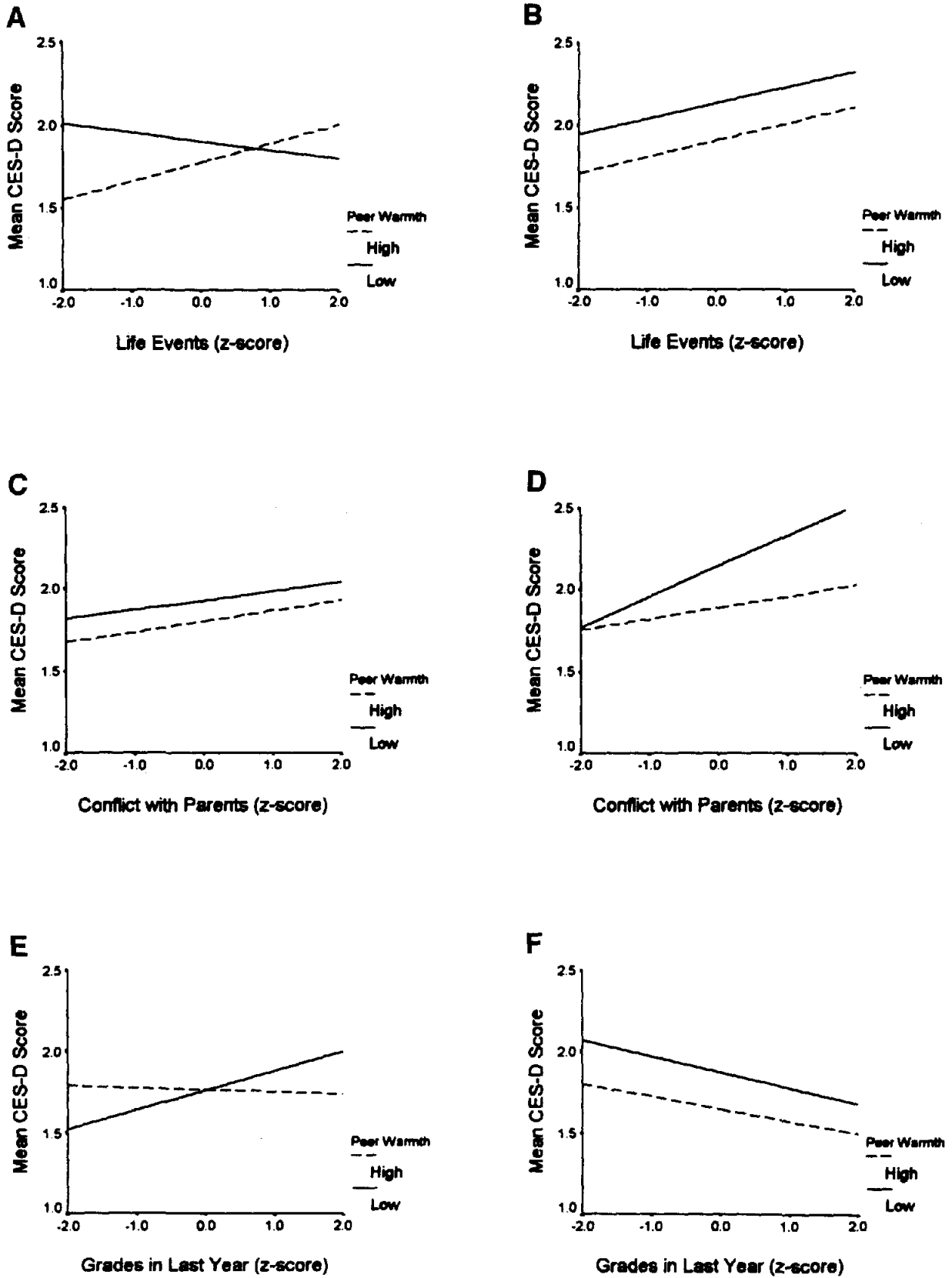
Figure 2. Plots of regression lines for the three-way interactions of culture, peer warmth, and selected risk factors for depressive symptoms: Life events for (A) U.S. sample and (B) Chinese sample, conflict with parents for (C) U.S. sample and (D) Chinese sample, and grades in last year for (E) U.S. sample and (F) Chinese sample. CES–D = Center for Epidemiological Studies Depression scale.

The findings of this research also advance our understanding of results from previous studies. The lower mean levels of parental affection and greater adolescent–parent conflict of Asian American vis-à-vis European American late adolescents that have been identified in several studies (e.g., Greenberger & Chen, 1996; Uba, 1994) are the opposite of cultural differences in the quality of family relationships that surfaced in this study of mainland Chinese and U.S. youths. It seems reasonable, therefore, to suggest that the lower quality of family relationships among Asian Americans vis-à-vis European Americans may be the result of exposure to immigration-related stressors rather than the result of factors intrinsic to Chinese culture.

Several of the previously mentioned findings have important implications for clinicians (e.g., the disturbance in normative family relationships that appears to accompany Chinese families' immigration). Additionally, it should be of interest to clinicians (and also to researchers) that the CES–D revealed the same four-factor structure of depressive symptoms, and the same relations among factors, in two culturally distinctive groups of adolescents. In an extension of the present study, we are further investigating the cross-cultural utility of the CES–D in a study that draws on samples of adolescents from several other countries. It is important to emphasize that the present study not only found mean differences between cultures on several predictors of depressed mood but also detected cross-cultural differences in the *strength* of associations between those predictors and symptoms of depression. For example, Chinese adolescents reported higher parental warmth and acceptance and less conflict with parents; at the same time, however, these variables had stronger "effects" on symptom levels of Chinese youths than U.S. youths. Clinicians who seek to understand adolescents' level of symptomatology should pay attention to both the absolute level of known predictors of depression and cultural differences in the significance of these predictors.

Finally, clinicians should consider the possibility that academically achieving youths in cultures or settings that are ambivalent toward or dismissive of this form of accomplishment may need peer support that is specific to academic achievement. In some settings, as in the "average" Los Angeles area school that constituted the U.S. sample, good grades were not good for adolescents' mood unless adolescents who were doing well in school also had close friends whom they regarded as warm and accepting of them (including, perhaps, friends who were accepting or supportive of their academic accomplishments).

Several limitations of the present cross-sectional study should be noted. Our model implicitly or explicitly suggests that differences in the social parameters of adolescents' lives play a key role in their experience of depressive symptoms. However, longitudinal research and evaluations of clinical interventions are needed to determine whether *changes* in variables such as parental warmth and peer warmth might play a causal role in symptom level, to investigate whether shifts in adolescents' mood provoke changes in the variables that were treated as predictors of symptoms in this study, and to examine to what extent both processes may occur. Another limitation of the study is that all the data came from a single source—that is, adolescents' reports about themselves and their social environment. Although common method variance is generally problematic because it is likely to enhance estimates of association between measures, C. Chen et al. (1998) provided some reassurance that this may not be a critical issue in the present

investigation. C. Chen et al.'s study, which was based on Chinese, Taiwanese, and U.S. adolescents, demonstrated that data derived solely from adolescents' reports did not result in inflated estimates of the association between quality of family relations and adolescent misconduct when compared with estimates derived from multiple sources (i.e., pooled information from both adolescents and their mothers). It would be highly desirable, of course, to obtain additional data from multiple sources in future cross-cultural studies of the correlates of depressed mood. Nonetheless, adolescents' perceptions of themselves and others—the measures central to the present study—are clearly consequential for their well-being.

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