

Depression in the Chinese: the impact of acculturation

GORDON PARKER^{1*}, BIBIANA CHAN¹, LUCY TULLY¹
AND MAURICE EISENBRUCH²

¹ *School of Psychiatry, University of New South Wales, and Black Dog Institute, Sydney, Australia;*
² *School of Public Health and Community Medicine, Sydney, Australia*

ABSTRACT

Background. Studies of depression in the Chinese have long identified low rates and a greater likelihood of somatization, findings which could reflect cultural influences or real differences. We report a study from a western region examining the impact of acculturation on depression to clarify the role of cultural factors.

Method. In a Sydney-based study, Chinese subjects ($n = 385$) and a matched control group of 143 non-Chinese subjects completed either a Chinese or English questionnaire assessing state and lifetime depression, attributional style, depression recognition and help-seeking. The impact of acculturation was examined by several strategies.

Results. Any tendency by the Chinese to somatize depression appeared to be attenuated by acculturation. State depression levels countered the view that Chinese necessarily deny depression. Lifetime depression rate differences were also attenuated by acculturation, with Chinese subjects being less likely than controls to judge episodes as a distinct disorder and to seek professional help.

Conclusions. Results suggest that Australian Chinese do not differ intrinsically in recognizing and ascribing depressive symptoms, and that the greater the degree of acculturation, the greater the tendency for reporting persistent and impairing depressive episodes.

INTRODUCTION

It has long been held that the Chinese have low rates of depression, a phenomenon that might be valid or reflect cultural or artefactual influences. As reviewed previously (Parker *et al.* 2001), early representative published community surveys in mainland China, such as the 1993 seven-region epidemiological study (Zhang *et al.* 1998), reported strikingly low depression rates in comparison to North American studies. Low rates have also been reported in other Asian regions with predominantly Chinese populations, such as Taiwan (Hwu *et al.* 1989), although a more recent Taiwanese study (Chong *et al.*

2001) reported rates comparable to western regions in a sample of elderly subjects. While few studies of Chinese in westernized regions have been undertaken, indicative data also suggest low rates. For example, Takeuchi *et al.* (1998) undertook a community study of Chinese Americans living in Los Angeles, with their lifetime DSM-III-R major depression rate of 6.9% being clearly lower than the 17.1% rate established in the North American National Comorbidity Study (Kessler *et al.* 1994).

Interpretation of low depression rates is not straightforward, as the symptoms and meanings of depression are construed by culture (Kleinman, 1982, 1986). Certain resilience factors (such as the Chinese traditions of withstanding hardship, viewing emotional illness as 'part of life', and accepting fate and destiny) might contribute to a 'true' difference. Common

* Address for correspondence: Professor Gordon Parker, Black Dog Institute, Prince of Wales Hospital, High Street, Randwick, Sydney 2031, Australia.
(Email: g.parker@unsw.edu.au)

artefactual explanations (e.g. reporting biases, denial, somatizing tendencies, political and stigmatization effects) might also reflect cultural influences. The impact of culture is difficult to measure directly, and can often be better clarified by studying the influence of cultural change and 'acculturation'.

We, therefore, undertook a comparative study of depression in Chinese and non-Chinese subjects in a western region, with the principal hypothesis being that, if the documented lower depression rate in the Chinese is culturally determined, differences would be attenuated or non-demonstrable in acculturated Chinese subjects. As depression rates are likely to be influenced by 'psychological mindedness', acknowledgement of depressive symptoms and help-seeking disposition, our study design considered acculturation effects on (i) attributional style, (ii) depression levels and rates and (iii) help-seeking patterns.

METHOD

The samples

We studied individuals routinely attending primary physicians in Sydney, Australia. Recruitment occurred at 11 general practices in both the central business district and surrounding suburbs with an over-representation of Chinese subjects. The second author approached Chinese subjects in their preferred language (Mandarin, Cantonese or English) to complete a questionnaire (English or Chinese version) anonymously, while waiting to see the physician. She attempted to recruit all eligible subjects (i.e. all individuals presenting to those facilities while she was present), with this objective compromised only by busy periods exceeding her capacity to recruit. We subsequently similarly recruited a non-Chinese group (the controls) of approximately one-third the Chinese sample from the same general practices with selection weighted to promote age and sex matching.

The questionnaire – general issues

Completed questionnaires were returned to a 'post box' near the receptionist to respect confidentiality. The questionnaire sought socio-demographic, educational, occupational and study-specific information. The Chinese version was translated from the English version by a

team of translators to ensure that western constructs were translated with cultural sensitivity. Semantic translations were frequently adapted in order to find idiomatic expressions matching English phrases. The translated versions were independently back-translated into English until semantic and linguistic equivalence were achieved. Specific questionnaire measures are now detailed.

Attributional style

Here, we employed a strategy used previously in primary practice attenders (Parker & Parker, 2003) and adapted from a British primary practice study (Kessler *et al.* 1999), with subjects asked to consider three differing 'symptoms' (fatigue, insomnia and loss of appetite) and nominate (for each) the most likely of three explanatory options (weighting either 'somatic', 'normalizing' or 'psychologizing' interpretations). Thus, respective options for insomnia were 'There is likely to be a physical reason', 'I'm just not tired' and 'I've been worrying too much or must be stressed'. For fatigue, the respective options were: 'There is a medical cause (e.g. anaemia)'; 'I've been over-exerting myself or not exercising enough'; and 'I'm emotionally exhausted or discouraged'. For loss of appetite, the respective options were: 'I have a physical problem (e.g. stomach ulcer)'; 'My body doesn't need as much food (or energy) at the moment'; and 'I am emotionally stressed'. Summing subjects' somatic responses on the three probe questions generated a total 'somatizing' attribution score. In addition, the questionnaire included a 'Social Desirability' measure, with items asking respondents whether they liked everyone they knew, were always nice to others and had never broken any parental rules, with the yes/no format allowing a total score to be calculated (0–3).

Lifetime 'depression'

Possible 'lifetime depression' episodes were assessed by asking whether subjects had experienced a (minimum) 2-week period of worthlessness and hopelessness, a loss of energy and motivation to do things, and a decreased ability to cope. To avoid cueing, a key issue of relevance to the overall research question, we did not use a standardized interview schedule and our probe question deliberately did not use the

term 'depression'. If affirmed, subjects provided their age at first episode, duration of longest episode and whether it had caused impairment (i.e. in preventing them from getting to work or school, or working around the house). In addition, we asked whether they judged such episodes as 'only normal blues to be expected over one's lifetime', 'at times, a distinct disorder – above and beyond what could be viewed as reasonable distress given circumstances' or 'always a distinct disorder', with 'distinct' viewed as a proxy for likely clinical depression.

State depression

Levels of state depression were assessed by the self-report DMI-10 measure (Parker *et al.* 2002). Designed for assessing depression in the medically ill (with its exclusion of somatic items and weighting of cognitive features of depression potentially correcting any tendency by the Chinese to 'somatize' the experience of depression), its utility was subsequently demonstrated in primary practice (Parker *et al.* 2003) and out-patient (Parker & Gladstone, 2004) psychiatric settings.

Help-seeking

Help-seeking was assessed in two ways. First, as a more general response to psychological symptoms. Thus, respondents were asked if they had ever consulted a doctor for 'emotional unease' (e.g. stress, depression, anxiety), received Chinese herbal therapies for 'emotional distress', or received any antidepressant medication. Second, in relation to any lifetime 'depressive' episode experienced. Thus, respondents who answered positively to the probe about a lifetime 'depressive' episode were asked whether they had ever consulted a general practitioner, a psychiatrist, a psychologist, a traditional Chinese herbal doctor or 'other'. Respondents who selected the 'other' category were asked to provide additional details.

Acculturation

The likely extent of acculturation of the Chinese subjects was to be examined indirectly by the proportion of time lived in Australia (ratio of years lived in Australia over current age \times 100) and age at any migration, and to be more directly assessed by the Suinn–Lew Asian Self-Identity Acculturation Scale (SLAS; Suinn *et al.*

1992), modified slightly to respect Australian contextual issues. The SLAS is one of the most commonly used measures of acculturation in studies of Asians in North America (Salant & Lauderdale, 2003), tapping several social domains (e.g. language choice, community associations, food preferences) and provides scores from 1 to 5, with 5 representing the highest level of acculturation. To examine comparability of English and Chinese versions, a separate sample of 29 bilingual Chinese were randomly given one version to complete and the alternate version after a minimum interval of 1 day. The total SLAS scores of the English and Chinese versions were highly correlated (Pearson's $r=0.95$, $p<0.001$), as were 19 of the 21 individual items (r 's = 0.72–0.97). The two items with only moderate correlations ($r=0.49$ and 0.55) were amended to enhance linguistic agreement across the English and Chinese forms.

RESULTS

Response rates

Of those accepting a questionnaire, the response rate was 64.8% (64.1% for Chinese subjects and 66.2% for controls). Six subjects returning substantively incomplete questionnaires were excluded. We ceased recruitment when we had a sample of 431 Chinese subjects and 157 controls. We subsequently inspected datasets for non-discriminatory responses (e.g. checking the same response option for all questionnaire items), and excluded datasets returned by 46 Chinese and 14 controls to derive our final sample of 385 Chinese subjects (256 completing the Chinese version and 129 the English version) and 143 controls.

Preliminary analyses

The mean ages of 38.5 years (s.d. = 15.7) for the Chinese and 41.5 years (s.d. = 17.9) for the controls were comparable, as were the female preponderances (56% *v.* 53%). The groups were also comparable in occupational status, with 37.3% of Chinese subjects and 44.0% of controls being of high occupational status (professional or management positions). The principal countries of birth for the Chinese subjects were Hong Kong (34.6%), mainland China (30.1%), Taiwan (13.1%), Vietnam (4.7%), Malaysia (4.2%) and Australia (6.3%),

Table 1. Percentage of respondents selecting somatizing, normalizing and psychologizing attributions of three physical symptoms for Chinese-Chin, Chinese-Eng and control groups

	Chinese-Chin A (n=214)	Chinese-Eng B (n=115)	Controls C (n=115)	χ^2 analyses		
				A v. C	B v. C	A v. B
Fatigue				χ^2	χ^2	χ^2
Somatizing	18.5	6.3	8.1	6.19*	0.29	8.98*
Normalizing	58.5	50.9	50.5	1.91	0.01	1.72
Psychologizing	22.9	42.9	41.4	11.89**	0.05	13.71***
Insomnia						
Somatizing	21.0	11.3	17.4	0.62	1.73	4.87*
Normalizing	25.7	23.5	20.0	1.34	0.41	0.20
Psychologizing	53.3	65.2	62.6	2.65	0.17	4.37*
Appetite loss						
Somatizing	21.7	23.6	14.6	2.22	2.82	0.16
Normalizing	39.4	33.6	44.7	0.79	2.72	1.02
Psychologizing	38.9	42.7	40.8	1.00	0.08	0.43

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

while 74.8% of the controls had been born in Australia. At home, the principal languages of the Chinese subjects were Cantonese (51.7%), Mandarin (31.1%), English (6.8%), and a mix of English and a Chinese dialect (4.4%). The mean SLAS score was 2.3 (s.d.=0.48) for the Chinese subjects. On the Social Desirability measure, the Chinese (mean=2.2, s.d.=0.8) and controls (mean=2.3, s.d.=0.8) scored comparably. In the Chinese sample, SLAS scores correlated -0.39 with age and -0.62 with age at migration, +0.64 with proportion of time lived in Australia and -0.64 with selecting the Chinese language forms (all $p < 0.001$), demonstrating links between our direct and indirect measures of acculturation. As age at migration and proportion of time lived in Australia were highly correlated ($r = -0.83$), the latter measure was deleted in subsequent analyses.

Preliminary analyses considered if differences existed between Chinese subjects completing the Chinese and English versions of our questionnaire (now termed Chinese-Chin and Chinese-Eng respectively). The Chinese-Chin were older (42.4 v. 30.6 years; $t = 7.5$, $p < 0.001$), older at migration (31.4 v. 13.4 years; $t = 12.3$, $p < 0.01$), returned a lower SLAS score (2.1 v. 2.7; $t = 15.2$, $p < 0.001$), less likely to converse in English at home ($\chi^2 = 36.5$, $p < 0.001$), more likely to be involved in home duties or retired rather than in full-time work or a student ($\chi^2 = 59.1$, $p < 0.001$) and had a lower level of education (3.0 v. 3.4; $t = 3.0$, $p < 0.001$) than the Chinese-Eng – but did not differ by gender (57.0% v.

54.3% female), results identifying two relatively distinct subsets. One subset – the English-speaking Chinese – was younger, better educated and clearly more acculturated. Such major distinctions, as well as the fact that language preference was likely to be a proxy measure for acculturation, encouraged us to undertake principal analyses on those two subsets of Chinese subjects rather than by using the SLAS dimensional measure.

Attributional style

Table 1 reports percentages of respondents selecting a somatizing, normalizing or psychologizing attributional response to the three physical symptom questions, with somatizing responses being less common across all three groups. χ^2 analyses indicated responses did not differ for the Chinese-Eng subjects and the controls. However, the Chinese-Chin were more likely than Chinese-Eng to offer a somatizing interpretation and less likely to offer a psychologizing interpretation in response to the 'fatigue' and 'insomnia' symptom cues, while a similar pattern was evident in regard to the 'fatigue' symptom when the Chinese-Chin were compared with the controls.

The total mean somatizing attribution score was 0.62 (s.d.=0.79) for the Chinese-Chin, 0.39 (s.d.=0.65) for the Chinese-Eng and 0.44 (s.d.=0.84) for the controls, with the only significant difference being the Chinese-Chin generating higher somatizing scores than the Chinese-Eng ($t = 2.5$, $p < 0.01$) group. In the

Table 2. Percentage of respondents reporting lifetime depression, mean age of onset and longest episode, and associated rates of impairment for the Chinese-Chin, the Chinese-Eng and control groups

	Chinese-Chin A (n=245)	Chinese-Eng B (n=125)	Controls C (n=132)	χ^2 analyses		
				A v. C	B v. C	A v. B
Depressive episode	29.0%	37.6%	48.5%	χ^2	χ^2	χ^2
Episode judged as 'normal blues'	16.0%	18.9%	15.6%	14.1**	3.70	2.83
Episode judged as a 'distinct disorder at times'	6.3%	15.6%	25.8%	0.01	0.46	0.45
Episode judged as 'always a distinct disorder'	5.1%	1.6%	7.0%	27.5**	3.95*	8.03**
For those who had experienced depression				0.59	4.32*	2.52
				Wilcoxon <i>W</i> test/ χ^2		
	(n=68)	(n=43)	(n=62)	Z	Z	Z
Mean age at first episode (years)	30.4	22.3	27.1	1.81	1.19	3.37**
Mean of longest episode (months)	7.3	7.7	22.1	2.15*	1.93	0.20
				χ^2	χ^2	χ^2
Impairment	29.9%	51.2%	66.1%	17.00***	2.37	5.04*

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

overall Chinese sample, 'somatizing' scores were associated weakly with age at migration ($r = 0.19$, $p < 0.01$) and SLAS scores ($r = -0.22$, $p < 0.001$), further suggesting that somatizing responses were weakly linked (and attenuating) with acculturation.

Mean Social Desirability scores differed in the three subsets ($F = 15.3$, $p < 0.001$), being highest in the Chinese-Eng (2.5), intermediate in the controls (2.2) and lowest in the Chinese-Chin (2.0). Other analyses restricted to the Chinese sample established that Social Desirability scores were not significantly associated with age ($r = -0.01$) or age at migration ($r = -0.10$), but positively associated with SLAS scores ($r = 0.22$, $p < 0.001$) – indicating a slight increase in such a response bias with acculturation as also suggested by subset scores.

Lifetime depression

Table 2 reports data on reported lifetime 'depression' rates, variably defined depressive patterns, age of onset, episode length and associated rates of impairment. Group comparisons indicate that the Chinese-Chin were less likely to report experiencing lifetime depression than controls. There were no significant group differences in rates of reporting episodes as being only 'normal blues'. However, both Chinese subsets were less likely than the controls to report an episode as being a 'distinct disorder at

times', while the Chinese-Chin were less likely than the Chinese-Eng to report such a pattern. The low prevalence makes group comparison of those judging episodes as 'always a distinct disorder' problematic.

For all those affirming the probe for broadly defined lifetime depression, age at first episode did not distinguish either Chinese group from the controls, but the Chinese-Eng returned a younger mean age at first episode than did the Chinese-Chin subjects. In terms of episode duration, the mean length (of the longest episode) was significantly shorter for the Chinese-Chin than the controls, while duration data did not distinguish the Chinese-Eng from the controls. Impairment data indicated that the Chinese-Chin reported less impairment in comparison to both the Chinese-Eng and the controls.

State depression

Mean total DMI-10 (state depression) scores were 7.0 (s.d. = 7.2) for controls, 12.3 (s.d. = 6.3) for the Chinese-Chin and 7.1 (s.d. = 6.4) for the Chinese-Eng, with the Chinese-Chin group scoring higher than both the Chinese-Eng ($t = 7.4$, $p < 0.001$) and the controls ($t = 7.3$, $p < 0.001$), but without the latter two differing. In analyses of the whole Chinese group, DMI-10 depression scores were unassociated with age ($r = 0.03$), but weakly associated with age at migration ($r = 0.11$, $p < 0.05$), education level

Table 3. *General help-seeking and help-seeking in response to reporting a likely lifetime episode of depression for the Chinese-Chin, Chinese-Eng and controls*

	Chinese-Chin A (n=252) %	Chinese-Eng B (n=128) %	Controls C (n=140) %	χ^2 analyses		
				A v. C	B v. C	A v. B
General help-seeking						
Lifetime rate of consulting a primary physician for psychological problems	15.5	20.5	36.4	22.3**	8.3**	1.5
Lifetime rate for ever receiving antidepressant medication	5.6	10.9	27.1	35.8**	11.2**	3.5
Lifetime rate for receiving any Chinese herbal remedy for psychological problems	17.5	14.0	17.0	0.02	0.5	0.8
In relation to those experiencing a likely lifetime episode of depression (2 weeks or more)						
Rate of consulting a primary physician	28.4	35.0	57.4	11.0**	4.8**	0.5
Rate of consulting a psychologist	17.9	22.5	29.5	2.4	0.6	0.3
Rate of consulting a psychiatrist	10.4	12.5	29.5	7.4*	4.0*	0.1
Rate of consulting a Chinese herbalist	3.0	2.5	4.9	0.3	0.4	0.02
Rate of consulting friends or family	22.4	5.0	13.1	0.9	1.8	4.3*

* $p < 0.05$, ** $p < 0.01$.

($r = -0.11$, $p < 0.05$), Social Desirability ($r = -0.25$, $p < 0.01$) and SLAS ($r = -0.23$, $p < 0.01$) scores. Thus, higher DMI-10 scores were linked with less acculturation, as measured directly and indirectly, and with a lower social desirability response.

In light of the higher DMI-10 scores returned by the Chinese-Chin sample subset, we examined data on a bilingual subset ($n = 28$) of the Chinese sample, who completed both Chinese and English versions before and after their medical consultation. While the total DMI-10 correlation was 0.73, indicating acceptable reliability, mean scores were higher for the Chinese than for English version (9.7 v. 7.1; $t = 2.8$, $p < 0.01$).

Help-seeking

Table 3 data demonstrate that, in relation to general help-seeking patterns, both Chinese subsets were less likely than controls to have consulted a primary physician or to have received an antidepressant drug. There was no difference between Chinese subsets and controls in taking Chinese herbal remedies. In relation to any lifetime depressive episode, both Chinese subsets were less likely than controls to seek professional help (significant in relation to consulting a primary physician and a psychiatrist). The Chinese-Chin were more likely than the Chinese-Eng subset to report consulting 'others' (generally, family or friends). We created a

variable of 'no help sought' to identify subjects who had never consulted a primary physician, psychologist, psychiatrist or Chinese herbalist for a depressive episode of at least 2 weeks. The comparative rates were 38.8% for the Chinese-Chin, 47.5% for the Chinese-Eng and 24.6% for the controls, with only the comparison between the Chinese-Eng and controls being significant ($\chi^2 = 5.7$, $p < 0.05$).

Relationships between SLAS scores and depression variables

Our analytical approach examined the impact of acculturation on two principal groups (i.e. Chinese and English-speaking Chinese) rather than using SLAS acculturation scores dimensionally (as our two subsets appeared to differ more 'categorically'). Here, we now also report on relationships between (dimensional) SLAS scores and depression variables – in the Chinese sample only. When compared to those who did not report a lifetime depressive episode, SLAS scores were not significantly different from those reporting any lifetime depressive episode (2.4 v. 2.3, $t = 1.7$) or from subgroups reporting that episodes were generally 'normal blues' (2.4 v. 2.3, $t = 1.1$) or from those reporting 'distinct episodes' (2.4 v. 2.3, $t = 1.6$). Higher SLAS scores were significantly associated with lower DMI-10 scores ($r = -0.23$, $p < 0.01$) and with a younger age of first onset of depression ($r = -0.37$, $p < 0.01$). In terms of representative

help-seeking variables, there were no significant differences in SLAS scores for those who had or had not consulted a primary physician for psychological problems (2.4 v. 2.3, $t=1.5$) or for those who had or had not received anti-depressant medication previously (2.4 v. 2.3, $t=1.5$).

DISCUSSION

This study is one of few undertaken in a western region to examine the impact of acculturation on depressive experiences in Chinese people. Results indicate that both the low rates of reported depression and the phenomenon of somatization in Chinese people are likely to be influenced principally by cultural factors. While it is difficult to determine to what extent the findings of this study extrapolate to Chinese in indigenous regions, it provides a starting point to understand how depressive experience is shaped by culture.

Our study required a valid measure of acculturation. While we incorporated the benchmark SLAS as our primary measure, we also assessed several less direct measures. Group differences between those selecting English as against Chinese versions of the questionnaire were so substantial as to suggest that distinction should serve to respect these subsets for examining the impact of acculturation. However, we also report dimensional analyses using the SLAS measure within the Chinese subsets (the SLAS not being given to the controls).

We first pursued the proposition that the Chinese have a different attributional style for interpreting psychological and somatic cues, and that any greater tendency to 'somatize' may contribute to lower rates of state and lifetime depression. Our focus was not on so-called 'somatic' symptoms or manifestations of depression (e.g. lack of energy or pain) but more on 'somatizing' as an alternative interpretive, communicative or help-seeking behaviour. Thus, we provided three indefinite cue symptoms, and examined rates of those providing a somatizing (as against a normalizing or psychologizing) explanation. The less acculturated Chinese-Chin group were more likely to offer a somatizing interpretation than the more acculturated Chinese-Eng (for fatigue and insomnia) and controls (for fatigue), but, of greater importance,

there were no differences between the Chinese-Eng group and the controls. In addition, in the overall Chinese group, somatizing responses were associated, albeit weakly, with SLAS scores, with both approaches indicating that the tendency to interpret a symptom with a 'somatic' explanation decreased as acculturation increased.

'Somatizing' psychological stress (e.g. via constructs such as neurasthenia) was also once common in western communities. Despite this term falling into disuse in America (Kleinman, 1982), it was transmitted into China, with the non-stigmatizing diagnosis of *shenjing shuairuo* (neurasthenia) being accepted by physicians and lay people alike (Lee, 1998). However, studies (e.g. Zhang, 1989) in mainland China and Hong Kong indicate that such a diagnosis has declined dramatically, again attesting to the strong influence of cultural change on the expression of psychological distress.

Comparison of our 'lifetime depression' rates with community or primary-care survey data is inappropriate as we did not use a standardized diagnostic interview. We assumed that, while our probe question identified those with true lifetime clinical episodes, it also included a percentage of individuals who had less severe or less impairing episodes. Our key finding was that, when compared to the controls, the Chinese-Chin were less likely to report an episode of putative lifetime depression lasting at least 2 weeks. Group differences were most distinct in regard to rates of reporting episodes as being a 'distinct disorder' at times – with both Chinese subsets being less likely to so report than the controls, and with the Chinese-Chin being less likely to so report than the Chinese-Eng. While acculturation appeared to contribute, even in the highly acculturated subset, differential rates remained – which could reflect a true difference (greater resilience that resulted in a later age of onset and shorter duration of episode), differential attribution in judging 'disorder' status and impairment levels, a 'recall' differential and older age effects. Notwithstanding these possibilities, we suggest that acculturation in westernized Chinese appears to be associated with being more likely to report an episode of lifetime 'depression' and with episodes being more likely to reach 'clinical depression' status.

If the differential rates in lifetime depression were secondary to subjective reporting biases (e.g. denial of any depression) we would have anticipated similar group differences in state depression rates. Mean DMI-10 scores were comparable for the Chinese-Eng subset and controls, but significantly higher in the Chinese-Chin subset. The higher state depression scores in the Chinese-Chin subset could reflect a number of differing artefactual or real factors. Higher scores when completing the Chinese language version of the DMI-10 (as against the English version, within the sample who completed both versions) suggest that this finding is at least partially artefactual, reflecting recall biases and differential interpretation across language versions, a lower social desirability bias (as demonstrated) and requires pursuit of methodological explanations. A true difference may be a consequence of subset members being older and less acculturated, or being exposed to a larger number of depressogenic stressors. To the extent that our DMI-10 measure validly assesses state depressive symptoms (which needs to be formally pursued in Chinese groups), these results argue against the Chinese necessarily denying depression.

Study limitations should be taken into account when interpreting findings. First, recruitment in a primary practice setting clearly shaped sample selection to Chinese prepared to seek help from a westernized medical service and who were, therefore, acculturated to some degree. Our study hypotheses did not require us to select a representative community sample in terms of acculturation, only that there was variation in acculturation levels. Consequently, study findings cannot be readily generalized to all Chinese living in a western region. Second, as noted, we did not measure lifetime depression with a validated diagnostic measure, disallowing any consideration as to whether our rates of 'depression' were comparable or idiosyncratic when considered against general community prevalence rates. It would be of distinct importance to undertake a replication study of Chinese born in, and highly acculturated to a western region, and then determine if they differ on parameters of depression severity and duration, associated impairment and help-seeking. The third limitation relates to our capacity to assess the more

subtle, culturally nuanced beliefs about depression, when acculturation researchers like Ying (1995) and Tsai (2003) have called for greater emphasis upon the contexts and the social domains in which Asian migrants' life experiences are based. We will explore such nuances in subsequent qualitative studies. Fourth, despite our questionnaire being carefully translated to respect idioms of Chinese language, language nuances may still have influenced study findings. Finally, we made no statistical adjustments for multiple hypothesis testing as we viewed the study as an exploratory one and it is, therefore, possible that some of the significant findings were due to type I errors.

Our study benefits from considering literature on cross-culture variations in symptoms of depression. In one large primary-care study (Simon *et al.* 2002), the prevalence of major depression varied 15-fold across 14 countries. Such differences were held to reflect variations in thresholds for diagnosis and help-seeking more than variation in the nature of the depressive disorder. Cheng (1989) studied minor psychiatric morbidity (MPM) in a community survey in Taiwan, with findings indicating that MPM patterns were 'mainly subject to socio-cultural influence'. Similarly, Cheng (2001) has argued for the universality of psychopathology and with differential rates of common psychiatric disorders more reflecting the cultural impact on presenting features.

In summary, the few differences between the Chinese-Eng and controls in all domains except lifetime depression, impairment and help-seeking, suggest that many of the assumptions about 'depression in the Chinese' may be determined by cultural factors. Any true differences (e.g. in resilience or coping repertoires) impacting on the development and persistence of depression might benefit from the strategy of studying fully acculturated Chinese in western regions.

ACKNOWLEDGEMENTS

We thank the NHMRC (Program Grant 2223708) and Centre for Mental Health for funding support, Dusan Hadzi-Pavlovic for statistical assistance, and the medical centres and health practitioners facilitating this study.

DECLARATION OF INTEREST

None.

REFERENCES

- Cheng, A. T. A. (2001). Case definition and culture: are people all the same? [Editorial]. *British Journal of Psychiatry* **179**, 1–3.
- Cheng, T. A. (1989). Symptomatology of minor psychiatric morbidity: a crosscultural comparison. *Psychological Medicine* **19**, 697–708.
- Chong, M.-Y., Chen, C.-C., Tsang, H.-Y., Yeh, T.-L., Chen, C.-S., Lee Y.-H., Tang, T.-C. & Lo, H.-Y. (2001). Community study of depression in old age in Taiwan. *British Journal of Psychiatry* **178**, 29–35.
- Hwu, H.-G., Yeh, E.-K. & Chang, L.-Y. (1989). Prevalence of psychiatric disorders in Taiwan defined by the Chinese Diagnostic Interview Schedule. *Acta Psychiatrica Scandinavica* **79**, 136–147.
- Kessler, D., Lloyd, K., Lewis, G. & Pereira, D. (1999). Cross sectional study of symptom attribution and recognition of depression and anxiety in primary care. *British Medical Journal* **318**, 436–439.
- Kessler, R. C., McGonagle, K. A., Zhao, S., Nelson, C. B., Hughes, M., Eshleman, S., Wittchen, H.-U. & Kendler, K. S. (1994). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. *Archives of General Psychiatry* **51**, 8–19.
- Kleinman, A. (1982). Neurasthenia and depression: a study of somatization and culture in China. *Culture, Medicine and Psychiatry* **6**, 117–190.
- Kleinman, A. (1986). *Social Origins of Disease and Distress: Depression, Neurasthenia, and Pain in Modern China*. Yale University Press: New Haven, Connecticut.
- Lee, S. (1998). Estranged bodies, simulated harmony, and misplaced cultures: neurasthenia in contemporary Chinese society. *Psychosomatic Medicine* **60**, 448–457.
- Parker, G. & Gladstone, G. (2004). Capacity of the 10-item Depression in the Medically Ill screening measure to detect depression 'caseness' in psychiatric out-patients. *Psychiatry Research* **127**, 283–287.
- Parker, G., Gladstone, G. & Chee, K. T. (2001). Depression in the planet's largest ethnic group: the Chinese. *American Journal of Psychiatry* **158**, 857–864.
- Parker, G., Hilton, T., Bains, J. & Hadzi-Pavlovic, D. (2002). Cognitive based measures screening for depression in the medically ill: the DMI-10 and DMI-18. *Acta Psychiatrica Scandinavica* **105**, 419–426.
- Parker, G., Hilton, T., Hadzi-Pavlovic, D. & Irvine, P. (2003). Clinical and personality correlates of a new measure of depression: a general practice study. *Australian and New Zealand Journal of Psychiatry* **37**, 104–109.
- Parker, G. & Parker, K. (2003). Influence of symptom attribution on reporting depression and recourse to treatment. *Australian and New Zealand Journal of Psychiatry* **37**, 469–474.
- Salant, T. & Lauderdale, D. S. (2003). Measuring culture: a critical review of acculturation and health in Asian immigrant populations. *Social Science and Medicine* **57**, 1–90.
- Simon, G. E., Goldberg, D. P., Von Korff, M. & Üstün, T. B. (2002). Understanding cross-national differences in depression prevalence. *Psychological Medicine* **32**, 585–594.
- Suinn, R. M., Ahuna, C. & Khoo, G. (1992). The Suinn–Lew Asian Self-identity Acculturation Scale: concurrent and factorial validation. *Educational and Psychological Measurement* **52**, 1041–1046.
- Takeuchi, D. T., Chung, R. C.-Y., Lin, K.-M., Shen, H., Kurasaki, K., Chun, C.-A. & Sue, S. (1998). Lifetime and twelve-month prevalence rates of major depressive episodes and dysthymia among Chinese Americans in Los Angeles. *American Journal of Psychiatry* **155**, 1407–1414.
- Tsai, J. H. (2003). Contextualizing immigrants' lived experience: the story of Taiwanese immigrants in the United States. *Journal of Culture Diversity* **10**, 76–83.
- Ying, Y.-W. (1995). Cultural orientation and psychological well-being in Chinese Americans. *American Journal Community Psychology* **23**, 893–911.
- Zhang, M. Y. (1989). The diagnosis and phenomenology of neurasthenia: a Shanghai Study. *Culture Medicine and Psychiatry* **13**, 147–161.
- Zhang, W. X., Shen, Y. C. & Li, S. R. (1998). Epidemiological investigation on mental disorders in seven areas of China. *Chinese Journal of Psychiatry* **31**, 69–71.