LIFE EVENTS AND SERIOUSNESS OF ILLNESS IN A PREDOMINANTLY MEXICAN-AMERICAN POPULATION

by

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A Thesis Submitted to the Faculty of the

DEPARTMENT OF PSYCHOLOGY

In Partial Fulfillment of the Requirements
For the Degree of

MASTER OF SCIENCE

In the Graduate College

THE UNIVERSITY OF ARIZONA

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ACKNOWLEDGMENTS

I would like to express my appreciation to the members of my committee for their help, Dr. MacKinnon and Dr. Moore, and especially Dr. Kahn, the chairman of my committee, for his readiness to guide my project. I would also like to thank Jesus Jauregui, a friend and roommate, for his expertise and patience in translating the questionnaire used in my study into its Spanish version.

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ABSTRACT

The present study was an investigation of the relationship between stress and severity of illness in a predominantly Mexican-American population. With the formulation of the Social Readjustment Rating Scale (SRRS) and the Severity of Illness Rating Scale (SIRS), both based on the psychophysics technique of magnitude estimation, a method has been found to quantify and measure amounts of stress incurred in daily living and the severity of an illness, respectively. Past research has consistently shown that many illnesses, including physical and psychiatric, are preceded by relatively high amounts of stress so that stress is positively correlated with severity of illnesses.

In the present study, it was found that stress and severity of illness were not significantly correlated (.05 level), contrary to the hypothesis stated. Analyses of variance of stress scores by demographic variables found that stress was significantly differentiated in terms of age of respondent, education, present job situation, and language of the questionnaire used. Also, the data was analyzed in terms of percentages of subjects experiencing the 42 stress items of the SRRS. Analyses of variance of severity of illness by demographic variables did not result in any significant differences. Criticisms and suggestions were, finally, offered.

INTRODUCTION

The psychosomatic approach which, according to Coleman (1972), is concerned with investigating all relevant biological, psychological, and sociological factors in the etiologies of diseases, both physical and psychological, is now of interest to many researchers. In the past, the medical professions tended to ignore the psychological and sociological contributing factors to diseases while the social sciences tended to ignore the biological contributing factors. Now researchers from the various camps of theoretical orientations are becoming more aware of the interacting effects of the environment and the biological states of the body in the etiology of diseases.

The psychosomatic approach was given a potent research tool for investigating the causative role of "stress" in physical and mental diseases by the construction and development of the Social Readjustment Rating Scale (SRRS) by Holmes and Rahe (1967). What the SRRS attempts to do is to provide a way by which a quantifiable sum of stress, accrued over a period of time, by an individual, can be assessed.

The scale consists of 43 items that the authors (Holmes and Rahe) believed dealt with significant life events or life changes that an individual may experience over the course of his life (see Table 1). For the authors, stress is seen as any event necessitating an adaptive or coping behavior by the individual. Thus, stress is not seen simply

Table 1. The Social Readjustment Rating Scale.

Rank	Life Event	Mean Value
1	Death of spouse	100
2	Divorce	73
3	Marital separation	65
4	Jail term	63
5	Death of close family member	63
6	Personal injury or illness	53
7	Marriage	50
8	Fired at work	47
9	Marital reconciliation	45
10	Retirement	45
11	Change in health of family member	44
12	Pregnancy	40
13	Sex difficulties	39
14	Gain of new family member	39
15	Business readjustment	39
16	Change in financial state	38
17	Death of close friend	37
18	Change to different line of work	36
19	Change in number of arguments with spouse	35
20	Mortgage over $10,000	31
21	Foreclosure of mortgage or loan	30
22	Change in responsibilities at work	29
23	Son or daughter leaving home	29
24	Trouble with in-laws	29
25	Outstanding personal achievement	28
26	Wife begin or end school	26
27	Begin or end school	26
28	Change in living conditions	25
29	Revision of personal habits	24
30	Trouble with boss	23
31	Change in work hours or conditions	20
32	Change in residence	20
33	Change in schools	20
34	Change in recreation	19
35	Change in church activities	19
36	Change in social activities	18
37	Mortgage or loan less than $10,000	17
38	Change in sleeping habits	16
39	Change in number of family get-togethers	15
40	Change in eating habits	15
41	Vacation	13
42	Christmas	12
43	Minor violations of the law	11

in terms of negative consequences or undesirability. Rather, stress is any event that requires a change from an existing steady state of affairs. Some researchers (including Dohrenwend 1973a, 1973b; Selye 1973) feel that the existing research literature does tend to support the view that stress is more accurately perceived in terms of a change from a homeostatic state or equilibrium.

The items in the SRRS cover a wide range of events and include such areas as the family constellation, marriage, occupation, economics, residence, interpersonal relations, education, religion, recreation, and health. The particular items in the scale were events that the authors, from their clinical experience, felt were significant sources of stress.

The rationale for quantifying and assigning weights to the items in the SRRS came from the field of psychophysics (Stevens 1966). Stevens (1966, p. 530) developed a procedure called "magnitude estimation," that besides other uses, can be used to "gauge the consensus concerning intensity or degree for such variables as strength of expressed attitudes, pleasantness of musical selections, seriousness of crimes, and other subjective dimensions for which the stimuli can be analyzed only on nonmetric or nominal scales." Magnitude estimation, as one method of scaling among several, has established the relation that states that "subjective magnitude is a power function of stimulus magnitude" (Stevens 1966, p. 540). Thus, subjective judgments can be used to establish quantification of nonmetric stimuli.

Early research by Rahe et al. (1964) had already established that cluster of life changes tended to be associated with forthcoming illnesses simply by considering the number and types of events experienced by the individual. Now with the method of magnitude estimation it was possible to quantify those events.

In constructing the SRRS, Holmes and Rahe (1967) gathered a nonrandom sample of convenience and had them rank order the 43 life change items. More specifically, the items "marriage" was first arbitrarily assigned a value of 500 points. Next, the subjects were asked to assign a proportional weight or score to the rest of the 43 items in terms of the readjustments needed for each particular item by using the marriage item as the module point of reference. Then the weight of the item was derived by obtaining the mean score of the sample for each item and dividing the mean by ten (see Table 1).

Analysis of the data revealed that a very high consensus existed in the ranking and the magnitude of the items. High Pearson's correlation coefficients among the discrete groups within the sample were all significant (all were above .90 with the exception of the correlation between the white and black ethnic groups which was .82). Subsequent replication of the ranking and magnitude estimating of the life change items with an American college population has confirmed the high consensus (Ruch and Holmes 1971). Cross-cultural studies have also been done and again high consensus has been found in all of them with the Spearman's rank order correlation coefficients ranging from 0.629 to 0.943. Masuda and Holmes (1967) did a cross-cultural study with

Japanese and Americans and found a correlation of 0.754. Komaroff, Masuda and Holmes (1968) in their comparisons of blacks, Mexican-Americans, and white Americans, found correlations of 0.798 for blacks and white Americans, 0.892 for blacks and Mexican-Americans, and 0.735 for Mexican-Americans and white Americans. Other researchers have compared Western Europeans and Americans (Harmon, Masuda and Holmes 1970), Americans, Japanese, Danes, and Swedes (Rahe 1969b), and Malaysians and Americans (Woon, Masuda and Holmes 1971).

A host of research has now been done using the SRRS, much of it concerned with investigating the relationships of stress and illness onset. Several reviews of the literature involving the SRRS and its variants are now available (Holmes and Masuda 1973; Rahe 1969a, 1972). After the establishment of the SRRS, Wyler, Masuda and Holmes (1968) among others (including Hinkle et al. 1960), came to the conclusion that there seemed to be a direct relationship between the amount of life changes before an illness and the severity of that illness. In order to test this hypothesis more accurately, they found it necessary to also construct a scale by which they could quantify the severity of illnesses. This was done by constructing the Severity of Illness Rating Scale (SIRS (SIRS).

The SIRS is a research tool that is also based on the direct magnitude method of psychophysics and that permits one to have a quantifiable measure of the severity of 126 illnesses. Two samples of 117 physicians and 141 laymen rank ordered the items and assigned weights to them on the basis of relative seriousness to a module item. They

gave peptic ulcers an arbitrary score of 500 and used this as their module point. The Spearman correlation coefficient for the two samples was highly significant (0.947). A grand rank order and mean weight of the items was obtained by combining the two samples (see Table 2 for the SIRS).

Purpose of the Study

This study investigated the relationship of stress to severity of illness, as measured by the SRRS and the SIRS, respectively, in a predominantly Mexican-American population attending a "neighborhood health center" in a southeastern Arizona city. The health center provides a host of different medical services. More specifically, the study was replication, in part, of the Wyler, Masuda and Holmes (1971) study in which they found a positive correlation of stress scores with seriousness of illness scores in patients with chronic, but not acute, diseases. The patients in their study were predominantly white, Protestant, and with at least a high school education.

The present study also investigated the relationships of the stress scores and the severity of illness scores with 19 demographic variables. For example, it was hypothesized that those individuals with lower numbers of school years would score higher in the SRRS and the SIRS than those individuals with higher numbers of school years. Also, those individuals having lower incomes should score higher in the SRRS and SIRS than those individuals making higher amounts of income. The preceding two hypotheses are congruent with the general finding that the lower social economic classes have higher rates of psychopathology

than the higher social economic classes (Dohrenwend and Dohrenwend 1974). It was also hypothesized that the younger the individual, the higher his stress score would tend to be, simply on the basis that a young adult is barely getting started establishing himself with school, work, and/or marriage.

Little psychosomatic research has been done with the Mexican-American ethnic group. Therefore, this study is also intended to provide valuable normative data on how stress, as defined by the SRRS, affects these people as well as testing the stress and illness hypothesis.

METHODS

The subjects for the study were all patients at a "neighborhood health center," which is funded in part by the federal government and is situated in the west side of Tucson, Arizona. The center serves predominantly lower socioeconomic individuals with the greater majority being Mexican-Americans (more than 75 percent). The center provides a host of different medical services, including minor medical care, social and psychological counseling, and minor dental work. The data for the present study was gathered in the time span between September 1973 and May 1974 while the investigator was working at the center as a psychology extern.

All of the subjects were asked to volunteer for the study. Individuals under the age of 19 were excluded from the study so as to avoid any difficulties with legal and parental consent. Since the study was attempting to obtain subjects who were actual patients for the particular day that they were asked to participate, all subjects were asked, first of all, if they were indeed patients. If they stated that they were not patients, they were thanked and another individual was approached. If, on the other hand, the potential subject stated that they were indeed patients, the investigator then proceeded to introduce himself by stating his name and position with the clinic. Then he explained that he was also a student at the university, enrolled in a doctoral program in clinical psychology, and that he was conducting a

survey concerned with daily stresses and life changes among the people attending this clinic. At this point, any questions asked were answered. Afterwards, the subject was requested to fill out the questionnaire. On four occasions it was necessary to read the questionnaire aloud to the subject because of visual difficulties or an inability to read English or Spanish.

The questionnaire used in the study consisted of a four-page pamphlet with the front page concerned solely with identifying and demographic items while the second, third, and fourth pages contained 42 items from the SRRS. One item (Christmas) was not included because it did not contribute any differentiating information about the respondents since all individuals would have experienced two Christmases over the last two years. Furthermore, the value of the "Christmas" item was worth only 12 points so that its loss did not lead to any marked underestimation of a person's stress score. The wording and directions for answering the SRRS section of the questionnaire came from a paper by Elpers (1972) in which he included a copy of a simplified SRRS. It was decided to use this particular format because it was so much more simple to administer, answer, and score than the original SRRS and because the population under consideration would include many individuals with low levels of formal schooling. Thus, a much more detailed and complex questionnaire was sacrificed in the interest of simplicity and greater understanding. In completing the SRRS section of the questionnaire the subject was asked to check off the "yes" or "no" column if he had or had not, respectively, experienced the particular event under

consideration over the last two years. The questionnaire was available in English or in Spanish (see Appendix A for copies of the form used in this study).

The summary stress score (also called "life change units" or LCU) for the SRRS from each individual was obtained by simply adding up the "yes" responses in terms of the weights assigned to them. On the other hand, the severity of illness score for each individual was determined by checking the diagnosis or diagnostic impression that the physician or medical personnel had given the subject on the particular day that the subject had filled out the questionnaire. If the diagnosis was included in the 126 items of the SIRS, the appropriate score was then assigned to it. In the cases where the individual had multiple diagnoses, it was decided to pick the one with the highest score (see Table 2 for the SIRS).

In order to assess the relationship between the LCU scores and the severity of illness scores, a Pearson's product correlation coefficient was used. Mean differences of the subgroups within the demographic variables, in terms of the LCU scores and severity of illness scores, were tested by the analysis of variance. The demographic variables were also analyzed, individually, by the percentage of the sample answering in the same manner. For the correlation coefficient and the analyses of variance, the alpha level was set at .05.

Table 2. The seriousness of illness rating scale.

Grand Rank	Disease Item	Grand Geometric Mean
1	dandruff	21
2	warts	32
3	cold sore, canker sore	43
4	corns	46
5	hiccups	48
6	bad breath	49
7	sty	59
8	common cold	62
9	farsightedness	72
10	nosebleed	73
11	sore throat	74
12	nearsightedness	75
13	sunburn	80
14	constipation	81
15	astigmatism	83
16	laryngitis	84
17	ringworm	85
18	headache	88
19	scabies	89
20	boils	96
21	heartburn	98
22	acne	103
23	abscessed tooth	108
24	coloredblindness	109
25	tonsillitis	117
26	diarrhea	118
27	carbuncle	122
28	chicken pox	134
29	menopause	140
30	mumps	148
31	dizziness	149
32	sinus infection	150
33	bed sores	153
34	increased menstrual flow	154
35	fainting	155
36	measles	159
37	painful menstruation	163
38	infection of the middle ear	164
39	varicose veins	173
40	psoriasis	174
41	no menstrual period	175
42	hemorrhoids	177
43	hay fever	185

Table 2. The seriousness of illness rating scale.--continued

Grand Rank	Disease Item	Grand Geometric Mean
44	low blood pressure	189
45	eczema	204
46	drug allergy	206
47	bronchitis	210
48	hyperventilation	211
49	shingles	212
50	mononucleosis	216
51	infected eye	220
52	bursitis	222
53	whooping cough	230
54	lumbago	231
55	fibroids of the uterus	234
56	migraine	242
57	hernia	244
58	frostbite	263
59	goiter	283
60	abortion	284
61	ovarian cyst	288
62	heatstroke	293
63	gonorrhea	296
64	irregular heart beat	302
65	overweight	309
66	anemia	312
67	anxiety reaction	315
68	gout	322
69	snake bite	324
70	appendicitis	337
71	pneumonia	338
72	depression	344
73	frigidity	347
74	burns	348
75	kidney infection	374
76	inability for sex	382
77	hyperthyroid	393
78	asthma	413
79	glaucoma	426
80	sexual deviation	446
81	gallstones	454
82	arthritis	468
83	starvation	473
84	syphilis	474
85	accidentally poisoned	480
86	slipped disk	487

Table 2. The seriousness of illness rating scale.--continued

Grand Rank	Disease Item	Grand Geometric Mean
87	hepatitis	488
88	kidney stones	499
89	peptic ulcers	500
90	pancreatitis	514
91	high blood pressure	520
92	smallpox	530
93	deafness	533
94	collapsed lung	536
95	shark bite	545
96	epilepsy	582
97	chest pain	609
98	nervous breakdown	610
99	diabetes	621
100	blood clot in blood vessels	631
101	hardening of the arteries	635
102	emphysema	636
103	tuberculosis	645
104	alcoholism	688
105	drug addicition	722
106	coma	725
107	cirrhosis of the liver	733
108	Parkinson's disease	734
109	blindness	737
110	mental retardation	745
111	blood clot in the lung	753
112	manic depressive psychosis	766
113	stroke	774
114	schizophrenia	776
115	muscular dystrophy	785
116	congenital heart defects	794
117	tumor in the spinal cord	800
118	cerebral palsy	805
119	heart failure	824
820	heart attack	855
121	brain infection	872
122	multiple sclerosis	875
123	bleeding in brain	913
124	uremia	963
125	cancer	1020
126	leukemia	1080
	MEAN = 370	

RESULTS

There were a total of 64 subjects completing the questionnaire. Four questionnaires were started but were left unfinished (the patient either had to see the doctor or, else, had to leave the clinic unexpectedly). Approximately 40 individuals turned down the invitation to participate in the study. As Table 3 shows, the majority of the subjects were definitely in the lower SES levels. By defining SES levels into two categories in terms of who completed high school and who didn't (Dohrenwend 1973b), we find that between 54 to 92 percent of the sample would fall within the lower end of the SES level. In terms of education, being more specific, approximately half of the sample (54.0 percent had received some grade school education while no one had received an advance college degree. Also, for only 41.3 percent of the sample was their primary source of income being currently earned. There were 17.2 percent males and 82.8 percent females in the sample. Eighty-five and four-tenths percent were either Mexican-American, Mexican nationals, or Yaqui, while 4.8 percent were Anglo and 4.8 percent were also Black. Eventually 29.7 percent of the respondents answered the Spanish edition of the questionnaire while the rest (70.3 percent) was, of course, in English.

The hypothesis of a positive correlation between stress and the severity of illness was not supported by the findings. The Pearson

Table 3. Percentages of the sample within the demographic variables.

Variable	Percentage
1. Sex:	
male	17.2
female	82.8
2. Ethnic group:	
Anglo	4.8
Yaqui	3.2
Black	4.8
American Indian	1.6
Mexican-American	67.7
Mexican national	14.5
other	3.2
3. Age group:	
under 21	7.9
21-30	25.4
31-45	33.3
46-65	25.4
over 65	7.9
4. Religion:	
Protestant	17.5
Catholic	77.8
Jewish	3.2
none	0.0
other	1.6
5. Present marital status:	
married	53.1
divorced	18.8
separated	7.8
widowed	9.4
never married	10.9
6. Education received:	
grade school	54.0
high school	38.1
technical school	3.2
college	4.8
advanced college degree	0.0

Table 3. Percentages of the sample within the demographic variables. --continued.

Variable	Percentage
7. Time at present home:	
1 year	34.4
2 years	14.1
3-5 years	18.8
5-10 years	3.1
10 or more years	29.7
8. Number of marriages:	
0	11.1
1	69.8
2	14.3
3	3.2
4 or more	1.6
9. Most of life spent in:	
farm	3.3
city, less than 5000 people	45.0
more than 5000 people	13.3
more than 50,000 people	28.3
more than 500,000 people	10.0
10. Number of brothers:	
0	18.3
1	10.0
2	18.3
3	16.7
4	16.7
5 or more	20.0
11. Number of sisters:	
0	11.1
1	17.5
2	22.2
3	15.9
4	15.9
5 or more	17.5
12. Present job situation:	
working full time	15.9
part time (less than 30 hours per week)	11.1
not working	63.5
school	2.1
other	12.8

Table 3. Percentages of the sample within the demographic variables. --continued.

Variable		Percentage
13.	Present job situation of spouse:	
	working full time	25.5
	part time (less than 30 hours per week)	6.4
	not working	51.1
	school	2.1
	other	12.8
14.	Head of household:	
	self	48.4
	spouse	38.7
	Mother	6.5
	Father	4.8
	relative	1.6
15.	Number of children:	
	0	7.9
	1	20.6
	2	7.9
	3	17.5
	4	14.3
	5	14.3
	6	3.2
	7 or more	14.3
16.	Primary source of income:	
	earned	41.3
	welfare	39.7
	pension	4.8
	other	14.3
17.	Number of persons in house:	
	1	7.8
	2	20.3
	3	18.8
	4	10.9
	5	10.9
	6	14.1
	7 or more	17.2

Table 3. Percentages of the sample within the demographic variables. --continued.

Variable	Percentage
18. Your generation:	
born in other country but now living here	24.6
born in this country but parent(s) born in other country	34.4
both you and parent(s) born this country but grandparents born in other country	27.9
other	11.5
19. Questionnaire edition:	
Spanish	29.7
English	70.3

product correlation between the stress and seriousness of illness scores was not significant ($r = .067$). Thus, this finding was not in line with what much of the research literature in this area has shown. However, out of the total 64 questionnaires with usable stress scores, only 37 were usable in calculating the correlation coefficient. For the rest of the questionnaires, eight had diagnoses that were not included in the 126 items of the SIRS while the other 19 did not have a diagnostic impression.

A possible explanation for the large number of "no diagnosis" is that these questionnaires were answered by individuals who were not in fact patients the particular day that they answered the questionnaire. Possibly they misunderstood the instructions or did not want to let the investigator down.

The mean stress score for the entire sample for the past two years since answering the questionnaire was 314.531 with a range of a low of 34.0 to a high of 650.0 (the standard deviation was 153.635). The median, on the other hand, was 299.500. The distribution of stress scores is fairly symmetrical with some positive skewness. By dividing the two year mean stress score (314.531) by two we find that a subject in the sample would incur, on the average, a stress score of 157.266 per year. Wershow and Reinhart (1974) report, in their study of hospitalized VA patients a mean yearly stress score of 103. Thus, the patients in the present study seem to have a much higher amount of stress than did the patients in the Wershow and Reinhart study. The discrepancy in stress scores is made more important by the fact that the

subjects in the present study were all outpatients while the patients in the Wershow and Reinhart study were hospitalized patients, individuals that one would expect to have relatively high stress scores.

It is difficult, though, to assess how valid the above comparison really is since Wershow and Reinhart do not specify which particular form of the SRRS they used. Stress scores for an individual may vary depending on the time interval chosen over which the life changes will be summed. Two years (as used in the present study), one year, six months, three months, one week, and one day have all been used (Rahe 1972). If, for example a yearly summary score is obtained by adding two six months' summary scores rather than dividing a two-year summary score by two, it is more likely that the yearly stress score will be higher in the first instance than the second one. This is because, in the two six months' summary score, an individual has two opportunities of having an item included in the yearly figure. Thus, as an example, if a person is asked if he took a vacation (worth 11 points) within a six month period and he took one in each of the two six month periods his year summary score would be 22. On the other hand, with a two year time interval the mean yearly value of the vacation item would be 5.5. In any event, the mean yearly stress score in the present study is surely much more higher than the yearly score stated by Wershow and Reinhart.

In analyzing the percentages of subjects experiencing the individual items of the SRRS over the last two years, we find ten such items for each of which 40 percent or more of the sample did in fact answer affirmative (see Table 4). Likewise, there were 11 items in which, at

Table 4. SRRS items which were answered yes by at least 40 percent of the sample.

Item	Percentage
Changes in sleeping habits	51.6
Changes in eating habits	51.6
Revision of personal habits	40.6
Change in social activities	46.9
Change in church activities	42.2
Change in family get-togethers	50.0
Change in financial state	63.5
Major personal injury or illness	41.3
Death of a close friend	40.6
Change in health of a family member	47.6

the most, ten percent of the sample indicated that they had experienced the particular item over the last two years (see Table 5).

It is interesting to note that 40.6 percent of the sample had experienced the death of a close friend during the last two years. On the other hand, the finding that 63.5 percent of the sample experienced a change in financial status seems more in line with the social economic status of these people. It is also of interest to note that only 1.6 percent of the sample admitted to having a mortgage or loan greater than $10,000.

Table 5. SRRS items which were answered "yes" by at most ten percent of the sample.

Item	Percentage
Death of spouse	3.2
Spent time in jail	1.6
Minor violations of the law	6.3
Business readjustment	3.1
Divorce	9.4
Fired from work	3.1
Wife began or stopped work	7.8
Mortgage or loan greater than $10,000	1.6
Foreclosure or mortgage or loan	4.7
Change in schools	7.9
Marital reconciliation	4.7

The mean seriousness of illness score for the 37 valid subjects in the present study was 304.054. If one simply adds up the values of the 126 items of the SIRS and finds their mean value it comes out as 370 (Wyler et al. 1968). Thus, it is seen that patients in this sample had scores that were skewed toward the less serious end of the illnesses rating. The mean seriousness of illness score in a study done by Wyler et al. (1971) with a sample of hospitalized patients was 475, again much more higher than that found in the present study.

The smallest score in the present study was 62.0 (heatstroke) while the highest score was 824.0 (heart failure). Table 6 includes the different diseases found in the sample and the number of individuals in each category. "Anxiety reaction" was the category with the largest number of cases--eight. There were seven categories that had two cases apiece, including the common cold sore throat, infected eyes, inability for sex, arthritis, high blood pressure, and diabetes.

The analysis of variance was used to assess if there were any significant mean differences in terms of life change scores and seriousness of illness scores, individually, within the subgroups of the 19 demographic and identifying variables. In the analysis of variance of demographic variables by life change scores, four variables were found that were significant at the .05 level as indicated in Table 7. As the table shows, (1) the younger the individual the higher his stress score tends to be, (2) in general, the more education the higher his stress score tends to be, (3) individuals either going to school or working part time have higher stress scores than those individuals not working or working full time, and (4) individuals answering the questionnaire in Spanish tended to have lower stress scores than those individuals answering in English.

Three items were significant between the .05 and .10 levels (see Table 7). These were (1) individuals having lived a period of two or five to ten years in their present homes tended to have higher stress scores than those individuals having lived either one, three to five, or more than ten years in their present home; (2) respondents whose parents

Table 6. The SIRS items found in the sample and the number of subjects in each disease item.

Items	Number of Subjects
Common cold	2
Sore throat	2
Constipation	1
Astigmatism	1
Headache	1
Heartburn	1
Tonsillitis	1
Dizziness	1
Infected eye	2
Sinus infection	1
Hemorrhoids	1
Hernia	1
Overweight	1
Anemia	1
Anxiety reaction	8
Pneumonia	1
Depression	1
Inability for sex	2
Arthritis	2
High blood pressure	2
Diabetes	2
Drug addiction (non-narcotic)	1
Heart failure	1
Total	37

Table 7. Analysis of variances: Stress score by demographic variable.

Variable (.05 alpha level)			Mean	S.D.
Age:				
less than 21			440.400	203.634
21-30			344.000	126.710
31-45			337.524	171.900
46-65			262.563	125.671
greater than 65			184.600	50.252
F = 2.6988	df: 4,58	Significant at .05		
Education:				
grade school			262.706	136.483
high school			364.500	156.837
technical school			496.500	217.082
college			415.000	24.331
F = 3.9626	df: 3,59	Significant at .025		
Present job situation:				
working full time			368.000	174.376
part time (less 30 hrs)			395.286	178.288
not working			275.250	142.038
school			408.500	87.560
F = 2.8795	df: 3,59	Significant at .05		
Questionnaire edition:				
Spanish			250.211	145.924
English			341.689	150.148
F = 5.0401	df: 1,62	Significant at .05		
(.10 alpha level)				
Time at present home:				
1 year			331.091	161.237
2 years			418.889	146.455
3-5 years			290.500	181.267
5-10 years			350.000	46.669
greater than 10			256.842	112.645
F = 1.9991	df: 4,59	Significant at .10		

Table 7. Analysis of variances: Stress score by demographic variable. --continued.

Variable (.10 alpha level)	Mean	S.D.
Head of household:		
self	335.067	137.460
spouse	311.875	164.713
Mother	147.000	59.251
Father	477.667	156.928
relative	193.000	*
F = 2.53 df: 4,57 Significant at .10		
Generation:		
born in other country	246.400	127.780
born here, parents out	286.619	171.099
born here, parents here, grandparents out	359.412	137.841
other	412.857	129.103
F = 2.5298 df: 4,56 Significant at .10		

and themselves were born in this country but whose grandparents were born in another country or "other" (not specified in the questionnaire) got higher mean stress scores than those individuals born in this country or born in this country but whose parents were not born here.

In the analysis of variance of illness score by demographic variables not one of the 19 variables was found to be significant. The small number of cases and the limited representation of illnesses probably contributed to the lack of significant differences.

DISCUSSION

The hypothesized positive correlation between amount of stress (as measured by the SRRS) and severity of illness (as measured by the SIRS) was not found for the sample in this study. In other words, individuals with higher scores of stress did not have more serious kinds of illnesses or, conversely, individuals with lower amounts of stress did not have less serious kinds of illnesses. This finding is in contradiction to much of the findings reported in the literature in this research area. Thus, it seems imperative that some explanation be provided to explain this discrepancy.

Three principle sources of difficulty are readily available in explaining the present finding. One can argue that the hypothesis of a positive correlation between stress and illness does not hold for the population under consideration, or criticize the methodology of the study, or argue that the instruments used in the study are inadequate in their application.

It is possible that the hypothesis of a positive correlation between the amount of stress and severity of illness does not hold for the population used in this study. Stress and severity of illnesses may interact differently in populations that are predominantly Mexican-American, poor, and uneducated. Although Dohrenwend (1973a) found that stress scores and psychological symptom scores (measured by "Langner's

22 item screening instrument") were positively correlated in a sample incorporating low SES Blacks and Puerto Ricans, physical illnesses were not studied in that study. Also, although the study done by Wyler et al. (1971) did find a positive correlation between illnesses and stress, they used a sample that was predominantly white, Protestant, and with at least a high school education. Other studies using minority groups in comparing stress and illnesses have simply not been done so that the hypothesis of a positive correlation between stress and severity of illnesses still remains to be shown. It is not being argued that these people from minority groups and lower social economic levels do or do not have higher amounts of stress and illnesses or both, but only that stress may interact with other variables in a different manner than it does with the "typical" Anglo-American. For example, one might argue that the model Mexican-American sees life and its daily hardships through a more flexible conceptual frame of reference and that his cultural background permits him to safely endure more stress than the Anglo-American. Thus, it is possible that a Mexican-American, who undergoes more stressful events in his daily life than the typical Anglo-American, can endure higher amounts of stress before it leads to physical damage.

In terms of methodology, one clear weakness of the study was the narrow and constricting definition of what constituted a diagnosis. It will be recalled that the diagnosis for each subject was obtained from what the physician or medical personnel examining the subject the day of the visit had written in his charts. Many of the diagnoses were probably tentative since the more serious illnesses probably required extensive

tests and other medical consultations. Thus, these initial diagnoses might have been corrected later. For example, one wonders how many of the "anxiety reaction" diagnoses may have turned out to be more serious illnesses. Also, the sample in the study was not random and therefore those individuals that refused to participate in the study may have been those that were in more pain. One also has to wonder as to how many of the subjects clearly understood the instructions and intentions of the study. Although the investigator took no empirical data on how valid the responses were for each respondent, it was the investigator's subjective impression that many of the respondents were unclear as to the purposes of the project and that many respondents, furthermore, had difficulty in reading the questionnaire. This was especially true for the older subjects. This impression is supported by the fact that only 37 subjects (out of a total of 64) had actual diagnoses, indicating that many subjects did not understand that only patients for the day that they answered the questionnaire were needed for the study. Furthermore, considering the relatively little education that many of the subjects had received, it is easier to understand how many of the subjects would have problems understanding the reading material.

The third factor that may have contributed to the present finding concerns the validity and reliability of the instruments used to assess stress and the severity of illness. Wershow and Reinhart (1974), in their study with newly admitted patients to a VA hospital, did not find the expected high stress scores nor the expected finding that the preceding six months before hospitalization would produce higher stress

scores than the preceding 7 to 12 months. They conclude, in part, that the SRRS and findings derived from it are inadequated and in error. They further state that the standard deviations in many of the studies are several times as large as the mean (in the present study the mean was 314.531 while the S.D. was 153.635) and that, therefore, the data lack central tendency and are probably randomly distributed.

McDonald et al. (1972) found that the SRRS has low to moderate reliability (around .55 for 6 and 12 months test-retest reliabilities). They offered several suggestions by which the SRRS might improve its usefulness. They recommended changing the items so as to indicate either more or less change in direction but not both and using 12 months rather than 6 months in plotting life events changes. Also Rahe et al. (1974) further suggested that the items in the SRRS be divided into clusters that occur together and assign similar weights to all items in a particular cluster. In summary, a host of criticisms have been leveled at the validity and reliability of the SRRS and findings derived by the SRRS may be dubious at best.

The extreme poverty conditions of many of the respondents show up very clearly in their responses to the demographic variables, suggesting that stress is a constant factor in their lives. Only 41.3 percent of the sample admitted that their primary source of income was being earned at the time they answered the questionnaire (see Table 3). Likewise, between 51 to 63 percent of the sample admitted that they or their spouse were working only part time. It seems reasonable to imagine that obtaining money is a constant struggle for many of these people.

The families of the respondents also tend to be quite large with 63.6 percent of the sample reporting three or more children. In fact, 14.3 percent of the sample reported having seven or more children. More important, in terms of present living conditions, 71.9 percent of the sample answered that three or more individuals were living in the same household as the respondent. Even more important is the finding that 17.2 percent of the sample reported seven or more individuals living in the same household as the respondent. Considering the kinds and number of stress items that are present on the SRRS, it seems safe to assume that the stress summary scores provided by the SRRS are missing many important sources of stress and crises in the lives of these people.

There were several major stressful events that the questionnaire was able to pick up. For example, 41.3 percent of the sample admitted to having a major personal injury or illness the preceding two years since answering the questionnaire. Possibly the respondents overreacted as to the seriousness of their illnesses or perhaps the illnesses were serious but short-termed or nonfatal. Other explanations are, of course, possible. Another surprising finding was that 40.6 percent of the sample experienced the death of a close friend. The older ages of the respondents (see Table 3) or possibly the large families or clans might be explanations for this finding. The older you are the more likely it is that a friend will pass away; likewise, the larger the family the higher chances are that a non-family member will become a member of the primary family, either through marriage or other means. A third related finding is that 47.6 percent of the sample admitted that a change in the health

of a family member had occurred over the last two years since answering the questionnaire.

CONCLUSION

With the construction of the SRRS, an empirical approach to studying the effects of stress on illnesses has now become possible. The present study was an attempt to assess how stress and illnesses were distributed within a sample of mostly poor, uneducated, Mexican-American patients at a neighborhood health center in southern Arizona. Although stress scores and seriousness of illness scores were not found to be positively correlated, to a statistically significant degree, contrary to previous findings using other populations, the study did show the kinds and high amounts of stress (as measured by the SRRS) experienced by these people.

In spite of the findings in the present study, it is the experimenter's contention that the SRRS did not adequately measure all the important sources of stress that the people in the present study are undergoing daily so that any present figure would grossly underestimate the true stress figure. It seems obvious that a high SES individual receiving the same stress score as a low SES individual is under different kinds of stressful circumstances.

It is, therefore, recommended that extensive modifications be made to the SRRS to increase its usefulness. For example, the number of items included in the questionnaire should be increased. The present number (43) is much too small to adequately sample the kinds of crises

and stressful events possible. Also, the contents of the items in the SRRS should be chosen in such a manner that a representative sample of all the important aspects of life are included. Even more important, it is necessary that the SRRS contain some provision in which the respondent is able to show how well he "weathered" the crisis or stressful event that he might have encountered. For example, if a person got married (worth 50 points in the SRRS) and was able to adjust quickly and effectively the effects of this situation would be different than the situation in which the individual got married but was not able to adjust adequately or effectively. It is assumed that the individual who adjusted effectively would, in the final analysis, have a lower stress score or weight than the individual who was not able to adjust adequately. Thus, it is recommended that the SRRS provide a way to assess how effectively and efficiently an individual can achieve equilibrium or homeostasis once the stress has occurred. One way to handle this might be by having the respondent go back to the items he did experience and mark on a second sheet how well, adequately, successfully, or efficiently he was able to readjust to that event by, for example, marking on a scale from zero to ten. Zero might indicate very good adjustment while ten might indicate very poor adjustment. Then, the number of points of adjustment might be added or multiplied by the weight assigned to the event by the SRRS. Thus, the marriage item might carry a final weight ranging from 50 to 60, depending on how well the individual "weathered" the event. By this simple procedure it becomes possible to assess, both, stress an individual experienced and also how well he was able to adjust to it.

In summary, it still remains to be shown exactly how stress and severity of illness are related in minority groups. A more precise and extensive SRRS would be a step in the right direction. Future studies will have to show to what extent the hypothesis that stress is positively correlated to severity of illness is correct.

APPENDIX A

QUESTIONNAIRE IN BOTH ENGLISH AND SPANISH

Demographic Data

Project Number_____ Today's date___/___/_____
no day year

Please Circle Correct Response

1. SEX--a) male, b) female.
2. ETHNIC GROUP--a) Anglo, b) Yaqui, c) Black, d) American Indian, e) Mexican-American, f) Mexican national, g) other_____
3. AGE GROUP--a) under 21, b) 21-30, c) 31-45, d) 46-65, e) over 65
4. RELIGION--a) Protestant, b) Catholic, c) Jewish, d) none, e) other _____
5. PRESENT MARITAL STATUS--a) married, b) divorced, c) separated, d) widowed(r)
6. EDUCATION RECEIVED--a) grade school, b) high school, c) technical school, d) college, e) advanced graduate degree
7. TIME AT PRESENT HOME--a) 1 year, b) 2 years, c) 3-5 years, d)5-10 years, e) 10 or more years
8. NUMBER OF MARRIAGES--a) 0, b) 1, c) 2, d) 3, e) 4 or more
9. MOST OF LIFE SPENT IN--a) farm, b) city, less than 5000 people, c) more than 5000 people, d) more than 50,000 people, e) more than 500,000 people
10. NUMBER OF BROTHERS--a) 0, b) 1, c) 2, d) 3, e) 4, f) 5 or more
11. NUMBER OF SISTERS--a) 0, b) 1, c) 2, d) 3, e) 4, f) 5 or more
12. PRESENT JOB SITUATION--a) working full time, b) part time (less than 30 hours per week), c) not working, d) school, e) other _____

13. PRESENT JOB SITUATION OF SPOUSE--a) working full time, b) part time (less than 30 hours per week), c) not working, d) school, e) other_____

14. HEAD OF HOUSEHOLD--a) self, b) spouse, c) Mother, d) Father, e) relative, f) other_____

15. NUMBER OF CHILDREN--a) 0, b) 1, c) 2, d) 3, e) 4, f) 5, g) 6, h) 7 or more

16. PRIMARY SOURCE OF INCOME--a) earned, b) welfare, c) pension, d) other_____

17. NUMBER OF PERSONS IN HOUSE--a) 1, b) 2, c) 3, d) 4, e) 5, f) 6, g) 7 or more

18. YOUR GENERATION--a) born in other country but now living here, b) born in this country but parent(s) born in other country, c) both you and parent(s) born in this country but grandparent(s) born in other country, d) other_____

Schedule of Recent Experience

INSTRUCTIONS: Each item below describes an event which may or may not have occurred to you. Please read each item carefully and decide whether you have had that experience within the last two years. If it has happened to you within the last two years, check "YES." If it has not, check "NO." When in doubt, check "YES." Do not leave any blanks. If you change your mind, or make a mistake, erase the incorrect answer and check the correct one.

EVENTS EXPERIENCED IN LAST 2 YEARS	YES	NO
1. Either a lot more or a lot less trouble with the boss		
2. A major change in sleeping habits (sleeping a lot more or a lot less, or change in part of day when asleep)		
3. A major change in eating habits (a lot more or a lot less food eaten, or very different meal hours or surroundings)		
4. A change in your personal habits (dress, manner, associations, etc.)		
5. A major change in your usual type and/or amount of recreation		
6. A major change in your social activities (e.g., clubs, dancing, movies, visiting, etc.)		
7. A major change in church activities (e.g., a lot more or a lot less than usual)		
8. A major change in number of family get-togethers (e.g., a lot more or a lot less than usual)		
9. A major change in amount of money you have (e.g., a lot worse off or a lot better off than usual)		
10. In-law troubles		
11. A major change in the number of arguments with spouse (e.g., either a lot more or a lot less than usual regarding child rearing, personal habits, etc.)		

	YES	NO
12. Sexual difficulties		
13. Major personal injuries or illness		
14. Loss of a close family member (other than spouse) by death		
15. The death of spouse		
16. The death of a close friend		
17. Gained a new family member (e.g., through birth, adoption, oldster moving in, etc.)		
18. Major change in the health or behavior of a family member		
19. Change of home		
20. Spent time in jail or other institution		
21. Found guilty of minor violations of the law (e.g., traffic tickets, jay walking, disturbing the peace, etc.)		
22. A major change in your job's company (e.g., strike, reorganization, bankruptcy, etc.)		
23. Got married		
24. Got divorced		
25. Marital separation from your mate		
26. Received or accomplished an important personal goal		
27. Son or daughter left home (e.g., marriage, attending college, etc.)		

	YES	NO
28. Retired from work		
29. Major change in working hours or conditions		
30. Major change in responsibilities at work (e.g., promotion, demotion, transfer)		
31. Been fired from work		
32. Major change in living conditions (building a new home, remodeling, deterioration of home or neighborhood)		
33. Wife began or stopped working outside the home		
34. Took on a credit account greater than $10,000 (e.g., buying a home, business, etc.)		
35. Took on a credit account or loan less than $10,000 (e.g., purchasing a car, TV, freezer, etc.)		
36. You experienced a foreclosure on a mortgage or loan		
37. Took a vacation		
38. Changed to a new school		
39. Changed to a different line of work		
40. Began or stopped attending school		
41. Got back together with husband or wife		
42. That you had a pregnancy		

THANK YOU FOR YOUR COOPERATION

Perhaps you would like to discuss with me some of the events that you have experienced during the past two years. I would be willing to meet with you and talk about those events which are hard to explain with just a few words. If you would like to see me here at the clinic write "YES" below. If you do not wish to talk with me please write "NO." I will be calling you in the next few days if you do decide to see me.

Informacion Demografica

Numero del projecto_____ Fecha_____/_____/_____
mes dia ano

Por Favor de Circundar La Respuesta Correcta

1. SEX--a) masculino, b) femenino
2. RAZA--a) anglo, b) yaqui, c) negro, d) indio-americano, e) mexicano-americano, f) mexicano nativo, g) otro_____
3. GRUPO DE EDAD--a) menos de 21, b) 21-30, c) 31-45, d) 46-65, e) mayor de 65
4. PREFERENCIA DE RELIGION--a) protestante, b) catolico, c) judio, d) ninguna, e) otra_____
5. ESTADO CIVIL--a) casado, b) divorciado, c) separado, d) viudo, e) nunca se ha casado
6. EDUCACION OBTENIDA--a) escuela primaria, b) escuela secundaria, c) escuela tecnica, d) colegio, e) titulo avanzado de la universidad
7. TIEMPO EN RESIDENCIA ACTUAL--a) 1 ano, b) 2 anos, c) 3-5 anos, d) 5-10 anos, e) mas de 10 anos
8. NUMERO DE MATRIMONIOS--a) 0, b) 1, c) 2, d) 3, e) 4 o mas
9. MAYOR PARTE DE SU VIDA LA HA VIVIDO EN--a) area rural, b) poblacion de 5000 o menos, c) poblacion de 5000 o mas, d) poblacion de 50,000 o mas, e) poblacion de 500,000 o mas
10. NUMERO DE HERMANOS--a) 0, b) 1, c) 2, d) 3, e) 4, f) 5 o mas
11. NUMERO DE HERMANAS--a) 0, b) 1, c) 2, d) 3, e) 4, f) 5 o mas
12. ESTADO DE EMPLEO ACTUAL--a) empleo permanente, b) empleo temporal (menos de 30 horas por semana), c) no esta empeado, d) escuela, e) otra_____

13. ESTADO DE EMPLEO ACTUAL DE SU ESPOSA(O)--a) empleo permanente, b) empleo temporal (menos de 30 horas por semana), c) no esta empleado, d) escuela, e) otra_____

14. PUESTO PRINCIPAL DE LA FAMILIA--a) usted mismo, b) esposa(a), c) madre, d) padre, e) pariente, f) otro_____

15. NUMERO DE NINOS--a) 0, b) 1, c) 2, d) 3, e) 4, f) 5, g) 6, h) 7 o mas

16. ORIGEN PRIMARIO DE SUELDO--a) ganancias, b) bienestar social, c) pension de retiro, d) otro_____

17. NUMERO DE PERSONAS EN SU CASA--a) 1, b) 2, c) 3, d) 4, e) 5, f) 6, g) 7 o mas

18. SU GENERACION--a) fue nacido en otro pais pero vive aqui presente, b) fue nacido en este pais pero suspadres fueron nacidos en otro, c) usted y sus padres fueron nacidos en este pais pero sus abuelos en otro, d) otro_____

Lista de Experiencia Reciente

INSTRUCCIONES: Cada articulo representa un resultado que puede o no haberle ocurrido a usted. Por favor lea cada articulo cuidadosamente y decida si usted ha tenido esta experiencia dentro de los 2 anos pasados. Si le ha pasado a usted dentro de los 2 anos pasados, marque "Si." Si no le ha pasado marque "No." Cuando tenga una duda marque "Si." No deje ningun espacio blanco. Si quiere cambiar su repuesta o comete un error, borre la repuesta incorrecta y marque la repuesta correcta.

RESULTADOS EXPERENCIADOS DENTRO DE LOS 2 ANOS PASADOS	YES	NO
1. Sea mucho mas o menos dificultad con el jefe		
2. Un cambio mayor en costumbres de dormir (duerme mucho mas o menos, o cambio en parte del dia cuando duerme)		
3. Un cambio mayor en costumbres de comer (come mucho mas o menos comida que antes, o hay un cambio en horas de comer o ambiente)		
4. Una revision en sus costumbres personales (vestir, conducta, asociaciones, etc.)		
5. Un cambio mayor en cantidad y/o tipo de diversion		
6. Un cambio mayor en sus actividades sociales (clubs, bailes, cine, de visita, etc.)		
7. Un cambio mayor en actividades de la iglesia (mucho mas o menos que lo usual)		
8. Un cambio mayor en el numero de tiempos que se rejunta la famila (mucho mas o menos que lo usual)		
9. Un cambio mayor en su estado economico (peor o mejor que lo usual)		
10. Dificultades con los suegros y/o cunados		
11. Un cambio mayor en el numero de argumentos con esposa o esposa (soa mas o menos que lo usual con respecto a la crianza del nino, costumbres personales, etc.)		
12. Dificultades sexuales		
13. Mayor lastimadura personal o enfermedad		

	YES	NO
14. Muerte de algun familiar sercano (distinto de su esposa)		
15. Muerte de su esposa o esposo		
16. Muerte de un amigo sercano		
17. Adquirio un miembro de familia nuevo (nacido, adoptado, anciano se movio con usted, etc.)		
18. Un cambio mayor en la salud o en el portamiento de algun miembro de la familia		
19. Cambio de dormicilio		
20. Encierro en la carcel o otro instituto		
21. Lo encontraron culpable de violacion menores de la ley (infraccion de transito, violacion de cruzar caminos al caminar, perturbar la paz, etc.)		
22. Un reajustamiento mayor de negocio (unirse, vuelga, bancarrota, etc.)		
23. Se caso		
24. Se divorcio		
25. Separacion de su esposa o esposa		
26. Tuvo una excelente realizacion personal		
27. Hijo o hija salio de casa (se caso, esta asistiendo colegio, etc.)		
28. Retirado de trabajo		
29. Cambio mayor en horas de trabajo o condiciones		

	YES	NO
30. Cambio mayor en responsabilidades en su trabajo (promocion, democion, trasladar lateral, etc.)		
31. Lo han despedido de su trabajo		
32. Cambio mayor en sus condiciones de vivir (construccion de casa nueva, modelar, deterioracion de su hogar, o de su vecindad)		
33. Esposa empezo o dejo de trabajar afuera de la casa		
34. Tomo un prestamo mas de $10,000		
35. Tomo un prestamo menos de $10,000		
36. Usted experiencio un embargo de un prestamo		
37. Tomo vacaciones		
38. Cambio a diferente escuela		
39. Cambio a diferente linea de trabajo		
40. Empezo o dejo la escuela formal		
41. Tuvo un ajuste marital con su esposa o esposo		
42. Tuvo un embarazo		

MUCHAS GRACIAS POR SU COOPERACION

Tal vez usted quedra discutir conmigo algunos de los resultados que usted ha experiensado sobre los 2 anos pasados. Yo estoy dispuesto encontrarme con usted para hablar cerca de esos resultados que siembre son dificil explicar en unas cuantas palabras en papel. Si usted desea reunirse conmigo aqui en la clinica, marque "Si" abajo. Si no desea reunirse conmigo, marque "No." Yo me pondre en contacto con usted en los siguiente 2 o 3 dias si usted si desea verme.

Otra vez, muchas gracias

/signed/

Danny Luera

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