

College-Stress and Symptom-expression in International Students:  
A comparative study

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(ABSTRACT)

The primary purpose of the investigation was to examine differences in symptom-expression between Caucasians and Asians in response to college-stress. College-stress was defined as adjustment problems that students experience as a function of exposure to a college environment. The propensity of each group to express symptoms in response to stress in somatic (i.e., bodily) versus psychological (i.e. anxiety and depression) modes was investigated. Previous reports have postulated a somatization hypothesis for Asians, as opposed to a psychologization tendency in Caucasians. Intra-Asian differences with respect to symptom-expression were also examined. Data were collected electronically. 115 graduate students participated in the study. Using Fisher's transformations to compare correlations, it was found that neither the somatization nor the psychologization hypotheses were supported. However, within Asians depression demonstrated a stronger association with stress than somatic symptoms.

A subsidiary purpose of this investigation was to determine whether attribution-style was an aspect of culture that could lead to differences in symptom-expression. It was hypothesized that Asians would have a more external attribution-style, while Caucasian-Americans would have a more internal style. External style was hypothesized to be related to a somatic tendency, while internal style was hypothesized to be related to a psychological tendency. None of these hypotheses were supported. Finally, some exploratory analyses were carried out to assess the effect of demographic variables on symptom-expression. Sex was related to anxiety symptoms, while level of education was related to somatic symptom-reports. Overall, these findings highlight the need for cross-cultural research in psychology to adopt a more systemic approach in studying variables, as opposed to using merely country/culture as an independent variable.

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**College-Stress and Symptom-expression in International Students: A  
comparative study**

“The unprecedented volume and character of contemporary international migrations provide exceptional opportunities for research to examine psychological dimensions of exposure and immersion in a new and different socio-cultural environment” (Rogler, 1994, p. 701).

Among the first to draw attention to possible problems related to migration was Olberg (1955) who introduced the term culture shock to refer to the problems of acculturation and adjustment among Americans working on a health project in Brazil. Since then increasing attention has been paid by researchers to this issue. Over the years, the process of migration and crossing cultural boundaries has been examined in a number of disciplines including social psychology, cultural psychology and sociology.

Migration involves crossing language, communication, interpersonal, social and cultural boundaries. The presence of such differences—and the fact that the immigrant has to learn to cope with these differences—provides support for the possibility of stress and/or development of disorders in this population. Ramirez (1989) pointed out that coping with some of the aspects of the new culture constituted groundbreaking efforts for some immigrants, and feelings of stress, failure, and defeat were not uncommon. Several stressors present themselves to the new immigrant. The result of becoming a minority-group member in the host country, concern about relatives in the home country, losses associated with migration, fear of learning new things, and cultural conflicts may all be potential sources of stress (Guarnaccia & Lopez, 1998; Westermeyer, 1989).

### Migration and International Students

While stress in relation to migration has been investigated in a variety of populations such as college students (Redmond & Bunyi, 1993; Zimmerman, 1995), international spouses (Verthelyi, 1995) and work-migrants (Briody & Chrisman, 1991; Janssens, 1995), the former has been one of the most widely-studied samples in the cross-cultural field. In relation to crossing cultural boundaries, issues such as identification of kinds of adjustment problems, predictors of adjustment, and elucidation of potential psychological problems have been studied in this population. In a review of literature on international students, Church (1982) identified the following areas as potential areas of difficulty: monetary problems, language difficulties, adjustment to a new educational system, and social adjustment to the new milieu. Some predictors of adjustment that have been identified are cultural distance, acculturation, language difficulties and coping strategies (Searle & Ward, 1990; Ward, 1995; Ward & Searle, 1991; Ward & Kennedy, 1992, 1993a, 1993b, 1994). Psychological problems in relation to cross-cultural adjustment have not been widely studied, and these have been typically difficult to identify (Aubrey, 1991). Some studies in the recent past have identified depression and anxiety as a concomitant of cross-cultural adjustment (Ward & Kennedy, 1992, 1994). In short, our knowledge of stress in international students is more comprehensive with respect to predictors of stress, as opposed to the quality of outcome.

Not only is our understanding of stress in international students limited in terms of outcome, little is known about the adjustment problems or stress that international students experience in comparison to the local student population in the host country. Thus, there is a lack of comparative understanding regarding stress/college adjustment problems and its consequences on international versus host country students. A major reason for the current ambiguity can be attributed to problems in conceptualization of the independent (stress/adjustment problems) and dependent variables (in terms of symptomatology/disorders).

Stress in cross-cultural comparisons

In the study of psychological outcomes in relation to a postulated negative event, it is important to ask ourselves what the "negative issue" being investigated is. Especially with respect to international subjects, the question that needs to be addressed is whether the negative event is relevant for the group under study. For example, Leong, Mallinckrodt, and Kralj (1990) compared stress among international and American college students using a questionnaire designed to assess general life stress, and found that the former group reported fewer stressful events than the latter. International students may not experience some general life stressors that most Americans experience, due to differing life circumstances. For example, international students may be of higher socio-economic status or may have been offered a good assistantship to enable their international travel, and hence financial concerns may not be as prevalent as among American students. Wang (1999) also compared U.S.(residing in the U.S.) and Chinese (residing in China) college students' stress using a life stress inventory and reported less stress in the Chinese group. Although this study compared students in their home countries, a measure of general life stress may not have been applicable to both groups due to differing cultural values and lifestyles.

A valid comparison of stress between international and American students entails examining kinds of stress that are applicable to both groups. Potential exposure of both groups to the stress selected is a necessary condition in such comparative studies. One type of stress that both groups of students may be exposed to is that experienced with respect to adjusting to a college environment. Problems related to adjustment to college life such as academic pressures, financial problems, poor health, loneliness, interpersonal conflicts and difficulty in adjusting to change have been noted in U.S. college students (Baker & Siryk, 1986). Boyer and Sedlacek (1988) and Pederson (1991) have noted that although international students may have good academic skills, they are likely to experience more problems than their U.S. counterparts due to access to fewer resources. Kaczmarek, Matlock, Merta, Ames, and Ross

(1994) also reported increase in symptom-reports in an international student group, which comprised mostly of Asians. Specifically, in this study, twenty-nine volunteer international students—comprising of both undergraduate and graduate students—were administered the Student Adaptation to College Questionnaire (SACQ) during an orientation-meeting, and later after a nine-week period. It was found that international students reported an increase in somatic and psychological symptoms.

Although few, some studies in the recent past have used this concept of college adjustment to compare international and domestic students. For example, on comparing adjustment difficulties between U.S. and international students, (Kaczmarek et al., 1994) found that the international group had a more difficult transition to college than U.S. students. They compared twenty-nine international students with twenty-nine domestic students using the SACQ. Abe, Talbot, and Geelhoed (1998) compared college adjustment between international students, and found that students from Asian countries had more difficulty adjusting to college life than international students from non-Asian countries. Specifically, using the SACQ they found that Asian students, in comparison to non-Asian students, reported lower scores. These studies indicate that the concept of college adjustment difficulties may lend itself fairly well to cross-cultural comparisons.

#### Expression of stress/ difficulties in the cross-cultural context:

Another problem in studies on stress and its consequences in international populations lies in our conceptualization of these consequences. Westermeyer (1989) noted that the losses associated with migration precipitates depression and anxiety in migrant groups. Neurotic disorders such as depression and anxiety have been commonly studied in international students around the world (Searle & Ward, 1990; Ward, 1995; Ward & Searle, 1991; Ward & Kennedy, 1992, 1993a, 1993b, 1994). Depression and anxiety are also disorders that have been commonly studied in local college students across U.S.A. and in

other countries (Arthur, 1998; Lange & Byrd, 1998; Segrin, 1999; Vickers & Vogeltanz, 2000). While these symptoms have been investigated in independent studies for Americans and international groups, most studies—even with international groups—have used instruments standardized in Western countries, such as the Beck Depression Inventory (BDI). This trend is in keeping with the dominant etic (universalistic) epistemology in cross-cultural research, which holds that behavior is common to human beings independent of their culture: namely, psychiatric disorders—as described in successive editions of the Diagnostic and Statistical Manual of Mental Disorders (DSM) and International Classification of Diseases (ICD)—are valid throughout the world. However, cross-cultural studies from the emic (relativistic) position—which holds that meaning systems are culturally constituted and that Western-based DSM categories of illness cannot be applied to non-Western societies—have revealed cultural differences in symptom-expression. Regarding outcome variables to be examined within this investigation, cross-cultural reports have found that depression and anxiety are expressed in somatic terms in non-western cultures, in comparison to Western cultures (Gureje, Simon, Ustun, & Goldberg, 1997; Simon, Gater, Kiseli, & Piccinelli, 1996). Kleinman (1988) noted that in non-Western societies feelings of sadness, worthlessness and guilt were less common, while somatic complaints such as feeling tired, stomach-aches and headaches were more common. Kleinman (1988) also noted that the association of culturally salient somatic language of complaints with depression and anxiety has been recorded for clinical samples in a variety of countries such as Saudi Arabia, Iraq, India and Hong Kong. He added that this tendency is prevalent in many non-Western countries in general. These somatic symptoms have been reported to include symptoms such as dizziness, tiredness, fatigue, headaches, and abdominal pain (Cheung, 1985; Kleinman, 1988; Youngmann, Minuchin-Itzigsolin, & Miriam, 1999). It should be noted that almost all these studies have been carried out in primary health care facilities or research centers based in non-urban areas. These studies have thus mostly targeted adult, semi-educated or uneducated populations. Kim, Li, and Kim (1999) found that depressed Chinese patients characteristically reported

somatic symptoms. They also reported that most reports in Asia indicated predominantly somatic symptoms. This study also focused on adult patients. A tendency to report somatic complaints among adult neurotic patients has also been reported in Taiwan (Yeh, 1985).

Many of the above represent findings of individuals living in their native countries. This poses the question of applicability of concepts such as "somatization tendency" to immigrants from these countries, and whether immigrants carry with them these culturally sanctioned ways of expression. A question which arises is to what extent does this mode of symptom-expression exist within international students. Specifically with respect to international students, not much information is available with respect to symptom-presentations. However, the wide-spread understanding in the theoretical literature is that international students—especially those from Eastern cultures—express distress in somatic terms (Char, 1987). In a theoretical review, he noted that international students were not well-served by Western agencies their attempts to manage problems, as there was a tendency to discuss disorders in somatic terms. In a pilot study questioning whether international students or domestic students experienced more stress-related symptoms, Ebbin and Blankenship (1986) found that international students had higher frequencies of headaches, insomnia, constipation, abdominal pain, chest pain and gastritis. In this study, a survey of 476 college health centers was done using a general questionnaire that requested respondents to list the most diagnosed disorders in foreign students. These preliminary findings with respect to international students, together with studies on immigrants in general discussed above, indicate that there may be a tendency in international students to report problems such as depression in somatic terms.

Support for this notion may be drawn from the medical literature have found that immigrant adults in general suffer from a number of stress-related somatic illnesses (Adeyanju, Tricker, & Spencer, 1990; Leong et al., 1990). Somatic presentation of complaints has also been noted to some extent in immigrant literature in general. Westermeyer (1989) found that somatization was common among

migrants. Specifically, hot and cold spells, headaches and feelings of tiredness were observed. He added that depressive and anxiety disorders accounted for an overwhelming majority of somatic complaints in migrants. In a sample of Chinese immigrants in Singapore, (Tsoi, 1985) reported that instead of presenting typical symptoms of anxiety and depression, the majority of people in a mental health survey presented with somatic complaints. Drawing from such studies, it has been postulated that immigrants may demonstrate a trend towards somatization.

#### Somatization versus psychologization.

"Health is a product of culture" (Mechanic, 1990, p. 1345). The above studies lend credence to this observation in that certain styles of symptom-expression or health-related behavior appears to be culturally determined. The preceding discussion suggests a somatization bias in international groups, particularly Asian cultures as opposed to a "psychologization" bias in Western, especially Caucasian groups. "Somatization refers broadly to presentation, complaint or manifestation of somatic symptoms that relate to psychological or emotional problems, rather than the strict psychoanalytical meaning of the organic expression of mental process" (Cheung, 1985, p. 289). An important point to be noted here is that somatization is considered a symptom - not a disorder in itself. This is because most reports suggest that although such individuals typically present with somatic complaints and do not volunteer symptoms of depression or anxiety on their own accord, when questioned about the presence of symptoms such as sad thoughts, they do admit to these, and diagnosis of the disorder is facilitated (Cheung, 1985; Westermeyer, 1989). On the other hand, its reverse, that is psychologization, is conceptualized to represent direct reference to symptoms, for example, feelings of sadness and nervousness. Somatization and psychologization have been typically conceptualized as dichotomized processes. For example, psychological complaints have been thought to be replaced by somatic complaints (Kleinman, 1988). That is, in general theoretical literature in the cross-cultural field suggests that patients may either

express symptoms, such as those represented in depression, by presenting either with somatic complaints, or by directly referring to psychological symptoms such as feelings of unhappiness and guilt.

One of the primary purposes of this paper was to investigate such hypothesized differences in symptom-expression between American and international groups. Specifically, comparison of symptom-expression in relation to college stress/adjustment difficulties between international and American college students was done. It was postulated that international students from non-Western countries will report more somatic symptoms (i.e., bodily symptoms) and less psychological symptoms (i.e., typical symptoms associated with depression and anxiety such as unhappy feelings) than American students. The sample of international students was restricted to non-Western countries, specifically those from Asian cultures because most of the literature on somatization has focused on Asian cultures. Chinese and Indians are the two largest groups on most college campuses, hence these two groups were included in the present study. Because of the diversity among Americans, one specific group, that is, Caucasians, were selected since this culture is thought to represent the typical Western culture.

#### Study of Asians in Cross-cultural research:

While the term "Asians" carries connotations of both heterogeneity and homogeneity, it is widely used in research as a homogeneous term. Specifically, diverse countries such as China, Japan, India, Philippines, and Vietnam, have been represented as a single group. In general, this term has been loosely used to denote anyone of Asian origin (Feng & Cartledge, 1996; Rosenblatt & Attkisson, 1992; Stone, 1992). The commonality or homogeneity is assumed to be derived from the common collectivistic or communal orientation that is characteristic of Eastern cultures (Triandis, 1995). It is this collective orientation that has facilitated consideration of individuals from various Asian countries as one group. The importance of this collective characteristic cannot be underestimated, for it determines the

personality features of this group, aspects that need consideration in diagnostic and treatment strategies for this group. It helps to identify common issues and problems in therapy, and permits generalizability of therapeutic considerations. Another kind of homogeneity arises from its simultaneous usage for both recent immigrants, as well as individuals of Asian origin born in the United States. Due to its loose application, current published reports on Asians differ widely in the nature of their samples. There is a lack of consensus regarding inclusion and exclusion criteria for this group, which precludes integrative information regarding this group that could be useful in designing psychological and educational interventions.

While certain aspects of Asian cultures, such as an interdependent value-orientation—as opposed to the independent value held in Western countries—justifies the use of this term in a homogeneous fashion, there is a lot of heterogeneity within Asian countries in terms of religion, SES and political philosophy to question the homogeneous use of the term "Asians". For example, the Muslim religion in certain countries such as Saudi Arabia, Kuwait, and Pakistan necessitates a different lifestyle than Hindu practices in India or Buddhist practices in Nepal. In China, Buddhism, together with the political ideology, leads to significant differences in individuals who are socialized within this country, as opposed to individuals from other Asian countries such as India. To date, little information is available on differences within individuals from various Asian countries.

The somatization hypothesis also follows this trend towards generalizability of concepts among all Asian groups. That is, it is believed that most Asians will have a predisposition to express problems in somatic ways. However, there is a dearth of information on possible differences between various Asian groups. In short, while inter-group differences between Asians and Western cultures has often been the focus of investigations in cross-cultural studies, not much attention has been paid to the study of intra-group differences.

Where does this leave us?

The above discussion points to the sparsity of comparative or cross-cultural information about stress and its outcome in terms of symptom-expression in college students. The primary purpose of the investigation was to examine differences in symptom-expression between Caucasians and Asians in response to college-stress. College-stress was defined as adjustment problems that students experience as a function of exposure to a college environment. Hence, for the purpose of this study, the terms college-stress and college adjustment problems were used interchangeably. Somatic and psychological symptoms were studied. Specifically, the propensity of each group to express symptoms in response to stress in somatic (i.e., bodily) versus psychological (i.e. anxiety and depression) modes of expression was investigated. Previous reports have postulated a somatization hypothesis for Asians, as against a psychologization tendency in Caucasians. The present study tested this difference in a sample of Asian (Chinese and Indian) and Caucasian college graduate students.

A secondary purpose was to examine possible intra-group differences between Asian countries with respect to symptom-expression and college problems. That is, in addition to inter-groups differences, as noted earlier, intra-group differences also needs investigation. Hence, the relationship of stress/adjustment problems and symptom-expression was compared between the two Asian groups used in this study—Indian and Chinese students. Information about possible similarities/differences could provide valuable insight for orientation programs for individuals from differing cultures, and also help identify potential groups that may be in need of psychological interventions. It should be noted that the hypotheses developed to test for possible intra-group differences were preliminary, because of lack of data in this regard. In short, comparison of the relationship between stress and symptom-expression was the primary goal in this study. Two different sets of comparisons were attempted— between Caucasians and Asians, and between Indians and Chinese.

While college-adjustment problems may encompass similar situations that both local and international groups experience, and may be more valid than the concept of general life stress, it should be remembered that international students face some additional stress/problems due to differences in the socio-cultural milieu. Leong (1984) categorized international student problems in terms of general or common problems associated with college life for all students as well as those related to culture-shock. That is, while endemic or general college stress may be common to both groups, this may not represent the entirety of experience for international groups due to the potential socio-cultural stressors acting upon them. Stress/college adjustment problems in international groups can thus be conceptualized as being composed of both general or endemic stress, as well as socio-cultural stress. It can be postulated then, that the addition of socio-cultural items may enhance the concept of adjustment difficulties or stress in this population. That is, with respect to intra-group comparison, it may be potentially useful to add items related to socio-cultural factors in addition to the general questions of college adjustment problems, to enhance the concept of adjustment problems for this population.

For the purpose of this study, while stress was defined as adjustment problems intrinsic to a college environment, this concept was slightly modified to facilitate comparison between Chinese and Indians. Specifically, as noted earlier, while all international students are faced with generic college stressors, they have to face some additional stressors related to cross-cultural stress. Cross-cultural stress is defined here as the stress experienced in relation to moving to a new sociocultural milieu. For example, language may pose as a barrier to some students, while learning to dress in a different manner may be an aspect of adjustment to others. Hence, in order to measure stress within international students, both generic stress factors, and cross-cultural stress factors were included.

The primary research question under investigation in the present study was whether Asians students exhibit a propensity to express symptoms in relation to stress more somatically than Caucasian

students. An associated question in this regard was whether differences in the relationship between stress and symptom-expression exist within a group of Asian students, specifically between Indians and Chinese students.

Now, while the first part of the study attempted to empirically test the somatic hypothesis that has been frequently alluded to, but rarely tested in past research, the second part of the study was developed to focus on trying to explain why culture may lead to such differences. Is there an aspect of culture that, at a group-level, leads to differences in symptom-expression?

What do we know about cultural differences in symptom-expression?.

Knowledge about the existence of cultural differences provides only a veneer understanding regarding the reasons for these differences. As noted earlier, it has been generally believed that culture plays a role in differences in symptom-expression, but this is an inadequate explanation. That is, culture is a broad term, and knowledge of particular components of culture that exert influence on expression is not clear. The National Advisory Mental Health Council (1996) identified that research was needed on the role of culture in symptom-expression of psychiatric disorders. That is, while cross-cultural research has stressed the culture to behavior link, it has not adequately addressed the process through which it occurs. With respect to cultural differences, Wu and Tseng (1985) also noted that it was necessary to elaborate on how cultural factors influenced nature of stress in society and how the manifestation of psychopathology is created. One conceptual model that has been provided to link behavior to culture suggests that cultural differences manifest themselves in individual psychological processes, and these lead to observable differences in behavior (Singelis & Brown, 1992). Along similar lines, National Advisory Mental Health Council (1996) noted that cultures often created a distinct context that influenced how basic psychological processes were expressed. They added that by studying specific behaviors and attitudes, researchers would be able to identify how context influenced individual

functioning. They identified attribution style as one aspect of culture that influenced psychological experience. In relation to the issue of cultural differences in symptomatology, this tentatively suggests that attribution-style may mediate the relationship between culture and symptom-presentation. The importance of causal attribution style in relation to symptom-expression was also elaborated upon by Kirmayer, Young, and Robbins (1994). They noted that attributions influenced the experience of symptoms and illness and may play a role in psychopathological processes. Attribution-style can be described as a propensity to offer similar sorts of explanations for different events. Causal attribution style is one way individuals explain behavior.

With respect to the culture-attribution style-symptomatology link tentatively outlined earlier, indirect support can be drawn from two separate kinds of research. Firstly, there is lot of research that supports the culture-attribution style link. For example, Kirmayer et al. (1994) reported that Americans have a tendency towards causal explanations that emphasized the self, whereas people from non-Western societies were less psychologically minded and emphasized external contextual factors as determinants of behavior and experience. Kawanishi (1995) found that Japanese subjects were more likely than Anglo-Americans to use external attributions. Chinese have also been reported to use more situational or external explanations than Americans (Morris & Peng, 1994). Miller (1984) reported that Americans used more dispositional explanations than Indian Hindus. This propensity of Asians towards situational explanations and that of non-Western individuals towards dispositional attributions has been supported by many studies in the recent past (Al Zahrani & Kaplowitz, 1993; Lee, Hallahan, & Horzhog, 1996; Yan & Gaier, 1994). In short, there is some evidence to support a specific culture-attribution style link.

The second part of the hypothesized link, that is, the attributional style-symptomatology link finds more support in theoretical literature than empirical data. Specifically, some authors have postulated that differences in attribution style may influence the psychiatric presentation of illness as primarily

somatic or psychological (Kirmayer et al., 1994). Westermeyer (1989) also stated that culture may assign differing attributions and affect expression of an experience. In one of the few empirical studies carried out with respect to the relation between attribution style and symptom-expression, Kirmayer and Robbins (1996) reported that those who made less internal attributions were less likely to somatize. While the literature concerning attribution-style-symptomatology is sparse in relation to somatization versus psychologization, this link has been studied widely in a different way. Specifically, it has been reported that specific attribution styles such as pessimistic style with respect to negative events, is associated with disorders such as depression, anxiety and social phobia (Heimberg, Vermilyea, Dodge, Becker, & Barlow, 1987; Heimberg et al., 1989; Nezu, Nezu, & Nezu, 1986; Peterson & Seligman, 1984).

Drawing from such reports, it can be hypothesized that attribution-style is one aspect of culture that may play a role in differential symptom-expression. That is, the expression of psychiatric problems in somatic or psychological terms may be related to the way in which problems are perceived. It can be hypothesized that those who make more external attributions may express symptoms somatically because they do not perceive difficulties as related to themselves and they are less psychologically minded, while those with more internal attributions may be more likely to express symptoms in a psychological fashion because of greater emphasis on psychological explanations. Indeed, if attribution-style proves to be a distinguishing factor between ethnic groups, and attribution-style is found to be related to differences in symptom-expression, then attribution-style can be identified as one component of culture that influences symptom-expression.

Hence, one of the subsidiary purposes of this paper was to investigate in greater depth the relationship between culture and symptom-expression. Specifically, one variable—*attribution style*—was studied to determine whether group-differences in relation to this variable explain differences in symptom-expression. The related research question was: are there inter-group (Caucasians versus Asians)

and intra-group (Indians versus Chinese) differences in attribution-style, and are particular attribution styles associated with somatic and psychological modes of symptom-expression in relationship to stress? In keeping with past reports, it is hypothesized that Asians will report greater external attribution-styles than Caucasians and that the relationship between stress and somatic symptoms will be greater for those with an external attribution style than those with an internal style. Along similar lines, it is hypothesized that the relationship between stress and psychological symptoms will be greater for those with internal attribution styles, as opposed to external attribution styles. Similar to the first part of the study, in addition to examining inter-group differences between Asians and Caucasians, intra-group differences between Asians (or inter-group differences between Indians and Chinese) were also investigated with respect to attribution-style. However, it should be noted that the hypotheses developed in this regard represent preliminary attempts to investigate possible differences, because there is little data in this field.

### The Present Study

In short, the main purpose of the present study was to examine the somatization versus psychologization hypotheses in American-Caucasians and international Asian students. Caucasian students were selected because this culture is thought to represent a westernized value-orientation. With respect to the Asian group, two specific groups— Chinese and Indians—were targeted. This is because these represent the two largest international groups on campus. It was decided to select two groups in order to enable intra-group comparison within the Asian group, as not much is known about possible differences/similarities. That is, a secondary purpose of this study was to examine intra-group variation with respect to the college-stress-symptom relationship. In addition to examination of cultural differences, a subsidiary purpose of this investigation was to test how culture affects psychopathology. Specifically, the two theoretical links that have been proposed in the literature were tested. The first was the relationship between culture and attribution-style, wherein it was proposed that Caucasians would

demonstrate greater tendency towards an internal attribution-style, whereas Asians would exhibit a tendency towards an external attribution-style. The second link was that between attribution-style and symptom-outcome, wherein it was hypothesized that external style would be related to somatic symptoms, while internal style would be related to psychological symptom-expression.

### Dependent and Independent Variables

#### **Independent Variables**

**College Adjustment Difficulties/College Stress** For the purpose of this study, the concept of college adjustment difficulties is synonymous with college stress. Stress was defined as adjustment problems encountered on exposure to a college-environment. Entering college has been conceptualized as a potential stress-producing factor. This is because of the various new responsibilities that most students are faced with, for example, pressure of increasing academic work, living independently, and managing finances. These aspects of college life can be thought of as endemic to both local and international students. As noted earlier, because this concept of stress is more generalizable to both international and local students, as opposed to the concept of general life stress, this was selected as the independent variable in the present study.

In addition to some of the common stressors that both local and international students face, international students have to also deal with socio-cultural adjustment factors like learning a new language, and differing living styles. Hence, to make the concept of college adjustment difficulties more meaningful to international students, some additional items related to cultural issues were added. Thus, for international students, college adjustment was hypothesized as being composed of general or common factors, as well as sociocultural factors.

For inter-group comparison between Asians and Caucasians, the general or common concept of college adjustment difficulties was used. For intra-group comparison between Indians and Chinese, the expanded concept of college adjustment difficulties, specifically general factors as well as socio-cultural factors, was used.

### **Dependent Variables**

**Somatic Symptoms** These have traditionally been reported to be primary modes of expression for international, especially Asian groups (Westermeyer, 1989). The reporting of physical or body-related symptoms in relation to adjustment difficulties was studied in the present investigation. Some examples of this include experiencing feelings such as having hot or cold spells, pressure in one's head, headaches and generally feeling run down and ill over a period of a few weeks. It is believed that some groups find it easier to report their inner feelings and turmoil through such somatic terminology.

**Psychological Symptoms:** As opposed to "somatic" ways of symptom-expression, "psychological" modes of expression have been conceptualized to include direct reports of feelings such as sadness, worthlessness, fears, etc. These are represented in typical Western notions of anxiety and depressive symptomatology. Depression and anxiety are frequently cited outcomes of exposure to stress in the college-environment (Monk, 1999), hence, these disorders will be focused upon in the present investigation. As opposed to specific DSM depressive and anxiety disorders, in which qualitative and quantitative symptoms have to be met to fit the criteria for the disorder, this study will attempt to measure overt psychological distress symptoms that are identified with depression and anxiety. This approach has been found to be reliable and valid in past cross-cultural studies (Gureje et al., 1997; Simon et al., 1996) and is somewhat similar to a multivariate approach in psychiatry as opposed to a nosological

approach.

Subsidiary Variable of interest in the present study

**Attribution-Style:** Attribution style is defined as the logical rules people use in their explanations for the causes of behavior. Attribution-style has been identified in the theoretical literature as one aspect of culture that leads to cross-cultural differences in perception of various events or issues. Specifically, the internal dimension of attribution-style has been implicated with respect to culture. Two broad kinds of attribution-styles with respect to this dimension have been traditionally described in the literature (Peterson, Buchanan, & Seligman, 1995). The tendency to explain behavior in terms of situational factors is known as an external attributing style. On the other hand, the tendency to look inward, or to focus on dispositional factors, is known as internal attribution-style. Other aspects of attribution style include dimensions of globality and stability. However, for the purpose of this investigation, only one dimension—internal and external attribution styles—was used. That is, only the internality dimension was focused upon. This was because the theoretical literature suggests a link between specifically the internalization-externalization dimension in attribution style with the tendency towards somatization and psychologization.

It should be noted that the general overall concept of attribution-style encompasses both positive and negative life events. That is, attributions for positive as well as negative life events can be determined with this variable. Because individuals may exhibit a towards differing attribution styles for these two kinds of events (i.e., an internal attribution style for positive events and an external style for negative events), it may be important to examine responses to each of these two kinds of events separately, in addition to an overall attributional style. These are referred to in the literature as Internal Positive (IP) and Internal Negative (IN) scores, referring to internal dimensions for positive and negative

events respectively. Differences between groups with respect to these variables were examined in the present study.

### Hypotheses

#### American versus Asian.

1. The relationship between stress and somatic symptoms will be stronger for Asians than for Caucasians.
2. The relationship between stress and anxiety symptoms will be stronger for Caucasians than for Asians.
3. The relationship between stress and depression symptoms will be stronger for Caucasians than for Asians.
4. For Asians, the relationship between stress and somatic symptoms will be stronger than the relationship between stress and anxiety symptoms.
5. For Asians, the relationship between stress and somatic symptoms will be stronger than the relationship between stress and depression symptoms.
6. For Caucasians, the relationship between stress and anxiety symptoms will be stronger than the relationship between stress and somatic symptoms.
7. For Caucasians, the relationship between stress and depression symptoms will be stronger than the relationship between stress and somatic symptoms.

Chinese versus Indian. Although specific hypothesis regarding Chinese versus Indians have also been developed for this study, it should be noted that these hypothesis are tentative due to the dearth of information regarding possible differences between these two groups.

1. The relationship between stress/adjustment problems and somatic symptoms will be stronger for Chinese than for Indians.
2. The relationship between stress/adjustment problems and anxiety symptoms will be stronger for Indians than for Chinese.
3. The relationship between stress/adjustment problems and depression symptoms will be stronger for Indians than for Chinese.
4. For Chinese and Indian students, the relationship between stress/adjustment problems and somatic symptoms will be stronger than the relationship between stress/adjustment problems and anxiety symptoms.
5. For Chinese and Indian students, the relationship between stress/adjustment problems and somatic symptoms will be stronger than the relationship between stress/adjustment problems and depression symptoms.

Attribution Style. With respect to attribution-style and symptom-expression, the following tentative hypotheses were initially developed.

1. Asian students will report greater external attribution-styles than Caucasians students, who will report more internal attributions.
2. The relationship between stress/adjustment problems and somatic symptoms will be stronger for those with external attribution styles than for those with internal attribution-styles.
3. The relationship between stress/adjustment problems and anxiety symptoms will be stronger for those with internal attribution styles than for those with external attribution-styles.
4. The relationship between stress/adjustment problems and depression symptoms will be stronger for those with internal attribution styles than for those with external attribution-styles.
5. For those with external attribution-style, the relationship between stress/adjustment problems

and somatic symptoms will be stronger than that the relationship between stress/adjustment problems and anxiety symptoms.

6. For those with external attribution-style, the relationship between stress/adjustment problems and somatic symptoms will be stronger than that the relationship between stress/adjustment problems and depression symptoms.

7. For those with internal attribution-style, the relationship between stress/adjustment problems and anxiety symptoms will be stronger than that the relationship between stress/adjustment problems and somatic symptoms.

8. For those with internal attribution-style, the relationship between stress/adjustment problems and depression symptoms will be stronger than that the relationship between stress/adjustment problems and somatic symptoms.

9. Chinese students will report greater external attribution-styles than Indian students, who will report more internal attributions.

Revised Hypotheses for Attribution Style. Because of subsequent changes in the data-scoring style, these above hypotheses with respect to attribution-style could not be tested. Instead, the following tentative revised hypotheses were developed.

1. The mean internalization score (i.e. the internal-external dimension of attribution style) will be higher for Caucasians than for Asians.

2. There will be a significant negative correlation between internalization and somatic symptoms, while the correlations between internalization and anxiety and between internalization and depression will be significant, though in a positive direction.

## Method

### Participants

Thirty graduate students enrolled in Virginia Tech were administered questionnaires as part of the pilot study. The purpose of the pilot study was to assess reliability of the measures to be used in the main study. Ten American students, 10 Chinese students and 10 Indian students participated in the pilot study. Three questionnaires were administered during this time. These included: General Health Questionnaire (GHQ), Attributional Style Questionnaire (Modified), and the Student Adaptation to College Questionnaire (SACQ). The international students (i.e. the Chinese and Indian students) were administered a modified version of the SACQ. The difference between this and the original version was the addition of 17 extra questions related to cross-cultural adjustment. It should be noted that the term 'adaptation' from the SACQ has been used interchangeably with the term 'adjustment'. Data for the pilot study were obtained electronically. Results of the pilot study suggested moderate to good reliabilities for each of the questionnaires. Specifically, Cronbach's Alpha values for the GHQ for Americans, Chinese and Indians were 0.76, 0.82, and 0.92 respectively. For the SACQ, Cronbach's Alpha values for the three countries (in the same order) were 0.86, 0.99 and 0.98 respectively. For the SACQ (Modified) Alpha values for Chinese and Indians were 0.99 and 0.97 respectively. For the ASQ (Modified), Alpha values for Americans, Chinese and Indians were 0.41, 0.75 and 0.69 respectively.

115 graduate students enrolled at Virginia Tech participated in the Main study. Forty-five American students, 35 Chinese students and 35 Indian students participated in the main study, which was also done electronically. The same questionnaires used in the Pilot study were administered at this time - the GHQ, ASQ (Modified), SACQ (for Americans) and SACQ - Modified (for Chinese and Indians).

## Procedures

Data for both the pilot and main study were collected electronically. The Caucasian students were contacted through the Graduate students mailing list of Virginia Tech. The international groups were contacted through the respective student bodies—Association of Chinese Students and Scholars and the Indian Students Association. Although the data were collected electronically for both the pilot study and the main study, there was a difference in the manner in which this was done for the two studies. For the pilot study, a form-based document was created using Microsoft Word, which included all the questionnaires as well as the consent form. This was sent via electronic mail to potential participants. Information regarding the study was also sent along with this. This method proved only partly successful in that feedback provided by some of the participants indicated that they were unhappy because of the length of time associated with downloading the e-mail attachment. For the main study, to encourage more participation the survey was posted on the internet. Specifically, a website was created that provided an introduction to the study as well as the consent form (refer to Appendix A) and questionnaires to be used in the study. Eligible participants had the option of filling out the questionnaires either through this site, or by downloading the previously mentioned Microsoft Word document. In either case the responses were received via e-mail. General information was first sent to potential participants. Along with an overview of the study, this information contained the address of the specific website wherein to find more details of the study. The participants responded individually, and were anonymous with respect to each-other. It should be noted that an overwhelming majority of respondents used the web-based forms to fill out the questionnaires. The primary investigator received a lot of positive feedback regarding the ease and convenience of conducting a survey in this manner. Especially within the international group, several respondents indicated that this method was less intimidating to them than face-to-face interviews.

## Measures

- Student Adaptation to College Questionnaire (Modified): This was used to measure college stress. The original questionnaire (Baker & Siryk, 1989) is a 67 item self-report scale comprising of four subscales—academic, social, personal and emotional, and institutional attachment and goal commitment. For the purpose of testing the various comparative hypotheses, items from two subscales were included—academic and social. The academic subscale (24 items) is reflective of educational demands made on students, while the social subscale (20 items) assesses interpersonal relationships, feelings associated with leaving home, and the quality of social atmosphere in the university. The institutional attachment and goal commitment subscale assesses goals and level of commitment of students to an institution, and does not assess for stressors or difficulties. Hence, this subscale was not included in the present study. The fourth subscale—personal and emotional—is also not related to assessing a specific area of potential stress as it is concerned with assessing psychological symptoms, and hence this was not used in the present study. Cronbach’s Alpha values for the academic subscale have been reported to range from 0.81 to 0.90, while that of the social subscale have been reported to range from 0.83 to 0.91. In the modified questionnaire to be used for Asians only, items from the Index of Life Stress (Yang, 1992), which was designed to specifically measure stress in Asian students were added in order to incorporate aspects of cross-cultural stress that international students may experience. Reliability indices for the original scale has been reported to be 0.86 (Cronbach’s Alpha) and 0.87 (test-retest reliability) (Yang, 1992). Thus, the modified questionnaire was designed to reflect both general college stress items as well as cross-cultural stress experienced in a college environment. Hence, while the first 44 questions was administered to Caucasian students, the entire questionnaire (61 items) was administered to Asians. Refer to Appendix C.

- Attribution-Style Questionnaire (Modified): The original questionnaire developed by Peterson

et al. (1982). It contains 12 hypothetical events, half of which are good, and half of which are bad. Three composite scores can be obtained—overall explanatory style for bad life events, overall explanatory style for good life events, and a total explanatory style score. Besides the composite scores, six individual dimension scores can be obtained, which include separate scores of internality, stability, and globality for both bad and good life events. Reliability coefficients of 0.72 to 0.75 have been noted for the composite scores (Reivich, 1995). Test-retest reliability of approximately 0.65 have been reported for both the good and bad life events (Reivich, 1995).

The original questionnaire was modified for the current study to reflect situations applicable to graduate students. The modified questionnaire also contained six positive and six negative events, similar to the original scale. As noted earlier, among the individual dimension scores, only the external-internal dimension (Internal Positive and Internal Negative) was focused upon for the purpose of this investigation. For the purpose of this study, an overall internalization score was obtained by subtracting IP from IN scores. It should be noted that in the original questionnaire, a total score is obtained by subtracting the composite positive score from the composite negative score. Because the composite score (which is a combination of internality, stability and globality aspects of attribution style) was not used in this study, this overall internalization score was used, as the internal-external dimension was the primary focus in this investigation. Refer to Appendix D.

- General Health Questionnaire - 28 (Goldberg & Hillier, 1979): This instrument measures overt psychological distress that is identified with depression and anxiety, somatic symptoms, and social dysfunction. For purposes of this study, the depression, anxiety and somatic subscales were used. It should be noted that in contrast to specific diagnosable depression or anxiety categories such as those in the DSM, this questionnaire focuses on distinguishing those “on the hinterland between psychological sickness and health” (Goldberg & Hillier, 1979). That is, a significant response on either the depression or anxiety subscale is indicative of the presence of significant psychiatric problems in these areas in

general, as opposed to being indicative of a specific anxiety or depressive disorder. In this regard, it is more suitable for use with cross-cultural populations because of its general versus specific nature. Reported Cronbach's Alpha coefficients for the depression and anxiety subscales are 0.83 and 0.86 respectively (Piccinelli & Simon, 1997) for international samples, including Indians and Chinese. Validity indices such as sensitivity, specificity and Receiver Operating Characteristics (ROC) have been reported to be high for international samples (Goldberg et al., 1997). Refer to Appendix E.

### Data Analyses

For the Pilot study, the reliability of each of the three scales was determined. Cronbach's Alpha was used to assess reliability.

For the Main study, data analysis was carried out in several stages. At first, reliability of each of the three scales was assessed using Cronbach's Alpha. With regards to the SACQ for the two international groups, reliability for both the original and modified versions were obtained. The GHQ was used to obtain scores from respondents on somatic and psychological symptoms. This scale is comprised of at least three distinct subscales: Somatic symptoms, anxiety symptoms and depression symptoms. Because "anxiety" and "depression" are traditionally considered more "psychological" ways of symptom-expression, these two subscales were used as indicators of "psychological" modes of symptom-expression. Specifically, to compare somatic versus psychological symptoms, somatic symptoms were compared to anxiety and depression scores separately. With respect to the ASQ, in addition to the Internal Positive (IP) and Internal Negative (IN) dimensions, an overall internality score (attributional score) was obtained as an overall composite score for internality dimension, which was the focus of this study. For the main analysis, responses of Chinese and Indian subjects were combined to form the "Asian" category for the purpose of inter-group comparison between American and Asian students.

For the purpose of hypothesis-testing, correlation-coefficients were first computed. Statistical significance between pairs for correlation-coefficients were then computed using Fisher's transformation. Specifically, using Fisher's r-to-z transformations, pairs of correlations were compared to determine whether the strength of any one correlation was stronger than another. As an additional method of determining whether inter-group/country differences existed with respect to expression of college adjustment problems in somatic and/or psychological terms, linear regression analyses were carried out. The main purpose of the regression analysis was to obtain the partial correlation coefficients to compare the effect of somatic versus anxiety/depression symptoms.

For the second part of the study, in which the effect of attribution-style on ways of symptom-expression was investigated, it had been initially proposed to compare proportions of group members classified as either external or internal. The scale ranges from external to internal dimension. However, this would force continuous data into categories - external or internal, so it was decided to use the continuous data without forcing subjects into categories. That is, the total internalization scores were obtained for each subject instead of categorizing participants into artificial dichotomies of "external" and "internal" styles. The initial hypotheses had been developed with this dichotomy in mind. Due to this change in data-scoring style, the initial hypotheses developed with respect to attribution-style could not be tested. Now, to test the original research question of whether countries differed with respect to specific attribution styles and whether these specific attribution styles were related to specific ways of symptom-expression, the following analysis was carried out. To test for differences between countries/groups with respect to attribution-style scores, differences between means were compared for various groups using Independent Samples t-test procedure. On account of the differences between Chinese and Indians, inter-group comparisons between all three groups - Americans, Chinese and Indians was also done (in lieu/addition to the Asian-American comparisons) at times to obtain a more fine-grained analysis of differences between the three groups. Analysis of Variance (ANOVA) was used for

this purpose. To test for the possibility of a linear association of attribution-style and symptom-expression, correlations were computed between attribution-style scores, and somatic, anxiety and depressive scores respectively.

Now, in addition to the overall external-internal score, internalization scores for positive and negative events can be obtained separately for the ASQ. That is, people may have a propensity towards a more external attribution-style for positive events, but may be inclined to use a more internal attribution-style for negative events. Hence, to obtain a more fine-grained analysis of participant's attribution-styles, differences between group means for positive and negative events were also computed. These differences were tested using the t-test (when two groups were compared) and ANOVA (when three groups were compared). Post-hoc comparisons using Tukey's HSD was carried out for the purpose of obtaining multiple comparisons between groups.

Because of the lack of empirical studies with this population, some exploratory analyses were also carried out to determine effects of various demographic/categorical variables for the three groups. Specifically, the effect of gender, country of origin, and length of stay in US were studied in relation to college adjustment, somatic and psychological symptom-reports (anxiety and depression) and attribution scores. Depending upon the number of groups, t-test or ANOVA was used. If ANOVA revealed significant differences, Tukey's HSD procedure was used to determine exact nature of differences between the three groups. Specifically, when Americans, Chinese and Indians were compared, it was found that at least one country differed from another with respect to adjustment scores, and scores for attributions for both positive and negative events. Hence, for each of these three dependent variables—adjustment, positive event attributions, and negative event attributions—Tukey's HSD procedure was used to find the nature of the differences.

In cases where two categorical variables were found to be related to a dependent variable, Type III

ANOVA was carried out to determine whether there were any interaction effects between variables. That is, because of the unbalanced design in the current study, this helps determine which factors are important above others when the effects of other variables are partialled out. Specifically, both country and sex were found to be significant in separate analysis with respect to anxiety reports, and the proportion of subjects belonging to either sex varied greatly between Asian and American groups. Hence Type III ANOVA was carried out to determine whether levels of sex interacted with country/group. Similarly, level of education was also found to be related to somatic scores and also to total attribution scores. Hence, Type III ANOVAs were also used here to determine presence of any interaction effects.

## Results

Reliability analysis (Cronbach's Alpha) for each of the questionnaires for three groups in the Pilot study are noted in Table 1. It should be noted that the term "Americans" refers specifically to Caucasian-Americans.

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Insert Table 1 about here

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For the main study, demographic information about the students is noted in Table 2. Cronbach's Alpha values for the three questionnaires used in the study are noted in Table 3 for each of the three groups - Americans, Chinese, and Indians.

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Insert Table 2 about here

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Insert Table 3 about here

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Mean and standard deviation values for each of the questionnaires is noted in Table 4. For the SACQ, higher scores are indicative of better adjustment. For the GHQ, higher scores indicate the presence of greater number/intensity of symptoms. For the ASQ-Modified, similar to the original scale, the scale ranges on a continuum of more external score to a more internal score. That is, the higher the value, the more likely it is that the person uses an internal attribution style as opposed to a more external attribution style.

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Insert Table 4 about here

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#### Preliminary analysis.

Prior to the proposed analysis, some preliminary analysis with respect to the two main variables of interest — adjustment difficulties and symptom-expression — was made. Specifically, differences between means were ascertained for the three countries represented in the study with respect to college adjustment scores, somatic-symptom, anxiety-symptoms, and depressive-symptom scores. Because the analysis involved three groups — Americans (Caucasians), Chinese and Indians — Analysis of Variance (ANOVA) was used to test for differences between means.

Using ANOVA to test for differences between the three countries, it was found that at least one country differed from the other two on scores of college adjustment ( $F = 6.79, p = 0.00$ ). Post-hoc comparison using Tukey's HSD was used to determine which countries differed with respect to college adjustment scores. It was found that there was a statistically significant difference between Americans and Chinese (Mean Difference = 35.70,  $p = 0.00$ ), with Americans reporting higher scores than Chinese students. Americans did not differ statistically from Indians (Mean Difference = 11.76,  $p = 0.45$ ), and Chinese came close to, but were not statistically different when compared to Indians (Mean Difference = -23.94,  $p = 0.058$ ). This suggests that both Americans and Indians reported significantly fewer adjustment problems when compared to Chinese, with Americans reporting slightly fewer, though not statistically different, problems in relation to Indians.

With respect to somatic symptoms, it was found that at least one country differed from the other two when ANOVA was used to compare differences between means ( $F = 6.89, p = 0.00$ ). Post-hoc

comparison using Tukey's HSD was used to determine which countries differed with respect to somatic symptoms. It was found that there was a statistically significant difference between Americans and Indians (Mean Difference = 2.11,  $p = .01$ ) and between Chinese and Indian ( Mean Difference = 2.34,  $p = p = 0.00$ ). However Americans did not differ from Chinese (Mean Difference = -0.24,  $p = 0.93$ ). This implies that both Americans and Chinese reported significantly higher somatic scores than Indians. Although Chinese reported slightly higher scores than Americans, this difference was not significant. It was also found that there was a statistically significant difference between the countries with respect to anxiety symptoms ( $F = 3.97$ ,  $p = 0.020$ ). Tukey's HSD revealed that Americans differed significantly from Indians (Mean Difference = 2.59,  $p = 0.02$ ), with Indians reporting significantly lower scores on anxiety than Americans. However, Americans did not differ from Chinese, and Chinese did not differ significantly from Indians. This indicates that Indians reported the lowest scores while Americans reported the highest anxiety scores. No significant difference between the three countries was found with respect to depression scores ( $F = 2.32$ ,  $p = 0.10$ ).

It should be noted that the above represents preliminary analysis in terms of mere symptom-counts or scores. The major research question in this study involved ascertaining modes of symptom-expression in relation to college stress/college adjustment problems, and this is discussed below.

### Main Analysis

For the first part of the study, different styles of symptom-expression in relation to college adjustment was studied. Inter-group (American-Asian) and intra-group comparisons (Chinese-Indian) were carried out. For the comparison involving Asians, Chinese and Indian responses were together treated as one group.

#### American-Asian Comparison.

The correlations between college adjustment score and somatic score, college adjustment score and anxiety score, and college adjustment and depression score were computed for Asians and Americans. These are reported in Table 5. The values reported are 2-sided p-values. It should be noted that while hypotheses had been initially proposed in certain directions, 2-sided p-values were selected because the hypotheses were tentative due to lack of studies in this field. For Americans, college adjustment was significantly related to somatic symptoms ( $r = -0.48$ ,  $p < 0.01$ ) and depressive symptoms ( $r = -0.43$ ,  $p < 0.01$ ), but not with anxiety symptoms. For Asians, college adjustment was significantly related to both anxiety symptoms ( $r = -0.49$ ,  $p < 0.01$ ) and depressive symptoms ( $r = -0.504$ ,  $p < 0.01$ ), but not to somatic symptoms.

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Insert Table 5 about here

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Pairs of correlations were then tested to determine whether group-membership/country was related to specific ways of symptom-expression. Fisher's transformation was used to compare correlations. The results are depicted in Table 6. The critical z-value (2-sided) were  $\pm 1.96$ . There was not enough evidence to support a significant difference in the strength of the relationship between college adjustment and somatic symptoms between Americans in comparison to Asians. Hence, the hypothesis that the strength of association between adjustment and somatic symptoms will be stronger for Asians when compared to Americans was not supported. The strength of the relationship between college adjustment and anxiety, and between college adjustment and depression was not significantly different for Americans in comparison to Asians. The hypotheses that the strength of the relationship between adjustment and anxiety, and between adjustment and depression, would be stronger for Americans in comparison to Asians were not supported.

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Insert Table 6 about here

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Within each group, correlation coefficients were calculated to test for differences in symptom-reports. The critical z-value was  $\pm 1.96$ . Results are depicted in Table 7. For Americans, no significant difference was obtained in the strength of the relationship between college adjustment and somatic symptoms, in comparison to the relation between college adjustment and anxiety symptoms and that between college adjustment and depressive symptoms. Hence, the hypotheses that for Americans (Caucasians), the strength of relationships between adjustment and anxiety and between adjustment and depression would be stronger than that between adjustment and somatic symptoms were not supported.

For Asians, comparing the strength of the correlation between college adjustment and somatic symptoms to that between college adjustment and anxiety symptoms, the observed z-value was close to, but not significant. That is, there was not enough evidence to support the presence of a significant difference in the strength of the relationship between college adjustment and somatic symptoms as opposed to that between college adjustment and anxiety symptoms. It follows from this that the hypothesis for Asians that the strength of relationship between adjustment and somatic symptoms would be stronger than that between adjustment and anxiety symptoms was not supported. A significant difference in strength was obtained when comparing the correlation of college adjustment and somatic symptoms with the correlation between college adjustment and depressive symptoms. This implies that for Asians, the strength of the correlation between college adjustment and depression is greater than that between college adjustment and somatic symptoms. Thus, the hypothesis that the strength of relationship between adjustment and somatic symptoms would be stronger than that between adjustment and depressive symptoms was not only not supported, and results appeared to be in a direction opposite

to what had been hypothesized.

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Insert Table 7 about here

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Regression analysis was also carried out to determine relative contribution of somatic versus anxiety/depression symptoms. For this analysis, college adjustment was used as the dependent variable, while somatic, anxiety and depression were used as the independent variables. Separate analysis was run for Americans and Asians. For Americans, overall, the regression equation was statistically significant ( $F = 4.98$ ,  $p = 0.005$ ). Somatic symptoms, anxiety, and depression predicted approximately 21 percent of the variance in college adjustment ( $R^2 = 0.27$ , Adjusted  $R^2 = 0.21$ ). The results are depicted in Table 8. Somatic symptoms emerged as the only individual significant predictor for college adjustment. The partial correlation for somatic symptoms was  $-0.32$ , whereas that for anxiety symptoms and depression symptoms was  $0.05$  and  $-0.22$  respectively. Thus, the assumption that for Americans the partial correlations for anxiety and depression symptoms would be higher than that for somatic symptoms was not supported.

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Insert Table 8 about here

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Similar analysis was carried out for Asians. The results are depicted in Table 9. Overall, the regression equation was statistically significant ( $F = 8.80$ ,  $p = 0.00$ ). Somatic symptoms, anxiety, and depression predicted approximately 25 percent of the variance in college adjustment ( $R^2 = 0.29$ , Adjusted  $R^2 = 0.25$ ). Depression symptoms emerged as the only individual significant predictor ( $p < 0.05$ ) of college adjustment. The partial correlation for somatic symptoms was  $0.03$ , while that for

anxiety and depression symptoms was -0.21 and -0.25 respectively. Hence, the assumption that for Asians the partial correlation for somatic symptoms would be greater than those for anxiety and depression was not supported.

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Insert Table 9 about here

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#### Chinese-Indian Comparison.

The correlations between college adjustment score and somatic score, college adjustment score and anxiety score, and college adjustment and depression score were computed for Chinese and Indians. SACQ - Modified version, was used to compute these correlations, which are noted in Table 10. For Chinese, college adjustment was significantly related to somatic symptoms ( $r = -0.58$ ,  $p < 0.01$ ), anxiety symptoms ( $r = -0.63$ ,  $p < 0.01$ ) and depressive symptoms ( $r = -0.60$ ,  $p < 0.01$ ). For Indians, college adjustment was significantly related to anxiety ( $r = -0.34$ ,  $p < 0.01$ ) and depression ( $r = -0.52$ ,  $p < 0.01$ ) but not to somatic symptoms.

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Insert Table 10 about here

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Pairs of correlations were then tested to determine whether being Chinese or Indian was related to specific ways of symptom-expression. Fisher's transformation was used to compare correlations. The results are depicted in Table 11. The critical z-value was  $\pm 1.96$ . The strength of the relationship between college adjustment and somatic symptoms was significantly different for Chinese as compared to Indians. Specifically, this supports the hypothesis that the strength of the correlation between college

adjustment and somatic symptoms would be stronger for Chinese than for Indians. The strength of the relationship between college adjustment and depression or that between college adjustment and anxiety symptoms did not differ significantly between Chinese and Indians. This suggests that the hypotheses that the relationships between adjustment and anxiety and between adjustment and depression, would be greater for Indians in comparison to Chinese, were not supported.

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Insert Table 11 about here

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Within each group, correlation coefficients were calculated to test for differences in symptom-reports. Results are depicted in Table 12. The critical z-value was  $\pm 1.96$ .

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Insert Table 12 about here

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For Chinese students, no significant difference was found in the strength of relationship between college adjustment and somatic symptoms and between college adjustment and anxiety symptoms. Similarly, no significant difference was found in the strength of the correlation between college adjustment and somatic symptoms and college adjustment and depression symptoms. Hence, the hypotheses that the strength of relationship between adjustment and somatic symptoms would be stronger than that between adjustment and anxiety and between adjustment and depression, were not supported.

For Indians, there was no significant difference in the strength of the relationship between college adjustment and somatic symptoms as compared to that between college adjustment and anxiety symptoms. For Indians, there was also not enough evidence to support a difference in the strength of the

relationship between college adjustment and somatic symptoms and college adjustment and depression symptoms.

For each of the two groups - Chinese and Indians, regression analysis was also carried out to determine relative contribution of somatic versus anxiety/depression symptoms. For this analysis, college adjustment was used as the dependent variable, while somatic, anxiety and depression were used as the independent variables. For Chinese, the overall the regression equation was statistically significant ( $F = 8.11, p = 0.00$ ). Somatic symptoms, anxiety, and depression predicted approximately 39 percent of the variance in college adjustment ( $R \text{ square} = 0.44, \text{ Adjusted } R \text{ square} = 0.39$ ). The results are depicted in Table 13. The partial correlation for somatic symptoms was -0.21, whereas that for anxiety symptoms and depression symptoms was -0.18 and -0.17 respectively. No variables emerged as individual significant predictors for college adjustment. Although the partial correlation for somatic symptoms was slightly higher than for anxiety or depressive symptoms, all three values were within a narrow range. This indicates that the partial coefficients for all three symptoms were somewhat similar.

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Insert Table 13 about here

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For Indian, the overall regression equation was statistically significant ( $F = 4.27, p = 0.01$ ). Somatic symptoms, anxiety, and depression predicted approximately 22 percent of the variance in college adjustment ( $R \text{ square} = 0.29, \text{ Adjusted } R \text{ square} = 0.22$ ). The results are depicted in Table 14. The partial correlation for somatic symptoms was 0.19, whereas that for anxiety symptoms and depression symptoms was -0.10 and -0.45 respectively. Depression emerged as the only individual significant predictor of college adjustment.

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Insert Table 14 about here

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Does attribution style affect symptom-expression?

For the second part of the study, the effect of attribution-style on modes of symptom-expression was investigated. The mean attribution score—internalization score— for each of the groups - Americans and Asians as well as the means scores for Chinese and Indians are noted in Table 15. As noted earlier, the internalization score was obtained by subtracting the internal negative score from the internal positive score. The mean of this overall internalization score was computed.

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Insert Table 15 about here

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In order to test hypothesis related to attribution-style and country, the mean attribution-style scores of those in each country/group were compared. Inter and intra-group comparisons are noted below.

American-Asian comparison.

The independent samples t-test was used to test for differences in mean attribution scores between the two groups. A statistically significant difference ( $t = -3.14$ ,  $p = 0.00$ ) in the mean attribution style scores between Americans and Asians. Hence, the hypothesis related to the internalization score being higher for Caucasian-Americans in comparison to Asians was not supported. In fact, these results indicate the reverse, i.e., Asians in the present sample were more internal than Americans.

The above results represent findings when the total internalization score, which was a combination

of positive and negative events, was used. It is likely that people's attribution-style varies depending upon the type of event. Hence, in order to obtain a more fine-grained analysis of the relationship of attribution-style and country of origin, mean scores for each group/country for positive events (IP) and negative events (IN) were calculated. These are noted in Table 16.

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Insert Table 16 about here

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T-test was performed to compare means among the various groups. With respect to attributions for positive events, there was a statistically significant difference in the means between Americans and Asians ( $t = -2.59$ ,  $p = 0.01$ ). Specifically, Asians tended to use greater internal attributions than Americans regarding positive events. Results are depicted in Table 17. With respect to attributions for negative events (refer to Table 17), although the results were not statistically significant at the 0.01 level, there was a statistically significant difference (at the 0.05 level) between Americans and Asians ( $t = 2.46$ ,  $p = 0.015$ ). That is, Americans, in comparison to Asians, tended to use more internal attributions for negative events.

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Insert Table 17 about here

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#### Chinese-Indian comparison.

T-test was used to test for differences in mean internalization scores between the two groups. It was found that there was no statistically significant difference ( $t = -3.93$ ,  $p = 0.70$ ) in the mean internalization style scores between Chinese and Indians.

With respect to IP and IN dimensions, t-test for intra-group comparison between Chinese and Indians did not reveal any statistically significant differences. Specifically, Chinese did not differ from Indians with respect to IP—internalization scores for positive events ( $t = -1.24, p = 0.22$ ), as well as with respect to IN—internalization scores for negative events ( $t = -0.79, p = 0.43$ ).

The difference between this finding and that when Asians were compared to Americans prompted a more fine-grained analysis of the nature of the differences between the specific countries with respect to positive and negative events. ANOVA was used to test for differences in means between all three countries - Americans, Chinese and Indians separately for positive and negative events. Results comparing means for positive events are noted in Table 18.

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Insert Table 18 about here

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Although the results were not statistically significant at the 0.01 level, statistically significant differences at the 0.05 level were found in attribution-style for positive events ( $F = 4.0, p = 0.02$ ). This indicates that the mean attribution-style for positive events for least one group differed from the mean of another group.

When means for negative events were compared (refer to Table 19 ), statistically significant difference at the 0.05 level ( $F = 3.31, p = 0.04$ ) was found, indicating that at least one group differed from another.

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Insert Table 19 about here

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In order to determine which groups differed, post-hoc comparison using Tukey's HSD procedure was used. Level of significance used for this analysis was 0.05. For attributions concerning positive events, Americans differed from Indians (Mean difference = -3.18,  $p = 0.02$ ). Specifically, the internalization score for positive events was greater for Indians when compared to Americans. Americans did not differ from Chinese (Mean Difference = -1.81,  $p = 0.26$ ), and also Chinese did not differ from Indians (Mean Difference = -1.37,  $p = 0.50$ ). For attributions concerning negative events, Americans differed significantly only from Chinese (Mean Difference = 2.49,  $p = 0.04$ ). That is, mean scores did not differ significantly between Americans and Indians (Mean difference = 1.68,  $p = 0.22$ ). Similarly, mean scores between Chinese and Indians did not differ (Mean Difference = -0.82,  $p = 0.73$ ), as expected from the earlier finding.

#### Attribution-Style and Symptom-expression.

Correlations were computed to test for the possibility of a linear relationship of internalization and somatic, anxious and depressive symptomatology (refer to Table 20).

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Insert Table 20 about here

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The correlation between internalization and somatic symptoms ( $r = -0.31$ ,  $p = 0.00$ ) was found to be significant at the 0.01 level, while that between internalization and depression ( $r = -0.24$ ,  $p = 0.01$ ) was significant at the 0.05 level. the correlation between internalization and anxiety score ( $r = -0.17$ ,  $p = 0.08$ ) was statistically non-significant. In relation to the tentative hypotheses that had been proposed, this indicates that the first hypothesis related to internalization-somatization was supported. With respect to the second hypothesis, no significant relationship was found between anxiety and

internalization. In reference to the internalization-depression link, the results were significant as predicted, but in a direction opposite to what had been hypothesized.

#### Do demographic variables have any influence?

At the last stage of the analysis, exploratory analyses were carried out. Specifically, the effect of demographic variables such as sex/gender, educational level, length of stay in US on variables such as college adjustment, symptom-expression and attribution-style was studied. T-test was used to test for mean differences between groups because two groups were involved in both sex (male versus female) and educational level (Masters versus Ph.D).

Sex was not significantly related to respondent's reports of adjustment ( $t = -1.10$ ,  $p = 0.27$ ) Sex was significantly related to anxiety symptoms ( $t = -2.78$ ,  $p = 0.01$ ), but not significantly related to somatic symptoms ( $t = -1.05$ ,  $p = 0.29$ ) or depression symptoms ( $t = -1.55$ ,  $p = 0.12$ ). Regarding anxiety symptoms, females reported greater anxiety scores than males. Because anxiety scores were significantly related to sex, and the number of males and females were different in Asians when compared to Americans, Type III ANOVA was carried out to determine whether the interaction of sex and country affected scores on the anxiety scale. It was found that the interaction was not significant ( $F = 4.92$ ,  $p = 0.03$ ). While the overall model was not significant at the 0.01 level, it was statistically significant at the 0.05 level ( $F = 2.77$ ,  $p = 0.02$ ). The interaction-term was not significant ( $F = 0.88$ ,  $p = 0.42$ ). Sex emerged as an individual significant factor ( $F = 4.92$ ,  $p = 0.03$ ) at the 0.05 level, while country ( $F = 1.36$ ,  $p = 0.26$ ) was non-significant. Approximately 8 percent of the variance in anxiety scores was accounted to for by the various factors in this model.

Sex was also not significantly related to internalization ( $t = 0.99$ ,  $p = 0.33$ ), the internal positive score ( $t = 0.50$ ,  $p = 0.62$ ), or the internal negative score ( $t = -1.33$ ,  $p = 0.19$ ).

Level of education was not significantly related to respondent's reports of adjustment ( $t = -0.77$ ,  $p = 0.44$ ). Level of education was significantly related to somatic symptoms ( $F = -2.07$ ,  $p = 0.04$ ), but not significantly related to anxiety symptoms ( $t = -1.68$ ,  $p = 0.10$ ) or with depression symptoms ( $t = 1.10$ ,  $p = 0.27$ ). With respect to somatic symptoms, this implies that respondents at the doctoral level reported greater somatic symptoms than those at the Master's level. Because level of education was significantly related to somatic symptoms, and country was also earlier found to affect somatic scores, Type III ANOVA was carried out to determine whether the interaction of level of education with country affected somatic symptom-reports. It was found that the interaction term ( $F = 2.11$ ,  $p = 0.13$ ) nor the individual factors, specifically country ( $F = 0.22$ ,  $p = 0.80$ ) and level of education ( $F = 2.42$ ,  $p = 0.12$ ) were not significant. However, the overall model ( $F = 3.90$ ,  $p = 0.00$ ) was statistically significant. That is, while country and level of education were independently found to be related to somatic symptom-reports, although the overall model emerged as statistically significant, neither of these independently nor through their interaction, affected somatic symptom-reports. There is a possibility that this is due to co-linearity between the factors in the model.

Level of education was not statistically related to IP ( $t = 1.76$ ,  $p = 0.08$ ), IN ( $t = 1.36$ ,  $p = 0.18$ ), or to internalization ( $t = -0.26$ ,  $p = 0.80$ ).

For Asians, correlations were computed between length of stay and the following variables: adjustment scores ( $r = 0.10$ ,  $p = 0.41$ ), somatic symptom-reports ( $r = 0.18$ ,  $p = 0.14$ ), anxiety symptom reports, depression symptom-reports, internalization score ( $r = -0.21$ ,  $p = 0.08$ ), IP score ( $r = -0.22$ ,  $p = 0.67$ ) and IN score ( $r = 0.05$ ,  $p = 0.68$ ). As can be seen, none of these correlations were statistically significant.

Overall, this suggested that certain demographic variables, for example, sex, may influence symptom-expression. The following chapter will attempt to discuss and integrate all of the above findings.

## Discussion

### Cross-cultural comparison of symptom-expression: Caucasian-Americans versus Asians

The primary purpose of the study was to examine differences in symptom-expression between Caucasian-American and Asian college students in response to college stress, termed as college adjustment difficulties in this study. College-life has been hypothesized to be related to possible maladjustment, emotional problems and psychological distress (Oliver, Reed, Katz, & Haugh, 1999). Stress or adjustment difficulties also lends itself to cross-cultural comparison because of both local and international students being exposed to somewhat similar circumstances. Hence, symptom-reports in response to college-stress (as opposed to general life stress) was studied. The focus of this investigation was to compare such differences between Americans (Caucasians) and Asians. Past reports have suggested that Asians have more of a tendency to respond to stress in somatic ways (Lin & Cheung, 1999). Somatization is thought to represent the obverse or reverse of psychologization (Kirmayer, Dao, & Smith, 1998). Americans, especially Caucasians, have been assumed to have a 'psychologization' bias (Kirmayer & Young, 1998). Depression and anxiety are thought to represent examples of psychologization. Moreover, depression and anxiety are problems that have been postulated to be most prevalent in the acculturative-stress literature (Westermeyer, 1989). Hence, this study attempted to examine differences between Asians and Caucasian-American students with respect to somatic versus psychological symptom-reports, the latter being represented by depressive and anxiety symptoms.

While such differences have been traditionally attributed to "cultural factors", the question about identifying specific aspects of culture that can lead to such differences remains unanswered. With respect to somatic versus non-somatic styles of symptom-expression, it has been suggested that attribution style may be one important factor that could lead to such differences (Anderson, 1999; Edman & Kameoka,

1997; E, Yang, & Lin, 2000). Specifically, two separate links have been hypothesized in past theoretical literature. First, the link between culture and aspects of attribution style—specifically the internal-external dimension—has been suggested. Second, a link between internal-external dimension of attributions and somatization/psychologization has been postulated. Hence, in addition to investigating possible differences in symptom-expression, this study also attempted to identify a specific cultural variable — attribution style — that may lead to differences in symptom-expression by testing these two proposed links. Information about adjustment difficulties, somatic symptoms, anxiety symptoms, depressive symptoms and attribution styles was obtained. In addition, basic demographic information such as sex, educational level, and length of stay (applicable only to international groups) was also obtained.

One major problem in cross-cultural studies is the problem of finding scales that can be used reliably in different groups (Canino & Lewis-Fernandez, 1998). Past cross-cultural studies have used questionnaires normed on Western samples without consideration to determination of its suitability with the groups targeted. Keeping this in mind, as the first step, this study attempted to modify two of the three questionnaires and to test reliability of the modified scales through a pilot study prior to carrying out the main study. Specifically, while the General Health Questionnaire has been used in cross-cultural studies and its psychological properties have been well-established through these investigations (Bhogle & Prakash, 1994), the other two questionnaires - Student Adaptation to College Questionnaire and Attribution-Style Questionnaire were modified keeping in mind the issues and situations encountered by the sample group. For the SACQ, it was thought that addition of aspects related to socio-cultural adaptation may enhance the concept of college adjustment for international students. Hence certain items, for e.g., difficulty with language, were added for the international groups. While Cronbach's Alpha values for the pilot study did not show any improvement in reliability estimates for SACQ (Modified) when compared to the SACQ when tested on the international groups, Alpha values for the main study

were slightly higher for the SACQ (Modified) when compared to SACQ. There is a chance that the small number of subjects in the pilot study contributed to the non-observed difference in this study as compared to the main study. For international students, the small increase in reliability estimates between the SACQ and SACQ (Modified) in the main study demonstrates that inclusion of socio-cultural or culturally relevant factors in questionnaires may enhance the meaningfulness of certain concepts for this group.

In addition, the Attribution-Style Questionnaire was also modified for both the American and international groups. This is because some of the situations in the original scale, for e.g., being treated lovingly by one's spouse, may not have been applicable to the groups under study. Hence, situations that are more likely to be encountered by college students, like getting along with roommates, were included in the modified version. While reliability analysis of the pilot study demonstrated moderate to good reliability, with the reliability for Asians group being higher than for Americans, the main study estimates indicated moderate reliability for all three groups. One reason for the lowered estimates in the main study as compared to the pilot study may be related to particular student characteristics of the former group in comparison to the latter. It is likely that those who initially responded to the study (i.e. those who participated in the pilot study) had spent lesser time in the university, and were less exposed to the stressors that could later develop in response to college life. It can also be postulated that the pilot study and main study were carried out at different times during the semester, and the issues facing students at one time may not have been as relevant at another time. Overall, the moderate estimates for this scale are in keeping with past reports of Cronbach's values for this scale (Peterson et al., 1982). The small number of items comprising the scale may also be another factor leading to the moderate reliability values. Another reason for the moderate values may have been related to the inclusion of only one dimension of the ASQ. The original scale includes three individual dimensions, that are all used for the total score. However, since the research question dealt with only one dimension, it was decided to use the

relevant dimension-that of internality. In this regard, some authors in the recent past (Carver, 1989; Peterson et al., 1995) have argued that if outcomes are not specific to all three dimensions, it may not be worthwhile to use a composite score of all three. Instead, they argue that unless there is theoretical justification to examine the three dimensions and form a composite, study of individual dimensions may be beneficial as well. Yet another factor affecting reliability for this scale may be related to the concept of stability of attribution style. Specifically, there is a possibility that attributions in the group under study are not stable, leading to differences in reliability such as that observed between the pilot and main studies.

Preliminary investigation of the two major scales - SACQ and GHQ revealed some differences in the pattern of responses between the three countries - America, China and India. Specifically, in response to the SACQ, both Americans and Indians reported fewer adjustment problems than Chinese, with Americans reporting slightly better adjustment, or fewer adjustment problems than Indians. This has two implications. First, some international groups, for eg., Indians, do not have significantly lesser adjustment to graduate school demands when compared to local Caucasian students, despite many of them having migrated to US just prior to starting graduate school. Second, different Asian groups may have significantly different levels of adjustment upon coming to U.S.A. for graduate studies, and this difference needs attention when using "Asians" as a unitary group. For eg., this study demonstrated that Chinese as a group have significantly higher adjustment problems than Indians. In a study on college students, Kim, Won, Liu, and Kitanishi (1997) also found that Chinese reported higher stress than some other Asian groups, specifically Japanese or Korean counterparts. In keeping with this trend, the present study also found that Chinese students as a group had greatest adjustment problems to college than some other groups like Indians or Americans. One reason for this may be the difficulty that Chinese face in learning a new language, as opposed to Indians, as English is the major language of instruction in colleges in the latter country. Some other reasons for this difference can be postulated, such as

discrepancies between students of these two countries in willingness to accept American culture, and differences in socio-economic status.

Preliminary analysis with respect to GHQ subscales, in which differences in means between the three groups was tested, suggested that Chinese and American students reported significantly higher somatic scores as compared to Indians, with Chinese being slightly higher than Americans. This finding partly supports previous research that has documented high rates of somatic symptoms in Chinese (Chin, 1999). However, it does not support findings that most Asians have a greater tendency to somatize than Americans. For anxiety symptoms, Americans reported the highest symptoms, followed by Chinese and then Indians. Once again this partly supports the notion that Americans, in comparison to Asians, may use more “psychological” symptoms. Within Asians, a difference was found between Chinese and Indians, with Chinese reporting higher anxiety as opposed to Indians. No significant differences in depressive symptoms between the three countries—Americans, Chinese and Indians— were noted. This does not support prior reports of higher depressive symptoms among Americans in comparison to Asians . Some reasons for this difference may be the specific sample in this study (graduate students) as opposed to general population studies, differences in socio-economic status of the present sample as compared to previous studies, and movement towards assimilation as part of the acculturative process on the part of international students.

The main purpose of the study was to investigate differences in the relationship between college-adjustment problems and symptom-reports. Comparison of correlations was the primary statistical method used for this purpose. Preliminary correlational analysis for Americans revealed that while there was a linear relationship between adjustment problems experienced and the presence of somatic and depressive symptoms, there was no statistically significant linear relationship between anxiety symptoms and adjustment problems. Specifically, while better adjustment was related to the

presence of fewer somatic and depressive symptoms in Americans, there was no support for a linear reduction in anxiety symptoms with improved adjustment. While this indicates that American students in the present study may not use anxiety as a mode of symptom-expression in relation to stress/adjustment problems, there is also a possibility that the relationship between anxiety and adjustment problems is not linear for this group. One argument in favor of such a non-linear relationship is that Americans reported the greatest number of anxiety symptoms, as noted earlier. That is, while Americans did report presence of anxiety symptoms, these were not correlated with college adjustment difficulties. Hence, there is a possibility that the relationship between anxiety and college problems is not linear. Yet another explanation could be related to the possibility of Americans not responding to specifically college difficulties in terms of anxiety. That is, the reports of anxiety symptoms in this group could be postulated to be a result of some other stressors such as interpersonal or financial stressors that these students may be faced with.

On the other hand, for Asians it was found that better adjustment was related to fewer anxiety and depressive symptoms, but no linear association was found with respect to somatic symptoms. While there is a chance that Asian students in the present sample do not express difficulties in somatic terms, this may also suggest that the relationship between adjustment difficulties and somatic symptoms is not linear in this group. Yet another reason for this non-significant correlation could be related to the specific pattern of responses within subjects included in this group. Specifically, responses of Chinese and Indians were combined to form the “Asian” category. Because of the low reports of somatic symptoms within the Indian group, there is a chance that the relationship between somatic symptoms and college adjustment problems emerged non-significant when their responses were combined with those from the Chinese group.

Pairs of correlations were then tested to determine whether group-membership/country was related to specific ways of symptom-expression in relation to college difficulties. Because past reports indicated a

somatic tendency as opposed to a psychological tendency in Asians when compared to Americans, the following hypotheses were developed for Asians to test this difference:

- The strength of the relationship between stress/adjustment problems and somatic symptoms would be stronger for Asians as compared to Americans.
- For Asians, the strength of the relationship between stress/adjustment problems and somatic symptoms would be stronger than that between stress/adjustment problems and anxiety and that between stress/adjustment problems and depression.

In relation to this, the first hypothesis that the strength of association between somatic symptoms and adjustment will be stronger for Asians as compared to Americans was not supported. It should also be noted that for Asians the correlation between somatic symptoms and adjustment was not even statistically significant, as earlier noted. Together, this suggests that Asian students may not have greater somatic symptoms in response to greater adjustment problems, and partly rejects the belief that Asians have a tendency towards somatization. In addition, for Asians, there was not enough evidence to support the presence of a significant difference in the strength of the relationship between college adjustment and somatic symptoms as opposed to that between college adjustment and anxiety symptoms. That is, the second hypothesis mentioned above was partially not supported. However, a significant difference in strength was obtained when comparing the correlation of college adjustment and somatic symptoms with the correlation between college adjustment and depressive symptoms. This implies, contrary to the hypothesis, that for Asians the strength of the correlation between college adjustment and depression is greater than that between college adjustment and somatic symptoms. Regression analysis also revealed that the partial correlation for somatic symptoms, contrary to hypothesis, was less than that for anxiety and depressive symptoms. In fact the partial coefficient was higher for depressive symptoms than for somatic symptoms. This suggests that Asians, contrary to belief,

may demonstrate a tendency to express adjustment problems through depressive features in comparison to traditional somatic ways. Given that the partial coefficient for anxiety symptoms was also greater than that for somatic symptoms, and the adjustment-anxiety correlation came close to being significantly different when compared to the adjustment-somatic correlation, there may also be a tendency in Asians towards expressing anxiety symptoms as compared to somatic symptoms. That is, Asians in the present sample appeared to exhibit more psychological symptoms than somatic symptoms in response to college difficulties. More recently, Khoi (1998) also failed to support the somatization hypothesis in first generation Cambodian college-students.

Some reasons for the difference in findings from the present study, as opposed to past reports could be differences in educational level, sex of respondents, and the present sample being immigrants in a western society as opposed to citizens living in their home-country. Specifically, many cross-cultural investigations have traditionally used psychiatric samples from primary health care centers (Gureje, Simon, Ustus, & Goldberg, 1997). These samples not only belong to a low socio-economic class, but also have little or no formal education. So findings in past research in these countries may not apply to the higher educated and higher socio-economic class residents from the same countries. Although not clear, it is also possible that differences in sex of respondents in the previous studies as compared to the present study lead to the present pattern of findings.

It can be hypothesized that the younger age-group in the present sample may be more inclined to use psychological symptoms than older individuals from the same countries who may use somatic symptoms as a dominant way of expression. This is partly supported by the fact that many studies that have supported somatization have used older age-groups (Gureje et al., 1997). Another interesting possibility is related to the nature of the present sample. Specifically, this study consisted of examining problems in a normal college population, as compared to an in-patient or out-patient psychiatric

clientele. It is possible that somatization is higher among Asians who have significant clinical problems, as against a non-patient population. In support of this, it should be noted that most cross-cultural studies, especially the World Health Organization studies on depression, were all carried out in health facilities wherein individuals came to seek treatment. In a study on comparison of symptom-manifestation of psychiatric distress among various Chinese populations, Yen (1998) also found higher rates of somatization among patients than non-patients. These findings suggest that in normal populations there may not be a significant difference in somatic versus psychological modes of expression across countries, given a somewhat similar SES and educational level, but as problems increase beyond a clinically significant level, ways of symptom-expression may change between Asians and Caucasians.

Yet another reason for the current findings may be related to the process of acculturation. It is also possible that the present sample had already adjusted to some extent to the Western socio-cultural environment, hence somatic symptoms were not the predominant form of expression in relation to stress. Not unrelated to acculturation is the notion that it is more acceptable to speak of symptoms such as depression and anxiety in Western nations. Hence, international respondents could have been more prone to report "psychological" problems than individuals in their native countries. Another possibility for the finding that Asians in this sample did not support patterns of somatization reported in earlier studies could be related to the process of globalization. In today's fast-growing internet-accessible world, individuals all around the world are developing access to similar information. It can be postulated that due to this increasing sophistication and access to Western culture, which involves exposure to similar styles of expression, etc. individuals in various countries are becoming more psychologically minded than in the past. Mesquita and Frijda (1992) noted that to the extent that universal expressive patterns of behavior were available, there may be lesser cross-cultural differences in behavior than when such patterns are not readily accessible. Given that patterns may be becoming more accessible due to internet and electronic technology, it is likely that cultural differences reported in past investigations are reducing

or changing. Oyama (1987) postulated that organism's natures are phenotypic, as against genotypic. She added that because phenotypes change, natures too are transient. In keeping with this, it can be argued that today's computerization that has led to dramatic transformations in our daily living are also transforming basic psychological processes. Lastly, it can also be hypothesized that the mode of data collection—electronic format—permitted greater freedom and encouraged respondents to respond without any fears of being evaluated or judged, as in face-to-face interviews.

Given the findings from past investigations that Americans tend to express problems in more psychological than somatic terms, the following hypotheses were developed to test this finding for Americans:

- The strength of the relationship between stress/adjustment problems and anxiety and between stress/adjustment problems and depression would be stronger for Americans as compared to Asians.
- For Americans, the strength of the relationship between stress/adjustment problems and anxiety, and between stress/adjustment problems and depression, would be stronger than that between stress/adjustment problems and somatic symptoms.

The strength of the relationship between college adjustment and anxiety, and between college adjustment and depression was not significantly different for Americans in comparison to Asians. The first hypothesis was hence not supported. This suggests that Americans do not have a greater tendency to express problems in psychological terms when compared to Asians. Once again, it should be noted here that for Americans the correlation between anxiety and adjustment was not found to be statistically significant, which suggests that Americans may not have a greater propensity to develop anxiety symptoms in response to greater adjustment problems. In addition, for Americans, no significant difference was obtained in the strength of the relationship between college adjustment and somatic symptoms, in comparison to the relation between college adjustment and anxiety and that between

college adjustment and depressive symptoms. Thus the second hypothesis was also not supported. Results from the regression analysis also revealed that partial coefficients for psychological symptoms such as anxiety and depression were not greater than that for somatic symptoms. This supports the notion that Americans in the present sample did not favor psychological modes of expression in comparison to somatic ways. One reason for this finding, as mentioned earlier, could be related to the possibility of Americans in this group may not have evidenced a linear increase in certain symptoms, specifically anxiety, in response to college difficulties. Another reason could be related to the independent variable used, specifically college stress/adjustment difficulties. It can be hypothesized that Caucasian college students do not have a propensity towards expressing college difficulties in psychological ways, as opposed to somatic ways. On the other hand, this may not hold true with respect to other stressors that they may encounter, where they may express more psychological symptoms. Yet another reason, similar to Asians, may be associated with the age-group in the present sample. That is, college-students may have more somatic symptoms than their older counterparts (Daughtry & Kunkel, 1993).

#### Cross-cultural comparison of symptom expression: Chinese versus Indians

Basic correlational analysis revealed that for Chinese, a linear relationship was found between adjustment and all three symptoms - somatic, anxiety and depression. For Indians, while a linear relationship was found between adjustment and anxiety and between adjustment and depressive symptoms, there was no evidence of a statistically significant relationship between adjustment and somatic symptoms. It should be noted that similar pattern of findings were observed for the "Asian" group earlier reported. These two findings suggest that the term "Asian" may mask differences between various groups comprising this category. That is, the heterogeneity between groups comprising the term "Asians" warrants the need to exercise caution when studying this group. Several past and present cross-cultural studies use this group to study various variables of interest (Meston, Heiman, & Trapnell,

1999; Murray, Selby, Grambach, & Quensenberry, 2000; Thompson & Bhugra, 2000; Yu, 1998). The results from the present study indicate that future studies, in addition to inter-group comparisons, should attempt to examine possible intra-group differences as well.

In order to test intra-group differences in modes of symptom-expression, the following preliminary hypothesis were developed for Chinese:

- The strength of the relationship between stress/adjustment problems and somatic symptoms would be stronger for Chinese as compared to Indians.
- For Chinese, the strength of the relationship between stress/adjustment problems and somatic symptoms would be stronger than those between stress/adjustment problems and anxiety and between stress/adjustment problems and depression.

Results indicated the first hypothesis in this regard was supported. This suggests that Chinese have a greater propensity towards somatization when compared to Indians. However, the second hypothesis was not supported. Regression analysis also showed a somewhat similar tendency to express adjustment problems in all three ways — somatic, anxiety, and depression. These findings suggest that Chinese may be equally likely to develop psychological symptoms as compared to somatic symptoms. It should be noted here that the results from the “Asian” group suggested a propensity on the part of this group to use psychological modes, especially depression, in relation to adjustment problems. The difference between this finding, and that for the Chinese group (which comprised the Asian category) once again demonstrates the possible heterogeneity among various Asian groups, and indicates a need to exercise caution when using this as a general term.

To examine Indian ways of symptom-expression, the following preliminary hypotheses were developed:

- The strength of the relationship between stress/adjustment problems and anxiety and between stress/adjustment problems and depression would be stronger for Indians as compared to Chinese.
- For Indians, the strength of the relationship between stress/adjustment problems and somatic symptoms would be stronger than that between stress/adjustment problems and anxiety and that between stress/adjustment problems and depression.

Comparison of correlations indicated that the first hypothesis was not supported. This indicates that Chinese and Indians did not differ significantly in their use of psychological modes of symptom-expression in relation to college difficulties. The second hypothesis was also not supported. In fact, the adjustment-depression correlation came close to being significant when compared to the adjustment-somatic correlation, but in a direction opposite to what had been proposed. This suggests that the present Indian sample, far from traditional expectations, may be inclined to use psychological ways, especially depression, to express problems. This needs to be compared to two previous findings. First, this hypothesis was not supported for the Chinese group. Second, for the overall Asian group, a tendency towards psychologization, especially depression, was observed. Together, it suggests that the “Asian” finding may be more representative of Indians than Chinese. That is, although as a group Asians may exhibit a propensity towards depressive ways of symptom-expression, this difference is more evident in Indians than in Chinese. Once again, differences between the two groups comprising the “Asian” category demonstrates a need to be careful when using this heterogeneous group in a homogeneous fashion.

#### Do countries differ with respect to attribution-style?

##### A comparison of Asians and Americans.

The presence of group differences in symptom-expression is useful in understanding how disorders

may manifest themselves in various cultures. However not much is known about why these differences may occur. That is, is there any variable related to somatic versus psychological modes of symptom-expression that can be associated with culture? As noted earlier, in this regard, two separate links have been postulated. The first is a link between culture and specific dimensions of attribution-style, while the second link that has been suggested is that between specific dimensions of attribution-style and somatization / psychologization tendency. A subsidiary purpose of this investigation was to test these two links in order to understand how culture may affect manifestation of psychopathology.

The first hypothesis developed in this regard was:

- The mean internalization score will be higher for Caucasians than for Asians.

With respect to the first hypothesis, a reverse trend found in the present sample. That is the internalization score was higher for Asians than for Caucasians. That is, suggests that in the present sample, Asians were more internal than Americans. Contrary to earlier findings (Al-Zahrani & Kaplowitz, 1993; Edman & Kameoka, 1997; Kohli & Dalal, 1998), the present results do not support the belief that Asians tend to be more external than Americans. More recently, the findings in this regards have been mixed. For example, in an investigation of community college students in which various countries were represented, Pecuch (1998) did not find any significant differences in attribution-style between groups. It should be noted that most of these studies used varied attribution scales, and this may be one reason for the mixed findings. Another reason could be the difference in samples between studies, ranging from adults to college students. With respect to the pattern found in the present study, several reasons can be postulated. First, it is possible that among graduate students, Asians are more internal than Caucasians. Second, the nature of the particular score used - which was a composite of IP and IN, may have contributed to the nature of the findings. Third, reliability analysis for the Attribution Style Questionnaire (Modified), noted earlier, suggested only moderate estimates of reliability for the

various groups, and this may have affected the nature of findings in the present study. Some other reasons for the nature of the current finding with respect to non-differences between groups may be similar to those offered earlier for findings related to symptom-expression. Specifically, one possible reason for this may be related to the high educational level of the sample studies. Differences in SES may also have contributed to the difference between the present study and past studies. Another explanation could be related to migration effects. Student immigrants in the process of acculturation, may not represent beliefs and values held by similar groups in the native country.

It should be noted that the above represents a combined score derived from IP and IN scores. That is, this score was computed to obtain an understanding of participant's overall inclination for different kinds of events, including positive and negative ones. It is likely that attributional style with respect to internality differs for positive and negative events. Hence, in order to obtain a more fine-grained understanding of cultural differences with respect to attribution-style, mean scores on positive and negative events were compared. For positive events, it was revealed that Asians tended to use more internal attributions than Americans. On the other hand, for negative events, Americans tended to use more internal attributions than Asians. These findings support earlier reports of cultural differences in attribution-style (Carpenter, 2000). This indicates that Asians in the present sample were more likely to attribute positive happenings to themselves and take the credit for success in comparison to Americans. However, Americans were more likely to accept responsibility for negative happenings than Asians.

#### A comparison of Chinese and Indians.

There were no intra-group differences observed between Chinese and Indians with respect to internalization. In fact no significant differences were found between these two groups with respect to both positive and negative attributions as well. This suggests that while inter-group differences exist with respect to how Asians and Americans explain occurrence of positive and negative events, there were no

observable intra-group differences regarding the same. This finding partly supports the notion that these countries have similar cultural value-system and beliefs. At the same time, the differences observed with respect to symptom-expression in relation to stress leads to the tentative hypothesis that attribution-style does not lead to differences in symptom-expression.

#### A comparison of Americans, Chinese and Indians.

Because earlier results found that the term “Asian” can sometimes mask within-group differences, in order to obtain a better understanding of nature of internalization dimension of attribution-style, all three countries were compared with respect to positive and negative attribution-style. It should be noted that this analysis had not been initially proposed, and was carried out solely to gain knowledge about comparative information between the three countries. For positive events, it was revealed that Indians tended to be much more internally oriented than Americans, who were not very different when compared to Chinese. Chinese tended to more internal than Americans, but less internal compared to Indians. This indicates that among the three countries, Indians are most likely to accept credit for positive happenings, followed by Chinese and then Americans. With respect to attributions for negative events, Americans tended to use more internal attributions than Chinese. Indians used more internal attributions than Chinese, but less than Americans. Among the three countries, this indicates that Americans are most likely to accept responsibility for negative events, followed by Indians, and then Chinese. Overall, this indicates that some cultural/group differences may exist with respect to the internalization dimension of attribution-style.

#### Is attribution-style related to ways of symptom-expression?

The research question with respect to attribution-style had two components. While the first component was related to whether tendency towards internality/externality can be associated with

different countries/groups, the second component was related to whether trends on the internalization score can be linked to styles of symptom-expression. The tentative hypothesis developed in this regard was:

- There will be a significant negative correlation between internalization and somatic symptoms, while the correlations between internalization and anxiety and between internalization and depression will be significant, though in a positive direction.

This hypothesis was partly supported. Specifically, a significant negative correlation was found between internalization and somatic symptoms, as hypothesized. This indicates that the more internal one's attributions, the less likely the tendency to report somatic symptoms. In other words, the more external one's attributions (the less one's internal attributions), the greater were the self-reports of somatic symptoms. However, the remaining parts of the hypothesis, that is the proposed correlations between internalization and anxiety and between internalization and depression were not supported. That is, there was no support for a linear relationship between internalization and anxiety symptoms. With respect to depression, the results were in a direction opposite to what had been hypothesized. Specifically, a significant relation was found between internalization and depression, indicating that the more internal one's attributions, the less likely was the tendency to report depressive symptoms. In other words, the more external one's attributions (the less internal one's attributions), the greater were the self-reports of depressive symptoms. Together, these results indicate a linear relationship between internalization and self-reports of symptoms such as somatic and depressive symptoms. That is, the more internal one's attributions, the less likely was the tendency to report both somatic and depressive symptoms. Tentatively, this suggests that a tendency towards internal explanations either prevent development, or prevent reporting of, symptoms of mental distress.

With respect to the two theoretical links between culture and attribution style, and between attribution-style and symptoms, the following conclusions can be drawn, based on the above findings. Cultures were significantly different with respect to internalization dimension of attribution-style, with Asians reporting more internal attributions than Americans. Internal dimension of attribution-style was related to self-reports of some kinds of symptoms such as somatic and depressive problems. However, both psychologization and somatization were found to be related to degree of internalization in a similar way. That is, instead of somatization being related to greater externality and depression being related to greater internality, both somatization and psychologization (represented only by depression scores) demonstrated an increase with decrease in internal/increase in external scores. This suggests that internal-external dimension of attribution style is not related differentially to somatic and psychological symptoms.

#### Some exploratory findings

Some investigations in the recent past have suggested that differences in levels of symptom-expression of psychological distress may be determined to a considerable extent by demographic factors such as sex and country of origin (Ponizovsky et al., 1998). Because many of the hypotheses developed in this study were not supported, attempts to examine demographic variables such as sex, educational level, and length of stay in U.S.A., and the relation of these to some of the variables in the study, were made. Sex was not found to be related to either depressive or somatic symptom-reports. However, it was found to be related to anxiety reports. That is, females tended to report higher anxiety than males. Now, because preliminary analysis had also revealed that means of the three countries differed with respect to anxiety, both sex and country were entered in a Type III ANOVA model to test for interactions. While the overall model emerged as statistically significant at the 0.05 level, both the interaction term as well as country were non-significant predictors. However, sex emerged

as a significant factor, though at the 0.05 level. The somewhat discrepant finding between these results, and the results when the effects of sex and country were analyzed independently suggests the potential pitfalls of using only single variables, such as country, in cross-cultural investigations. That is, many cross-cultural studies focus on identifying instances or similarities or differences between countries as if country was the sole distinguishing variable. However, in reality an individual's country does not exist separate from other variables such as gender. A tentative conclusion that can be drawn from this is the need for cultural psychology to overcome its problem of under-represented models. Instead, a need for a systems approach is suggested.

Level of education was found to be related to somatic symptoms, with students at the doctoral level reporting greater somatic symptoms than students at the Master's level. Some explanations for this difference include possibilities of greater stress at the doctoral level, and somatic symptoms being a way to express this stress. That is, somatic symptoms may serve as a protective factor and an acceptable way to express the growing stress of doctoral-level work as compared to Master's level work. Interestingly, the earlier findings in this investigation related to non-presence of greater somatic symptoms in Asians, as opposed to the general findings in the cross-cultural field, were thought to be related to this very factor - higher educational level. That is, the findings reported earlier in terms of non-presence of significant somatization in Asians was partly attributed to the higher education level of the present sample in comparison to past studies that have typically used patients in primary health care settings. On the other hand, this finding of difference between Master's versus Doctoral level students suggests the reverse - that is higher somatization in more educated samples. These two findings together indicate the possibility of a non-linear relationship between education and somatization. An inverted u-shaped curve could be hypothesized, that is, that somatic ways of symptom expression may steadily decrease with increase in education up to a certain level, after which increase in somatic rates may be found with increasing education. In general, this finding points to the importance of educational level as a variable of

interest for studies using international students. Most cross-cultural studies use country as the sole variable of interest, and this study suggests that other demographic variables such as education, may play a role in determining symptom-expression.

Because preliminary analysis had indicated that the three countries differed with respect to somatic symptoms, once again Type III ANOVA using education and country as factors with somatic symptoms as the dependent variable was carried out to determine possible interaction effects. While the overall model using education, country and the interaction term was significant, neither country nor education level nor the interaction term emerged as individually significant. This finding may be attributable to possible collinearity between the factors.

For Asians, it was found that length of stay did not have a linear association with adjustment, symptom-expression, or attributions style reported. One reason for this could be the range-restriction in terms of length of stay. Many of the respondents had not stayed in the U.S.A. for more than five years. Another possibility is that length of stay does not follow a linear association with symptom-expression or adjustment problems. Lastly, there may not be any relationship between length of stay and the variables included in this study.

#### Limitations of the Current Investigation

One drawback of the current study was the range-restriction of the sample in terms of educational level. Another limitation was the moderate reliability estimates obtained with respect to one scale - the Attributional Style Questionnaire - Modified. As noted earlier, while these estimates are not inconsistent with earlier reliability estimates for this scale, it may be more useful to develop scales that are more reliable with this population. Another feature related to Attribution-style was the nature of the score used. That is, only one dimension—that of internalization—was studied. It may be useful for future

studies to make use of all three dimensions in order to gain an in-depth understanding of how countries differ with respect to the various components of attribution-style. Another feature that may have affected the present results was the method of data collection. Specifically, the data was collected electronically. It can be hypothesized that those international students who responded were more culture-savvy because of ability and confidence in using internet and connecting to Western culture even when they were their home-country. Hence, these individuals may have had a propensity to use more psychological sophistication than others in their home country. Indeed, it can be hypothesized that the internet culture is leading to globalization of more basic psychological processes such as modes of expression, thinking and reasoning! Yet another drawback is the inequity in sex of respondents. For international respondents, far greater number of males responded than females. It is possible that males felt more confident or safe to respond to psychological questions electronically, and hence the difference in the number of males and females who responded. In addition, international students are typically over-represented by males, and hence it is not feasible to obtain an equal distribution in sample characteristics. Another factor that may have affected results, specifically ways of symptom-expression, is level of acculturation, which was not included in this study. The particular pattern of symptom-expression among international students may have been partly representative of their stage of acculturation, and the relationship of this variable to ways of symptom-expression needs investigation. While examining the results, it should also be kept in mind that stress was defined as difficulties in college adjustment for the purpose of this study. Hence, the variables under investigation in the current study were studied with respect to this particular kind of stress - that related to difficulties in college adjustment.

## Implications

” Psychiatric practice is becoming more multicultural as a result of migration, tourism, and the lifting barriers to services by the World Trade Organization” (Mak & Nadelson, 1996, p. 476) . In response to this, it is becoming more important to understand psychiatric symptom presentation in different cultural groups represented by the various countries. Particularly immigration to the United States is on the increase each year. Gopaul-McNicol and Brice-Baker (1998) have noted that the United States is the most culturally diverse country in the world. As more and more immigrants present to psychiatric facilities, psychiatrists in western countries such as United States and United Kingdom have been grappling with the debate of whether to treat such patients in traditional ways, or if more culture-specific diagnostic and assessment issues need implementation. A major support for the culture-specific or emic view has been the findings from cross-cultural psychiatry that have revealed important differences in terms of symptom-reports in various countries around the world. Specifically, it has been often reported that Asians have a somatic style of expression (Daughtry & Kunkel, 1993; Gureje et al., 1997; Simon et al., 1996) Several reasons have been offered to lend credence to this view. Lin and Cheung (1999) suggest that due to the Asian viewpoint of a unitary mind-body self, as opposed to a dualistic view held in western nations, Asians focus on physical distress leading to an over-representation of somatic symptoms. It has also been suggested that physical complaints are more socially acceptable in non-Western nations as opposed to emotional complaints (Chin, 1999). While these studies have, to a large extent, been carried out on native populations living in home-countries, little is known about international populations, or immigrants, who reside in foreign countries. Because of this dearth of information about immigrant psychology, health professionals have generalized findings obtained in native countries to immigrants from these countries. Hence, several studies have suggested culture-specific diagnostic and treatment considerations for immigrant groups (Gopaul-McNicol &

Brice-Baker, 1998; Al-Issa., 1995; Zoucha & Husted, 2000) in Western countries.

The present investigation offers some commentary to these views held in the cross-cultural field. Firstly, this study does not support the notion that rates of somatic symptoms are higher among Asians as compared to Americans. That is, it did not validate the concept of somatization among Asians. Several reasons such as differences in sample characteristics like SES, educational level, other differences in sample characteristics such as patient versus non-patient populations, and also other reasons such as effects of acculturation and globalization were offered earlier to explain the finding. Overall, this suggests that immigrant psychology cannot generalize from studies carried out in these individual's home countries for similar individuals living in foreign countries. A basic assumption in psychology, as Valsiner (1987) noted, was that individuals are often separated from their environments in psychological studies. Cross-cultural psychology, especially immigrant psychology, is no exception to this trend. Applying concepts found in one country to individuals from these countries whose environment is dissimilar to that found in the home country, may not be the best alternative. For example, as noted earlier, most of the studies that are carried out in native or home countries have sampled psychiatric patients who visit primary health care settings (e.g. WHO studies on depression and schizophrenia). Typically these patients are from lower socio-economic classes with little or no formal education. On the other hand, many immigrants from select countries, such as Korea, India, and China typically belong to middle or higher socio-economic class and have some degree of high educational qualifications. It may not be totally appropriate to assume that this group of immigrants may benefit from an emic psychiatric approach. Individuals need to be studied in their context, and this speaks to the need for specific studies on immigrants, as opposed to studies in home-countries, to build literature in this field. Even within this field, it may be useful to invoke the notion of probabilistic epogenesis (Oyama, 1987) in that certain outcomes are associated with a combination of a certain set of individuals and environments. That is, there is large variation within immigrants in terms of educational level, SES, kind of immigration (forced

versus voluntary). And hence specific studies on immigrants may have generalizability to only immigrants in similar conditions. Caution needs to be exercised in overgeneralization of one immigrant study to dissimilar immigrant groups. It is necessary for future investigations to carry out studies with diverse immigrant groups, in order to further our understanding of how various immigrants may react to stress. In turn this offers some guidelines to Western psychiatrists/psychologists who have increasing number of immigrants seeking their service.

This investigation also suggests that it may be useful to examine different symptoms such as somatic symptoms and depressive symptoms in immigrant groups, as well as in local groups. This is opposed to the traditional view that holds that immigrant populations may have predominantly somatic reports, versus Western populations that have typically psychological symptoms. This study did not validate the concept of somatic versus psychological symptoms. Instead, the results of this study suggest that symptoms exist on different continuums, and individuals may lie at different points for each symptom. There may not be a specific inverse relation of somatic and psychological symptoms, as previously believed. It is important for future cross-cultural studies to revise this concept of “somatic versus psychological” and instead examine each of these symptoms in the population being studied. Cheung (1985) also commented upon the issue of the dichotomy between somatization and psychologization, suggesting that these need to be instead considered as parallel processes. This investigation revealed that immigrants may express some somatic symptoms, but may also be able to report symptoms in psychological ways, such as depressive or anxiety symptoms. That is, the presence of somatic symptoms does not preclude the possibility of reporting other symptoms such as depression. More recently, a cross-cultural investigation in twenty-five countries found a strong correlation between somatic and psychological symptom-reports, and also concluded that somatic and psychological distress are intertwined. Contrary to beliefs about immigrants, overall this group of Asians did not exhibit a predisposition towards somatization. The inherent assumption in most data on international students

that this population is different as compared to Americans needs to be used with caution.

Another important finding is that Asians may not be a homogeneous as has been previously assumed. Given that most studies use this as a homogeneous group, and use this group as a comparison against other groups, such as Americans, there is a serious need to reexamine this usage. This study demonstrated that there were significant differences between these two countries with respect to certain variables such as adjustment to international college life and somatic symptom-reports. Hence, using “Asians” as a homogeneous group may not be justified in some studies. What this suggests is that future studies need to first examine possible differences between Asians groups with respect to a variable of interest. Only if sufficient evidence for similarities is found, then it may be appropriate for such studies to use “Asians” as a homogeneous group.

Yet another implication is related to a limitation of using a reductionist view. Valsiner (1987) in her classic paper on basic assumptions underlying psychological research, pointed out that the principle of additive elementarism has dominated the field of research. This is a model that assumes that the world is conceptualized as classes of independent things which when combined by simple summation, make up the whole. Instead, she advocated for the adoption of structural wholism, that assumes that functioning is dependent upon the interdependence of the parts that comprise the whole. The present investigation, as well as other multi-cultural studies, attempt to focus on some variables and use these to explain certain phenomenon. However, individuals exist in an overall system, in which the interaction of various variables may affect the outcome. That is, instead of focusing on individual variables, it is important to study the relationship or interaction of these variables designated to be important, because in reality the variables do not exist or exert their influence independently. For example, cultural variables do not exist independent of sex or educational level of individuals. Hence, it is important to develop a systemic approach while viewing cultural issues. Cross-cultural psychology needs to involve a developmental

systems approach. In keeping with this, it is important for future investigations to frame research questions from a systemic viewpoint and to develop more appropriate research tools for this purpose.

Overall, this investigation shows that cross-cultural differences may be in a state of flux, and cultural psychology may be in need of a developmental approach. Especially with increasing globalization and changes occurring in various countries, there is a need to give up the static beliefs of existence of cultural/country differences between countries.

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## APPENDIX A

### Virginia Polytechnic Institute and State University Informed Consent Form

**Nature of Project:** Adjustment problems

**Principal Investigator:** Uma A. Shenoy

#### **Purpose of Research**

You are invited to participate in a study concerning adjustment problems of college students. Through this study we hope to gain an understanding of some of the problems that students face in adjusting to a new environment and how these problems are experienced and perceived. We also hope that we can identify, to some extent, why students may experience problems in different ways.

#### **Procedures**

This study is open to all American Caucasian, Asian Chinese and Asian Indian graduate students. As a participant in this study, you will be required to fill out three questionnaires which will take no longer than 30 minutes to fill out. The content of the questionnaires will include problems that college students face, what you think of these problems and how you experience them. These questionnaires have been attached to this file. You will be required to fill them out and mail this file back to the principal investigator electronically.

#### **Risks**

Previous studies in this field have shown no evidence of any kind of distress to subjects while filling out questionnaires. However, should you feel uncomfortable, please feel free to contact the principal investigator or the faculty advisor at any point. If you feel uncomfortable, you can withdraw from the study at any point.

#### **Confidentiality**

The results of this study will be kept confidential. The information that you provide will only have a number attached to it. The information that you provide will only be used for scientific purposes. This may include presentation of the results at a scientific meeting, publication in professional books, or any other purpose that the Virginia Tech Department of Psychology deems proper in the interest of education, knowledge or research. As mentioned earlier, your name or address will not be revealed in any way.

#### **Benefits**

It is hoped that this study will help us understand how to assess some of the problems that students face in a college environment and how these problems are perceived.

If you wish, you will be provided a brief summary of this study once it is completed. In case of any questions, you are welcome to contact the principal investigator of the study.

**Approval of Research**

This research project has been approved, as required, by the Institutional Review Board for Research Involving Human Subjects at Virginia Polytechnic Institute and State University and by the Cranwell International Center.

**Subject's Permission**

I have read and understand the above description of the study. I hereby acknowledge the above and give my voluntary consent for this study. I further understand that if I participate, I may withdraw at any point during the study without penalty. I understand that if I should have any questions regarding this research and its conduct, I should contact any of the person's named below:

**Primary Researcher:** Uma Shenoy, M.S., Phone: (810)739-0049

**Faculty Advisor:** Russell T. Jones, Ph.D., Phone: (540)231-5934

**Chairman HSC:** David Harrison, Ph.D., Phone: (540)231-4422

**Chair IRB:** Ernest Stout, Phone: (540)231-9359

Date: \_\_\_\_\_

Initials: \_\_\_\_\_

Email address: (e.g.: you@vt.edu) \_\_\_\_\_

**APPENDIX B**

**Demographic Information**

Gender:  Male  Female

Home Country: \_\_\_\_\_

Number of months of stay in USA: \_\_\_\_\_

Department: \_\_\_\_\_

Degree Pursued:  Master's  PhD

Religion (optional) : \_\_\_\_\_

APPENDIX C

Student Adaptation To College Questionnaire - Modified

Directions

The 61 statements on this form describe college experiences. Read each one and decide how well it applies to you at the present time (within the past few days). For each statement fill in the circle at the point in the continuum that best represents how closely the statement applies to you. Fill in only one circle for each statement. Please note that not all situations may apply in your case.

|   | ← <b>Applies Very<br/>Closely to Me</b> | <b>Doesn't Apply<br/>to Me at All</b> → |
|---|---|---|
| 1. I feel that I fit in well as part of the college environment                             | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 2. I have been keeping up to date on my academic work                                       | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 3. I am meeting as many people, and making as many friends as I would like at college ..... | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 4. I know why I'm in college and what I want out of it                                      | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 5. I am finding academic work at college difficult .....                                    | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 6. I am very involved with social activities in college ...                                 | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 7. I am adjusting well to college .....   | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 8. I have not been functioning well during examinations                                     | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 9. I am satisfied with the level at which I am performing academically .....                | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 10. I have had informal, personal contacts with college professors .....                    | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 11. I am pleased now about my decision to attend this college in particular .....           | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 12. I'm not working as hard as I should at my course work                                   | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 13. I have several close social ties at college .....                                       | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 14. My academic goals and purposes are well defined ...                                     | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 15. I'm not really smart enough for the academic work I am expected to be doing now .....   | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 16. Lonesomeness for home is a source of difficulty for me now .....                        | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 17. Getting a college degree is very important to me ....                                   | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 18. I haven't been very efficient in the use of study time lately .....                     | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 19. I enjoy living in university housing .....  | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |
| 20. I enjoy writing papers for courses .....  | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                       |   |

|  | <b>Applies Very<br/>Closely to Me</b> | <b>Doesn't Apply<br/>to Me at All</b> |
|--|---------------------------------------|---------------------------------------|
|  | ←                                     | →                                     |
| 21. I really haven't had much motivation for studying lately .....   | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 22. I am satisfied with the extracurricular activities available at college .....                              | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 23. Lately I have been having doubts regarding the value of a college education .....                          | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 24. I am getting along very well with my roommate(s) at college .....  | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 25. I am satisfied with the number and variety of courses available at college .....                           | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 26. I feel I have enough social skills to get along well in the college setting .....                          | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 27. Recently I have had trouble concentrating when I try to study .....  | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 28. I'm not doing well enough academically for the amount of work I put in .....                               | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 29. I'm having difficulty feeling at ease with other people at college .....                                   | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 30. I am satisfied with the quality or caliber of courses available at college .....                           | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 31. I am attending classes regularly .....   | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 32. I am satisfied with the extent to which I am participating in social activities at college .....           | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 33. I haven't been mixing too well with the opposite sex lately .....  | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 34. I am enjoying my academic work at college .....  | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 35. I have been feeling lonely a lot at college lately .....   | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 36. I am having a lot of trouble getting started on homework assignments .....                                 | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 37. I am satisfied with my program of courses for the semester .....   | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 38. I feel I am very different from other students at college in ways I don't like .....                       | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 39. On balance, I would rather be home than here .....   | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 40. Most of the things I am interested in are not related to any of my course work at college .....            | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 41. I am very satisfied with the professors I have now in my courses .....                                     | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 42. I have some good friends and acquaintances at college with whom I can talk about any problems I might have | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |

|   | <b>Applies Very<br/>Closely to Me</b> | <b>Doesn't Apply<br/>to Me at All</b> |
|---|---------------------------------------|---------------------------------------|
|   | ←                                     | →                                     |
| 43. I am quite satisfied with my social life at college ....                                | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 44. I'm quite satisfied with my academic situation<br>at college .....                      | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 45. My English embarrasses me when I talk to people ..                                      | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 46. I don't like the religions in the U.S.A. ....   | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 47. I can feel racial discrimination toward me from<br>other students .....                 | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 48. It's hard for me to develop opposite-sex<br>relationships here .....                    | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 49. I don't like American food .....  | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 50. People treat me badly just because I am a foreigner .                                   | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 51. I can feel racial discrimination toward me in stores ..                                 | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 52. I worry about whether I will have my future career<br>in the U.S.A. ....                | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 53. Americans' way of being too direct is uncomfortable<br>to me .....                      | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 54. I can feel racial discrimination toward me from<br>professors .....                     | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 55. I can't express myself well in English .....  | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 56. I don't like American music .....   | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 57. I can feel racial discrimination toward me in<br>restaurants .....                      | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 58. I worry about my future: will I return to my home<br>country or stay in the U.S.A. .... | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 59. I haven't become used to enjoying the American<br>holidays .....                        | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 60. I cannot understand American jokes .....  | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |
| 61. I am conscious because I look different from most<br>Americans .....                    | ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨                     |                                       |

## APPENDIX D

## Attributional Style Questionnaire (Modified)

Please try to vividly imagine yourself in the situations that follow. If such a situation happened or were to happen to you, what would you feel have caused it? While events may have many causes, we want you to pick the only one—the major cause of this event that happened to you. Please write this cause in the blank provided after each event. Next we want you to answer a question about the cause. To summarize, we want you to:

1. Reach each situation and vividly imagine it happening to you.
2. Decide what you feel would be the major cause of the situation if it happened to you.
3. Write one cause in the blank provided.
4. Answer one question about the cause.

A. You meet a friend who compliments you on your appearance.

1. Write down the one major cause
2. Is the cause due to something about you or to something about other people or circumstances? (circle one number)

|                  |               |             |
|------------------|---------------|-------------|
| Totally due to   |               | Totally due |
| other people     | 1 2 3 4 5 6 7 | to me       |
| or circumstances |               |             |

B. You have been looking for a job unsuccessfully for some time.

1. Write down the one major cause
2. Is the cause of your unsuccessful job search due to something about you or to something about other people or circumstances? (circle one number)

|                  |               |             |
|------------------|---------------|-------------|
| Totally due to   |               | Totally due |
| other people     | 1 2 3 4 5 6 7 | to me       |
| or circumstances |               |             |

C. You become very rich.

1. Write down the one major cause
2. Is the cause of your becoming rich due to something about you or to something about other people or circumstances? (circle one number)

|                  |               |             |
|------------------|---------------|-------------|
| Totally due to   |               | Totally due |
| other people     | 1 2 3 4 5 6 7 | to me       |
| or circumstances |               |             |



I. You come down with an allergy before your exams.

1. Write down the one major cause
  2. Is the cause of your allergy due to something about you or to something about other people or circumstances? (circle one number)
- |                  |               |             |
|------------------|---------------|-------------|
| Totally due to   |               | Totally due |
| other people     |               | to me       |
| or circumstances | 1 2 3 4 5 6 7 |             |

J. You apply for a position that you want very badly (e.g., important job, graduate school admission) and you get it.

1. Write down the one major cause
  2. Is the cause of your getting the position due to something about you or to something about other people or circumstances? (circle one number)
- |                  |               |             |
|------------------|---------------|-------------|
| Totally due to   |               | Totally due |
| other people     |               | to me       |
| or circumstances | 1 2 3 4 5 6 7 |             |

K. You cannot get along with your roommates.

1. Write down the one major cause
  2. Is the cause of not getting along with your roommates due to something about you or to something about other people or circumstances? (circle one number)
- |                  |               |             |
|------------------|---------------|-------------|
| Totally due to   |               | Totally due |
| other people     |               | to me       |
| or circumstances | 1 2 3 4 5 6 7 |             |

L. You get a raise in your assistantship/job.

1. Write down the one major cause
  2. Is the cause of your getting a raise due to something about you or to something about other people or circumstances? (circle one number)
- |                  |               |             |
|------------------|---------------|-------------|
| Totally due to   |               | Totally due |
| other people     |               | to me       |
| or circumstances | 1 2 3 4 5 6 7 |             |

## APPENDIX E

## General Health Questionnaire

Please read this carefully:

We should like to know if you have had any medical complaints, and how your health has been in general, over the past few weeks. Please answer ALL the questions on the following pages simply by underlining the answer which you think most nearly applies to you. Remember that we want to know about present and recent complaints, not those that you had in the past.

It is important that you try to answer ALL the questions.

Thank you very much for your cooperation.

## HAVE YOU RECENTLY:

|     |   |                   |                    |                        |                       |
|-----|---|-------------------|--------------------|------------------------|-----------------------|
| A1. | Been feeling in need of some medicine to perk you up?         | Better than usual | Same as usual      | Worse than usual       | Much Worse than usual |
| A2. | Been feeling in need of a good tonic?                         | Not at all        | No more than usual | Rather more than usual | Much more than usual  |
| A3. | Been feeling run down and out of sorts?                       | Not at all        | No more than usual | Rather more than usual | Much more than usual  |
| A4. | Felt that you are ill?  | Not at all        | No more than usual | Rather more than usual | Much more than usual  |
| A5. | Been getting any pains in your head?                          | Not at all        | No more than usual | Rather more than usual | Much more than usual  |
| A6. | Been getting a feeling of tightness or pressure in your head? | Not at all        | No more than usual | Rather more than usual | Much more than usual  |
| A7. | Been having hot or cold spells?                               | Not at all        | No more than usual | Rather more than usual | Much more than usual  |
| B1. | Lost much sleep over worry?                                   | Not at all        | No more than usual | Rather more than usual | Much more than usual  |
| B2. | Had difficulty staying asleep?                                | Not at all        | No more than usual | Rather more than usual | Much more than usual  |
| B3. | Felt constantly under strain?                                 | Not at all        | No more than usual | Rather more than usual | Much more than usual  |
| B4. | Been getting edgy and bad-tempered?                           | Not at all        | No more than usual | Rather more than usual | Much more than usual  |
| B5. | Been getting scared or panicky for no good reason?            | Not at all        | No more than usual | Rather more than usual | Much more than usual  |
| B6. | Found everything getting on top of you?                       | Not at all        | No more than usual | Rather more than usual | Much more than usual  |
| B7. | Been feeling nervous and uptight all the time?                | Not at all        | No more than usual | Rather more than usual | Much more than usual  |

|     |   |                    |                     |                           |                        |
|-----|---|--------------------|---------------------|---------------------------|------------------------|
| C1. | Been managing to keep yourself busy and occupied?                         | More so than usual | Same as usual       | Rather less than usual    | Much less than usual   |
| C2. | Been taking longer over the things you do?                                | Quicker than usual | Same as usual       | Longer than usual         | Much longer than usual |
| C3. | Felt on the whole you were doing things well?                             | Better than usual  | About the same      | Less well than usual      | Much less well         |
| C4. | Been satisfied with the way you've carried out your task?                 | More satisfied     | About Same as usual | Less satisfied than usual | Much less satisfied    |
| C5. | Felt you are playing a useful part in things?                             | More so than usual | Same as usual       | Less useful than usual    | Much less useful       |
| C6. | Felt capable of making decisions about things?                            | More so than usual | Same as usual       | Less so than usual        | Much less capable      |
| C7. | Been able to enjoy your normal busy and occupied?                         | More so than usual | Same as usual       | Less so than usual        | Much less than usual   |
| D1. | Been thinking of yourself as a worthless person?                          | Not at all         | No more than usual  | Rather more than usual    | Much more than usual   |
| D2. | Felt that life is entirely hopeless? worthless person?                    | Not at all         | No more than usual  | Rather more than usual    | Much more than usual   |
| D3. | Felt that life isn't worth living?  | Not at all         | No more than usual  | Rather more than usual    | Much more than usual   |
| D4. | Thought of the possibility that you might do away with yourself?          | Definitely not     | I don't think so    | Has crossed my mind       | Definitely have        |
| D5. | Found at times you couldn't do anything because your nerves were too bad? | Not at all         | No more than usual  | Rather more than usual    | Much more than usual   |
| D6. | Found yourself wishing you were dead and away from it all?                | Not at all         | No more than usual  | Rather more than usual    | Much more than usual   |
| D7. | Found that the idea of taking your own life kept coming in your mind?     | Definitely not     | I don't think so    | Has crossed my mind       | Definitely have        |

### Curriculum Vitae

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#### Educational Qualifications:

- Bachelor of Arts (B.A.) from Ferguson College, Pune, India. First Class with distinction (82%). Stood first in the University of Pune at the B.A. level.
- Master of Social Work (MSW) with specialization in Medical and Psychiatric Social Work from the Tata Institute of Social Sciences, Bombay, India. Graduated with Grade A. Stood in the top 10% throughout.
- Diploma in Human Resources Management (DHRM) from the Institute of Management Development and Research, Pune India. Graduated in First Class. Ranked first in the Institute.
- Master of Science in Clinical Psychology (January 1997), Virginia Polytechnic Institute and State University, Blacksburg, Virginia, USA.
- Doctor of Philosophy in Clinical Psychology (August 2000), Virginia Polytechnic Institute and State University, Blacksburg, Virginia, USA.

#### Professional Affiliations:

- Vice President and Associate Editor (1996-1997, and 1997-1998): Cross-cultural Behavior Therapy - Special Interest group (SIG) in AABT.
- Student Representative (1997-1999): Asian-American issues in Behavior Therapy—Special Interest group (SIG) within AABT

- Student Member: International Society for Traumatic Stress Studies
- Student Member: Association for the Advancement of Behavior Therapy (AABT)

### **Awards and Honors:**

- Received a national government scholarship for three years during undergraduate study at Pune, India (1989-1991).
- Received an award for standing first in the district at the BA level from the University of Pune, India (1991).
- Received an award from the Cultural Diversity Committee at Virginia Tech (Fall 1997).

### **Practical Experience:**

[A] In India:

- As part of practical/field experience, I worked in a cancer hospital in Bombay as a student Social Worker. I was involved in a variety of activities in the hospital in the course of the year.. During this time, I initiated play therapy groups for children undergoing therapy. Prior to this, there was no group for children. During this time, I also worked with a group for controlled cancer patients—After Completion of Therapy (ACT) group, which had been started by a doctor at the hospital. This consisted mainly of adolescents, and some children. I was also involved in counseling women undergoing treatment for cervical cancer. I was also involved in helping the main social workers to conduct groups for patients undergoing radiation therapy. These were mainly information groups. In addition to these group activities, I also had the experience of counseling some individual clients.

- As part of my first year field training during my social Work training, I was placed in an agency working on adult literacy in a slum area in Bombay. As part of this, I conducted adult literacy groups for women in the slum area. I also conducted play groups for their children. these children had difficulty in school, often because the curriculum was not in keeping with their experiences, and the language of instruction was different from their native language. In these groups, I conducted play sessions designed to help them understand the study material better. Another goal of this group was to foster cooperation among the children, as they came from different castes, and their parents often did not associate with each other. Development of basic social skills was the secondary goal of this group.

- Worked for a month as part of practical training experience in a drug and alcohol de-addiction

center—"Muktangan". Most of my experience here consisted of community-based interventions, and prevention programs for slum residents. We conducted street plays, and gave people information about negative effects of alcohol. Also conducted groups for adult males in the Center along with other Social Workers. Case work here was conducted along with the other social workers.

[B] As a student at Virginia Tech:

(a) Clinical Practicum - Psychological Services Center and Child Services Center, Virginia Polytechnic Institute and State University:

August 1994–May 1995

Supervisors: Dr. Russell Jones and Dr. George Clum

August 1995–May 1996

Supervisors: Dr. Richard Eisler and Dr. Cynthia Lease

- I have had the opportunity to work with both adult and child clients, as well as American and International clients to a certain extent. In working with child clients, I have had the experience of dealing with Conduct Disorder, Attention deficit Disorder, Adjustment problems, Pervasive Developmental Disorder, and also had some experience in parent training. With adults, I have dealt with Depression, Anxiety and Adjustment problems.

- During this time, I had the opportunity to develop conceptualizations of client's cases, develop and carry out treatment plans, carry out psychological assessments. I have also had the opportunity to present comprehensive case-presentations of clients to supervisors and practicum teams.

(b) Clinical Practicum - Southwest Virginia Mental Health Institute (SWVMHI)

August 1996–Present time

Supervisors: Dr. Mears, Dr. Teel and Mr. Parsons

- During this time I had the opportunity to work with both adult and adolescent patients. In the adolescent unit, I conducted mental status examinations/psychological assessments, and comprehensive assessments, including personality assessment and intellectual testing. My job responsibilities also included conducting individual therapy and group therapy sessions. In the adult unit, job responsibilities included working as part of a multidisciplinary team, and conducting psychological assessments with the

team. Assessing patient's intellectual level, personality-testing, and testing for organicity were also part of my work-experience in this unit. In addition, conducting individual and group therapy sessions were also part of my responsibilities in this unit.

## (c) Clinical Internship - Wayne State School of Medicine

September 1999–August 2000

Supervisors: Dr. Bell, Dr. Petti and Dr. McArthur

- During this time I had the opportunity to work with both adult and adolescent patients in both in-patient and out-patient settings. As part of the different rotation sites, I was able to gain experience in working with clients in community psychology settings, in-patient adolescent patients in a state hospital, and with out-patient clients in psychiatric clinics. In addition, I was also able to gain experience in Behavioral Medicine and worked with patients in some of the Wayne State School of Medicine hospitals as well as in a Nursing Home affiliated with this School. I am also grateful for the opportunity to attend a variety of Grand Rounds during this internship period.

- In the community psychology setting, I had the experience of individual testing and counseling in some settings operated by a Detroit-based agency—“Residential Care Alternatives”. The rotation at a State Adolescent psychiatric hospital gave me the opportunity for individual counseling, group therapy as well as intellectual and personality testing. The Behavioral Medicine experience has equipped me to function as part of a multi-disciplinary team in a medical hospital setting. Some experiences there included conducting mental status examinations, some specifically geared towards determining whether patients were able to make decisions about their medical condition. Through this rotation I also served as a part of a Behavioral Medicine team in which we evaluated the mental status of patients in a Nursing home.

- Working with outpatients throughout this academic year helped me to consolidate my individual and group counseling skills with adults. It also helped me to enhance my individual and family therapy skills with children.

### **Research Experience:**

[A] In India

- During my one year of field experience in the Cancer Hospital, I was involved in a quantitative research initiated by a hematologist-Dr. Advani. This study examined the relation of Retinoblastoma with religion and with consangual marriages. I was involved in collecting data, and interviewed 50 children or their families (if the child had expired).

- I also carried out a qualitative study, interviewing 10 women suffering from cervical cancer,

looking at the effects of cervical cancer on the quality of their lives.

- Worked as a Research Assistant for two months on a project entitled “Private Health Sector Facilities” under Dr. Yesudian at the Tata Institute of Social Sciences in April-May 1992. Worked mainly as an interviewer.
- Completed own Master’s thesis project. This study investigated the attitudes of medical students towards “Preventive and Social Medicine” and was mainly an exploratory study.

[B] At Virginia Tech:

- I have been involved in a study by Dr. Russell Jones which investigates young children’s coping strategies, and the relation of use of these to effectiveness in solving problems. I have helped analyze the data, and write up the results and discussion. We are currently involved in getting the document ready for publication.
- Along with Dr. Russell T. Jones and other colleagues, I was involved in writing a book chapter—“Representativeness of African-Americans in Behavior Therapy”.

### **Professional Presentations:**

- Shenoy, A. & Jones, R. T. (2000, November). Development of a Culturally Sensitive Treatment for Asian-Americans. Poster presented at the Special Interest Group (SIG) evening as part of the annual conference of the Association for the Advancement of Behavior Therapy. Toronto
- Shenoy, A. & Jones, R. T. (1998, November). PTSD in Children of War: A Critical Analysis. Poster presentation session, for the 14th Annual Meeting of the International Society for Traumatic Stress Studies (ISTSS).
- Langley, A., Parker, M., Weeks, C., Seligman, L., Byrd, D., Shenoy, U., Kephart, C., Jones, R., Ollendick, T., & Lease, C. (1998, November). Children and Adolescents exposed to Residential Fire: Impact of Trait anxiety on Post Traumatic Symptomatology. Poster presentation for 14th Annual Meeting of the International Society for Traumatic Stress Studies (ISTSS).
- Shenoy, U. & Jones, R.T. (1997, November). Cross-Cultural Applicability of the CBCL-P and RCMAS: Some preliminary findings. Poster presented at the annual conference of the Association for the Advancement of Behavior Therapy. Miami.
- Shenoy, U. & Jones, R. T. (1997, September). PTSD in children of war: What do we know? Poster accepted, but not presented at the Seventh Annual Virginia Beach Conference. This conference is

sponsored by the Department of Psychiatry, Virginia Commonwealth Institute, VA.

- Shenoy, U. & Jones, R. T. (1997, September). Adjustment problems in a multi-ethnic sample: The case for children of immigrants. Symposium-presentation at the Seventh Annual Virginia Beach Conference. This conference is sponsored by the Department of Psychiatry, Virginia Commonwealth Institute, VA.
- Byrd, D., Davis-parker, M., & Shenoy, U. (1997, September). Developing a Culturally Sensitive Treatment for anxiety Disorders in African-American children. Symposium-presentation at the Seventh Annual Virginia Beach Conference.
- Shenoy, U. & Jones, R.T. (1996, November). In Moving to a New Culture: Children and Adolescent's Adaptation. Poster presented at the Annual conference for the Association for the Advancement of Behavior Therapy. New York.
- Jones, R.T., Davis, M., Jeffries, R., & Shenoy, U. (1996, October). Representativeness of African-Americans in Behavior Therapy. Symposium conducted at Virginia Beach, Virginia.
- Jones, R. T., Fiore, M., & Talwalkar, U. (1995, November). Young Children's Adaptive Coping. Poster presented at the Annual conference for the Association for the Advancement of Behavior Therapy. Washington D.C.

**References:**

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Table 1

Cronbach's Alpha for Pilot Study

|               | Americans | Chinese | Indian |
|---------------|-----------|---------|--------|
| GHQ           | 0.76      | 0.82    | 0.92   |
| SACQ          | 0.86      | 0.99    | 0.98   |
| SACQ-Modified | N/A       | 0.99    | 0.97   |
| ASQ-Modified  | 0.41      | 0.75    | 0.69   |

Table 2

Demographic Information for Main Study

|  |          | Americans | Chinese | Indian |
|--|----------|-----------|---------|--------|
| Gender                                 | M        | 16        | 23      | 27     |
|  | F        | 29        | 12      | 8      |
| Educational Level                      | Master's | 26        | 17      | 31     |
|  | Ph.D.    | 19        | 18      | 2      |
| Mean Number of Months Stay in the U.S. |          | N/A       | 26.2    | 21.9   |

Table 3

Cronbach's Alpha for Main Study

|               | Americans | Chinese | Indian |
|---------------|-----------|---------|--------|
| GHQ           | 0.89      | 0.94    | 0.92   |
| SACQ          | 0.88      | 0.88    | 0.89   |
| SACQ-Modified | N/A       | 0.92    | 0.93   |
| ASQ-Modified  | 0.50      | 0.53    | 0.46   |

Table 4

Mean and Std. Dev. values for all scales

|                       | Americans |         | Chinese |         | Indian |         |
|-----------------------|-----------|---------|---------|---------|--------|---------|
|                       | Mean      | Std Dev | Mean    | Std Dev | Mean   | Std Dev |
| GHQ (Somatic Scale)   | 5.13      | 3.15    | 5.51    | 3.12    | 2.89   | 2.32    |
| GHQ(Anxiety Scale)    | 6.84      | 4.19    | 5.97    | 4.22    | 4.26   | 3.85    |
| GHQ(Depression Scale) | 1.42      | 2.39    | 2.93    | 4.16    | 2.00   | 2.79    |
| SACQ                  | 294.04    | 41.53   | 258.34  | 39.88   | 282.29 | 48.44   |
| SACQ-Modified         | N/A       | N/A     | 358.51  | 58.67   | 408.34 | 62.51   |
| ASQ-Modified          | 4.13      | 6.86    | 7.62    | 6.11    | 8.17   | 5.60    |

Table 5

Correlations between College Adjustment and Symptoms for Asians and Americans

|                         | Somatic<br>Symptoms              | Anxiety<br>Symptoms             | Depressive<br>Symptoms           |
|-------------------------|----------------------------------|---------------------------------|----------------------------------|
| Adjustment in Americans | r = -0.48<br>p = 0.001<br>n = 45 | r = -0.26<br>p = 0.10<br>n = 45 | r = -0.43<br>p = 0.003<br>n = 45 |
| Adjustment in Asians    | r = -0.20<br>p = 0.10<br>n = 70  | r = -0.49<br>p = 0.00<br>n = 70 | r = -0.50<br>p = 0.00<br>n = 70  |

Table 6

Comparison of sets of correlations between Asians and Americans

|           | Adjustment-Somatic<br>Correlation | Adjustment-Anxiety<br>Correlation | Adjustment-Depression<br>Correlation |
|-----------|-----------------------------------|-----------------------------------|--------------------------------------|
| Americans |                                   |                                   |                                      |
| versus    | $z_{\text{obs}} = -1.628$         | $z_{\text{obs}} = 1.373$          | $z_{\text{obs}} = 0.455$             |
| Asians    |                                   |                                   |                                      |

Table 7

Comparison of adjustment-somatic versus adjustment-anxiety and adjustment-depression within each group

|           | Adjustment-Somatic<br>versus<br>Adjustment-Anxiety | Adjustment-Somatic<br>versus<br>Adjustment-Depression |
|-----------|--|---|
| Americans | $z_{\text{obs}} = -1.177$                          | $z_{\text{obs}} = -0.289$                             |
| Asians    | $z_{\text{obs}} = 1.932$                           | $z_{\text{obs}} = 2.008$                              |

Table 8

Regression analysis for Americans

R square = 0.267

Adjusted R square = 0.213

F = 4.98

Sig F = 0.005

Dependent Variable. . . College Adjustment (SACQ)

| Model      | Unstandardized |           | Standardized | t     | Sig. | Partial<br>Correlations |
|------------|----------------|-----------|--------------|-------|------|-------------------------|
|            | Coefficients   |           | Coefficients |       |      |                         |
|            | Beta           | Std Error | Beta         |       |      |                         |
| Constant   | 321.46         | 12.61     | -            | 25.5  | 0.00 | -                       |
| Somatic    | -4.77          | 2.25      | -0.36        | -0.21 | 0.04 | -0.32                   |
| Anxiety    | 0.46           | 1.61      | 0.05         | 0.29  | 0.78 | 0.05                    |
| Depression | -4.27          | 3.01      | -0.25        | -1.42 | 0.16 | -0.22                   |

Table 9

Regression analysis for Asians

R square = 0.290

Adjusted R square = 0.250

F = 8.80

Sig F = 0.000

Dependent Variable. . . College Adjustment (SACQ)

| Model      | Unstandardized |           | Standardized | t     | Sig. | Partial<br>Correlations |
|------------|----------------|-----------|--------------|-------|------|-------------------------|
|            | Coefficients   |           | Coefficients |       |      |                         |
|            | Beta           | Std Error | Beta         |       |      |                         |
| Constant   | 293.92         | 9.13      | -            | 32.19 | 0.00 | -                       |
| Somatic    | 0.41           | 1.72      | 0.03         | 0.24  | 0.82 | 0.03                    |
| Anxiety    | -2.97          | 1.74      | -0.27        | -1.71 | 0.09 | -0.21                   |
| Depression | -4.10          | 1.99      | -0.32        | -2.06 | 0.04 | -0.25                   |

Table 10

Correlations between Adjustment and Symptoms for Chinese and Indians

|                        | Somatic<br>Symptoms              | Anxiety<br>Symptoms              | Depressive<br>Symptoms           |
|------------------------|----------------------------------|----------------------------------|----------------------------------|
| Adjustment for Chinese | r = -0.58<br>p = 0.000<br>n = 35 | r = -0.63<br>p = 0.000<br>n = 35 | r = -0.60<br>p = 0.000<br>n = 35 |
| Adjustment for Indians | r = -0.17<br>p = 0.33<br>n = 35  | r = -0.34<br>p = 0.048<br>n = 35 | r = -0.52<br>p = 0.001<br>n = 35 |

Table 11

Comparison of sets of correlations between Chinese and Indians

|         | Adjustment-Somatic<br>Correlation | Adjustment-Anxiety<br>Correlation | Adjustment-Depression<br>Correlation |
|---------|-----------------------------------|-----------------------------------|--------------------------------------|
| Chinese |                                   |                                   |                                      |
| versus  | $z_{\text{obs}} = -1.962$         | $z_{\text{obs}} = -1.548$         | $z_{\text{obs}} = -0.467$            |
| Indians |                                   |                                   |                                      |

Table 12

Comparison of adjustment-somatic versus adjustment-anxiety and adjustment-depression within each group

|         | Adjustment-Somatic<br>vs.<br>Adjustment-Anxiety | Adjustment-Somatic<br>vs.<br>Adjustment-Depression |
|---------|---|--|
| Chinese | $z_{obs} = 0.315$                               | $z_{obs} = 0.122$                                  |
| Indians | $z_{obs} = 0.729$                               | $z_{obs} = 1.617$                                  |

Table 13

Regression analysis for Chinese

|                   |   |       |
|-------------------|---|-------|
| R square          | = | 0.440 |
| Adjusted R square | = | 0.390 |
| F                 | = | 8.11  |
| Sig F             | = | 0.000 |

Dependent Variable. . . College Adjustment (SACQ-modified)

| Model      | Unstandardized |           | Standardized | t     | Sig. | Partial<br>Correlations |
|------------|----------------|-----------|--------------|-------|------|-------------------------|
|            | Coefficients   |           | Coefficients |       |      |                         |
|            | Beta           | Std Error | Beta         |       |      |                         |
| Constant   | 415.03         | 17.53     | -            | 23.67 | 0.00 | -                       |
| Somatic    | -4.53          | 3.79      | -0.24        | -1.20 | 0.24 | -0.21                   |
| Anxiety    | -3.76          | 3.61      | -0.27        | -1.04 | 0.31 | -0.18                   |
| Depression | -3.09          | 3.26      | -0.22        | -0.95 | 0.35 | -0.17                   |

Table 14

Regression analysis for Indians

R square = 0.290

Adjusted R square = 0.220

F = 4.27

Sig F = 0.012

Dependent Variable. . . College Adjustment (SACQ-modified)

| Model      | Unstandardized |           | Standardized | t     | Sig. | Partial<br>Correlations |
|------------|----------------|-----------|--------------|-------|------|-------------------------|
|            | Coefficients   |           | Coefficients |       |      |                         |
|            | Beta           | Std Error | Beta         |       |      |                         |
| Constant   | 425.47         | 15.60     | -            | 27.28 | 0.00 | -                       |
| Somatic    | 5.63           | 5.36      | 0.21         | 1.05  | 0.30 | 0.19                    |
| Anxiety    | -1.98          | 3.44      | -0.12        | -0.57 | 0.57 | -0.10                   |
| Depression | -12.48         | 4.48      | -0.56        | -2.79 | 0.01 | -0.45                   |

Table 15

Mean Scores on the External-Internal Continuum for each Group

|           |      |
|-----------|------|
| Americans | 4.13 |
| Asians    | 7.90 |
| Chinese   | 7.62 |
| Indians   | 8.17 |

Table 16

Mean Scores on the External-Internal Continuum for Positive and Negative Events for each Group

|           | Mean Score |          |
|-----------|------------|----------|
|           | Positive   | Negative |
| Americans | 28.24      | 24.93    |
| Asians    | 30.75      | 22.86    |
| Chinese   | 30.06      | 22.44    |
| Indian    | 31.43      | 23.26    |

Table 17

T-test comparing differences in means for Positive events between Americans and Asians

|                 | t     | df  | Mean Difference | Sig. |
|-----------------|-------|-----|-----------------|------|
| Positive events | -2.59 | 112 | -2.51           | 0.01 |
| Negative events | 2.46  | 112 | 2.08            | 0.02 |

Table 18

ANOVA comparing differences in means for Positive events for 3 countries

|         | SS      | df  | MS     | F    | Sig. |
|---------|---------|-----|--------|------|------|
| Between | 203.84  | 2   | 101.92 | 4.00 | 0.02 |
| Within  | 2830.77 | 111 | 25.50  |      |      |
| Total   | 3034.61 | 113 |        |      |      |

Table 19

ANOVA comparing differences in means for Negative events for 3 countries

|         | SS      | df  | MS    | F    | Sig. |
|---------|---------|-----|-------|------|------|
| Between | 129.12  | 2   | 64.56 | 3.31 | 0.04 |
| Within  | 2167.87 | 111 | 19.53 |      |      |
| Total   | 2296.99 | 113 |       |      |      |

Table 20

Correlations between Internalization scores and Symptoms

|                 | Somatic<br>Symptoms               | Anxiety<br>Symptoms              | Depressive<br>Symptoms            |
|-----------------|-----------------------------------|----------------------------------|-----------------------------------|
| Internalization | r = -0.31<br>p = 0.001<br>n = 114 | r = -0.17<br>p = 0.08<br>n = 114 | r = -0.24<br>p = 0.011<br>n = 114 |