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## Psychological Maladjustment and Academic Achievement: A Cross-Cultural Study of Japanese, Chinese, and American High School Students

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CRYSTAL, DAVID S.; CHEN, CHUANSHENG; FULIGNI, ANDREW J.; STEVENSON, HAROLD W.; HSU, CHEN-CHIN; KO, HUEI-JEN; KITAMURA, SEIRO; and KIMURA, SUSUMU. *Psychological Maladjustment and Academic Achievement: A Cross-Cultural Study of Japanese, Chinese, and American High School Students*. CHILD DEVELOPMENT, 1994, 65, 738-753. Psychological maladjustment and its relation to academic achievement, parental expectations, and parental satisfaction were studied in a cross-national sample of 1,386 American, 1,633 Chinese, and 1,247 Japanese eleventh-grade students. 5 indices of maladjustment included measures of stress, depressed mood, academic anxiety, aggression, and somatic complaints. Asian students reported higher levels of parental expectation and lower levels of parental satisfaction concerning academic achievement than their American peers. Nevertheless, Japanese students reported less stress, depressed mood, aggression, academic anxiety, and fewer somatic complaints than did American students. Chinese students reported less stress, academic anxiety, and aggressive feelings than their American counterparts, but did report higher frequencies of depressed mood and somatic complaints. High academic achievement as assessed by a test of mathematics was generally not associated with psychological maladjustment. The only exception was in the United States, where high achievers indicated more frequent feelings of stress than did low achievers.

It has become increasingly clear during the past decade that the general level of academic achievement of American elementary and secondary school students falls below that of their peers in other developed countries. Comparisons with East Asian students, such as those in Japan, Taiwan, Hong Kong,

and Mainland China, have been of special concern. Chinese and Japanese students have consistently been among the top performers, while the average scores of American students typically have been at or below the mean for the participating countries (e.g., Lapointe, Mead, & Askew, 1992;

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McKnight et al., 1987; Stevenson, Lee, & Stigler, 1986; Stevenson et al., 1990).

In response to these studies, many suggestions have been made about how to improve the performance of American students. When suggestions involve raising academic standards, many American parents and teachers react with great concern. They often suggest that East Asian students may attain their impressive levels of academic achievement at an undesirable cost, and that they do not want American students to pay this price. They point to reports in the American media that portray East Asian students, especially those in high school, as nervous, depressed, and generally overburdened by the pressures of trying to maintain high levels of academic excellence (e.g., Holman, 1991; Watanabe, 1992).

Although this negative perception of the mental health of Chinese and Japanese students appears to be widely shared among both professional and nonprofessional communities in the West, we know of no large-scale empirical investigations that have compared the psychological adjustment of high school students in these cultures.

Despite the efforts of scholars such as Lebra (1986) and Munakata (1986) to introduce Asian concepts of mental health and mental illness into the literature, there is neither a valid set of measures nor a clear theoretical framework for comparing psychological adjustment among members of East Asian and Western societies. Research conducted in other Asian societies, however, may offer models for understanding variable patterns of distress in different cultures. For example, Weisz, Suwanlert, Chaiyasit, and Walter (1987), in their study of behavior problems among children from Thailand and the United States, posit what they call a problem suppression-facilitation model to account for differences in the types of children referred to psychological clinics in the two cultures. According to the model, certain characteristics of a culture, such as its values, beliefs, or child-rearing practices, may suppress the manifestation of certain types of behavior problems and promote or facilitate the manifestation of other types of problems. Such a model, consistent with Draguns's (1973) formulation of psychopathology as an exaggeration of shared patterns of adaptation within a specific culture, may be useful for understanding cultural differences in children's psychological adjustment as well.

Based on a suppression-facilitation model, for example, the traditional emphasis on harmony, social order, nonaggression, and unemotionality in East Asian cultures would be expected to suppress the development in Asian students of symptoms of undercontrolled behavior—that is, aggressive feelings—and facilitate the development of psychological problems related to overcontrolled behavior—that is, stress, depressed mood, anxiety, and somaticizing. More specifically, the cultural proscription of Chinese (e.g., Bond & Wang, 1983) and Japanese (e.g., Reischauer, 1977) against open confrontation and outward displays of anger, added to the tendency, at least in Japan, to practice self-blame and introspection (e.g., Lebra, 1986), might very well lead to a higher incidence of depressed mood among Asian than American students. Similarly, given the intense academic pressure that Asian students are assumed to be under, Asian child-rearing practices that encourage self-control, inhibition of feelings, and strict discipline (e.g., Breiner, 1980; Hess et al., 1986), combined with limited outlets for nonacademic socializing (e.g., Rohlen, 1983), suggests that stress would be higher among Chinese and Japanese than among American adolescents. In addition, the lack of emphasis on emotional adjustment and the greater importance given to physical well-being in Chinese culture (Tseng & Hsu, 1969) should elicit heightened frequencies of somatic complaints among Chinese students.

Although predictions based on the suppression-facilitation model would seem to support the widely held image of the excessively tense and depressed Asian student, other evidence suggests that the stereotype may not be accurate. One common belief, for example, is that there is a high rate of adolescent suicide in countries such as Japan. That was true 40 years ago. In the early and mid-1950s, during the chaotic period following the end of World War II, Japan had an inordinately high incidence of adolescent suicide. After the peak year of 1955, however, the rate began to fall steadily. Since 1980, the United States has actually led Japan in rate of suicide among youths 15 to 20 years old (White, 1988). It is difficult to locate exactly comparable statistical categories in the United States and Japan; however, in 1989, the rates for Japanese adolescents from 15 to 19 years and 20 to 24 years were 4.4 and 11.0 per 100,000, respectively. In the United States for the same year, the

rate for youths aged 15 to 24 was 13.2 per 100,000 (Somucho Seishonen Taisaku Honbu, 1992; U.S. Bureau of the Census, 1991).

Japanese adolescents are also reported to exhibit significantly lower rates of deviant behavior than their American counterparts. Arrests for substance abuse, prostitution, and aggravated assault, for example, are only a fraction of the number occurring in the United States (Rohlen, 1983). Data on serious crimes committed in Taiwan by juveniles, such as homicide, robbery, and burglary, also show lower rates of incidence than those in the United States (Federal Bureau of Investigation, 1990; Ministry of the Interior, R.O.C., 1989). The greater prevalence of antisocial behavior among American youths compared to their Japanese and Chinese peers, while partly reflecting differences in the structure of the three societies, also suggests a possibly higher level of psychological disturbance among many American adolescents.

Our purpose in this study is to evaluate the popular stereotype that students in high-achieving Asian countries such as Taiwan and Japan experience a higher degree of psychological distress than do their lower-achieving American counterparts. We do this by examining, with a nonclinical approach, Chinese, Japanese, and American high school students' perceptions of factors related to their psychological adjustment. Using questionnaires and interviews that were part of a larger cross-cultural study of academic achievement, we first explored students' self-reported levels of stress, depressed mood, anxiety, aggression, and somatic symptoms among large, representative samples of eleventh graders. These five areas were chosen because they are among the most commonly investigated domains of psychological disturbance in adolescents (e.g., Brady & Kendall, 1992; Cromer, McLean, & Heald, 1992; Deming, 1989; Hinshaw, 1992), and are ones for which there are equivalent terms in Chinese, Japanese, and English. Moreover, they represent the symptoms most likely to result from the intense academic pressure, rigid teaching methods, and inhibited life-styles stereotypically associated with Asian education. To clarify the cultural meaning of psychological distress, we looked at students' explanations of the sources of stress and depressed mood. We then examined students' feelings of parental satisfaction and expectations. Finally, by analyzing the relation between psycho-

logical adjustment, parental pressure, and the students' academic achievement in the three cultures, we addressed the question of whether superior performance in school might be negatively related to students' mental health.

## Method

### Subjects

We conducted the study in three large metropolitan areas: Minneapolis, Taipei (Taiwan), and Sendai (Japan). We chose these cities because they are the locales of a long-term study of academic achievement that we have been conducting since 1980 (Stevenson, Chen, & Lee, 1993).

The subjects were representative, cross-sectional samples of students attending high schools in each city. As is the case in nearly all cross-cultural comparisons, it was impossible to match samples according to socioeconomic status. Our sampling was based, therefore, on the selection of students attending representative samples of high schools within each city. In Taipei and Sendai, where high schools form a hierarchy defined by the academic achievement scores of entering students, we visited schools with stringent, average, and lax entrance requirements. Minneapolis high schools enroll students of a wide range of ability; thus our major criterion for sampling was the region of the metropolitan area in which the high school was located. We selected schools in the Minneapolis metropolitan area according to the socioeconomic status of the families living within the school district so that our sample would contain students from families of high, average, and low levels of socioeconomic status. Occupations ranged from unskilled worker (Minneapolis, 2%; Taipei, 6%; Sendai, 0%) to professional (24%, 5%, and 3%, respectively). Skilled worker was the most frequent occupational classification for fathers in Taipei (23%) and Sendai (50%); in Minneapolis it was semi-professional (37%). The average number of years in school for fathers was 15 in Minneapolis, 11 in Taipei, and 13 in Sendai. For mothers it was 14, 9, and 12 years, respectively.

In Minneapolis, consent to participate in the study was obtained directly from the students themselves. To our knowledge, only five out of the almost 1,400 available students in Minneapolis declined to participate. In Taiwan and Japan, consent is vested in school authorities. Permission was ob-

tained from the school principal, and then the cooperation of the teachers was sought. When the teachers' permission was obtained, participation from the students was obligatory and universal. Such procedures to obtain consent were in accord with those approved by the sponsoring agencies and the relevant committees and authorities in each city.

The numbers of students in these samples were 1,386 (Minneapolis), 1,633 (Taipei), and 1,247 (Sendai), with an average age of 17.2 years, 17.3 years, and 17.0 years, respectively. The percentages of girls were, respectively, 51%, 58%, and 43%. In Minneapolis, the percentage of Euro-, African-, Asian-, Hispanic-, and Native-American students was 81%, 6%, 8%, 1%, and 1%, respectively. Three percent were categorized as "other." Samples in Taipei and Sendai were racially homogeneous.

The students attended 9 schools in Minneapolis, 18 in Taipei, and 8 in Sendai. It was necessary to visit the larger number of schools in Taipei because of the existence of separate schools for boys and for girls. We attempted to include an unbiased sample of students attending each school. We were able to visit some schools only during a particular study period; in others, we were allowed to include all eleventh graders. Although the percentage of eleventh-grade students included from each school varied, no selective biases related to levels of adjustment should have been operative.

### Measures

Great care was taken in constructing the measures to ensure that the questions were relevant in each culture and that their wording conveyed the same meaning in each language. Members of our research group, which included bilingual native speakers of Chinese, Japanese, and English, devised the questions simultaneously in all three languages. Consensus on the wording of the instruments was arrived at through further discussion with bilingual and trilingual colleagues in the United States, Taiwan, and Japan. We believe this process of simultaneous construction of the questions avoids the problems that inevitably arise when items are initially written in English and then translated into unrelated languages such as Chinese and Japanese.

Problems involving differences in connotation and nuance are especially pronounced when psychological terms are involved, and finding words and forms of

expression that are clear and comparable in all three languages poses an arduous task. We could not find satisfactory expressions in all three languages for some characteristics, such as the English terms "dependence" and "independence," and therefore could not include them in the questionnaire.

All but one of our five measures of maladjustment—that of academic anxiety—assess the frequency of students' feelings. We originally intended to measure frequency on all five indices, but questions assessing the intensity of academic anxiety, rather than frequency, had been used in a previous wave of the large research project on which the present report is based. The academic anxiety scale, therefore, measures the intensity of feelings. Issues of language influenced our decision to use 5-point scales to evaluate the frequency of symptoms. We could not find appropriate frequency terms for use in 7-point scales in all three languages.

Our goal was to assess the daily experience of adolescents in the three cultures in a nonclinical manner, using items that did not require complex or clinical interpretations. Items that were finally included were ones that could be readily understood by high school students in all three cultures. Clinically valid scales developed in the West tap symptoms of stress and depression; however, we believed it was inappropriate to translate these instruments to evaluate the psychological adjustment of individuals from completely different cultures. Moreover, we could not find accurate equivalents in all three languages for many of the terms used in these scales. Concerns about language also account, in large part, for our use of single-item measures for the indices of stress and depressed mood. Since no large-scale investigation comparing American, Chinese, and Japanese students has ever been reported, economy of research dictated that we begin with global assessments before we attempted to construct more highly differentiated measures of psychological adjustment. Such an effort would constitute a major research project in itself. The questions, along with the romanized versions of the key words in Chinese and Japanese, are presented in Table 1.

The 5-point scales ranged from 1 ("never") to 5 ("almost every day"). Three 7-point scales measuring academic anxiety ranged from "not at all nervous/worried" to "very nervous/worried." We conceptualized



TABLE 1

## QUESTIONNAIRE ITEMS AND CRONBACH ALPHAS

1. *Stress*: "How often do you feel stressed (under pressure)?"
2. *Depression*: "How often do you feel depressed?"
3. *Aggression*: "In the past month, how often have you: (a) felt like hitting someone, (b) felt like destroying something, (c) gotten into serious arguments or fights with other students, (d) felt angry at your teacher?" [.74 (USA), .77 (Taiwan), .72 (Japan)]
4. *Academic anxiety*: "How worried do you get about keeping up with your school-work? How nervous do you get when the teacher hands back tests? How nervous do you get while you are taking a test?" [.76 (USA), .73 (Taiwan), .56 (Japan)]
5. *Somatic complaints*: "In the past month, how often have you: (a) felt tired for no reason, (b) had a headache, (c) had a stomach ache, (d) had trouble sleeping, (e) lost your appetite, (f) overeaten, (g) had diarrhea, (h) had frequent urination?" [.71 (USA), .73 (Taiwan), .71 (Japan)]

NOTE.—The following words were used in the Chinese and Japanese versions of the questionnaire: depressed = *yoyu*, *jusang* (Chinese), *ochikomu* (Japanese); stress = *yali* (Chinese); *sutoresu* (Japanese); worried = *danxin* (Chinese), *shimpai suru* (Japanese); nervous = *jinzhang* (Chinese), *kincho suru* (Japanese).

stress as stimuli coming from the students' environment in the form of "daily hassles," defined as "the irritating, frustrating, distressing demands that to some degree characterize everyday transactions with the environment" (Kanner, Coyne, Schaefer, & Lazarus, 1981, p. 3). The measure of somatic complaints tapped eight symptoms of possible psychosomatic origin. Scores for this measure were created by determining the mean of each student's ratings on the eight items. The index of aggression was the average rating on four items concerning aggression. Cronbach alphas presented in Table 1 represent acceptable levels of reliability for all measures.

In addition to measures of psychological adjustment, an index of parental satisfaction measured students' perceptions of the degree to which their parents were satisfied with their academic performance. A measure of parental expectations assessed the degree to which students believed their parents' expectations for them were too high. Both items used 7-point scales, with 1 ("strongly disagree") and 7 ("strongly agree").

The interrelations among the indices of maladjustment appear in Table 2; those

TABLE 2

## INTERCORRELATIONS AMONG INDICES OF MALADJUSTMENT

	VARIABLE			
	2	3	4	5
1. Stress:				
U.S.A. ....	.48	.26	.21	.34
Taiwan ....	.52	.34	.20	.33
Japan ....	.53	.14	.27	.38
2. Depression:				
U.S.A. ....		.18	.30	.42
Taiwan ....		.24	.27	.40
Japan ....		.27	.13	.32
3. Anxiety:				
U.S.A. ....			.03†	.23
Taiwan ....			.02†	.14
Japan ....			-.05†	.07*
4. Aggression:				
U.S.A. ....				.38
Taiwan ....				.42
Japan ....				.44
5. Somatic				

NOTE.—All  $ps < .001$ , except \* $p < .05$ , † $p > .05$ .

among parental satisfaction, parental expectations, and achievement appear in Table 3. Nearly all measures were significantly interrelated, and the degree of relationship was remarkably similar in all three locations. Stress and depression were most strongly related, but few other relations shared as much as 20% of the variance.

In addition to the major sample, interviews were conducted with a second sample of approximately 200 students in each city. These students were initially chosen as rep-

TABLE 3

## INTERCORRELATIONS AMONG ACHIEVEMENT, PARENTAL SATISFACTION, AND PARENTAL EXPECTATIONS

	VARIABLE	
	2	3
1. Achievement:		
U.S.A. ....	.29	-.07*
Taiwan ....	-.19	-.05
Japan ....	.12	.05
2. Parental satisfaction:		
U.S.A. ....		-.22
Taiwan ....		-.07*
Japan ....		-.08*
3. Parental expectation		

NOTE.—All  $ps < .001$ , except \* $p < .05$ .  $N_s = 1,077$  (U.S.A.), 1,600 (Taiwan), 1,135 (Japan).

representative samples for a longitudinal study begun in 1980 when they were in first grade. Among the interview questions were ones asking students to explain when and why they felt stressed or depressed. Two native speakers of each language coded the answers to these open-ended questions according to six categories of response. The coders resolved disagreements through discussions between themselves and all coders, and often with the entire research group. The percentage of agreement among coders before resolution on the question about sources of depressed mood was 93% in the United States, 90% in Taiwan, and 85% in Japan; for the question about sources of stress it was 93%, 95%, and 90%, respectively.

Responses to the questions about the bases of stress and depressed mood were coded according to five major categories. School-related situations included responses such as "when I have a test" and "when papers are due." Peer-related responses referred to problems and interactions with peers, such as "when I have an argument with someone in my class" or "when I get picked on by other kids." The category of family-related responses included answers such as "when my parents keep bugging me" and "when I hear my parents arguing." Responses related to sports and jobs referred to organized athletics or the student's employment. A final, "general" category contained explanations that involved general or diffuse stress or depression.

#### Mathematics Test

All students were given a test of mathematics achievement. The test was based on detailed analyses of the textbooks used in the high schools where we conducted the study. The difficulty of the items increased rapidly. Early items tapped knowledge of fractions, percentages, and decimals, and the last items in the 47-item test required the solution of problems of limits, the intersection of a plane and a line, and the addition of tangents and secants. All items were open-ended. Forty minutes were allowed for the test. The test is difficult, and even the best students found it challenging. The reliability of the test is high; Cronbach alpha values ranged between .93 and .95 in the three cultures.

#### Administration of the Materials

All materials were administered in the students' classrooms by residents of the

cities in which the study was conducted. In administering the questionnaire, examiners told the students: "We are interested in getting a better idea of what American [Chinese, Japanese] high school students are like. Please answer the following questions as well as you can. All of your answers will be completely confidential." The examiners did not inform students that they were participating in a cross-cultural study.

## Results

To examine the relations among location, gender, and students' self-reported levels of maladjustment, parental expectations, and parental satisfaction,  $3 (\text{location}) \times 2 (\text{gender})$  ANOVAs were performed separately for each of the measures. These ANOVAs were then followed up by Scheffé contrasts to determine the nature and direction of the differences between pairs of locations. In addition, a measure of the magnitude of the difference between locations is also provided in terms of the  $d$  statistic, which expresses the differences in standard deviation units.

#### Psychological Maladjustment

Average levels of response on the five indices of maladjustment appear in Table 4. Although differences between locations were significant,  $F(2, 3,954-3,977) = 17.60-177.95$ ,  $ps < .001$ , the  $d$  statistics indicated that these differences were generally small to medium in size. We found little evidence to support the suggestion that students in Taiwan and Japan display more frequent indications of psychological maladjustment than do American students. Only two aspects of the data give any support to this suggestion: Chinese students reported somewhat higher frequencies of depression and more frequent disorders of sleeping and eating than did the American and Japanese students. Japanese students were notable for the low frequencies with which they indicated any disturbance in adjustment.

Gender differences emerged for all of the outcomes,  $F(1, 3,954-3,977) = 8.40-82.76$ ,  $ps < .001$ . Girls generally reported higher levels of psychological maladjustment than did boys (see Table 5). The interaction between location and gender, however, was significant for stress, depression, somatic complaints, and academic anxiety,  $F(1, 3,954-3,977) = 4.16-9.73$ ,  $ps < .05$ , suggesting that gender differences in these outcomes varied according to location. Significant gender differences were more

TABLE 4

MEANS AND STANDARD DEVIATIONS OF INDICES OF PARENTAL SATISFACTION, PARENTAL EXPECTATIONS, AND MALADJUSTMENT ACCORDING TO LOCATION

INDEX	LOCATION			<i>d</i> SCORES		
	U.S.A.	Taiwan	Japan			
	<i>M</i> (SD)	<i>M</i> (SD)	<i>M</i> (SD)	U-T	U-J	T-J
Parental satisfaction .....	4.32 (1.81)	3.53 (1.68)	2.94 (1.51)	.48	.79	.34
Parental expectations .....	3.31 (1.72)	4.09 (1.52)	3.83 (1.63)	-.47	.32	.16
Stress .....	3.90 (1.06)	3.49 (1.21)	3.15 (1.26)	-.34	.62	.28
Depressed mood .....	3.12 (1.04)	3.45 (1.10)	3.00 (1.17)	-.29	.11*	.40
Academic anxiety .....	4.22 (1.35)	4.08 (1.30)	3.78 (1.17)	.11*	.34	.23
Aggression .....	2.06 (.79)	1.95 (.82)	1.87 (.86)	.13**	.23**	.10*
Somatic complaints .....	2.12 (.61)	2.24 (.65)	1.77 (.61)	-.18	.53	.72

NOTE.—All were 5-point scales, except academic anxiety, which was 7-point. *N*s = 1,220–1,277 (U.S.A.), 1,609–1,620 (Taiwan), 1,139–1,231 (Japan). All *p*s < .001, except \**p* < .05, \*\**p* < .01.

TABLE 5

MEANS AND STANDARD DEVIATIONS OF INDICES OF PARENTAL SATISFACTION, PARENTAL EXPECTATIONS, AND MALADJUSTMENT ACCORDING TO GENDER AND LOCATION

LOCATION AND INDEX	GENDER		CONTRASTS
	Males	Females	
	M (SD)	M (SD)	
U.S.A.:			
Parental satisfaction .....	4.13 (1.80)	4.47 (1.80)	F > M**
Parental expectations .....	3.33 (1.65)	3.29 (1.78)	N.S.
Stress .....	3.77 (1.14)	4.03 (.97)	F > M***
Depressed mood .....	2.93 (1.07)	3.30 (.97)	F > M***
Academic anxiety .....	3.88 (1.29)	4.53 (1.33)	F > M***
Aggression .....	2.16 (.83)	1.97 (.74)	M > F***
Somatic complaints .....	1.97 (.57)	2.26 (.61)	F > M**
Taiwan:			
Parental satisfaction .....	3.31 (1.66)	3.70 (1.68)	F > M***
Parental expectations .....	4.24 (1.56)	3.98 (1.49)	M > F***
Stress .....	3.49 (1.24)	3.49 (1.19)	N.S.
Depressed mood .....	3.39 (1.20)	3.48 (1.02)	N.S.
Academic anxiety .....	4.06 (1.30)	4.09 (1.31)	N.S.
Aggression .....	2.02 (.89)	1.90 (.75)	M > F**
Somatic complaints .....	2.14 (.63)	2.31 (.65)	F > M***
Japan:			
Parental satisfaction .....	2.87 (1.55)	3.03 (1.45)	N.S.
Parental expectations .....	3.96 (1.66)	3.67 (1.57)	M > F**
Stress .....	3.10 (1.32)	3.21 (1.17)	N.S.
Depressed mood .....	2.81 (1.19)	3.24 (1.09)	F > M***
Academic anxiety .....	3.61 (1.19)	3.99 (1.11)	F > M***
Aggression .....	1.97 (.94)	1.75 (.73)	M > F***
Somatic complaints .....	1.74 (.66)	1.81 (.55)	F > M*

NOTE.—*N*s = 1,200–1,204 (U.S.A.), 1,605–1,610 (Taiwan), 1,139–1,169 (Japan).

\**p* < .05.

\*\**p* < .01.

\*\*\**p* < .001.



frequent in the United States and Japan than in Taiwan.

**Stress.**—The frequency with which students reported feeling stress appears in Figure 1. It is evident in the Scheffé contrasts presented in Table 4 that American students reported more frequent feelings of stress than did their peers in Taiwan and Japan, and that the frequency was higher for Chinese than for Japanese students. Over three-fourths of the American students but only half or fewer of the Chinese and Japanese students said that they felt stress once a week or almost every day. The means shown in Table 5 indicate that while girls in the United States and Japan reported more stress than boys, there was no gender difference in the reported frequency of stress in Taiwan.

To discover the sources of stress, we asked the subsample of students "in what situations or on what occasions" they felt stressed (see Fig. 2). The most frequent response in all three countries was to describe some type of experience at school,  $\chi^2(4, N = 77-153) = 75.13-608.02, ps < .001$ . However, more students in the United States and Taiwan than in Japan reported school as a source of stress,  $\chi^2(2, N = 575) = 84.35, p < .001$ . A relatively small percentage mentioned other sources, except for the Japanese, who cited their peers, and the Ameri-

can students, who mentioned sports and their jobs.

American and Japanese students who indicated that school was a source of stress also reported more frequent feelings of stress than their counterparts who did not mention school,  $ts(146-194) = 2.25, 2.95, ps < .05$ . There was no significant difference in the levels of stress reported by Chinese students who did or did not mention school as a source of stress.

**Depressed mood.**—A pattern of response different from that of stress appeared for the measure of depressed mood (see Fig. 3). Although Chinese students reported being depressed somewhat more frequently than did students in either the United States or Japan, the frequency distribution of responses was similar in all three locations. Japanese students were more likely than American or Chinese students to report that they never experienced depressive feelings and generally reported the lowest frequencies of depressed mood. As with stress, girls in the United States and Japan reported more frequent depressed moods than did boys; no gender difference in the frequency of depressed mood was found in Taiwan (see Table 5).

The sources of depressed mood differed markedly among the Chinese, Japanese, and American students (see Fig. 4). American

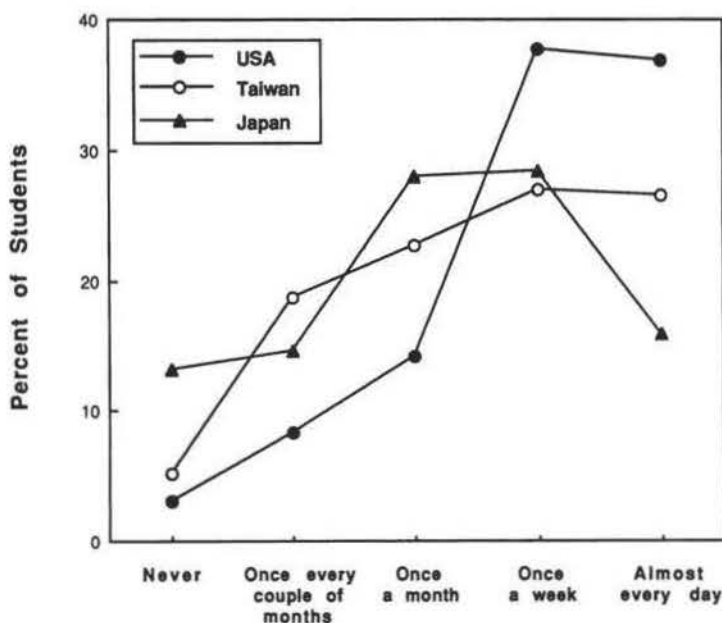


FIG. 1.—Self-reported frequencies of feelings of stress

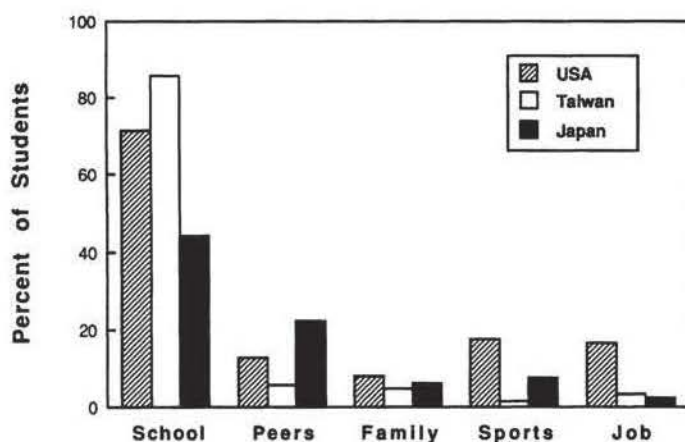


FIG. 2.—Students' reports of sources of stress

students identified relationships with peers as the most frequent cause,  $\chi^2(4, N = 130) = 137.07, p < .001$ , and more of them did so than in the other countries,  $\chi^2(2, N = 574) = 19.19, p < .001$ . The next most common sources for American students were school and family problems. Peer relations and school were mentioned most frequently among Japanese students,  $\chi^2(4, N = 101) = 88.26, p < .001$ , followed by school and then by sports. School situations evoked the highest frequency of depressed mood in Taipei,  $\chi^2(4, N = 149) = 195.98, p < .001$ , followed by peer and family relations.

Chinese students who noted school as a source of depressed mood were more likely to report feeling depressed than were students who did not mention school as a source,  $t(220) = 2.26, p < .05$ . There was no significant difference in the reported frequency of depressed mood between students who did or did not cite school as a source of depression in the United States or Japan.

*Anxiety and aggression.*—American and Chinese students reported feeling more anxious about school and having more frequent

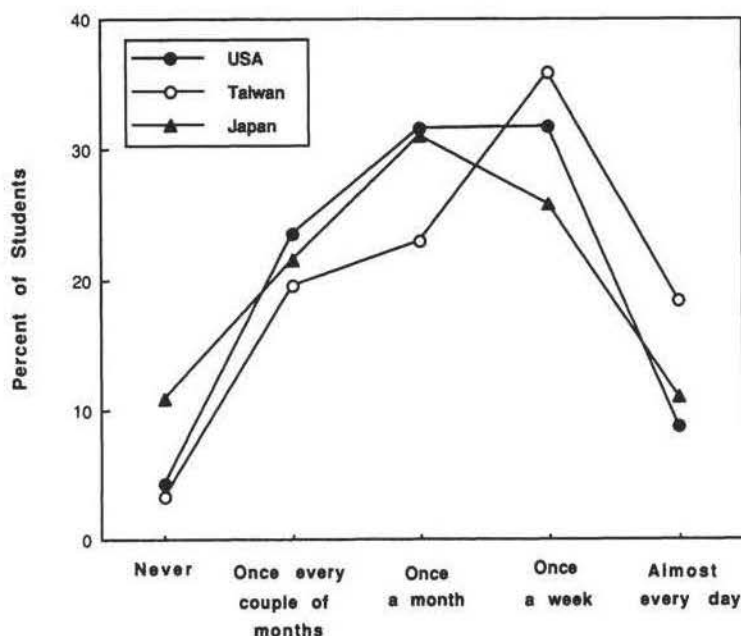


FIG. 3.—Self-reported frequencies of feelings of depression

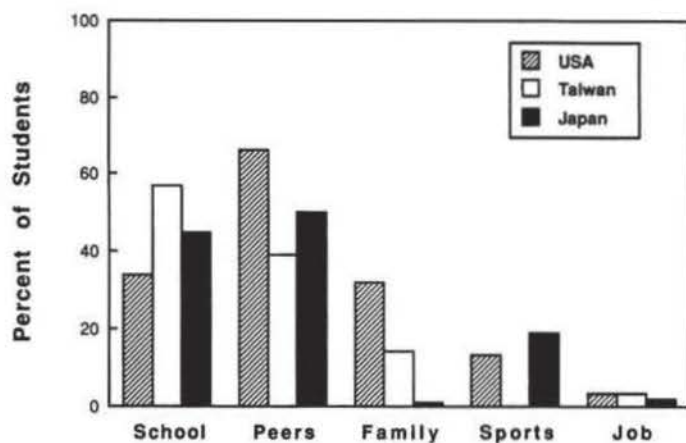


FIG. 4.—Students' reports of sources of depression

aggressive feelings than did students in Japan. In addition, American students reported higher levels of anxiety and aggressive feelings than did the Chinese students. Once again, girls in the United States and Japan reported more anxiety than did boys, while no difference was found between boys and girls in Taiwan. Boys in all three countries, however, reported more frequent aggressive feelings than did girls.

**Somatic complaints.**—In line with our predictions, Chinese students reported a higher frequency of somatic complaints than did their counterparts in the United States and Japan. In turn, American students reported higher frequencies than did Japanese students. It is evident in Table 6 that disturbances in sleeping, appetite, eating, and elimination were the major sources of the Chinese students' higher scores. Girls in Taiwan and the United States reported more

frequent somatic complaints than did boys; gender was not a significant variable in Japan.

**Parental satisfaction and expectations.**—Results indicated significant location,  $F_s(2, 3,936-3,977) = 82.21-194.56$ ,  $ps < .001$ , and gender,  $F_s(1, 3,939-3,977) = 14.63-33.96$ ,  $ps < .001$ , differences in adolescents' perceptions of parental satisfaction and expectations. Interactions between location and gender, however, were not significant,  $ps > .05$ . As can be seen in Table 4, American students reported that their parents were the most satisfied, and Japanese students reported that their parents were the least satisfied with their schoolwork.

The converse was found for parental expectations. Chinese students were more likely than Japanese students, who, in turn, were more likely than American students to

TABLE 6  
MEANS AND STANDARD DEVIATIONS FOR SOMATIC COMPLAINTS ACCORDING TO LOCATION

COMPLAINTS	U.S.A.	Taiwan	Japan	SCHEFFÉ CONTRASTS
	M (SD)	M (SD)	M (SD)	
Tired .....	3.06 (1.19)	3.07 (1.22)	2.67 (1.44)	U, T > J
Headache .....	2.48 (1.12)	2.00 (1.05)	1.94 (1.04)	U > T, J
Stomachache .....	2.02 (.96)	2.08 (1.06)	1.81 (1.11)	U, T > J
Can't sleep .....	2.35 (1.19)	2.75 (1.34)	1.53 (1.02)	T > U > J
Lose appetite .....	1.83 (1.00)	2.16 (1.06)	1.51 (.89)	T > U > J
Overeat .....	2.09 (1.10)	2.41 (1.18)	1.89 (1.23)	T > U > J
Diarrhea .....	1.31 (.61)	1.78 (.87)	1.58 (.89)	T > U > J
Urination .....	1.83 (1.16)	1.63 (.98)	1.22 (.72)	U > T > J

NOTE.—All differences were significant at  $p < .001$ .  $N_s = 1,215-1,220$  (U.S.A.), 1,610-1,615 (Taiwan), 1,134-1,167 (Japan).

report that their parents' expectations for them were too high. As shown in Table 5, boys in all three locations perceived their parents to be less satisfied with their performance than did girls. In addition, boys in Taiwan and Japan believed their parents had higher expectations than did girls in these locations.

#### Within-Country Analyses

Analyses were also conducted to determine the relations within each country among levels of maladjustment, achievement, parental satisfaction, and parental expectations. We formed high and low groups for each of these measures by selecting students whose test scores or ratings fell within the top or bottom 15% of the students in their respective cultures. *T* tests were then conducted to assess the significance of the differences between the two groups on the indices of psychological maladjustment.

**Achievement.**—The means of psychological maladjustment for high and low achievers in each country are presented in Table 7. The strongest relations between level of achievement and psychological maladjustment occurred in the United States.

American students in the low-achieving groups expressed less stress, but, conversely, those in the high-achieving groups gave the fewest indications of academic anxiety, aggression, and somatic complaints. The relations were weak in Taiwan and Japan. The only significant difference to emerge was that Chinese low achievers had more frequent somatic complaints than high achievers.

#### Parental satisfaction and expectations.

—Parental satisfaction seemed to be highly related to maladjustment in Taiwan (see Table 8). Chinese students who perceived low parental satisfaction reported higher levels of maladjustment than those who perceived high parental satisfaction on all outcomes. American adolescents who saw their parents as being dissatisfied tended to have more frequent depressed moods, somatic complaints, and aggressive feelings. Japanese adolescents who indicated low parental satisfaction, in turn, reported more frequent aggressive feelings.

As with parental satisfaction, Chinese students' perceptions of parental expectations were highly related to their psycholog-

TABLE 7

MEANS AND STANDARD DEVIATIONS OF INDICES OF MALADJUSTMENT FOR LOW- AND HIGH-ACHIEVING STUDENTS IN MATHEMATICS ACCORDING TO LOCATION

LOCATION AND INDEX	ACHIEVEMENT LEVEL		CONTRASTS
	Low M (SD)	High M (SD)	
U.S.A.:			
Stress .....	3.55 (1.16)	3.99 (1.02)	H > L***
Depressed mood .....	3.05 (1.13)	3.08 (.95)	N.S.
Academic anxiety .....	4.41 (1.43)	3.60 (1.22)	L > H***
Aggression .....	2.18 (.81)	1.85 (.72)	L > H***
Somatic complaints .....	2.21 (.64)	1.98 (.54)	L > H***
Taiwan:			
Stress .....	3.40 (1.33)	3.56 (1.15)	N.S.
Depressed mood .....	3.33 (1.27)	3.46 (1.03)	N.S.
Academic anxiety .....	4.13 (1.32)	4.05 (1.19)	N.S.
Aggression .....	2.01 (.93)	1.92 (.78)	N.S.
Somatic complaints .....	2.36 (.71)	2.12 (.60)	L > H***
Japan:			
Stress .....	3.17 (1.20)	3.03 (1.33)	N.S.
Depressed mood .....	3.04 (1.14)	2.83 (1.18)	N.S.
Academic anxiety .....	3.91 (1.25)	3.66 (1.26)	N.S.
Aggression .....	1.88 (.82)	1.94 (.96)	N.S.
Somatic complaints .....	1.80 (.65)	1.70 (.64)	N.S.

NOTE.—Ns = 324–325 (U.S.A.), 475–477 (Taiwan), 345–353 (Japan).

\**p* < .05.

\*\**p* < .01.

\*\*\**p* < .001.

TABLE 8

MEANS AND STANDARD DEVIATIONS OF INDICES OF MALADJUSTMENT FOR STUDENTS  
WITH LOW AND HIGH PARENTAL SATISFACTION ACCORDING TO LOCATION

LOCATION AND INDEX	PARENTAL SATISFACTION		CONTRASTS
	Low	High	
	M (SD)	M (SD)	
U.S.A.:			
Stress .....	4.04 (1.09)	4.02 (.99)	N.S.
Depressed mood .....	3.34 (1.09)	3.07 (1.01)	L > H*
Academic anxiety .....	4.17 (1.45)	4.29 (1.41)	N.S.
Aggression .....	2.30 (.90)	1.88 (.69)	L > H***
Somatic complaints .....	2.22 (.63)	2.01 (.60)	L > H**
Taiwan:			
Stress .....	3.77 (1.27)	3.20 (1.28)	L > H***
Depressed mood .....	3.68 (1.21)	3.23 (1.10)	L > H***
Academic anxiety .....	4.17 (1.51)	3.90 (1.37)	L > H*
Aggression .....	2.24 (.96)	1.72 (.71)	L > H***
Somatic complaints .....	2.35 (.68)	2.18 (.68)	L > H**
Japan:			
Stress .....	3.28 (1.43)	3.05 (1.21)	N.S.
Depressed mood .....	3.07 (1.30)	2.85 (1.12)	N.S.
Academic anxiety .....	3.88 (1.41)	3.61 (1.15)	N.S.
Aggression .....	2.06 (.99)	1.82 (.86)	L > H*
Somatic complaints .....	1.87 (.67)	1.74 (.62)	N.S.

NOTE.—Ns = 365–366 (U.S.A.), 482–484 (Taiwan), 342–349 (Japan).

\* $p < .05$ .

\*\* $p < .01$ .

\*\*\* $p < .001$ .

TABLE 9

MEANS AND STANDARD DEVIATIONS OF INDICES OF MALADJUSTMENT FOR STUDENTS IN  
GROUPS OF LOW AND HIGH PARENTAL EXPECTATIONS ACCORDING TO LOCATION

LOCATION AND INDEX	PARENTAL EXPECTATIONS		CONTRASTS
	Low	High	
	M (SD)	M (SD)	
U.S.A.:			
Stress .....	3.87 (1.06)	4.07 (.99)	N.S.
Depressed mood .....	2.96 (1.01)	3.36 (1.03)	H > L***
Academic anxiety .....	4.18 (1.45)	4.34 (1.42)	N.S.
Aggression .....	1.90 (.71)	2.30 (.90)	H > L***
Somatic complaints .....	2.07 (.58)	2.26 (.65)	H > L**
Taiwan:			
Stress .....	3.33 (1.36)	3.79 (1.24)	H > L***
Depressed mood .....	3.35 (1.19)	3.55 (1.14)	N.S.
Academic anxiety .....	3.86 (1.46)	4.32 (1.43)	H > L***
Aggression .....	1.85 (.82)	2.07 (.93)	H > L**
Somatic complaints .....	2.11 (.63)	2.35 (.69)	H > L***
Japan:			
Stress .....	3.16 (1.40)	3.32 (1.33)	N.S.
Depressed mood .....	2.91 (1.32)	3.05 (1.23)	N.S.
Academic anxiety .....	3.46 (1.38)	3.80 (1.25)	H > L*
Aggression .....	1.96 (.96)	2.02 (.99)	N.S.
Somatic complaints .....	1.74 (.67)	1.93 (.71)	H > L*

NOTE.—Ns = 365–366 (U.S.A.), 481–482 (Taiwan), 336–340 (Japan).

\* $p < .05$ .

\*\* $p < .01$ .

\*\*\* $p < .001$ .



ical well-being (see Table 9). Students reporting high parental expectations tended to show greater psychological distress than those reporting low parental expectations on all outcomes except for depression. In the United States, students who perceived high expectations were more likely to indicate depressed mood, somatic complaints, and aggressive feelings. In Japan, students whose parents had high expectations tended to report higher academic anxiety and more frequent somatic complaints.

*Interactions among satisfaction, expectations, and achievement.*—To determine if parental satisfaction or parental expectations interacted with students' achievement to influence their level of psychological maladjustment, we performed 2 (high/low achievement)  $\times$  2 (high/low parental expectations or parental satisfaction) ANOVAs for each of the maladjustment measures.

In general, the ANOVAs yielded no significant interactions between achievement level and parental satisfaction or parental expectations for any of the maladjustment measures. The only exception was found for frequency of depressed mood among Chinese students,  $F_s(1, 122-129) = 5.12-6.88$ ,  $ps < .05$ . Low achievers in Taiwan who felt that their parents were dissatisfied with their schoolwork tended to have more frequent depressed moods than those whose parents were satisfied. Similarly, low achievers who reported high parental expectations were depressed more often than their counterparts whose parents had low expectations. High and low levels of parental satisfaction or expectations did not differentiate among high achievers on any index of maladjustment.

Additionally, we wanted to analyze the simultaneous effects of parental satisfaction, expectation, and achievement level on the measures of maladjustment. However, some of the cell  $N$ s were too small when using the top and bottom 15% of students to create the high and low groups on these variables. We therefore used the mean of the mathematics scores and the mean of the ratings on the measures of satisfaction and expectation in each culture to divide the samples into high and low groups. We then performed 2 (high/low achievement)  $\times$  2 (high/low parental expectations)  $\times$  2 (high/low parental satisfaction) ANOVAs on each index of maladjustment in each culture. No significant interaction effects emerged between satisfaction and expectation on the indices of

maladjustment, nor were there any three-way interactions among satisfaction, expectation, and achievement level.

## Discussion

The belief that the high achievement of Chinese and Japanese students exacts a high cost in terms of their psychological well-being is not supported by these data. Although high school students in both Taiwan and Japan indicated greater parental dissatisfaction with their academic achievement and higher levels of parental expectations than did students in the United States, they nevertheless reported less frequent feelings of stress, anxiety, and aggression than did their American counterparts. Japanese students also reported lower frequencies of depressed mood and fewer somatic complaints than the American students. Nor did we find support for the proposal that within each culture, high achievers experience more frequent symptoms of psychological maladjustment. When statistically significant differences between low and high achievers were found, it was the high achievers who reported the fewer indications of disturbance. The one exception was that American high achievers indicated more frequent feelings of stress than did the low achievers.

One explanation of the higher frequency of stress reported by American students may be found in the work of Lazarus and Folkman (1984). These authors defined stress as a particular relationship between the person and the environment that is assessed by the person to be taxing, dangerous to his or her well-being, or exceeding his or her resources. The notion that stress derives from a poor person-environment fit has been incorporated by Fenzel (1989) into the idea of role strain and applied to understanding stress in early adolescence resulting from the transition from one school level to another. Similarly, we may better understand the greater stress reported by the American students in our study as resulting from their cognitive appraisals that the demands of their environment exceed their abilities to cope with these demands.

Adolescent culture in the United States is characterized by an abundance of competing interests. For example, Csikszentmihalyi and Larson (1984) found that American adolescents devoted only a quarter of their time to studying and classwork, compared with the 40% they devoted to leisure activities such as socializing with friends, playing

sports, and watching television. The adolescents in our study followed this pattern. As we will report elsewhere, the American students spent more time on dates, working, and socializing than did the students in Taiwan and Japan. Such findings convey the impression that adolescents in the United States feel obliged not only to do well in school, but also to have many friends, be good at sports, date, and be employed in some part-time job. In contrast, doing well in school appears to be the major developmental task of Chinese and Japanese teenagers. Despite the demands made on them to maintain high levels of academic achievement, it seems likely that East Asian students are less conflicted, and therefore experience less stress, than American students.

It may also be that American students receive less social support for scholastic achievement from peers and family than do their Asian counterparts. For example, more often than the Chinese or Japanese students, the American adolescents in our sample perceived their peers as choosing to socialize with friends rather than study. In contrast, the sense of group cohesion, mutual cooperation, and strong family support in regard to academic achievement often observed among Asian students (e.g., Rohlen, 1983; Schneider & Lee, 1990; Steinberg, Dornbusch, & Brown, 1992), may account, in part, for their ability to maintain their psychological well-being in the face of a rigorous academic curriculum. A third possibility is that problems in other domains, such as peer groups or family, although not directly felt in terms of stress, may drain the personal resources of American students and leave them poorly equipped to handle the scholastic demands placed upon them.

The competition between academic and nonacademic interests hypothesized to cause stress among American students in general must take an especially high toll on American high achievers. Our data show that high-achieving students in the United States devote more time to studying than do their low-achieving peers. At the same time, the value American high achievers place on out-of-school activities such as being good at sports and dating is not significantly different from that of other students. By spending the extra time on their studies, then, high-achieving students may experience even greater conflict than their low-achieving counterparts in their efforts to respond to the many interests that compete with academic

achievement in the lives of American adolescents.

We have referred earlier to the concern of American parents that a greater emphasis on academic achievement would heighten the stress of high school students. Our data give some support to this concern. American students not only report higher frequencies of stress than their Asian counterparts, but, as noted above, high-achieving American students report more frequent stress than do low achievers. Furthermore, those American students who attribute their stress to activities related to school report higher frequencies of stress than their peers for whom school is not a source of stress. This finding is consistent with other studies showing that academic performance and keeping up with schoolwork cause the most stress among American adolescents (e.g., Armacost, 1989). Paradoxically, then, our data indicate that American parents may be correct in predicting that a push for higher academic achievement would increase stress, even though their use of East Asian examples to support their beliefs appears to be in error. The American perception of the relation between academic achievement and stress may be more of a reflection of the situation of students in the United States than in Chinese and Japanese societies.

The finding that Chinese students reported higher frequencies of depressed mood and of psychosomatic disturbance are in line with the results of numerous other studies (e.g., Cheung, 1986; Yamamoto, 1985). Depression is one of the most common types of disturbance among Chinese. Shek (1991), for example, reported that over 50% of the Chinese adolescents he studied in Hong Kong indicated various levels of depressive symptomatology. Studies comparing psychosomatic symptoms among Chinese and American adolescents are rare. Chang (1985), however, found that Chinese undergraduates tended more often to express their depression in terms of somatic complaints, while their American counterparts were more likely to manifest cognitive and existential concerns. Similarly, Wong and Chan (1984) report that somatic complaints are also an important clinical feature of other psychiatric illnesses among Chinese. Whether this is because of a greater tendency towards somatization by Chinese than by other groups or whether somatic complaints are more acceptable than psychological distress in Chinese culture is unclear.

Japanese students reported comparatively low levels of psychological distress on almost all of the indices of maladjustment. The most straightforward explanation is that Japanese high school students do, in fact, possess higher levels of psychological well-being than their Chinese and American peers. Another possibility is that students in Japan, aware of the "face" they present to the public, gave only socially desirable responses. We believe this is unlikely, for they were self-critical on other items in the interview and questionnaire.

In summary, the overall picture that emerged from this study is one of basically similar levels of psychological adjustment among high school students in Japan, Taiwan, and the United States. Although statistically significant, cross-cultural differences in the frequency of complaints among the cultures were small. The major message conveyed by the findings is clear: high academic achievement, such as that exhibited by students in Taiwan and Japan, can be attained without necessarily increasing students' reports of psychological distress.

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