Sharpening the Focus on Acculturative Change

ARSMA-II, Stress, Pregnancy Anxiety, and Infant Birthweight in Recently Immigrated Latinas

Belinda Campos
Christine Dunkel Schetter
University of California, Los Angeles

Julia A. Walsh
University of California, Berkeley

Marc Schenker
University of California, Davis

Acculturation is conceptualized as a multidimensional process but is typically measured as a concurrent movement away from culture of origin as a new cultural orientation is obtained. In this study, the authors examined the overall and subscale scoring systems of the ARSMA-II, the most popular acculturation measure, for its associations with stress, pregnancy anxiety, and birthweight in a large sample of pregnant, Mexican-origin women from the Study for Hispanic Acculturation, Reproduction, and the Environment. As predicted, the ARSMA-II's overall acculturation score and two orthogonal subscales, Mexican orientation and Anglo orientation, revealed differing patterns of associations with stress, pregnancy anxiety, and birthweight. Mexican orientation was negatively associated with stress, positively associated with pregnancy anxiety, and not associated with birthweight. Anglo orientation was positively associated with stress and negatively associated with birthweight. The gains to be made in understanding processes that may change with acculturation by incorporating multidimensional analyses of acculturation are discussed.

Keywords: Latina acculturation; stress; pregnancy anxiety; birthweight; ARSMA-II

The process of acclimating to a new culture is recognized to be complex and multidimensional. Rather than a simple movement away from culture

of origin and toward the new culture, acculturation can involve varying degrees of retaining values and practices from one's culture of origin and adopting new values and practices (Benet-Martinez, Leu, Lee, & Morris, 2002; Berry, 1980; Chun, Balls Organista, & Marin, 2003). Research on bicultural identity, for example, suggests that two cultural identities can be retained simultaneously and flexibly and exert independent effects on social behavior and perception of social events (Haritatos & Benet-Martinez, 2002; Wong & Hong, 2005). Despite these advances, traditional measures of acculturation and related proxies (e.g., length of time in United States) that treat acculturation as a concurrent movement away from culture of origin toward the new culture continue to be widely used, especially in health and public policy research (e.g., Abraído-Lanza, Chao, & Gates, 2005; Caetano, Ramisetty-Mikler, & McGrath, 2004; Garcia, Hurwitz, & Kraus, 2005).

In this study, we examined the ARSMA-II (Cuellar, Arnold, & Maldonado, 1995), a popular acculturation measure, for its associations with stress, pregnancy anxiety, and infant birthweight in a large sample of pregnant immigrant women of Mexican origin. Research using traditional indices that treat acculturation as a concurrent movement away from culture of origin toward the new culture have clearly established that greater acculturation is associated with more prenatal stress, less pregnancy anxiety, and lower infant birthweight (Cobas, Balcazar, Benin, Keith, & Chong, 1996; Rini, Dunkel-Schetter, Wadhwa, & Sandman, 1999; Zambrana, Scrimshaw, Collins, & Dunkel-Schetter, 1997). In this study, we compared how the ARSMA-II's traditional overall score, where Mexican orientation is subtracted from Anglo orientation, and its two separate subscales, Mexican orientation and Anglo orientation, were associated with these health-related factors. In doing so, we sought to better understand how ARSMA-II can be most effectively used to investigate the influence of acculturation on health processes.

Acculturation and Pregnancy

In line with the Latino paradox, the pregnancy outcomes of U.S. Latinas initially surpass expectations associated with their low socioeconomic status

but grow worse with increased time in the United States (Fuentes-Afflick & Lurie, 1997; James, 1993; Sorlie, Backlund, Johnson, & Rogot, 1993). Mexican-origin Latinas in the United States give birth to babies whose birthweights are comparable with their more affluent European American counterparts (Collins & Shay, 1994; Dunkel Schetter & Rini, 2004; Singh & Yu, 1996; Zambrana, Dunkel-Schetter, Collins, & Scrimshaw, 1999). With increased time in the United States, however, Latinas have lower birthweight babies who are more at risk for newborn complications and longer term disabilities (Pickett & Collins, 2004). Cultural factors and the stresses associated with adapting to life in the United States have been suggested to contribute to this change in health outcomes (Dunkel Schetter & Rini, 2004; Lobel, 1994; Zambrana et al., 1997).

Although acculturation processes are implicated in the Latino paradox, the pathways through which acculturative change affects pregnant Latinas are not well understood. One possibility is that some aspects of Mexican culture may be protective of mental and physical health, and this protection may be lost with greater acculturation to the United States (Abraído-Lanza, Dohrenwend, Ng-Mak, & Turner, 1999; Campos et al., 2007; Chun et al., 2003; Eschbach, Ostir, Kushang, Markides, & Goodwin, 2004; Golding, Karno, & Rutter, 1990). Mexican culture, along with other Latino cultures, places high value on positive interpersonal relationships and, in particular, values positive family relationships and motherhood (Marin, 1993; Sanchez-Burks, 2003; Triandis, Marin, Lisansky, & Betancourt, 1984). Consistent with these cultural values, newly immigrated Latinas report positive attitudes toward pregnancy and motherhood and low levels of smoking or drug use while pregnant (Zambrana et al., 1999). These same women, however, also report high levels of pregnancy-related anxiety, a risk factor for low birthweight and preterm birth (Copper et al., 1996; Lobel, 1994; Rini et al., 1999; Wadhwa, Sandman, Porto, Dunkel-Schetter, & Garite, 1993). Whether Mexican culture is protective or not, greater acculturation to the United States seems to negatively affect Latinas' health (Fuentes-Afflick & Lurie, 1997; Zambrana et al., 1999). More acculturated Latinas perceive their lives to be more stressful, have less positive attitudes toward pregnancy, are more likely to smoke cigarettes or use drugs, and experience more depressive symptoms (Kasirye et al., 2005; Zambrana et al., 1999). When pregnant, more accultuated Latinas are less likely to remain connected with the baby's father than less acculturated Latinas and are more likely to seek support from family of origin (Dunkel-Schetter, Sagrestano, Feldman, & Killingsworth, 1996). Whether this pattern of experience is best understood as a concurrent movement away

from Mexican orientation to Anglo orientation or whether particular aspects of one cultural orientation (e.g., Mexican and Anglo in the ARSMA-II) have differential influence remains an open empirical question.

Emerging Perspectives on Acculturative Processes and Measurement

In response to emerging research on the multidimensional aspects of acculturation, Cuellar et al. (1995) revised their original ARSMA measure of acculturation. The revised measure, ARSMA-II, independently measures Mexican and Anglo orientation as two cultural "poles" and can be scored to yield an overall index of change from Mexican orientation to Anglo orientation, separate Mexican and Anglo orientation subscale indices, as well as bicultural typology scores. As intended, these changes provided a more sophisticated and flexible measure that takes into account the complexity of acculturative experiences. However, Cuellar et al. (1995) also indicated that the more conceptually sophisticated scoring overlapped considerably with traditional scoring. In their work, overall, subscale, and typology scores converged to support the traditional acculturation model of concurrent change away from Mexican orientation to Anglo orientation. Perhaps as a consequence, researchers continue to rely heavily on traditional indices or related proxies such as length of time in the United States. Nonetheless, separately examining the two aspects of acculturation and their links to health processes may help us better understand the relationships between acculturation and maternal and child health.

Research

This study examined whether the Mexican and Anglo orientation subscales of the ARSMA-II reveal meaningfully different patterns of associations with stress, pregnancy anxiety, and infant birthweight compared with the traditional overall index. The ARSMA-II is the most widely used measure of acculturation and has proven to be a reliable, useful measure of the association of acculturation with psychosocial processes, health behaviors, and outcomes. By examining the ARSMA-II's subscales, we sought to contribute to a better understanding of changes in stress and pregnancy anxiety that are associated with immigration to the United States for Mexican-origin women and have implications for pregnancy and infant outcomes. Our hypotheses were as follows:

Hypothesis 1. Overall acculturation scores will be associated with higher perceptions of stress. However, given indications that Mexican culture's emphasis on positive social relationships may protect against stress (Abraído-Lanza et al., 1999; Campos et al., 2007), we further predicted that Mexican orientation would negatively relate to perceptions of stress, whereas Anglo orientation would not relate to perceptions of stress.

Hypothesis 2. Overall acculturation scores will be associated with lower pregnancy anxiety. However, following previous research showing that Latina women report the highest levels of pregnancy-related anxieties (Rini et al., 1999), we expected Mexican orientation to positively relate to pregnancy anxiety but Anglo orientation to show no relation with pregnancy anxiety.

Hypothesis 3. In line with past research, we expected overall acculturation scores to be associated with lower infant birthweight (Fuentes-Afflick & Lurie, 1997). Following indications that acculturated Latinas are more likely to smoke, use drugs, and eat less nutritious food (Kasirye et al., 2005; Zambrana et al., 1999), we further predicted that Anglo orientation would be negatively associated with infant birthweight, whereas Mexican orientation would not be associated with birthweight.

Finally, to better understand the associations of acculturation with stress and pregnancy anxiety, the overall scores and Mexican and Anglo orientation indices were further examined for their associations with individual items from the psychosocial scales. It was anticipated that these more exploratory analyses would reveal specific patterns of social behavior and stress perceptions that might shed light on previously documented associations between linear acculturation and psychosocial processes and health.

Method

Participants

One thousand sixty-four women from the Study for Hispanic Acculturation, Reproduction, and the Environment (SHARE) were assessed (Kasirye et al., 2005). SHARE was funded by the National Institute for Environmental Health Sciences (NIEHS) to investigate factors affecting reproductive outcomes among Latinas in a California urban agricultural community. Participants were recruited from six obstetrics and gynecology (OB/GYN) clinics affiliated with San Joaquin General Hospital, a major regional center in Stockton, California, that serves a large number of Mexican Latinos.

Procedure

To recruit women at the early stages of pregnancy, Latinas were informed about the study while obtaining an initial prenatal care visit at one of the six OB/GYN clinics. Women who consented to participate were scheduled for a 45-minute personal interview with a trained bilingual/bicultural field worker. Interviews were conducted in English or Spanish, according to participant preference. Participants were asked to describe the occupation they had worked in the longest, their health habits, and their health risk behaviors, including their perceived stress and pregnancy anxiety.

Demographics. Interviewers used a set of standard questions to obtain participant's date and place of birth, marital status, years of formal education, and total number of years in the United States. For foreign-born women, years in the United States was set as the difference between age at immigration to the United States and age at the time of interview. For U.S.-born women, number of years in the United States was set to equal their age at the time of interview. Women also reported their number of previous births and whether they ever experienced any complications or risk factors in their pregnancies (e.g., high blood pressure, diabetes, or asthma). This information was verified via medical record after the birth occurred.

ARSMA-II. The short version of the revised Acculturation Rating Scale for Mexican Americans (ARSMA-II) was used (Cuellar et al., 1995). The ARSMA-II-SV is a 12-item scale that measures the extent to which an individual prefers to use Spanish or English in his or her everyday life (e.g., I think in Spanish/English; I enjoy Spanish movies/English music). Participants indicated their agreement with each item using 5-point Likert-type scales (1 = *not at all*; 5 = *extremely often or almost always*).[1] This reliable measure ($\alpha = .87$) is made up of two 6-item subscales of Mexican and Anglo orientation where an overall score is computed by subtracting the mean score for Mexican orientation from the mean score for Anglo orientation. Higher overall index scores indicate greater English preference and diminished Spanish preference. In this study, the two subscales showed a correlation of $r = -.60$, $p < .001$, and factor analysis confirmed that a two-factor solution including Mexican and Anglo orientation is an acceptable way of treating the data. The factor loadings are shown in Table 1.

Perceived stress. A 6-item version of the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) measured subjective perceptions of stress during the last month (e.g., How often have you been able to

Table 1
Factor Loadings for the Revised Acculturation Rating Scale
for Mexican Americans (ARSMA-II) Items

ARSMA-II Item	Factor 1	Factor 2
I associate with Anglos.	**.92**	.11
My friends are Caucasian.	**.90**	.06
I speak English.	**.90**	.03
I write letters in English.	**.87**	.07
I enjoy listening to English music.	**.86**	.08
I think in English.	**.81**	.16
I enjoy Spanish TV.	.14	**.88**
I enjoy Spanish movies.	.14	**.85**
I enjoy speaking Spanish.	.04	**.84**
I speak Spanish.	.09	**.80**
I think in Spanish.	.26	**.67**
I enjoy reading Spanish books.	.05	**.66**

Note: Principal components analysis with Promax rotation was used. Factor loadings for items corresponding to Mexican and Anglo orientation subscales are highlighted in bold.

control irritations in your life?). The items were selected from the 14-item full scale based on earlier studies containing English and Spanish translations (Lobel, 1994; Rini et al., 1999; Zambrana et al., 1997). Participants rated their perceived stress using 4-point Likert-type scales (0 = *never*; 3 = *all of the time*). The PSS is reliable and valid (Cohen et al., 1983). High scores reflect perception that one's personal resources are overwhelmed. In this study, alpha reliability for the shortened scale was .75 for participants interviewed in Spanish and .64 for participants interviewed in English.

Pregnancy anxiety. This 6-item scale measured pregnancy-specific sources of anxiety, including concerns about labor, delivery, and fetal development (e.g., I am concerned about having a hard or difficult labor/ delivery). Participants rated these items using 4-point Likert-type scales (0 = *never*; 3 = *all of the time*). This scale was developed for use in pregnancy research (Rini et al., 1999) and is reliable in English and Spanish (α = .75-.85). In this study, a shorter version was created with alpha reliability of .81 for participants interviewed in Spanish and .80 for participants interviewed in English.

Infant birthweight. Infant weight at time of birth was obtained from participants' medical records and analyzed as a continuous measure. A birthweight of more than 2,500 grams is considered normal. Birthweight equal to or below 2,500 grams is considered low and places the infant at higher risk

Table 2
Demographic Characteristics of the Study
for Hispanic Acculturation, Reproduction, and the
Environment (SHARE) Participants

	M	*SD*
Age at survey	25.17	6.26 years
Years of formal education	8.76	3.15 years
Years in the U.S.	6.33	5.88 years
# of prior pregnancies	1.81	1.93 pregnancies
In prior pregnancy:		
High blood pressure	53 women	5%
Diabetes	42 women	3.9%
Asthma	25 women	2.3%

Note: $N = 1,064$. Interview language: Spanish, 72.8%; English, 25.5%.

of developing problems in the neonatal period and potentially thereafter (Cunningham, MacDonald, & Gant, 1989).

Results

Sample characteristics. Women in the SHARE study were Mexican-origin Latinas and, as Table 2 shows, sample demographics indicated low U.S. acculturation. SHARE women reported being in the United States for an average of 6 years and 73% chose to be interviewed in Spanish. The majority reported being married or living as married (75.3%), with smaller groups reporting being unmarried (22.3%) and divorced, separated, or widowed (3%). In terms of medical condition, the sample was low risk. Few women reported experiencing common prenatal risk factors of high blood pressure, diabetes, and asthma in their previous pregnancies ($\leq 5\%$).

Paralleling the sample demographics, Cuellar et al.'s (1995) scoring guidelines indicated that two thirds of the sample reported low U.S. acculturation (65%), whereas a smaller group reported high U.S. acculturation (15.2%). More specifically, mean acculturation scores for women in the SHARE sample were $M = 1.86$ ($SD = 1.34$) for the overall scoring, and a paired samples t test showed that SHARE women were higher in Mexican orientation ($M = 3.86$, $SD = .99$) than Anglo orientation ($M = 2.50$, $SD = 1.40$), $t(1060) = 20.79$, $p < .001$.

Table 3
Total Scale and Item-by-Item Analysis of Stress Measures' Association
With the Revised Acculturation Rating Scale for
Mexican Americans' (ARSMA-II) Overall Acculturation Index
and Mexican Orientation and Anglo Orientation Subscales

	Overall Acculturation	Mexican Orientation	Anglo Orientation
Perceived Stress items			
Have not successfully dealt with daily problems and hassles	−.03	−.02	**−.07***
Have not coped well with important changes in life	−.01	−.02	.04
Have not felt confident about being able to handle problems	.01	−.03	.02
Have not been able to control irritations in life	.00	−.01	.03
Have not felt on top of things	**.10*****	**−.13*****	**.07***
Have not felt that things were going well	**.16*****	**−.16*****	**.15*****
Total scale	**.06***	**−.09*****	.02
Pregnancy Anxiety items			
Fear of harm during delivery	**−.13*****	**.18*****	**−.09*****
Worried that baby could be abnormal	−.02	**.09*****	.01
Concerned about how baby is growing inside	**.15*****	**−.07***	**.20*****
Concerned about losing baby	−.02	**.10*****	.01
Concerned about a hard or difficult labor/delivery	−.00	.03	.02
Concerned about developing medical problems	−.02	**.10*****	−.01
Total scale	−.01	**.10*****	.04

Note: $N = 1,064$. Significant correlations are highlighted in bold.
*p < .05. **p < .01. ***p < .001.

Analysis of hypotheses. The complete correlation matrix between the ARSMA-II's overall index and Mexican and Anglo orientation subscales with stress and pregnancy anxiety is presented in Table 3.

Hypothesis 1. Was acculturation associated with greater perceptions of stress? The overall acculturation index showed a significant association with more perceived stress, $r = .06$, $p < .05$. However, Mexican orientation was associated with less perceived stress, $r = -.09$, $p < .001$, whereas Anglo orientation was unrelated to perceptions of stress, $r = -.02$, *ns*. Item analyses

further revealed that Mexican orientation was negatively associated with not feeling on top of things, $r = -.13$, $p < .001$, and feeling that things were not going well, $r = -.16$, $p < .001$. In contrast, Anglo orientation was positively associated with not feeling on top of things, $r = .07$, $p < .05$, and not feeling that things were going well, $r = .15$, $p < .001$. In contrast to the overall index, subscale analyses suggested that Mexican orientation was associated with perceiving less stress. Item analysis further suggested that Anglo orientation was associated with specific aspects of stress such as feeling that things were not going well and not feeling on top of things.

Hypothesis 2. Was acculturation associated with less pregnancy anxiety? The overall acculturation index was not significantly related to pregnancy anxiety, $r = -.01$, *ns*. However, Mexican orientation was positively associated with pregnancy anxiety, $r = .10$, $p < .001$, whereas Anglo orientation was not, $r = .04$, *ns*. Item analyses revealed that Mexican orientation was positively associated with fear of harm during delivery, $r = .18$, $p < .001$, worry that the baby could be abnormal, $r = .09$, $p < .001$, concern with losing the baby, $r = .10$, $p < .001$, and concern with developing medical problems, $r = .10$, $p < .001$. Mexican orientation was negatively associated with concern about the baby's growth inside the mother, $r = -.07$, $p < .05$. In contrast, Anglo orientation was positively associated with concern about the baby's growth inside the mother, $r = .20$, $p < .001$, and negatively associated with fear of harm during delivery, $r = -.09$, $p < .001$.

Hypothesis 3. As might be expected from the general health of our sample, SHARE women generally gave birth to babies who weighed within the normal range ($M = 3348.76$, $SD = 565.85$). This remained true when we used the Cuellar et al. (1995) scoring guidelines to identify women who were highest in Mexican orientation ("traditional Mexican") ($n = 639$; $M = 3374.63$, $SD = 559.34$) and women who were highest in Anglo orientation ("assimilated") ($n = 98$; $M = 3338.36$, $SD = 471.04$). In terms of our hypothesis, the overall acculturation index was expected to be associated with lower infant birthweight, but this association did not reach significance, $r = -.05$, *ns*. Examination of the subscales, however, revealed that whereas Mexican orientation was not associated with infant birthweight, $r = .01$, *ns*, Anglo orientation was negatively associated with infant birthweight, $r = -.06$, $p < .05$. Controlling for gestational age did not alter this pattern of results ($r = -.04$, *ns*; $r = .00$, *ns*; $r = -.06$, $p < .04$, respectively). Furthermore, logistic regressions using categorical low birthweight outcomes replicated Pearson correlation analyses ($OR = 1.17$, *ns*; $OR = .97$, *ns*; $OR = 1.28$, $p < .01$,

respectively). Thus, overall acculturation and Mexican orientation did not relate to infant birthweight, but Anglo orientation was associated with lower infant birthweight.

Discussion

The results of this study contribute to a growing body of research showing that acculturation is a complex, multidimensional process. As expected, the ARSMA-II subscales provided a more detailed and complex picture of acculturation's associations with perceived stress, pregnancy anxiety, and infant birthweight than the traditional overall scoring. Although the overall index remained useful, the Mexican and Anglo orientation subscales provided a more nuanced pattern that helps advance our understanding of how cultural orientations that may change during the process of acculturation influence health-relevant psychosocial factors.

For perceived stress, the overall index results could be interpreted as suggesting that higher perceptions of stress result from the difficulties inherent in adapting to a new environment. In contrast, our subscale analyses suggest that Mexican orientation may be protective against stress. For example, the strong positive interpersonal orientation valued by Mexican culture (Sanchez-Burks, 2003; Triandis et al., 1984) may help create and maintain socially supportive environments that reduce perceptions of stress or mitigate the effects of exposure to stress (Eschbach et al., 2004). Alternatively, recently immigrated women may find that the hardships of their new lives in the United States still compare favorably with the circumstances they left behind (Norbeck & Anderson, 1989). This study cannot elucidate the pathway to increased stress perception, but our results suggest that acquiring an Anglo orientation may not be the direct pathway to poorer outcomes. Rather, aspects of the Mexican cultural experience that protect against stress may erode with more time in the United States. Further research should seek to identify protective aspects of Mexican culture and address whether maintaining a monocultural or bicultural identity that embraces Mexican culture is good for health.

Past research indicates that pregnancy anxiety is a risk factor for preterm or low weight birth delivery that is particularly relevant for Mexican-origin women, for whom pregnancy anxiety is often high (Dunkel-Schetter, 1998; Rini et al., 1999). Indeed, in this study, Mexican orientation was associated with higher pregnancy anxiety, but Anglo orientation showed no relation to pregnancy anxiety. Our item analyses provided a possible account of how

pregnancy-related concerns may change with acculturation. Women high in Mexican orientation appear to be anxious about the delivery experience, whereas women high in Anglo orientation have concerns that focus more on the baby's development. These results are consistent with Scrimshaw, Zambrana, and Dunkel-Schetter (1997), who suggested that recently immigrated women may be more justifiably fearful of the birth process, given the more limited medical resources in their home country (Dunkel Schetter & Rini, 2004; Scrimshaw et al., 1997). Documenting these associations is an important first step in understanding the origins of elevated pregnancy anxiety among Latinas. In turn, this knowledge can inform the development of culturally competent interventions to address Mexican immigrant fears concerning the delivery process.

Mexican orientation appears to be more relevant than Anglo orientation to perceived stress and pregnancy anxiety processes. Our birthweight findings, however, imply that Anglo orientation is the more relevant influence for birth outcomes. That is, Anglo orientation was negatively associated with infant birthweight, whereas Mexican orientation was not associated with infant birthweight. The Latino health paradox renders this issue especially important, as Latina infant birthweight is known to fall to unhealthy levels with increased time in the United States. Consistent with previous research, our results indicate that something about the experience of becoming more oriented to U.S. culture negatively affects Latina immigrant perinatal health. However, our subscale analysis clearly indicates that the erosion of protective aspects of Latino culture is less important than new practices that may be acquired with greater Anglo orientation, such as greater likelihood of engaging in risky health behaviors including smoking, drug use, and less nutritious food consumption (Bethel & Schenker, 2005; Kasirye et al., 2005; Zambrana et al., 1999). Further research should continue to examine the consequences of developing an Anglo orientation among immigrants to better understand how this process or its concomitants translate into less healthy birth outcomes for Latinas.

Acculturation theory and recent research suggest that individuals can identify with two cultures simultaneously and with varying degrees of psychological ease (e.g., Haritatos & Benet-Martinez, 2002). Health research stands to benefit from incorporating these advances in the study of the role that cultural processes can play in health. This suggestion is easy to follow. The ARSMA-II, which is efficient and user friendly, can continue to be used. Researchers can simply analyze their data using both the overall and subscale measures. Furthermore, item analyses of established scales can also be conducted to gain insight into the attitudes, behaviors, or feelings

that are associated with varying types and levels of acculturation. In this way, health research can capitalize on recent advances in acculturation scholarship without sacrificing the short, efficient measures needed for large-scale, time-intensive studies.

The process of acclimating to a new culture can take many paths. Whereas some people may embrace new cultural beliefs and practices, others may strive to retain culture of origin, and still others may develop compatible or oppositional bicultural identities. Taking these divergent experiences into greater consideration is central to developing a better understanding of the social and health concomitants of acculturation processes. This research is a first step in that direction, and the results provide a good example of the gains that can be made in understanding health-relevant acculturative changes in Latinas by taking the multidimensional aspects of acculturation experience into greater account.

Note

1. The questionnaire was inadvertently altered midway through data collection. Approximately two thirds of the participants received an ARSMA-II version with three response options rather than five (i.e., options 2 and 4 were omitted from the 1-5 scale). To adjust for the effects of this alteration, new values were imputed (on the original 1-5 scale) for women who received the altered questionnaire. Using the subsample of women who received the complete scale, we estimated the proportion of women who were likely to have chosen options 2 and 4 if the scale had allowed. This adjustment allowed us to recreate a full 1-5 scale for the entire sample and compute overall and subscale indices of acculturation consistent with the Cuellar, Arnold, and Maldonado (1995) scoring guidelines.

References

Abraído-Lanza, A. F., Chao, M. T., & Gates, C. Y. (2005). Acculturation and cancer screening among Latinas: Results from the National Health Interview Survey. *Annals of Behavioral Medicine*, *29*, 22-28.

Abraído-Lanza, A. F., Dohrenwend, B. P., Ng-Mak, D. S., & Turner, J. B. (1999). The Latino mortality paradox: A test of the "salmon bias" and health migrant hypotheses. *American Journal of Public Health*, *89*, 1543-1548.

Benet-Martinez, V., Leu, J., Lee, F., & Morris, M. W. (2002). Negotiating biculturalism: Cultural frame switching in biculturals with oppositional versus compatible cultural identities. *Journal of Cross-Cultural Psychology*, *33*, 492-516.

Berry, J. W. (1980). Acculturation as varieties of adaptation. In A. M. Padilla (Ed.), *Acculturation: Theories, models, and some new findings* (pp. 9-25). Boulder, CO: Westview.

Bethel, J. W., & Schenker, M. B. (2005). Acculturation and smoking patterns among Hispanics. *American Journal of Preventive Medicine*, *29*, 143-148.

Caetano, R., Ramisetty-Mikler, S., & McGrath, C. (2004). Acculturation, drinking, and intimate partner violence among Hispanic couples in the United States: A longitudinal study. *Hispanic Journal of Behavioral Sciences*, *26*, 260-278.

Campos, B., Dunkel Schetter, C., Abdou, C. M., Hobel, C., Glynn, L., & Sandman, C. (2007). *Positive implications for pregnant Latinas: The association of familism with social support, stress, and pregnancy anxiety*. Manuscript under review.

Chun, K. M., Balls Organista, P., & Marin, G. (Eds.). (2003). *Acculturation: Advances in theory, measurement and applied research*. Washington, DC: American Psychological Association.

Cobas, J. A., Balcazar, H., Benin, M. B., Keith, V. M., & Chong, Y. (1996). Acculturation and low-birthweight infants among Latino women: A reanalysis of HHANES data with structural equation models. *American Journal of Public Health*, *86*, 394-396.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, *24*, 385-396.

Collins, J. N., & Shay, D. K. (1994). Prevalence of low birth weight among Hispanic infants with United States-born and foreign-born mothers: The effect of urban poverty. *American Journal of Epidemiology*, *139*, 184-192.

Copper, R. L., Goldenberg, R. L., Das, A., Elder, N., Swain, M., Norman, G., et al. (1996). The preterm prediction study: Maternal stress is associated with spontaneous preterm birth at less than thirty-five weeks' gestation. *American Journal of Obstetrics and Gynecology*, *175*, 1286-1292.

Cuellar, I., Arnold, B., & Maldonado, R. (1995). Acculturation Rating Scale for Mexican Americans-II: A revision of the original ARSMA scale. *Hispanic Journal of Behavioral Sciences*, *17*, 275-304.

Cunningham, F. G., MacDonald, P. C., & Gant, N. F. (1989). *Williams obstetrics* (18th ed.). Norwalk, CT: Appleton & Lange.

Dunkel-Schetter, C. (1998). Maternal stress and preterm delivery. *Prenatal and Neonatal Medicine*, *3*, 39-42.

Dunkel Schetter, C., & Rini, C. (2004). Pregnancy outcomes: Psychosocial aspects. In N. B. Anderson (Ed.), *Encyclopedia of health and behavior* (pp. 669-671). Thousand Oaks, CA: Sage.

Dunkel-Schetter, C., Sagrestano, L. M., Feldman, P., & Killingsworth, C. (1996). Social support and pregnancy. In G. R. Pierce, B. R. Sarason, & I. G. Sarason (Eds.), *Handbook of social support and the family* (pp. 375-412). New York: Plenum Press.

Eschbach, K., Ostir, G. V., Kushang, P., Markides, K. S., & Goodwin, J. S. (2004). Neighborhood context and mortality among older Mexican-Americans: Is there a barrio advantage? *American Journal of Public Health*, *94*, 1807-1812.

Fuentes-Afflick, E., & Lurie, P. (1997). Low birth weight and Latino ethnicity: Examining the epidemiologic paradox. *Archives of Pediatric Adolescent Medicine*, *151*, 665-674.

Garcia, L., Hurwitz, E. L., & Kraus, J. F. (2005). Acculturation and reported intimate partner violence among Latinas in Los Angeles. *Journal of Interpersonal Violence*, *20*, 569-590.

Golding, J. M., Karno, M., & Rutter, C. M. (1990). Symptoms of major depression among Mexican-Americans and non-Hispanic Whites. *American Journal of Psychiatry*, *147*, 861-866.

Haritatos, J., & Benet-Martinez, V. (2002). Bicultural identities: The interface of cultural, personality, and socio-cognitive processes. *Journal of Research in Personality*, *36*, 598-606.

James, S. A. (1993). Racial and ethnic differences in infant mortality and low birthweight: A psychosocial critique. *Annals of Epidemiology*, *3*, 130-136.

Kasirye, O. C., Walsh, J. A., Romano, P. S., Beckett, L. A., Garcia, J. A., Elvine-Kreis, B., et al. (2005). Acculturation and its association with health risk behaviors in a rural Latina population. *Ethnicity and Disease*, *15*, 733-739.

Lobel, M. (1994). Conceptualizations, measurement, and effects of prenatal stress on birth outcomes. *Journal of Behavioral Medicine*, *17*, 225-272.

Marin, G. (1993). Influence of acculturation on familialism and self-identification among Hispanics. In M. E. Bernal & G. P. Knight (Eds.), *Ethnic identity: Formation and transmission among Hispanics and other minorities* (pp. 181-196). Albany: State University of New York Press.

Norbeck, J. S., & Anderson, N. J. (1989). Psychosocial predictors of pregnancy outcomes in low income Black, Hispanic, and White women. *Nursing Research*, *38*, 204-209.

Pickett, K. E., & Collins, J.W.J. (2004). Low birth weight: Psychosocial aspects. In N. B. Anderson (Ed.), *Encyclopedia of health and behavior*. Thousand Oaks, CA: Sage.

Rini, C. K., Dunkel-Schetter, C., Wadhwa, P. D., & Sandman, C. A. (1999). Psychological adaptation and birth outcomes: The role of personal resources, stress, and sociocultural context in pregnancy. *Health Psychology*, *18*, 333-345.

Sanchez-Burks, J. (2003). Protestant relational ideology and (in)attention to relational cues in work settings. *Journal of Personality and Social Psychology*, *83*, 919-929.

Scrimshaw, S.C.M., Zambrana, R. E., & Dunkel-Schetter, C. (1997). Issues in Latino women's health: Myths and challenges. In S. B. Ruzek, V. L. Oleson, & A. E. Clarke (Eds.), *Women's health: Complexities and differences* (pp. 329-347). Columbus: Ohio State University Press.

Singh, G. K., & Yu, S. M. (1996). Adverse pregnancy outcomes: Differences between U.S.- and foreign-born women in major U.S. racial and ethnic groups. *American Journal of Public Health*, *86*, 837-843.

Sorlie, P. D., Backlund, E., Johnson, N. J., & Rogot, E. (1993). Mortality by Hispanic status in the United States. *Journal of the American Medical Association*, *270*, 2464-2468.

Triandis, H. C., Marin, G., Lisansky, J., & Betancourt, H. (1984). *Simpatia* as a cultural script of Hispanics. *Journal of Personality and Social Psychology*, *47*, 1363-1375.

Wadhwa, P. D., Sandman, C. A., Porto, M., Dunkel-Schetter, C., & Garite, T. J. (1993). The association between prenatal stress and infant birthweight and gestational age at birth: A prospective investigation. *American Journal of Obstetrics and Gynecology*, *169*, 858-865.

Wong, R. Y., & Hong, Y. (2005). Dynamic influences of culture on cooperation in the prisoner's dilemma. *Psychological Science*, *16*, 429-434.

Zambrana, R. E., Dunkel-Schetter, C., Collins, N. L., & Scrimshaw, S.C.M. (1999). Mediators of ethnic-associated differences in infant birth weight. *Journal of Urban Health*, *76*, 102-116.

Zambrana, R. E., Scrimshaw, S.C.M., Collins, N., & Dunkel-Schetter, C. (1997). Prenatal health behaviors and psychosocial risk factors in pregnant women of Mexican origin: The role of acculturation. *American Journal of Public Health*, *87*, 1022-1026.

Belinda Campos received her PhD in social-personality psychology from the University of California, Berkeley, and completed an NIMH Postdoctoral Fellowship in health psychology at the University of California, Los Angeles. She is currently a postdoctoral researcher at the UCLA Center for the Everyday Lives of Families. Her research examines how evolved social function, positive emotion, and cultural values can promote relationship satisfaction, prosocial behavior, and positive health outcomes. She balances her intellectually satisfying career with an equally satisfying personal life and enjoys spending time with her loved ones, reading, cooking, and traveling.

Christine Dunkel Schetter received her PhD in social psychology from Northwestern University and completed an NSF Postdoctoral Fellowship at the University of California, Berkeley. She is currently a professor of psychology at the University of California, Los Angeles, and is the director of health psychology. She studies stress processes in pregnancy including emotional, physiological, social, cultural, and other aspects and their interrelationships as contributors to preterm delivery and low birthweight. She is raising several teenage boys and enjoys entertaining, jazz and classical music, art and architecture, and reading fiction in her spare time.

Julia A. Walsh is an adjunct professor of maternal and child health at the School of Public Health at the University of California, Berkeley. She received her MD at New York University School of Medicine, trained in internal medicine at the University of California at San Francisco, and trained in infectious diseases at Albert Einstein College of Medicine. She received her MSc degree from London University's School of Tropical Medicine and Hygiene. She teaches cost-effectiveness analysis, international health, and doctoral seminars. When not working and traveling to poor countries with her work on global health, she plays tennis, hikes, and reads fiction.

Marc Schenker received his MD from the University of California, San Francisco, and his MPH from the Harvard School of Public Health. He is currently a professor and chair of the Department of Public Health Sciences at the University of California, Davis. Following training in internal medicine and pulmonary disease, he directed his efforts at occupational health, epidemiology, and preventive medicine, and his recent research has focused on health of agricultural workers and health effects of immigration. He is the director of the Western Center for Agricultural Health and Safety at Davis and director of the Davis component of the Center for Occupational and Environmental Health. He has published more than 150 scientific manuscripts. In his free time, he enjoys the art of photography, capturing portraits of people around the globe. His images can be viewed at http://www.marcschenker.com.