

Stress and Depressive Symptoms Among Mexican American Elders

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Although social stressors have successfully predicted depressive symptomatology in a number of populations, few studies have examined the relevance of stressors for Mexican American elders. Results are reported here from a multistage probability sample of 3,050 Mexican Americans aged 65 and older drawn from a 5-state region. Participants reported low levels of education and income, and most reported difficulty in reading or writing in English. Deaths, illness of close other, and financial problems were the three most frequent life events, and many reported financial strains. Depressive symptoms were then regressed on demographic indicators, cognitive status, linguistic acculturation, social supports, and three types of stressors. Being a woman, lower income, decreased income, chronic financial strain, and several health stressors were associated with greater symptomatology. Results identified a cluster of economic stressors and conditions that may play a critical role in the etiology of depressive symptoms in this minority population.

IN this article we report the experiences of a population about whose stress exposure and its consequences little is known: the Mexican American elder. The Hispanic population in general is of interest not only because it constitutes the nation's second largest minority group but also because it is exhibiting a growth rate seven times larger than the country as a whole (Therrien & Ramirez, 2000). Within the broader Hispanic American community, Mexican Americans are the largest subgroup: of the 32.8 million Hispanics in the United States in 2000, approximately 66.1% are of Mexican origin and reside primarily in the Southwest (Therrien & Ramirez, 2000).

The need for research on stress and the Mexican American elderly population draws from the well-documented relationship of stress exposure to physical and mental health. As a way of beginning an exploration, this article focuses on depressive symptomatology as an outcome. We chose depressive symptomatology because there is clear evidence of an elevated rate of depressive symptoms among older Hispanics, especially women (e.g., Black, Markides, & Miller, 1998; Kemp, Staples, & Lopez-Aqueres, 1987; Mendes de Leon & Markides, 1988;), but reasons for the elevation are unknown. At the same time there are a wealth of studies demonstrating a detrimental effect of stress exposure upon the depressive symptoms of Anglo-American and other populations. The problem of heightened symptom levels, in turn, is accentuated by the underutilization of mental health services by middle-aged and older Mexican Americans (López-Aqueres, Kemp, Plopper, Staples, & Brummel-Smith, 1984; Vega, Kolody, Aguilar-Gaxiola, & Catalano, 1999). An enhanced understanding of the relationship of stress exposure and depression in this population could facilitate the delivery of services if Mexican American elders were found to manifest specific and remediable stress vulnerabilities.

Of course, stress exposure does not occur in a vacuum: The impact of stressors may be modulated by specific conditions. Almost from its inception, stress research placed an emphasis on identifying factors associated with the stress process (Chiriboga & Cutler, 1980). This effort has by and large been successful, with the result that stress today has well-established general models and measures (Glass, Kasl, & Berkman, 1997; Hobfoll, 1998; Kaplan, 1996; Thoits, 1995). Common to all models are one or more social stressors (i.e., life events, chronic stressors, hassles), mediating and contextual elements (i.e., adaptive resources), and indicators of outcome (i.e., physical health, depression). Given our focus on stressors, in this article we sought to include as many of these variables as possible, while holding to the single criterion of depressive symptoms.

Past research suggests that the influence of stress upon functioning is robust and transcends culture and race (i.e., Kamarck et al., 1998; Krause, Liang, & Gu, 1998). On the other hand, there has been a developing interest in how stress applies in specific contexts (Turner, Lloyd, & Lloyd, 1995; Dohrenwend et al., 1993; Chou & Chi, 2001). Evidence already exists that specific sociodemographic and cultural factors help shape both stress exposure and its consequences (Briones et al., 1990; Connell & Gibson, 1997; Chou & Chi, 2001). As one example, studies of stress and depressive symptomatology have consistently found that women report higher levels of both stress events and symptoms (e.g., Chiriboga, 1984; Culbertson, 1997; Mirowsky, 1996; Turner, Lloyd, et al., 1995).

An area of growing interest is the relevance of stress to minority populations, especially to their older members. The stress context of older minorities groups is relatively unexplored despite the manifest need for this type of research (Marsella, Friedman, Gerrity, & Scurfield, 1996). The need

is underscored by the fact that people from disadvantaged backgrounds may, because of these very disadvantages, have fewer resources with which to cope and adapt (Blankenship, 1998). For example, Chou and Chi (2001) found that among the relatively impoverished Chinese elderly population of Hong Kong, greater financial strain is strongly related to depressive symptom expression.

There are marked variations in adaptive resources across minority populations that render any uniform assessment of risk suspect. In the instance of the Mexican American elder, research suggests that the extended family is generally more extensive and potentially supportive than in mainstream Americans (Markides & Black, 1996; Mendes de Leon & Markides, 1988). Their often robust social resources, however, may be offset by economic problems that are not only more likely among Hispanic groups but that may reduce coping resources and create greater vulnerabilities (Flack et al., 1995; see also Smith, 1999). Financial strain may indeed be a major risk factor for many disadvantaged groups. Ferraro and Su (1999) report that such strain was a predictor of psychological distress in three of the four Western Pacific localities they studied. Overall, there is a need for better understanding of what constitutes risk factors, and the distribution of risk factors, for diverse cultural groups (Culbertson, 1997; Perez-Stable, Marin, & Marin, 1994).

In addition to those already mentioned, we included measures of two other potential risk factors in the present investigation because of their potential relevance to the study population. Because of a likelihood of cognitive decline in the age groups being studied, we included a measure of cognitive status. We also included indicators of acculturation since low levels of acculturation have been associated with depression in Mexican American elders (Zamanian, Thackrey, & Starrett, 1992). Whereas the available measures of acculturation dealt primarily with just its linguistic aspect, the latter aspect has demonstrated content and predictive validity (e.g., Cuellar, Arnold, & Maldonado, 1995; Marin & Gamba, 1996).

A final point is that although the general relationship of stress to health is well established, there is some suggestion that it is now time for the entire paradigm, and its constituent building blocks, to be reexamined (e.g., Brown, Harris, & Hepworth, 1994). Studies of diverse populations may facilitate this reexamination process at the same time that they generate useful information concerning the relationships among variables within a specific group. In the present instance, the availability of a large, five-state probability study provides a unique opportunity for rigorous examination of the applicability of stress measures to an at-risk minority population. Although our general interest was in beginning an assessment of the role of stress for older Mexican Americans, we developed five hypotheses on the basis of existing literature: (a) consistent with past research, the level of depressive symptom expression will be relatively high; (b) consistent with past research, women and those with lower incomes will be more depressed; (c) because of the influence of cultural factors, those who are more highly acculturated will demonstrate lower levels of depressive symptoms; (d) because of the general robustness of the stress paradigm, stressful experiences of all types will be associated with the

reporting of depressive symptomatology, and (e) because of the marginal economic circumstances of many older Mexican Americans, economic stressors will demonstrate the strongest associations.

METHODS

The Study

Analyses drew from the initial wave of a multiwave panel study of Mexican American elders. We closely modeled the research design after existing Established Populations for Epidemiological Studies of the Elderly (EPESE) research and included many of the EPESE instruments (c.f. Cornoni-Huntley et al., 1990). Between July 1993 and April 1994, we conducted home interviews with an area probability multistage sample of 3,050. All participants were aged 65 or older, noninstitutionalized, and resided in a five-state region that contains the majority of Mexican Americans: Texas, California, Mexico, Colorado, and Arizona.

Sampling Frame

Louis Harris and Associates Poll, Inc. developed and implemented a multistage area probability sampling frame for the study. As described in detail by Miller, Markides, and Black (1997), we included four stages in sampling procedures: (a) we selected counties from a complete listing of counties in the five states; (b) we randomly selected 300 census tracts (primary sampling units); (c) we randomly selected blocks from each census tract; and (d) we conducted house-to-house surveying, requesting interviews of all Mexican Americans, aged 65 and older. The response rate, at 86%, approximates the response rate found in the other EPESE (see Cornoni-Huntley et al., 1990). Of the 3,050 participants included in the sample, 2,873 were interviewed in person and 177 were interviewed by proxy, either because of illness or low cognitive capacity as judged by their score on the Mini-Mental State Examination (MMSE).

Conceptual Model

The model applied to the cross-sectional data represents a relatively "no frills" direct effects approach incorporating variables common to most stress models (e.g., Lazarus & Folkman, 1984; Hobfoll, 1998) but does include additional variables appropriate to the study population. Five hierarchical levels of explanatory variables guided the regression analyses, entered by sets according to whether they tapped preexisting or stable social characteristics (e.g., age, gender, income), were more or less current, or might act as conditioning or predisposing factors (e.g., cognitive status, acculturation, supports) for depression. In order of entry, the sets included: (a) sociodemographic characteristics; (b) cognitive status; (c) acculturation; (d) social resources and supports; and (e) three domains of stressors: recent life events, chronic strains, and recent health events. The criterion selected for study was depressive symptomatology, one of the most widely used indicators of stress response (e.g., Aneshensel, 1996; Brown, Harris, & Hepworth, 1994). The evidence for heightened levels of depressive symptoms among

Mexican American elders was critical to our selection of this criterion (e.g., Black et al., 1998).

Measures

Where possible, we drew measures from other EPESE studies, especially the one conducted at Duke University. If suitable measures were not available from the EPESE studies, we drew measures were drawn from the Hispanic Health and Nutrition Examination Survey (HANES) or created ones specifically for this study. The measures analyzed for this article represent a subset of those available in the larger study. A Spanish version of the interview schedule was available, and all interviewers were bilingual.

Sociodemographic.—The six items include: (a) age, (b) gender, (c) educational attainment (grade level), (d) personal income, (e) work status (fully employed, partially employed, not employed), and (f) marital status (in analyses coded as presently married and spouse present vs. all alternatives).

Cognitive status.—We included a Spanish version (Bird, Canino, Rubio-Stipe, & Shrout, 1987; Escobar et al., 1987) of the MMSE (Folstein, Folstein, & McHugh, 1975), as a means of assessing the individual's general adaptive capacity. Note that we substituted spelling *world* (or the Spanish equivalent, *mundo*) backwards for the option of *serial sevens* subtraction. Scores can range from 0 to 30, with higher scores indicating fewer errors. For mainstream American populations, scores from 0 to 17 suggest severe cognitive impairment, 18–23 indicate mild impairment, and scores from 24 to 30 indicate probable lack of deficit (Weissman et al., 1985; Yu et al., 1989; Zarit & Zarit, 1998). Although there is evidence that education can affect the significance of scores, no change in the above cutoffs was made in the presentation of frequencies. Cronbach's alpha level of internal reliability for the present data set was .65.

Acculturation.—Following the lead of the Hispanic HANES, the overall study included 13 acculturation items drawn from the indices of Cuellar, Harris, and Jasso (1980) and Hazuda, Stern, and Haffner (1988). The majority of items assessed linguistic acculturation, only one dimension of what is generally recognized to be a multidimensional construct (e.g., Cuellar, Arnold, & Maldonado, 1995; Keefe & Padilla, 1987; Padilla, 1980). Additional questions probed for the cultural background of social others. Because several of the items had relatively high levels of missing data as a result of vacated or never occupied role status (e.g., language currently spoken with parents: in most cases the parent was deceased), the present analyses employed only five of the linguistic items and two of the cultural background items. Included items each had 2% or less missing data, and included self-reports of: (a) how well the respondent (R) spoke English, (b) how well the R was able to read English, (c) language used with most of R's friends, (d) language used at family gatherings, (e) language used with most of neighbors, (f) whether neighbors had been primarily Mexican American or Anglo American over the life course, and (g) whether close friends had been primarily Mexican American or Anglo American over the life course. The internal

reliability for these seven items was high (Cronbach's $\alpha = .91$), but we did not include a summary scale in the following analyses because we were most concerned with identifying individual items of significance to stress and depression. To round out the breadth of assessment, we included also two additional indicators (see Cuellar, Arnold, & Maldonado, 1995) of acculturation: (a) whether the R was born in the United States or not, and (b) whether the interview was conducted (per participant request) in English or Spanish.

Social resources.—Social resources are not only the most commonly studied mediators in stress research, but also represent a construct of particular significance to studies of Mexican Americans because of the generally larger size of the extended family. Given the importance of the overall construct, we included 11 items. Two dealt with how often the R felt he or she could (a) count on some family or friends in "times of trouble", and (b) talk to some family or friends about "your deepest problems" (coded from 1 [most of the time] to 3 [hardly ever]). The remaining nine items dealt with characteristics of the family network. Items included: (a) how many different family generations lived in the household; (b) how many individuals under 18, 18–24, 25–49, 50–64, and 65 and older lived in the household; (c) number of living sons and number of living daughters; and (4) how many children the R saw at least once a month. Cronbach's α for the 11 items, at .65, was relatively low. Inspection of the zero-order intracorrelations indicated great variation in magnitude, which is not surprising given that we did not intend for the included items to constitute a scale.

Stressors.—Measures representing three different domains of stressor were included.

1. **Life events.** These were 13 acute life events reported by the R as occurring within the past year. Seven items were from the Duke EPESE (Cornoni-Huntley et al., 1990; see also Holmes & Rahe, 1967): death of a close other, widowed, illness of close other, finances got worse, change in residence, retired, and divorced. We draw six additional items from several inventories developed for older populations (e.g., Chiriboga & Cutler, 1980; Murrell, Norris, & Hutchins, 1984): victim of crime, became caregiver, spouse hospitalized, married, separated, moved to USA (a subset of the general question concerning change in residence). Note that for one general item ("Did anyone close to you die?"), we included probes to ascertain relationship of the deceased for up to two reported deaths. Because the two probes elicited reports of more deaths than did the initial yes or no response, results are based on recodings that drew upon responses to all three items. Internal reliability for all items, at .45, is quite low but typical of inventories designed to assess the incidence of adventitious events over a limited period of time.
2. **Chronic economic strains.** Because research has emphasized the important role of chronic stress (e.g., Cohen et al., 1998), we included five items. The focus of these items was disproportionately on economic stress, because past research has indicated that Mexican Americans in general experience higher rates of poverty, and

we hypothesized that economic strain might be particularly important in the lives of older members of this target population. Four items came from the Pearlin, Menaghan, Lieberman, and Mullen (1981) Index of Chronic Economic Strain (reported Cronbach's $\alpha = .73$; 3-year test-retest reliability = .9; Chronbach's α for present study = .76).

3. *Personal health events.* These were 10 items that assess onset or initial diagnosis of either acute health events or chronic health problems within the past year. Such health stressors are problematic in that they often introduce a spurious effect into predictions of health-related outcomes. In the analyses presented in this article, we treated health stressors as a distinct category. We were concerned that because the outcome measure of depression includes several somatic items, it was possible that any relationship could be due to explanatory and outcome measures both tapping health status. Of the included items, two dealt with experiences within the past three months: (a) having a health problem that limited activities, and (b) having a health problem that required bed rest. The remaining eight items dealt with health experiences over the past year: (a) an illness or injury requiring hospitalization; (b) total days spent in a hospital; (c) heart attack; (d) stroke; (e) bone fracture; and (f) diagnosis with cancer, hypertension, or diabetes. Internal reliability, at .21, was low but again we did not presume health events to constitute a scaleable set of items.

Depressive symptoms.—We included the 20-item Center for Epidemiologic Studies–Depression (CES-D) scale (Radloff, 1977). The CES-D contains 16 negatively oriented items and 4 positively oriented items (reverse scored) and has proved to be a valid and reliable instrument when used with Spanish-speaking populations (Angel & Guarnaccia, 1989). Although previous factorial studies of the CES-D in mainstream samples have reported from two to four factors, there is evidence that there are two major dimensions, and this has been found to be the case with our own sample (Miller, Markides, & Black, 1997). We used the translation developed for the Hispanic HANES; at .88 the internal reliability for this study was moderately high. A score of 16 or higher is often used as a cutoff for heightened probability for clinical depression, although the CES-D is not considered a diagnostic or clinical tool (Radloff, 1977; Zarit & Zarit, 1998).

Analyses

All computations included adjustments based on the multistage sampling design. For example, although the actual frequency distributions shown in Table 1 are unweighted, the percentages represent normalized population estimates, and the extrapolated frequencies represent projections based on census data ($N = 498,176$) for Mexican Americans aged 65 and older in the region covered (U.S. Census, 1991). We adjusted also all derived scores, such as means, standard deviations, or regression coefficients to represent normalized estimates. In calculating levels of significance, we used the SUDAAN procedure (Version 7.5.2; Shah, Barnwell, & Bieler, 1997) to adjust analyses for weight and design effects.

Overall, these adjustments allowed us to make generalizations regarding distributions and relationships manifest in the Mexican American elderly population living in the five southwestern states from which the sample was drawn.

RESULTS

Basic Characteristics

Demographic.—Because the demographic characteristics of the sample have implications for how Mexican American elders fare when exposed to stressors, we present these characteristics in some detail. As shown in Table 1, and reflecting the fact that the Mexican American population has proportionately fewer older people than the Anglo-American population, the age distribution was highly skewed. Two thirds of the sample were aged 65 to 74 years, an age period often referred to as the *young old* stage of life; only slightly more than 7% were aged 85 and older. Even this oldest group, however, was sizable when extrapolated to the population of the five-state region: over 35,000 Mexican Americans were estimated to fall into the oldest-old category.

Women accounted for 56% of the sample, fewer than would be anticipated in an Anglo sample. More striking, perhaps, are the distributions for income and education. Well over a third reported personal incomes of less than \$5,000, and half had not completed elementary school. These results demonstrate that, compared to other groups of older adults, Mexican Americans have fewer economic resources with which to cope with adverse events and conditions.

Cognitive status.—Although the levels of educational disadvantage evident in our sample have been associated with increased MMSE errors in both American and international studies (Crum, Anthony, Bassett, & Folstein, 1993), the results suggested that this was a relatively intact group. Nearly two thirds fell within what is generally considered the normal range for Anglos, with another 30% falling within the mild impairment category (Zarit & Zarit, 1998). Fewer than 7% had scores indicative of severe cognitive deficit. This low proportion translated into a projection that well over 30,000 older, community-dwelling Mexican Americans in the five-state region may suffer from severe cognitive impairment.

Acculturation.—By and large the sample displayed relatively low levels of linguistic acculturation. For example, approximately 37% was unable to read English and 30% reported that they could not speak English. In contrast, about 58% reported they spoke only Spanish with their spouse, and a full 74% reported that they spoke only Spanish with their (middle-aged) children. At family gatherings, the proportion relying solely on Spanish dropped to 47%, perhaps reflecting out-marriages and greater use of English among younger generations. Two questions asked about characteristics of neighbors and friends over the participant's lifetime, with responses suggesting that large numbers of older Mexican Americans live rather segregated lives. Over 76% reported that their friends had been mostly Mexican Americans

Table 1. Characteristics of the Sample ($n = 3,050$), by Actual Number, Normalized Percent, and Inflated Number

Characteristic	<i>n</i>	%	Inflated <i>n</i>	Characteristic	<i>n</i>	%	Inflated <i>n</i>
Demographic				Life Events Within Year			
Age				Death of close other ^b	734	22.4	111,821
Young-old (65–74)	2003	66.1	329,218	Illness of close other ^b	598	19.3	96,118
Old-old (75–84)	833	26.9	133,786	Finances got worse ^b	420	14.1	70,118
Oldest-old (85+)	214	7.2	35,172	Changed residences ^b	256	10.2	50,876
Women	1775	56.7	282,394	Spouse hospitalized	291	9.3	46,242
Married	1693	55.2	275,216	Became caregiver	187	5.8	28,833
Income < \$5000	1094	34.3	158,483	Widowed ^b	78	2.5	12,590
Up to sixth-grade education	2208	71.1	347,991	Retired ^b	46	2.3	11,211
Acculturation				Victim of crime	60	1.8	9,120
Doesn't speak English	1016	30.0	149,648	Moved to United States ^b	13	0.8	3,943
Doesn't read English	1200	36.7	178,027	Divorced ^b	6	0.3	1,354
Only Spanish with friends	1630	50.3	250,453	Separated	4	0.2	755
Only Spanish at family gatherings	1501	47.7	237,677	Married	4	0.1	557
Only Spanish with neighbors	1643	49.7	247,828	Chronic Financial Strain			
Neighbors mostly Mexican-American	2516	73.1	363,869	Not enough for food: fairly often or more	199	7.2	31,387
Close friends mostly Mexican-American	2514	76.5	377,727	Difficulty w/monthly bills: some of time or more	244	55.4	241,370
Born outside the United States	1347	46.9	233,569	Not enough for medical care: fairly often or more	1609	8.9	38,831
Spanish used for interview	2374	72.6	361,676 ^a	Not enough at end of month	481	17.5	75,825
Mini-Mental State Examination Score				Acute Health Events			
0 to 17 correct ("severe" range)	152	6.7	31,454	Health limited activities within past 3 months	820	27.0	133,734
Social				Bedfast within past 3 months	597	19.0	94,896
Lives alone	640	20.9	104,234	Illness and/or injury limited activities ^b	625	20.5	101,885
Up to two people at home	1975	61.9	308,573	Hospitalized 1+ times in past year ^b	579	19.2	95,875
Has two or fewer living sons	1752	57.6	286,867	Hypertension diagnosed	152	5.9	29,149
Two or fewer living daughters	1747	56.7	282,428	Diabetes diagnosed	60	2.0	10,155
No children to age 18 at home	2502	81.0	391,713	Heart attack	83	3.1	15,545
Sees one or no children per month	498	22.1	90,722	Stroke	47	2.5	12,522
Can count on family most times	2024	68.5	321,184	Cancer diagnosed	35	1.2	6,200
Can talk about problems most times	1970	66.2	310,725	Bone fracture	22	0.7	3,534
				CES-D Scale			
				Score of 16 and above	687	25.7	120,770

Notes: Percentages were computed by using normalized inflation weights to allow estimates to the population of Mexican Americans who are aged 65 and older and living in the five states in the United States covered by the study. Frequencies are unweighted; inflated frequencies project to estimated population of Mexican Americans aged 65 and older ($N = 498,176$) in the five-state region under study [U.S. Bureau of the Census. (1991). *Race and Hispanic Origin* (Census Profile No. 2). Washington, DC: Department of Commerce]. CES-D = Center for Epidemiologic Studies–Depression.

^aEstimated number of older Mexican Americans who would have requested an interview in Spanish.

^bLife event item included in Duke Established Populations for Epidemiologic Studies of the Elderly.

(or Mexican), and for 73% the same was true of neighbors. Reflecting the overall level of linguistic acculturation in this sample, nearly 73% requested that the interviews be conducted in Spanish.

Finally, it should be noted that about 47% of the participants—nearly half—had been born outside of the United States of America. Although this high proportion of immigrants might suggest greater than usual vulnerability, many of these individuals had spent a substantial length of time here: The average number of years in the United States was 42.7 ($SD = 22.34$). Only 13 had moved to this country within the past year; at the other extreme, a total of 7 had immigrated 90 or more years ago.

Social supports.—Turning to social support characteristics (Table 1), the results suggested that the Mexican American elders were generally well integrated into the family network. Contrary to stereotypes, the majority did not live as part of a large and multigenerational household: Over 20% lived alone and this percentage increased to approximately 62% when two person households were counted (the

average number of persons in the household was 2.75). Approximately 57% reported having only one or two living sons, and roughly the same proportion reported one or two living daughters. A series of questions asking about the numbers of people in the household of differing ages again suggested that the majority of the participants did not live with people of differing generations. On the other hand, although generally not living as part of an extended family, the majority of these elders were not socially isolated: 68.5% reported that they could count on family members to help out most of the time, and 66.2% reported having a family member or friend with whom they could talk "about your deepest problems" most of the time. Only 22% reported seeing one or no children each month.

Life events.—Several of the included events were reported with some frequency. As shown in Table 1, 22.4% of the subjects reported the death of a family member or close friend within the past year, and 19.3% reported the serious illness of a family member. Slightly over 14% reported a worsening of their financial situation and about 10% reported

a residential change of some sort. Several other events occurred with less frequency, but are still of interest because the events were not trivial: 9.3% reported that their spouse was hospitalized within the past year; 5.8% reported they had become caregivers, and 2.5% reported becoming a widow (a specific instance of "death of a close other").

Chronic strains.—Perhaps the most striking information contained in the distributions for more durable stressors was that over 55% of participants reported difficulty in paying monthly bills some or most of the time. This percentage translated into an estimate that over 240,000 Mexican Americans elders in the five-state region frequently encountered problems paying their bills. Approximately 18% reported that they did not have enough money left at the end of the month to make ends meet. Lower proportions reported not having enough money for food (7.2%) and medical care (8.9%) some or most of the time.

Health stressors.—For this sample, the most frequently reported health events were those that either limited activities or required hospitalization (Table 1). The most commonly reported health event, at 27%, was having to cut down on activities within the past 3 months because of illness or injury. Approximately 19% reported having been bedfast all or most of a day within the past 3 months because of illness or injury. At least one hospitalization during the past year was reported by 19.2%, and nearly 17% reported having spent 2 or more days in the hospital. The frequency of being diagnosed during the past year with hypertension, diabetes, and cancer was relatively low, as was the incidence of stroke and heart attack. Still lower was the incidence of bone fractures, a finding that builds on reports indicating that the prevalence of osteoporosis among older Mexican Americans was relatively low (Markides, Rudkin, Angel, & Espino, 1997).

Depressive symptoms.—The outcome measure used in this study was the CES-D. With the standard cutoff of 16 or higher, the results suggested that over one quarter of the Mexican American elderly population in the five-state region covered by the study manifest symptom levels indicative of depression. This translated into a five-state estimate of 120,770 older Mexican Americans who may be in need of treatment.

Prediction of Depressive Symptomatology

To evaluate the contribution of a general stress model toward an understanding of depressive symptomatology in this sample, we employed a hierarchical regression approach that followed the conceptual model outlined earlier in this article. Each included variable has been found in previous research to associate with depressive symptoms. As shown in Table 2, at nearly every level the hierarchical analysis generated significant results. Overall, the predictive set accounted for 25% of the variance in depressive symptomatology. It should be noted that all predictors retained for the final analysis had previously demonstrated probability levels of .10 or lower, when we ran initial regressions without the use of inflation weights. We adjusted these probabilities during the final SUDAAN procedures.

Table 2. Results of Hierarchical Set Regression of Depressive Symptoms on Assumed Predictors ($n = 2,852$)

Block	(Block R^2 Change) Beta Coefficient
Block 1: Demographic	(.05)
Gender	.16***
Marital status	-.05
Personal income	-.07*
Education	-.06*
Block 2: Cognition	(.01)
Number correct on MMSE	-.09*
Block 3: Acculturation	(.00)
Language with family gatherings	.08*
Ethnicity of neighbors	-.05
Block 4: Social Supports	(.03)
Someone to talk to	.13***
Number of living sons	.06*
Has someone to count on	.05
Number of people in household	-.03
Block 5: Life Events	(.05)
Illness in close other	.04
Finances get worse	.21***
Retired	-.04***
Newly widowed	.04
Block 6: Chronic Money	(.04)
Not enough money for food	.11*
Not enough money for medical care	.08
Not enough money for bills	-.06
Block 7: Health Events	(.07)
Days in hospital	.06**
Activities limited	.23***
Stroke	-.04*
Cancer	.04
Bedfast within year	.03

Note: Beta coefficients were computed by using normalized inflation weights; probability levels were computed by using SUDAAN, Version 7.5.2x. MMSE = Mini-Mental State Examination.

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

Demographic variables accounted for 5% of the variance in depression (Table 2). As reported in other studies of Mexican Americans (e.g., Chiriboga, 1996), as well as studies of the majority population, women were substantially more likely to report depressive symptoms. Also in accord with studies of Anglo-American and other populations, participants with lower levels of education and lower incomes reported more symptoms.

The MMSE contribution was significant and suggested that older Mexican Americans with lower scores on cognition were likely to report more depressive symptoms. At the same time, the very low proportion of explained variance that came with adding the cognitive score suggested that cognitive factors play only a minimal role in the origins of depressive symptoms. One possible explanation for the quite minimal MMSE contribution was that cultural or linguistic factors may have affected responses to the cognitive test and thereby vitiated its meaningfulness. However, although those who took the MMSE in English scored significantly higher than those who took the test in Spanish, the mean difference was minor (means of 24.77 vs 24.55, $t(2851) = 12.12, p = .00$).

Turning to linguistic acculturation, this two-measure (only two variables contributed in initial regressions) set accounted for less than 1% of the variance in depressive symptoms. The one significant association indicated that those elders who were more likely to speak Spanish at family gatherings were significantly more likely to report symptoms of depression. On the whole, however, the results suggest that lower levels of acculturation do not dramatically increase the risk of experiencing depressive symptoms for older Mexican Americans.

The findings for social supports are very much in line with results from studies of other populations of older adults. As one example, it has been known for over 30 years that having someone to talk to about problems is associated with mental wellness (e.g., Lowenthal & Haven, 1967). Thus, it is not really a surprise to find that having someone to talk to about problems was associated with fewer symptoms in this Mexican American group. A finding that is at the very least provocative was that those with more living sons were likely to report more symptoms (number of living daughters did not contribute in either direction). An examination of zero-order correlations indicated that having more living sons was significantly ($p = .001$) associated with being male, being less linguistically acculturated, and living with more generations in the same residence. More investigation is obviously needed to parse out the relationships with mental health.

The last three sets in the hierarchical regression all dealt with various domains of life stress and together accounted for 16% of the variance in symptoms. In the first set of stressors, we entered the more traditional life-event measures. Three associations remained significant after the SUDAAN-based regression, with the strongest indicating that people who had recently experienced a worsening of their financial situation were more depressed. In addition, those who had retired within the year were less depressed than those who retired over a year ago. This latter finding suggests that distance from retirement may represent a proxy for chronic economic problems or for age itself. Finally, people whose spouse had died within the year reported more symptoms. Overall, the life-event measures explained 5% of the variance in depressive symptoms, an amount equal to that explained by demographic characteristics.

The indices of chronic financial problems also made an independent, and significant, contribution, accounting for approximately 4% of the variance in symptom level. The only significant contributor was a measure indicating how often the subject reported not having enough money to buy food. After we adjusted the significance level by the SUDAAN procedure, the significance levels of measures indicating difficulty with medical bills and bills in general fell to what is sometimes indicated to be a "trend" level ($p < .10$).

The final set we entered into the equation (i.e., that dealing with recent changes in one's personal health) made the greatest overall contribution to levels of symptom expression: 7%. The two major contributors were variables that seem to reflect the consequences of many different health problems. The first was a self-report of the amount to which one's activities had become limited by ill health within the past 3 months. The second was a self-report of how many days had been spent in a hospital over the entire year.

DISCUSSION

This article focuses on factors associated with depressive symptoms among older Mexican Americans. Although analyses are inherently limited by virtue of the cross-sectional design, a unique characteristic of the investigation is its ability to extrapolate numbers and percentages to the entire five-state region included within the sampling frame. The resulting figures, as depicted in the first table, show the extent of need and risk in the population. Confirming our initial hypothesis (regarding levels of depression), the proportion reporting depressive symptoms is surprisingly high. Indeed, at 25.7% the proportion who report 16 or more symptoms on the CES-D (a cut-off score associated with a heightened risk of clinical depression) is substantially above the 15.1% reporting the same symptom range in the primarily Anglo-American New Haven EPESE (White, Kohout, Evans, Cornoni-Huntley, & Ostfeld, 1986). Such findings emphasize the need for clinical intervention in the population under study.

The level of symptomatology is not particularly surprising, however, given the generally sparse economic and educational resources available to these older Mexican Americans. We had expected relatively low incomes on the basis of existing census data, but the fact that well over one third (37.5%) of our subjects report personal incomes of under \$5000 is particularly striking. This proportion is lower than levels reported by any of the other EPESE populations. Comparable figures include 25.6% for the East Boston EPESE, 17.2% for the Iowa EPESE, 29.0% for New Haven, and 25.3% for North Carolina (Brock, Manton, & Woodbury, 1990; Brock, Wineland, Freeman, Lemke, & Scherr, 1986).

In light of the extreme poverty manifest in our sample, it is also not surprising that chronic and acute economic problems are among the most common stressors reported. Over 50% report difficulty meeting monthly bills at least some of the time, and over 17% report not having enough money to make ends meet at the end of the month. Among more acute stressors, the two most frequent events are related to the death or illness of a close other. The third most frequent event is a worsening of financial status within the past year. Medical events are also common, with over a quarter of the sample reporting that their health had limited activities during the 3 months prior to the interview.

The investigation not only evaluated prevalence of potential risk factors but sought in addition to evaluate which of these factors are associated with problems. We, therefore, examine how depressive symptoms are related to stressors and other elements of what is generally considered to be the basic stress mode. The results demonstrate that several stressors—as well as several other social and personal characteristics—do in fact manifest an association. Generally, the factors that are associated with symptom expression in this population are very similar to those factors associated with symptoms in Anglo Americans, African Americans, and other groups and nationalities. The role of demographics, for example, is essentially the same as has been reported in numerous studies of mainstream Americans. Specifically, and supporting our second hypothesis, women and those with lower incomes report more symptoms.

Cognitive status, the second hierarchical set, is not generally included in stress paradigms. We include cognition

because the perception of stress is widely acknowledged as important in the stress literature, and in older populations cognition might play a critical role as a conditioning factor for stress responsivity in addition to having a direct predictor role with regard to depressive symptoms. The results indicated that cognitive status played only a minor role with regard to symptom expression, and the triad of stressor types (acute, chronic, and health related) continued to be significantly associated with symptoms after the removal of variance attributed to cognition.

Partial support is provided for our third hypothesis (regarding the role of acculturation). Only one acculturation measure is associated with symptoms: Those who are less likely to speak Spanish at family gatherings report fewer symptoms. This particular indicator may indirectly tap the level of overall family acculturation: It can be hypothesized that the more likely an elder is to speak Spanish in family gatherings, the less acculturated is his or her extended family. One result may be that the extended family is less able to provide help, including linkages with the formal providers. Two caveats deserve mention here. First, given that most of our measures tap just one dimension of acculturation, the scarcity of associations may reflect limitations of our instrumentation rather than limitations of the concept itself. Second, being more or less acculturated in itself is not clearly linked to adaptation: The individual and context play important roles (Garza & Gallegos, 1995; Padilla, 1980; Ward, 2001).

In contrast to cognition and acculturation, but providing support for the fourth hypothesis, all three sets of stress indicators do account for moderate proportions of the variance in depressive symptoms. In total, the 12 measures included in the final analysis generate 16% of the 25% of the variance accounted for in the full model. Although these levels are certainly not striking, they hold interest for at least three reasons. The first reason is that we have relatively few items within each of the three stressor inventories. Shorter inventories such as these often are lacking in content validity: They may not detect the stress experiences of subjects (e.g., Chiriboga & Cutler, 1980). On the other hand, the present results suggest that a relatively brief array of potential stressors will generate results if the items are carefully selected for population relevance.

The second reason is that most studies of stress focus on only one type of stressor: either life events or chronic strains. In this study, we include both events and chronic strains. We also separate out those events that can be classified as health related, so that the contribution of each can be examined independently. It is noteworthy that all three types of stress measure contribute to our findings.

The third reason the stress measures are of interest is that they told a coherent story. Supporting the fifth hypothesis, results from the life events and chronic strain sets of the regression analysis suggest vulnerabilities related to socioeconomic factors. This vulnerability to economic stress occurs in the context of socioeconomic disadvantage: Over 35% have an income of less than \$5,000, and over 71% report a sixth-grade education or less. The substantial proportions reporting limited or no knowledge of English may also represent at least a potential barrier to health services.

Given their income levels, it is not surprising that low income is significantly associated with higher levels of depressive symptomatology. However, the influence of economic factors clearly does not end with income. Even after the variance associated with the latter variable is partialled out of the equation, financial life events and chronic economic strains, in their respective sets, are significantly associated with symptom expression. In other words, it is not just level of income, but the experience of acute and chronic economic events and strains, that independently and additively affect their mood.

These results are in agreement with past research suggesting that economic constraints are profoundly important in the lives of older adults (e.g., Brenner, 1997; Krause, 1997). Low income is perhaps the most common of constraint, with either acute or chronic financial stressors occasionally added or employed in substitution. For example, Ferraro and Su (1999), who refer to money as a power resource, used financial strain as their primary economic indicator in a study of psychological distress in four Western Pacific countries. In the present study, we find that for older Mexican Americans there may be a triad of economic constraints with implications for emotional well-being. It is not simply low income. It is not simply a specific financial loss. It is not simply the chronic burden of meeting monthly bills. It is in fact all three (income, economic events, and chronic strains) that exert an independent and additive influence on symptoms of depression. For health professionals these results suggest a new strategy for risk screening: Although low income remains an important risk factor for depression among Mexican American elders, attention should be directed towards identifying persons with chronic and acute financial stressors. These stressors play a role in depressive symptom expression that is independent of the effect of income.

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