Academic Stress Among College Students: Comparison of American and International Students

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This study compared academic stressors and reactions to stressors between American and international students using Gadzella's Life Stress Inventory (B. M. Gadzella, 1991). Five categories of academic stressors (i.e., frustrations, conflicts, pressures, changes, and self-imposed) and four categories describing reactions to these stressors (i.e., physiological, emotional, behavioral, and cognitive) were examined. The sample consisted of 392 international and American students from 2 Midwestern universities. American students reported higher self-imposed stressors and greater behavioral reactions to stressors than international students. Respondent's status (American or international) and interaction of status and stressors emerged as the 2 strongest predictors of their behavioral, emotional, physiological, and cognitive reaction to stressors. Five stressors attained statistical significance in the regression model. The findings emphasize the need to recognize cultural differences in stress management. Implications for mental health providers in the university arena are discussed.

KEY WORDS: academic stressors; American students; international students; reactions to stressors

The international student population in the United States has been growing steadily since the 1950s and constitutes a significant proportion of higher education students. For example, international students represent 12% of all master's degrees and 26.7% of doctoral degrees earned in the

United States (Davis, 1996). According to the Institute of International Education (2002), a total of 582,996 students representing more than 186 nations attended 2,500 institutions of higher education in the United States in 2001. Economic, cultural, and political factors indicate an increase in future enrollment (Hayes & Lin, 1994; Huang, 1994).

College is a stressful time for many students as they go through the process of adapting to new educational and social environments. College may be even more stressful for international students who have the added strain of learning different cultural values and language in addition to academic preparation (Essandoh, 1995; Mori, 2000). As stressors accumulate, an individual's ability to cope or readjust can be overtaxed, depleting their physical or psychological resources. In turn, there is an increased probability that physical illness or psychological distress will follow (Lazarus & Folkman, 1994; Pearlin, 1999).

Although numerous studies have evaluated the impact of stress on college students (e.g., Edwards, Hershberger, Russell, & Market, 2001; Misra, McKean, West, & Russo, 2000; Reifman & Dunkel-Schetter, 1990; Zaleski, Levey-Thors, & Schiaffino, 1999), there has been a dearth of studies on international students. Both American and international students share common academic stressors such as family-related pressures, scholarship requirements, financial burdens, competition in class, and course-related stress (Cheng, Leong, & Geist, 1993). However, perceptions of academic stress and coping strategies might differ across cultures. Hence, American and international students may differ in their perceptions and reactions to academic stressors.

A recent study indicates a nationwide increase in college students' stress (Sax, 1997). Academic stressors include the student's perception of the extensive knowledge base required and the perception of inadequate time to develop it (Carveth, Geese, & Moss, 1996). Students report experiencing academic stress predictably, with the greatest sources of academic stress being found in taking and studying for exams and with respect to grade competition and the large amount of content to master in a small amount of time (Abouserie, 1994; Kohn & Frazer, 1986).

Reactions to stressors refer to the state of physical or psychological arousal that usually results from the perception of stress (Thoits, 1995). Students experience physical and psychological reactions to stressors when they perceive excessive or negative stress. Excessive stress induces physical impairments, and it is not uncommon to find students afflicted with persistent lack of energy, loss of appetite, headaches, or gastrointestinal problems (Winkelman, 1994). In addition, some international students may somaticize their feelings of stress to avoid the stigma of seeking psychological assistance (Mori, 2000). For example, international students' experiences of headaches, loss of appetite, or sleep problems may be attributed

to a physical illness even though the complaints have no clear organic basis (Khoo, Abu-Rasain, & Hornby, 1994; Mori, 2000). Although American students experience stress reactions such as anxiety, depression, or both, many international students do not distinguish emotional distress from somatic complaints (Mori, 2000). As such, they use the college health center more frequently than American students for stress-related problems (Ebbin & Blankenship, 1986, 1988; Essandoh, 1995).

Gender differences also influence a student's perception and reaction to academic stressors (Misra et al., 2000). For example, female students more often report letting out their feelings, whereas men more often report controlling their emotions, accepting the problem, not thinking about the situation, and engaging in problem-solving efforts (Hyde & Plant, 1995; Milkie & Thoits, 1993). Coping styles to stressors also differ by gender. When compared at similar levels of stress, women exhibit stress more overtly than males (Hyde & Plant, 1995; Thomas & Williams, 1991).

International students share some common characteristics regardless of their diverse cultural, social, religious, and political backgrounds. Most international students are in the United States temporarily to fulfill their educational objectives and succeed in academic pursuits (Yang & Clum, 1994). However, the majority of these students are deprived of their traditional sources of social support and familiar means of communication (Pederson, 1991). Many of these students experience stressful life changes and cultural adjustments (Leong & Mallinckrodt, 1992). For example, difficulties have been reported with English-language proficiency and with adjustments to the American culture that might contribute to academic stress. Furthermore, international students have difficulties adapting to a new educational system in a short period of time.

Psychological distress is reported especially among those who fail to succeed academically (Essandoh, 1995). Many international students rank in the top levels of their native country schools, and their expectations about academic performance in a new educational environment may be unrealistically high (Mori, 2000). Furthermore, additional pressures to obtain financial support that is often limited for international students contributes to their stress (Mori, 2000). Consequently, lack of traditional social support, high academic achievement, and financial aid restrictions are a few of the critical stressors international students encounter.

Although American and international students may encounter common stressors in college, perceptions of what are considered as academic stressors and their reactions to these stressors may differ. As such, the purpose of this study was to compare perceptions of academic stressors and reactions to these stressors between American and international students. We hypothesized that international students will perceive higher academic stress and exhibit greater reactions to stressors than American students.

METHOD

Participants

This study consisted of American and international students at two public Midwestern universities. Participants consisted of 249 American students and 143 international students. The mean age of the American students was 21 years ($SD = 2.9$) and the mean age of the international students was 25 years ($SD = 4.1$). The majority (75% American and 56% international) of the students were women. Table 1 provides a summary of participant demographics.

Instrumentation

Demographic Information

A brief demographic questionnaire was used to obtain background characteristics of the participants. Items in this questionnaire requested information on age, gender, race, American or international student status, country of origin, educational level, major, and health risk behaviors (e.g., smoking and alcohol consumption).

Academic Stress Scale

Academic stress was measured by Gadzella's Student-Life Stress Inventory (SLSI; Gadzella, 1991), which contains 51 items in a 5-point Likert-

Table 1. Demograpic Characteristics

Variable	Total sample ($n = 392$)	American students ($n = 249$)	International students ($n = 143$)
Age	22.10 (3.55)	20.70 (1.91)	24.70 (4.41)
Gender			
Male	32	25	42
Female	68	75	56
Class status			
Graduate	11	11	23
Undergraduate	89	89	77
Smoke	22*	25	15
Alcohol consumption	63**	73	38

Note. Standard deviations are in parentheses. Smoke = current use of any number of cigarettes; alcohol consumption = had at least one drink in the last week.
*$p = .05$.   **$p = .001$.

type response format (1 = *never* to 5 = *most of the time*). Gadzella's inventory reflects a student's academic stress on and off campus. The SLSI measures academic stressors and reactions to stressors. In the academic stressors section, five categories of academic stressors (i.e., frustrations, conflicts, pressures, changes, and self-imposed) are assessed. In the reactions to stressors section, four categories describing reactions to these stressors (i.e., physiological, emotional, behavioral, and cognitive) are measured. Items are summed for each subscale to obtain a total score, with higher scores indicative of greater academic stress and reactions to stress, respectively.

For the academic stressors section of the SLSI, items consists of statements such as, "I have experienced too many changes occurring at the same time," and "I have experienced frustrations due to delays in reaching my goal." The Frustration subscale comprises 7 items and measures frustration that is due to delays, daily hassles to reach goals, lack of resources available (e.g., money for books, automobile), failures to accomplish goals, feelings of being a social outcast, dating problems, and denied opportunities in spite of one's qualifications. The Conflict subscale has three items and measures academic stress produced by having two or more desirable and undesirable alternatives and goals with positive and negative impacts. The three-item Changes subscale assesses academic stress that is due to life changes and includes changes that are disruptive to the respondent's life. The six-item Self-Imposed subscale measures stress in areas such as when a student likes to compete to win or to be noticed and loved by all. Finally, the four items of the Pressure subscale measures academic stress resulting from competition, deadlines, work overload, and work responsibilities and expectations. Cronbach's alphas were .65, .63, .71, .75, and .63 for the Frustrations, Conflicts, Pressures, Changes, and Self-Imposed subscales, respectively.

In the reactions to stressors section, four types of reactions to academic stressors—physiological (14 items), emotional (4 items), behavioral (8 items), and cognitive (2 items) reactions—are assessed. The Physiological Reactions subscale measures responses such as sweating, stuttering, trembling, exhaustion, weight loss/gain, and headaches. Emotional Reactions include fear, anxiety, worry, anger, guilt, and grief. The Behavioral Reaction subscale measures reactions to stressful situations such as crying, drug use, smoking, and irritability. Cognitive Reactions are measured by the respondent's ability to analyze and think about stressful situations and the use of effective strategies to reduce stress. Participants in the study obtained alphas of .78, .81, .68, and .85 for the Physiological, Emotional, Behavioral, and Cognitive subscales, respectively.

Gadzella (1991) reported satisfactory reliability of the SLSI. Construct validity of the SLSI stressors for international students was completed using principal axis factoring with a varimax rotation. The factor analysis

provided a listing of nine factors with eigenvalues greater than 1. An eigenvalue of 1 or greater indicates that the factor possesses at least as much total variance as contained in a single item (Walz & Bausell, 1981). A factor pattern–structure coefficient of .40 was determined to be the lowest acceptable loading. The factors accounted for 53% of the variance for international students and were comparable with 52% for the American students. The variance for the total sample was 51%.

Procedure

For American participants, the registrars' directories of address files served as the sampling frame and provided an up-to-date address list of students. A list of 595 student-mailing addresses was randomly generated from the registrars' directories. Survey packets, which consisted of a brief letter describing the study and statement of institutional review board approval, a demographic questionnaire, the SLSI, and a self-addressed postage-paid envelope were mailed to the participants. Follow-up mailings were sent after 2 weeks. No incentives were provided. Of the 595 surveys mailed, 251 questionnaires were returned, yielding a response rate of 42%. Two surveys were returned incomplete, leaving 249 complete surveys for the final sample.

International students were recruited at another university with a modest number of international students enrolled. The directors–advisors of the international students' offices were informed about the study and requested to provide a list of students' names and addresses for mailing the survey. For reasons of confidentiality, both offices agreed to mail the questionnaire directly to the students from their office. A total of 370 survey packets were mailed, with follow-up mailings after 2 weeks to improve the response rate. No incentives were provided. One hundred forty-four questionnaires were returned, yielding a response rate of 39%. One survey was returned incomplete and was discarded leaving 143 complete surveys for the final sample.

RESULTS

Statistical Analysis

Confirmatory factor analyses were conducted on the 51 items measuring academic stress to examine the factorial structure of constructs of academic stressors and reactions to stressors for American and international

student participants. Univariate analysis was done to investigate differences between the American and international students for all five academic stressors and four reactions to stressors. Effect sizes, as determined by Cohen's (1988) *d,* were calculated to determine the magnitude of the difference.

A 2 × 2 multivariate analysis of covariance (MANCOVA) was performed, with academic stressors and reactions to stressors as the dependent variables, to determine gender and group differences. The two groups were status (American vs. international student) and gender (male vs. female) and the covariate (control variable) was the age of the respondents. ω^2, a corrected effect size defined as $1 - \Lambda$, was calculated to measure the strength of association for multivariate analysis of variance (Baugh & Thompson, 2001). η^2 examined the magnitude of the difference for all the nine indicators by group status, gender, and interaction. Data analysis was performed using the Statistical Package for Social Science (SPSS, 2002) software.

Prior to the MANCOVA analysis, the data were checked and no outliers were detected. The assumptions of normality, homogeneity of variance–covariance matrices, and multicollinearity were examined. Correlations among the stressors and reactions to stressors showed small to moderate association. The values of skewness and kurtosis for the indicators showed that the variables were approximately normally distributed. However, the Box M test for assumption of homogeneity of variance–covariance matrices was not met, $F(135, 10473) = 2.06, p < .001$. Because the Box M test is considered a strict and sensitive measure, large sample sizes are usually necessary for multivariate applications of analysis of variance (ANOVA; Tabachnick & Fidell, 2001). The normal distribution of the dependent variables, the large sample size in this study, and a reduced alpha level of .01 were considered appropriate to address the violation of this assumption (Tabachnick & Fidell, 2001).

Four hierarchical regression analyses were performed, with reactions to stressors as the outcome variable for each regression model. Variables were entered in blocks, with status entered into the model in the first block, followed by each of the five stressors, and finally the interaction of stressors (computed by averaging the five stressor items) and status.

Group Differences and Effect Sizes

Table 2 describes the mean scores and standard deviations for academic stressors and reactions to stressors for American and international students. In general, irrespective of their American or international status, women perceived greater reactions to stressors than men. In four of the

Table 2. Mean Academic Stressors and Reactions to Stressors by Gender and Status

| Variable | American students | | | International students | | |
	Males	Females	Total	Males	Females	Total
Stressor						
Change	2.61 (0.72)	2.60 (0.72)	2.60 (0.72)	2.53 (1.21)	2.64 (1.01)	2.59 (1.10)
Conflict	3.14 (0.59)	3.06 (0.62)	3.08 (0.61)	2.75 (0.71)	2.52 (0.71)	2.64 (0.74)
Frustration	2.71 (0.49)	2.72 (0.53)	2.72 (0.52)	2.60 (0.67)	2.44 (0.62)	2.51 (0.64)
Pressure	3.61 (0.65)	3.68 (0.60)	3.66 (0.62)	3.16 (0.79)	3.34 (0.86)	3.26 (0.83)
Self-imposed	3.62 (0.52)	3.77 (0.55)	3.72 (0.55)	2.93 (0.79)	3.02 (0.74)	2.98 (0.76)
Reaction						
Emotional	2.73 (0.91)	2.90 (1.08)	2.86 (1.04)	2.53 (0.86)	2.82 (0.95)	2.68 (0.93)
Cognitive	2.77 (1.01)	2.92 (0.97)	2.88 (0.98)	3.28 (1.11)	3.13 (1.07)	3.21 (1.10)
Behavioral	2.00 (0.65)	2.12 (0.72)	2.09 (0.71)	1.59 (0.51)	1.81 (0.48)	1.71 (0.50)
Physiological	1.81 (0.59)	2.07 (0.75)	2.00 (0.72)	1.86 (0.57)	2.07 (0.49)	1.97 (0.53)

Note. Standard deviations are in parentheses. Academic stressors and reactions to stressors: 1 = *never,* 5 = *most of the time.*

five categories of academic stressors (conflicts, frustrations, pressures and self-imposed stress), American students perceived higher levels of stress than their international counterparts. The magnitude of difference for effect sizes ranged from 0.02 to 1.12 and can be considered as small for Frustration subscale ($d = 0.34$), medium for the Pressure subscale ($d = 0.56$), and large for Self-Imposed Stress subscale ($d = 1.12$; Tabachnick & Fidell, 2001). Self-imposed stress produced the greatest academic stress among the American students whereas pressure caused the greatest source of academic stress among international students.

The two groups also significantly differed in two out of the four measures of reaction to stressors. The magnitude of difference was small for physiological and emotional reactions (ds = 0.02 and 0.12, respectively) and medium for cognitive and behavioral reactions (ds = –0.31 and 0.53, respectively). The most frequent reactions to stressors, for both groups, were cognitive (i.e., their cognitive appraisal of stressful situations and their strategies) and emotional (i.e., fear, anxiety, and worry). However, American students recorded higher behavioral (e.g., crying and self-abuse) reactions to stressors and international students perceived greater cognitive reactions to stressors.

A second 2 × 2 between-subjects MANCOVA was performed on the five academic stressors and four reactions to stressors to examine the differences among the groups after adjusting for age. There was a significant age difference (approximately 4 years) between American and international students that could have resulted in differences in attitude toward academics, level of development, and one's experiences, consequently affecting their perceptions of stressors and reactions to stressors. Hence, age was controlled in the multivariate analysis. Independent variables were gender (male and female) and group (international and American stu-

dents). The covariate was age and the dependent variables were academic stressors and reactions to stressors. With the use of Wilks's criterion, the combined academic stressors were significantly affected by both group status and gender, but there their interaction was not significant (see Table 3). After adjustment for age, the significant main effects were group status, Wilks's Λ = .71, $F(5, 351)$ = 27.74, $p < .001$, ω^2 = . 28; gender, Wilks's Λ = .95, $F(5, 351)$ = 3.78, p = .002, ω^2 =.05; and the Gender × Group interaction, Wilks's Λ = 0.98, $F(5, 351)$ = 1.52, p = .18, ω^2 =.02. The strength of association, as measured by ω^2, was modest between group status and the combined academic stressors and less substantial between gender and the academic stressors. Age was not significantly associated with the academic stressors and did not provide any reliable adjustment for the composite academic stressors.

As demonstrated in Table 4, the MANCOVA yielded a significant main effect, adjusted for age, for the combined reactions to stressors with group status, Wilks's Λ = .92, $F(4, 349)$ = 6.91, $p < .001$, ω^2 = .07, and gender, Wilks's Λ = .97, $F(4, 349)$ = 2.38, p = .05, ω^2 = .03. No Gender × Group interaction for reactions to stressors was observed, Wilks's Λ = .98, $F(4, 349)$ = 1.50, p = .20, ω^2 = .017. The strength of association was small between group status and the combined reactions to stressors and low between gender and the academic stressors. Age was significantly associated with the reactions to stressors.

To investigate the impact of each main effect on individual stressors

Table 3. Multivariate Analysis of Covariance of Academic Stressors

Variable	$F(df)$	η^2	p
Status			
Change	0.20 (1)	.001	.655
Conflict	29.35 (1)	.076	.001**
Frustration	8.13 (1)	.022	.005**
Pressure	23.76 (1)	.063	.001**
Self-imposed	89.40 (1)	.201	.001**
Gender			
Change	1.13 (1)	.003	.290
Conflict	4.54 (1)	.013	.030*
Frustration	1.25 (1)	.004	.264
Pressure	1.88 (1)	.005	.171
Self-imposed	5.45 (1)	.015	.020*
Gender × Status			
Change	1.87 (1)	.005	.172
Conflict	0.93 (1)	.003	.336
Frustration	0.93 (1)	.003	.337
Pressure	0.21 (1)	.001	.647
Self-imposed	0.08 (1)	.001	.931

Note. Status = American or international student status. Effect size (η^2) measure is a standardized unit.
*$p < .05$.   **$p < .01$.

Table 4. Multivariate Analysis of Covariance of Reactions to Academic Stressors

Variable	$F(df)$	η^2	p
Status			
Emotional	3.25 (1)	.009	.072
Cognitive	2.18 (1)	.006	.141
Behavioral	14.08 (1)	.038	.001**
Physiological	0.001 (1)	.001	.988
Gender			
Emotional	3.35 (1)	.009	.068
Cognitive	0.06 (1)	.001	.797
Behavioral	5.05 (1)	.014	.025*
Physiological	7.94 (1)	.022	.005**
Gender × Status			
Emotional	0.47 (1)	.001	.492
Cognitive	2.44 (1)	.007	.119
Behavioral	1.10 (1)	.003	.293
Physiological	0.11 (1)	.001	.745

Note. Status = American or international student status. Effect size (η^2) measure is a standardized unit.
*$p < .05$.   **$p < .01$.

and reactions to stressors, follow-up univariate F tests were conducted. Results revealed that American students perceived higher academic stress from conflict ($\eta^2 = .08$), frustration ($\eta^2 = .02$), pressure ($\eta^2 = .06$), and self-imposed stress ($\eta^2 = .20$) than their international counterparts. American students also displayed higher behavioral reactions to stressors ($\eta^2 = .04$) than international students to academic stressors. Men perceived higher academic stress from conflict ($\eta^2 = .04$) and lower self-imposed stress ($\eta^2 = .02$), whereas women displayed greater behavioral ($\eta^2 = .01$) and physiological ($\eta^2 = .02$) reactions to academic stressors.

Regression Analysis

Correlations among the predictor variables were examined. These relationships are depicted in Table 5. Results of the correlational analysis revealed that stressor variables correlated significantly with reaction variables. However, the cognitive reaction variable did not significantly correlate with any stressor variables.

Hierarchical regression analyses were performed to identify the importance of status, each of the five stressors, and the interaction of stressors and status in predicting each of the four reactions to stressors. Status was the first variable to be entered into the model, followed by each of the five stressors, and finally the interaction of stressors (computed by averaging the five stressor items) and status. Result of the regression analysis is

Table 5. Intercorrelations Between Predictor Variables

Variable	1	2	3	4	5	6	7	8	9
1. Physiological	—	.63**	.62**	.27**	.27**	.21**	.26**	.32**	.26**
2. Emotional		—	.62**	.21**	.37**	.26**	.39**	.37**	.39**
3. Behavioral			—	.17**	.39**	.31**	.32**	.28**	.34**
4. Cognitive				—	.01	.01	.07	.07	.03
5. Frustrations					—	.39**	.46**	.43**	.38**
6. Conflict						—	.36**	.27**	.43**
7. Pressure							—	.41**	.61**
8. Change								—	.52**
9. Self-imposed									—

**p < .01.

indicated in Table 6. Respondent's status (American or international) was a significant predictor for behavioral, emotional, and physiological reactions but not the cognitive reaction; status was the strongest predictor for students' emotional reactions. Interaction of stressor and status was significant for behavioral and emotional reactions, indicating that multiple effects of student status (American or international) and academic stressors contributed in their effect on reactions. The differential effect of academic stressors on reaction by student status was examined by plotting the two predictor variables as well as their interactions (Pedhazur, 1997). The slope of lines intersected for both behavioral and emotional reactions but at different regions of significance. Stressors were more important for American students in their effects on reactions, and those with higher academic stressors exhibited greater emotional and behavioral reactions compared with the international students.

All the five stressors (frustration, self-imposed, change, conflict, and pressure) were significant predictors in the regression models except for cognitive reaction. Coefficient of determination (R^2) indicated 49% of variance was explained for behavioral reaction, 28% for emotional reaction, 22% for physiological reaction, and 21% for cognitive reaction by the predictor variables in the model. The regression model was significant for all the four reaction variables ($p < .001$).

DISCUSSION

This study compared academic stressors and reactions to stressors between American and international students. The results did not support our hypothesis. International students reported lower academic stress and fewer reactions to stressors than their American counterparts in this study. Furthermore, differences in reaction to stress by gender were also found.

Table 6. Hierarchical Regression Analyses of Reactions to Academic Stressors

Step and variable	B	β	R^2	p
Behavioral reaction ($R^2 = .49$, $F = 17.27$, $p < .001$)				
1. Status	1.03	0.73	.245	.007
2. Change	0.21	0.27	.372	.001
3. Conflict	0.23	0.23	.412	.001
4. Frustration	0.38	0.32	.465	.001
5. Pressure	0.19	0.20	.470	.004
6. Self-imposed	0.18	0.19	.471	.035
7. Stressor × Status	−0.41	−0.86	.493	.001
Constant	−1.32			.045
Emotional reaction ($R^2 = 0.28$, $F = 20.74$, $p < .001$)				
1. Status	1.98	0.94	.005	.001
2. Change	0.29	0.25	.141	.001
3. Conflict	0.23	0.16	.164	.001
4. Frustration	0.45	0.26	.201	.011
5. Pressure	0.36	0.26	.237	.001
6. Self-imposed	0.56	0.40	.260	.001
7. Stressor × Status	−0.55	−0.79	.279	.002
Constant	−3.50			.001
Physiological reaction ($R^2 = 0.22$, $F = 10.40$, $p < .001$)				
1. Status	0.17	0.24	.124	−.026
2. Change	0.17	0.24	.124	.003
3. Conflict	0.13	0.14	.142	.036
4. Frustation	0.23	0.21	.169	.013
5. Pressure	0.20	0.23	.197	.043
6. Self-imposed	0.27	0.30	.211	.007
7. Stressor × Status	−0.28	−0.62	.222	.073
Constant	−0.82			.148
Cognitive reaction ($R^2 = 0.21$, $F = 2.32$, $p < .001$)				
1. Status	−0.38	−0.01	.156	.955
2. Change	−0.63	−0.05	.169	.545
3. Conflict	−0.21	−0.01	.174	.848
4. Frustration	−0.96	−0.05	.174	.448
5. Pressure	0.66	0.04	.195	.565
6. Self-imposed	0.60	0.04	.202	.678
7. Stressor × Status	0.17	0.23	.206	.433
Constant	2.41			.039

Note. Stressor computed by averaging the five stress items (change, conflict, frustration, pressure, and self-imposed stress).

American participants reported a statistically significant higher level of academic stress from self-imposed stress. This was an unexpected finding. However, self-imposed stress (i.e., like to compete and win) is characteristic of American culture that values competition (Katz, 1985), and American students reported higher self-imposed stress than international students. American participants also perceived higher academic stress from pressure and conflict than international student participants. These differences may not necessarily indicate that international student participants

have lower academic stress from pressure, conflict, or self-imposed stress but could be due to stigmatization of admitting to stress (Mori, 2000). For example, self-disclosure of personal problems may be regarded as disgraceful and considered as a sign of immaturity and weakness in some international students (Uba, 1994).

Although American participants reported higher levels of academic stressors and reactions to stressors, hierarchical analyses indicate that status does influence reactions to stressors. Status significantly contributed to the variance in behavioral, emotional, and physiological reactions to stressors. When the interaction of stressor with status was examined, stressors were more important for American students in their effect on behavioral and emotional reactions. For international students, stressors had an effect on cognitive reactions; however, this finding was not statistically significant. The lack of significance may be due to the small sample size of international students. It is clear that more research with a larger sample size is needed.

Although the literature indicates that international students tend to somaticize feelings of stress, results of this study indicated no statistically significant difference in physiological reactions between international and American students. However, the findings suggest that participants did react differently to stressors. American participants reported statistically significant higher behavioral reactions than their international counterparts. This may explain why American students in the study's sample reported higher rates of drinking and smoking (Thoits, 1995).

Differences in stressors and reaction to stressors were found between men and women after controlling for age. Male participants reported more stress that was due to conflict. Women (American and international) displayed greater behavioral and physiological reactions to academic stressors. This supports the literature's findings that female students tend to express their emotions behaviorally (Hyde & Plant, 1995; Misra et al., 2000; Thomas & Williams, 1991). Gender differences in the reactions to stress may be the result of gender-role socialization, which teaches that behavioral expression of emotions is socially acceptable (Gilbert & Scher, 1999).

Limitations

There are a number of limitations restricting the generalizability of this study. First, the results of this study are limited by a relatively small preliminary survey of self-reported academic stress rather than a study of actual behavior, which would be very difficult to achieve. As such, participants may have answered questions in a socially desirable manner to avoid the stigma associated with admitting personal inadequacies.

Another limitation is that the level of acculturation of the international students was not examined. Research shows that international students who are more acculturated tend to experience less stress (Berry, 1985). Because the measures were in English, many international students who have not mastered the English language may have been excluded from the study or placed different meanings on survey questions. As mastery of the English language may be an important component of acculturation (Paniagua, 1998); using English-worded measures may have restricted the sample to more acculturated students. Future studies should examine the impact of acculturation on international students' perceptions and reactions to academic stress.

The study is limited by grouping international students into one group because of the small sample size and skewness of the variable (82% from non–English speaking countries: Africa, Asia, and Middle East) and may have masked important within-group differences among students from different countries. Cultural variations, attitudes, and values can render unique differences in students' perception and reactions to academic stressors from Westernized (e.g., English, Canadian, and German) versus non-Westernized (e.g., Middle Eastern, African, and Asian) and English speaking versus non-English speaking countries (Sue & Sue, 1999). For example, although American culture has unique cultural values that differ from other Western cultures, such as rugged individualism, international students from Western countries also have common cultural values. Furthermore, international students from non-Western cultures (e.g., Middle Eastern, African, and Asian) may differ from Western international students (e.g., English, Canadian, and German) in their cultural values such as collectivism and time orientation (Sue & Sue, 1999). Future research should examine within-group and between-group differences, as this may also influence perceptions and reactions to stress.

More female students (both American and international) and sophomores (American) responded to the survey questionnaire, and they may not be comparable with the general student population as a whole. Although the female (American) population in both universities was slightly higher (approximately 57%) than the male population (43%), it does not justify the much higher response rate of 68%. Similarly, a higher percentage of female international students responded to this survey. Future studies should be proactive in maintaining a balance of participants on the basis of gender and college student status.

Implications and Future Research

This study found important differences in perceptions of academic stressors and reactions to stressors between American and international

student participants. As such, the findings from this study have implications for mental health professionals working with international students. First, it provides empirical validation of differences in the experience and reactions to stress of American and international students. As mental health professionals become aware of these differences, they will be better able to structure prevention and treatment programs for international and American students. For example, some international students, depending on country of origin, may react to stress by using the cognitive approach. Some American students may display behavioral reactions when coping with stress. As such, mental health practitioners need to use different approaches in reducing stress. For students who display behavioral reactions, counseling that focuses on constructive behavioral coping strategies such as exercise would be useful. Cognitive–behavioral therapies that focus on recognizing cognitive distortions and using mentally healthy cognitive strategies such as cognitive reframing can be beneficial for students who react cognitively to stress.

Because the findings show that men and women differ in their perceptions and reactions to stress, mental health practitioners may also consider using treatment interventions on the basis of these differences. For example, the findings show that female students' reaction to stress may be emotional and physical in nature. As such, it may be beneficial for practitioners to work collaboratively with college campuses in educating the student population about the physical and emotional symptoms of stress.

This study adds to the body of knowledge concerning students' academic stressors and reactions to stressors. Further research on academic stress needs to examine the within-group variability of international students and provide more detailed information on differences by countries and level of acculturation. It is also imperative to explore the relationships among academic stress and students' time management behaviors, coping mechanisms, and support structures and how these factors might vary in different cultures. Future studies may also investigate the impact of gender-role expectations on perception and reactions to academic stress (Castillo & Hill, in press).

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