

Cross-Cultural Measurements of Psychological Well-Being: The Psychometric Equivalence of Cantonese, Vietnamese, and Laotian Translations of the Affect Balance Scale

ABSTRACT

Objectives. This paper evaluates the cultural equivalence of Cantonese, Vietnamese, and Laotian translations of the Affect Balance Scale.

Methods. The scale was completed by 399 Vietnamese, 193 Laotian, 756 Cantonese, and 319 English speakers who were participants in the Clarke Institute–University of Toronto Refugee Resettlement Project ($n = 1667$).

Results. Confirmatory factor analyses indicated a good fit between the hypothesized two-factor model (separate factors for positive and negative affect) across the original English-language version and each of the Asian-language translations. Factorial invariance (numbers and patterns of factor loadings) was evident across all versions of the scale. No evidence of item bias was detected by mixed Language \times Item analyses of variance. Acceptable reliability was observed; coefficient alphas ranged from .62 to .72 for positive affect and from .62 to .70 for negative affect items.

Conclusions. These findings substantiate the cultural equivalence of the three translations of the scale for population health research. Important future research directions made possible by the availability of culturally equivalent instruments are discussed. (*Am J Public Health.* 1997;87:794–799)

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Introduction

The pluralistic transformation of North American society directs serious attention to the development and adaptation of culturally appropriate survey measures. Although concerns about psychological well-being, its determinants, and the ways in which it can be maximized are widespread, the research evidence, to date, has relied almost exclusively on English-language materials and respondents. Because Asia has become the single largest source of new immigrants to North America—accounting for 53% of all immigrants to Canada in 1992¹ and, in the same year, for 38% of all immigrants to the United States²—the need for quality-of-life measures in languages used on that continent is particularly acute.

The quality-of-life construct encompasses externally ratable dimensions, such as role performance, as well as internal states, among which psychological well-being is a particularly core dimension.³ Although it is a subject of debate, many investigators agree on the usefulness of assessing well-being as a balance of negative and positive affect. Support for this approach includes many research reports illustrating statistically independent unipolar measures of positive and negative affect and research findings demonstrating nonoverlapping determinants for each of these affective states (see references 4 through 6). The Affect Balance Scale,⁴ perhaps the single most widely used quality-of-life measure, incorporates both positive and negative affect into a single index of psychological well-being.

The sizable literature adducing the reliability and validity of the Affect Balance Scale as an index of well-being (see references 4 through 7) draws for the

most part on studies of English-speaking, primarily Euroamerican populations. Applying the scale to non-English-speaking populations requires not only adequate translation but also tests of reliability and validity.

In previous work on “boat people” in Canada,^{8–11} we adapted the Affect Balance Scale for use among ethnic Vietnamese, Chinese, and Laotians. In the present paper we describe the process of translating the scale into the languages spoken by these three groups; evaluate the cultural equivalence of the translations with the original English-language version; and report the psychometric properties of the positive and negative affect subscales of the Affect Balance Scale.

Methods

Data from two population samples, described in Table 1, provide the basis for the current report.

Refugee Sample

Between 1979 and 1981, Canada admitted 60 000 Southeast Asian refugees, about 5000 of whom came to live in

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Vancouver, British Columbia. In 1981, one of us (M.B.) initiated the Refugee Resettlement Project, a longitudinal study of the psychological, economic, and social adaptation of these survivors of war, persecution, flight, and refugee camp internment. Because Canada's confidentiality laws prohibited the Federal Department of Employment and Immigration's release of refugee names and addresses, we could not identify a population universe from which to draw a sample. Using a combination of key informant and probability sampling techniques suggested by Mendenhall and Schaeffer¹² and described elsewhere,^{8,9} project staff enlisted the assistance of community agencies in first-line contact with refugees to construct a list of potential interviewees. To expand the initial list, bilingual interviewers, many of them refugees themselves, contacted people appearing on the initial list to ask for names of other refugees. This expanded list was then used by the team to draw a wave probability sample based on techniques suggested by Schaeffer et al.¹³ According to this technique, once a household has been identified for the sample, an individual within the household is selected by using a table of random numbers. This can be viewed as a variation of cluster sampling in which households are the clusters, rather than more frequently used units, such as city blocks. During the initial round of the survey, the interviewers asked each person in the sample for the names of all his or her refugee acquaintances. Using these lists to draw successive samples, the investigators continued the process until repeated duplication of names signaled successful identification of most, if not all, the population universe. Ninety-seven percent of the refugees approached for the study agreed to participate. The initial sample numbered 1348.

Most of the refugees were young, almost three quarters of them younger than age 35. Only 13% of the sample were 46 or older. There was a slight preponderance of males over females (58% vs 42%). The majority (56%) were ethnic Chinese from Vietnam, the rest either ethnic Vietnamese or Laotian. At the time they completed the Affect Balance Scale, all refugees had resided in Canada for approximately 3 years (the Chinese refugees for a mean of 40 months, SD = 6.7; the Vietnamese for a mean of 37 months, SD = 6.5; and the Laotians for a mean of 43 months, SD = 6.1). In demographic profile, the 1348 Refugee Resettlement

TABLE 1—Demographic Profile of English-Speaking and Non-English-Speaking Respondents, Refugee Resettlement Project, Vancouver, Canada (1983 through 1984)

	English (n = 319)	Total Non-English (n = 1348)	Vietnamese (n = 399)	Laotian (n = 193)	Cantonese (n = 756)
Male sex	56.1	57.6	69.9	55.3	51.6
Age, y					
18–25	34.2	38.8	45.1	56.8	31.1
26–35	33.5	34.3	35.8	30.5	34.3
36–45	14.4	13.4	12.5	6.8	14.9
46–55	10.2	8.4	5.5	3.2	11.2
≥56	7.7	5.1	1.0	3.6	8.5
Marital status					
Married	52.0	58.1	53.9	63.2	59.0
Single	48.0	41.9	46.1	36.8	41.0
Education					
None	0.4	3.3	0.5	6.8	4.0
Primary	4.9	40.6	31.0	41.1	45.5
Secondary	36.1	43.0	45.6	32.6	44.3
Postsecondary	58.6	13.1	22.9	19.5	6.2

Note. Numbers in table are percentages of the group with the relevant characteristic.

Project subjects closely resembled the total population of adult refugees resettling in and around Vancouver between 1979 and 1981.

Comparison Sample

To create a Canadian majority-culture comparison sample, we used a Kish¹⁴ area probability approach. This method begins by randomly selecting areas (e.g., census tracts within a city); households are then randomly sampled within an area and individuals are selected within sampled households. We selected 319 Vancouver residents, stratified by age and sex to match the refugee sample. All were fluent in English and had lived in Canada for at least 3 years and in Vancouver for at least 6 months. Seventy-eight percent of all potential subjects approached agreed to participate. Sample selection was done with replacement; nonvolunteers were replaced by individuals matched for age and sex from the same census tract, maintaining sample representativeness.

Translation Process

The Refugee Resettlement Project questionnaire included the Affect Balance Scale as one of several indices of psychosocial adjustment to refugee resettlement. The implicit assumption underlying the use of such instruments is that they constitute universally valid expressions of emotional upset or well-being, but this

assumption has rarely been tested. One of the five Affect Balance Scale items intended to tap positive affect—"Have you been feeling on top of the world?"—provided an illustration of the importance of evaluating cross-cultural applicability. This expression has no idiomatic equivalent in Southeast Asian languages. Thus it defied translation and had to be eliminated. The result was a nine-item scale, four items relating to positive affect and five to negative affect. The phrase "During the past few weeks have you felt . . ." was used to introduce each item. A three-alternative response format was employed: "often," "sometimes," or "never."

Bilingual interpreters translated the questionnaires from English into Cantonese, Vietnamese, and Laotian. Following a procedure recommended by Brislin et al.,¹⁵ a new group of interpreters translated the results back into English. Discrepancies between the original English version and back-translations were resolved by consensus.

Procedure

The 2½-hour structured interview, conducted in the respondent's mother tongue, took place in the respondent's home. For English speakers, trained project personnel administered an English-language version of the questionnaire that omitted information relevant only for refugees (see references 8 through 11 for a more detailed description of procedures).

TABLE 2—Factorial Invariance of Affect Balance Scale Responses across English-Speaking and Non-English-Speaking (Cantonese, Vietnamese, and Laotian) Groups, Vancouver, Canada

	χ^2	df	GFI	BBI
Model 0	2148.80	72
Model 1	184.47	52	.98	.91
Model 2	193.32	58	.98	.91

Note. GFI = goodness-of-fit index; BBI = Bentler and Bonett Index¹⁷; model 0 = nine-factor model with complete independence among the items; model 1 = two-factor model with covariances among factors; model 2 = two-factor solution that is identical to model 1, but with covariance estimates among factors and variances of uniqueness freed. Models 1 (constrained) and 2 (relaxed) do not differ significantly [$\Delta\chi^2$ (6, $n = 1647$) = 8.85, NS].

Analytic Strategy

We first established the optimal number of factors, using two goodness-of-fit indices—an adjusted goodness-of-fit statistic¹⁶ and a normed index (the Bentler and Bonett Index, or BBI¹⁷). Second, we evaluated factorial invariance across the cultural groups with LISREL 7.¹⁸ Third, we investigated item bias through a series of mixed Group \times Item analyses of variance. Finally, in each group, we calculated internal consistency reliability (coefficient alpha) separately for the positive and negative affect subscales of the Affect Balance Scale.

To test the cross-cultural equivalence of scales designed to measure positive and negative affect, we investigated a series of related hypotheses: (1) two underlying dimensions (latent variables) would best account for item variance in each of the groups studied; (2) the structure of these dimensions would prove invariant; (3) no item would show consistent bias; and (4) scales derived from factors would possess acceptable reliability in each of the groups. Initial examinations of sample distributions did not detect violations of normality; skewness and kurtosis did not exceed 2.0.

Results

According to Bradburn's theoretical analysis,⁴ a two-factor solution should best account for item variance in the Affect Balance Scale. We assessed the fit of all possible models of the scale separately for each of the four language groups. The hypothesized two-factor model provided the best fit for all groups, yielding in each case an adjusted goodness-of-fit value that equaled or exceeded .90.¹⁶ No other factor solution produced an equally satisfactory or a superior fit.

Factorial Invariance

We simultaneously compared the factor matrix of one group (e.g., English speakers) with that of a second group (e.g., Vietnamese speakers).¹⁹ In each case, we evaluated whether the numbers of factors and patterns of item loadings were equivalent.

As an initial step, we evaluated factorial invariance across the three translations via multiple pairwise comparisons conducted with LISREL 7. Each comparison indicated a reasonable model fit (goodness-of-fit indexes [GFIs] were .97 for all three comparisons), indicating that the two-factor model was optimal. The test for invariance in the pattern of factor loadings indicated a statistically significant difference only for Vietnamese vs Cantonese translations [$\Delta\chi^2$ (6, $n = 997$) = 20.18, $P < .001$]. When we tested a less restrictive model in which the same parameters were freed, however, the improvement in overall fit was trivial ($\Delta\text{GFI} < .01$). This minor difference in model fit, coupled with the sensitivity of the chi-squared statistic to negligible changes when sample sizes are very large, suggests factorial invariance across the three Asian groups. Therefore, we pooled the variance-covariance matrices for the remaining analyses, creating a combined Southeast Asian matrix.

A comparison between the combined Southeast Asian and the English-speaking samples demonstrated that the same number of factors was optimal for each group (BBI = .91). As shown in Table 2, neither the goodness-of-fit index nor the likelihood ratio chi-squared statistic improved significantly when the constrained model (model 1) was compared with the less restrictive one (model 2), indicating that the factor loading patterns were also comparable across groups [$\Delta\chi^2$ (6,

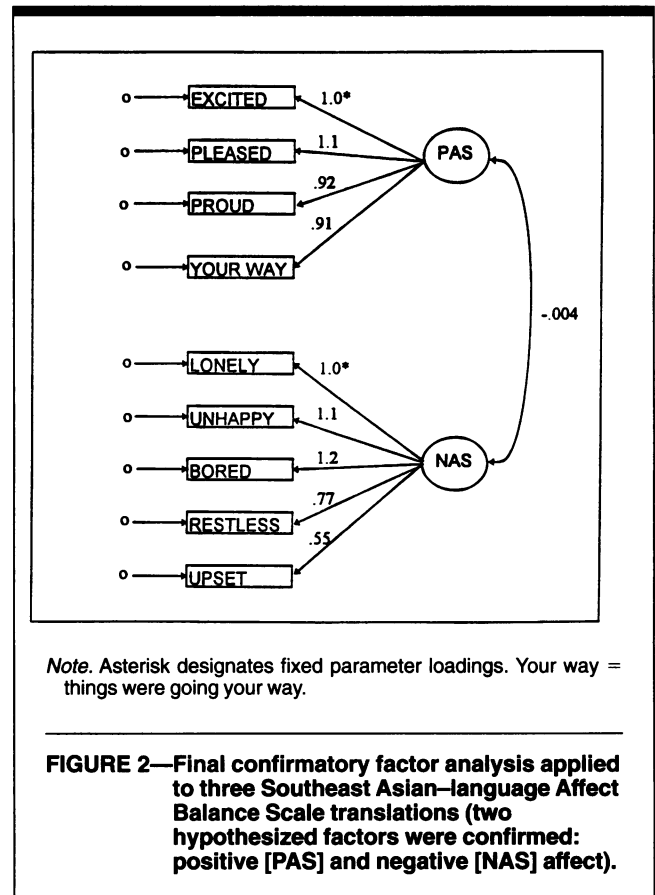
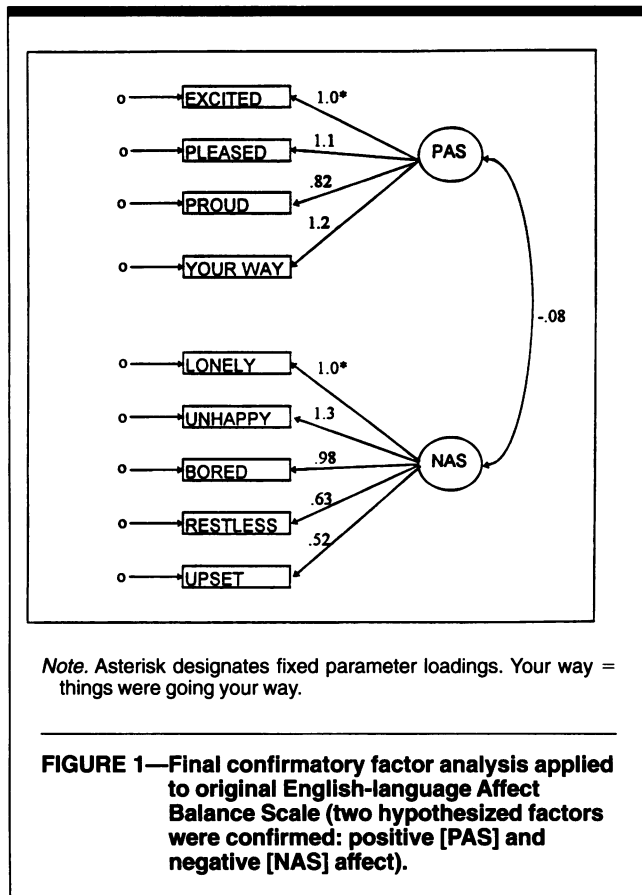
$n = 1647$) = 8.85, NS]. Results for the hypothesized model are illustrated in Figures 1 and 2.

Item Bias

Next we examined item bias, using a mixed Group \times Item analysis of variance (ANOVA) with Language Group as the between-groups factor and Item as the within-groups factor (separate analyses were undertaken for the positive and negative affect subscales).²⁰ Initial two-way analyses—3 (Vietnamese, Laotian, Cantonese) \times 4 (positive affect items) and 3 (Vietnamese, Laotian, Cantonese) \times 5 (negative affect items)—revealed significant two-way interaction effects for both subscales [$F(6, 3486) = 24.68$, $P < .001$, $\epsilon^2 = .041$ (positive affect subscale) and $F(8, 4644) = 11.87$, $P < .001$, $\epsilon^2 = .020$ (negative affect subscale)]. These results stimulated an investigation of item bias in each of the Asian-language groups.

For each of the language groups included in this analysis—English, Vietnamese, Laotian, and Cantonese—we performed separate analyses for the four positive affect items and the five negative affect items. Significant main effects for Language Group and Item were qualified by a significant two-way interaction [$F(9, 4401) = 27.30$, $P < .001$, $\epsilon^2 = .053$]. Similar results were observed when this analysis was applied to the five negative affect items. Significant main effects for Language Group and for Item were again qualified by a significant two-way interaction effect [$F(12, 5872) = 35.01$, $P < .001$, $\epsilon^2 = .067$]. Table 3 shows group means and 95% confidence intervals for the nine Affect Balance Scale items. Although the results were statistically significant, inspection of the data indicated no striking interitem variations across language groups.

(We note that mean values are significantly higher across all NAS items for the English-speaking group compared with the three Southeast Asian groups. This effect may indicate a valid difference or a methodological artifact. To rule out the latter, we conducted corresponding analyses with data from a national probability sample of 8084 English-speaking noninstitutionalized adult Canadian residents who completed the ABS as part of the 1991 General Social Survey.²¹ The survey sampled participants by households with an 80% response rate; nonresponse was handled by sample weighting at the household level.^{21(p20)} Since the survey took place several years after the RRP, comparisons between these two data



sets provide an indication of the extent to which historical developments [e.g., socio-economic trends] may have influenced the temporal stability of ABS scores. These analyses indicated that there were no substantive differences in either number of factors or patterns of factor loadings between the two English-speaking samples [$\Delta\chi^2$ (6, $n = 8387$) = 7.53, NS] and that the patterns of Group \times Item interactions observed for both PAS and NAS item sets were highly similar, regardless of whether the English-language data included RRP or General Social Survey responses. We conclude, therefore, that the group differences in NAS responses are not attributable to historical artifact.)

Reliability

Internal consistency reliabilities²² were calculated separately for each group and for each subscale. Highly similar reliability coefficients were observed across subscales and language groups. For the positive affect subscale, coefficient alphas were .72 for the English version and .76 for the Vietnamese, .62 for the Laotian, and .69 for the Cantonese translations. For the negative affect subscale, coefficient alphas were .62 for the English version and .67 for the Vietnamese, .70 for the Laotian, and .65 for the Cantonese translations.

Discussion

The results of this study, demonstrating that Cantonese, Vietnamese, and Laotian translations of scales to measure positive and negative affect meet many of the requirements of cultural equivalence,²³ corroborate the feasibility of cross-cultural studies of psychological well-being. A culturally appropriate translation is a necessary first step. In our study, a rigorous back-translation technique, in combination with expert consultation, resulted in the exclusion of one item in which psychological well-being was phrased as a trope (or figure of speech) that defied meaningful translation. Although it has been used in many studies employing the Affect Balance Scale, the question "Have you felt on top of the world?" is probably meaningful only in an urban North American context.^{6,24,25}

Confirmatory factor analyses to evaluate the fit between the structural equations models implicit in each of the three Affect Balance Scale translations and the original English-language version indicated that a two-factor solution, hypothesized on the basis of theory and extant literature, provided the best fit for

each translated version of the scale. For each linguistic version of the scale, the same pattern of item loadings and number of factors fit the observed data well. Goodness-of-fit statistics also indicated an acceptable degree of agreement between the structural model reported for the original English-language scale and the model that provided the best fit for each of the translated versions.

Examination for item bias suggested some cross-group differences. Statistically significant Group \times Item interactions are typically interpreted as indicative of item bias.²⁰ Such effects were, in fact, observed when we undertook item-by-item comparisons across the language groups. The large sample sizes employed for these analyses, however, provided unusually high statistical power.²⁶ Power was boosted even further because one of the independent variables (Item) was a within-subjects (repeated measures) factor, generating very high degrees of freedom for the interaction term. It seems likely that the significant Group \times Item interaction effects occurred, at least in part, because our study employed large sample sizes and a within-subjects design.

TABLE 3—Group Means (95% Confidence Intervals) for Nine Affect Balance Scale Items across Four Language Groups

Item	English	Vietnamese	Laotian	Cantonese
Positive Affect Scale				
Excited	2.6 (2.44, 2.78)	2.6 (2.54, 2.65)	2.5 (2.38, 2.58)	2.4 (2.39, 2.48)
Pleased	2.4 (2.19, 2.54)	2.6 (2.53, 2.64)	2.4 (2.28, 2.48)	2.2 (2.17, 2.27)
Proud	2.6 (2.42, 2.76)	2.6 (2.50, 2.62)	2.0 (1.85, 2.06)	2.2 (2.18, 2.28)
Your way	2.5 (2.33, 2.69)	2.6 (2.56, 2.67)	2.5 (2.42, 2.60)	2.5 (2.42, 2.51)
Negative Affect Scale				
Lonely	1.4 (1.32, 1.45)	2.6 (2.58, 2.70)	2.6 (2.47, 2.65)	2.8 (2.78, 2.85)
Unhappy	1.6 (1.52, 1.66)	2.7 (2.62, 2.73)	2.4 (2.28, 2.48)	2.7 (2.63, 2.72)
Bored	1.5 (1.47, 1.62)	2.5 (2.44, 2.57)	2.6 (2.48, 2.66)	2.5 (2.48, 2.57)
Restless	1.5 (1.40, 1.54)	2.8 (2.76, 2.86)	2.7 (2.63, 2.79)	2.9 (2.85, 2.91)
Upset	1.2 (1.17, 1.27)	2.7 (2.70, 2.80)	2.8 (2.75, 2.87)	1.7 (1.60, 1.76)

Note. Your way = things were going your way.

Although these results provide some reassurance that our translated versions of the Affect Balance Scale are comparatively free of item bias, we note a puzzling pattern of negative affect subscale item responses evident in Table 3. Although one might have predicted that Southeast Asian survivors of war, persecution, and loss would have higher levels of negative affect than their host population, the results are in the opposite direction.

These counterintuitive results may stem from a difference between Asian and North American response styles. For example, North Americans may feel freer to express negative affect than do Southeast Asians, who, although they clearly have the same emotional experiences, may rely on subtler forms of expression.⁸ It is also possible that Bradburn's negative affect items⁴ fail to capture the most salient idioms of distress in Chinese, Vietnamese, and Laotian culture. Alternatively, a scale of items translated from one language to another may succeed in capturing the core of an affective construct but not do justice to its range. If it were possible to incorporate culture-specific or *emic*^{27,28} idioms of distress as well as those imported from North American culture, the range of scores might approximate more closely the results arising from a majority-culture population.

Substantive explanations, such as selection artifact, are also plausible. Refugees selected for resettlement are not a random sample of all refugees but are persons chosen on the basis of factors such as positive employment history and good health.^{8,9} Furthermore, the Refugee

Resettlement Project sample contained few Cambodians, the group that among all Southeast Asian refugees is at the highest risk for mental disorder.²⁹⁻³¹ Compared with the recent past spent fleeing their homelands and waiting in refugee camps hoping for permanent asylum somewhere, the early months of life in Canada may have spelled relief for the Southeast Asians. Although objectively more deprived than their host country counterparts, the refugees may have been comparing their current situation with what they left behind. Thus they were probably feeling privileged.

Investigation of competing explanations will require further research. For example, comparisons between Chinese living in Taiwan or Hong Kong, Chinese in Canada, and majority-culture North Americans could help to clarify questions about response style. Research in progress is investigating the effects of incorporating culture-specific idioms of distress into measures of depression. A follow-up study of the Southeast Asian refugees in Canada would also be instructive. One might predict that, as memories of past deprivation fade, the refugees would increasingly respond to the same socioenvironmental pressures facing all Canadians and their affective responses would, as a consequence, become increasingly similar to those of the host country population. Although selection biases may account for the differences in absolute levels of affect reported by the resident Canadians and Southeast Asian refugees who participated in the Refugee Resettlement Project, this possibility does not challenge the cultural equivalence of the three Asian-

language translations of the Affect Balance Scale.

Research Uses for Affect Balance Scale Translations

Culturally equivalent measures of affect can benefit both within- and cross-cultural investigations. The structural stability of positive and negative affect across the cultural groups examined permits the investigation of questions such as the determinants of well-being in different ethnocultural groups as well as comparisons of the relative salience of socioenvironmental factors for well-being in minority- and majority-culture populations. Comparing cultural groups is defensible if the contrast involves an investigation of relationships between dependent and independent variables in each of the groups under question. The only requirement for this type of analysis is that the structure of the variables in question be cross-culturally stable. Direct comparisons—for example, an attempt to investigate whether refugees are more or less depressed than majority-culture respondents—would require not only invariant scale structures but constancy of the metric.

These issues are not unique to the Affect Balance Scale and its translation into Southeast Asian languages. The problem of cross-cultural equivalence has attracted considerable conceptual and empirical attention.^{23,32-35} Together with smaller scale clinical studies (e.g., Mollica et al.³⁶), the results of the present investigation challenge those scholars working within a cultural relativism framework who assert that cultural differences shape affective expression profoundly enough to obviate cross-cultural comparisons.³⁷⁻³⁹ In all cases, two factors—corresponding to positive and negative affect—clearly provided the best of all possible fits between hypothesized structures and empirical observations. Standard and widely used statistical criteria indicated a good fit between the model originally hypothesized and supported by North American English-language data and the structural models estimated for Southeast Asians speaking Cantonese, Vietnamese, and Laotian. These findings support the proposition that the experience of psychological well-being is universal, and that its expression transcends ethnocultural boundaries.

Conclusions

Cross-cultural theory has tended to emphasize uniqueness and difference.^{28,38}

However, it is hard to imagine that the search for well-being is anything less than universal. The present study suggests that the expression of well-being may also be universal. Although culture undeniably influences affective tropes and intensity of affective expression, physiology probably limits the plasticity of human emotion. As a result, the structure of affect seems remarkably resistant to cultural variation.

Assuming that linguistic and cultural barriers make the investigation of phenomena such as mental health and well-being difficult, if not impossible, population surveys often routinely omit ethnocultural groups. However, systematic investigation into psychological well-being and its sources among ethnocultural minorities is no less important or interesting than studies focused on majority-culture populations. Although people from diverse backgrounds share at least some affective experiences, few measurement tools are available. Research that recognizes the importance of ethnocultural groups in North America and that takes the trouble to find culturally appropriate methods to include them can contribute to fulfilling the promise of cultural pluralism. In a truly pluralistic society, the well-being of everyone is equally significant. □

Acknowledgments

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