Cultural Diversity, Stress, and Depression: 
Working Women in the Americas 

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ABSTRACT
Social support lengthens life, and stressors induce morbidity early in life and death later. Social supports and stressors, however, particularly those embedded in daily social interactions, exhibit important forms of cultural variation not yet incorporated into stress measurements. This article reports a clinically useful measure of stress applicable to culturally diverse populations. Ninety working women with a wide range of ages, educational attainments, class backgrounds, and historical origins (Africa, northwest Europe, Hispanic, and Native Americans) provided cultural data on the meaning of stress. Consensus analysis, principal components analysis and Cronbach’s alpha, and logistic regression document content validity of the stress scale items and the reliability and construct validity of the stress scale. The meaning of social supports (words or acts that imply respect, equality, or help or otherwise lead one to feel special and important) and stressors (words or acts that demean, imply inferiority, impede achievement, or otherwise lead one to feel bad about oneself) experienced in the course of daily social interaction cuts across cultural differences in other realms of life. Informants with a recent history of stress experienced a risk of depressive symptoms 85 times higher than informants without such a history. Standardized cultural research methods yield an instrument based on potential cultural universals that can facilitate clinical assessment and management of stress and health outcomes, such as depression, in culturally diverse populations.

INTRODUCTION
A large body of literature now shows that the risk of death falls for people with high social support and that stressors contribute, directly or indirectly, to mortality from all major causes of death. Depression may serve as one of the most important means by which stress kills. Depression appears to precede suicide and other violence-related mortality and morbidity, the use of alcohol and illicit drugs, cigarette smoking, and a wide variety of disabling physical symptoms, including chronic and incapacitating pain, fatigue, and headaches, and through suppressed immunological function, to precede or accelerate the course of diverse forms of physical illness, including cancer, cardiovascular disease, and acquired immunodeficiency syndrome (AIDS). During the last half of the 20th century, mood disorders have occurred at increasingly younger ages and with greater frequency. Depressive disorders in adolescence constitute a risk factor for depressive disorders in early adulthood.

The most developed characterization of the relationship between stress and depression hypothesizes intracellular mechanisms that bear on the survival and function of specific hippocam-
pal neurons. A growing body of evidence documents associations between stress and hippocampal atrophy. Rat studies show that highly stressful (violent) childhood experiences tend to produce adults with altered neurological function and behavioral analogs to human depression and anxiety. An immense body of literature using retrospective designs suggests that violence experienced in childhood constitutes a risk factor for a large number of health outcomes in adulthood. These include depression, substance abuse, delinquency, suicide, partnership and parenting problems, and a pattern of sexuality marked by adolescent pregnancy and various forms of high-risk behavior associated with sexually transmitted diseases (STDs) and their sequelae, including HIV/AIDS and, thus, the birth of infants with fetal alcohol syndrome, drug dependency, and HIV+ diagnoses. Altered neurological function may precede these forms of morbidity.

Much of this evidence supports the view that stress and, perhaps, depression constitute an evolved mechanism for responding to specific ecosystem properties, but the properties of ecosystems that constitute stressors and social supports exhibit important forms of historical and regional (i.e., cultural) variation. Characteristically, their measures either do not take into account cultural diversity or erroneously conflate culture with race or with social identities, such as Puerto Rican, Navaho, and African American. Dressler et al. addressed this problem by applying standardized cultural research tools to develop culturally specific measures of relative deprivation-induced stress. This study follows Dressler’s lead and develops a culturally sensitive measure of stress coming from the events and processes that constitute a person’s daily social interaction, which may constitute our most important source of stress.

In 1871, Edward Tylor defined culture as everything we learn and thus share with others by virtue of living our lives as social creatures. Culture continues to be best understood as the knowledge people use to live their lives and the manner in which they do so. One implication is that what we do not know as well as what we do come from when, where, and with whom we have lived all our lives. All clinicians share a common set of understandings that come from their training in biomedicine, for example, but different experiences and training mean that physicians work with a body of knowledge that typically distinguishes them from nurses and physician assistants. Similarly, psychiatrists work with a body of knowledge distinct from that used by surgeons or psychologists. Variation in life experiences leads people to see the world differently. Older people—whether physicians or nurse practitioners—tend to share a distinctive vantage point owing only to age. The knowledge of men and women—psychiatrists or internists—may differ solely because of gendered experiences. Men and women of different ages, however, may work with a common body of knowledge because they grew up in poverty or experienced the privileges bestowed by wealthy parents. Hispanic Americans, irrespective of age, gender, and class, may use a common body of knowledge because they share an ethnic heritage, which may differ significantly from understandings shared by European Americans. Fathers—whether Hispanic or European American, African, or Native American, whether physicians or nurses, old or young, rich or poor—may work with shared knowledge simply because they share the experience of being fathers. Neurosurgeons, whether they live in China, Russia, Nigeria, Mexico, or America, tend to share a distinctive culture irrespective of other differences. Thus, except for the knowledge and behavioral patterns that make each of us unique, no one possesses a single culture. Everyone participates in many cultures. A person’s age, gender, dress, social identity, or skin color poorly predicts which cultures you share and which you do not. Knowledge about which life experiences signal pertinent cultural differences comes only from focused observations on who agrees with whom and about what and to what degree.

Data on culture and data on life experiences that may have shaped culture exhibit different sets of properties and require distinctive research tools. Life experience data consist of measurements of individual characteristics (e.g., age, gender, height, weight) and events or processes that mark the life experience of particular people (e.g., how many years people spent in school, whether or not they grow cash crops, if they grew up in poor or wealthy households, how often they use condoms when having sex, or the degree to which they experienced one or another form of violence as a child). Cultural data, by contrast, consist of measurements of the systems of mental constructions people use to interpret and respond to the world around them and of the behavior isomorphic with those systems of
meaning. Given that culture consists of the knowledge that people use to interpret and respond to the world of experience, culture necessarily evolves through a process in which people actively create and change what they know by interacting with other people. Thus, as Dressler et al. showed, one source of stress consists of lifestyle incongruities with community-constructed norms of reasonable living conditions. Other stressors and social supports become part of our lives through the acts and words through which we carry out social interaction with key people in the behavioral ecosystem in which we live—our bosses, co-workers, spouses, children, family, and friends. The socially constructed nature of cultural phenomena means that any one person who knows about a particular cultural phenomenon participates with other experts in its construction. In short, cultural phenomena inescapably embody spatial and temporal autocorrelation.

Three methodological implications follow. First, a random sample of people does not constitute a random sample of cultural phenomena. Given the definition of culture and random (i.e., unbiased) samples, random samples of cultural phenomena cannot exist. The two constitute mutually exclusive alternatives. A sample of cultural data comes from cultural experts. Cultural experts consist of people who know about the subject of study by virtue of their experience and active construction of culture through interaction with others. Second, cultural research aims to accurately characterize spatial and temporal autocorrelation, not correct for it. To accurately characterize spatial and temporal autocorrelation, we design sampling frames for cultural data to encompass life experience differences that might lead to cultural differences. A generic sampling frame encompasses differences in age, gender, class, and historical origins (ethnicity), although these criteria may change in light of information collected in the course of research. Third, because cultural data violate the assumptions necessary for the valid use of classic statistical tests, hypothesis testing usually requires use of permutation tests. However, has shown that the Spearman-Brown Prophesy Formula can be applied to information rather than items, which allows us to measure the reliability and validity of the cultural data we report. Ethnographic findings based on information from small numbers of informants (3–36, depending on the average level of agreement, from 0.5 to 0.9) exhibit exceptional reliability (0.90–0.99) and validity (0.95—1). By measuring who agrees with whom about what and to what degree, consensus analysis procedures and diagnostics test the construct validity and reliability of claims made about specific cultural domains of meaning and behavior and, thus, allow valid generalization to populations defined by the studied life experiences.

**MATERIALS AND METHODS**

**Participants**

Cultural experts for the present study include 90 working women who exhibited a wide range of ages, educational levels, class backgrounds, and historical origins (ethnicities). Women of African origin living in Barbados and Connecticut constitute 24% of the sample, women of northwest European origin living in Connecticut and Massachusetts constitute 50% of the sample, women of Hispanic origin living in Puerto Rico and Connecticut constitute 9% of the sample, and women of Native American origin living in California's North Coast constitute 17% of the sample. Informant ages range from 18 to 78 (mean 40.7, SD 13.7). Educational attainment ranges from a completed primary school education (6 years) to a completed graduate education (Ph.D., M.D., coded as 21 years even if took longer). The mean level of educational attainment of 15.6 years (SD 3.2) represents just under a completed college education. Informant ages and educational attainment are comparable among women of all ethnic groups, with the exception of the oldest African American women, who left school after the primary grades because of limited educational opportunities. Forty-one percent of the sample grew up in poverty. European Americans (odds ratio [OR] = 1.00) and Hispanic Americans (OR = 2.0, 95% confidence interval [CI] = 13.4–0.3) exhibited an equivalent likelihood of growing up in poverty, controlling for age. African American informants were approximately 6 times more likely to report growing up in poverty (OR = 5.7, 95% CI = 17.8–1.9). Native American informants were 44 times more likely to report growing up in poverty (OR = 44.6, 95% CI = 280.7–7.1).
**Data collection**

Initial informal and semistructured ethnographic interviews yielded information on the nature and components of stress experienced by working women and potential cultural variation by age, ethnicity, educational attainment, and class background. Subsequent structured interviews yielded rating assessments (with a 4-point scale, from 0 = never acceptable to 3 = always acceptable) of each component. These interviews also elicited information on (1) the frequency with which women had experienced each of the forms of behavior that might comprise a scale for stress on a 5-point scale (from 0 = never to 4 = all the time) during the previous month and (2) the frequency with which they experienced symptoms of depression measured with a four-item scale adapted from Berwick et al.’s Mental Health Screening Test, which exhibits excellent criterion validity. We asked for the voluntary participation of informants based on explanations of the purposes of the research and, for participants, recorded data in ways that avoided the use of individual identifiers.

**Statistical procedures**

Output reported here comes from Anthropac and SYSTAT software. Consensus analysis procedures apply minimum residuals factor analysis to informant responses. A single factor that accounts for a large proportion of matrix variance constitutes evidence of the construct validity of a single cultural consensus. If there exists a single underlying agreement among informants and diagnostic analysis of loadings on the first two factors reveals no coherent alternative, inferences about what informants agree about come from the application of Bayesian statistical methods. The Spearman-Brown Prophecy Formula applied to the average factor loading among informants yields inferences about the reliability and validity of the cultural consensus. Principal components analysis of scale items tests for construct validity, and Cronbach’s alpha tests scale reliability.

**RESULTS**

**Core stressors for working women**

Informants consistently equated stress with their emotional response to dissonance between the behavior they experience and the behavior they find acceptable. The behavioral characteristics women consistently associated with emotional dissonance included words or acts that:

1. “make you feel bad about yourself,” rather than make you feel special and important, as in the following:

   Luckily, Allen [pseudonym, as are all subsequent names in the following quotations] hasn’t done it in a while. But, one of the things that he has said to me any number of times, that has pushed this incredible button in me, is “you’re just not as ambitious as you used to be.” And I can feel this like, thing go off in me... Well, sometimes it makes me feel horrible. Like I’m not the person I used to be [before we had children] or that I am not somehow living up to the ideal of the person that he thought I was or that he wanted me to be.

   or

   [Speaking about the reaction of women she encounters in social situations] My children have been the subject of pity (“It’s too bad they have to go to day care.”). My ability to juggle [children and a career] has been proclaimed amazing (“You are the only mother who does this well!”). Derisively, I hear “you sound like such a professional” when I tell my son’s friend’s mother at 8 o’clock that I don’t have time to arrange a play date because I’m supposed to be at work. When I attempted to find a network of working mothers through the school, the school psychologist told me that there were no groups and by the way “the children do so much better when you’re at home.”

2. “treat you as an inferior,” rather than treat you as an equal, as in the following:

   [Responding to a question about the stress of being interviewed about “stress.”] This is actually really nice. As long as Bob is not coming upstairs and saying “excuse me, you are in my space and I want to be here.” As long as he’s happy downstairs I’m fine. As long as we didn’t invade his space.

   or

   [Speaking about support from higher level management] I come in and they don’t pay me very much money and I work pretty hard for the time that I’m there. I don’t feel lack of support from
them. I feel nothing from them. I sort of feel like I'm a nonentity as far as they're concerned.

3. "block your attempts to achieve," rather than helping you achieve, as in the following:

[A single working mother speaking about her mother's reaction to a planned trip to undergo professional training while leaving her child at home] But [my mother] comes right out and says: "Do you think Annie will be OK? I think that's a lot to ask of such a little girl." Well, she's not such a little girl. Anyway, I'm going. [But] No one will forgive me if I die in a plane crash. (Laugh)

or

[A married working mother speaking about a child's reaction to the demands of her challenging career] I took one day off last week to be with [my daughter] during her school vacation and she wanted to know why [like her friend's mothers] I couldn't take more of the days off. Why I couldn't be home on Tuesday because I was home on Monday. That makes me feel very guilty! Very guilty!

4. "demean or belittle you," rather than treat you with respect, as in the following:

[A woman, a trained clinician working for a grant-funded public service foundation with uncertain continuing funding, reported a conversation with less highly qualified co-workers about their future employment prospects] One woman told me, "Well, you don't have to worry. John [husband] will take care of you." I wanted to belit her. My other co-worker said, "You know, top [clinicians] make more money [than you]." [During this interview, she also mentioned that she also senses a general lack of empathy or support from her inner circle. In addition, she now lives in a neighborhood of mostly nonprofessional women who focus on home and family management. She senses that they think of her as inferior because she works and doesn't attend to home and family the way they do.]

or

The vignettes that pop to mind are many: the pediatric surgeon who sought out the male resident to teach how to drain an abscess on my patient; the neonatologist who said he would "clobber" me had I not been a "lady" because he didn't like being called late in the day about a sick newborn. (I guess I should be thankful I was a woman that day).

Content validity of scale items

Ratings data on the extent to which informants find acceptable each of the previous forms of behavior give us a basis for assessing cultural differences in potential sources of stress and a means for validating the cultural content of scale items. Briefly, informants expressed a strong consensus that certain words or acts are always acceptable (rating of 3 on the 0–1–2–3 scale) and other words or acts are never acceptable (range of 0 on the 0–1–2–3 scale). The first factor of agreements among informants was 23.951 times larger than the second and accounted for 88.5% of variance among informants. The average factor loading was 0.93 (SD 0.16). The reliability and validity of the inferred cultural consensus are approximately 0.99.

A multiple regression analysis using the factor loadings that measure agreement-with-the-consensus as the dependent variable yields a multiple $R^2$ of 0.081 and an $F$ ratio of 0.895 (1-tailed $p = 0.566$; probabilities based on 10,000 random permutations). This analysis thus reveals that informant agreements with the consensus factor bear no relationship to the degree to which they had recently experienced stressful behavior, the degree to which they had recently experienced mood disorder symptoms, their age, their educational attainment, whether or not they grew up in poverty, or their ethnicity. A plot of loadings on the first two factors extracted from the matrix of agreements among informants revealed no cluster of low agreement with the consensus factor and high agreement with the residual factor (which accounted for only 3.7% of matrix variance), which would indicate the presence of a coherent alternative consensus about the acceptability of the behaviors studied here.

These findings warrant the inference that there exists, independent of age, education, class, or historical origins, cultural agreement that words or acts that imply respect, equality, or active assistance or otherwise make one feel special and important, are always acceptable and function as social supports. By contrast, words or acts that imply inferiority, impede achievement, or otherwise make one feel bad about oneself are never acceptable and function as stressors.


Scale validation and reliability

Table 1 shows output from principal components analyses of (1) the depression items adapted from Berwick et al.'s Mental Health Screening Test and (2) the items for stress identified by the consensus analysis. Both analyses reveal one major factor and a strong Cronbach's alpha. The depression scale had a first eigenvalue 5.2 times greater than the second, which accounted for 68.8% of the matrix variance, and a Cronbach's alpha of 0.837. The stress scale had a first eigenvalue 3.4 times higher than the second, which accounted for 62.4% of the matrix variance, and a Cronbach's alpha of 0.911. These findings warrant the inference that both sets of scale items exhibit construct validity and excellent reliability.

Clinical utility of the stress scale

A multiple regression analysis using depression scale factor scores as the dependent variable yielded a multiple $R^2$ of 0.477 and an $F$ ratio of 9.217 (1-tailed $p = 0.008$; probabilities based on 10,000 random permutations). Table 2 shows that the degree to which informants expressed a recent history of depressive symptoms (as measured by factor scores) was solely a function of their recent history of stressful social interaction (as measured by factor scores; 1-tailed $p < 0.000$).

Once we control for informant's recent history of stressful social interaction, ethnicity (1-tailed $p = 0.460$ for the contrast between African Americans and Hispanic Americans; 1-tailed $p = 0.463$ for the contrast between Native Americans and Hispanic Americans; 1-tailed $p = 0.217$ for the contrast between European Americans and Hispanic Americans), age (1-tailed $p = 0.246$), educational attainment (1-tailed $p = 0.497$), having been raised in poverty (1-tailed $p = 0.320$), and the degree to which they agreed with the consensus factor (1-tailed $p = 0.255$) show relationships best explained by chance. Figure 1 plots this relationship and shows that increasing levels of recent stress predict higher levels of recent depressive symptoms, and increasing levels of recent social support predict higher levels of recent buoyant mood symptoms.

Much simpler analyses can help in the management and treatment of stress and depression in clinical settings. Simple sums of the scale items correlate perfectly with the factor scores. Binary indicators may constitute effective means of identifying patients at risk for depression or other stress-related health problems. A binary indicator of depressive symptoms might consist of anyone who has an average depression scale score higher than 8 (an average of scores of 2 on the scale items) or who scores 4 (All the time) on any

<table>
<thead>
<tr>
<th>Component loadings for depression scale</th>
<th>First eigenvalue (%)</th>
<th>Ratio: first/second</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over the last month, how often have you:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Felt downhearted and blue?</td>
<td>0.876</td>
<td>2.751 (68.8%)</td>
</tr>
<tr>
<td>Felt happy?</td>
<td>0.798</td>
<td></td>
</tr>
<tr>
<td>Felt so down in the dumps that nothing could cheer you up?</td>
<td>0.860</td>
<td></td>
</tr>
<tr>
<td>Gotten angry quickly?</td>
<td>0.780</td>
<td></td>
</tr>
<tr>
<td>Cronbach's alpha</td>
<td>0.837</td>
<td></td>
</tr>
</tbody>
</table>

| Component loadings for stress scale    |                      |                     |
| Over the last month, how often did someone: |                      |                     |
| Demean or belittle you?                | 0.793                | 4.995 (62.4%)       | 3.4    |
| Treat you as an inferior?              | 0.769                |                     |        |
| Block your attempts to achieve?        | 0.814                |                     |        |
| Make you feel bad about yourself?      | 0.791                |                     |        |
| Treat you as an equal?*                | 0.821                |                     |        |
| Help you achieve?*                     | 0.648                |                     |        |
| Make you feel special?*                | 0.784                |                     |        |
| Show you respect?*                     | 0.882                |                     |        |
| Cronbach's alpha                       | 0.911                |                     |        |

*Reverse coded for analysis.
### Table 2. Predictors of Current Depressive Symptoms

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Regression coefficient</th>
<th>1-tailed probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consensus agreement loading</td>
<td>-0.376</td>
<td>0.255</td>
</tr>
<tr>
<td>Educational attainment</td>
<td>0.000</td>
<td>0.497</td>
</tr>
<tr>
<td>Age</td>
<td>-0.007</td>
<td>0.246</td>
</tr>
<tr>
<td>Raised in poverty</td>
<td>-0.162</td>
<td>0.320</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>-0.045</td>
<td>0.460</td>
</tr>
<tr>
<td>Native American</td>
<td>0.047</td>
<td>0.463</td>
</tr>
<tr>
<td>European American</td>
<td>-0.344</td>
<td>0.217</td>
</tr>
<tr>
<td>Stress factor score</td>
<td>0.643</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Symptoms from a recent history of stress, the current model correctly identifies depressive and nondepressive cases 34.8% better than a random model. The stress scale developed here constitutes a specific (specificity = 0.903) and reasonably sensitive (sensitivity = 0.514) screening tool for depression symptoms among working women from highly diverse age, educational, class background, and ethnic populations.

### DISCUSSION

Social support lengthens life, and stressors induce morbidity early in life and death later. However, social supports and stressors, particularly those embedded in daily social interactions, exhibit important forms of cultural variation not yet incorporated into stress measurements. Patients’ declarative knowledge is one component of culture, so culture-free screening items cannot exist. However, stress screening items may constitute cultural universals when constructed on the basis of the meaning rather than the form of stressors or social supports in patients’ lives. This approach yielded items for stressors that, in previous research, were identified as measures of violent and exploitative social interaction, and so-

![Figure 1. LOWESS (locally-weighted regression smoother)-smoothed relationship between a recent history of depressive symptoms and a recent history of stress. (Cases identified by historical origin: A, Africa; E, northwest Europe; H, Hispanic; N, Native American.)](image-url)
clial support items earlier considered measures of affectionate and empowering social interaction. Scales for violence (stressors) and affection (social supports) developed from these items showed excellent construct validity and reliability for both men and women in two radically different populations: (1) people of African descent now making a living on tourist islands in the West Indies and (2) people of Asian and Native American descent who continue to live as hunters, fishermen, and herders in the Arctic regions of Alaska and the Russian Far East. Standardized cultural research methods thus yield an instrument that can facilitate clinical assessment and management of stress and such health outcomes as depression in culturally diverse populations.

ACKNOWLEDGMENTS

This study began as a project for a graduate seminar taught for the Department of Community Medicine at the University of Connecticut. Seminar members Deborah Hovey, Carrie Klima, JoAnn Lord, Robin Tousey-Ayres, and Shari Smith helped formulate the problem, initiated data collection, and carried out preliminary analyses. Research assistants Katherine Handwerker-Droz and Jan Ward collected much additional data and helped me think through selected issues. Conversations with Robin Harwood and James Boster led to a more cogent argument.

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