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THE PREVALENCE OF DEPRESSIVE SYMPTOMS AMONG MEXICAN AMERICANS AND ANGLOS

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Vega, W. (Dept. of Mexican American Studies, San Diego State U., San Diego, CA 92182), G. Warheit, J. Buhl-Auth and K. Meinhardt. The prevalence of depressive symptoms among Mexican Americans and Anglos. Am J Epidemiol 1984;120:592-607.

The study reports epidemiologic field survey data on the distribution of depressive symptoms among Anglos (n = 637) and two Mexican-American subsamples (n = 551) living in Santa Clara County, California. One of the Mexican-American subsamples was interviewed in English (n = 330) and the other in Spanish (n = 221). Analysis of variance indicated that those with low educational achievement, females, those in disrupted marital statuses, and those under 30 years of age had significantly higher levels of depressive symptoms than their counterparts. The prevalence of depressive symptoms for the Anglo and Mexican-American English-speaking samples was very similar and much lower than that reported by the Spanish-speaking Mexican-American subsample. Differences in educational levels appear to be accounting for many of the variations in depressive symptoms between the Anglo and English-speaking subsamples and the Spanish-speaking one. The authors suggest that the lack of language skills along with low educational achievement may be indicating a relative lack of acculturation and societal integration which in turn may be accounting for some of the increased symptoms among the Spanish-speaking subsample. The results of multiple stepwise regression analyses indicate that age, sex, marital status, and educational attainment explain relatively low and fluctuating amounts of the total variance. These analyses also indicate that social and demographic factors are differentially related to depressive symptoms for each of the subsamples. The variables education, female, and separated were significant in all of the equations, but their order of entrance and the amount of variance explained by them varied.

depressive symptoms; Mexican Americans; socioeconomic factors

This paper presents the findings from an epidemiologic field survey which had four major objectives: 1) to determine the prevalence and distribution of psychiatric symptoms and related dysfunctions among a community population which contained large numbers of Anglos and Mexican Americans; 2) to enumerate the prevalence of physical health problems among and between different subgroups in the population; 3) to identify the relationships between mental and physical health problems; and 4) to determine the utilization of both formal and informal health and other human services. Although the data obtained by this survey include information on an extensive

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Abbreviation: CES-D measure, Center for Epidemiologic Studies Depression measure.
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array of psychiatric symptoms and dysfunctions, this paper is limited to a presentation and discussion of the prevalence and distribution of depressive symptoms among two Mexican-American subsamples and a single sample of Anglos.

Mexican Americans represent a large and rapidly growing minority group in the United States. In 1970, the Census Bureau reported 9.6 million persons of Spanish origin living in this country. Ten years later, 14.6 million were enumerated. This represents more than a 50 per cent increase in one decennial period and, of course, the census did not include undocumented persons living in the United States. Approximately one third (4,543,700) of all Hispanics identified in 1980 were living in California, and most of these are of Mexican heritage.

In spite of this large and expanding population of Mexican Americans, there is a relative paucity of rigorous, empirical research regarding their mental health characteristics vis-a-vis those of Anglos and other ethnic groups living in the same geographic area. Moreover, many of the existing findings are inconsistent. This inconsistency exists because the limited number of studies which have addressed the issue have used disparate theoretical and methodological designs (1–7). For example, most of the early research findings were derived from anthropologic fieldwork or from studies of populations in treatment. These studies almost always report that Mexican Americans had lower rates of psychiatric disorders than Anglos. This finding was frequently attributed to the characteristics of the Mexican-American family system, which was viewed as more integrated and supportive than the Anglo one.

In recent years, a small number of psychiatric epidemiologic field studies using statistical probability samples of the general population have been conducted which have obtained data on both Mexican Americans and Anglo samples. Many of these have relied on global measures of "caseness" or mental disorders, e.g., the Langner 22-Item Symptom Inventory (8) or the Health Opinion Survey (9). Both of these measures were developed to provide a global assessment of a respondent's mental health status and included items whose content tended to elicit information on symptoms of depression, anxiety, and psychoneuroticism. And, although the Langner 22-Item Inventory and the Health Opinion Survey have considerable content overlap in their items, the results reported by researchers using them have not been consistent. For example, Gaitz and Scott (10), Antunes et al. (11), and Mirowsky and Ross (12), all of whom utilized the Langner 22-Item Inventory, reported lower symptom levels for Mexican Americans than for Anglos even when socioeconomic status was controlled. In contrast, Vega et al. (13), who employed the Health Opinion Survey as part of a field survey of Mexican-American farmworkers, found no important differences in Health Opinion Survey scores among ethnic groups when socioeconomic variables were controlled.

Another group of studies, based on the Center for Epidemiologic Studies Depression (CES-D) measure (14), have consistently reported higher depression levels for Mexican Americans than for Anglos. Vernon and Roberts (15) in their Alameda County, California survey found higher symptom levels for Mexican Americans than for Anglos or blacks. Similarly, Frerichs, et al. (16), who also used the CES-D measure, reported higher levels of depression among Hispanics than among Anglos or blacks in Los Angeles County. However, when controlled for demographic and socioeconomic variables, these differences were not statistically significant. Regrettably, both of these studies had relatively small samples of Mexican Americans, and both had

nonresponse rates of approximately 30 per cent. As a consequence, their results must be interpreted cautiously. In another study, Quesada et al. (17), who used both the Zung depression scale (18) and the Florida Health Study analytical design (19), found that Mexican Americans had slightly lower symptom levels than blacks on this scale.

As noted above, much of the research on Mexican-American mental health as it relates to that of other racial and ethnic groups has been marked by inconsistent and conflicting results. Some of these differences may be reflecting differences in instrumentation, refusal rates, sample sizes, and modes of analysis. Or, they may be attributable to variations in the populations being studied. In either case, these differential research outcomes indicate that our knowledge regarding the distribution of mental health problems among Mexican Americans remains fragmented and incomplete and, furthermore, that more basic, descriptive, epidemiologic information is required before we will be able to engage in more precise, verificational research.

Materials and Methods

Study design

The design and methods of the study reported in this paper were based on those developed by Schwab et al. (19) as part of the original Florida Health Study (n = 4,202). The results of their research have been published extensively and will not be detailed here (20–22). Since their original efforts, Warheit and his colleagues (23) have collected approximately 8,000 additional household interviews using the same measures that were utilized in the Florida Health Study. A listing of the research sites, sample sizes, and principal investigators are found in table 1.

The depression scale from the Florida Health Study was used in all of these projects, including the one reported in this paper. The list of items included in this measure is available from the authors. A review of the Florida Health Study items shows that they resemble those of the CES-D measure (14), the Zung depression scale (18) and a number of other depression symptom inventories. The Florida Health Study depression scale, which predates the CES-D measure, taps four dimensions commonly found among clinical populations: mood, affect, psychobiologic reactivity, and future outlook. The CES-D measure has been used with other studies involving Mexican Americans, and because our results will be compared with those reported by them, it is important to point out that the Florida Health Study depression scale differs from the CES-D measure in two basic ways: the time frame within which the questions are asked and the method of scoring. The CES-D measure asks about symptoms in the prior week; the Florida Health Study depression questions are asked in the context of the last year. The item scoring and analysis of the two scales are also different. The CES-D measure establishes a cutting point (a score of 16) which is used to dichotomize a sample into two groups: the depressed and the nondepressed. The Florida Health Study, on the other hand, places respondents along a continuum of scores and analyzes subgroups on the basis of their mean scores and standard deviations. The Florida Health Study depression scale makes no attempt to establish the prevalence of clinical depression. The rationale for the Florida Health Study statistical normative approach was predicated on the belief that depression is a multidimensional construct which includes the interaction of biologic, psychologic, and sociocultural elements and, furthermore, that there is more than one type of clinical depression. Given these beliefs, the Florida Health Study research team concluded that it is not possible to identify differing clinical depressive syndromes on the basis of a brief set of field

TABLE 1

Research sites, sample sizes, and principal investigators of projects using the Florida Health Study field survey assessment model (total n = 12,001)*

Location	Year conducted	Sample size	Principal investigator
Florida	1969–1973	4,506	John Schwab George Warheit Roger Bell
Kentucky	1974–1975	1,078	Roger Bell Martin Sundell John Schwab
California			
Mexican American/Anglo	1980	1,345	William Vega Kenneth Meinhardt
Guamanian	1980	312	David Shimizu
Mexican immigrants	1981	150	Luz Fernandez Pieda Garcia Sylvia Tello
Ohio			
Northwest study	1980	1,728	Richard Hunter Richard Naida
South central	1980	1,072	Mary Stefl
Nebraska	1981	1,810	Peter Beeson

survey items. Rather, their approach has been to focus on the prevalence and distribution of symptoms known to be associated with depressive syndromes and to compare these distributions among differing social and demographic subgroups.

Although both of these scales and their scoring methods have advantages and disadvantages, we believe that ultimately they are measuring the same phenomena. This belief is supported by one of the most widely cited validity studies using the CES-D measure. Weissman and her associates (24) concluded after careful research that although the CES-D measure could identify high risk groups who had symptoms independent of diagnosis, it could not differentiate between primary and secondary depression. Moreover, the results of their research showed that the scale could not be used to ascertain rates of psychiatric disorders as defined and diagnosed in treatment settings.

Another study which reinforces our contention that most of the nondiagnostic depression scales are measuring the same phenomena comes from the research of Hough and his colleagues at University of California Los Angelos (25). The results of an extensive project which examined the CES-D measure and a number of measures with similar subscales showed that these scales, the Hopkins Symptom Checklist-25 and the General Health Questionnaire, are remarkably similar in their sensitivity and specificity when analyzed within the context of findings derived from the National Institute of Mental Health Diagnostic Interview Schedule (26). To reiterate, it is our opinion that the CES-D measure and the Florida Health Study depression scale basically identify the same phenomena and that they share mutual advantages and disadvantages.

The Florida Health Study depression scale has been tested for reliability by means of Cronbach's alpha (27) and has been found to have high levels of internal consistency. The alphas for the depression scales as administered to seven different samples with a combined number of

12,053 are reported in table 2. The coefficients ranged from 0.78 to 0.84. The coefficients for this study were 0.83 for the entire sample, 0.77 for Anglos, 0.84 for Spanish-speaking Mexican Americans, and 0.82 for English-speaking Mexican Americans. All of these are substantially above accepted standards.

In addition to tests for reliability, the scales have been analyzed for validity in several ways. Space limitations prohibit a full description of all the validity procedures here and because they have been described in the previously cited literature regarding the Florida Health Study, only a brief summary of these validity tests is provided.

An initial study was conducted in which three psychiatrists made blinded, independent ratings of a probability sample of community respondents (n = 322) and a sample of psychiatric patients (n = 107) who were being treated in community inpatient and/or outpatient settings. Using protocols generated from structured interviews, the psychiatrists rated both community respondents and patients along a continuum ranging from not impaired to incapacitated. Overall, the raters significantly agreed on the global levels of impairment for both the patient and nonpatient groups. When the depression score distributions were analyzed in the context of the impairment ratings, it was found that the scores for both the patients and those from the community sample rated as having some level of impairment were significantly higher than those in the sample rated as nonimpaired. Moreover, the scale score differences within the impaired groups were statistically significant; as impairment levels increased, so did their scale scores (28). These tests also disclosed a strong association between global psychiatric impairment ratings and the Florida Health Study depression scale.

A second validity study was based on a probability sample (n = 300) of community respondents only. They were also rated by these psychiatrists for psychosocial impairment by means of protocols generated from their interview schedules. These ratings were also made independently and blinded, and once again, the results showed statistically significant relationships between the impairment ratings of the psychiatrists and the scale scores of respondents in the sample.

A third test involved comparing the scores of 256 psychiatric inpatients who were being treated in community mental health units with those of a probability sample of community respondents (n = 1,645). Community respondents were placed in one of four risk categories as determined by their personal and social histories, including treatment for mental health problems, psychotropic drug use, suicidal ideation and behaviors, recent life events, and similar factors known to be associated with mental health problems. When the scores of the patients were compared with those of the risk groups from the community sample, statistically significant differences were found between patients' scores and the no or low risk groups from the community sample. The analyses also showed that the differences between the patients' scores and those of the moderate and high

TABLE 2

Coefficients of reliability for the Florida Health Study depression scale in seven different field surveys

Field survey site	Depression scale (Cronbach's alpha)
Florida	0.84
Kentucky	0.80
California	
Anglos + Mexican Americans	0.83
Guamanians	0.78
All Mexican Americans	0.83
Ohio	0.83
Nebraska	0.81

risk community groups were not significantly different from each other.

A fourth validity test consisted of analyzing the relationships between scale score distributions and 59 factors known to be related to mental health problems, e.g., employment patterns, marital and family histories, alcohol and drug use, suicidal ideation and behaviors, physical health problems, hospitalizations, and life crises events. The results of these detailed analyses showed statistical associations between scale scores and all of these 59 factors. Those wishing more details on the procedures just described can obtain them by contacting us.

A Spanish version of the questionnaire was developed through the efforts of an eight-person team which included a distinguished Mexican-American linguist, a mental health researcher of Mexican origin, and five Mexican-American staff members of a mental health center serving a predominantly Mexican-American population. Dr. William Vega, who is proficient in both Spanish and English, served as the coordinator for the translation team. Several pretests specifically designed to test the efficacy of the items in the questionnaire were completed as part of the construction process. The development and testing of the Spanish version took approximately four months to complete.

Sampling procedures

Santa Clara County, California was the research site. The 1980 population of the county was approximately 1,295,071, of whom 17.5 per cent were of Mexican heritage. After considering alternative methods, it was decided to conduct the interviews by telephone. This decision grew from two factors. First, prior researchers had employed the telephone to conduct Florida Health Study-based studies, and they had done so with relatively low refusal rates. For example, Hunter (29), who relied on random digit dialing to select the sample and the telephone to conduct the interviews in his Florida Health Study-based study of eight northwest Ohio counties (n = 1,739), reported a 10 per cent nonresponse rate. Also, Stefl (30) used the same procedures in her study in south central Ohio (n = 1,083) with similar results. The nonresponse rate for her telephone survey was 9.2 per cent. Both of these compare favorably with the nonresponse rates of field researchers working in face-to-face interviewing situations. In addition, telephone company representatives in Santa Clara County indicated that approximately 99 per cent of the county's households had telephones. This information allayed our earlier fears that the Mexican-American population might have a disproportionately large number of homes without telephones which, of course, would have posed major problems for the research group.

The specific techniques used in selecting the sample were based on those outlined by Lucas and Adams (31) in their Rand Corporation report. The methodology consists of generating a sample of telephone numbers by means of random digit selections from banks of prefixes. Once a household was identified, a technique similar to the one developed by Kish (32) was used to select specific respondents within it. The representativeness of the sample has been established by Sena-Rivera and Gilbert (33) who compared its social and demographic characteristics with those of the county. The refusal and noncompletion rate was 12.0 per cent for Anglos and 9.3 per cent for Mexican Americans. There were no specific age-sex subgroups with unusual nonresponse rates. Interviews conducted in English took an average of 30 minutes; the Spanish version averaged 34 minutes.

All of the interviewers were given extensive training which included participating in several small pretests. Those recruited to conduct the Mexican-American

phase of the survey were Mexican Americans and were bilingual. The interviewing process was supervised by both Anglo and Mexican-American research personnel. After identifying the nature of the study, Mexican-American respondents were asked their language of preference for continuing the interview and were paired with the appropriate language-gender interviewer.

The social and demographic characteristics of the entire sample are detailed in table 3. The sample contained 637 Anglos and 551 persons of Mexican heritage. There were 330 Mexican Americans who took the interview in English and 221 who responded in Spanish. The sample also contained 58 persons with an Asian background, 25 blacks, 26 non-Mexican Hispanics, and 13 native Americans. An additional 35 respondents provided incomplete information and could not be categorized by ethnicity. As noted above, this paper focuses on the Anglo and Mexican-American samples.

Results

The data presented were analyzed by means of *t* tests, by one-way analysis of variance, and by multiple regression analysis. Because a preliminary review of the data indicated that the scores of the Mexican Americans who took the interview in English were quite different from those of the Spanish-speaking respondents, these two groups were separated for purposes of detailed analysis.

Results of t tests and analysis of variance (ANOVA)

Total sample. The results of the *t* tests for the total sample are presented in table 4. The mean score was 12.7 with a standard deviation of 8.5. Among all respondents, females had significantly higher depression scores than males. Those under 30 had higher depression scores than those in any other group, and the differences between age groups were statistically significant. There were also sta tistically significant differences betwee marital groups, with those in disrupte statuses having higher scores than th married and never married. The highes mean score in the total sample was foun among the maritally separated, 22.6 Depression score differences between ed ucational groups were also highly signif icant. The data show that depressio scores generally decrease as educationa levels increase. These results are simila to those reported by other psychiatri field surveys (34–37).

Although higher rates of psychopa thology among females, including depres sion, have been commonly reported in th literature, there is little agreement re garding the explanations for this finding Gove (38, 39) has maintained that bein married produces more stresses and con flicts for women than for men. Anothe set of explanations has been offered b Brown and Birley (40), and by B. S. Doh renwend (41). These investigators hav hypothesized that the differential rates o psychopathology between males and fe males can be attributed to a greate number of stressors experienced by fe males in western societies. And, relyin on methodological data, Phillips an Segal (42) postulated that females ar found to have more psychopathology tha males because it is more socially accept able for them to admit to having th symptoms associated with mental healt problems. In spite of these and other ef forts to explain the differential rates o psychologic disorder between males an females, no agreement has been reache by researchers.

The findings reporting a curvilinear re lationship between age and psychologi symptoms replicate the research of Fre richs et al. (16) with Mexican American as well as the findings from other inves tigations (19, 43). Finding high depres sion scores among those under 30 year of age is inconsistent with what is popu

TABLE 3

Social and demographic characteristics of Santa Clara Mental Health Needs and Utilization Study (n = 1,345)

	Total sample		Anglo		Mexican Americans				Asian		Black		Other Hispanics		American Indian	
					Spanish-speaking		English-speaking									
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Sex																
Male	635	47.3	278	43.8	102	46.2	171	51.8	35	60.3	13	54.2	9	34.6	8	61.5
Female	707	52.7	357	56.2	119	53.8	159	48.2	23	39.7	11	45.8	17	65.4	5	38.5
Age																
18–19	83	6.2	37	5.8	7	3.2	32	9.8	4	6.9	1	4.0	0	0.0	0	0.0
20–29	387	28.9	145	22.8	68	30.9	120	36.7	19	32.8	7	28.0	9	34.6	5	38.5
30–39	299	22.3	139	21.9	46	20.9	77	23.5	15	25.9	8	32.0	3	11.5	1	7.7
40–49	209	15.6	97	15.3	38	17.3	50	15.3	11	19.0	3	12.0	6	23.1	1	7.7
50–59	186	13.9	98	15.4	30	13.6	37	11.3	7	12.1	4	16.0	3	11.5	3	23.1
60–69	100	7.5	65	10.2	20	9.1	8	2.4	1	1.7	1	4.0	2	7.7	2	15.4
70 +	76	5.7	55	8.6	11	5.0	3	0.9	1	1.7	1	4.0	3	11.5	1	7.7
Marital status																
Never married	253	18.9	114	18.0	27	12.2	80	24.4	14	24.6	5	20.0	5	19.2	2	15.4
Married	847	63.2	408	64.3	145	65.6	196	59.8	40	70.2	12	48.0	16	61.5	7	53.8
Widowed	80	6.0	48	7.6	18	8.1	8	2.4	0	0.0	2	8.0	2	7.7	0	0.0
Separated	44	3.3	10	1.6	11	5.0	17	5.2	0	0.0	3	12.0	1	3.8	2	15.4
Divorced	116	8.7	55	8.7	20	9.0	27	8.2	3	5.3	3	12.0	2	7.7	2	15.4
Education																
0–4 years	70	5.2	6	0.9	54	24.4	6	1.8	0	0.0	1	4.0	2	7.7	0	0.0
5–8 years	134	10.0	14	2.2	81	36.7	33	10.0	0	0.0	3	12.0	0	0.0	2	15.4
9–11 years	189	14.1	52	8.2	38	17.2	78	23.6	2	3.4	3	12.0	6	23.1	5	38.5
High school graduate	379	28.2	186	29.2	28	12.7	124	37.6	13	22.4	7	28.0	10	38.5	3	23.1
13–15 years	316	23.5	195	30.7	16	7.2	59	17.9	19	32.8	8	32.0	4	15.4	2	15.4
College graduate	151	11.2	105	16.5	3	1.4	19	5.8	15	25.9	2	8.0	2	7.7	1	7.7
17 + years	105	7.8	78	12.3	1	0.5	11	3.3	9	15.5	1	4.0	2	7.7	0	0.0
Total*	1,345		637		221		330		58		25		26		13	

* Thirty-five people could not be identified by ethnic category.

TABLE 4

Distribution of depression scale scores by social and demographic groups, Santa Clara Study (n = 1,345)

	Total sample			Anglos			Mexican Americans						
							Spanish-speaking			English-speaking			
	n	Mean	SD	*n*	Mean	SD	*n*	Mean	SD	*n*	Mean	SD	*p*
Sex													
Male	635	11.2	8.1	278	10.6	7.5	102	14.8	10.0	171	10.1	7.7	****
Female	707	14.0	9.1	357	12.4	8.3	119	18.1	9.8	159	14.9	8.9	****
p		****			***			*			****		
Age													
18–19	83	13.4	8.2	37	12.8	8.1	7	18.9	8.0	32	12.6	8.9	NS†
20–29	387	14.1	8.8	145	13.3	8.1	68	16.7	9.9	120	13.4	8.9	*
30–39	299	11.7	8.0	139	11.1	8.5	46	13.6	6.5	77	11.7	8.1	NS
40–49	209	12.8	9.7	97	11.5	7.9	38	18.9	14.2	50	11.4	7.7	****
50–59	186	11.6	8.4	98	10.9	8.1	30	18.0	8.9	37	10.9	7.8	****
60–69	100	12.6	9.3	65	10.5	6.9	20	18.2	9.8	8	16.3	16.2	***
70+	76	11.8	8.0	55	10.8	7.5	11	12.7	7.8	3	14.3	3.2	NS
p		**			NS			NS			NS		
Marital status													
Never married	253	13.5	8.4	114	12.4	7.8	27	15.7	9.4	80	14.1	9.3	NS
Married	847	11.5	7.8	408	10.4	6.8	145	15.9	9.6	196	11.1	7.6	****
Widowed	80	14.4	8.9	48	12.5	7.9	18	16.8	9.5	8	13.8	6.5	NS
Separated	44	22.6	12.0	10	18.1	11.0	11	28.8	13.7	17	20.9	10.1	NS
Divorced	116	14.8	10.5	55	16.5	12.2	20	15.7	8.6	27	11.7	9.3	NS
p		****			****			****			****		
Education													
0–4 years	70	16.8	10.8	6	5.0	5.0	54	18.2	10.7	6	18.8	9.4	*
5–8 years	134	16.2	10.9	14	11.6	7.8	81	17.7	11.4	33	15.3	10.9	NS
9–11 years	189	15.1	9.0	52	15.6	9.1	38	15.5	7.1	78	14.0	9.0	NS
High school graduate	379	12.5	8.3	186	12.8	9.1	28	14.4	8.1	124	11.8	7.8	NS
13–15 years	316	11.5	7.9	195	11.3	7.9	16	14.1	8.6	59	11.3	8.2	NS
College graduate	151	9.6	5.8	105	9.7	5.4	3	6.0	3.0	19	7.8	5.0	NS
17+ years	105	9.9	7.2	78	10.0	6.8	1	10.0	0.0	11	9.4	7.7	NS
p		****			****			NS			***		
Total	1,345	12.7	8.5	637	11.6	8.0	221	16.6	10.0	330	12.4	8.6	****

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$, **** $p < 0.001$.
† NS, not significant.

larly believed, i.e., menopause, the male climacteric, age-related health problems, and other midlife crises produce elevated levels of depression. Although we have no theoretical explanations to account for the high rates of depressive symptoms among the young, it is evident that we need to reconsider earlier notions regarding the relationships between age and depression.

The data on marital status and depressive symptoms are in agreement with a vast body of other epidemiologic data which show that the married have the lowest rates of psychopathology and that those in disrupted statuses have the highest rates (22, 43–45).

The findings on educational achievement and depression scale scores are consistent with most other epidemiologic field survey results which have indicated that the highest rates of psychopathology are found among the lowest social classes (46). And, although educational level is only one dimension of socioeconomic status, it has been found to be highly correlated with both income and occupational status. In the absence of precise income data, we rely on education alone as a proxy measure for socioeconomic status. We found that those in the lowest educational groups had the highest symptom levels. Attempted explanations regarding the relationships between social class and mental disorders have engendered an extensive debate among researchers in the field. These have centered largely on the issues of social selection and social causality (34). To date, however, attempts to establish causal relationships between socioeconomic status and mental disorders have not moved beyond the propositional level.

Ethnic group comparisons. In summarizing the findings for the sample as a whole, it can be concluded that they are similar to those reported by other research in the field. However, a number of exceptions are found when the data are analyzed for the three separate ethnic groups. These results are also presented in table 4.

One of the most important between-group findings is that the scores of the Anglos and Mexican-American English-speaking subgroups approximate one another and, simultaneously, are quite lower than those of the Spanish-speaking subsample. This was true for almost every social and demographic subcategory. And, where variations from this pattern are found, they are usually accompanied by very small cell sizes. Overall, the Spanish-speaking respondents had higher depression scores than their study counterparts, although group differences were not always statistically significant. As noted, this lack of significance often appears to be the result of small sample sizes, but in other instances, the mean scores are not remarkably different, and the lack of statistical significance is reflecting an accurate description of the data.

In all but two comparisons, there was a lack of statistical significance between the scores of the three ethnic subgroups when the data were controlled for education and for marital status. This suggests that these two sets of factors are so powerful in their impact on individuals, i.e., marital disruptions and/or low educational achievement, that they outweigh other possible intervening variables including ethnicity.

The within-group score patterns are similar for most subcategories among the three subsamples. The scores of females were significantly higher than those of males in all three groups; marital status scores were also significantly different, and educational score variations were significant for Anglos and the English-speaking Mexican-American samples. While not significant for the Spanish-speaking subgroup, the data revealed a

generally inverse relationship between educational levels and depression scores. The lack of statistical significance for the Spanish-speaking subsample may be due to small cell sizes and to the fact that there was very little variation in the educational statuses of this group. Only 20 persons of the 221 in the sample had more than a high school education.

The mean depression score differences among the age categories were not statistically significant for any of the three subsamples, and no distinct trends were observable. Age does not emerge as an important correlate of depressive symptoms among the population included in this research.

Multiple regression analysis

In an effort to better understand the relationships between the social and demographic characteristics of the three subpopulations and the distribution of their depressive symptoms, a series of multiple stepwise regression analyses were performed.

Inasmuch as preliminary tests of the depression scale scores showed that their distribution was slightly skewed, logarithmic transformations were made prior to completing the multiple stepwise regression analyses. Additional tests indicated that multicollinearity and interaction effects were not confounding the results of the analyses, and for this reason, these issues are not discussed in our presentation. Because of space limitation, only the most salient data from the regression analyses are presented. However, those wishing more detailed information on the regression analyses can receive it by contacting us.

Total sample. The results of the regression analysis for the entire sample are shown in table 5. All of the variables were statistically significant ($p < 0.01$). The total variance explained was 10.6 per cent. The variable education entered the equation first and accounted for 5.3 per cent of the total. Female entered second and explained an additional 1.7 per cent and age entered third. It also added 1.7 per cent. The remaining 1.9 per cent of the explained variance was contributed by disrupted marital statuses; most of this was derived from the variable separated. Both educational status and age tended to be inversely related to depression scores. For the sample as a whole, low education, younger age, being female, and being separated were correlated most highly with elevated depressive symptoms.

Anglos. The results of the regression analyses for Anglos only are reported in table 6. All variables were significant in the equation ($p < 0.01$). Together they explained approximately 7.6 per cent of the total variance. This was about 3.0 per cent less than that accounted for by the variables in the equation for the sample as a whole, and the stepwise ordering was altered somewhat. Education entered first and contributed 2.4 per cent to the variance explained. Divorce entered next and accounted for an additional 1.7 per cent. Age entered third, and the variance attributable to it was 1.4. The remaining variables and their contributions to the total variance explained were: female, 0.9; separated, 0.8; and widowed, 0.4 per cent.

The results of the regression analyses for Anglos suggest that the variables included in the equation were not as powerfully correlated with depression symptom scale scores as they were for the population as a whole. Furthermore, being female, which is customarily associated with increased depressive symptoms (38, 39), was less influential in accounting for the variance than was being divorced, although there was a small amount of collinearity between them. The variable widowed was barely significant (F test = 2.92) and accounted for very little variance.

The regression findings for Anglos in-

TABLE 5

Prediction of depression scale scores from sex, age, marital status, and education (Santa Clara sample, CA: entire sample n = 1,332)

Variable	*R* square	Regression coefficients		*F* test	Significance
		Standardized beta	Standard error B		
Education	0.05299	−0.21115	0.00234	62.98	$p < 0.01$
Female	0.06994	0.12126	0.01803	20.57	$p < 0.01$
Age	0.08726	−0.15541	0.00059	29.54	$p < 0.01$
Separated	0.09924	0.11848	0.04979	20.10	$p < 0.01$
Divorced	0.10257	0.06627	0.03182	6.28	$p < 0.01$
Widowed	0.10602	0.06580	0.04145	5.12	$p < 0.01$
Multiple *R*	0.32561				
R square	0.10602				
Standard error	0.31922				

TABLE 6

Prediction of depression scale scores from sex, age, marital status, and education (Santa Clara sample, CA: Anglos only, n = 629)

Variable	*R* square	Regression coefficients		*F* test	Significance
		Standardized beta	Standard error B		
Education	0.02394	−0.14320	0.00489	13.12	$p < 0.01$
Divorced	0.04117	0.13990	0.04668	12.78	$p < 0.01$
Age	0.05562	−0.16100	0.00083	13.96	$p < 0.01$
Female	0.06433	0.08791	0.02677	4.89	$p < 0.01$
Separated	0.07240	0.09225	0.10312	5.71	$p < 0.01$
Widowed	0.07673	0.07545	0.05613	2.92	$p < 0.01$
Multiple *R*	0.27701				
R square	0.07673				
Standard error	0.32289				

cated that the relationships between e social and demographic variables and pressive symptoms were different in veral instances from those for the total pulation. Additional evidence for these ferential relationships is provided by alyses of the data for the two Mexican-erican samples.

Mexican-American English-speaking sample. The results of the regression alyses for the Mexican-American En-sh-speaking subsample are shown in le 7. Only three variables were signif-nt in the equation: female, education, separated ($p < 0.01$). Moreover, these iables accounted for all but 1.0 per cent of the total explained variance (approximately 13.0 per cent). The variance accounted for by these variables was: female, 8.2 per cent; education, 2.7 per cent; and separated, 1.0 per cent.

The findings presented in table 7 which are unlike those reported for the total sample and for Anglos indicated that depressive symptoms are differentially distributed among and between social, demographic, and ethnic subpopulations. The depressive symptoms scores for females and for those of low educational status were higher than for those of any other groups in the English-speaking subsample.

TABLE 7

Prediction of depression scale scores from sex, age, marital status, and education (Santa Clara sample, CA: Mexican-American, English-speaking, n = 327)

Variable	R square	Regression coefficients		F test	Significance
		Standardized beta	Standard error B		
Female	0.08215	0.23890	0.03786	19.25	$p < 0.01$
Education	0.10909	−0.16363	0.00682	9.09	$p < 0.01$
Separated	0.11946	0.09648	0.08495	3.16	$p < 0.01$
Age	0.12544	−0.07811	0.00150	2.03	NS*
Divorced	0.12841	−0.05224	0.06731	0.96	NS*
Widowed	0.12956	0.03511	0.12154	0.42	NS*
Multiple R	0.35995				
R square	0.12956				
Standard error	0.32775				

* NS, not significant.

Mexican-American Spanish-speaking subsample. When the data for the Spanish-speaking subsample were analyzed, the findings were once again different from those of the total sample and the other two ethnic subsamples. Less of the variance was explained than for the English-speaking cohort, and some differences were found among the social and demographic subcategories. The findings which are presented in table 8 reveal that only three of the variables were significant in the equation ($p < 0.01$). These were separated, female, and educational status. Approximately 7.0 per cent of the total variance was explained by all of these variables, and of this amount, 4.2 per cent was explained by being separated; an additional 1.2 per cent was accounted for by being female, and 0.6 per cent was related to education. Age, widowhood, and divorced marital status together contributed only about 1.0 per cent to the total variance explained.

DISCUSSION

The findings are, at a macro level, consistent with those reported for other psychiatric epidemiologic field surveys. Those with low educational achievement, females, those in disrupted marital statuses, and the young had higher depressive symptom scores than their counterparts.

When the data were controlled for ethnicity, Anglos had lower scores than those found for both Mexican-American samples. It is important to emphasize, however, that the scores of the Mexican-American English-speaking subsample were very similar to those of the Anglos. Conversely, they were appreciably lower than those of the Spanish-speaking subsample overall and for almost every social and demographic subgroup.

One of the most important findings from the global analysis is the one which shows only minor score differences between the Anglo and the Mexican-American English-speaking subsamples. This finding strongly suggests that the distribution of depressive symptoms in the population from which the samples were drawn is not due to factors indigenous to the ethnic groups included in the research. Educational achievement and its relationship to socioeconomic status appear to be the most influential factors affecting subsample differences.

Another finding of importance can also be drawn inferentially from the data. It is logical to suggest that the depression score differences between the two Mexican-American samples reflect their rel-

TABLE 8

Prediction of depression scale scores from sex, age, marital status, and education (Santa Clara sample, CA: Mexican-American, Spanish speaking only, n = 220)

Variable	*R* square	Regression coefficients		*F* test	Significance
		Standardized beta	Standard error B		
Separated	0.04183	0.16802	0.09041	5.96	$p < 0.01$
Female	0.05367	0.11363	0.03981	2.69	$p < 0.01$
Education	0.05973	−0.13121	0.00524	2.97	$p < 0.01$
Age	0.06938	−0.10086	0.00146	1.51	NS*
Widowed	0.07014	−0.02901	0.07901	0.15	NS*
Divorced	0.07021	0.00827	0.07049	0.01	NS*
Multiple *R*	0.26496				
R square	0.07021				
Standard error	0.28060				

* NS, not significant.

ative degree of acculturation and societal integration. One possible indicator of this is their relative mastery of the English language and another (which is related to language skills) is educational achievement. As shown in table 3, the English-speaking subsample was on the whole much better educated than the Spanish-speaking one. Almost two-thirds of the Spanish-speaking subsample had less than a ninth grade education, and only 1.9 per cent had a college degree or more. In contrast, only 11.8 per cent of the English-speaking subsample had less than nine years of schooling, and 9.1 per cent had completed college and/or some graduate education. Even more dramatic is the comparative educational achievement of the Anglo sample. Only 3.1 per cent had fewer than nine years of formal education, and 28.8 per cent had completed college and/or more. The distribution of other factors associated with increased depressive symptoms, e.g., sex, age, and disrupted marital statuses, is not dissimilar enough among the three ethnic subgroups to suggest that they are accounting for much of the score differences.

The results of the regression analyses indicated that the amount of variance explained by the social and demographic factors included in the equation was low and, furthermore, that it varied among the three samples. Curiously, the variance explained was higher for the English-speaking Mexican-American subsample (12.9 per cent) than it was for either the Anglos (7.6 per cent) or the Spanish-speaking subsample (7.0 per cent). The regression analyses suggest that other social and cultural factors as well as biologic and psychologic ones must be identified and their interrelationships understood before we are able to offer meaningful statements regarding the etiology, prevalence, and distribution of depressive symptoms and the syndromes they may be reflecting.

The regression analyses also suggest that there is a need for additional research before one can offer meaningful statements concerning the relationships between depressive symptoms and sex, marital status, and educational achievement among Anglos and Mexican Americans. We are presently involved in an analysis designed to identify which specific items in the depression scale are contributing to the high scores for each ethnic group. If for the subsamples these items are clustered within differing subcomponents of the scale, e.g., affect or psychobiologic reactivity (and preliminary analysis suggests this is the case), we will

be in a better position to test specific postulates regarding these clusters and their relationships to other factors such as the availability of coping resources, level of acculturation, and physical health problems. Hopefully, these analyses will provide an empirical basis for offering some tentative explanations for the differential distribution of depressive symptoms among Anglos and Mexican Americans and, simultaneously, suggest areas for future research.

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