

**Psychometric Properties of a Chinese Version of the 21-Item
Depression Anxiety Stress Scales (DASS21).**

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Abstract

A Chinese version of the 21-item Depression Anxiety Stress Scales (DASS21) was developed. Its psychometric properties were evaluated in an Australian immigrant sample (N=356) and compared to the data reported by Lovibond and Lovibond (1995a) using the English version of the DASS (N=720). Confirmatory factor analysis showed that the Chinese DASS21 discriminates between depression, anxiety, and stress, but the extent of differentiation between these negative emotional syndromes was less in comparison to the English DASS. Moreover, the Chinese DASS21 showed less discrimination between the three scales in an Australian Chinese-speaking sample in comparison to a normal Chinese-speaking sample in Hong Kong (N=729), as measured by a similar version of the questionnaire. In general, the factor loadings for all 21 DASS items in the Australian Chinese-speaking sample were comparable to those in both the English-speaking and the Hong Kong Chinese-speaking samples, and indicated that the items had been adequately and appropriately translated and adapted. Implications of the results for the universality of the depression, anxiety, and stress syndromes are considered.

Key words: depression, anxiety, stress, Chinese, cross-cultural

The present study aimed to develop a measure of negative emotion in Chinese, and to examine its psychometric properties. The proposed Chinese measure was developed to reflect contemporary knowledge of negative emotion and take into account cultural issues regarding the expression of symptoms.

Contemporary views on the structure of negative emotion have largely arisen from the well-documented observations that scores from various instruments designed to measure the states of depression and anxiety tend to be highly correlated (Clark & Watson, 1991), and high rates of comorbidity exist among the anxiety and mood disorders (Andrews, 1996). Clark and Watson (1991) proposed a tripartite model of anxiety and depression, which claims that both states are characterised by symptoms of elevated negative affect or general distress (e.g., distress, irritability), but that anhedonia (low levels of positive affect e.g., happiness, confidence, enthusiasm) is specific to depression, and physiological hyperarousal is unique to anxiety. Research has provided support for this view (Watson et al., 1995).

Additional support for the tripartite view comes from the convergence of several lines of research. For instance, the Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988; Beck & Steer, 1990) was specifically designed to discriminate from the Beck Depression Inventory (Beck & Steer, 1987) by using physiological autonomic symptoms that distinguish anxiety from other syndromes.

Similarly, research has indicated that the three psychometrically distinct Depression Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995b) are also consistent with this view (Lovibond, 1998). Specifically, the Depression scale appears to measure

features that are unique to depression (low positive affect), and the Anxiety scale measures features proposed to be unique to anxiety (physiological hyperarousal).

Lovibond and Lovibond (1995a) have proposed that a third syndrome, namely stress, can be distinguished from depression and anxiety and also from negative affect. The Stress scale has been shown to measure a distinct negative emotional syndrome, rather than nonspecific symptoms common to both depression and anxiety (Lovibond, 1998). Such nonspecific symptoms were excluded from the DASS during its development. Support for the existence of a third dimension comes from several studies which demonstrate that the DASS Stress scale is an independent construct related to Generalised Anxiety Disorder (GAD; American Psychiatric Association, 1994) (Brown, Barlow, & Liebowitz, 1994; Brown, Marten, & Barlow, 1995; Lovibond, 1998; Lovibond & Lovibond, 1995b; Lovibond & Rapee, 1993; Watson et al., 1995). Therefore, there is a converging view of the existence of three separate syndromes. Research also provides evidence for the convergence between the DASS Depression and Anxiety scales, and the Beck Depression and Anxiety inventories, respectively (Lovibond & Lovibond, 1995a).

Research has shown that the factor structure of the DASS is essentially the same in clinical and nonclinical samples (Antony, Bieling, Cox, Enns, & Swinson, 1998; Brown, Chorpita, Korotitsch, & Barlow, 1997). This supports the idea that clinical disorders, such as DSM-IV mood and anxiety disorders, represent an extreme or pathological manifestation of basic emotional states that are represented on a continuum, and may be discerned in nonclinical individuals.

At present, there is no single Chinese instrument available that reflects contemporary thinking on the structure of negative emotion. Chinese translations are available for a

number of instruments, including the Hospital Anxiety and Depression scale (Lam, Pan, Chan, Chan, & Munro, 1995; Leung, Ho, Kan, Hung, & Chen, 1993), the Beck Depression Inventory (Shek, 1991a; Zheng, Wei, Lianggue, Guochen, & Chenggue, 1988), the State-Trait Anxiety Inventory (Shek, 1991b, 1993), the Hamilton Depression Rating Scale (Zheng et al., 1988), and the Zung Depression Inventory (Chang, 1985; Lee et al., 1994; Leung, Lue, Lee, & Tang, 1998). Psychometric information for these scales is limited, and it is not known whether they discriminate between anxiety and depression. In addition, many of these scales have been directly translated without attention being given to cross-cultural issues.

In developing a new instrument, it is important to take into account cross-cultural issues. A longstanding debate exists regarding the degree to which negative emotions are universal or culture-specific. This has implications for test development. Those who take the position that negative emotions are universal argue that tests can be adapted for use in cultures other than the one in which they were originally developed. Numerous studies document the translation and adaptation of existing Western instruments for use in various non-Western cultures, and have shown that these measures are reliable and appear to measure similar phenomena across different population subgroups (Abdel-Khalek, 1989, 1998; El-Rufaie & Absood, 1994; Mollica, Wyshak, de Marneffe, Khuon, & Lavelle, 1987; West, 1985). On the other hand, those who argue that negative emotions are culture-specific claim that tests cannot be adapted for use in cultures other than the one in which they were developed, and that tests must therefore be developed for each culture individually. Consequently, it becomes impossible to make cross-cultural comparisons using such measures without further validation or adaptation.

Although evidence strongly suggests that phenomena such as depression and anxiety are universal, there is also some suggestion that symptoms may be expressed differently in different cultures (Cheung, 1982; Cheung, Lau, & Waldmann, 1980; Hughes, 1998; Kim, Li, & Kim, 1999; Kirmayer, Young, & Hayton, 1995; Kleinman, 1977, 1982; Manson & Kleinman, 1998; Thakker & Ward, 1998). It is therefore important to be sensitive to local cultural and linguistic issues when developing a new instrument. For instance, it is often asserted that patients from non-Western cultures ‘somatise’ their emotional distress, in contrast with patients from Western cultures (Goldberg & Bridges, 1988; Kleinman, 1982, 1987; Srinivasan, Srinivasa Murthy, & Janakiramaiah, 1986; Zhang, 1995). In addition, language may not be available to express particular emotions (Littlewood, 1990; Lutz, 1985; Mumford, 1993; Zhang, 1995). On the other hand, it has been emphasised that it is one thing to assert that non-Westerners present to doctors more often with somatic complaints than Westerners do, but it is quite another to claim that they actually experience more somatic symptoms (Mumford, 1993).

For instance, Kleinman (1982) systematically examined some of these issues and found that 87% of Chinese psychiatric patients with a clinical diagnosis of neurasthenia, a disorder that is highly prevalent in Chinese-speaking countries and has low prevalence in Western countries, met the diagnostic criteria for Major Depressive Disorder according to DSM-III criteria (American Psychiatric Association, 1980). Diagnoses of anxiety disorders were also frequent. Furthermore, Kleinman noted that these patients expressed their complaints primarily using somatic/illness idioms. Thirty percent complained entirely of somatic symptoms, and 70% of both somatic and psychological complaints but with an emphasis on the somatic complaints. None of the patients complained

entirely or even mostly of psychological symptoms. This is surprising considering that all of these patients met diagnostic criteria for Major Depressive Disorder. Thus, it appears that these individuals complained of physical symptoms that are correlates of depressed or anxious affect.

Furthermore, items of existing tests may be modified (Brislin, 1986), thus, providing a conceptually equivalent instrument. The development and use of culturally sensitive translations and interpretation of existing measurement tools represents one way of overcoming at least some of the methodological limitations mentioned above. General guidelines that are widely accepted for the successful translation of instruments in cross-cultural research include a high quality translation, blind back-translation, input from ethnic mental health professionals, and piloting of the instrument in the target population (Brislin, 1970, 1986; Westermeyer & Janca, 1997). In blind back-translation, one bilingual translates from the source to the target language, and another translates back to the source without knowledge of the original source.

Moreover, the empirical means required to resolve the issue of whether or not phenomena such as depression, anxiety, or stress are universal exist. Specifically, factor analysis of the data gathered using culturally sensitive instruments, can determine the presence of any 'universal' or 'culture-specific' aspects of syndromes. That is, if there is a universal aspect to these syndromes, it would be expected that the factor structure of the data gathered from a set of items in one language, would be similar to the factor structure of the data gathered from the same set of items in the other language.

It was therefore decided that a culturally sensitive version of an existing instrument would be developed. The instrument employed for the purposes of this study, the short

21-item version of the DASS (DASS21), was chosen for several reasons. The DASS is a self-report questionnaire that was specifically designed to distinguish between, and provide relatively pure measures of, the three related and clinically significant negative emotional states of depression, anxiety, and stress. It provides a quantitative (dimensional) measure of the severity of each syndrome. The psychometric properties of the DASS have been demonstrated to be good in numerous studies (Antony et al., 1998; Brown et al., 1997; Lovibond, 1998; Lovibond & Lovibond, 1995a). Factor analytic studies have confirmed that the DASS items can be reliably grouped into three scales, namely Depression, Anxiety, and Stress, in both nonclinical (Lovibond & Lovibond, 1995a) and clinical samples (Brown et al., 1997). The DASS, therefore, reflects contemporary thinking on the nature of negative emotion, has good psychometric properties that are well established, and provides a measure of stress as well as depression and anxiety. Moreover, the DASS is widely used both in Australia and overseas, in research studies, clinical assessment and outcome evaluation. It is therefore an instrument that would be valuable for use with client populations from non-English speaking backgrounds. The DASS21 is brief and highly suitable for the purpose of regular assessment and outcome evaluation.

The aim of the present study was therefore to develop a Chinese version of the DASS21 for the valid assessment and evaluation of the negative emotional states of depression, anxiety, and stress in the Chinese-speaking population. The study employed an immigrant sample in Australia, ensuring that the instrument would be suitable for people from a variety of Chinese-speaking countries and dialects.

Method

Subjects

Subjects of 18 years-of-age and older were recruited from community groups, via local newspapers, Church groups, and community organisations as well as English language schools ($n = 354$). Chinese-speaking clients of 18 years-of-age and older accessing services in the South Eastern Area Health Service (Sydney) were also included in the sample ($n = 2$). There were 222 females and 98 males (36 missing data for gender). The mean age was 55 years and the mean number of years of education was 12.1. The purpose of the study was explained to all potential subjects. It was made clear to all subjects that participation was completely voluntary, that they could withdraw their participation at any time without penalty or prejudice, and that all information obtained was confidential. Subjects were provided with a Chinese version of the DASS21 to complete.

Measures

The Chinese version of the DASS21 was based in the first instance on the original (English) version of the instrument (Lovibond & Lovibond, 1995b). The English DASS21 is a 21-item instrument measuring current (“over the past week”) symptoms of depression, anxiety, and stress. Each of the three scales contains seven items. Subjects are asked to use a 4-point combined severity/frequency scale to rate the extent to which they have experienced each item over the past week. The scale ranges from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). Scores for

Depression, Anxiety, and Stress are calculated by summing the scores for the relevant items and multiplying by two.

Procedure

The DASS21 was adapted and translated according to guidelines that are widely accepted for the successful translation of instruments in cross-cultural research, in order to develop a culturally sensitive instrument (Brislin, 1970, 1986; Westermeyer & Janca, 1997). A three-phase procedure was used.

Phase 1: A Chinese-speaking psychologist* had previously translated the 42-item version of the DASS into Chinese. Permission was granted to use the translation for the purposes of this study. A blind back-translation (into English) was then performed by a professional, Level 3 National Australian Authority for Translators and Interpreters (NAATI) accredited translator.

Phase 2: The 21 items corresponding to the short version of the DASS were then extracted. A group of Chinese-speaking mental health professionals compared the back-translated version with the original version for these items, and reviewed the Chinese translation in detail. Translated items that demonstrated the closest semantic equivalence were retained. Items whose concepts appeared to be readily expressible in only the English language were modified to obtain the closest semantic equivalence. In particular, attention was given to the literacy level of the instrument, in an attempt to ensure that individuals from a wide range of literacy levels would be able to comprehend and complete the questionnaire. Moreover, special care was taken to remove all idioms, making the translated instrument generalisable to all Chinese-speaking countries, as well

as all Chinese-speaking immigrant populations. Six trained Chinese-speaking mental health professionals were directly involved in this process.

Phase 3: A field trial of the first revised draft of the Chinese questionnaire was then conducted. Subjects were assisted in completing the questionnaire if they requested assistance, and in a minority of cases questionnaires were orally administered (these participants had had little formal education and could not read). During this field trial, feedback was obtained from Chinese-speaking mental health professionals and participants regarding the quality of the translation of the instrument, including its clarity, comprehensibility, and acceptability. Statistical analyses were then performed on the field trial data.

Results

Confirmatory factor analysis

The approach used to test the DASS21 factor structure was confirmatory factor analysis, as this was the analysis of choice used to test the original English DASS (Lovibond & Lovibond, 1995a). The statistical program Lisrel8.30 (Joreskog & Sorbom, 1996) was used to test the adequacy of the allocation of the 21 items to the three DASS scales using a covariance matrix (N=356). The first model tested was a single factor model, which yielded a large and significant chi-square value [$\chi^2(189) = 896.25, p < 0.05$], indicating a significant discrepancy between the model and the data. The adjusted goodness of fit index was 0.76. A two-factor model was then tested in order to examine the validity of the distinction between Depression and the other two DASS scales. This

model yielded an improved fit [$\chi^2(188) = 814.96, p < 0.05$; adjusted goodness of fit = 0.78], and differed significantly from the one-factor model [$\chi^2(1) = 81.29, p < 0.05$]. Next, three factors were defined, corresponding to the three DASS scales. This model yielded a lower chi-square value again [$\chi^2(186) = 802.95, p < 0.05$; adjusted goodness of fit = 0.78], and provided a significantly better fit than the two-factor model [$\chi^2(2) = 12.01, p < 0.05$]. The phi coefficients, which assess the strength of the links between the three factors, were: Depression-Anxiety 0.92; Anxiety-Stress 0.94; Depression-Stress 0.91. These comparisons indicate that distinguishing between depression and the other two scales yields a significant improvement in fit to the data, and that distinguishing between anxiety and stress yields a further small but significant improvement in fit. Where indicated by modification indices, items were reallocated to different scales but in no case were these better than the original allocation of items to their corresponding scale.

In order to provide a reference point to evaluate the adequacy of the distinction between the three DASS scales in the Chinese sample, the data used by Lovibond and Lovibond (1995a) derived from the English version of the DASS (N=720) were reanalysed for the 21 items with confirmatory factor analysis. Unlike the published analysis, this analysis was based on the covariance matrix, as is recommended in the Lisrel manual (Joreskog & Sorbom, 1996). The results for the one-factor [$\chi^2(189) = 1954.72, p < 0.05$; adjusted goodness of fit = 0.75], two-factor [$\chi^2(188) = 918.41, p < 0.05$; adjusted goodness of fit = 0.87], and three-factor solutions [$\chi^2(186) = 701.97, p < 0.05$; adjusted goodness of fit = 0.89], and the differences between the one-factor and two-factor solutions [$\chi^2(1) = 1036.31, p < 0.05$] and the two-factor and three-factor

solutions [$\chi^2(2) = 216.44, p < 0.05$], demonstrated a pattern similar to the Chinese results. The phi coefficients were: Depression-Anxiety 0.57; Anxiety-Stress 0.73; Depression-Stress 0.60. Thus, in both the Chinese and the English case, the three-factor solution produced a significantly better fit than the one-factor and two-factor solutions. In contrast, however, the degree of improvement in fit in the Chinese case is proportionately much less in comparison to that in the English case. This suggests that the Chinese items are not discriminating between the three factors as well as the English items are. This conclusion is also consistent with the very high phi coefficients for the Chinese sample, which are considerably higher than the phi coefficients for the English sample.

Finally, data gathered from a normal Chinese-speaking sample in Hong Kong (N=729) by Dr. Calais Chan* using the original draft of the Chinese version of the DASS were also reanalysed with permission. The psychometric properties of the DASS scales for the 21-items were evaluated using confirmatory factor analysis based on the covariance matrix for comparison purposes. The results for the one-factor [$\chi^2(189) = 1231.91, p < 0.05$; adjusted goodness of fit = 0.83], two-factor [$\chi^2(188) = 1007.19, p < 0.05$; adjusted goodness of fit = 0.86], and three-factor solutions [$\chi^2(186) = 942.34, p < 0.05$; adjusted goodness of fit = 0.86], and the differences between the one-factor and two-factor solutions [$\chi^2(1) = 224.72, p < 0.05$] and the two-factor and three-factor solutions [$\chi^2(2) = 64.85, p < 0.05$], demonstrated a pattern similar to the results of both the Australian Chinese-speaking and English samples. The phi coefficients were: Depression-Anxiety 0.81; Anxiety-Stress 0.88; Depression-Stress 0.83. Once again, the three-factor solution produced a significantly better fit than the one-factor and two-factor solutions. Overall, the degree of improvement in fit in this case is less in comparison to

that in the English case, but is more in comparison to that in the Australian-Chinese case. This suggests that the Chinese items are not discriminating between the three factors in the Australian Chinese-speaking sample as well as they are in the Hong Kong sample.

Approximately 7.3% ($n = 26$) of participants and Chinese-speaking mental health professionals involved in the field trial provided feedback about the questionnaire. Overall, feedback regarding the quality of the translation, including its clarity, comprehensibility, and acceptability was positive. The DASS items and their factor loadings from three-factor confirmatory factor analysis are listed in Table 1 for the Australian and Hong Kong Chinese-speaking, and the English samples separately. In general, the factor loadings for the Australian Chinese-speaking sample are comparable to those of the English and the Hong Kong normal samples.

Insert Table 1 about here

Descriptives

Means and standard deviations for the three DASS scales (21 items) are provided in Table 2 for the Australian-Chinese, English, and Hong Kong-Chinese samples separately. A test of the differences in means between the Australian-Chinese and English samples indicated that for the depression and stress scales, the Australian-Chinese mean was significantly lower than the English mean, whereas there was no significant difference between the two samples for the anxiety scale [Depression: $t(1074) = 4.89, p < 0.05$;

Anxiety: $t(1074) = 0.58, p > 0.05$; Stress: $t(1074) = 5.98, p < 0.05$]. A test of the differences in means between the Australian-Chinese and Hong Kong-Chinese samples indicated that for the anxiety and stress scales, the Australian-Chinese mean was significantly lower than the Hong Kong-Chinese mean, whereas there was no significant difference between the two samples for the depression scale [Depression: $t(1074) = 0.71, p > 0.05$; Anxiety: $t(1075) = 3.93, p < 0.05$; Stress: $t(1074) = 7.39, p < 0.05$]. Finally, a test of the differences in means between the English and Hong Kong-Chinese samples indicated that the English sample was significantly higher on the depression scale, was significantly lower on the anxiety scale, and that there was no significant difference in comparison to the Hong Kong-Chinese sample on the stress scale [Depression: $t(1438) = 5.52, p < 0.05$; Anxiety: $t(1439) = 4.43, p < 0.05$; Stress: $t(1438) = 1.66, p > 0.05$]. Intercorrelations between the three scales are shown in Table 3 for each sample separately. Consistent with the factor analysis, the intercorrelations were higher in the Australian-Chinese sample.

Insert Table 2 about here

Insert Table 3 about here

Discussion

At present, well-established and empirically validated instruments that reflect contemporary knowledge of the structure of negative emotion for the proper assessment and evaluation of the levels of depression, anxiety, or stress in the Chinese-speaking population are virtually nonexistent. The aim of the present study was to develop a Chinese instrument that reflects contemporary thinking about the structure of negative emotion, taking into account cross-cultural issues, and to examine its psychometric properties. This study modified and adapted a Chinese version of the DASS21 that consisted of translations of the original 21 DASS items.

The factor structure of the 21-item Chinese DASS was tested with confirmatory factor analysis, which indicated that the three scales provided a better fit to the data than either a one-factor or a two-factor solution. The results also demonstrated, however, that while the Chinese DASS21 significantly discriminates between the negative emotional syndromes of depression, anxiety, and stress, there is less differentiation between the scales in comparison to the English DASS21. This is suggested by the significant but not very large difference in chi-square between the two-factor and three-factor solutions, and by the relatively high chi-square and low adjusted goodness of fit index for the three-factor solution, in comparison to the English DASS, taking into account sample size. Moreover, the Chinese DASS21 showed less discrimination between the three scales in an Australian Chinese-speaking sample in comparison to a normal Chinese-speaking sample in Hong Kong, as measured by a similar version of the questionnaire.

Nevertheless, the moderate-to-high factor loadings for the Chinese translations of the 21 items indicate that the items are tapping into the constructs under study and have therefore been translated adequately. They also indicate that the content of these items has meaning and is acceptable within the Chinese-speaking population, which is consistent with the positive feedback received from participants and Chinese-speaking mental health professionals regarding the quality of the translation. Moreover, the factor loadings are generally comparable to those of the English sample and the Hong Kong normal sample. Taken together, these results suggest that the poorer discrimination between the DASS21 scales in the Australian Chinese-speaking sample, relative to the English and Hong Kong normal samples, is more likely to be due to factors in this particular Chinese-speaking sample and/or the Australian Chinese-speaking population and not the quality of the translation itself. Moreover, the relatively higher associations between the three scales, as indicated by the correlations, in the Australian Chinese-speaking sample, in contrast to the Hong Kong normal sample, are unlikely to be the result of translation difficulties or the scales failing to adequately measure three separate constructs. Rather, these correlations may reflect the comorbid experience of depression, anxiety, and stress. This is consistent with evidence, which suggests that in the majority of groups from non-English speaking backgrounds, the prevalence of emotional distress and mental illness is at least as high and often higher than in non-immigrants (Minas, Lambert, Kostov, & Boranga, 1996). It may be argued, therefore, that the relatively high associations between the DASS scales in the Australian Chinese-speaking sample are unlikely to be the result of translation difficulties or the scales failing to adequately measure three separate constructs. Rather, these correlations may reflect the experience

of comorbid negative affective states, namely depression, anxiety, and stress, as has been documented in immigrant populations.

Another possible explanation for the difference in degree of differentiation between the scales in the three samples may be related to the mean ages for the groups. The mean age in the Australian-Chinese sample was 55.0 years whereas the mean age in the English sample was 21.0 years and in the Hong Kong-Chinese sample was 30.9 years. It is possible that those in the Australian Chinese-speaking sample were likely to have experienced more negative life events and life stressors in comparison to those in the English and Hong Kong-Chinese samples, and therefore suffered a relatively more comorbid experience of negative affect in general.

Overall, the reason(s) for the differential degree of discrimination between the three scales in the different samples cannot be concluded from the results of this study. Future research which evaluates the ability of the Chinese DASS21 to measure three separate constructs and examines the associations between the three scales in other samples, such as in a non-immigrant Australian Chinese-speaking sample, might shed light on these observations.

In summary, the present research provides preliminary support for the psychometric properties of a Chinese version of the DASS21. The Chinese DASS21, which was developed to be sensitive to cultural and linguistic issues, was shown to significantly discriminate between the negative emotional syndromes of depression, anxiety, and stress. This provides evidence for the universality of these syndromes, and supports the development of culturally sensitive translations and adaptations of existing measurement tools in cross-cultural research. Moreover, the literacy level of the instrument ensures

that individuals from a wide range of literacy levels are able to comprehend and complete the questionnaire. The Chinese DASS21 is particularly suitable for the purpose of regular assessment and evaluation of treatment outcome. It is important, however, that future research further investigates the utility and psychometric properties of the Chinese DASS21, such as in a non-immigrant Australian Chinese-speaking sample. Further validation of the instrument will also enhance cross-cultural comparisons.

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Table 1

List of DASS item summaries with factor loadings from three-factor confirmatory analysis for the Australian-Chinese (N=356), English (N=720), and Hong Kong-Chinese (N=729) samples.

SCALE	Australian-Chinese	English	Hong Kong-Chinese
	Factor loadings 1/2/3	Factor loadings 1/2/3	Factor loadings 1/2/3
DEPRESSION			
couldn't experience positive [Q3]	0.80	0.76	0.61
difficult work up initiative [Q5]	0.56	0.47	0.58
nothing look forward [Q10]	0.79	0.73	0.61
downhearted and blue [Q13]	0.85	0.62	0.78
unable become enthusiastic [Q16]	0.65	0.70	0.58
not worth much as person [Q17]	0.51	0.69	0.60
life meaningless [Q21]	0.69	0.68	0.68
ANXIETY			
dryness of mouth [Q2]	0.48	0.43	0.30
breathing difficulty [Q4]	0.55	0.40	0.41
trembling [Q7]	0.46	0.58	0.58
worried situations panic [Q9]	0.65	0.56	0.56
close to panic [Q15]	0.75	0.66	0.75
aware action heart [Q19]	0.59	0.47	0.46
scared no good reason [Q20]	0.78	0.57	0.68
STRESS			
hard to wind down [Q1]	0.71	0.53	0.68
over-react to situations [Q6]	0.63	0.53	0.56
using nervous energy [Q8]	0.75	0.64	0.48
getting agitated [Q11]	0.87	0.64	0.70
difficult to relax [Q12]	0.83	0.70	0.64
intolerant kept doing [Q14]	0.58	0.51	0.49
rather touchy [Q18]	0.58	0.63	0.57

Table 2

Means and standard deviations for the DASS21 scales for the Australian-Chinese (N=356), English (N=720), and Hong Kong-Chinese (N=729) samples*.

	Australian-Chinese	English	Hong Kong-Chinese**
DASS Depression	5.04 (7.39)	7.32 (7.11)	5.35 (6.42)
DASS Anxiety	5.01 (6.55)	5.23 (5.49)	6.54 (5.72)
DASS Stress	7.51 (8.68)	10.54 (7.36)	11.17 (7.07)

*Values enclosed in parentheses represent SDs.

**Depression: n=720; Anxiety: n=721; Stress: n=720.

Table 3

Intercorrelations between the DASS21 scales for the Australian-Chinese (N=356), English (N=720), and Hong Kong-Chinese (n=716) samples.

	Australian-Chinese		English		Hong Kong-Chinese	
	Depression	Anxiety	Depression	Anxiety	Depression	Anxiety
Anxiety	0.74	--	0.46	--	0.61	--
Stress	0.78	0.78	0.49	0.54	0.63	0.67