Journal of Abnormal Psychology
2008, Vol. 117, No. 2, 300–313

0021-843X/08/$12.00 DOI: 10.1037/0021-843X.117.2.300

The Cultural Shaping of Depression: Somatic Symptoms in China, Psychological Symptoms in North America?

Andrew G. Ryder
Concordia University and Sir Mortimer B. Davis–Jewish General Hospital

Jian Yang
University Health Network

Xiongzhao Zhu, Shuqiao Yao, and Jinyao Yi
Second Xiangya Hospital of Central South University

Steven J. Heine
University of British Columbia

R. Michael Bagby
Centre for Addiction and Mental Health and University of Toronto

The expectation that Chinese people present distress somatically is a central prediction of cultural psychopathology and has been the subject of considerable theoretical speculation. At the same time, empirical studies have been infrequent and have yielded mixed results. The authors examined symptom presentation in Chinese ($n = 175$) and Euro-Canadian ($n = 107$) outpatients, using spontaneous problem report, structured clinical interview, and symptom questionnaire methods. All 3 methods yielded cross-culturally equivalent somatic and psychological symptom subscales. Chinese outpatients reported more somatic symptoms on spontaneous problem report and structured clinical interview compared with Euro-Canadians, who in turn reported more psychological symptoms on all 3 methods. The relation between culture and somatic symptom presentation was mediated by a tendency toward externally oriented thinking. Difficulties with identifying emotions or describing them to others did not differ significantly across cultures, supporting a nonpathological interpretation of observed differences. Psychological symptom effects were larger and more consistent than somatic symptom effects; because other studies have confirmed the ubiquity of somatic presentations worldwide, these results suggest that *Western psychologization* may be more culturally specific than is Chinese somatization.

Keywords: depression, somatization, psychologization, culture, Chinese

The tendency for Chinese individuals to emphasize somatic symptoms of depression is widely acknowledged and is now a key finding of cultural psychopathology (Ryder, Yang, & Heine, 2002). Chinese somatization has been described in China, Hong Kong, and Taiwan,

Andrew G. Ryder, Department of Psychology, Concordia University, Montréal, Québec, Canada; Division of Social and Transcultural Psychiatry, Sir Mortimer B. Davis–Jewish General Hospital, Montréal, Québec, Canada. Jian Yang, Asian Initiative in Mental Health, Department of Psychiatry, University Health Network, Toronto, Ontario, Canada. Xiongzhao Zhu, Shuqiao Yao, and Jinyao Yi, Clinical Psychological Research Center, Second Xiangya Hospital of Central South University, Changsha, China. Steven J. Heine, Department of Psychology, University of British Columbia, Vancouver, British Columbia, Canada. R. Michael Bagby, Mood and Anxiety Program, Centre for Addiction and Mental Health, Toronto, Ontario, Canada; Department of Psychiatry, University of Toronto, Toronto, Ontario, Canada.

We acknowledge the contributions of the translators and interviewers who contributed to the present study—Jason Bacchiochi, Niki Fitzgerald, Janice Mak, Lesley Miller, Kei-Yan Poon, Tina Wang, and Maria Wong. We also thank Michael Chandler, Jessica Dere, Andrea Krawczyk, Tracy Lindberg, Wolfgang Linden, Meaghen Quinlan-Davidson, Jennifer Ritsher, Mark Schaller, and Brett Thombs for their valuable comments and assistance at various stages.

The research described in this article was facilitated by a Michael Smith Foundation for Health Research predoctoral fellowship to Andrew G. Ryder, a National Institute of Mental Health R01 research grant to Steven J. Heine, and a Social Sciences and Humanities Council standard research grant to R. Michael Bagby. This research was conducted as part of Andrew G. Ryder's doctoral dissertation at the University of British Columbia, supervised by Steven J. Heine and cosupervised by R. Michael Bagby.

Correspondence concerning this article should be addressed to Andrew G. Ryder, Department of Psychology (PY 153-2), Concordia University, 7141 rue Sherbrooke O., Montréal, Québec, Canada, H4B 1R6. E-mail: andrew.ryder@concordia.ca

as well as in Chinese immigrants to Western[1] countries, and these descriptions have been accompanied by an extensive theoretical literature. The much smaller empirical literature is mixed, however; comparison groups are infrequently used, and explanatory hypotheses are often proposed but rarely tested (F. M. Cheung, 1995). We designed the following study, therefore, to assess the extent of Chinese somatic symptom emphasis and to better understand when and why it is observed. This study, to the best of our knowledge, is one of only a few to address these questions with a direct cross-cultural comparison of clinical patients and is the only such study to use multiple assessment modalities and to test specific explanations. Three questions have guided this research: (a) Do the Chinese indeed emphasize the somatic symptoms of depression relative to North Americans? (b) Under what assessment conditions is this Chinese somatic symptom emphasis observed? (c) Why does this Chinese somatic symptom emphasis take place?

Do the Chinese Emphasize Somatic Symptoms of Depression?

One of the first systematically reported cross-cultural differences in psychiatric epidemiology was the apparent rarity of depression in Chinese cultures (Kleinman, 1982). The Global Burden of Disease project (Murray & López, 1996) reported 1-year incidence rates of 2.3% for unipolar depression in China, compared with a 10.3% rate previously found in the United States (Kessler et al., 1994). Weissman et al. (1996) found a lifetime prevalence rate for major depression of 1.5% in Taiwan, compared with rates ranging from 2.9% to 19.0% in 10 other countries. If, however, Chinese populations present depression differently, the syndrome-based epidemiological approach would underestimate its occurrence. During the 1980s and 1990s, when these surveys were conducted, many psychiatric patients in China were diagnosed with *neurasthenia*, which emphasizes somatic symptoms—fatigue, sleep problems, muscle pain, headache, and so on (T.-Y. Lin, 1989)—as opposed to depression.

Kleinman (1982) used both anthropological and psychiatric methods to assess 100 neurasthenia patients in China and concluded that 87% were suffering from some form of depression. At the same time, common chief complaints included headaches (90% of cases), insomnia (78%), dizziness (73%), and various pains (49%), whereas depressed mood accounted for only 9% of cases. Kleinman concluded that neurasthenia was a Chinese-specific way of presenting depression but also that neurasthenia had a sufficiently distinct symptom profile to justify continued inclusion in the Chinese and international diagnostic systems. Other less detailed studies with psychiatric patients and health care workers have generally been supportive (D. W. Chan, 1990; Tseng, 1975; Tsoi, 1985; but see Cheng, 1989); the common problem with these studies was a lack of comparison groups, a troubling omission in studies seeking to demonstrate Chinese variation from an assumed Western norm.

Yen, Robins, and Lin (2000) conducted two studies in Chinese and Euro-American samples. Study 1 found that Chinese students seeking counseling reported considerably more somatic symptoms on questionnaire as compared with a Chinese student control group, which in turn reported more psychological symptoms. Study 2 found that a Chinese student sample reported significantly fewer somatic symptoms compared with Chinese American and Euro-American student samples, contrary to expectations. The authors interpreted these findings as evidence that the Chinese emphasis on somatic symptoms results from the patient role in the Chinese health care system.

Unfortunately, the lack of a Western patient sample does not allow us to determine whether an emphasis on somatic symptoms is culture specific or is a general feature of depression. Kirmayer, Robbins, Dworkind, and Yaffe's (1993) study of somatization in a large Canadian primary care sample demonstrated that somatic presentations of psychosocial distress are common in Western nonpsychiatric contexts. These findings were confirmed by Simon, VonKorff, Piccinelli, Fullerton, and Ormel's (1999) analysis of 1,146 interviewed patients with major depression across 15 sites, including 1 in China. Half the patients reported multiple unexplained somatic symptoms and about one tenth denied psychological symptoms on direct questioning; there were no systematic differences between sites. Somatic presentations were more common when patients lacked an ongoing relationship with a physician. If the assumed norm of psychologically focused depression in the West is exaggerated, studies demonstrating frequent somatic presentations in China cannot be interpreted as evidence for Chinese somatization.

In the only cross-cultural patient comparison to date, G. Parker, Cheah, and Roy (2001) found that 60% of a Malaysian Chinese depression sample nominated a somatic symptom as their chief complaint on self-report compared with 13% of a Euro-Australian sample. Chinese respondents were somewhat more likely to endorse somatic symptoms but had a much stronger tendency to endorse fewer psychological symptoms. These findings are compatible with the idea that Chinese individuals emphasize somatic symptoms as part of the patient role when engaging the health care system (Simon et al., 1999; Yen et al., 2000). At the same time, they suggested that the truly distinctive cross-cultural feature is the emphasis on psychological symptoms observed in Western samples.

We tested two central hypotheses in the present study: First, we predicted that the Chinese sample would emphasize somatic symptoms of depression more than the North American sample. Second, we predicted that the North American sample would emphasize psychological symptoms of depression more than the Chinese sample. We also anticipated that the latter hypothesis would yield stronger and more consistent findings. That said, a general prediction in favor of Chinese somatization and North American psychologization did not necessarily mean that these phenomena would be apparent regardless of the assessment modality used. The influence of modality has been subject to speculation and was also addressed.

When Might the Chinese Emphasize Somatic Symptoms of Depression?

Few researchers use multiple assessment modalities to study cross-cultural symptom presentation despite their potential influence on the results (F. M. Cheung, 1995). For example, symptoms

[1] Like *Chinese*, the term *Western* describes culture at a general and abstract level. As used here, the term refers to Canada, the United States, Western Europe, Australia, and New Zealand.

are more likely to be uncovered when an interviewer has the opportunity to ask follow-up questions and to probe more deeply (e.g., Bridges & Goldberg, 1985; Sayar, Kirmayer, & Taillefer, 2003). Kirmayer et al. (1993) found many patients in North America who presented exclusively somatic symptoms on spontaneous self-reports but who endorsed psychological symptoms when asked directly. A recent study of Chinese Americans in primary care found that 76% spontaneously reported somatic symptoms, whereas only 14% spontaneously reported psychological symptoms; moreover, no participant spontaneously reported depressed mood, but 93% endorsed depressed mood on a questionnaire (Yeung, Chang, Gresham, Nierenberg, & Fava, 2004). B. Chan and Parker (2004) argued that careful questioning of Chinese patients elicits more psychological symptoms, whereas relying on open-ended self-descriptions by the patient yields an overwhelmingly somatic picture. In general, Chinese individuals emphasize different problems in different contexts, with ramifications for studies of symptom reporting (F. M. Cheung, 1984).

Because the few cross-cultural comparisons in this area have relied on single assessment modalities, the influence of modality on the findings remains unclear. This issue is important clinically, especially if different approaches lead to different symptom profiles and conclusions about the patient. The current study, therefore, uses three different assessment modalities designed to reflect common approaches to patient report of symptoms used in research and clinical practice: (a) spontaneous report of problems on an unstructured clinical interview, (b) clinician-rated symptoms on a structured clinical interview, (c) and a symptom rating scale in questionnaire form. Agreement across these modalities would provide the most compelling support for any results. That said, if the research hypotheses are inconsistently confirmed, it would become necessary to discuss the ways in which assessment modality shapes cross-cultural differences in symptom presentation.

Why Might the Chinese Emphasize Somatic Symptoms?

Regardless of whether cross-cultural differences in symptom presentation are observed across modalities, the underlying reasons for these differences remain to be explored. When psychoanalytic writers first introduced the term *somatization,* they had in mind a specific process whereby anxious affect generated by intrapsychic conflict is suppressed and reaches consciousness only through visceral expression (Craig & Boardman, 1990). Expressing emotional problems through physical symptoms was seen as a way of avoiding anxiety-provoking content and, thus, was viewed as an *immature defense* (Draguns, 1996). This perspective has been emphatically rejected as out of date, mired in Western preference for psychological explanations, and compromised by failure to consider the role of somatic metaphor in Chinese culture (F. M. Cheung, 1995). F. M. Cheung (1984) argued that such views are remnants of mind–body dualism, noting that a somatic emphasis does not preclude simultaneous awareness of psychological experience.

Leff (1981) argued that Chinese somatization results from a lack of a well-developed emotional vocabulary in the Chinese language—Chinese depressed individuals, lacking the necessary words, resort to somatic descriptions. In response, Beeman (1985) argued against privileging mind–body dualism and criticized the notion that languages can be classified as primitive or advanced. The assumption that the Chinese language lacks emotion words has also been attacked as simply untrue (Chang, 1985; F. M. Cheung, 1995). Nonetheless, many Chinese terms for emotional experience are rooted in the body, and in consequence, Chinese respondents spontaneously use somatic metaphors when asked about the meaning of emotional expressions (Tung, 1994). These links are observable even when bilingual Chinese Americans are speaking English and decrease with greater acculturation to American culture (Tsai, Simeonova, & Watanabe, 2004).

If certain symptoms tend not to be reported in a particular culture, further inquiry into the social implications of these symptoms is warranted. Goffman (1963) described psychiatric stigma as a sense of spoiled identity among sufferers and those around them, which motivates individuals to avoid psychiatric classification. Somatization allows psychologically distressed individuals to inhabit the sick role in their societies without bearing the burden of stigma (Goldberg & Bridges, 1988). There is now considerable evidence that mental illnesses are stigmatized in Chinese societies (B. Chan & Parker, 2004; Chung & Wong, 2004; T.-Y. Lin & Lin, 1981; Parker, Gladstone, & Chee, 2001; Ryder, Bean, & Dion, 2000; Shon & Ja, 1982). Although symptoms are tolerated when the illness can be kept within the family (T.-Y. Lin, Tardiff, Donetz, & Goresky, 1978), Chinese families are likely to shield the afflicted member from the rest of the community when the need arises for direct contact with psychiatric health service providers (Kirmayer, 1989), with consequences for help seeking and delay of treatment (Li, Logan, Yee, & Ng, 1999). More somatic symptoms should be observed when psychological symptoms are stigmatized, especially when unfamiliar clinicians conduct interviews. The potential role of stigma as a mediator between culture and symptom presentation is examined in the present study.

Cultural differences in symptom presentation may also result from variations in processing and expressing affect (Sayar et al., 2003). *Alexithymia* describes individuals who have difficulties in experiencing clearly identifiable emotional states and in communicating these states to others. Individuals who score highly on this trait are particularly likely to misinterpret emotional arousal as physical symptoms and tend to have low scores on emotional intelligence (J. D. A. Parker, Taylor, & Bagby, 2001), a trait linked with healthy functioning in Western societies (Bar-On, 2000). Dion (1996) has argued that East Asian cultures might be unduly pathologized by the alexithymia construct; nonetheless, it has the advantage of measuring an ideal Western emotional style. Indeed, one aspect of alexithymia—externally oriented thinking—is assessed as a set of values and preferences rather than as a set of difficulties. A preference for this thinking style in China would not be pathological and would fit with the literature on cultural variation in self-construal (Markus & Kitayama, 1991).

F. M. Cheung (1995) noted that cross-cultural somatization research overwhelmingly offers explanations on a post hoc basis, rather than building relevant explanatory variables into the study design. Simultaneous consideration of both cultural and individual levels allow researchers to strengthen their explanations by *unpackaging culture,* showing that specific variables explain differences both within and across cultures (Heine et al., 2001; Heine, Lehman, Peng, & Greenholtz, 2002). Two testable explanations for the cross-cultural differences in symptom presentation have been reviewed: stigmatization of certain symptoms and attention paid to psychological versus somatic experience. We begin the

process of trying to understand Chinese somatization and Western psychologization by exploring these two possibilities.

Methods

Sites

The Chinese sample was composed of clinical outpatients from the Neurosis Clinic, Center for Psychological Research, Hunan Medical University—2nd Affiliated Hospital, in Changsha, Hunan, People's Republic of China. China has a median age of 33.7 years and a life expectancy of 72.9 years (Central Intelligence Agency, 2007). Changsha, the capital of Hunan province, has a metropolitan area of approximately 6 million people. The Neurosis Clinic is the premier site in the region for the treatment of psychiatric problems, including those that in North America would be termed *mood, anxiety, somatoform,* and *personality disorders.*

The North American sample was composed of clinical outpatients from the Depression Clinic, Mood and Anxiety Program, Centre for Addiction and Mental Health in Toronto, Ontario, Canada. The country has a median age of 39.1 years and a life expectancy at birth of 80.3 years (Central Intelligence Agency, 2007). Toronto, the capital of Ontario, has a metropolitan area of approximately 4.5 million people. The Mood and Anxiety Program, like the Neurosis Clinic in Changsha, is the premier site for the treatment of mood and anxiety disorders in the region.

Participants

All outpatients who entered the former facility between April 1st and September 30th, 2002, or entered the latter facility between April 20th and September 13th, 2002, were eligible. Potential participants were immediately excluded if (a) their initial presentation included symptoms of psychosis, mania, or cognitive impairment, (b) they were younger than 18 or older than 65, or (c) they lived outside the metropolitan area. Potential participants were asked for permission to use the results of their assessment, were informed that nonparticipation would not affect their care, and provided informed consent.

In Changsha, a total of 215 outpatients were approached for the study, 208 (97%) of whom provided informed consent. Twelve additional participants (6%) were excluded because of psychotic, manic, or neurocognitive symptoms that became apparent over the course of the assessment. All participants in Changsha reported a Han Chinese background. In Toronto, a total of 163 outpatients were approached for inclusion in the study, 155 (95%) of whom provided informed consent. Nine participants (6%) were excluded because of psychotic, manic, or neurocognitive symptoms. Twenty-three participants (14%) in Toronto reported a cultural background that was not Euro-Canadian and were not included for the present study. In total, 196 patients in Changsha and 123 patients in Toronto were included.

To maximize sample comparability, post hoc exclusion criteria were applied to address two problems. First, the depression clinic in Toronto works with depressed and mixed cases but refers pure anxiety or personality disorder patients elsewhere, a narrower mandate than the neurosis clinic in Changsha. Second, the Toronto site occasionally receives medication consults for patients without current psychopathology. One possible solution would be to insist that potential participants meet the criteria for major depressive disorder outlined in the *Diagnostic and Statistical Manual of Mental Disorder* (4th ed.; *DSM–IV*; American Psychiatric Association, 1994); however, the effect would be to privilege one culture's definition of the disorder under study. Describing schizophrenia, Kleinman (1988) demonstrated that insistence on strict and culturally specific criteria masks important variation. To address these concerns, only patients with at least one of the core symptoms of depression or neurasthenia, across the *DSM–IV*, International Classification of Diseases (ICD-10; World Health Organization, 1992), and Chinese Classification of Mental Disorders (CCMD-2-R; Chinese Medical Association and Nanjing Medical University, 1995) systems, were included in the study. The same procedure was used in both samples, leading to the removal of 21 participants (11%) in Changsha and 16 participants (13%) in Toronto.

The final Changsha sample consisted of 80 men and 95 women of Han Chinese background with a mean age of 31 years (range = 18–65, SD = 11). Of the 175 participants, 6 (3.4%) had not finished elementary school, 39 (22.3%) had finished elementary school only, 68 (38.9%) had finished secondary school, 58 (33.1%) had a bachelor's degree, and 4 (2.3%) had a master's degree. One hundred forty-three participants (81.7%) had received some form of treatment in the previous month, and 74 (42.3%) first sought help for their current problem during that month.

The final Toronto sample consisted of 46 men and 61 women of Euro-Canadian background with a mean age of 36 years (range = 18–60, SD = 10). Of the 107 participants, 9 (8.4%) had finished only elementary school, 31 (29.0%) had finished secondary school, 49 (45.8%) had a bachelor's degree, 16 (15.0%) had a master's degree, and 2 (1.9%) had doctoral degrees. Eighty-five participants (79.4%) had received some form of treatment in the previous month, and 23 (21.5%) first sought help for their current problem during that month.

There were no significant sample differences for sex, $\chi^2(1, N = 282) = 0.20$, *ns*, or treatment in the past month, $\chi^2(1, N = 282) = 0.22$, *ns,* but there were significant differences in age, $t'(238.6) = 3.89$, $p < .05$, and help seeking in the past month, $\chi^2(1, N = 282) = 12.7$, $p < .05$. Chinese participants tended to be younger and to have sought help more recently. The age difference noted earlier for China and Canada as a whole is mirrored in the two samples, suggesting that they are demographically representative. Also, the definition of treatment seeking did not include informal or nonprofessional help seeking, which in Chinese patients often delays formal treatment (Ryder et al., 2000). A higher education level was found for participants at the Toronto site (Mann–Whitney $U = 5{,}970.5$, $p < .05$), largely because of a subgroup of Chinese patients who did not complete elementary school.

Interview

All participants were assessed with the Structured Clinical Interview for *DSM–IV,* Axis I, Patient Version, modules for mood disorders (First, Spitzer, Gibbon, & Williams, 1997). Several modifications were made to improve the instrument for cross-cultural use:

1. Additional questions were added, assessing unique depression and neurasthenia criteria provided by the

ICD-10 and the CCMD-2-R, to expand the number of somatic and psychological symptoms considered.

2. All symptoms were assessed, regardless of syndrome criteria, as suggested by Ballenger et al. (2001).

3. A neurasthenia section was developed according to international and indigenous Chinese diagnostic criteria.

4. The rating scale was expanded to allow for dimensional assessment of symptom severity, facilitating multivariate analyses. Absent symptoms were coded as 0 if they were completely absent and as 1 if they were present but beneath the threshold for diagnosis and/or clinical significance. Clinical symptoms were coded as 3 if the symptom was present and severe and as 2 in all other cases. This system is based on the Present State Examination (Wing, Sartorious, & Üstün, 1998).

The interview was developed in English and then translated into Chinese by a bilingual psychiatrist. The English and Chinese versions of the interview were scrutinized by a bilingual doctoral student in clinical psychology with no prior exposure to the instrument. Only a few minor problems were detected, and improvements were based on discussions among the translator, checker, and principal investigator.

Spontaneous Problem Report (SPR). The SPR assessed symptoms and other problems in an open-ended manner. Several interview prompts were provided, designed to elicit problems in general and to encourage the patient to elaborate on them. Interviewers were instructed not to inquire about problems that were not spontaneously reported and not to suggest specific problems. The objective was to determine which symptoms patients were willing to identify to the interviewer without direct questioning.

The first four problems reported by each patient were coded by pairs of trained research assistants using a coding system developed by reviewing the depression and neurasthenia sections of the modified Structured Clinical Interview for *DSM–IV,* Axis I, Patient Version, and adding anxiety symptoms, practical life problems, and Chinese idioms of distress (Kleinman, 1986). The resulting system contained 44 categories (see the Appendix). Within each sample, the two research assistants each coded 60% of the problems, allowing for some overlap. Kappa coefficients calculated for the randomly selected overlapping areas were adequate for both Chinese and North American samples and were .80 and .84, respectively.

To organize categories into a small number of useful groups, the 44 categories were further divided into somatic and psychological classes. Separate classes were also created for anxiety symptoms and reversed physical symptoms (i.e., hyperphagia, hypersomnia, and agitation) but are not considered further here. Sorting was done by two undergraduate research assistants with 100% agreement. Percentages of total responses were then used to calculate somatic and psychological symptom reporting subscales.

Structured Clinical Interview (SCI). The first section of the SCI was based on *DSM–IV* criteria for a current major depressive episode, supplemented by criteria for (a) *DSM–IV* atypical and melancholic subtypes, (b) ICD-10 major depressive episode plus atypical and somatic subtypes, and (c) CCMD-2-R major depressive episode plus neurotic depression. The second section was based on CCMD-2-R criteria for neurasthenia, supplemented by additional details from ICD-10. Finally, the interviewer completed an overall impairment scale assessing mental/physical health and workplace/academic, family, and interpersonal problems. The purpose of the SCI was to assess the patient's responses when directly questioned about symptoms, with an approach common in research and in some clinical settings.

To generate variables for somatic and psychological reporting, it was first necessary to categorize the symptoms. First, we used the same method described for the SPR to code symptoms from the depression and neurasthenia modules into somatic and psychological classes. Two undergraduate research assistants coded the symptoms separately, with agreement on every symptom except for dizziness. Second, a principal axis factor analysis with Promax rotation was conducted on the SCI symptoms in the combined sample. The scree plot indicated a two-factor solution, and the two factors showed clear division between somatic and psychological symptoms. This solution matched the one obtained by coding the symptoms, although it also showed that three symptoms did not exceed a minimum loading of .30. Analyses of cross-cultural equivalence for the SCI Somatic and Psychological subscales are presented in the Results section.

Interviewers. Interviews in Changsha were conducted by one doctoral student in clinical psychology and two clinical psychologists; interviews in Toronto were conducted by three doctoral students in clinical psychology and one master's-level psychometrician. All interviewers had considerable prior experience with conducting clinical and structured interviews, both for clinical purposes and as part of research studies. Interviewers in Changsha were trained, observed, and approved by a bilingual psychiatrist experienced in collecting clinical research data. Interviewers in Toronto had been similarly trained and approved for previous research with the Structured Clinical Interview for *DSM–IV,* Axis I, Patient Version, but were not directly observed for the present study. None of the interviewers had previous clinical relationships with any of the patients.[2]

Symptom Questionnaire (SxQ)

After completing the interview, patients were given the SxQ to complete privately and return to the interviewer on the same day. Four instruments, two originally developed in English and two in Chinese, contributed items. Pre-existing and prevalidated translations were used when available. The remaining questionnaires were translated by a bilingual undergraduate research assistant with previous formal training and experience in Chinese translation and were back translated by a second bilingual research assistant with a background in psychology. All of the items were rated on a 0–3 scale. Inclusion of the SxQ allowed assessment of

[2] Note that Andrew G. Ryder carried out 57% of the interviews in Toronto. As described previously, the interview was used to develop four measures of symptom presentation: (a) SPR somatic, (b) SPR psychological, (c) SCI somatic, and (d) SCI psychological. No significant difference was found on any *t* test comparing the 61 protocols collected by Ryder, and the combined group of 46 protocols collected by the other three interviewers on any of these measures (all $ps > .30$). Only Ryder was aware of the study hypotheses.

patient responses to specific questions completed in private, without the presence of a clinician.

Center for Epidemiological Studies Depression Scale. The Center for Epidemiological Studies Depression Scale (Radloff, 1977) is a 20-item measure of depression designed for use in multisite survey research. Although it has primarily been used in Western samples, it has adequate psychometric properties in Chinese samples (C. K. Cheung & Bagley, 1998; N. Lin, 1989; Zhang & Norvilitis, 2002).

Chinese Depression Scale. The Chinese Depression Scale (N. Lin, 1989) is a Chinese translation of the Center for Epidemiological Studies Depression Scale that includes six additional items designed to assess Chinese-specific experiences of depression. Research has established adequate psychometric properties in a Chinese sample (N. Lin, 1989). The six items unique to the Chinese Depression Scale have not been evaluated outside China.

General Health Questionnaire. The 30-item version of the General Health Questionnaire (Goldberg, 1972; Goldberg & Williams, 1988) was designed to detect cases of minor psychiatric morbidity (i.e., unipolar depression and anxiety). An original item pool of 200 common symptoms was developed and the 30 items that best predicted the presence of a psychiatric disorder were incorporated into the scale. This instrument has been validated in a Chinese context (D. W. Chan & Chan, 1983).

Chinese Health Questionnaire. Cheng and Williams (1986) developed the 30-item Chinese Health Questionnaire as an alternative to the General Health Questionnaire for the study of Chinese samples. This scale has also been validated in a Chinese context (Choong & Wilkinson, 1989), although not in a North American one. In the present study, the two questionnaires were combined to first present the General Health Questionnaire in its original order, followed by the 15 items unique to the Chinese Health Questionnaire.

Construction of the SxQ. To develop somatic and psychological subscales for the SxQ, we used the same method followed for the SCI to sort the items from the four constituent instruments. First, the 71 items were sorted into positively and negatively coded items. Only the negatively coded items were used in the current study, because previous research has shown that positively coded items tend to form a single factor (e.g., Huppert, Walters, Day, & Elliot, 1989). The 51 remaining items were then coded by the same trained research assistants into somatic, psychological, or ambiguous (i.e., unclear or a mixture of somatic and psychological) symptoms with 94% agreement. Nine items were dropped because of rater disagreement or because raters agreed that an item was ambiguous.

The 42 items were then analyzed with principal axis factor analysis with Promax rotation. Visual inspection of the scree plot yielded a three-factor solution, with Psychological, Somatic, and Interpersonal factors. The 10 items that loaded on the Interpersonal factor were dropped because they were not relevant to the research question. Analyses of cross-cultural equivalence for the SxQ Somatic and Psychological subscales are presented in the Results section.

Additional Scales

Following the SxQ, participants were given two additional scales, chosen to assess potential explanatory variables.

Demoralization Scale. Link's (1987) Demoralization Scale is a four-item scale derived from a larger set of items designed to assess the experience of stigma by individuals suffering from psychopathology. Each item is rated on a 5-point scale ranging from *strongly disagree* to *strongly agree*. Internal consistency coefficients were $\alpha = .72$ in the Chinese sample and $\alpha = .68$ in the North American sample.

Toronto Alexithymia Scale. The Toronto Alexithymia Scale (Bagby, Taylor, & Parker, 1994) is a 20-item scale designed to measure the tendency to not clearly experience or articulate emotional states, with the negative pole often being associated with psychological mindedness. Three subscales can also be generated: Difficulty Identifying Feelings, Difficulty Describing Feelings, and Externally Oriented Thinking. The instrument has been tested and validated in 18 languages, including Chinese, across 19 nations (Taylor, Bagby, & Parker, 2003) and has been validated in Chinese psychiatric patients (Zhu et al., 2007). Each item is rated on a 5-point scale ranging from *strongly disagree* to *strongly agree*. Internal consistency coefficients were $\alpha = .81$ in the Chinese sample and $\alpha = .75$ in the North American sample.

Results

Clinician-Rated Impairment

A clinician-rated Impairment scale was generated by summing the four impairment items at the conclusion of the SCI. No significant group difference was found, $t'(164.54) = 1.42$, *ns*.[3] This null finding lessens concerns that observed cross-cultural differences in specific types of symptoms might have been due to an overall group difference in impairment.

Cross-Cultural Equivalence

Cross-cultural measurement requires that scales have equivalent meanings in the cultures under consideration. The best evaluation of equivalence involves structural equation modeling and item response analysis—techniques requiring large sample sizes, preferably large enough to allow sample splitting. Because our sample sizes were not sufficient for either of these methods, it was necessary to use a less rigorous approach recommended by cross-cultural methodologists for assessment of structural and measurement equivalence in smaller samples (van de Vijver & Leung, 1997). First, we tested structural equivalence by using identity and proportionality coefficients to compare the two pattern matrices (van de Vijver, 2003). Second, we used ordinal regression to test for uniform and nonuniform differential item functioning across the two samples. These analyses were conducted separately for (a) SCI Somatic, (b) SCI Psychological, (c) SxQ Somatic, and (d) SxQ Psychological subscales. Following Zumbo (1999), individual items served as dependent variables, and predictors were added in three steps: (a) total score, (b) total score + cultural group, (c) total score + cultural group + (total score × cultural group). A significant chi-square difference accompanied by a large change in the Nagelkerke R^2 (i.e., $\geq .13$) between Steps 1 and 2 indicated uniform differential item functioning and between Steps 2 and 3 indicated nonuniform differential item functioning.

[3] Given the unequal group sizes, Welch's t test (i.e., t') was used throughout this study in place of the regular t test, to account for potential differences in variance. One consequence of this test is reduction in degrees of freedom, which are no longer restricted to whole numbers.

Table 1
Principal Axis Factor Analysis of Structured Clinical Interview Items

Item	Changsha		Toronto	
	Somatic	Psychological	Somatic	Psychological
Insomnia/hypersomnia	**.84**	−.09	.77	−.13
Fatigue/loss of energy	**.48**	.19	**.60**	.18
Leaden paralysis	**.40**	.05	**.30**	.19
Deterioration	**.39**	.16	**.65**	.02
Disturbed sleep	**.84**	−.08	**.67**	−.09
Depressed mood	.05	**.63**	.11	**.71**
Loss of interest	−.07	**.73**	.26	**.46**
Worthlessness/guilt	−.06	**.83**	−.17	**.76**
Suicidality	.07	**.63**	−.04	**.69**
Hopelessness	−.01	**.59**	.01	**.66**
Lack of emotions	.15	**.66**	.07	**.31**
Low self-esteem	.00	**.84**	−.08	**.68**
Social avoidance	.01	**.68**	.12	**.45**
Factor intercorrelation	.49		.51	

Note. Loadings greater than or equal to .30 are shown in boldface.

SCI. The initial comparison of Procrustes-rotated SCI items revealed problems with two items on the SCI. First, psychomotor retardation/agitation loaded on both factors in the North American sample. Second, poor concentration and decision making loaded on the Psychological factor in the Chinese sample and on the Somatic factor in the North American sample. These two items were dropped from the final scales.[4] Three-step ordinal regression analysis did not identify any items with differential item functioning in either the Psychological or the Somatic subscale. The final solution is presented in Table 1; significant loadings were converted to unit-weighted scores and summed to generate Somatic and Psychological subscales.

The final Somatic and Psychological subscales had acceptable internal consistency coefficients in the Chinese sample (αs = .76 and .89, respectively) and in the North American sample (αs = .75 and .83, respectively). All corrected item–total correlations and mean interitem correlations exceeded .30. Following van de Vijver (2002), structural equivalence was assessed with identity and proportionality coefficients. Identity coefficients for the Somatic and Psychological subscales were .93 and .95, respectively; proportionality coefficients (i.e., Tucker's Φ) were .93 and .96, respectively. These results demonstrate that the final Somatic and Psychological subscales of the SCI are sufficiently reliable and have largely the same structure in both cultures, thus permitting cross-cultural comparison.[5]

SxQ. The initial comparison of Procrustes-rotated SxQ items revealed problems with three items. In all three cases, an item relating to concentration or alertness loaded on the Psychological factor in the Chinese sample and on the Somatic factor in the North American sample. Because a similar pattern effect was observed on the SCI, these results suggest that thinking difficulties may be understood or experienced differently in the two cultures. The three items were dropped from the final scales. Three-step ordinal regression analysis did not identify any items with differential item functioning in either the Somatic or the Psychological subscale. The final solution is presented in Table 2; significant loadings were converted to unit-weighted scores and summed to generate Somatic and Psychological subscales.

The final Somatic and Psychological subscales had acceptable internal consistency coefficients in the Chinese sample (αs = .85 and .93, respectively) and in the North American sample (αs = .84 and .94, respectively). All corrected item–total correlations and mean interitem correlations exceeded .30. Identity coefficients for the Somatic and Psychological subscales were .87 and .94, respectively; proportionality coefficients (i.e., Tucker's Φ) were also .87 and .94, respectively. Although there are no established criteria for Tucker's Φ, the Somatic subscale had a fit slightly lower than the commonly used cutoff of .90. Closer inspection of the factor loadings revealed that overall fit was reduced by large absolute differences in loadings for two items: heart palpitations and restless and disturbed nights. Because these items maintained clear loadings on the expected factor, they were retained in the analyses that followed. Taken together, these results demonstrate that the final Somatic and Psychological subscales of the SxQ are sufficiently reliable and have largely the same structure in both cultures, thus permitting cross-cultural comparison.

Scale Intercorrelations

After generation of the SPR, SCI, and SxQ subscales and before evaluation of cross-cultural differences, all variables were intercorrelated. Separate sets of Pearson's *r* coefficients were generated

[4] The removal of problematic items with poor psychometric properties or poor cross-cultural equivalence improves measurement at the expense of comprehensiveness; in effect, problematic but potentially important symptoms are excluded. We thus reran all major analyses with the original rater-identified scales. Results showed the same pattern of significance.

[5] Although *N* was insufficient to permit confirmatory factor analysis with individual items, these analyses of cross-cultural equivalence were followed up with randomly constructed item parcels of 2 to 3 items (SCI) or 3 to 4 items (SxQ). Across each instrument and cultural group, the two-factor model (Somatic and Psychological) showed good fit, significantly better than a single-factor model. Full details of these follow-up analyses are available from Andrew G. Ryder on request.

Table 2
Principal Axis Factor Analysis of Symptom Questionnaire Items

Item	Changsha		Toronto	
	Somatic	Psychological	Somatic	Psychological
Poor appetite	**.40**	.08	**.41**	.26
Restless sleep	**.61**	.09	**.89**	−.13
Headache	**.46**	.06	**.30**	.12
Heart palpitations	**.66**	−.21	**.41**	.25
Discomfort or pressure in chest	**.73**	−.11	**.40**	.19
Shaking or numbness in limbs	**.54**	.10	**.41**	.17
Loss of sleep due to worry	**.58**	.12	**.85**	−.05
Respiration not smooth	**.64**	−.16	**.32**	.10
Aches and pains in body	**.61**	−.09	**.36**	.09
Weakness of nerves	**.45**	.27	**.31**	.28
Restless and disturbed nights	**.58**	.13	**.99**	−.20
Difficulty shaking off blues	−.04	**.65**	.07	**.72**
Feeling depressed	.17	**.54**	.12	**.75**
Feeling everything is an effort	.27	**.43**	.17	**.54**
Feeling life is a failure	−.27	**.79**	−.22	**.81**
Fearful	.23	**.43**	−.02	**.58**
Less talk than usual	.11	**.38**	.12	**.55**
Loneliness	.14	**.61**	−.15	**.68**
Crying spells	.17	**.38**	.13	**.40**
Feeling sad	−.03	**.78**	.13	**.73**
Difficulty "getting going"	.30	**.51**	.05	**.54**
Loss of self-confidence	−.15	**.83**	.02	**.56**
Feeling life is hopeless	.09	**.59**	−.01	**.77**
Feeling worthless	−.13	**.86**	−.07	**.82**
Feeling life is not worth living	−.09	**.74**	.08	**.73**
Depressed and unhappy	.05	**.67**	.14	**.71**
Hard to enjoy things	.06	**.58**	.21	**.54**
Difficulty facing problems	−.03	**.67**	.04	**.64**
Factor intercorrelation	.60		.59	

Note. Loadings greater than or equal to .30 are shown in boldface.

Table 3
Intercorrelations Between Interview and Questionnaire Measures

Scale and subscale	SPR		SCI		SxQ		LDS: Stigma	TAS-20		
	Som	Psy	Som	Psy	Som	Psy		DIF	DDF	EOT
SPR										
Somatic	—	−.58*	.08	−.18*	.13	−.10	−.14	.19*	−.21*	−.18*
Psychological	.66*	—	.15*	.38*	−.09	.15*	.15	.11	.15*	.12
SCI										
Somatic	.39*	−.13	—	.46*	.46*	.30*	.16*	.25*	.15*	.17*
Psychological	.07	.13	.46*	—	.14	.47*	.25*	.23*	.19*	.14
SxQ										
Somatic	.24*	−.19*	.44*	.47*	—	.61*	.17*	.35*	.25*	.14
Psychological	.11	.03	.35*	.73*	.64*	—	.27*	.36*	.35*	.08
LDS: Stigma	.01	−.08	.22*	.35*	.26*	.35*	—	.25*	.26*	.20*
TAS-20										
DIF	.12	−.11	.22*	.30*	.41*	.35*	.25*	—	.72*	.23*
DDF	.07	−.01	.19*	.16	.12	.15	.13	.62*	—	.27*
EOT	.17	.02	.30*	.21*	.15	.21*	.03	.31*	.45*	—

Note. Coefficients from Changsha are reported above the diagonal, coefficients from Toronto are reported below the diagonal. SPR = Spontaneous Problem Report; SCI = Structured Clinical Interview; SxQ = Symptom Questionnaire; LDS = Link Demoralization Scale; TAS-20 = Toronto Alexithymia Scale; Som = somatic; Psy = psychological; DIF = Difficulty Identifying Feelings; DDF = Difficulty Describing Feelings; EOT = Externally Oriented Thinking.
* $p < .05$.

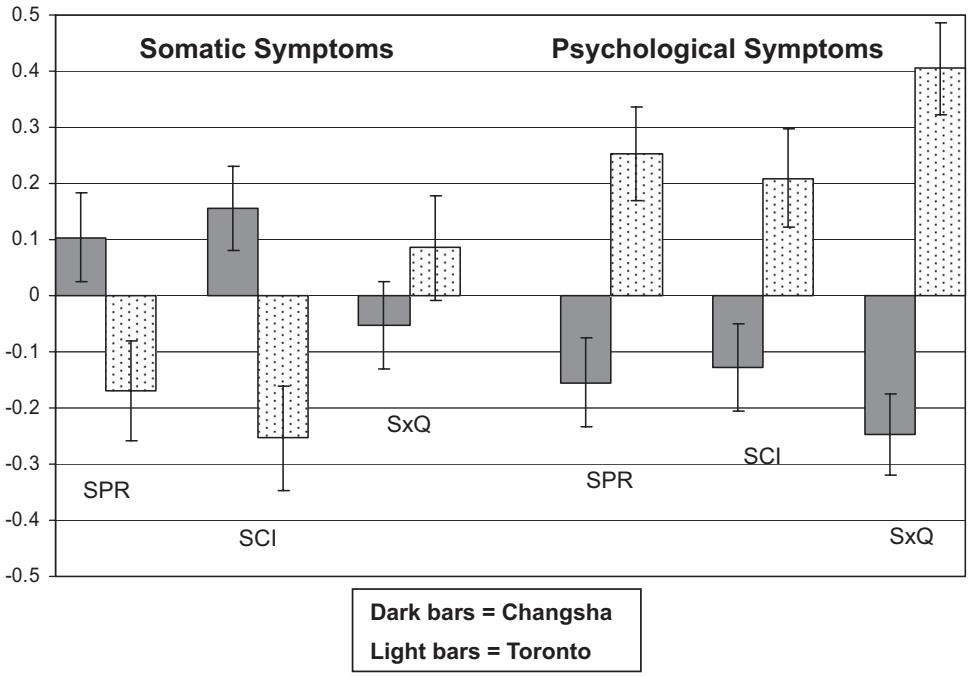

Figure 1. Mean *z* scores for three indices of symptom reporting in Changsha and Toronto. Error bars represent standard error of the mean. SPR = Spontaneous Problem Report; SCI = Structured Clinical Interview; SxQ = Symptom Questionnaire. Error bars represent standard error of the mean.

for the Chinese and North American samples, respectively. The resulting matrix is shown in Table 3.

Cross-Cultural Differences in Symptom Reporting

Somatic symptom reporting. Figure 1 shows *z* scores for somatic and psychological symptoms in both samples. Participants in the Chinese sample endorsed a significantly higher level of somatic symptom reporting on the SPR and the SCI than did participants in the North American sample, $t'(246.88) = 2.31$ and $t'(229.17) = 3.41$, respectively, both ps $< .05$; ds $= 0.28$ and 0.42, respectively. No significant differences were obtained with the SxQ, $t'(233.16) = -1.14$, *ns*, $d = 0.14$; indeed, the direction of the effect was opposite to that predicted. Follow-up 2 × 2 analyses of covariance (i.e., Culture × Sex, covarying out age and education) reduced the SPR effect to a nonsignificant trend, $F(1, 277) = 2.74$, $p < .10$. A negative relation was found between education and somatic symptom reporting, $F(1, 277) = 4.13$, $p < .05$. For SCI, meanwhile, a significant cultural difference was maintained, $F(1, 277) = 11.12$, $p < .05$, with older participants more likely to report somatic symptoms, $F(1, 277) = 11.79$, $p < .05$. Older participants were also more likely to report somatic symptoms on the SxQ, $F(1, 277) = 7.61$, $p < .05$.

Psychological symptom reporting. Participants in the North American sample endorsed a significantly higher level of psychological symptom reporting on the SPR, SCI, and SxQ than did participants in the Chinese sample, $t'(257.02) = 3.55$, $t'(245.32) = 2.86$, and $t'(223.76) = 5.60$, respectively, all ps $< .05$; ds $= 0.43$, 0.35, and 0.69, respectively. Taken together, these findings demonstrate a consistently greater level of psychological symptom reporting in the North American sample regardless of assessment method. Follow-up analyses of covariance (i.e., crossing culture with sex and covarying for age and education) maintained the same pattern. On the SCI, older participants were significantly more likely to report psychological symptoms, $F(1, 277) = 12.93$, $p < .05$, and on the SxQ, women were more likely to report psychological symptoms than were men, $F(1, 277) = 3.60$, $p < .05$. This latter analysis was rerun with the Culture × Sex interaction included, revealing that the sex effect was due entirely to Chinese women being significantly more likely to report psychological symptoms than Chinese men, $F(1, 276) = 4.18$, $p < .05$.

Unpackaging Cross-Cultural Differences in Symptom Reporting

Participants in the Chinese sample reported greater levels of stigma and alexithymia than did participants in the North American sample, as expected, $t'(244.22) = 2.12$ and $t'(190.85) = 2.69$, respectively, both ps $< .05$; ds $= 0.25$ and 0.34, respectively. Looking at the subscales of the Toronto Alexithymia Scale revealed, as predicted, that the alexithymia effect was carried entirely by the Externally Oriented Thinking subscale, $t'(186.82) = -6.49$, $p < .05$, $d = 0.83$. Neither the Difficulty Identifying Feelings subscale nor the Difficulty Describing Feelings subscale showed a significant effect, $t'(204.92) = 0.75$ and $t'(185.65) = 0.08$, both *ns*. This pattern of effects suggests a less pathological interpretation of the Toronto Alexithymia Scale findings.

Stigma was positively correlated with both somatic and psychological symptom reporting on the SPR and SCI in both cultures. These results suggest that increased demoralization resulted from

increased psychopathology in general, rather than being specific to either psychological or somatic symptoms. On the other hand, cultural differences in externally oriented thinking combined with positive correlations between this variable and somatic symptom reporting suggests that externally oriented thinking might mediate the relation between culture and somatic symptoms. Following the three-step model proposed by Baron and Kenny (1986), we used linear regression to predict (a) SCI somatic symptoms with cultural group, (b) externally oriented thinking with cultural group, and (3) SCI somatic symptoms with cultural group and externally oriented thinking. As expected, cultural group independently predicted SCI somatic symptoms and externally oriented thinking, βs = .20 and .38, respectively, both *p*s $< .05$. When cultural group and externally oriented thinking were considered together as predictors of SCI somatic symptoms, the former was reduced to a nonsignificant trend, $\beta = .11$, *ns*, whereas the latter remained significant, $\beta = .23$, $p < .05$. These results suggest that externally oriented thinking partially mediates the relation between cultural group and somatic symptoms, at least on the SCI.

Discussion

We began this article with the premise of Chinese somatization, but after reviewing the mixed literature on the subject, we noted that Western psychologization might instead be stronger and more consistent. This possibility has been borne out by our data. Across three methods of assessment, participants in Toronto reported significantly more psychological symptoms as compared with participants in Changsha. Effect sizes were in the medium range described by Cohen (1992), approximately half a standard deviation. Cultural differences in somatic symptoms were more inconsistent and dependent on assessment method—no effects were observed on SxQ, and SPR effects were reduced to trends after controlling for demographics. Effect sizes for significant somatic symptom differences were in the small-to-medium range.

Previous cross-cultural comparisons have either argued for the importance of the patient role in understanding somatic symptom presentation (Simon et al., 1999; Yen et al., 2000) or hinted at the greater importance of Western psychologization (G. Parker et al., 2002). We believe that our findings are consistent with both views. The cultural difference in somatic symptoms was strongest when participants were asked specific questions during an encounter with an unfamiliar clinician (on the SCI). This difference was smaller when participants played a role in shaping their own illness narrative (on the SPR) and disappeared entirely when they were responding privately to a questionnaire (on the SxQ). The demands of the clinical situation and the patient role may have encouraged the endorsement of somatic symptoms when communicating directly with a clinician but not when responding privately.

Although the mixed somatic symptom findings may reflect the demands of the patient role, as proposed by previous researchers, we do not believe the same can be said for our psychological symptom findings. Both of the research sites are well known as specialty clinics for the treatment of emotional distress by psychiatrists. Patients who present at these sites know that they are there to discuss psychosocial problems, and most of the patients did describe such problems, even if they also described many somatic symptoms. Indeed, use of psychiatric centers suggests that current findings represent conservative estimates of actual cross-cultural difference.

Clinical samples, nonetheless, do not necessarily represent all people suffering from a given set of symptoms. Participants had to present for help at a major urban psychiatric center. There is pronounced cross-cultural variation in pathways taken by patients from different cultures before seeking and receiving psychiatric care, and research on the ways in which these help-seeking strategies are affected by symptom presentation is much needed. At the same time, urban, depressed help seekers in a rapidly modernizing city, such as Changsha, would likely be more Westernized than would, for example, Chinese laborers or rural users of traditional Chinese medicine. Again, our choice of samples likely resulted in a conservative estimate of cross-cultural variation. Future studies comparing rural and urban China would help to clarify the effect of modernization and might reveal more profound cultural differences.

Although these data do not permit us to fully explore such hypotheses, we did begin the process of directly testing explanations involving stigma and alexithymia (especially externally oriented thinking). Chinese patients reported greater perceived stigma than did North American patients, and stigma was related to general symptom reporting in both samples. Stigma, at least as measured by Link's (1987) Demoralization Scale, appears to measure a consequence of psychopathology. This view is inconsistent with the idea that perceived stigma mediates the relation between culture and symptom presentation, even though stigma scores were higher in the Chinese sample. Future studies should measure directly individual perceptions of the stigma resulting from somatic and psychological symptoms before the role of stigma is discounted.

Individuals in the Chinese sample also had higher scores on alexithymia, a variable that was itself positively correlated with somatic symptom reporting in both samples. The link between alexithymia and somatization was refined by breaking the former construct into its constituent parts. This analysis revealed that the observed cross-cultural variability for somatization relates, in part, to cultural differences in internally versus externally oriented thinking, suggesting that somatic symptoms are noticed more by individuals who do not frequently focus on their internal emotional state. Moreover, externally oriented thinking mediated the relation between cultural group and somatic symptom reporting, at least on structured interview.

There is a lingering tendency in discussions of somatization to pathologize the expression of somatic symptoms and to assume an exclusive presentation of such symptoms in the context of depression. Such presentations were all but absent in the current study. Although we believe that observed effects represent important cross-cultural differences, especially for psychological symptoms, it was clear that in both groups, the experience of depression includes somatic and psychological components. Nonetheless, we have invoked a pathological construct, alexithymia, as a partial mediator of cultural group and somatic symptom presentation. Alexithymia has indeed been linked with somatization in the West (e.g., Grabe, Spitzer, & Freyberger, 2004), and higher alexithymia scores were observed in our Chinese participants. This effect was, however, carried exclusively by externally oriented thinking, which does not measure a difficulty but instead measures a tendency to not value inner emotional experience as particularly

important. These patients are able to experience and express their emotions, but they do not focus on these emotions, and they do not make them central to their life.

In contrast, Western culture stands out for its unusual emphasis on the personal experience and interpersonal communication of emotion. Asian immigrants to the United States, for example, become increasingly attuned to affective experience with greater acculturation to mainstream American culture (Chen, Guarnaccia, & Chung, 2003). The independent self-construal (Markus & Kitayama, 1991) and values of self-expression (Inglehart & Welzel, 2003) common to Western cultures emphasize an internal focus in contrast to the external and interpersonal focus found in many other parts of the world. It may be that depression is at one level a universal experience, perhaps even an experience with broadly similar causes worldwide—for example, an evolved response to loss (Nesse, 2000) or a failure to disengage from unobtainable goals (Wrosch, Scheier, Carver, & Schulz, 2003). The onset of depression triggers a biological response that takes place within a specific social context, resulting in a cascade of somatic and psychological experiences that are interpreted through a particular cultural lens. A greater understanding of these possibilities will require appreciation for Western cultures as cultures, rather than as the baseline from which other cultures deviate.

Cross-cultural studies require careful attention to measurement equivalence, to ensure that the same underlying constructs are assessed in each cultural group. Several advanced techniques have been developed to assist researchers in evaluating measurement equivalence. Unfortunately, the best such methods, including confirmatory factor analysis and item response theory approaches, require very large sample sizes. One limitation of the present study is that it relied on less demanding methods developed to address the difficulties involved in obtaining such samples (van de Vijver & Leung, 1997). Future research in this area would benefit from culturally appropriate psychopathology instruments where equivalence is established in large samples with the most sophisticated available methods.

Twenty-five years after Kleinman's (1982) original studies of neurasthenia and somatization in China, depressed Chinese individuals continue to report more somatic symptoms than their Western counterparts when interviewed by a clinician, especially when questioned directly. More strikingly, depressed patients in North America report more psychological symptoms regardless of the assessment method used. These effects are still observed after more than 2 decades of modernization and Westernization and can partially be explained by variation in thinking style, a consequence of differing value systems and self-construals. At the same time, these symptom differences are far from absolute—symptoms of both classes are observed in both cultures. Past research has shown that somatic symptom presentations are common in the West, and it appears that psychological symptom presentations are not rare in China.

Researchers have perhaps spent too much time discussing Chinese somatization as a culture-bound phenomenon, rather than considering that a psychological focus may be unusually common in Western countries. Cross-cultural measurement of symptoms, across three assessment modalities, allows us to conclude that psychologization is the stronger and more consistent effect. Although this pattern informs *DSM–IV* and much of the Western clinical literature on depression, it does not necessarily constitute the norm for depression worldwide. Much more work should now be done to unpackage the functional and communicative significance of individual somatic and psychological symptoms, moving beyond the broad symptom categories that have been emphasized to date. The interaction of biology, culture, and individual differences in predicting variations in depressive symptom presentation, and in understanding their meaning, will be rich terrain for future study.

References

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Bagby, R. M., Taylor, G. J., & Parker, J. D. A. (1994). The twenty-item Toronto Alexithymia Scale. *Journal of Psychosomatic Research, 38*(1), 23–40.

Ballenger, J. C., Davidson, J. R. T., Lecrubier, Y., Nutt, D. J., Kirmayer, L. J., Lepine, J. P., et al. (2001). Consensus statement on transcultural issues in depression and anxiety from the International Consensus Group on Depression and Anxiety. *Journal of Clinical Psychiatry, 62*[Suppl. 13], 47–55.

Bar-On, R. (2000). Emotional and social intelligence: Insights from the emotional quotient inventory. In R. Bar-On & J. D. A. Parker (Eds.), *Handbook of emotional intelligence* (pp. 363–388). San Fransisco: Jossey-Bass.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51,* 1173–1182.

Beeman, W. O. (1985). Dimensions of dysphoria: The view from linguistic anthropology. In A. Kleinman & B. Good (Eds.), *Culture and depression: Studies in the anthropology and cross-cultural psychiatry of affect and disorder* (pp. 216–243). Berkeley: University of California Press.

Bridges, K., & Goldberg, D. P. (1985). Somatic presentation of *DSM–III* psychiatric disorders in primary care. *Journal of Psychosomatic Research, 29,* 563–569.

Central Intelligence Agency. (2007). *The world factbook 2007.* Washington, DC: Author.

Chan, B., & Parker, G. (2004). Some recommendations to address depression in Chinese people in Australasia. *Australian and New Zealand Journal of Psychiatry, 38,* 141–147.

Chan, D. W. (1990). The meaning of depression: The Chinese word associations. *Psychologia, 33,* 191–196.

Chan, D. W., & Chan, T. S. C. (1983). Reliability, validity, and the structure of the general health questionnaire in a Chinese context. *Psychological Medicine, 13,* 363–371.

Chang, W. C. (1985). A cross-cultural study of depressive symptomatology. *Culture, Medicine and Psychiatry, 9,* 295–317.

Chen, H., Guarnaccia, P. J., & Chung, H. (2003). Self-attention as a mediator of cultural influences on depression. *International Journal of Social Psychiatry, 49,* 192–203.

Cheng, T. A. (1989). Symptomatology of minor psychiatric morbidity: A cross-cultural comparison. *Psychological Medicine, 19,* 697–708.

Cheng, T. A., & Williams, P. (1986). The design and development of a screening questionnaire (CHQ) for use in community studies of mental disorders in Taiwan. *Psychological Medicine, 16,* 415–422.

Cheung, C. K., & Bagley, C. (1998). Validating an American scale in Hong Kong: The Center for Epidemiological Studies Depression Scale (CES-D). *Journal of Psychology, 132,* 169–186.

Cheung, F. M. (1984). Preferences in help-seeking among Chinese students. *Culture, Medicine and Psychiatry, 8,* 371–380.

Cheung, F. M. (1995). Facts and myths about somatization among the Chinese. In T.-Y. Lin, W. S. Tseng, & E. K. Yeh (Eds.), *Chinese*

societies and mental health (pp. 156–180). Hong Kong: Oxford University Press.

Chinese Medical Association and Nanjing Medical University. (1995). *Chinese Classification of Mental Disorders, 2nd Edition–Revised (CCMD-2-R).* Nanjing, China: Dong Nan University Press.

Choong, M.-Y., & Wilkinson, G. (1989). Validation of 30- and 12-item versions of the Chinese Health Questionnaire (CHQ) in patients admitted for general health screening. *Psychological Medicine, 19,* 495–505.

Chung, K. F., & Wong, M. C. (2004). Experience of stigma among Chinese mental health patients in Hong Kong. *Psychiatric Bulletin, 28,* 451–454.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155–159.

Craig, T. K., & Boardman, A. P. (1990). Somatization in primary care settings. In C. M. Bass (Ed.), *Physical symptoms and psychological illness* (pp. 73–103). Oxford, England: Blackwell Scientific.

Dion, K. L. (1996). Ethnolinguistic correlates of alexithymia: Toward a cultural perspective. *Journal of Psychosomatic Research, 41,* 531–539.

Draguns, J. G. (1996). Abnormal behaviour in Chinese societies: Clinical, epidemiological, and comparative studies. In M. H. Bond (Ed.), *Handbook of Chinese psychology* (pp. 412–428). Hong Kong: Oxford University Press.

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (1997). *Structured Clinical Interview for DSM–IV Axis I Disorders, Research Version, Patient Edition (SCID-I/P*). New York: Biometrics Research, New York State Psychiatric Institute.

Goffman, E. (1963). *Stigma: Notes on the management of spoiled identity.* Englewood Cliffs, NJ: Prentice-Hall.

Goldberg, D. P. (1972). *The detection of psychiatric illness by questionnaire* (Maudsley Monograph 21). Oxford, England: Oxford University Press.

Goldberg, D. P., & Bridges, K. (1988). Somatic presentations of psychiatric illness in primary care setting. *Journal of Psychosomatic Research, 32,* 137–144.

Goldberg, D. P., & Williams, P. (1988). *A user's guide to the General Health Questionnaire.* Windsor, England: NFER-NELSON.

Grabe, H. J., Spitzer, C., & Freyberger, H. J. (2004). Alexithymia and personality in relation to dimensions of psychopathology. *American Journal of Psychiatry, 161,* 1299–1301.

Heine, S. J., Kitayama, S. J., Lehman, D. R., Takata, T., Ide, E., Leung, C., & Matsumoto, H. (2001). Divergent consequences of success and failure in Japan and North America: An investigation of self-improving motivations and malleable selves. *Journal of Personality and Social Psychology, 81,* 599–615.

Heine, S. J., Lehman, D. R., Peng, K., & Greenholtz, J. (2002). What's wrong with cross-cultural comparisons of subjective Likert scales? The reference-group effect. *Journal of Personality and Social Psychology, 82,* 903–918.

Huppert, F. A., Walters, D. E., Day, N. E., & Elliot, B. J. (1989). The factor structure of the General Health Questionnaire (GHQ-30). *British Journal of Psychiatry, 155,* 178–185.

Inglehart, R. F., & Welzel, C. (2003). The theory of human development: A cross-cultural analysis. *European Journal of Political Research, 42,* 341–479.

Kessler, R. C., McGonagle, K. A., Zhao, S., Nelson, C. B., Hughes, N., Eshleman, S., et al. (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.

Kirmayer, L. J. (1989). Cultural variations in the response to psychiatric disorders and emotional distress. *Social Science and Medicine, 29,* 327–339.

Kirmayer, L. J., Robbins, J. M., Dworkind, M., & Yaffe, M. J. (1993). Somatization and the recognition of depression and anxiety in primary care. *American Journal of Psychiatry, 150,* 734–741.

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.* New Haven, CT: Yale University Press.

Kleinman, A. (1988). *Rethinking psychiatry: From cultural category to personal experience.* New York: Free Press.

Leff, J. (1981). *Psychiatry around the globe: A transcultural view.* New York: Marcel Dekker.

Li, P. L., Logan, S., Yee, L., & Ng, S. (1999). Barriers to meeting the mental health needs of the Chinese community. *Journal of Public Health Medicine, 21,* 74–80.

Lin, N. (1989). Measuring depressive symptomatology in China. *Journal of Nervous and Mental Disease, 177,* 121–131.

Lin, T.-Y. (1989). Neurasthenia revisited: Its place in modern psychiatry. *Culture, Medicine and Psychiatry, 13,* 105–129.

Lin, T.-Y., & Lin, M. C. (1981). Love, denial and rejection: Responses of Chinese families to mental illness. In A. Kleinman & T.-Y. Lin (Eds.), *Normal and abnormal behavior in Chinese culture* (pp. 387–401). Boston: Reidel.

Lin, T.-Y., Tardiff, K., Donetz, G., & Goresky, W. (1978). Ethnicity and patterns of help-seeking. *Culture, Medicine and Psychiatry, 2,* 3–13.

Link, B. G. (1987). Understanding labeling effects in the area of mental disorders: An assessment of the effects of expectations of rejection. *American Sociological Review, 52,* 96–112.

Markus, H. R., & Kitayama, S. (1991). Culture and the self-implications for cognition, emotion, and motivation. *Psychological Review, 98,* 224–253.

Murray, C. J., & López, A. D. (1996). *The global burden of disease.* Cambridge, MA: Harvard University Press.

Nesse, R. M. (2000). Is depression an adaptation? *Archives of General Psychiatry, 57,* 14–20.

Parker, G., Cheah, Y. C., & Roy, K. (2001). Do the Chinese somatize depression? A cross-cultural study. *Social Psychiatry and Psychiatric Epidemiology, 36,* 287–293.

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, J. D. A., Taylor, G. J., & Bagby, R. M. (2001). The relationship between emotional intelligence and alexithymia. *Personality and Individual Differences, 30,* 107–115.

Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1,* 385–401.

Ryder, A. G., Bean, G., & Dion, K. L. (2000). Caregiver responses to symptoms of first-onset psychosis: A comparative study of Chinese- and Euro-Canadian families. *Transcultural Psychiatry, 37,* 255–265.

Ryder, A. G., Yang, J., & Heine, S. J. (2002). Somatization vs. psychologization of emotional distress: A paradigmatic example for cultural psychopathology. In W. J. Lonner, D. L. Dinnel, S. A. Hayes, & D. N. Sattler (Eds.), *Online readings in psychology and culture* (Unit 9, Chapter 3). Bellingham, WA: Center for Cross-Cultural Research, Western Washington University.

Sayar, K., Kirmayer, L. J., & Taillefer, S. S. (2003). Predictors of somatic symptoms in depressive disorder. *General Hospital Psychiatry, 25,* 108–114.

Shon, S. P., & Ja, D. Y. (1982). Asian families. In M. McGoldrick, J. K. Pearce, & J. Giordano (Eds.), *Ethnicity and family therapy* (pp. 208–228). New York: Guilford Press.

Simon, G. E., VonKorff, M., Piccinelli, M., Fullerton, C., & Ormel, J. (1999). An international study of the relation between somatic symptoms and depression. *New England Journal of Medicine, 341,* 1321–1335.

Taylor, G. J., Bagby, R. M., & Parker, J. D. (2003). The 20-item Toronto Alexithymia Scale: IV. Reliability and factorial validity in different languages and cultures. *Journal of Psychosomatic Research, 55,* 277–283.

Tsai, J. L., Simeonova, D. I., & Watanabe, J. T. (2004). Somatic and social: Chinese Americans talk about emotions. *Personality and Social Psychology Bulletin, 30,* 1226–1238.

Tseng, W.-S. (1975). The nature of somatic complaints among psychiatric patients: The Chinese case. *Comprehensive Psychiatry, 16,* 237–245.

Tsoi, W.-F. (1985). Mental health in Singapore and its relation to Chinese culture. In W.-S. Tseng & Y.-H. Wu (Eds.), *Chinese culture and mental health* (pp. 229–250). Orlando, FL: Academic Press.

Tung, M. P. (1994). Symbolic meanings of the body in Chinese culture and "somatization". *Culture, Medicine and Psychiatry, 18,* 483–492.

van de Vijver, F. J. R. (2003). Bias and substantive analyses. In J. A. Harkness, F. J. R. van de Vijver, & P. P. Mohler (Eds.), *Cross-cultural survey methods* (pp. 207–233). New York: Wiley.

van de Vijver, F. J. R., & Leung, K. (1997). *Methods and data analysis for cross-cultural research.* Newbury Park, CA: Sage.

Weissman, M. M., Bland, R. C., Canino, G. J., Faravelli, C., Greenwald, S., Hwu, H.-G., et al. (1996). Cross-national epidemiology of major depression and bipolar disorder. *Journal of the American Medical Association, 276,* 293–299.

Wing, J. K., Sartorious, N., & Üstün, T. B. (1998). *Diagnosis and clinical measurement in psychiatry: A reference manual for SCAN/PSE-10.* Cambridge, England: Cambridge University Press.

World Health Organization. (1992). *The ICD–10 classification of mental and behaviour disorders—Clinical descriptions and diagnostic guidelines*. Geneva, Switzerland: World Health Organization.

Wrosch, C., Scheier, M. F., Carver, C. S., & Schulz, R. (2003). The importance of goal disengagement in adaptive self-regulation: When giving up is beneficial. *Self and Identity, 2,* 1–20.

Yen, S., Robins, C. J., & Lin, N. (2000). A cross-cultural comparison of depressive symptom manifestation: China and the United States. *Journal of Consulting and Clinical Psychology, 68,* 993–999.

Yeung, A., Chang, D., Gresham, R. L. J., Nierenberg, A. A., & Fava, M. (2004). Illness beliefs of depressed Chinese-Americans in primary care. *Journal of Nervous and Mental Disease, 192,* 324–327.

Zhang, J., & Norvilitis, J. M. (2002). Measuring Chinese psychological well-being with Western developed instruments. *Journal of Personality Assessment, 79,* 492–511.

Zhu, X., Yi, J., Yao, S., Ryder, A. G., Taylor, G. J., & Bagby, R. M. (2007). Cross-cultural validation of a Chinese translation of the 20-item Toronto Alexithymia Scale. *Comprehensive Psychiatry, 48,* 489–496.

Zumbo, B. D. (1999). *A handbook on the theory and methods of differential item functioning (DIF): Logistic regression modeling as a unitary framework for binary and Likert-type (ordinal) item scores.* Ottawa, Ontario, Canada: Directorate of Human Resources Research and Evaluation, Department of National Defense.

Appendix

Coding System for Self-Reported Symptoms

Symptom name	Symptom class	Example
Depressed mood	Psychological	Sad all the time, feeling down
Anhedonia	Psychological	Not interested in anything, don't enjoy things
Aphagia	Somatic	Losing a lot of weight, not eating much
Hyperphagia	Reversed somatic	Eating way too much, always craving food
Insomnia	Somatic	Can't get to sleep, keep waking up at night
Hypersomnia	Reversed somatic	Sleeping all the time, have trouble waking up
Fatigue/no energy	Somatic	Always tired, don't have energy to do things
Retardation	Somatic	Speaking really slowly, move more slowly than I used to
Agitation	Reversed somatic	People say I'm talking too quickly, body feels restless
Worthlessness	Psychological	Feel like I'm no good, hate myself
Guilt	Psychological	Always feeling bad about things I've done
Concentration Problems	Psychological	Can't keep my mind on things, trouble paying attention
Indecisiveness	Psychological	Unable to make up my mind, agonize over minor decisions
Other thinking problems	Psychological	Keep forgetting things, bad memory
Suicidality	Psychological	Want to die, tried to kill myself
Low libido	Somatic	Not interested in sex, sex drive lower than before
Other sex problems	Somatic	Worry about sex, have trouble getting aroused
Hopelessness	Psychological	Despair about the future, doubt things will ever change
Pessimism	Psychological	Don't expect much from life, always assume the worst
Low self-esteem	Psychological	Feel bad about myself, often tell myself I'm no good
Mood lability	Psychological	Am really moody, emotional outbursts
Social avoidance	Psychological	Prefer to stay away from people, cutting off my friends
Irritability	Psychological	Get angry a lot, everyone gets on my nerves
Nervousness/tension	Anxiety	Often feel nervous and tense, all wound up
Overwhelmed/stressed	Psychological	Can't deal with things, stressed at work
Tearfulness	Psychological	Crying all the time, can't hold back tears
Pain	Somatic	Frequent headaches, joints and back are sore
Gastro. problems	Somatic	Lots of stomachaches, diarrhea
Somatization symptoms	Somatic	Winds moving in my body, pushing on my chest
Panic	Anxiety	Feel panicky a lot, get all worked up into an anxious fit
Agoraphobia	Anxiety	Afraid to leave the house, hate crowds
Social anxiety	Anxiety	Can't stand social gatherings, nervous even with friends
General anxiety/worry	Anxiety	Worried all the time, keep thinking bad things will happen
Fearfulness	Anxiety	Sick of being afraid, very fearful, living in fear
Obsessions	Anxiety	Thoughts I can't get rid of, thinking things over and over
Compulsions	Anxiety	Always washing my hands, strong urge to count things
Health concerns	Anxiety	Keep thinking I have cancer, worry too much about health
Specific fear	Anxiety	Can't stand dogs, won't go in airplanes, afraid of heights
Interpersonal conflict	Psychological	Keep fighting with husband, children don't understand me
Helplessness	Psychological	Feel like nothing can save me, no power to change things
Existential concerns	Psychological	Worry about my purpose in life, afraid it's all meaningless
Amotivation	Psychological	No motivation, no will to get things done
Suppressed emotions	Psychological	Can't express myself, emotions are constricted

Received June 26, 2006
Revision received October 24, 2007
Accepted October 25, 2007 ■