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A prospective study of cultural consonance and depressive symptoms in urban Brazil

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Abstract

Cultural consonance refers to the degree to which individuals, in their own beliefs and behaviors, approximate the prototypes for belief and behavior encoded in shared cultural models. In previous cross-sectional studies, lower cultural consonance in several cultural domains was associated with worse health outcomes, including greater psychological distress. The current paper extends these findings in three ways. First, the effect of cultural consonance on depressive symptoms is tested in a prospective study. Second, it is hypothesized that the effect of cultural consonance in a specific cultural domain will depend on the degree of cultural consensus within that domain: the higher the cultural consensus, the greater the effect of change in cultural consonance in that domain on depressive symptoms. Third, it is hypothesized that cultural consonance will have an inverse effect on depressive symptoms independent of the occurrence of stressful life events (a well-known risk factor for depression). We tested these hypotheses in a study conducted in urban Brazil, and found that change in cultural consonance (assessed as a general construct) was associated with depressive symptoms at a 2-year follow-up. Furthermore, cultural consonance in the domains in which there was highest cultural consensus—the domains of family life and lifestyle—was more strongly associated with depressive symptoms at follow-up than cultural consonance in domains with lower cultural consensus. Finally, all of these effects were independent of stressful life events. These results lend further support to the importance of cultural consonance in relation to human health.

Keywords: Brazil; Cultural consonance; Depressive symptoms

Introduction

It goes virtually without saying that cultural factors are important in the etiology and expression of mental health problems. What has proven problematic is the development of theory and method to examine how culture, conceptualized as a property of a social group, translates into effects on individuals. Dressler and colleagues (Dressler, Balieiro, Ribeiro, & Santos, 2005; Dressler, Borges, Balieiro, & Santos, 2005) have proposed just such a theory, termed a "theory of cultural consonance," and a method to operationalize the key construct. Cultural consonance is the degree to which

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individuals, in their own beliefs and behaviors, approximate the prototypes for those beliefs and behaviors encoded in shared cultural models. Higher cultural consonance (assessed in several domains) was associated cross-sectionally with lower arterial blood pressure and fewer expressed symptoms of psychological distress in a series of studies (Dressler, 2005).

The purpose of this study is to expand upon these findings in three ways. First, in this paper, the effects of cultural consonance on depressive symptoms are examined prospectively, based on a 2-year follow-up of a sample from an urban Brazilian community. Second, hypotheses are proposed and tested regarding the relative effects of cultural consonance in different domains. Specifically, it is hypothesized that low cultural consonance in the cultural domains in which there is higher cultural consensus or sharing will have a stronger effect on depressive symptoms. And third, the effects of cultural consonance relative to the effects of a major known risk factor for depression, stressful life events, are examined. Depressive symptoms have been examined widely in research on culture and health and hence provide an appropriate outcome for this prospective test of a theory of cultural consonance.

Cultural consonance and health

There are a number of problems with conventional concepts of culture applied to the study of culture and health. The problem of linking culture as a term that refers to an aggregate (i.e., a social group) to the beliefs and behaviors of individuals is foremost. Linking these levels of analysis in a conceptually satisfying way, employing research methods that unambiguously show such a link, has proven elusive in social scientific research. This problem is addressed by a theory of cultural consonance (Dressler, 2005).

A theory of culture derived from cognitive anthropology provides the foundation for the concept of cultural consonance. In Goodenough's (1996) definition, culture is that which one needs to know in order to function adequately in a social group. It is this knowledge that is both learned and shared that enables us to appropriately interpret others' behaviors and that directs our own beliefs and behaviors. This definition locates culture in the individual, because not to do so leads to complex ontological problems. At the same time, elaborating the notion of sharing to mean also "distributed" extends the locus of culture to the group level (Sperber, 1985). Culture is the knowledge that constructs the world around us on the basis of a shared understanding that this is, indeed, the world and the way it works (D'Andrade, 1984; Searle, 1995). Individuals are variably able to reproduce that group knowledge, based on their own socialization and their position in the social structure. Given the incomplete nature of any individual's knowledge, the overall structure of the environment of meaning within which social life proceeds is a function of how shared knowledge is distributed across individual minds.

This shared knowledge is usefully conceptualized as encoded at the individual level in a series of linked and overlapping cultural models. Cultural models are schematized representations of an organized area of shared knowledge—or a cultural domain—that can be observed in everyday speech and that include the elements of that domain and the associations among those elements (D'Andrade, 1995, p. 151).

This theoretical orientation can be joined to the method of cultural consensus analysis developed by Romney, Weller, & Batchelder (1986). Cultural consensus analysis is a statistical technique for evaluating the degree of sharing among a set of informants regarding the structure of a cultural domain. Using cultural consensus analysis, the relative degree to which individual informants reproduce that shared knowledge in their own responses, referred to by Romney et al. as "cultural competence," can be quantified. Given a basic level of sharing, it is possible to estimate the content of the shared knowledge—the "culture"—that, in essence, is the best estimate of the responses to questions about that cultural domain that a reasonably culturally competent (or knowledgeable) informant would produce.

The cultural consensus model thus joins the aggregate and individual levels of analysis. At the same time, it evaluates how well an individual knows a particular cultural domain, relative to the aggregate knowledge structuring that domain. It does not evaluate what that informant herself believes or how she behaves relative to that aggregate knowledge. At this point, the construct of cultural consonance becomes important, linking the individual's own beliefs and behaviors to the shared cultural model in that domain. The more an individual's own beliefs and behaviors correspond

to the prototypes for belief and behavior encoded in shared cultural models, the higher her cultural consonance (Dressler, 2005).

We hypothesized that low cultural consonance would be a chronically stressful experience that would be associated with worse health outcomes. In a study conducted in the African-American community in the southern United States (Dressler & Bindon, 2000), and two conducted in urban Brazil (Dressler, Balieiro et al., 2005, 2007; Dressler, Borges et al., 2005), cultural consonance in various cultural domains was associated with elevated arterial blood pressure and symptoms of psychological distress. These associations persisted after controlling for other known correlates of blood pressure and psychological distress. Additionally, there was a tendency for individuals to be consistently more or less consonant across a number of domains, the result being a kind of generalized cultural consonance. Psychological distress was associated with this generalized cultural consonance, but arterial blood pressure was specifically associated with cultural consonance in domains defining social distinction and affiliation (Dressler, Balieiro et al., 2005, 2007; Dressler, Borges et al., 2005).

Study aims

The current study was undertaken to extend these findings in three ways. First, all previous studies were conducted using a cross-sectional research design. One weakness of this design is temporal ambiguity; that is, did low cultural consonance leads to psychological distress, or are distressed individuals less able to organize their lives effectively to become culturally consonant? The data analyzed here are from a 2-year follow-up of a sample for which the cross-sectional analysis has already been reported (Dressler et al., 2007). In that cross-sectional analysis, we found cultural consonance in five different cultural domains to be associated with reported symptoms of psychological distress. Here, we will determine if cultural consonance at Time 1, and change in cultural consonance from Time 1 to Time 2, is associated with depressive symptoms at Time 2, controlling for prior levels of depressive symptoms.

Second, while the idea of generalized cultural consonance is itself an interesting one, various orientations in anthropological theory have emphasized that different dimensions of culture have different causal potential. Here, we propose that the degree of cultural consensus (or sharing) in a cultural domain is a measure of its salience as an organizing principle within a society and that low cultural consonance in the cultural domains with the highest cultural consensus will be experienced as more stressful and will have the largest impact on reported depressive symptoms at the 2-year follow-up.

Finally, the effects of cultural consonance will be compared to another correlate of depressive symptoms. Depressive symptoms are associated with both chronic and acute social stressors (Paykel, 2003, p. 62). As noted above, low cultural consonance is hypothesized to be a chronic stressor. Stressful life events, on the other hand, are acute social stressors that have been found to be important risk factors for the onset of episodes of depression (Paykel, 2003, p. 62). In order to rule out the alternative hypothesis that low cultural consonance is a consequence of or confounded with stressful life events, we will examine the effect of cultural consonance on depressive symptoms controlling for stressful life events.

This study was conducted using a mixed qualitative–quantitative, ethnographic–epidemiologic design. The development of measurements for the quantitative, hypothesis-testing phase of the research depended on the results of the initial ethnographic phase in which exploratory and discovery-oriented methods were used to examine the shared meanings defining relevant cultural domains within the research community. In the following, the research setting and this initial ethnographic phase of cultural domain analysis will be described first, and the operational specification of research hypotheses flowing from that analysis will be delineated. Then the methods and results of epidemiologic survey research to test those hypotheses will be presented.

The research setting and cultural domain analysis

Ribeirão Preto is a city of approximately 500,000 people in the Brazilian state of São Paulo. It is both a financial and service center for the agricultural industries in the area (including the production of sugar cane, citrus, coffee, and cattle), and a center of education and health care for the region.

To adequately sample from this large and complex community, four socioeconomic strata, represented by residential neighborhoods, were

selected for study. These have been described in detail in other papers (Dressler, 2005; Dressler et al., 2007), so will only be briefly described here. The poorest neighborhood began almost 20 years ago as a *favela* or so-called squatter settlement. In 1994, the municipality created a housing project, removed the *favelados* (residents of a *favela*) to it, and then razed the *favela*. The residents thus achieved legal status, but they also assumed responsibilities for paying rent and bills for municipal services. Given their economic marginality, many were unable to do so and have since been replaced by persons of slightly higher means who could afford to buy houses in the neighborhood. Nevertheless, this still is a lower class neighborhood, with the majority of residents employed as unskilled or semi-skilled laborers, farm workers, and domestic servants.

The second neighborhood is a *conjunto habitacional*, a lower-middle class community that is a planned neighborhood built in a cooperative agreement between the municipality and a developer. Residents qualify for a lottery to buy homes with low-interest financing on the basis of the security of their employment status. This *conjunto* was begun in the late 1980s, and since has evolved from a strictly working class neighborhood into a mixed residential area of working people (especially factory workers, bus drivers, and similar occupations) and lower-level white-collar workers.

The third neighborhood is a solidly middle class, mixed residential and business area that was founded at the turn of the 20th century, shortly after the city was founded. Occupational pursuits are diverse, ranging from the owners of small businesses to middle-level management in larger concerns, as well as teachers and nurses.

The fourth neighborhood is an upper-middle class residential area, the residents of which are primarily upper-level professionals (doctors, lawyers, university professors), upper-level management, and owners of large businesses.

The cultural domains examined in this research were chosen on the basis of a combination of theory and ethnographic intuition, and because they are organized spheres of discourse commonly encountered in everyday conversation in Brazil. The domains included lifestyle, social support, family life, national identity, and food; however, for logistical reasons, we did not examine the domain of food in the follow-up study, so that will not be discussed or employed as a variable here. The cultural domains of lifestyle and social support represent individual experience of social class and social affiliation (Dressler & Bindon, 2000). Family life is a cultural domain of considerable importance in daily life in Brazil, as evidenced both in ethnographic data and in the scholarly literature (da Matta, 1985). National identity is also a topic of interest among Brazilians and a focus of Brazilian scholarly literature (da Matta, 1991).

The research was conducted in three stages: (a) cultural domain analysis, which provided both an understanding of the domains and a foundation for the development of measures of cultural consonance in each domain; (b) cross-sectional survey research, to collect data on cultural consonance and health outcomes; and (c) a follow-up interview to assess the effects of cultural consonance prospectively.

Cultural domain analysis (Bernard, 2006), the first stage of data collection, consisted of an in-depth examination of each cultural domain using the interviewing and data-analytic techniques of cognitive anthropology, including freelisting; unconstrained pile sorts; rating and ranking tasks; the analysis of these data with multidimensional scaling, cluster analysis, and correspondence analysis; focus group and open-ended individual interviews; and, ultimately, a cultural consensus analysis in each domain. Freelists, pile sorts, and ranking tasks were used to generate elements of each domain and to explore the dimensions of meaning structuring cultural models in each domain. These interviews were carried out iteratively with samples ranging from 15 to 45 respondents, depending on the domain. The final cultural consensus analyses were conducted with a sample of 66 respondents, selected purposively to reflect major dimensions of social variation in Brazil. Focus groups were conducted for each cultural domain in each neighborhood, resulting in a total of 20 focus groups. Individual interviews were conducted on each domain with two persons in each neighborhood, for a total of 40 individual interviews. Qualitative data from focus groups and individual interviews (both analyzed using standard indexing software) were used to further explore the content of each cultural model, relative to the organization of cultural models revealed by the more structured techniques of cultural domain analysis. In the following, the cultural domain analyses are discussed in general terms; a more specific discussion can be found in Dressler, Borges et al. (2005) and Dressler, Balieiro et al. (2005).

The cultural domains of lifestyle and social support were examined in previous research in Brazil and the US (Dressler, 2005; Dressler & Bindon, 2000). Lifestyle refers both to the acquisition of culturally desired material goods and to related behaviors, especially leisure-time activities. In the literature in the social sciences, lifestyle has been regarded as a means of displaying one's place in the socioeconomic hierarchy (Bourdieu, 1984). In cultural domain analyses, lifestyle is culturally constructed as things necessary to lead a "good life." Furthermore, the emphasis is not on conspicuous consumption, but rather on what we term a kind of "domestic comfort." In pile sorting tasks, respondents emphasized a distinction between what was truly necessary for a good life (e.g., a home, furnishings for the home, basic appliances, enough money for a few "extras") versus things that might be pleasant to have, but not truly necessary (e.g., jewelry, consumer electronics). Respondents also emphasized leisure time activities that both brought them together with family and friends, and that provided opportunities for self-improvement. In focus group discussions, this comfortable domestic life was linked to notions of "tranquility" and "relaxation." In the test for cultural consensus, there was strong agreement on the lifestyle necessary to have a good life (eigenvalue ratio = 6.59; mean competence = .71 ± .12).

Social support refers to help and assistance that individuals can anticipate within their social network in times of felt need. When asked to freelist problems for which help is often sought, the problems listed included problems within the family, issues such as needing to borrow money, and problems at the workplace. Supporters included those within intimate relationships such as family and friends, as well as co-workers, church members, and professionals such as a doctor. In focus group discussions, respondents emphasized the necessity of the entire support system (not just support from select individuals) to help them cope with everyday problems in life. In the test for cultural consensus, respondents were asked to rank potential supporters from most-to-least important for each problem. There was strong agreement on these rankings (eigenvalue ratio = 6.53; mean competence = .67 ± .14).

For the domain of family life, respondents listed the characteristics of families they did and did not admire. This resulted in a set of elements arrayed along an evaluative dimension. At the positive end of the dimension the elements fell into either a category of love and affection within the family, or into a category of structure and organization. At the negative end of the dimension, the elements fell either into a category that described rude or boorish behavior within the family (*mal-educado* in Portuguese) versus more serious family problems such as violence and addiction. In focus group discussions, respondents augmented these elements by including the importance of gendered social roles within the family, and emphasized the impact of social change on traditional conceptions of the family. When asked to rank the importance of elements "for having a family," there was strong consensus (eigenvalue ratio = 7.92; mean competence = .82 ± .09).

Finally, the cultural domain of national identity describes what makes Brazilians distinctly Brazilian in their own eyes. Respondents were asked to freelist Brazilian characteristics, and from the beginning this was the most highly contested cultural domain, mainly because some respondents named characteristics that were regarded as unflattering to other respondents. Additionally, in the focus group discussions, there was considerable emphasis placed on regional differences in Brazilian identity. The contested nature of the domain was confirmed in the cultural consensus analysis, in which there was consensus regarding these characteristics, but it was relatively low (eigenvalue ratio = 3.97; mean competence = .57 ± .19).

These cultural domain analyses served as the foundation for the development of measures of cultural consonance (described below). Cross-sectionally, cultural consonance in all domains was associated with psychological distress (Dressler et al., 2007). Furthermore, the measures of cultural consonance factored into two independent dimensions, one describing a generalized cultural consonance in social factors, and one describing cultural consonance in the four dimensions of the cultural model of food (again, not included in the prospective data set). Both factors of generalized cultural consonance were associated with psychological distress cross-sectionally (Dressler et al., 2007).

The first question that will be addressed here is if a generalized cultural consonance is associated with depressive symptoms assessed 2 years later. Second, we predict that as individual variables, the relative strengths of the effects of different measures of cultural consonance will be a function of their overall consensus. Specifically, the predictive effects of individual measures of cultural consonance should be ordered as follows: cultural consonance

in family life, cultural consonance in lifestyle, cultural consonance in social support, and cultural consonance in national identity. Third, all effects of cultural consonance will be independent of the effects of stressful life events over the 2-year period.

Methods

Simple random samples of households were selected from each of the neighborhoods using complete enumerations of occupied dwellings based on municipal service records. Within each household, the head of household, spouse, and one child over the age of 18 were invited to participate in the research. This resulted in a sample of 271 persons, which is a response rate of 72.3% (based on the number of people completing the research protocol divided by the number of people who were invited to participate). The research protocol was reviewed and approved by both the Institutional Review Board for the Protection of Human Subjects of The University of Alabama, and the Ethics Committee of the Faculty of Medicine of Ribeirão Preto, the University of São Paulo.

For the 2-year follow-up, 210 members of the original sample agreed to be re-interviewed (77.5% of the original sample). In the original data collection, in addition to the initial interview in which sociocultural and psychological data were collected, we carried out two dietary interviews and a clinical interview. We did not have sufficient resources to collect all of these data at follow-up, so the interviews on cultural consonance in food were dropped; hence, those variables are not included here.

The dependent variable in the research reported here is a Brazilian Portuguese version of the Center for Epidemiologic Studies Depression Scale (CES-D), translated and validated by da Silveira & Jorge (2000). The CES-D has acceptable reliability in this sample (Cronbach's alpha = .88).

Three covariates are employed: age (assessed as reported age in years); gender (coded as women = 0 and men = 1); and, socioeconomic status (SES). SES was assessed as a composite scale of household income (reported in number of minimum salaries per month), education (reported as years of education completed), and occupational status. The latter was coded using the scale reported in Pastore (1982) developed in Brazil. A single principal component accounts for 60.7% of the shared variance in these three variables, and the principal component score is used as the measure of SES.

Each measure of cultural consonance was calculated in general in the same way. Using the output from cultural consensus analysis that provides the culturally best responses to the questions posed in each domain, we designed questions to be asked of individuals about their own beliefs and behaviors. Then, the degree to which their reports of their beliefs or behaviors matched the answers from the cultural consensus analysis was calculated to operationalize cultural consonance in that domain. In the following, we briefly describe the derivation of these measures; a detailed discussion of each measure can be found in Dressler, Borges et al. (2005) and Dressler, Balieiro et al. (2005).

The measurement of cultural consonance in lifestyle assessed the degree to which individuals correspond to the model in their own behavior. For material goods, respondents indicated whether or not they owned each item. On leisure activities, respondents reported on a four-point scale (from never to several times per week) the frequency with which they engaged in those behaviors. To calculate cultural consonance in lifestyle, the number of material items owned by, and the number of leisure behaviors reported by, the individual were summed that were rated in the cultural consensus analysis as being at least "important" in having a good life. This sum was then divided by the total to yield a proportion. The closer this proportion is to 1.0, the more the respondent's own lifestyle matches that of the consensus model.

To measure cultural consonance in social support, respondents were provided with sets of cards for the seven potential supporters and were asked to rank order them in terms of seeking support from them for each of the nine problems. To calculate cultural consonance in social support, the data matrix was transposed so that each respondent became a column and each row was that respondent's ranking of a particular supporter for a particular problem. A column was added that was the corresponding cultural consensus ranking. We then calculated correlation coefficients between the rankings by each respondent and the rankings from the consensus analysis. These correlations are used as the measure of cultural consonance in social support.

To measure cultural consonance in family life we assessed individuals' perceptions of their families. Respondents were presented with a statement about

the family, phrased explicitly in terms of their own family, and asked to agree or to disagree with that statement. For each concept from the cultural domain analysis, we generated a statement describing the family that would be acceptable in everyday speech. We generated a minimum of one sentence for each concept, although for several of the more salient items we generated more than one statement. Examples of items include: "In my family we feel close to one another," and "At times I wish my family was more organized." All items were written originally in Portuguese. To arrive at the total scale score, we weighted an individual's responses by the importance of each particular concept estimated from the cultural consensus analysis. The scale has high internal consistency reliability (alpha = .89).

For national identity, as in the domain of family life, we wrote items that represented personal beliefs in this domain and asked respondents to agree or disagree with the statements (again, all items were written originally in Portuguese). In scaling the items, we first experimented with a unidimensional scale of all of the items, but this had very low internal consistency. Then, a series of exploratory factor analyses (principal components analysis with varimax rotation) were carried out, successively deleting items that had low communalities. It was apparent that the items referring to the most positive characteristics of Brazilian life had very low variability (i.e., people endorsed the most positive items). There was, however, a consistent factor that combined most of the unfavorable views of Brazilians. These included perceptions of others as unhelpful; of relying on the Brazilian *jeito* (a way of bending the rules); and, taking advantage of others (see da Matta, 1991). A scale of the eight items has acceptable internal consistency reliability (alpha = .69) and represents a scale of "cultural cynicism." That is, those individuals who endorse more of the items have a more cynical view of Brazilians and Brazilian life, but it is a distinctly culturally constructed cynicism.

All four of the cultural consonance variables load a single principal component that explains 46% of the variance among the measures. Principal component loadings are as follows: cultural consonance in lifestyle = .78, cultural consonance in social support = .62, cultural consonance in family life = .58, and cultural cynicism = −.77. The principal component score is used as a measure of generalized cultural consonance.

Stressful life events were collected using an inventory of events developed and validated in Brazil (Savoia, 2000). This inventory consists of 10 major events that are culturally regarded as negative (such as death of a family member, marital separation, and loss of a job) The number of events occurring in the year prior to the follow-up interview were counted.

Results

Descriptive statistics are shown in Table 1. When the original sample ($n = 271$, data not shown) and the follow-up sample ($n = 210$) were compared on all variables used in this analysis, there were no differences. A number of the variables used in the analysis differ between Time 1 and Time 2 for the follow-up subsample, with some values increasing over the time period and others decreasing.

To test the prospective effects of cultural consonance on depressive symptoms, a regression

Table 1
Descriptive statistics for the follow-up sample

Variable	Descriptive statistics ($n = 210$)
Age	40.6 (±11.3)
Sex (% men)	37.0
SES	.01 (±1.0)
Stressful life events	2.2 (±1.7)
Depressive symptoms	
Time 1	12.4 (±10.1)
Time 2	11.9 (±9.7)
Cultural consonance in lifestyle	
Time 1	.67 (±.15)
Time 2[a]	.69 (±.16)
Cultural consonance in social support	
Time 1	.49 (±.18)
Time 2[b]	.51 (±.16)
Cultural consonance in family life	
Time 1	106.5 (±24.8)
Time 2[a]	102.7 (±21.7)
Cultural cynicism	
Time 1	11.6 (±3.7)
Time 2[a]	11.2 (±3.4)
Generalized cultural consonance	
Time 1	.02 (±.9)
Time 2	.00 (±1.0)

[a]Time 1 versus Time 2, $p < .05$.
[b]Time 1 versus Time 2, $p < .10$.

model was used (Singer & Willett, 2003). The general form of the model is as follows:

$$Y_2 - Y_1 = a + b_1 Y_{\text{time 1}} + b_2 X_{\text{time 1}} + b_3 X_{\text{time 2-time 1}} + e,$$

where '*Y*' refers to the dependent variable and '*X*' refers to an independent variable. In formatting the regression equation in this way, change over time in the dependent variable is examined as a function of change over time in the independent variable, while controlling for initial levels of both independent and dependent variables, meaning that both the effects of initial levels of the independent variables, as well as their effects as a function of change over time, can be examined.

Table 2 shows the regression of the change in the CES-D in relation to both the initial levels of generalized cultural consonance and the change in generalized cultural consonance over time. Generalized cultural consonance at Time 1 has an effect on depressive symptoms at Time 2, controlling for initial levels of depressive symptoms. Also, as generalized cultural consonance increases over the 2-year follow-up, CES-D scores decrease, controlling for initial levels of both cultural consonance and depressive symptoms. The occurrence of stressful life events in the year prior to the follow-up interview also has a significant effect on change in CES-D scores over the 2 years, but this effect is independent of the effect of generalized cultural consonance.

Table 3 shows the regression of the change in CES-D scores in relation to both the initial levels of cultural consonance and the change in cultural consonance over time, but with the four measures of cultural consonance entered separately (in this analysis only three of the tolerance values associated with the cultural consonance variables—including both the Time 1 measures and the change measures—were less than .50, and those three were in the .40–.50 range; there is thus no problem with collinearity). There is a small effect of initial levels of cultural consonance in family life on the CES-D at follow-up. Otherwise, change in cultural consonance in family life and change in cultural consonance in lifestyle over the 2-year follow-up are associated with change in CES-D scores, controlling for initial levels of each cultural consonance variable and depressive symptoms. Again, these effects are independent of the effect of stressful life events.

Table 2
Regression of change in depressive symptoms from Time 1 to Time 2 on generalized cultural consonance, stressful life events, and covariates

Variables	Unstandardized regression coefficient	Standardized regression coefficient
Age	−.011	−.015
Sex	−2.457*	−.137*
SES[a]	.799	.094
CES-D$_{\text{time 1}}$[b]	−.483**	−.569**
Cultural consonance$_{\text{time 1}}$	−1.472*	−.168*
Stressful life events	.766*	.152*
Cultural consonance$_{\text{time2 – time 1}}$	−2.798**	−.200**
Intercept	5.124*	–
Multiple R	.556**	–
Multiple R^2	.309	–

*$p<.05$.
**$p<.01$.
[a]SES, socioeconomic status.
[b]CES-D, Center for Epidemiologic Studies Depression Scale.

Table 3
Regression of change in depressive symptoms from Time 1 to Time 2 on individual measures of cultural consonance, stressful life events, and covariates

Variables:	Unstandardized regression coefficient	Standardized regression coefficient
Age	.033	.004
Sex	−2.477*	−.138*
SES[a]	.923	.108
CES-D$_{\text{time 1}}$[b]	−.476**	−.560**
CCFamily life$_{\text{time 1}}$[c]	−.049^{+}	−.139^{+}
CCLifestyle$_{\text{time 1}}$[d]	−6.562	−.120
CCSocial support$_{\text{time 1}}$[e]	5.473	.118
Cultural cynicism$_{\text{time 1}}$	.270	.116
Stressful life events	.840**	.167**
CCFamily life$_{\text{time2−time1}}$	−.119**	−.271**
CCLifestyle$_{\text{time2−time 1}}$	−12.006*	−.137*
CCSocial support$_{\text{time 2−time 1}}$	4.610	.087
Cultural cynicism$_{\text{time 2−time 1}}$	.224	.082
Intercept	7.871	–
Multiple R	.593**	–
Multiple R^2	.351	–

*$p<.05$.
**$p<.01$.
[a]SES, socioeconomic status.
[b]CES-D, Center for Epidemiologic Studies Depression Scale.
[c]CCFamily Life, cultural consonance in family life.
[d]CCLifestyle, cultural consonance in lifestyle.
[e]CCSocial support, cultural consonance in social support.

Discussion

This paper had three aims: (a) to determine if change in generalized cultural consonance over a 2-year period was associated with change in depressive symptoms, (b) to predict and test which individual measures of cultural consonance would be most important in determining change in depressive symptoms, and (c) to determine if any of these effects were independent of the effect of a major known risk factor for depression, stressful life events.

With respect to the first aim, the analysis confirmed that change in generalized cultural consonance over the 2-year period was associated with change in depressive symptoms. Controlling for the initial level of cultural consonance, as generalized cultural consonance increased over the time period, depressive symptoms reported at the follow-up interview declined from those reported at the initial interview, controlling for the initial level of depressive symptoms (and for demographic variables with known associations with depressive symptoms). Furthermore, this effect is independent of the effect of stressful life events.

With respect to the second aim, we predicted that the importance of the individual measures of cultural consonance would be a function of their overall level of consensus. Based on cultural consensus analyses, this meant that the rank order of the importance of the effect of change over time in cultural consonance on depressive symptoms would be as follows: cultural consonance in family life, cultural consonance in lifestyle, cultural consonance in social support, and cultural cynicism. The results largely supported this prediction. As predicted, after controlling for initial levels of cultural consonance in family life, change over time in cultural consonance in family life had the strongest effect on changing depressive symptoms. Also, as predicted, change over time in cultural consonance in lifestyle had the next strongest effect on changing depressive symptoms. With respect to cultural consonance in social support and cultural cynicism, however, the support for the predictions was less clear, both because neither of these variables was statistically significant in this analysis, and because the standardized regression coefficients for each cultural consonance variable were approximately equal. The support for the second prediction is therefore qualified.

There does, nevertheless, appear to be some merit in regarding the overall cultural consensus within a cultural domain as an index of the causal potential with respect to cultural consonance within that domain. The foundation for this prediction deserves additional discussion. We have argued that low cultural consonance is a chronically stressful experience for persons precisely because knowledge of the cultural domains is so widely shared. Cultural models both guide our own beliefs and behaviors and shape our expectations for others' beliefs and behaviors. Where there is a wide consensus, there is probably very little conscious reflection upon our expectations of the structure of other peoples' beliefs and behaviors within a domain. This is precisely what would make the gap between expectation and experience so apparent in mundane social interaction. "Everyone" knows how everyday life is supposed to be structured within a particular domain, but the individual with low cultural consonance in that domain sees herself, and is seen by others, not to correspond to that model. As we have argued elsewhere, this is likely to lead to the kind of psychological dilemma that Antonovsky (1981) described as a lack of "sense of coherence."

Of course, not "everyone" knows or agrees upon the cultural model. As we have shown elsewhere (Dressler, 2005; Dressler, Balieiro et al., 2005; Dressler, Borges et al., 2005), there are significant differences between groups defined on the basis of age, gender, and education in cultural competence in specific cultural domains, although there is no consistent pattern. For example, in the domain of family life there are significant differences in cultural competence between men and women; women have higher cultural competence (mean competence = .85) than men (mean competence = .79). But this is not to say that there is not a high level of competence among men, it only means that women's competence is that much higher (which, on the basis of our focus group data, we interpret as reflecting the importance of women in that domain). Also, there is an interesting form of contention over the model. Both the cultural consensus analysis and our focus group data show that there is a lively dispute over the relative importance of family organization versus the emotional climate of the family in terms of creating a good Brazilian family. But this does not mean that people do not agree that structure and affect are both important; they merely dispute which is most important. A larger discussion of this point would take us too far afield; it is important to emphasize,

however, that a strong cultural consensus does not preclude systematic variability and contention within that consensus, and that this systematic variability and contention does not change the fact that this cultural model structures the environment of meaning and understanding within which people live their daily lives. (It is worth noting, too, that if the regression models in Table 3 are run separately for men and women, there are no differences.)

It might be objected that our emphasis on cultural consensus and the stressful nature of a lack of consonance with that consensus ignores individual agency. It might be argued that people know the conventional cultural model, but that they reject it in favor of an alternative and more personal construction of meaning, and that we should be examining consonance with those personal meanings. Curiously, if it were possible to separate out personal and cultural meaning here, the likely result would be stronger effects of cultural consonance in the models. If an additional measure of some kind of personal consonance was included, what this would do in a statistical model is account for some of the error variance, i.e., the residual variance associated with those people who have low cultural consonance and low depressive symptoms, or high cultural consonance and high depressive symptoms. Accounting for that error variance would likely reduce the standard error associated with the estimate of the effect of cultural consonance, and the estimate of the effect would at least be more statistically reliable. So, our point here is that even given the fact of intracultural diversity and the fact that culture is contested, and granting the possibility that consonance with personal (as opposed to cultural) meaning may be important, individual consonance with a shared model of culture has powerful causal potential with respect to psychological well-being.

Returning to the causal ordering of the variables, there are good reasons why the domains of family life and lifestyle are so important. Classic Brazilian ethnography places considerable emphasis on the family as a core institution in Brazilian society (da Matta, 1985; Wagley, 1971). While the family itself is changing substantially in Brazil, its salience as an institution is not. This was very clear in our focus group discussions. The focus groups converged with the more structured cultural domain analyses in identifying the salient elements of the cultural model of the family—specifically structure and affect—as well as contention over the relative importance of these elements. And several additional themes emerged as we observed discussants employ these models in the focus group. One of these was the notion of the family being basic, almost primordial, with respect to the structure of society. Focus group participants also emphasized the role of the mother within the family in virtually metaphysical terms. According to the discussants, it is the ''nature'' of the woman within the family to bring a special kind of ''understanding'' and ''comprehension'' to the nurturing of children, which in turn leads those children along the morally correct path in socialization. This central role of the family in Brazilian society is key to the significance of cultural consonance in family life as a predictor of psychological well-being. A higher cultural consonance in family life means to the individual, and to those with whom that individual interacts, that he or she has achieved something of fundamental importance in Brazilian life.

The cultural domain of lifestyle is interestingly different from that of family life, in that to the degree that focus group participants emphasized the importance of the family, they downplayed the importance of lifestyle. Focus group participants were quite critical of what would be regarded as conspicuous consumption; rather, as we suggested some years ago (Dressler, Santos, & Balieiro, 1996), the emphasis in the discussion was on a domestic comfort, not on status display. When discussing lifestyles, focus group participants did emphasize that a certain basic economic stability was necessary to live comfortably, but in doing so participants repeatedly returned to terms like ''tranquil,'' ''calm,'' and ''relaxed'' when discussing a style of life. Again, achieving this tranquility depends in part on achieving a certain level of material well-being, but the point of material well-being is to provide the context within which a tranquil life can be lived.

At one level, both cultural consonance in family life and cultural consonance in lifestyle contrast with the domains of social support and national identity (cultural cynicism) in terms that da Matta (1985) identified in discussing Brazilian society. He contrasted three ''spaces'' of Brazilian social life: *a casa* (the home), *a rua* (the street), and *outros espaços* (other spaces). The home refers to the loving bonds of the family and, in terms we might borrow from our focus group participants, the space in which one's tranquil and relaxed lifestyle can be constructed and enjoyed. The street refers to the

impersonal world of economics and politics, within which one is anonymous and, hence, vulnerable. And, other spaces refer to the metaphysical, the unseen, and the unknown. As cultural domains, family life and lifestyle describe *a casa*, while the bonds of social support as well as the nature of Brazilian identity take one out into *a rua*, if not into *outros espaços*. It can be argued, therefore, that the greater causal impact of cultural consonance in family life and cultural consonance in lifestyle is due precisely to the centrality of these domains in Brazilian social life (although it is possible that these cultural domains have an importance in human social life that transcends the specific Brazilian cultural context; this is a question for future research).

These measures of cultural consonance identify a separate causal pathway in the development of depressive symptoms. This is evidenced by the independence of their effects from the effect of stressful life events. The effect of stressful life events observed here is comparable to the effect of this variable observed in many epidemiologic studies of depressive symptoms. But the influence of cultural consonance is separate from that risk. As others have noted (Paykel, 2003), both chronic (low cultural consonance) and acute (stressful life events) stressors are associated with higher depressive symptoms. In some instances, low cultural consonance and certain kinds of stressful life events may be related (for example, loss of employment may lead to lower cultural consonance in lifestyle). But in general, the effects of a chronically stressful circumstance like low cultural consonance are separable from the effects of acute stressors like life events.

It is worth noting, too, that cultural consonance is associated prospectively with depressive symptoms independently of other known correlates of depression, such as low SES. This is particularly interesting in that it might be argued, for example, that cultural consonance in lifestyle is a proxy for SES. But the results obtained here indicate that it is not merely having material resources that are important with respect to individual well-being; rather, it is the investment of those material resources in a lifestyle that is collectively valued and that meaningfully communicates to others one's position in the social structure. In future work, it will be interesting to compare and contrast the effects of cultural consonance in various domains with other known correlates of the risk of depression.

There are several limitations of this study. First, the sample size is relatively modest; nevertheless, there was ample power to detect the effects of cultural consonance in family life and cultural consonance in lifestyle. Post hoc statistical power analyses show that the regression model employed here has power beyond the .80 level for both analyses. Second, we did not assess stressful life events at both time periods, relying instead on accurate recall at the second interview. There is little evidence, however, that individuals over-report the large-scale events (e.g., death of a family member, divorce) that make up the scale used here. Third, like all regression models, the results here assume that any unmeasured variables not included in the analysis would be uncorrelated with cultural consonance, and this may not be a reasonable assumption. And, finally, a 2-year follow-up period was used purely for convenience, but this may not be the optimal period for evaluating the prospective effects of cultural consonance. This can be addressed in future research.

Ultimately, these results continue to support the importance of cultural consonance as a significant factor in individual well-being. These results are particularly important in showing that change over time in cultural consonance is associated with change in depressive symptoms, and in suggesting how cultural consonance in different domains may have different causal potential.

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References

Antonovsky, A. (1981). *Health, stress, and coping*. San Francisco, CA: Jossey-Bass.

Bernard, H. R. (2006). *Research methods in anthropology* (4th ed.). Lanham, MD: Altamira Press.

Bourdieu, P. (1984). *Distinction: A social critique of the judgment of taste (Richard Nice, Trans.)*. Cambridge, MA: Harvard University Press.

da Matta, R. (1985). *A casa e a rua*. São Paulo, Brazil: Editora Brasiliense.

da Matta, R. (1991). *Carnivals, rogues, and heroes: An interpretation of the Brazilian dilemma (J. Drury, Trans.)*. Notre Dame, IN: Notre Dame University Press.

D'Andrade, R. G. (1984). Cultural meaning systems. In R. A. Schweder, & R. A. Levine (Eds.), *Culture theory: Essays on mind, self and emotion* (pp. 88–119). Cambridge: Cambridge University Press.

D'Andrade, R. G. (1995). *The development of cognitive anthropology*. Cambridge: Cambridge University Press.

da Silveira, D. X., & Jorge, M. R. (2000). Escalade rastreamento populacional para depressão (CES-D) em populações clínica e não-clínica de adolescentes e adultos jovens. In C. Gorenstein, L. H. S. G. Andrade, & A. G. Zuardi (Eds.), *Escalas de avaliação clínica em psiquiatria and psicofarmacologia* (pp. 125–138). São Paulo, Brazil: Lemos-Editorial.

Dressler, W. W. (2005). What's cultural about biocultural research? *Ethos*, *33*, 20–45.

Dressler, W. W., Balieiro, M. C., Ribeiro, R. P., & Santos, J. E. D. (2005). Cultural consonance and arterial blood pressure in urban Brazil. *Social Science & Medicine*, *61*, 527–540.

Dressler, W. W., Balieiro, M. C., Ribeiro, R. P., & Santos, J. E. D. (2007). Cultural consonance and psychological distress: Examining the associations in multiple cultural domains. *Culture, Medicine and Psychiatry*, *31*, 195–224.

Dressler, W. W., & Bindon, J. R. (2000). The health consequences of cultural consonance: Cultural dimensions of lifestyle, social support and arterial blood pressure in an African American community. *American Anthropologist*, *102*, 244–260.

Dressler, W. W., Borges, C. D., Balieiro, M. C., & Santos, J. E. D. (2005). Measuring cultural consonance: Examples with special reference to measurement theory in anthropology. *Field Methods*, *17*, 331–335.

Dressler, W. W., Santos, J. E. D., & Balieiro, M. C. (1996). Studying diversity and sharing in culture: An example of lifestyle in Brazil. *Journal of Anthropological Research*, *52*, 331–353.

Goodenough, W. H. (1996). Culture. In D. Levinson, & M. Ember (Eds.), *Encyclopedia of cultural anthropology* (pp. 291–299). New York: Henry Holt.

Pastore, J. (1982). *Inequality and social mobility in Brazil*. Madison, WI: University of Wisconsin Press.

Paykel, E. S. (2003). Life events and affective disorders. *Acta Psychiatrica Scandanavica*, *418*(Suppl.), 61–66.

Romney, AK., Weller, S. C., & Batchelder, W. H. (1986). Culture as consensus: A theory of culture and informant accuracy. *American Anthropologist*, *88*, 313–338.

Savoia, M. G. (2000). Instrumentos para avaliação de eventos vitais e de estratégias de enfrentamento (*coping*) em situações de estresse. In C. Gorenstein, L. H. S. G. Andrade, & A. G. Zuardi (Eds.), *Escalas de Avaliação Clínica em Psiquiatria and Psicofarmacologia* (pp. 377–386). São Paulo, Brazil: Lemos-Editorial.

Searle, J. (1995). *The construction of social reality*. New York: Free Press.

Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal analysis: Modeling change and event occurrence*. Oxford: Oxford University Press.

Sperber, D. (1985). Anthropology and psychology—Towards an epidemiology of representations. *Man*, *20*, 73–89.

Wagley, C. (1971). *An introduction to Brazil* (revised ed.). New York: Columbia University Press.