Abstract

An Investigation into Differential Experiences of Symptoms to Stress between the Asian and General Student Population at one Australian University

The development and validation of a new measure, the Social Strategies for Unwinding Scale (SSUS) employed for mediating stress is described. The results of a Maximum Likelihood Analysis determined that this scale contained four factors labelled: Sport, Social past-times, General past-times, and Lonely past-times. Earlier work, reported that Asian students in Hong Kong, when under stress, present with mainly somatic symptoms to stress. This was measured on the Chinese version of the Stress Symptoms Checklist (SSC). It was expected that from a sample of 295 students, 161 female and 134 male, that, the Asian students would report more physical symptoms to stress, than other students. It was also expected that social strategies would mediate stress. It was found that (1) the students in this sample do not unduly suffer stress. (2) physical and psychological symptoms were reported equally. (3) the SSUS, although it requires further development, represented a fair measure of social strategies. (4) the SSC was not a good measure of stress in this sample. It was also found that the lack of stress associated with this sample was a function of social integration and environmental factors.

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Stress and its concomitant symptoms and causes have been the subject of research for many years. For instance, the measurement of coping responses and their effects, in relation to stress was studied by (Weiss, 1968). The burden that stress places on society has it's genesis with such issues as workplace stress for high school and university teachers (Abel & Sewell, 2001; Blix, Cruise, Mitchell, & Blix, 1994), academic stress for university students (Abouserie, 1994; Akgun & Ciarrochi, 2003; Huan, Yeo, Ang, & Chong, 2006), job relocation needs (Anderson & Stark, 1988), specific occupations such as farming (Walker & Walker, 1988), members of the police force (Richmond, Wodak, Kehoe, & Heather, 1998) and fear of using computers (Bloom, 1985), among many others. The research into stress has been as diverse as the apparent sources and causes of the condition and places a huge financial burden on society not least of which relates directly to the overall cost of mental health funding (Australian Bureau of Statistics, 1997). It is reported by the Australian Bureau of Statistics that psychological conditions related to stress are highest in single men and women and people that have been separated or divorced. Correlated issues are lack of job training, job design and negative employer attitudes (Australian Bureau of Statistics, 1997; Keltner & Leung, 1995a).

Symptoms of stress

People who suffer from stress are likely to experience fear, helplessness or horror in its acute form and may feel numb or detached (American Psychiatric Association, 2000; Mental Health Foundation of Australia, 2008). They may experience a tendency to loose perspective, feel restless, anxious or depressed (Cheng & Hamid, 1996). Alternatively, or in conjunction with these symptoms, they may experience somatic symptoms such as a sore throat, dizziness, blurred vision or sweaty palms or feet (Cheng & Hamid). It has been

shown that academic stress is a predictor of suicide and is correlated with anxiety and depression (Ang & Huan, 2006).

According to the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) (American Psychiatric Association, 2000), Anxious people are apprehensive for more days than they are not apprehensive. This apprehension affects their every day performance at work or school and it makes them irritable, restless, fatigued and tense. This is supported by the American Psychological Association (2008) and the Mental Health Foundation of Australia (2008). These symptoms are frequently accompanied by a loss of sleep either through restlessness once they have fallen asleep or, through having difficulty initially falling asleep. Symptoms also may vary or depend on ethnic background (American Psychiatric Association, 2000; Ang & Huan, 2006; Leung, 2002; Makano, 1991).

According to the (American Psychiatric Association, 2000) Depressed people may have a loss of interest or pleasure. In addition they may loose or gain weight without dieting and they may suffer insomnia or hypersomnia nearly every day (Prendergast, 2006). They may have no energy, feel worthless or guilty. Also they may not be able to concentrate. They may feel agitated or really slowed down or have recurrent thoughts of death, committing suicide or have a specific plan to commit suicide (Prendergast).

Physiological responses to stress

It has been shown that many systems may be involved in the stress response (Schlebusch, 2004). These include the noradrenergic and endogenous opiate systems, the hypothalamic-pituitary-adrenal axis and physical disorders (Schlebusch). Studies by (Sarid, Anson, Yaari, & Margalith, 2003) on salivary antibodies in relation to immune responses to stress support the assertion that physical disorders may be implicated in stress. It has been shown that during periods of increased stress, such as examination periods, university

students have increased serum antibodies to herpes simplex virus (HSV), human cytomegalovirus (HCMV) and Epstein-Barr virus (EBV). These have been interpreted as responses associated with latent viruses (Sarid et al.). This study supports the hypothesis by (Sarid et al.) that stress may produce specific measurable changes in the immune system whereby, latent EBV and HCMV responses are reactivated. A sense of coherence (SOC) and coping style did not appear to be associated with elevated EBV or HCMV levels due to stress. It is suggested that immune responses to stress appear to indicate a systemic rather than a local immunological response (Sarid, Anson, Yaari, & Margalith, 2004). They also found that HCMV salivary antibodies are more sensitive to coping styles than EBV salivary antibodies (Sarid et al.).Their results further support findings that physical symptoms to stress may present in many bodily systems (Nakano, 1991).

Further research into the relationship between the immune system and symptoms of stress was conducted by Ellard (2005) and his associates. They found that stressed individuals had significantly depressed natural killer (NK) cells (number of cells and cytotoxic activity) (Ellard, Barlow, & Mian). They report that this depression of NK cells was heightened during examination time. They further report that polymorphonuclear neurophils (PMN), components of the non-specific immune system, comprise 60% - 70% of the leukocyte population. And these PMN are modulated even during short term stress, leading to conditions associated with upper respiratory infections (Ellard et al.).

Stress moderators

According to Gray-Toft and Anderson (1981) stress may be defined as an internal cue in the physical, social, or psychological environment that threatens the homeostasis of an individual. A number of moderating variables between potentially stressful events, and the products of those events if not attended to, have been suggested. These have included avoidance or emotionally focused interventions (Mitchell, Cronkite, & Moos, 1983;

Nakano, 1991). Where the Mitchell and associates' sample were mainly Caucasian, Nakano (1991) reported that these forms of intervention also moderate stress in Japanese students.

High levels of self esteem also, have been shown to moderate student stress and the lack of positive self esteem, and has been shown to correlate with depression (Barnett & Fanshaw, 1997). What is referred to as vulnerable self esteem predisposition is argued from dichotomous positions. On the one hand it is seen as a stable trait and on the other, a dormant state that may be triggered by life events (Roberts & Monroe, 1992). Barnett & Fanshaw's (1997) study, however, focussed on a sample that consisted of only 10% Asians. It may not therefore, conclusively be stated that the stress Asian students' experience may be moderated by self esteem. Also, as these students classed themselves as Asian American, it is possible that the adoption of American culture has modified their outlook, such that their level of self esteem has also been altered by the adopted culture. Personality traits such as extroversion have been implicated as moderators to stress (Roberts & Monroe) and these relationships have been shown to generalise to Asian populations with relationships of r = 0 .72 and r = 0 .76 being reported for students and adults respectively (Cheng & Hamid, 1996).

Another moderator to stress is level of optimism. Vivien Huan and her associates in their discussion over dispositional optimism argue that even in the face of adversity, individuals may succeed in fulfilling desired goals (Huan et al., 2006). The opposite is true however when the disposition is one of pessimism. It is shown by Leung (2002) that achievement under these conditions has a negative effect.

It has been reported by Rayle, Arrendondo, and Kurpius (2005) that there is a high positive correlation between the academic achievement of parents, and the grade point average (GPA) of their children. A relationship is also reported between high school GPA and educational self efficacy (Rayle et al.). However, self efficacy is negatively correlated with stress (Rayle et al.), therefore it may be seen that individuals who score high on self

efficacy would likely score low on stress. The researchers sampled groups from a range of ethnic backgrounds. The Asian group however, were considered too small and were therefore deleted from the study. Further study is therefore required to establish whether a relationship does occur between scores of self efficacy and stress within Asian populations.

Bradford & Lydden (1993) when discussing attachment of children to caregivers, state that coping mechanisms develop from early interactions. They state that insecure attachment to adults results in distress that is mediated by a tendency to employ ineffective problem focussed coping strategies. In addition they suggest that good preventive copers arrange their lives so that negative events are kept to a minimum. This allows one to make benign interpretations of life demands, when possible, that mitigate stressful reactions (Bradford & Lydden).

A study was conducted on the positive effects of specific positive events (Murrell, Norris, & Chipley, 1992). It was found that structural measures of support such as size or strength of social networks has direct effects on symptoms of stress, suffered by older people but does not serve the function of coping with the undesirable. Functional measures were found to be more relevant as buffers to the effects of stressors. Murrell and his associates found that functional measures, such as the perception of adequacy of available social support appeared to provide enduring and direct positive effects but was not influenced by events or an influence on events such as pressure over examinations (Murrell et al.). It was also shown that structural measures had opposite effects whereby, they had an influence on structure and were influenced by that structure. Structural measures did not however have enduring direct positive effects. From the results of this study, Murrell et al, concluded that functional systems are needed to maintain positive affect over time and that social integration also contributes to the gaining of psychological benefit.

Since suicide risk is associated with depression (American Psychiatric Association, 2000), a correlate of stress, negative correlates of suicide were investigated. It was found

that extraversion, mentioned by (Eysenck & Eysenck, 2006) and also discussed by (Cattell, Cattell, & Cattell, 2000; Costa & McCrae, 1992; Russell & Karol, 1994), may be useful as a screening tool for suicidal ideation. It has also been found to be an indicator of resilience following trauma (Friborg, Barlaug, Martinussen, Rosenvinge, & Hjemdal, 2005).

In response to the forgoing research, it was decided that the present study should include measures that addressed issues such as differentials of symptoms experienced by married people compared to other cohorts (Australian Bureau of Statistics, 1997; Keltner & Leung, 1995b) and whether stress appears to be moderated more by self esteem (Barnett & Fanshaw, 1997), personality (Roberts & Monroe, 1992), optimism (Huan et al., 2006), self efficacy (Rayle et al., 2005), or social networks (Murrell et al., 1992) in the population of interest.

Differentials in the presentation of stress symptoms

Presentation of stress symptoms are known to focus on psychological, somatic or a combination of symptoms (Cheng & Hamid, 1996). Nakano (1991) reported that Japanese people presented with physical symptoms more often when they tried to moderate their stress though avoidance or emotionally focused interventions. He found that problem focused interventions contributed to positive out-comes. It was shown that active behavioural coping strategies were predictive of negative depressive symptoms. Although he felt that avoidance and emotionally focused interventions are indicative of Japanese culture, specifically the culture of university aged females, Nakano found that there was no difference between the outcomes of observed subjects and those in the general American population. In other words, Japanese and American students may present with physical symptoms and/or psychological symptoms when under stress. This outcome is surprising in light of earlier studies in Asian populations. Cheung (1985) for instance presents compelling data to show that Chinese people living in Hong Kong, when suffering stress,

present with predominantly physical symptoms. Further research is required therefore, to investigate the relationship between culture and stress symptoms.

Misra, McKean et al. (2000) when studying stress symptoms suffered by Caucasians, in America also found that their sample reported both physical and psychological symptoms. The subjects reported body aches, crying, and abuse of self and others (Misra et al.). In a later study, (Misra & Castillo, 2004), found that students suffered both physical and psychological symptoms when the stressors were either negative or exceptional. They also found that distress was high when students did not perform as well as they had expected on examinations. This was put down to lack of traditional social support while students were studying overseas (Misra & Castillo).

One area of student stress that is recognised, more that others, as a high influence is that of medicine (Niemi & Vainiomaki, 1999). In 1999, a study was conducted in Finland to evaluate coping and achievement strategies of student doctors (Niemi & Vainiomaki). As expected, the subjective reports of these students reflected a high degree of stress. Symptoms in this case were largely psychological. They experienced emotional detachment, depression and other forms of psychological distress. It is reported that they became cynical and that their views of the future were unrealistic (Niemi & Vainiomaki). The above reports, collectively suggest that cultural background may be implicated in whether a sufferer of stress presents with psychological or physical symptoms.

The needs of students

Within the higher educational sector, seven key issues of influence on academic achievement have been suggested by (Michie, Glachan, & Bray, 2001). These are: age, gender, past educational experiences, motivation, global self esteem, academic self concept and academic stress. These are affected by: home sickness, new relationships, and developing skills in finance, (e.g., student loans). Michie et al., found that a high correlation

existed between each of the above conflicts and academic stress. They also found that if a student is an adult (re-entry), then a history of punitive teaching methods while at school equated to low self concept at university (Michie et al.). Additionally, peer evaluation is also an element of self concept. When peer evaluations were negative, continuity existed between study habits at high school and university.

Life events such as regular participation in sports, theatre or other recreational activities are recognised moderating variables associated with psychological health and positive self esteem (Barnett & Fanshaw, 1997). It may be argued that the converse is also true. Leung (2002), reports that East Asian students do not see the playing of sports or generally having fun as important. These same students report high levels of stress in their lives (Leung, 2002).

Hilsman and Garber (1995) reported on a test of the Cognitive Diathesis-Stress Model of Depression in children. According to this model, individuals who have a positive cognitive outlook on life are less likely to suffer depression due to stressful life events. Using a 15 point adjective checklist appropriate for fifth and sixth grade students, these researchers found that negative cognitions alone were able to produce a negative affect and depressive symptoms. It has also been shown that this may generalize to adolescents (Banez & Compas, 1990).

Finally, Brown and Lee (2005) reported on what they term “stigma consciousness”. Negative evaluations by self or others within minority groups, may play a part in reducing the self-esteem of a person from that group. The Brown & Lee study utilized a sample of 128 students consisting of: 58 whites (21 male and 37 female), 30 Asians (13 male and 17 female), 17 blacks (9 male and 8 female) and 23 Hispanics (9 male and 14 female). When tested using the Stigma Consciousness Questionnaire (SCQ), they found that black and Hispanic student scores correlated negatively with their GPA scores ($r = -0.30$ and $r = -0.24$) respectively. However they also found that Asian students SCQ scores correlated

more positively with GPA scores than white students (r = 0.19 and r = 0.05) respectively (Brown & Lee, 2005). On this basis it may be argued that Asian students are also conscious of the stigma associated with being different, though theirs may be a stigma for higher intelligence. This indicates that Asian students may suffer lower self-esteem in comparison to non-Asians, when not achieving expected university grades.

One concern relevant to students from Asian backgrounds is the propensity for them to ignore or disclaim symptoms of stress as being associated with stress (Carr, Koyama, & Thiagarajan, 2003). It is suggested that a cultural enigma exists over exhibition of stress symptoms. That exhibition of symptoms are a cause of shame or embarrassment (Carr et al., ; Cheng & Hamid, 1996) and the person experiencing symptoms, according to the social norm, needs to "save face", rather than show such symptoms (Carr et al.). In this way it may be argued that self esteem may play a role in the outworking of stress suffered by East Asian students (Crocker & Luhtanen).

Among the usual identifiers of self esteem such as feelings of being loved or being attractive, and being good in school, may also be fundamental to some individual's level of self esteem (Crocker & Luhtanen). Where some individuals spend time grooming, visits to the beauty parlour, exercising and dancing, others may find their self worth in studying (Crocker & Luhtanen). It may therefore be supposed that students from East Asia who spend great amounts of time studying, do so for reasons of self worth. It then follows that these students stress levels are driven by the need for self esteem, rather than high academic achievement per se (Barnett & Fanshaw, 1997; Crocker & Luhtanen). The combination of low self esteem, exacerbated by the stress that is produced by this condition, may then lead to lower levels of academic achievement, thus completing the cycle.

Although this argument may pertain to university students, the literature shows that high achievement is not restricted only to this cohort. Other researchers report high achievers from East Asian and South-east Asian countries at high school level in grade six

and seven (Dandy & Nettelbeck, 2002). Dandy & Nettelbeck tested 160 school children in these grades. Their sample consisted of, Chinese, Vietnamese and Anglo-Celtic backgrounds. It was shown that children from east and south-eastern Asian countries achieved significantly higher on teacher ratings than the Anglo-Celtic group, regardless of socio-economic status (Dandy & Nettelbeck). It was also shown that this result was not due to higher intellect (Dandy & Nettelbeck) therefore, a higher level of study participation appears to have been indicated in this cohort.

The social cost of stress

Although optimism may be used as a buffer for life stressors (Baldwin, Chambliss, & Towler, 2003),inevitably, stress will take its toll in most people's lives. Some occupations elicit stress from "burnout". Teachers and to a greater degree, female teachers are prone to burnout (Blix et al., 1994). Other health problems may be exacerbated through stress, such as increased smoking and alcohol abuse (Blix et al.). Co-worker support may not necessarily mediate stress (Davis-Sacks, Jayaratne, & Chess, 1985) though the fit of a person to a job may be beneficial. The job fit is the match between the motivational style of the person and the type of rewards that the job offers (Blix et al.). Where the job fit is not good, there is less job satisfaction and therefore more stress (Blix et al.). As well as health deficits due to stress, it is recognized that job outcomes also suffer due to reduced problem solving abilities (Eremsoy, Celimli, & Gencoz, 2005).

According to Cognitive-Motivational Theory, stressful events elicit three levels of response (Pury, 2002). These are: (1) very minor stimuli which are generally ignored by the individual. (2) Mild to moderate threats which may cause people to exhibit greater attentional biases and (3) high levels of threat resulting in lower engagement in current goals (Pury). These researchers found support for the hypothesis that information processing biases represent underlying predispositions to adverse responses to stress.

Since the present study is designed to address issues related to the stress suffered by students, it is necessary to discuss the ways in which the above three levels of response contribute and how these levels impact on the student. It was mentioned earlier that East-Asian students, who may be deemed non-traditional (Zajacova, Lynch, & Espenshade, 2005) have been severely under-studied. (Zajacova et al.) concluded, that academic self-efficacy is a greater predictor of GPA than perceived stress in non-traditional students but that stress has a negative influence on GPA. They highlighted the suggestion that students drop out of study due to inability to handle stress, lack of commitment and mismatch between their expectations and college reality (Zhang & RiCharde, 1998) and that drop-out rates persist as a problem in undergraduate students (Lloyd, Tienda, & Zajacova, 2001; Matheny et al., 2002). Such was found to be the case in Hong Kong where it was reported 35% of nursing students abandoned their training in 1992 (Keltner & Leung, 1995b). In this report it was shown that trainee nurses experienced typical responses to stress (Rice, 1987) such as digestive tract disorders, asthma, palpitations, rashes and physical exhaustion due to stress. The method of training was deemed to be the cause of that stress (Keltner & Leung). Other students have been found to avoid emotional relationships (Frydenberg & Lewis, 2004), and tend to blame themselves (Frydenberg & Lewis, 1993) and become depressed (Frydenberg & Lewis), take drugs (Matheny et al., 2002) or engage in expressive coping mechanisms such as acting out emotions or suppressing their expression (Renner, Laux, Schutz, & Tedeschi, 2004).

The present study

The present study aims to investigate levels of stress as they apply to students of Asian cultural background at Bond University. Specifically, to ascertain whether Asian students present symptoms of stress, somatically, psychologically or both somatically and psychologically. The hypothesis is that university students suffering from stress, who are

from an Asian cultural background, are more likely to present with significantly more somatic symptoms than psychological symptoms, than students from other cultural backgrounds studying at the same university.

Reporting on the Third International Mathematics and Science Study (TIMSS), (Leung, 2002) stated that students from four East Asian countries; Hong Kong, Japan, Korea and Singapore, are arguably the highest achievers in the world, when measured on mathematical ability. It is reported that they all see mathematics as very important and necessary however, with the exception of Singapore, no students from the Asian community enjoyed mathematics (Leung). These researchers state that there is no correlation between the country participating in the study, and enjoyment of the subject. Class sizes are not a variable in success as classes in all four countries are particularly large (Leung). The students in this study did not think that they worked harder than students from other countries (Leung). It was reported that Asian students feel under great pressure to succeed and many attend private cram schools after day school and at week-ends (Huan et al., 2006). Many feel that they have a natural ability in maths, however, their teachers put students achievement down to hard work (Leung, 2002). This suggestion supports the evidence of (Dandy & Nettelbeck, 2002). It would appear that co-variants to stress, may be pressure from parents, teachers and themselves (Huan et al.) and, lack or avoidance of healthier pursuits such as exercise (Leung). One issue that may impinge on post graduate students is the rejection of their under-graduate qualifications, by registering authorities (Hirschman, 1996), leading to additional stress (Abouguendia & Noels, 2001). Another is the teaching methodology employed by lecturers that may not allow for the different learning strategies of Asian students (Barrington, 2004).

It is seen that confidence in the ability to communicate in a second language has a positive effect on student stress levels (Clement, Noels, & Deneault, 2001), as does the sense or feeling of belonging (Gardner, 2005), which in turn is dependent on the relative

importance of the group to which belonging is desired (Clement et al., 2001; Damji, Clement, & Noels, 1996). Integration into desired groups is recognized as a facilitator of psychological health and stress, a function of discrimination (Clement et al.). Conflictive identity is seen to gain resolution through the integration process (Berry & Annis, 1974; Damji et al., 1996) but when resolution does not occur, the result is often loneliness and isolation (Gardner). Conflictive identity occurs when a minority group, such as Asian students in a western environment, grapple between their native culture and that of the culture in which they reside (Damji et al., 1996).

The present study also aims to measure levels of social strategies implemented by students during off-study periods, as a means to lowering stress. It is also hypothesized, therefore, that stress will be moderated significantly through social activity, and that this will be seen to a greater degree when students come from an Asian cultural background, compared to other cultural backgrounds.

Demographics

The demographics associated with student numbers in Australia have been continuously changing over the last two decades. According to an Australian government report, 374,600 students from overseas were studying in Australia during 2005 (Australian Bureau of Statistics, 2007). Table 1 provides the total number of educational students for the years 1985 and 2005. It shows a dramatic increase of overseas students, particularly East Asian, over that period. This increase highlights the need to address issues of stress, as they relate to the Asian student population. It has been shown that people from various cultures present differently in relation to stress. It is also known that Asian students present somatically in their home countries (Cheung, 1985) but may present similarly to Caucasians, when living in the west (Ang & Huan, 2006; Leung, 2002; Nakano, 1991). Past studies were carried out in America. Therefore it is important to know whether these students present stress

symptoms similarly or differentially, when living away from home, in the Australian environment.

Although there is plenty of evidence relating to stress in the general population, from overseas researchers, a dearth of evidence has been presented regarding Asian students, specifically Asian students in Australia. One Australian study did find that psychosomatic symptoms are associated with depression in high school students generally (Herman & Lester, 1994) though no differentiation was recorded regarding cultures.

Table 1. Overseas visitor arrivals to Australia, for education purposes, major countries of residence and proportion female

	1985(a)		2005(a)	
	Arrivals reported in thousands	Proportion female	Arrivals	Proportion female
Selected countries of residence		%	'000	%
China (excludes SAR)	0.4	24.9	63.6	52.9
Hong Kong (SAR of China)	1.5	41.7	22.5	49.8
India	0.3	13.7	16.7	20.3
Indonesia	1.7	36.4	18.6	48.7
Japan	1	64.5	25.6	65.6
Korea (Republic of South)	0.2	26.5	29.9	52.2
Malaysia	7.7	45.5	24.2	52.1
New Zealand	2.2	47.5	11.3	46.4
Singapore	1.3	42.3	20	52.9
Thailand	0.7	41.8	15.5	55.4
United States of America	2.2	58.5	29.1	60.2
Total(b)	**29.9**	**41.8**	**374.6**	**50.9**

Herman and Lester (1994) wanted to know whether students with psychosomatic symptoms were more or less depressed than depressed individuals who did not present with psychosomatic symptoms. They found 16 symptoms that were significantly associated with stress. These included constipation, hyperventilation, nausea-vomiting, migraine headaches, aching neck and shoulder muscles, heart palpitations and tension headaches (Herman & Lester). They also found that symptoms presented were a good indicator of depression and suicidal ideation. Although their research studied high school students, symptoms are known to generalize to older populations (Makano, 1991). It is notable in this study that Asian students were not identified. This study, of a sample that does not include Asian students, establishes a precedent for research into stress, where somatic symptoms only were recorded.

Method

A study was conducted using self-report questionnaires. The cover sheet introduced the researchers and supervisor. It also explained the voluntary nature of the research and the rights of the participant to withdraw from the research at any time. The cover sheet gave an assurance of confidentiality and anonymity and, explained in simple terms, the use of the data. The security and subsequent disposal of the data was explained. Finally, contact details were given that included telephone numbers and email addresses of the Principal Investigator, and, telephone numbers of counselling services that are available.

Participants

G-Power (Erdfelder, Faul, & Buchner, 1996), a statistical package designed for assessing sample size was used to compute an *a priori* sample size. An effect size of ή = 0.05 and power = 0.95, was computed. The suggested sample size developed from this computation was N = 212. This was based on the intended use of a multivariate analysis of variance (MANOVA) for statistical analysis of the data. However, since a factor analysis

was planned for a new instrument, the Social Strategies for Unwinding Scale (SSUS) (Jones, 2006), a larger sample was required. According to (Pett, Lackey, & Sullivan, 2003) a sample of n = 200 offers only a fair result possibility whereas when n = 300 it may be said to be good (Pett, Lackey, & Sullivan.).

The sample was taken from Bond University in Queensland Australia. Based on availability, the questionnaire was administered to a final sample of 295 students. A breakdown of the study shows that subjects consisted of 161 (54.6%) female and 134 (45.4%) male. Any students who reported being under the age of legal consent (18 years) were excluded from the study as were, those who did not understand basic-English or refused to give informed consent. Of this sample, 123 (41.7%) were Australian students and 172 (58.3%) were from other countries. 261 (88.5%) reported being single, 30 (10.2% reported being married or living in a de-facto relationship and 4 (1.4%) reported being widowed or divorced.

When questioned about their educational level, it was found that eight students (2.7%) were new to university and were studying prerequisite units, prior to commencing their degrees, 214 (72.5%) were engaged in under-graduate studies, and 73 (24.7%) were studying at post graduate level (either Post Graduate Diploma, Honours, Masters or PhD). It was shown that 91 (30.8%) students had a grade point average (GPA) of Pass, that 95 (32.2%) received credits, 83 (28.1%) received distinctions and 26 (8.8%) averaged a high distinction. Bond university is recognised for it’s diverse multicultural student base. It was found that 118 (40%) of the sample were Australian, 2 (0.7%) were from New Zealand, 30 (10.2%) were from the USA, 8 (2.7%) were from Canada, 71 (24.1%) were from East Asian countries, 2 (0.7%) from other Asian countries, and 64 (21.7%) were from other countries in Europe. When questioned on how the students paid for their tuition and living costs, 195 (66.1%) said that they were supported by their families. The Australian government were reported to be supporters of 32 (10.8%) of the students, 14 (4.7%) had

received a scholarship, 53 (18%) were self sufficient and 1 (0.3%) received support from other means. The age given by this sample had a mean of: *M* = 22.98, and a standard deviation of *SD* = 5.33.

Measures

The Chinese Stress Symptom Checklist (Cheng & Hamid, 1996).

The Chinese version of the Stress Symptom Checklist (SSC) is a measure of the frequency of physical and psychological symptoms associated with stress in Chinese people living in Hong Kong (Cheng & Hamid, 1996). During scale development the SSC was administered to 450 university students with a mean age of 21.2 years and a standard deviation of 1.86. Of these students, 39.4% were male and 60.6% female.

Following a factor analysis, a list of items pertaining to physical symptoms (21) and psychological symptoms (28) were reduced to 20 items in each category. Item stems on this instrument contain self-reports on such areas as changes in breathing rate, chest pain, dry mouth, frequency of urination, back pains, sore throats etc (physical symptoms). On the psychological symptom list, stems are constructed around: concentration, tendency to make mistakes, performance, irritability, anxiety and restlessness etc.

The scale is designed on a Likert style format. Items are rated on a scale of frequency from 1 to 5 in the previous month where 1 is “Never” and 5 is “Frequently” (Cheng & Hamid). The final design of the scale was administered to 327 students and 328 adults from the community. The adult sample, were aged 28 to 50 years. Due to missing data sample sizes were reduced to 314 students aged M = 20.7, SD = 1.89. Of these 38.9% were male and 61.1% were female. Adults (306) were aged M = 36.0, SD = 7.0. These consisted of 40.8% males and 59.2% female (Cheng & Hamid, 1996).

It is reported that none of the adult sample had received a college education and 22.2% had only primary or no education (Cheng & Hamid, 1996). The authors report Chronbach

alpha (internal consistency) levels of α equal to 0 .88, 0 .92 and 0 .94 for the physical subscale, psychological subscale and overall scale respectively. Corresponding alpha scores for the adult sample were 0.87, 0.92 and 0.94. The Chinese Affect Scale, shortened versions of the neuroticism and extraversion subscales of the Chinese version of the Eysenck Personality Inventory, and a Chinese version of the Life Orientation Test, were used to test for convergent and divergent validity. Analytical results showed discriminant validity ranging from r = - 0.08 to - 0.29 and convergent validity from r = 0.20 to 0.63. The authors report that the two subscales were highly correlated (r = 0.71, $p < 0.01$) in both samples and that Principal Component analysis revealed two statistically and conceptually distinct factors that were strongly correlated (r = 0.53 for students and r = 0.59 for adults). These results may not be relied upon, however, since Principal Components analyses have been shown to artificially inflate factor loadings due to common factor variance (Comrey & Lee, 1992).

Depression Anxiety Stress Scales (DASS 21)(S. Lovibond & Lovibond, 2002)

The DASS 21 is a short-form of the Depression, Anxiety and Stress Scales (DASS) (S. Lovibond & Lovibond, 2002). It consists of three self report scales that were "designed to measure the negative emotional states of depression, anxiety and stress (S. Lovibond & Lovibond, 2002, p. 1). It discriminates patients with myocardial infarction. On the depression and anxiety scales it also discriminates insomniacs. The authors report the DASS 21 has a moderate correlation with the Negative Outcome Questionnaire (NOQ) r = 0.71 (P. Lovibond & Rapee, 1993). Normative data is based on 1044 males and 1870 females, aged between 17 and 69 years. Cronbach alpha coefficients ranged from 0.84 to 0.91. Correlations reported with Beck Depression Inventory (BDI) (Beck, Steer, & Brown, 1996) and Beck Anxiety Inventory (BAI) (Beck, Epstein, Brown, & Steer, 1988) are r = 0.54 - 0.81. Since negative emotions, correlate negatively with extraversion e.g.

apprehension r = -0.39 and tension r = -0.53 (Cattell et al., 2000), the DASS 21 will be used as a test for divergent validity of the SSUS.

Eysenck Personality Scales (extraversion scale) (Eysenck & Eysenck, 2006)

The Eysenck Personality Scales (EPS Adult) comprise the Eysenck Personality Questionnaire Revised (EPQ-R), the EPQ-R short scale and the Impulsiveness (IVE) Questionnaire. These scales were designed to measure the major dimensions of personality that have emerged through self ratings, observational studies, experimental investigations, psychophysiological experiments and biochemical analyses (Eysenck & Eysenck, 2006).

The sample used to develop this instrument consisted of 408 males and 494 females aged M = 38.44, SD = 17.67 and F = 31.80, SD = 15.84 respectively. Each of the scales were designed with dichotomous responses of yes/no. The adult EPQ-R contains 106 item stems with questions such as “would being in debt bother you?”, “would you call yourself happy-go-lucky?” and “do you lock up your house carefully at night?” The EPQ-R short form contains items from the original but has been reduced to 48 item stems.

The Impulsiveness questionnaire contains 63 item stems including items such as “would you enjoy waterskiing?”, “do you like diving off the high board?” and “would you like to learn to fly an aeroplane?” Sub-scales of the EPS-R were designed to measure dimensions of introversion/extroversion, Neuroticism and psychoticism.

A fourth measure is the Lie Scale. Eysenck & Eysenck (2006) reported the following internal consistency (Alpha) scores from their study. (E), 0.88 (N) and 0.82(L), and Females: 0.76, 0.85, 0.85 and 0.79 respectively. With one month between testing, Test – retest reliabilities are reported as 0.77, 0.83, 0.76 and 0.76 (males) and, 0.81, 0.89, 0.81 and 0.80 respectively. In the present study the extraversion scale only is used. This includes item stems such as “are you rather lively?”, “do you like mixing with people?” and “can you get a party going?” This sub-scale has been reported to have item homogeneity of α =

0.85 (Francis, Lewis, & Ziebertz, 2006). Mean scores derived from the normative data for Extraversion were *M* = 7.60, *SD* = 3.27. It is expected that extraversion will correlate highly with the SSUS, therefore this sub-scale should provide evidence of convergent validity for the SSUS.

Social Strategies for Unwinding Scale (SSUS)(Jones, 2006)

The SSUS was designed by the author to answer a need in the psychometric literature. Initially, members of the general public in Brisbane were approached to ascertain popular ways in which people seek to alleviate or prevent symptoms of stress in their lives. From this narrative questioning, a short scale comprising 12 item stems was derived. Item stems were derived from a random allocation table and placed in random order.

The scale is of a Likert type with five response categories. Respondents were asked to report to each item stem, how many times per month they participate in activities such as watching sport, going to the movies, playing sport or going to the pub or tavern etc. The five response categories are: “not at all”, equal to or less than 7”, “between 8 and 14”, “between 15 and 21” or “equal to or more than 22”.

Test sampling was conducted in the library of the Queensland university of Technology (QUT) after gaining approval from the university. This was a convenience (non-probability) sample. The scale was administered to 30 university students. They were aged between 18 and 52 years, *M* = 24.36, *SD* = 8.68.and consisted of eight males (26.7%) and 22 females (73.3%). Of these students, 1 (3.3%) was of Asian culture, the other 29 (96.7%) were Caucasian. Scores on the SSUS were *M* = 1.09, *SD* = .569. Item homogeneity for the SSUS was found to be $\alpha = 0.80$. For the DASS21 and the EPS Cronbach alpha levels were 0.89 and 0.78 respectively, indicating that items in all three scales reliably measured the constructs of those scales. Correlations between the DASS21 and the SSUS were r = 0.002,

and between the EPS and the SSUS r = 0.49 Providing excellent discriminant and convergent validity.

Due to the excellent properties of the SSUS and the validity relating to the DASS21 and the EPS extroversion scale, it was decided that the SSUS be used in relation to the second hypothesis of the current study.

Procedure

A cross-sectional survey was conducted at Bond University. Data was collected from students in the university library and around the grounds of the university campus generally during the later half of the spring semester 2007. This was a convenience (non-probability) sample. Prospective participants were addressed individually. Researchers introduced themselves as post graduate students conducting research into student stress. Students were asked to participate by completion of a survey. An incentive (chocolate bar) was offered for participating.

There are four independent variables associated with this project: (1) Level of stress, this is a continuous variable. (2) Ethnicity, which has two levels East Asian and "other" ethnic groups. (3) Level of extroversion which is a continuous variable and (4) level of social strategies used to alleviate stress, also a continuous variable. There are four dependent variables. These are operationalised by scores derived on each of the scales.

Results

An un-rotated Maximum Likelihood analysis was conducted on the item correlations for all 295 participants on the SSUS, looking for Eigenvalues that exceeded 1.00 (Pett, Lackey, & Sullivan, 2003). It was found upon visual inspection of the scree plot (see Figure 1) that four factors existed.

The utility of the scree plot has been demonstrated empirically (Boyle, Stankov, & Cattell, 1995; Pett, Lackey, & Sullivan, 2003), and since the number of variables in the

SSUS is less than 20, the resulting plot may be said to be accurate (Child, 1990). A Kaiser-Meyer-Olkin (KMO) statistic revealed that a very high ratio of the squared correlation between variables to the squared correlation between variables existed (0.88).

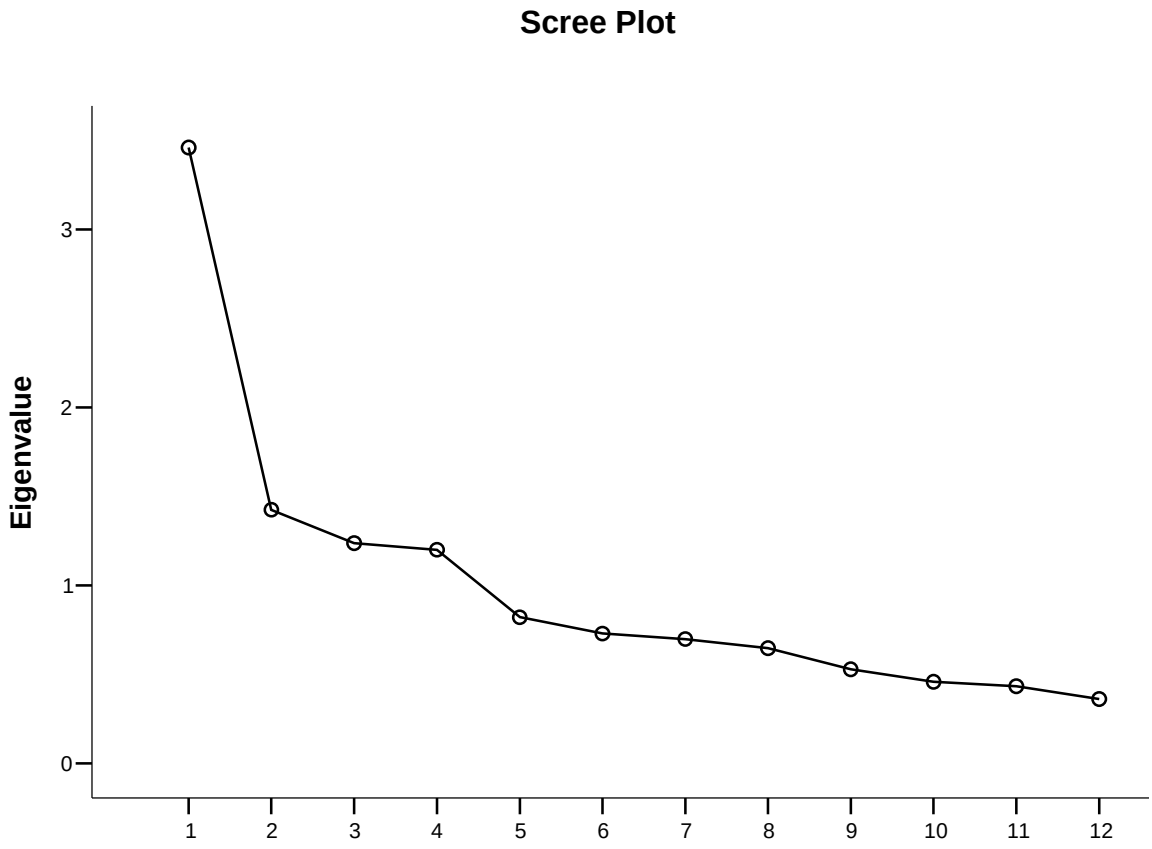

Figure 1: Scree plot displaying the eigenvalues for each of the 12 items in the SSUS using Maximum Likelihood procedure

This "meritorious" score (Pett, Lackey, & Sullivan, 2003, p. 78) indicating that a factor analysis should yield distinct and reliable factors. Field (2006) questions the practical utility of Bartlett's test of sphericity. He claims to have never seen a variance-covariance matrix that was not significant. In this instance, the test was significant (.000) and therefore a factor analysis was appropriate. Un-rotated factors are hard to interpret, therefore, rotation was utilised to improve interpretation and the scientific utility of the solution (Tabachnick & Fidell, 2007). It has been found that oblique rotation is more desirable (Boyle et al., 1995), therefore, this methodology was used within the Maximum Likelihood procedure.

From Table 2 it may be seen that items 3, 1, 6 and 11 loaded strongly onto Factor one. It was shown that only two items loaded onto Factor two, items 2 and 5. Items 12, 7 and 4 loaded onto Factor three. Items 9, 10 and 8 loaded onto Factor four. Where items loaded onto more than one factor, the higher loading was counted for that factor.

Factor names were taken as representative of the items from which they were taken. Factor one was named "sport" and consisted of items:

1. Watching sports (at the sports ground)
3. Playing a sport
6. Watching sport on TV
11. Going for a swim or surfing

Table 2: Factor structure for the SSUS

Pattern Matrix[a]

	Factor			
	1	2	3	4
SSUS3	.698	-.108		-.273
SSUS1	.658	.247		
SSUS6	.605			
SSUS11	.346		.302	-.141
SSUS2	.166	.820		
SSUS5	.194	.278	.230	
SSUS12			.719	
SSUS7	-.102	.290	.452	-.195
SSUS4	.260		.437	.169
SSUS9	.232	-.131	.143	-.636
SSUS10	.384	-.208	.146	-.479
SSUS8				-.305

Extraction Method: Maximum Likelihood.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 21 iterations.

Factor two which was named "Social past-times" consisted of items:

2. Going to the movies
5. Going to another recreation e.g. bowling

Factor three which was named "General past-times" consisted of items:

12. Any other activity that includes leaving your home or being with someone else
7. Going out to dinner with a friend or spouse
4. Going to a pub/tavern

Factor four which was named “Lonely pastimes” consisted of:

9. Going out purely for exercise (running or jogging)
10. Going to the gym
8. Going out to dinner alone

The average score for students on the SSUS was found to be 1.18 *SD* = .569. This score is a little higher than the reported scores on the pilot study (1.09) and the variability is identical.

Item homogeneity

Item homogeneity of the derived factors was assessed using Cronbach’s Alpha. From this approach Factor one (Sport), showed an alpha level of α = 0.70. Table 3 provides the correlations between each of the items for Factor one.

Table 3: Inter-item correlation matrix for Factor 1

Inter-Item Correlation Matrix

	SSUS3	SSUS1	SSUS6	SSUS11
SSUS3	1.000	.41	.44	.40
SSUS1	.41	1.00	.44	.32
SSUS6	.44	.44	1.000	.23
SSUS11	.40	.32	.23	1.000

The covariance matrix is calculated and used in the analysis.

On Factor 2 (Social past-times) α = 0.475. It may be seen from Table 4 that correlations between these items are similar to those of Factor 1. Factor 3, (General past-times) derived an alpha level of α = 0.54. Correlations for that matrix may be found in Table 5.

Table 4: Inter-item correlation matrix for Factor 2

Inter-Item Correlation Matrix

	SSUS2	SSUS5
SSUS2	1.000	.31
SSUS5	.31	1.000

The covariance matrix is calculated and used in the analysis.

Table 5: Inter-item correlation matrix for Factor 3

Inter-Item Correlation Matrix

	SSUS4	SSUS7	SSUS12
SSUS4	1.000	.20	.31
SSUS7	.20	1.000	.33
SSUS12	.31	.33	1.000

The covariance matrix is calculated and used in the analysis.

Factor 4 (Lonely past-times) had an alpha score of $\alpha = 0.57$. Correlations for the items in factor four may be found in Table 6. It may be seen from Table 6 that a poor relationship exists between exercise and going out to dinner alone. Conceptually, this is to be expected.

Table 6: Inter-item correlation matrix for Factor 4

Inter-Item Correlation Matrix

	SSUS8	SSUS9	SSUS10
SSUS8	1.000	.19	.08
SSUS9	.19	1.000	.55
SSUS10	.08	.55	1.000

The covariance matrix is calculated and used in the analysis.

It was shown by the correlation between factors that students who leave their home to go out with friends, to go out to dinner or to a pub or tavern, may predictably also enjoy going to the movies or other recreational past-times such as bowling (0.40). It is less likely that they will enjoy sport such as, watching sport on TV, at the ports ground, playing sport or going for a swim or surfing (0.06). If they pursue lone social activities such as going out to dinner alone, going to the gym or running/jogging alone they are less likely to follow any

of the other pursuits (-.22). The Cronbach Alpha coefficient for the whole scale was α = 0.77. This was slightly lower than the alpha score derived from the pilot study, which was α = 0.80, and was seen as closer to the optimal level of 0.70, suggested by Boyle (1991).

Conceptually, it is appropriate to think in terms that define a more reliable scale, as one with more items. After all, if more items ask for responses on a similar dimension, the likelihood is that the scale will be measuring that dimension from several different perspectives. This is the theory upon which is built the Spearman-Brown Prophecy formula and was first reported over seven decades ago, e.g. (Denney & Remmers, 1940; Remmers & Adkins, 1942; Remmers & Ewart, 1941; Remmers & House, 1941; Remmers, Karslake, & Gage, 1940; Remmers & Sageser, 1941). Although the concept of longer scales, having greater reliability is one that is adhered to in the literature, there are detractors who would argue that longer scales are not always the way to go. Boyle et al. (1995) for instance suggest that homogeneity of items should not be maximised. In this, they support the notion of Cattell (1978) who stated that low to moderate item homogeneity is preferable. The argument given by (Boyle et al.) is that an excessively high level of item homogeneity may reflect item redundancy. It is in this vane that it is suggested that the moderate correlations within each of the above sub-scales and, the Cronbach's alpha associated with the SSUS as a whole represents good item homogeneity.

In order that reliability of the SSUS be tested, a sub-sample of N = 30 was drawn on the basis of every eighth participant. These were approached after a one month delay in order to administer the SSUS a second time (test-retest reliability) (Gregory, 2004). It was found that the two administrations of the test, correlated significantly (r = 0.97). The scores on the two administrations were M = 1.26, SD = 0.60 and M = 1.00, SD = 0.40 respectively. This indicates that the second administration of this test may be predicted with 97% probability from the first administration of the test.

Validity

Pearson's product-moment correlations were calculated between mean scores on the SSUS and the DASS21 as well as the EPS and the SSUS and the EPS and the DASS21. The relationship between the SSUS and the DASS21 was shown to be, as expected, negatively correlated (r = -.09) indicating strong discriminatory power. The relationship between the SSUS and the EPS was r = 0.24 indicating convergent validity. The EPS and the DASS21 were negatively correlated r = -0.20 which was also expected. Each of the above tests were significant at the 0.01 level (2-tailed).

Correlations were conducted between each of the sub-scales of the SSUS. Strong correlations were found between scores on social past-time and sport (r = 0.31), general past-times and sport (r = 0.35), and lonely past-times and sport (r = 0.51). It was also found that a strong correlation existed between general past-times and social past-times (r = 0.30), however, general past-times and lonely past-times correlated weakly, (r = 0.15). The last correlation was expected. These correlations were significant at the 0.05 level (2-tailed).

Correlations were conducted between the physical scores and psychological scores of the SSC and the EPS, DASS21 and the SSUS (see Table 7). It was found that the psychological scores correlated negatively with the SSUS and the EPS but positively with the DASS21. This was expected since extraversion and social support systems are known to correlate negatively with stress, and, the DASS21 and the SSC were expected to be measuring similar symptoms. It was also found that the physical scores correlated positively with the SSUS, though negatively with the EPS. This was un-expected for similar reasons. It was found that the physical and psychological scores of the SSC, correlate significantly with the DASS21 (r = 0.55 and r = 0.58 respectively). Correlations between the SSC and EPS were approximately the same as those found by (Cheng & Hamid, 1996).

Table 7: Pearson's product-moment correlations between the SSUS, EPS, DASS21 and the physical and psychological sub-scales of the Chinese version of the SSC.

		SSUS	Chin Physical	Chin Phych	Eysenck	Dass21
SSUS	Pearson correlation	1				
	Sig. (2-tailed)					
	N	293				
ChinPhysical	Pearson correlation	0.02	1			
	Sig. (2-tailed)	0.75				
	N	293	295			
ChinPsych	Pearson correlation	-0.04	0.86*	1		
	Sig. (2-tailed)	0.45	.000			
	N	293	295	295		
Eysenck	Pearson correlation	0.24	-0.06	-0.11*	1	
	Sig. (2-tailed)	.000	0.30	0.05		
	N	293	295	295	295	
Dass21	Pearson correlation	-0.09	0.55*	0.58*	-0.20*	1
	Sig. (2-tailed)	0.12	.000	.000	.001	
	N	290	292	292	292	292

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

In light of the above results, further correlations were conducted between the two sub-scales of the SSC and each of the sub-scales of the SSUS, see Table 8. It was found that a very strong relationship occurred between the two sub-scales of the SSC. It was also shown that very low relationships occurred between each of the sub-scales of the SSC and the sub-scales of the SSUS. This would indicate that social activity has little or no relationship with stress.

Table 8: Pearson correlations between the SSUS, EPS, DASS21 and the physical and psychological sub-scales of the Chinese version of the SSC.

		Sport	SocialPtime	GenPtime	LonelyPtime	ChinPhysical	ChinPsych
Sport	Pearson correlation	1					
	Sig. (2-tailed)						
	N	290					
SocialPtime	Pearson correlation	0.31*	1				
	Sig. (2-tailed)	.000					
	N	290	290				
GenPtime	Pearson correlation	0.35*	0.30*	1			
	Sig. (2-tailed)	.000	.000				
	N	290	290	290			
LonelyPtime	Pearson correlation	0.51*	0.15*	0.27*	1		
	Sig. (2-tailed)	.000	0.01	.000			
	N	290	290	290	290		
ChinPhysical	Pearson correlation	0.003	0.10	0.02	0.03	1	
	Sig. (2-tailed)	0.96	0.08	0.68	0.64		
	N	290	290	290	290	292	
ChinPsych	Pearson correlation	-0.07	0.08	-0.06	-0.001	0.86*	1
	Sig. (2-tailed)	0.25	0.19	0.29	0.99	.000	
	N	290	290	290	290	292	292

Factor analysis – all scales

The above results appeared contrary to what was expected, therefore, it was decided to factor analyze, all scales used in this study. A Maximum Likelihood procedure using an oblique rotation and Kaiser normalisation was used. A scree plot using this methodology clearly resulted in a six-factor pattern, see Figure 2. All items from the Chinese version of the Stress Symptoms Checklist loaded highly onto Factor 1. Loadings ranged from 0.41 (ch3) referring to chest pain, to 0.65 (ch36) referring to judgmental attitude. All items from the DASS21 loaded onto Factor 2. These loadings ranged from -0.270 to -0.77. It was found that item 12 of the SSUS, also loaded onto Factor 2 (0.27). This item refers to “any other activity that includes leaving your home or being with someone else”.

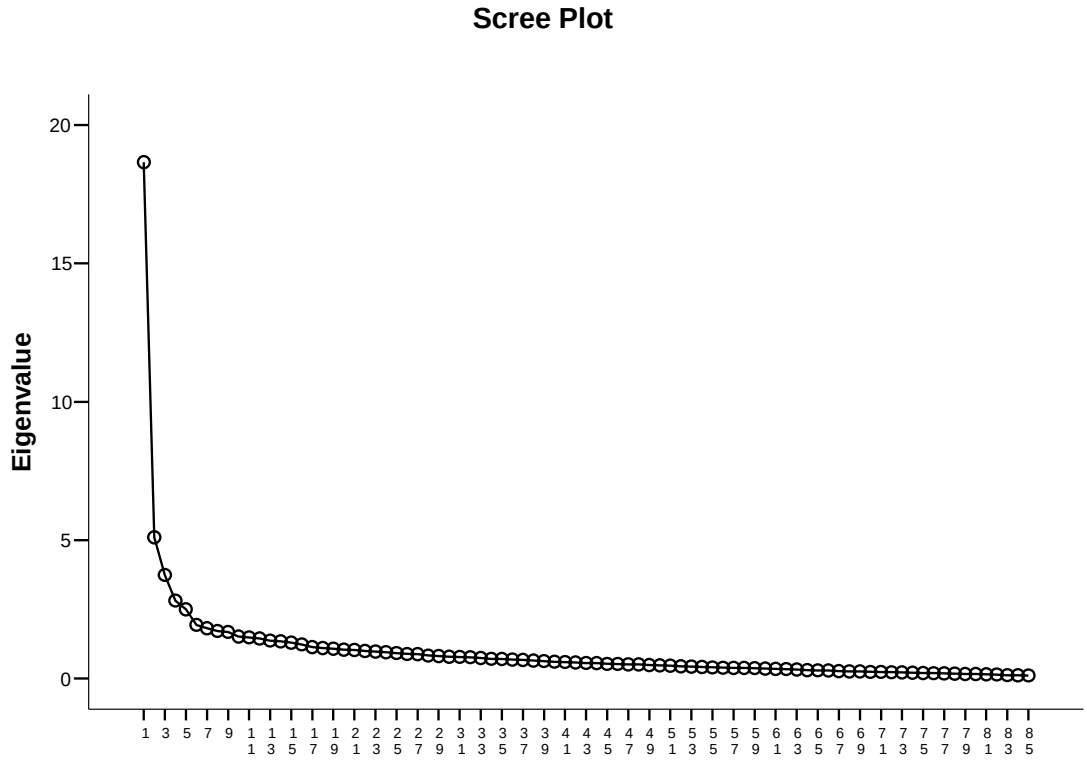

Figure 2: Scree plot displaying the eigenvalues for all items on all measures using Maximum Likelihood procedure, oblique rotation and Kaiser normalisation.

All items from the SSUS, including item 12, loaded onto Factor 3. These loadings ranged from 0.16 (SSUS8) referring to going out to dinner alone, to 0.75 (SSUS3) referring to playing a sport. Factor 5 received loadings from all items on the EPS, except items 7 and 10. These refer to keeping in the background on social occasions and, being quiet in the presence of other people. Item 7 did not load onto any factors, Item 10 loaded onto Factor 1, (-0.11). The other item loadings on Factor 5 ranged from 0.40 to 0.60. Of interest to this Factor, was the loading (0.30) of item 4 from the SSUS. This indicates that students from this sample who frequently go to a pub or tavern have tendencies to be extravert. Factors 4 and 6 consisted of low to moderate loadings (0.10 to 0.40) from each of the scales. The majority of these loadings were low and associated with all four instruments.

It is interesting that no apparent difference occurred between the loadings from either of the sub-scales of the SSC. Indicating that in this population, these two scales did not

discriminate. That is to say, the SSC was reported as a single scale rather than a stress scale for physical symptoms and one for psychological symptoms. Also of interest is the loading of SSUS12 onto the DASS21 scale. 0.27 is seen as a moderate loading. As such, item 12 of the SSUS was clearly not a measure of unwinding strategies but, more likely a measure of stress, depression or anxiety. Also of interest are the loadings associated with Factors 4 and 6. These Factors upon closer scrutiny showed that the moderate loadings which included the SSUS12, were associated with the DASS21 and the SSC.

It was shown that a high level of depression, anxiety and stress as measured by the DASS21is likely to predict a lower level of stress as measured by the Chinese version of the Stress Symptom Checklist. It was also shown that those students who engage in social activities have a 20% greater likelihood of being extravert, than other students, and a 22% greater likelihood of being depressed, anxious or stressed.

Factor analysis – SSC

To confirm the above assumption regarding the SSC, a factor analysis was conducted to confirm the number of factors present. Initially a scree plot (see Figure 3) identifying Factors with eigenvalues ≥ 1.0, using a non-rotated, Maximum Likelihood procedure identified 9 Factors. With very few exceptions, Factors 1 and 2 comprised loadings in excess of 0.30 to a maximum of 0.999 on item 19. Item 19 relates to levels of fatigue. The other 7 Factors identified comprised loadings that were extremely low to low (0.01 to 0.15), with the exception of item 20 on Factor 3. This loading was approximately the same as the loadings on Factors 1 and 2 for this item. Also items 2, 4, 6 and 10 on Factor 4 loaded equally well on Factors 1 and 2. Items 1, 15, 23 and 24 of Factor 5 loaded equally well on Factors 1 and 2. Only item 17 of Factor 6 loaded well on Factors 1 and 2. None of the other Factors had loadings that suggested distinct constructs, from Factors 1 and 2.

Using a Maximum Likelihood extraction and oblique rotation with Kaiser normalization, an analysis was conducted, looking for 2 Factors. It was found that all items

of the Chinese version of the SSC loaded heavily onto Factor 1 (0.43 to 0.72). All items on Factor 2 except items 6 and 25 loaded less than 0.30. Items 6 and 25 loaded approximately equally well on both Factors. This confirms the above assumption that, as it applies to this sample, the SSC represents a single Factor instrument.

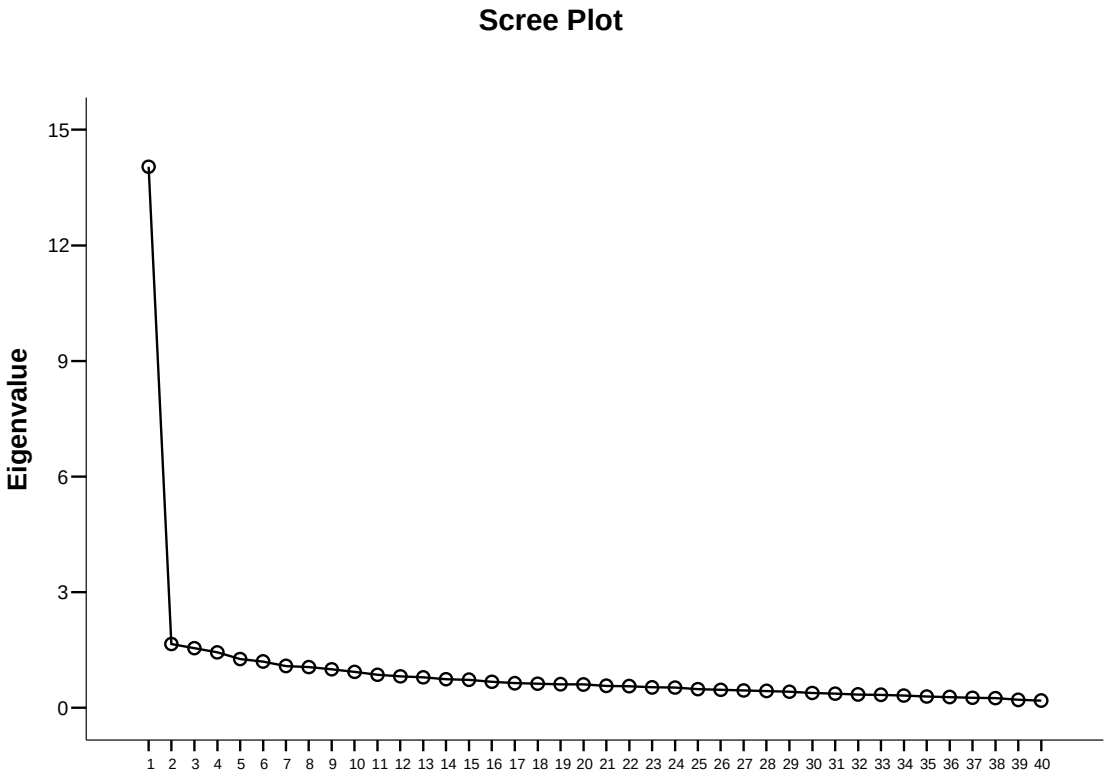

Figure 3: Scree plot displaying the eigenvalues for all items on the SSC using Maximum Likelihood procedure, oblique rotation and Kaiser normalisation.

Correlations with co-variants

Further analyses showed significant but small correlations between the DASS21 and GPA (r = -0.17, *p* = 0.003), SSUS and marital status (r = -0.17, *p* = 0.003), SSUS and area of study (r = -0.12, *p* = 0.05), SSUS and if English was the student's second language (r = -0.12, *p* = 0.034), EPS and gender (r = -0.18, *p* = 0.003), EPS and marital status (r = -0.14, *p* = 0.015). These results indicate that high levels of stress, anxiety or depression result in slightly lower grades at this university. Being married suggests a lower student response to take part in social activity to a small degree. It is shown that the academic area in which a

student studied could also affect whether they were sociable, as could possible language difficulties associated with English being a second language. In addition, to a small degree, it is shown that being female reduces a student's chance of being an extrovert, divorced or widowed.

Multiple regression

A multiple regression analysis was conducted on the overall SSUS. Initially all demographic data was included in the analysis. It was found that only age and gender had a significant influence on the scores of the SSUS. The other demographic data was therefore not included in further analysis. A test for outliers (Mahalanobis distance) revealed that a number of outliers existed. According to (Field, 2006), distance scores should not exceed 11.00. It was found that, outlier scores ranged from 16 to 35. A further test for outliers was conducted that did not include age as an independent variable. It was found that three participants, 99, 152 and 223, aged 18, 18, and 19 respectively, had Mahalanobis distance scores of 17, 19 and 18 respectively. As suggested by (Field), these participants were not included in further analysis.

When age and gender were chosen as predictors for scores on the SSUS, it was found that 2.9% ($R^2 = 0.03$) of the variability of scores was due to age and 5.2% ($R^2 = 0.05$) of the variability was due to a combination of age and gender. A Durbin-Watson statistic of 2.10 indicates that the assumption of independent errors has been met (Field, 2006). An analysis of variance of this variable indicates that this scale has the capacity to predict levels of social strategies for unwinding $F(1,288) = 8.509$, $p = .004$ (age), $F(1,288) = 7.898$, $p < .001$ (age and gender). Other predictors could not significantly be relied upon in this regard.

Multivariate statistical effect

Following deletion of data associated with non-normality, the between subjects factors comprised 72 Asians (25%) and 215 other nationalities (75%). The differences in sample

sizes, was not expected to contribute negatively to the analyses since multivariate analysis of variance (MANOVA) is said to be robust to the effects of heterogeneity of variance. According to Tabachnick and Fidell (2007), in small samples, it is important that sub-samples are of approximately equal size. In larger samples, however, the conditions that apply to multivariate normality may be met (Tabachnick & Fidell). This assertion is supported by (Seo, Kanda, & Fujikoshi, 1995). A MANOVA was therefore conducted. The multivariate effect on scores between Asian and other students, as expected, proved to be significant (F [9,275] = 55.535, $p < 0.05$, $\eta^2 = .65$, indicating that culture, gender and to a much lesser degree, age, when combined, impacted on the various measures.

It was shown that just less than 24% of the effect was due to culture F [9,275] = 9.450, $p < 0.05$, $\eta^2 = .236$. Age had a small though significant effect, F [9,275] = 2.943, $p < 0.05$, $\eta^2 = .0.09$, and gender was also influential F [9,275] = 6.121, $p < 0.05$, $\eta^2 = .17$.

Univariate effects

The analysis revealed that Asian students are significantly more stressed, anxious and depressed than other students in the present sample, returning: $M = 1.94$ $SD = 0.54$, $M = 1.83$ $SD = 0.555$, $M = 1.74$ $SD = 0.60$ and, $M = 1.74$ $SD = 0.58$, $M = 1.43$ $SD = 0.47$, $M = 1.42$ $SD = 0.44$ respectively when measured on the DASS21. The overall DASS21 score confirmed this $M = 1.79$ $SD = 0.53$ and $M = 1.48$ $SD = 0.43$, see Figure 4. These results however need to be taken in context with the normative data collected by S. Lovibond and Lovibond (2002). These authors reported that the mean scores, based on summation of the scale were 11.19 $SD = 8.25$, for this cohort. When scale scores are averaged, as these results were, this equates to $M = 1.74$, a difference in mean of only 0.20 for Asian students and no difference for others. This suggests that this sample of students, overall are no more stressed, anxious or depressed, than the population of Australia in general.

According to scores on the EPS, it was shown that Asian students are significantly less outgoing than other students: $M = 7.39$ $SD = 2.74$, $M = 8.25$ $SD = 2.50$. It was shown that

culture, age and gender had a significant effect on whether students suffered from stress, anxiety or depression, but not on whether they engaged in social strategies that may help moderate stress, Asian students scored $M = 1.11$ $SD = 0.51$ while others scored $M = 1.19$ $SD = 0.55$, indicating that, Asian students engage in social strategies almost as much as the others in the test group.

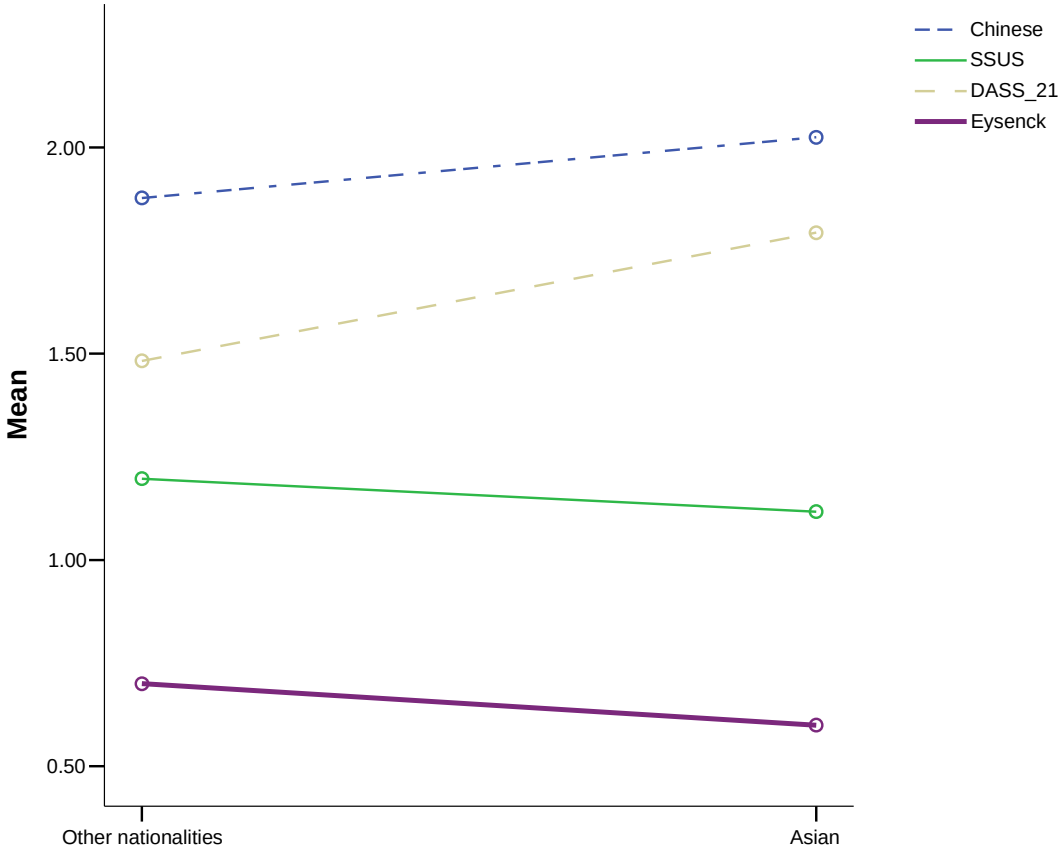

Figure 4: Mean scores for SSC, SSUS, DASS21 and EPS

An analysis of variance between the Asian and non-Asian groups confirmed that the differences on scores between these groups, discussed above, was significant for levels of extraversion: F [1,283] = 10.130, $p = 0.002$, $\eta^2 = 0.04$, overall stress: F [1,283] = 3.772, $p = 0.05$, $\eta^2 = 0.013$, anxiety: F [1.285] = 38.425, $p < 0.001$, $\eta^2 = 0.12$, and depression: F [1.285] = 23.266, $p < 0.001$, $\eta^2 = 0.08$, and physical symptoms of stress:

F [1.285] = 5.133, p = 0.024, η^2 = 0.02. Differences between the groups on psychological symptoms associated with stress and social strategies for minimising the effects of stress were not significant.

To address the second hypothesis, a correlation was inspected between scores on the DASS21, the SSUS and the EPS. Table 7 on page 28 shows that although a negative correlation exists between the DASS21 and the SSUS, it is small and is not significant, but, the relationship between the SSUS and the EPS is significant and accounts for 24% of the variability in scores. Figure 4 shows the relative mean scores for each of the measures used. To address the un-expected relationship between item 12 of the SSUS and the SSC, a between groups analysis was conducted on English as a second language. It was found on this item that students whose second language is English scored significantly lower than other students M = 2.88, SD = 1.11, compared to M = 3.31, SD = 1.27, F (1,291) = 8.92 p < 0.003. A further analysis showed that a significant difference of scores occurred between groups of nationalities on this item F (4,287) = 8.026 < 0.000. See Table 9 for Mean and Standard Deviation Scores.

Table 9: Mean and Standard Deviation scores for item 12 of the SSUS, according to nationality

	N	*Mean*	*SD*
Australia	*115*	*3.23*	*1.28*
New Zealand	*3*	*2.33*	*0.58*
USA	*30*	*4.07*	*0.98*
Canada	*8*	*3.50*	*1.60*
East Asia	*74*	*2.57*	*1.07*
Other - European	*63*	*3.21*	*1.06*

It was found on examination of a Tukey post-hoc test that American students scored significantly lower than Australian students on item 12 of the SSUS, Mean Difference = - 0.84 $p < .006$, Standard Error = 0.24. It was found that East Asian students scored significantly higher than Australian students, Mean Difference = 0.66, Standard Error = 0.17 $p < 0.002$. It was also shown that compared to American students, Asian students scored significantly higher, Mean Difference = 1.50, Standard Error = 0.25 $p < 0.000$.

Discussion

It may be seen from the data that item homogeneity of the Social Strategies for Unwinding Scale, (Jones, 2006), was shown to be high and that the convergent validity was much lower than expected, given the results from the pilot study (Jones). Since the sample for the pilot study for the SSUS consisted of only 30 participants including one Asian; and the present sample consisted of 25% (73) Asian students, it may be assumed that the lower correlation was a result of scores from Asian participants. This is in light of the results that showed the level of introversion of Asians. The SSUS did however discriminate depression, anxiety and stress. The results from the factor analysis indicated four factors, Sport, Social past-times and General past-times and Lonely past-times. This was not anticipated. During development of the scale (Jones), expected a single scale and on that basis, restricted the number of items to twelve. The derived sub-scales therefore were unusually short. Factor 1 proved to have high item homogeneity. The other three sub-scales had modest item homogeneity. It was considered that this level of item homogeneity across the scale represented a good breadth of measurement of the construct, therefore, it was decided to treat the SSUS as a single scale. The disappointment with the SSUS in relation to its' lower convergent validity score, reduces the scale's utility in its' present form and may only be used confidently, with non-Asian and non-American subjects.

The greatest difficulty of utility of the SSUS appears to be item 12. Because of it's high correlation with the SSC and, the difference scores as they relate to East Asian and

American students. A further problem was shown between students, when English was their second language. It is, therefore, suggested that this item be deleted from further use of this scale, due to it's inability to discriminate culturally.

The first hypothesis, that university students from an Asian Cultural background suffering from stress, are significantly more likely to present with somatic symptoms rather than psychological symptoms, than students from the general university population; the hypothesis is not supported. From the results, as applied to the normative data (S. Lovibond & Lovibond, 2002), it may be stated that this sample of students were not suffering stress, to any significant degree. The relationships between depression, anxiety and stress as measured by the DASS21 and the two sub-scales of the Chinese version of the SSC were surprisingly low. The DASS21/SSC (whole scale) accounted for less than 60% of the variability. This may have been affected by the very low power (.490) associated with the Anxiety scale of the DASS21. It would appear from the analysis that, given the high reliability and validity of the DASS21, in the Australian university environment; the low correlation between the two, may lie in a problem with the SSC. It may be suggested that although the SSC was shown to have excellent psychometric properties when applied to the Asian population in Hong Kong, that Asians in other countries may differ, in their presentation to stress. It is also more likely, given the discussion above, that scores on the SSC were masked by the lack of stress suffered by subjects. Given the results from the Maximum-Likelihood analysis, and the squared multiple correlations associated with that analysis, it is more likely that the SSC is a poor predictor of stress in the Australian environment.

That stress will be moderated through social activity to a large degree, if the students come from an Asian cultural background, compared with other cultural backgrounds is however supported. The results show that culture plays an indirect part in the relationship between social activity and levels of stress. It is shown that although Asian students scored

slightly lower that other students on the SSUS, indicating that they had less social activity, their level of social activity had a greater effect. A further argument that requires expansion relates to item 12 of the SSUS. Since this item loaded so highly on the SSC, the question arises as to the affect this had. It may be assumed that high scores on this item were a function of cultural differences, mentioned above. It may also be argued that students who scored high on this item, did so, because they were genuinely stressed when they engaged in this form of social interaction.

Level of extraversion/introversion associated with the groups in question appears to be at odds with the normative data. Asian students, who are shown to be more introverted, in this sample scored only a little lower than the norm (7.39 / 7.60) (Eysenck & Eysenck, 2006). However, other students scored considerably more than the norm (8.25). This leads one to question the relationship between personality (extraversion) and a willingness or ability, on the part of Asian students to socialize. If the Asian students have difficulty socializing, this may well be the reason for their high scores on item 12 of the SSUS. It also raises the question as to why other students appear more extraverted than the norm.

The area of social support appears to be moderated by ethnic differences and this may provide reasons for why socializing has a greater influence on Asian students compared to non-Asians. When discussing students from Asia, living with their family in an overseas country (Lay & Gnuyen, 1998), suggested that rather than receiving support, that family conflicts arise. Additionally, intercultural conflicts may arise, pre-disposing students to increased stress (Lay & Gnuyen). This is seen as part of the acculturation process (Abouguendia & Noels, 2001). The problems that (Lay & Gnuyen) elude to are generally associated with interactions with main-stream society, racial discrimination and language barriers (Lay & Gnuyen). The Asian students in the current sample, however, do not live with their families. Rather, they live on the university campus and are part of the larger campus community.

It has been known for more than a decade that a high correlation exists between social integration and fluency/confidence in fluency of a second language when applied to minority student groups (Noels & Clement, 1996). The Inter-group Model of Second Language Acquisition (Giles & Byrne, 1982) proposes that the learning of a second language is influenced by the wider motivational goals, in the context of social identity and inter-group relations. The low, negative correlation between the SSUS and second language acquisition, within the current study, indicates that there is a high level of fluency of English as a second language within the Asian participants. This supports the premise that a 'pass' in English (Vaughan & Hogg, 2005, p. 392) will reduce situation-specific anxiety and lead to native-like mastery of the language (Giles & Byrne) and therefore facilitates the acculturation process (Berry, Trimble, & Olmedo, 1986). Another element of interest is grounded in Social Identity Theory (Reicher & Potter, 1985). This suggests that there is a change that occurs when different groups come together. It is suggested that members of a smaller group, assume the identity of the dominant group (Reicher & Potter). It is possible therefore that the Asians in the current research, assumed aspects of the western group, regarding levels of extroversion, which influenced how their social interactions moderated their stress levels. It is also possible that influences from the dominant group produced changes in the sociability of the Asians. This suggestion is consistent with (Vaughan & Hogg, 2008) who asserts that group members look to the identity consistent behaviour of dominant group members for guidance.

This discussion would not be complete without a reference to the societal challenges that draw students together and allow them to be a part of the "in-group" as suggested by (Vaughan & Hogg, 2005) at the university. As an exposé of the Gold Coast, an area of southern Queensland, in which Bond University is situated, it is interesting to note the following. At the end of each scholastic year, following graduation students from high schools across Australia, go to Surfers Paradise, a large populated center on the Gold Coast

to celebrate the end of high school studies (The State of Queensland, 2006). During this celebration period of one to two weeks, students enjoy themselves playing beach sports, going to barbeques and listening to music from live bands and disk-jockies (The State of Queensland, 2006). As one would expect, alcohol is consumed (The Hon Pyne, 2004), and used as a mediator to stress (Berkman, 1995; Cohen & Lemay, 2007), often to the extent that the use of alcohol by students is seen as an epidemic (Ninemsn, 2008). A further enticement, to the Gold Coast are the plush hotels and use of rental limousines (MyGoldCoastLimos, 2008). It is in this holiday environment that Bond university is situated. The university boasts considerable entertainment pursuits (Bond University, 2008) including a sports center that provides volleyball, swimming, cricket and tennis, among others, promoting a reversal of empowerment deficits (Blinde & Taub, 1999). Thus increasing a sense of accomplishment and self-actualization, increased motivation to setting and realizing goals, bonding and broadening social skills, and promoting social inclusiveness (Blinde & McClung, 1997) and building psychological health (Trovato, 1998). There are also on-campus restaurants and a tavern where students may dampen their responses to stress (Sher, Bartholow, Peuser, Erickson, & Wood, 2007) and thereby reduce tension (Cappell & Herman, 1972). It is suggested that the occasional libation or restaurant meal, may in this way, play a part.

It is this researcher's assertion that Asian students, once settled into student life at this university, assume a "collective self esteem", related to their new group processes (Abrams & Hogg, 1988). That in many cases, differences between groups also elevates individuals self esteem (Crocker & Luhtanen, 1990) and that students protect themselves from low self esteem and the consequences of that low self esteem (stress, anxiety and depression), by assuming the social strategies of the dominant group (Long & Spears, 1997), and reducing uncertainty in their lives (Hogg, 2000).

Although issues such as past educational experiences, global self esteem, academic self concept, home sickness and skills in finance (Michie et al., 2001) were not directly measured, the results suggest to the author that these variables, possibly have had no impact in this study, therefore further research is required to address these variables. Similarly, stigma consciousness (Brown & Lee, 2005), although apparent in minority groups, did not appear to contribute to levels of stress in this study. All students suffer similar levels of stress, according to group norms (S. Lovibond & Lovibond, 2002).

The results from this study show that non-Asian student have higher than normal levels of extraversion. It is suggested that these variables are related to the relaxed atmosphere associated with living on the Gold Coast, or yet to be identified other variables. These variables may include the atmosphere associated with drinking and eating, whereby anxiety and stress are mediated (Ford, 2006). Thus cultural integration may be cemented (Abrams & Hogg, 1990).

Further research

This research has contributed to the current understanding of stress and associated literature. However, a number of unexpected results indicate further research is necessary. Further refinement of the SSUS, must be seen as on-going. Although the SSUS may be utilized in it's current form as a single scale, there is clearly a need to build a more robust stem that includes more items.

The Chinese version of the SSC (Cheng & Hamid, 1996) which contains great utility in Hong Kong, requires refining, if it is to enjoy the same acclaim in Australia. It is expected that such refinement would create an instrument, better able to differentiate between psychological and physical symptoms and suitable for screening stress in the Chinese university student population of Australia. It is also suggested, however, that the re-alignment include items that explicitly screen for stress in the East Asian population

generally, not just Chinese. In this way extrapolation may occur to include the wider Asian population in Australia.

References

Abel, M., & Sewell, J. (2001). Stress and burnout in rural and urban secondary school teachers. *Journal of Educational Research, 92*(5), 287-293.

Abouguendia, M., & Noels, K. (2001). General and acculturation-related daily hassles and psychological adjustment in first - and second - generation South Asian immigrants to Canada. *International Journal of Psychology, 36*(3), 163-173.

Abouserie, R. (1994). Sources and levels of stress in relation to locus of control and self esteem in university students. *Educational Psychology, 14*(3).

Abrams, D., & Hogg, M. (1988). Comments on the motivational status of self esteem in social identity and intergroup discrimination. *European Journal of Social Psychology, 18(4),* 317-334

Abrams, D., & Hogg, M. (1990). Social identification, self-categorisation, and social influence. *European Review of Social Psychology, 1(1),* 195-228.

Akgun, S., & Ciarrochi, J. (2003). Learned resourcefulness moderates the relationship between academic stress and academic performance. *Educational Psychology, 23*(3), 287-294.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders text revision (DSM-IV-TR)* (4th ed.). Arlington VA: American Psychiatric Association.

American Psychological Association. (2008). Do You Know the Signs of an Anxiety Disorder?, Retrieved March 6, 2008, from http://apahelpcenter.org/articles/article.php?id=7

Anderson, C., & Stark, C. (1988). Psychosocial problems of job relocation: Preventive roles in industry. *Social Work,* 33(1), 38-41.

Ang, R., & Huan, V. (2006). Academic Expectations Stress Inventory. *Educational and Psychological Measurement development, factor analysis reliability and validity, 66*(3), 522-539.

Australian Bureau of Statistics. (1997). Mental health and wellbeing: Profile of adults, Australia. Retrieved March 6, 2008, from http://www.abs.gov.au/AUSSTATS/abs@.nsf/detailsPage/4326.01997?opendocument

Australian Bureau of Statistics. (2007). 4102.0 - Australian Social Trends, 2007. Retrieved March 6, 2008, from http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts

Baldwin, D., Chambliss, L., & Towler, K. (2003). Optimism and stress: An African-American college student perspective. *College Student Journal, 37*(2), 11.

Banez, G., & Compas, B. (1990). Children's and parents' daily stressful events and psychological symptoms. *Journal of Abnormal Child Psychology, 18*, 591-605.

Barnett, P., & Fanshaw, J. (1997). Measuring school related stressors in adolescents. *Journal of Youth and Adolescence, 26*(4), 415-428.

Barrington, E. (2004). Teaching to student diversity in higher education: how multiple intelligence theory can help. *Teaching in Higher Education, 9*(4), 421-434.

Beck, A., Epstein, N., Brown, G., & Steer, R. (1988). An inventory for measuring clinical anxiety:Psychometric properties. *Journal of Consulting and Clinical Psychology, 56(6)*, 893-897.

Beck, A., Steer, R., & Brown, G. (1996). *BDI-II Manual*. San Antonio: Harcourt Brace.

Berkman, L. (1995). The role of social relations in health promotion. *Psychosomatic Medicine, 57(3)*, 245-254.

Berry, J., & Annis, R. (1974). Acculturative stress: The role of ecology, culture and differentiation. *Journal of Cross-Cultural Psychology, 5*, 382-405.

Berry, J., Trimble, J., & Olmedo, E. (1986). Assessment of acculturation. In W. Lonner & J. Berry (Eds.), *Field methods in cross-cultural research* (pp. 290-327). Beverly Hills: Sage.

Blinde, E., & McClung, L. (1997). Enhancing the physical and social self through recreational activity: Accounts of individuals with physical disabilities. *Adapted Physical Activity Quarterly, 14(4),* 327-344.

Blinde, E., & Taub, D. (1999). Personal empowerment through sport and physical fitness activity: Perspectives from male college students with physical and sensory disabilities. *Journal of Sport Behavior, 22*(2), 181-202.

Blix, A., Cruise, R., Mitchell, B., & Blix, G. (1994). Occupational stress among university teachers. *Educational Research, 36*(2), 157-169.

Bloom, A. (1985). An anxiety management approach to computerphobia. *Training and Development*, 39(1), 90-94.

Bond University. (2008). Retrieved March 6, 2008, from http://www.bond.edu.au/sport

Boyle, G. (1991). Does item homogeneity indicate internal consistency or item redundancy in psychometric scales? *Department of Psychology, University of Queensland, St Lucia 4067,* Queensland, Australia

Boyle, G., Stankov, L., & Cattell, R. (1995). Measurement and statistical models in the study of personality and intelligence. Retrieved March 6, 2008, from http://epublications.bond.edu.au/hss_pubs/60

Bradford, E., & Lydden, W. (1993). Current parental attachment: Its relation to perceived psychological distress and relationship satisfaction in college students. *Journal of College Student Development, 34(1),* 256-260.

Brown, R., & Lee, M. (2005). Self and identity. *Psychology Press, 4(1),* 149-157.

Cappell, H., & Herman, C. (1972). Alcohol and tension reduction: A review. *Journal of Studies on Alcohol, 33(1),* 33-64.

Carr, J., Koyama, M., & Thiagarajan, M. (2003). A woman's support group for Asian international students. *Journal of American College Health, 52*(3), 131-134.

Cattell, R. (1978). *The scientific use of factor analysis in behavioral and life sciences*. New York: Plenum.

Cattell, R., Cattell, A., & Cattell, H. (2000). *16PF* (5th ed.). Champaign, IL: Pearson Assessments.

Cheng, S., & Hamid, P. (1996). A Chinese Symptom Checklist: preliminary data concerning reliability and validity. *Journal of Social Behavior and Personality, 11*(2), 241-252.

Cheung, F. (1985). An overview of psychopathology in Hong Kong with special reference to somatic presentation. In W. Tseng & D. Wu (Eds.), *Chinese culture and mental health*. Orlando, FL: Academic.

Child, D. (1990). *The essentials of factor analysis* (2nd ed.). London: Cassell.

Clement, R., Noels, K., & Deneault, B. (2001). Interethnic contact, identity, and psychological adjustment: The mediating and moderating roles of communication. *Journal of Social Issues, 57*(3), 559-577.

Cohen, S., & Lemay, E. (2007). Why would social networks be linked to affect and health practices? *Health Psychology, 26*(4), 410-417.

Comrey, A., & Lee, H. (1992). *A first course in factor analysis* (rev.2nd ed.). Hillsdale, New Jersey: Erlbaum.

Costa, P., & McCrae, R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five Factor Inventory*. Odessa: Psychological Assessment Resources.

Crocker, J., & Luhtanen, R. (1990). Collective self-esteem and ingroup bias. *Journal of Personality and Social Psychology, 58(1)*, 60-67.

Crocker, J., & Luhtanen, R. (2003). Level of self-esteem and contingencies of self-worth: Unique affects on academic, social and financial problems in college students. *Personal and Social Psychology, 29*(6), 701-712.

Damji, T., Clement, R., & Noels, K. (1996). Acculturation mode, identity variation, and psychosocial adjustment. *Journal of Social Psychology, 136*(4), 493-500.

Dandy, J., & Nettelbeck, T. (2002). The relationship between IQ, homework, aspirations and academic achievement for Chinese, Vietnamese and Anglo-Celtic Australian school children. *Educational Psychology, 22*(3), 267-275.

Davis-Sacks, M., Jayaratne, S., & Chess, W. (1985). A comparison of the effects of social support on the incidence of burnout. *National Association of Social Workers*, 240-244.

Denney, H., & Remmers, H. (1940). Reliability of multiple-choice measuring instruments as a function of the Spearmenr-Brown formula, II. *Journal of Educational Psychology, 31*(9), 699-704.

Ellard, D., Barlow, J., & Mian, R. (2005). Perceived stress, health status, and the activity of neurophils in undergraduates over one academic year. *Stress and Health, 21(4),* 245-253.

Erdfelder, E., Faul, F., & Buchner, A. (1996). GPower: A general power analysis program. *Behavior Research Methods, Instruments, & Computers, 28(1),* 1-11.

Eremsoy, C., Celimli, S., & Gencoz, T. (2005). Students under academic stress in a Turkish university: variables associated with symptoms of depression and anxiety. *Current Psychology, 24*(2), 123-133.

Eysenck, H., & Eysenck, S. (2006). *Manual of the Eysenck Personality Scales*. London: Hodder & Stoughton.

Field, A. (2006). *Discovering statistics using SPSS* (2nd ed.). London: SAGE.

Ford, J. (2006). Some implications of denominational hetrogeneity and church attendance for alcohol consumption among Hispanics. *Journal for Scientific Study of Religion, 45*(2), 253-267.

Francis, L., Lewis, A., & Ziebertz, H. (2006). The Short-form Revised Eysenck Personality Questionnaire (EPQR-S): A German edition. *Social Behavior and Personality, 34*(2), 197-204.

Friborg, O., Barlaug, D., Martinussen, M., Rosenvinge, J., & Hjemdal, O. (2005). Resilience in relation to personality and intelligence. *International Journal of Methods in Psychiatric Research, 14*(1), 29-42.

Frydenberg, E., & Lewis, A. (1993). *The Adolescent Coping Scale: Practitioners manual*. Melbourne: Australian Council for Educational Research.

Frydenberg, E., & Lewis, R. (2004). Adolescents least able to cope: how do they respond to their stresses? *British Journal of Guidance & Counselling, 32*(1), 25-37.

Gardner, J. (2005). Barriers influencing the success of racial and ethnic minority students in nursing programs. *Journal of Transcultural Nursing, 16*(2), 155-162.

Giles, H., & Byrne, J. (1982). The intergroup model of second language acquisition. *Journal of Multilingual and Multicultural Development, 3(1)*, 17-40.

Gray-Toft, P., & Anderson, J. (1981). The Nursing Stress Scale: development of an instrument. *Journal of behavioural assessment, 3*(1), 11-23.

Gregory, R. (2004). *Psychological testing: History, principles and applications* (4th ed.). Boston: Pearson Education Group Inc.

Herman, S., & Lester, D. (1994). Physical symptoms of stress, depression, and suicidal ideation in high school students. *Adolescence, 29*(115). 639-641.

Hirschman, C. (1996). Studying immigrant adaptation from the 1990 population census: from generational comparisons to the process of "becoming American". In A. Portes (Ed.), *The new second generation* (pp. 54-81). New York: Russell Sage Foundation.

Hogg, M. (2000). Subjective uncertainty reduction through self-categorisation: A motivational theory of social identity processes. *European Review of Social Psychology, 11(1),* 223-255.

Huan, V., Yeo, L., Ang, R., & Chong, W. (2006). The influence of dispositional optimism and gender on adolescents' perception of academic stress. *Adolescence, 41*(163), 533-546.

Jones, R. (2006). *Social Strategies for Unwinding Scale (SSUS) Development of a test instrument.* Unpublished manuscript.

Kaplan, R., & Saccuzzo, D. (2005). *Psychological testing: Principles, applications, and issues* (6th ed.). Belmont, CA: Thomson Wadsworth.

Keltner, A., & Leung, R. (1995a). Perceived stressors and stress responses among hospital-based nursing trainees. *International Journal of Stress Management, 2*(2), 97-111.

Keltner, A., & Leung, R. (1995b). Perceived stressors and stress responses among hospital-based nursing trainees. *International Journal of Stress Management, 2*(2), 97-111.

Lay, C., & Gnuyen, T. (1998). The role of acculturation-related and acculturation non-specific hassles: Vietnamese-Canadian students and psychological distress. *Canadian Journal of Behavioral Science, 30(3),* 172-181.

Leung, F. (2002). Behind the high achievement of East Asian students. *Educational Research and Evaluation, 8*(1), 87-108.

Lloyd, K., Tienda, M., & Zajacova, A. (2001). *Trends in educational achievement of minority students since Brown V Board of Education*. Paper presented at the Achieving high educational standards for all: conference summary.

Long, K., & Spears, R. (1997). The self-esteem hypothesis revisited: Differentiation and the disaffected. In R. Spears, P. Oakes, N. Ellemers & S. Haslam (Eds.), *The social psychology of stereotyping and group life* (pp. 296-317). Oxford, UK: Blackwell.

Lovibond, P., & Rapee, R. (1993). The representation of feared outcomes. *Behaviour Research and Therapy, 31(6),* 595-608.

Lovibond, S., & Lovibond, P. (2002). *Manual for the depression anxiety stress scales* (2nd ed.). Sydney: Psychology Foundation.

Makano, K. (1991). Coping strategies and psychological symptoms. *Journal of Clinical Psychology, 47*(3), 346-350.

Matheny, K., Curlette, W., Aysan, F., Herrington, A., Gfroerer, C., Thompson, D., et al. (2002). Coping resources, perceived stress, and life satisfaction among Turkish and American university students. *International Journal of Stress Management, 9*(2), 81-97.

Mental Health Foundation of Australia. (2008). Pfizer Australia Health Report. Retrieved March 6, 2008, from www.healthreport.com.au/reports/11.pdf

Michie, F., Glachan, M., & Bray, D. (2001). An evaluation of factors influencing the academic self-concept, self-esteem and academic stress for direct and re-entry students in higher education. *Educational Psychology, 21*(4), 455-472.

Misra, R., & Castillo, L. (2004). Academic stress among college students: comparison of American and international students. *International Journal of Stress Management, 11*(2), 132-148.

Misra, R., McKean, M., West, S., & Russo, T. (2000). Academic stress of college students: comparison of student and faculty perceptions. *College Student Journal, 34*(2).

Mitchell, R., Cronkite, R., & Moos, R. (1983). Stress, coping, and depression among married couples. *Journal of Abnormal Psychology, 92(4),* 433-448.

Murrell, S., Norris, F., & Chipley, Q. (1992). Functional versus structural social support, desireable events, and positive affect in older adults. *Psychology and Aging, 7*(4), 562-570.

MyGoldCoastLimos. (2008). Accomodation and limo rentals. Retrieved March 6, 2008, from http://www.goldcoast.mygoldcoastlimo.com/schoolies.html

Nakano, K. (1991). Coping strategies and psychological symptoms in a Japanese sample. *Journal of Clinical Psychology, 47*(3), 346-350.

Niemi, P., & Vainiomaki, P. (1999). Medical students' academic distress, coping, and achievement strategies during the pre-clinical years. *Teaching and Learning in Medicine, 11*(3), 125-134.

Ninemsn. (2008). Teenage drinking: the silent epidemic. Retrieved March 6, 2008, from http://ninemsn.com.au/sunday/cover_stories/transcript_1390.asp

Noels, K., & Clement, R. (1996). Communicating accross cultures: Social determinants and acculturative concequences. *Canadian Journal of Behavioral Science, 28*(3), 214-228.

Pett, M., Lackey, N., & Sullivan, J. (2003). *Making sense of factor analysis*. London: Sage.

Prendergast, M. (2006). What is depression. Retrieved March 6, 2008 from http://www.depressionet.com.au/what-is-depression/what-is-depression.html

Pury, C. (2002). Information-processing predictors of emotional response to stress. *Cognition and Emotion, 16*(5), 667-683.

Rayle, A., Arrendondo, P., & Robinson Kurpius, S. (2005). Educational self-efficacy of college women: implications for theory, research and practice. *Journal of Counselling and Development, 83(4)*, 361-366.

Reicher, S., & Potter, J. (1985). Psychological theory as intergroup perspective: A comparitive analysis of 'scientific' and 'lay' accounts of crowd events. *Human Relations, 38(9)*, 167-189.

Remmers, H., & Adkins, R. (1942). Reliability of myltiple-choice measuring instruments, a function of the Spearman-Brown prophecy formula, VI. *Journal of Educational Psychology, 33*(5), 385-390.

Remmers, H., & Ewart, E. (1941). Reliability of multiple-choice measuring instruments as a function of the Spearmenr-Brown formula, III. *Journal of Educational Psychology, 32*(1), 61-66.

Remmers, H., & House, J. (1941). Reliability of multiple-choice measuring instruments as a function of the Spearmenr-Brown formula, IV. *Journal of Educational Psychology, 32*(5), 372-376.

Remmers, H., Karslake, R., & Gage, N. (1940). Reliability of multiple-choice measuring instruments as a function of the Spearmenr-Brown formula, I. *Journal of Educational Psychology, 31*(8), 583-590.

Remmers, H., & Sageser, H. (1941). Reliability of multiple-choice measuring instruments as a function of the Spearmenr-Brown formula, V. *Journal of Educational Psychology, 32*(6), 445-451.

Renner, K., Laux, L., Schutz, A., & Tedeschi, J. (2004). The relationship between self-presentation styles and coping with social stress. *Anxiety Stress and Coping, 17*(1), 1-22.

Rice, P. (1987). *Stress and health: Principles and practice for coping and wellness*. San Francisco: Brooks and Cole.

Richmond, R., Wodak, A., Kehoe, L., & Heather, N. (1998). How healthy are the police? A survey of life-style factors. *Addiction, 93*(11), 1729-1737.

Roberts, J., & Monroe, S. (1992). Vulnerable self esteem and depressive symptoms: Prospective findings comparing three alternative conceptualisations. *Journal of Personality and Social Psychology, 62*(5), 804-812.

Russell, M., & Karol, D. (1994). *16PF Administrators Manual* (5th ed.). Champaign, IL: Institute for Personality and Ability Testing Inc.

Sarid, O., Anson, O., Yaari, A., & Margalith, M. (2003). Are coping resources related to humoral reaction induced by academic stress? An analysis of specific salivary

antibodies to Epstein-Barr virus and cytomegalovirus. *Psychology, Health and Medicine, 8*(1), 105-117.

Sarid, O., Anson, O., Yaari, A., & Margalith, M. (2004). Coping styles and changes in humoural reaction during academic stress. *Psychology, Health and Medicine, 9*(1), 85-98.

Schlebusch, L. (2004). The development of a stress symptom checklist. *South African Journal of Psychology, 34*(3), 327-349.

Seo, T., Kanda, T., & Fujikoshi, Y. (1995). The effects of nonnormality on tests for dimentionality in canonical correlation and MANOVA models. *Journal of Multivariate Analysis, 52(2),* 325-337.

Sher, K., Bartholow, B., Peuser, K., Erickson, D., & Wood, M. (2007). Stress-response-dampening effects of alcohol: Attention as a mediator and moderator. *Journal of Abnormal Psychology, 116*(2), 362-377.

Tabachnick, B., & Fidell, L. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Pearson.

The Hon Pyne, C., M P. (2004). Teenage drinking - parents can make a difference. Retrieved March 6, 2008, from http://www.health.gov.au/internet/ministers/publishing.nsf

The State of Queensland, D. o. C. (2006). Schoolies week. Retrieved March 6, 2008, from http://www.schooliesweek.qld.gov.au/faq/#dates

Trovato, F. (1998). The Stanley Cup of hockey and suicide in Quebec, 1951-1992. *Social Forces, 77*(1), 105-126.

Vaughan, G., & Hogg, M. (2005). *Introduction to social psychology* (4th ed.). Frenchs Forest: Pearson Education Australia.

Vaughan, G., & Hogg, M. (2008). *Introduction to social psychology* (5th ed.). Frenchs Forest: Pearson Education Australia.

Walker, J., & Walker, L. (1988). Self reported stress symptoms in farmers. *Journal of Clinical Psychology, 44*(1), 10-16.

Weiss, J. (1968). Effects of coping responses on stress. *Journal of Comparative and Physiological Psychology, 65*(2), 251-260.

Zajacova, A., Lynch, S., & Espenshade, T. (2005). Self-efficacy, stress, and academic success in college. *Research in Higher Education, 46*(6), 677-706.

Zhang, Z., & RiCharde, R. (1998). *Prediction and analysis of freshman retention*. Paper presented at the Annual Forum of the Association for Institutional Research.