CULTURE CHANGE AND STRESS IN RURAL PERU
A PRELIMINARY REPORT

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Cultural change is a necessary concomitant of economic progress, and yet the process subjects the inhabitants of the changing community to psychological stress. One should not assume that such stresses are always "bad things," which could and should be eliminated by more effective social and economic planning. A certain level of stress may be required to stimulate individuals to make creative responses to the new challenges they confront. On the other hand, stresses can be so extreme and oppressive as to push people into blind defensive reactions or to lead them to seek to withdraw from the stressful situation.

People do not all respond alike to a given psychological stress. Some individuals are more vulnerable than others. Also, the individual's response to stress is not determined solely by his own personality, but is also greatly influenced by the support or lack of support he receives from those around him.

The change-stress relationship is a practical problem, for one can readily imagine otherwise constructive changes that are not accepted by a community because they generate more psychological stress than community members can tolerate. It is an important theoretical problem also, for any theory of social and cultural change would

be deficient if it did not include consideration of the psychological correlates of such change.

This paper reports the beginning effort to examine the relationships between culture change and stress in rural Peru which was begun by applying measures of the reactions to stress. Since the stress itself is not being measured, but rather reactions to it, these reactions will be called "psychological strain," after the terminology of Leighton and his associates and which involves self-reported physiological factors.[1] An examination is made of individual differences in response to stress, according to certain demographic characteristics of the individuals. In addition, the relationship between the strain manifested by individuals and their psychological orientations to the world around them is examined.

AREAS UNDER STUDY

This is a report on one aspect of a comparative and longitudinal research program in rural Peru that is being carried out jointly by Cornell University and the Instituto de Estudios Peruanos. The present paper is based primarily upon questionnaires or scheduled interviews carried out in four areas of rural Peru. The four areas here under consideration are distinctly different groups of villages from the Chancay Valley, Arequipa, the Mantaro Valley and Cuzco. Each of the villages has a population of less than 3,000.

The Chancay Valley is located on the coast, an hour's drive from Lima. In this area most of the people speak Spanish, and only scattered remnants of indigenous cultures remain. Four villages are located from one to three hours' driving distance from the city of Arequipa. These Andean villages range from very poor and backward to reasonably prosperous and progressing. Spanish is the predominant language in all of them.

The Mantaro Valley in the central highlands is generally considered the most dynamic area in rural Peru. Nevertheless, the seven communities selected, between the cities of Huancayo and Jauja, represent a considerable range from static and traditional to dynamic and progressing. All are officially indigenous communities.

Some Quechua is spoken in these villages, but this presented no problem in applying the scheduled interview in Spanish. The seven communities in the Cuzco area are concentrated around the village of Pisaq. They represent one mestizo village (Pisaq), one traditional hacienda and five indigenous communities. Here, except in the mestizo village, the scheduled interview was applied in Quechua. A total of 2,353 respondents are represented in this phase of the study. The respondents represent all adults from a ten per cent sample drawn in each of the communities.

THE MEASURING INSTRUMENT

How could the strain manifested by individuals in rural Peru be measured? No psychiatrists were working with the interviewers, nor could it be assumed in any case that the mere collaboration of competent psychiatrists would have solved the problem. The question of standardizing psychiatric diagnoses would still have to be dealt with, which has proved a thorny issue even in the most industrialized nations, and which would be especially difficult in the widely differing cultural areas being studied.

The measures were based upon the testimony respondents could give regarding their own physical or psychosomatic symptoms. Items were drawn from what has been termed the "Health Opinion Survey." The construction of the survey was based mainly upon the Army's Neuropsychiatric Screening Adjunct and the Cornell Medical Index. It has been utilized by Leighton and his associates in both Nova Scotia and Nigeria.[2] The instrument has been partially validated in Canada by comparing scores on the Health Opinion Survey with a psychiatrist's assessment of the same person's mental health without the psychiatrist having knowledge of that person's score. The correlation between the psychiatrist's mental health evaluations and the 15 items included in the Peruvian measure is .60.

The psychological screening items used were designed for research in Nova Scotia. Can one have any confidence in the results when the same items are applied in rural Peru? Although one would feel

more confident if validation research in Peru had been carried out, comparing responses on these items with psychiatric diagnoses, evidence indicates that the results are valid.

These items appeared to work as well in Nigeria as in Nova Scotia. Rogler and Hollingshead[3] have successfully applied this screening instrument in Latin America in a study done in the slums of San Juan, Puerto Rico. There the instrument differentiated, at significant levels, schizophrenics from neurotics, and clinically diagnosed (by teams of psychiatrists) sick individuals from a normal group. Although wide cross cultural differences in patterns of behavior and in the way people describe their illnesses should be expected, direct reports on physiological symptoms seem to be much less subject to cultural influences.

Finally, it is reassuring to note that the findings fall into patterns that resemble those found in other parts of the world where validation studies have been made.

On the basis of consultation with Leighton and his associates, a list of 19 items dealing with physiological symptoms (insomnia, nightmares, stomach upsets, cold sweats, and so on) was selected. These were included in the first pilot survey in the Chancay Valley.

This field test showed that rural Peruvians could respond to such items without difficulty. (In fact, they had much greater difficulty with abstract or hypothetical attitudinal items.) Separate factor analyses of the responses of males and females led to discarding four items. Smoking proved to be either unrelated or negatively related to the other stress items. It was later reasoned that smoking is related to social status in rural Peru, for only the more prosperous can afford to buy tobacco. Otherwise the expected positive correlation between good mental health and high status appears to hold for Peru, as it does elsewhere. Three items dealing with headaches and nausea were also eliminated because, for women, they formed a separate factor, and it was assumed they might relate to symptoms normally associated with menstruation.

The remaining 15 items were included in all villages in the 1964 survey. They are listed in the appendix.

All but two of the items were presented in the following form:

How often do you have stomach upsets?

1 . . . . often

2 . . . . sometimes

3 . . . . never

Giving each item equal weight, the strain index for each respondent was obtained simply by adding the scores of the 15 items. Thus an individual evidencing the highest possible psychological strain would have a score of 15. The respondent having the lowest possible strain index would have a score of 45. As might have been expected, hardly anyone scored at the extreme of 15 (high strain), but, except in the Trujillo area which has been excluded from this analysis, responses were sufficiently distributed so that meaningful groupings of high, moderate and low strain respondents could be made.

The first analytical step was to compare the high and low groups in each of the four areas. Cut-off points were established that would yield approximately 15 per cent of the extreme scores, high and low, for each sample. Since some variation occurred in the distribution of scores from one area to another, the percentages in the high and low groups in each area are not exactly the same. The low psychological strain group consists of those scoring at or greater than 40, 42, 37 and 40 and high strain consists of those scoring at 26, 28, 25 and 26 or less in Arequipa, Chancay, Cuzco and the Mantaro Valley respectively.

Preliminary analysis indicated that the high and low groups did

TABLE I. AREAS AND DISTRIBUTION OF RESPONDENTS

Strain	Chancay		Arequipa		Mantaro Valley		Cuzco	
	N	%	N	%	N	%	N	%
High	50	11	40	15	115	10	61	12
Medium high	163	36	99	37	385	35	212	42
Medium low	161	35	82	31	372	34	153	31
Low	83	18	46	17	240	20	72	15
Total N	457		267		1112		498	

indeed differ markedly in their responses to other items of interest. Although this was encouraging, it was recognized that the value of the analysis based upon extremes would be dubious unless the 70 per cent in between the two extremes conformed to the general pattern being discovered. The next step was to divide this approximately 70 per cent remaining into two groups of about equal size using the median score. One of these was called "medium high strain" and the other was called "medium low strain." (It should be noted, however, that the distribution is skewed so that the middle groups are closer to the low-strain than to the high-strain end.)

The number of individuals present in each of the mental strain groups for the four different areas and the total sample is shown in Table 1.

FINDINGS: DEMOGRAPHIC CHARACTERISTICS

Table 2 shows the relationship between sex and psychological strain. As has been found in other studies, in each of the four areas women evidence more strain than men. The differences in percentages are significant beyond the .01 level in two areas and beyond the .05 level in the other two areas.

It was also found that younger individuals evidence less strain than do older persons, which is again similar to findings in numerous studies. As Table 3 indicates, those 34 years old or younger show less strain than those 55 or older. In most areas, strain is significantly (.05 level or greater) higher when comparing youngest to intermediate and intermediate to oldest age groups. A bivariate regression analysis indicated a significant (.01 level or greater) linear trend in all areas.

Table 4 demonstrates the relationship between marital status and degree of strain expressed by individuals. The table indicates that individuals who are not and have never been married evidence less strain than any other group. These individuals, of course, are younger on the average than the rest of the respondent population, which no doubt acounts for part of this relationship. Nevertheless,

TABLE 2. PER CENT OF INDIVIDUALS IN MENTAL STRAIN CATEGORIES
BY SEX

Strain	Chancay Male N = 267	Female N = 190	Arequipa Male N = 136	Female N = 131	Mantaro Valley Male N = 570	Female N = 542	Cuzco Male N = 300	Female N = 198
High	6—**—17		9—*—21		6—**—15		10—*—16	
Medium high	34	37	39	35	33	36	40	47
Medium low	37	33	32	30	37	30	31	30
Low	22—**—12		20	14	24—*—19		19—**—8	

* Difference between percentages significant at or beyond .05 level.
** Difference between percentages significant at or beyond .01 level.

TABLE 3. PER CENT OF INDIVIDUALS IN MENTAL STRAIN CATEGORIES,
BY AGE

Strain	Chancay Age 21–34 N = 158	35–54 N = 192	55+ N = 107	Arequipa Age 21–34 N = 66	35–54 N = 102	55+ N = 94
High	6	12	17	0	16	24
Medium high	32	37	38	30	35	46
Medium low	39	34	32	44	34	19
Low	23	17	13	26	15	11

Strain	Mantaro Valley N = 445	N = 433	N = 233	Cuzco N = 187	N = 224	N = 85
High	4	12	19	10	9	22
Medium high	28	34	47	39	45	45
Medium low	40	33	21	33	34	19
Low	27	21	13	18	12	14

* Difference between percentages significant at or beyond .05 level.
** Difference between percentages significant at or beyond .01 level.

Strain	Chancay Marital Status			Arequipa Marital Status		
	Single $N = 70$	Married $N = 345$	Separated or Widowed $N = 42$	Single $N = 45$	Married $N = 186$	Separated or Widowed $N = 36$
High	3	12	17	4	14	33
Medium high	33	36	40	11	38	39
Medium low	33	37	26	42	31	14
Low	31	16	17	20	17	14

Strain	Mantaro Valley			Cuzco		
	$N = 176$	$N = 822$	$N = 109$	$N = 38$	$N = 394$	$N = 65$
High	7	10	20	5	10	28
Medium high	33	34	42	26	43	48
Medium low	35	35	21	45	31	21
Low	25	22	17	24	15	3

* Difference between percentages significant at or beyond .05 level.
** Difference between percentages significant at or beyond .01 level.

the magnitude of the differences and their consistency across all four areas seem noteworthy.

No differences were found on the strain score according to type of marriage relationship (common law, religious ceremony only, civil ceremony only and both religious and civil marriage). Therefore, all in these four categories have been analyzed as one group as "married" in Table 3.

Those who are widowed, divorced or separated show the highest evidence of psychological strain, and, conversely, were underrepresented in the low-strain category. Although the findings are consistent and statistically significant across areas, the underrepresentation in the low-strain category is particularly extreme in the Cuzco villages. (Here again the age difference may account for the findings

	Chancay Education			Arequipa Education		
	Four Years or Less	Completed Elem.	Secondary and Beyond	Four Years or Less	Completed Elem.	Secondary and Beyond
Strain	N = 267	N = 123	N = 67	N = 167	N = 67	N = 33
High	15	8	1	20	6	6
Medium high	41	28	28	41	34	24
Medium low	30	40	49	27	39	33
Low	15	24	21	12	21	36

	Mantaro Valley			Cuzco		
	N = 689	N = 274	N = 148	N = 446	N = 29	N = 23
High	15	4	1	13	0	4
Medium high	38	33	21	46	21	0
Medium low	28	39	47	30	31	52
Low	18	24	32	11	48	43

* Difference between percentages significant at or beyond .05 level.
** Difference between percentages significant at or beyond .01 level.

in part, for the average age of people in the widowed-separated category is higher than the rest of the respondent population.)

One of the most important indicators of social and economic status in any country is level of education. Table 5 analyzes the responses of the sample in these terms. Consistent with the findings in other cultures, the higher the individual had advanced up the educational ladder, the less strain he is likely to evidence. For example, in Chancay, 15 per cent of those with four years of education or less fall into the high-strain category, whereas only one per cent of those with a secondary education or more fall in that category. A statistically significant difference exists between almost all educational groupings for both high- and low-strain categories. Bivariate

regression analyses, computed for each of the four areas, range from .22 to .34 (all significant at the .01 level).

Sorting the respondents according to literacy-illiteracy, according to their own testimony, tells about the same story. This test was run separately, for in this culture one cannot predict reading and writing capacity as a function of some school attendance. Poor attendance plus a copying and rote memorization learning process are some of the contaminating factors. For each area, the higher the psychological strain score, the greater the probability that the individual would acknowledge that he could not read or write or say "not really, just a little."

Various studies have shown that the integration or lack of integration of the individual into social groupings will affect his mental health. This relationship was tested with an item asking whether the individual belonged to any clubs or associations. As can be seen in Table 6, although in all areas the majority of respondents falls in the non-membership category, a highly significant relationship in all areas is found. Members tended to be disproportionately concentrated in the low strain category. For example, the Chancay area for those in the high-strain category, 86 per cent indicate that they do not belong to a club or association, as against 73 per cent in the low-strain category. An orderly progression of percentages is found, with the same trend in each of the four areas.

TABLE 6. PER CENT OF RESPONDENTS REPORTING NO MEMBERSHIP IN VOLUNTARY ORGANIZATIONS OR GROUPS, BY STRAIN SCORE

Strain	Chancay $N = 457$	Arequipa $N = 267$	Mantaro Valley $N = 1112$	Cuzco $N = 498$
High	86 ⎤	90 ⎤	90 ⎤	93 ⎤
Medium high	76 ₊⎦	82 ₊⎦	83 ₊₊	93 ₊⎦
Medium low	70	72	77	91
Low	73 ⎦	69 ⎦	75 ⎦	82 ⎦

* Difference between percentages significant at or beyond .05 level.
** Difference between percentages significant at or beyond .01 level.

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Step-wise Regression Analysis

So far, the data have been arranged to show the separate relationships between various demographic factors and the strain score. It has been indicated that these findings are very similar to other studies relating psychological strain and/or mental health to demographic items. Moreover, it has been indicated that these findings hold for various regional areas of Peru as well as for the total sample population.

Obviously, however, these demographic factors are not separate. In a culture such as this males receive more education than females and are allowed a greater flexibility in the roles that they assume in the community. Age and education are contaminated by the fact that younger individuals tend to have more education than their elders. Because all of the demographic factors have a certain amount of interrelationship it became necessary to test the capacity of the demographic variables as joint predictors of the strain score. Using the psychological strain score as the dependent variable, a number of demographic variables were employed in a step-wise regression program to obtain an estimate of the predictive and presumably causal relationship between the independent demographic variables considered jointly and the fully range of scores on the strain variable.

A step-wise regression analysis allows for an estimation of regression lines within a program which selects first the independent variable that alone accounts for the most of the predictable variance in the dependent variable. After doing this, the program then ascertains, in order, the other independent variable contributions to the dependent variable score. Table 7 indicates the contribution of the various demographic factors to the strain score. Two data entries are included: one that involves the multiple regression score for each variable showing the cumulative correlational relationship between the demographic variables and the mental strain score, and the other, the R-squared statistic, which indicates that portion of the variance of the strain score accounted for by the demographic variables separately and collectively. As can be seen from Table 7, although all of the demographic variables make a statistically signifi-

TABLE 7. CORRELATIONAL RELATIONSHIP BETWEEN DEMOGRAPHIC FACTORS AND STRAIN SCORE (STEP-WISE REGRESSION ANALYSIS)

Analysis 1

Step No.	Variable	Multiple R.	R^2
1	Education	.34740	.12069
2	Age	.39135	.15135
3	Formerly married*	.39694	.15756
4	Sex	.40010	.16008
5	Not married	.40023	.16018

Analysis 2

Step No.	Variable	Multiple R.	R^2
1	Education	.33467	.11201
2	Age	.38025	.14459
3	Literacy	.40292	.16235
4	Ethnicity	.40984	.16797

* Marital status was examined by transforming into two variables, single and all others, and formerly married and all others. Similar transformations were made for the ethnicity variable so that correlation procedures could be used on nominal scale data.

TABLE 8. COMPARISON OF STRAIN SCORE AND RESPONSE TO ITEMS ON FUTURE ORIENTATION

Responses	Strain	Chancay N = 457	Arequipa N = 267	Mantaro Valley N = 1112	Cuzco N = 498
"very important	High	40 ⌉	20 ⌉	17 ⌉	42 ⌉
to know plans for	Medium high	61 ⌋**	39 ⌋**	38 ⌋**	43 ⌋*
the future"	Medium low	66 ⌉†	51 ⌉†	43 ⌉†	43
	Low	70 ⌋	54 ⌋	34 ⌋	57 ⌋
"man's life should	High	Not asked	46	52	43 ⌉
be guided more	Medium high	in this	62	66	37 ⌋†
by his hopes for	Medium low	area study	65	62	52
the future"	Low		63	61	56 ⌋
"Useless to plan	High	64 ⌉	21 ⌉	24 ⌉	16 ⌉
for the future"—	Medium high	80	35	28 ⌋†	17 ⌋†
disagree	Medium low	78**	39**	31	35**
	Low	82 ⌋	48 ⌋	33 ⌋	35 ⌋
"Present rapid	High	24	15 ⌉	25 ⌉	30 ⌉
change in life is	Medium high	28	25 ⌋*	24 ⌋*	31 ⌋*
no good"—	Medium low	26	32 ⌉†	31 ⌉†	37 ⌉†
disagree	Low	36	39 ⌋	36 ⌋	47 ⌋

* Differences in percentages significant at or beyond .05 level.
** Differences in percentages significant at or beyond .01 level.
† Bivariate regression, slope significant at or beyond .05 level.

cant contribution to the total strain score, the two major contributors are education and age with education the "prime" variable.

The addition of several other demographic variables to this array added nothing of statistical or phenomenological importance to the prediction of the strain score. Such variables as ethnicity and literacy (Table 7) are found to be related in predictable ways, but in all cases the major contributions to prediction were education and age. From this discussion it is possible to conclude that, of all the demographic variables, education and age have the highest predictive relationship to the strain score. It should also be noted that no combination of demographic variables accounts for more than 16 or 17 per cent of the total variance of the dependent variable. Even though the amount of error variance in the dependent variable is unknown, attempts to account for a portion of it by predicting only to the four categories used in the previous analysis rather than the separate scores did not increase the amount of predicted variance.

STRAIN AND ATTITUDINAL RELATIONSHIPS

Do differences exist between high- and low-strain people in the ways they regard themselves, their fellows and the nature of the world in which they live? Items that could be assumed to be relevant for measurement along the traditional-modernism dimension were also selected for analysis.

Future Orientation

Table 8 presents a comparison of the strain score and responses to items dealing with present or future orientation. The first item involves degree of importance attached by the respondents to knowing their plans for the future very clearly. The percentage of respondents in each strain category reporting that it was "very important" is indicated in the table. Those with low strain scores are significantly (.05 level or greater) more future-oriented than are those with a high strain score. Another item asked individuals to make a choice between whether "man's life should be guided more by the problems of the present or more by his hopes for the future." The

per cent of respondents as a function of the strain score endorsing the hopes for the future response is indicated. Again low-strain individuals were more future oriented although the differences are not statistically significant.

Responses were also obtained to the following statements: "Some say that for the average man it is useless to plan for the future," and "The present rapid change of life is no good." In each case respondents could agree, partially agree or disagree. As can be seen from the table, a direct and significant relationship is found between future orientation and a low score on the strain index. Orientation toward the future tends to increase as one proceeds from high to low on the strain index. This finding suggests that the low-strain people are especially those who feel that future outcomes can be affected by present thoughts and actions.

Fatalism-Activism. Related to future orientation is the fatalism-activism dimension so often reported in studies of modernization. Six of the items used in this study to tap this dimension are reported in Table 9.

In this study, fatalism involved expressing agreement with the following statements:

One cannot change his own fate.

Success in life depends more on luck than on personal ability.

Some have been born to lead and others to follow.

The end of the world will likely come before much progress in Peru.

(In each case, respondents had three choices: agree, partially agree, disagree.)

The following items were also used:

Through working harder, do you believe you would have a higher standard of living? (no; very little; yes; definitely.)

Some say that success in life depends on one's own efforts. Others say that it depends on the will of God. (more on one's own efforts; more on the will of God; on both equally.)

In these cases, the fatalists would be those who saw little or no value in working harder and who saw God as controlling man's success.

As can be seen from Table 9, a strong association is found be-

tween the fatalism items and the strain score. The higher the strain score, the more likely is the respondent to embrace a fatalistic orientation. Of the 23 comparisons made, the difference between the high and low categories is significant at or beyond the .01 level in ten cases and at or beyond the .05 level in seven. In five cases the same trend is shown, though the differences do not reach the .05

TABLE 9. COMPARISONS OF STRAIN SCORE AND RESPONSES TO FATAL-ISM ITEMS

Response	Strain	Chancay N = 457	Arequipa N = 267	Mantaro Valley N = 1112	Cuzco N = 498
"Through work-ing harder do you believe you would have a higher standard of liv-ing?" Yes, definitely	High Medium high Medium low Low	46 ⌉ 47** 58 ⌡ 72	34 ⌉ 46** 55 ⌡ 69	52 ⌉ 70*_ 75 ⌡ 75	64 43 51 71
"One cannot change his own fate"—agree	High Medium high Medium low Low	54 ⌉ 27*_* 27 ⌡ 31	68 56 48 50	51 45 50 44	72 ⌉ 87*_ 75 ⌡ 73
"Success in life depends more on luck than on personal abil-ity"— Agree	High Medium high Medium low Low	64 ⌉ 34 32** ⌡ 24	60 62 71 61	48 43 36 39	77 ⌉ 80*_ 70 ⌡ 58
"Some are born to lead and others to follow"—Agree	High Medium high Medium low Low	66 ⌉ 52*_* 50 ⌡ 42	76 ⌉ 85*_ 87 ⌡ 56	69 ⌉ 54*_* 59 ⌡ 49	71 79 66 60
"The end of the world will likely come before much progress in Peru"—Disagree	High Medium high Medium low Low	76 ⌉ 82 84 ⌡ 87	54 ⌉ 61*_ 78 ⌡ 76	39 ⌉ 49*_* 66 ⌡ 68	21 ⌉ 28*_* 46 ⌡ 61
"Success in life de-pends more on will of God than on one's own efforts"	High Medium high Medium low Low	Not asked in this area study	71 ⌉ 50*_ 56 ⌡ 35	64 ⌉ 44*_* 34 ⌡ 34	61 ⌉ 66*_ 58 ⌡ 41

  * Difference between percentages significant at or beyond .05 level.
  ** Differences between percentages significant at or beyond .01 level.

level of significance. A bivariate regression analysis indicates a significant linear trend in 14 cases (.05 level or greater).

On an *a priori* basis, one might assume that fatalistic individuals would experience little strain, since they were resigned to accepting the *status quo*. The figures suggest that, although they may be resigned, they are not relaxed.

Interpersonal Trust. Does a relationship exist between faith in people and psychological strain? The following items were used to test for this relationship:

These days a person doesn't really know whom he can count on in difficult situations.

If you don't watch yourself, people will take advantage of you.

Nobody is going to care if you fail.

Human nature is fundamentally cooperative.

Would you say that most people like to help others or like to watch out for themselves?

Some people say that most people can be trusted. Others say you can't trust people. How do you feel about it?

On the basis of studies elsewhere, it might be expected that mistrust of one's fellow man would be correlated with high strain. On the other hand, surveys done previously in the high schools, in an industrial company and in the villages all indicate that mistrust of one's fellow man is exceedingly prevalent in Peru.[4, 5] In fact, using the above items little consistent relationship was found between faith-mistrust and psychological strain. This finding, against the background of previous studies, suggests that low faith in people is a "normal" condition in Peru and is not indicative of poor mental health.

Envy. On the other hand, another aspect of the respondent's perception of his fellow man does seem closely related to psychological strain: the perception of envy. Peruvian psychiatrist Humberto Rotondo found a great preoccupation with envy among the migrants from the sierra that he studied in the *barriadas* of Lima, with the American anthropologist, William Mangin.[6] It was on Rotondo's suggestion that an item was included: "Do you believe other people envy you?" in the high school questionnaire and in later studies.

TABLE IO. COMPARISON OF PERCEPTION OF ENVY AND STRAIN SCORE

Response	Strain	Chancay N = 457	Arequipa N = 267	Mantaro Valley N = 1112	Cuzco N = 498
"Do you believe	High	22 ⎤	8	12 ⎤	13 ⎤
other people envy	Medium high	29 ⎥*	9	15 ⎥**	23 ⎥*
you?"—Hardly	Medium low	25 ⎥ †	11	13 ⎥ †	32 ⎥ †
anyone	Low	41 ⎦	19	26 ⎦	45 ⎦

* Differences between percentages significant at or beyond .05 level.
** Differences between percentages significant at or beyond .01 level.
† Bivariate regression, slope significant at or beyond .05 level.

In fact, definite patterns of regional differences in both the high schools and in the villages were found. In the high schools, the boys of the sierra cities of Puno, Cuzco and Huancayo were higher in perception of envy than those in Lima, Trujillo, Chimbote or Iquitos. Likewise, among the sierra villages and those studied by Hickman in Puno, perception of envy is higher than it is on the coastal villages of the Trujillo area or of the Cháncay Valley.[7]

Rotondo has interpreted high concern over envy as evidence of anxiety. Table 10 tends to confirm his interpretation. One can see that those saying that "hardly anyone" envies them tend to be concentrated toward the low-strain end of the scale. The high-low differences are statistically significant in three out of the four areas. In Arequipa, which showed least concern with envy, the findings run in the same direction but do not reach the .05 level of significance. A bivariate regression indicated a significant linear trend in the same three areas (.05 level or greater).

Modernization

Table 11 presents the relationship between the strain scores and orientation toward the progress of the village. Respondents were asked if "much conflict (exists) between people who want to do things in the old ways and those who want to do things in the new ways." Those reporting "much" or "some" conflict (which were the majority) were asked whether or not they sided with the "group with old customs" or with the "group with modern ideas" (or "with

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both equally" or "with neither"). The table shows that those identifying themselves with "modern ideas" tend to fall more often in the low-strain than in the high-strain category. The relationship is consistent for all four areas, though it fails to reach statistical significance in one.

Progress orientation was also tested by asking whether respondents, concerning "possibilities of economic progress for this village," were "more optimistic or more pessimistic" than they had been two years earlier (one year earlier in Chancay). They were also asked if, five years in the future, they expected "people in this village to be better off or worse off, compared to today." In each case, the questionnaire provided for an optimistic, a pessimistic, and a "no change" response. As Table 11 shows, the low-strain people are more likely than the high-strain people to view the future with optimism. In nearly all cases, greater optimism is expressed by successively lower strain groups.

TABLE II. COMPARISON OF PROGRESS ORIENTATION AND STRAIN SCORES

Response	Strain	Chancay N = 457	Arequipa N = 267	Mantaro Valley N = 1112	Cuzco N = 498
(For those perceiving conflict in the community) "Side with group with modern ideas"	High	20 ⎤	48	44 ⎤	38 ⎤
	Medium high	35* ⎮	54	54* ⎮	37* ⎮
	Medium low	37 ⎮	63	44 ⎮	39 ⎮
	Low	36 ⎦	61	58 ⎦	55 ⎦
"More optimistic about the possibility of economic progress than two years ago"	High	44	38 ⎤	61 ⎤	67 ⎤
	Medium high	59	50 ⎮	60** ⎮	73* ⎮
	Medium low	54	55* ⎮	54 ⎮	77 ⎮
	Low	51	59 ⎦	75 ⎦	85 ⎦
"Expect people in village to be better off five years from now."	High	52 ⎤	30 ⎤	66 ⎤	82
	Medium high	62 ⎮	50** ⎮	77** ⎮	77
	Medium low	63* ⎮	61 ⎮	79 ⎮	80
	Low	70 ⎦	59 ⎦	81 ⎦	90
"The village is not progressing or is going backwards."	High	47 ⎤	34	8	22 ⎤
	Medium high	28* ⎮	19	11	9 ⎮
	Medium low	14 ⎮	22	11	11* ⎮
	Low	20 ⎦	22	8	12 ⎦

* Difference between percentages significant at or beyond .05 level.
** Difference between percentages significant at or beyond .01 level.

Finally, respondents were asked, "What would you say about the progress of this village? Would you say it is . . . (progressing rapidly, progressing slowly, not progressing, going backward)? Table 11 shows that those in the high-strain category are more likely than low-strain people to see their village as stagnating or losing ground. In two out of the four areas, the relationship is statistically significant, and in a third the same trend is found. In the Mantaro Valley, where very few respondents fail to see the village progressing, no relationship is found between this item and strain scores.

Although the data are not given here, it is interesting to note that the high-strain people appear to be somewhat more likely to endorse the response "progressing rapidly" than do the low-strain people. This difference was found for all four areas, although it was not statistically significant in any of them. This suggests that the high-strain people either see no movement at all or that the movement is too fast for them.

Finally, it might be asked if the degree of faith a man has in the institutions of his country is related to his level of psychological strain. Questions were asked which probed for the individual's estimate of his chances of getting justice in a court case, for his opinion as to whether laws and evidence or "personal influence and money" were more important in court decisions. The respondent was also asked whether, if he has a problem with the government in the departmental capital, he would be "treated the same as other people."

On these items, a pattern was found indicating that low-strain individuals had more faith in institutions of government than high-strain individuals, though the relationships were not nearly so marked as those reported in the tables. (Two of these three questions were not asked in the Chancay Valley. Of the ten relationships tested, three were significant at or beyond the .01 level, and three at the .05 level.)

To what extent do these data fit the pattern of previous studies of culture change and mental health?

The general conclusion of earlier studies has been that[8]

. . . . the Westernization of underdeveloped areas is the only situation in which social factors are clearly reflected in an increased incidence of mental illness.

This conclusion is supported by the studies of Schmitt in Hawaii, Carothers in Kenya, Gans in Java, Tooth in the Gold Coast (now Ghana), Van Loon in Acheen, Hallowell among the Ojibwa Indians, Murphy in Southwest Asia, Dawson in Africa, and others.[9]

On the other hand, one should not assume a simple one-to-one correlation between change and mental health. Even though the changes accompanying the shift of the isolated peasant community toward increasing relations with the industrializing cities may, on the average, produce a higher psychological strain index in the community, one should not be satisfied with averages.

Some individuals will meet the stresses of change with no evidence of increasing psychological strain, whereas others, facing the same conditions, will appear to crack under the strain. What makes the difference among them? Hinkle and Wolff put it this way:[10]

. . . . the bulk of psychiatric and physical illness episodes occur at times when individuals perceive their life situations as unsatisfying, threatening, too demanding, and productive of conflict . . . the critical factor in the development of illness is *not* actual social or environmental stress, but the individual's perception of such stress.

The individual may experience strain because he perceives an *absolute* worsening of his situation or a growing discrepancy between experience and expectations. For example, increased strain within minority groups in the United States may not be due to an objective worsening of their conditions. As an oppressive but stable situation begins to break down, Negroes raise their expectations. For many individuals, such expectations will turn out to be either unattainable or attainable only at a cost that is more than the individual is willing

to bear. It can be assumed that people caught in this situation will experience increased strain.

Say that in situation A individual X is standing still while all others around him are also standing still. In situation B, individual X is standing still while others around him appear to be moving forward. We assume that situation B will induce more strain in X than does situation A. This is an illustration of the principle of relative deprivation, which was first formulated in that monumental study, THE AMERICAN SOLDIER.[11] The individual's expectations are not simply a function of his own unique personality, but are strongly influenced by what he observes happening to others.

This poses one of the dilemmas of development. Psychological strain and social conflicts seem to be at their highest not under conditions of uniform and stable deprivation, but rather under conditions where change and improvements are beginning to take place. When movement does become possible, for many people rising expectations tend to outrun achievable objectives, with resulting frustrations and psychological strain.

Here it may be helpful to view the Peruvian sierra in terms of cultural dualism. Changes are indeed taking place, but not all of the inhabitants of any community move at a uniform rate of speed from their traditional to a modern or westernized cultural model. Some people hold to traditional ways, others accept or even reach out for new ways, and still others adapt to the new in some activities and hold to the old in others.

The individual is not completely free to accept or reject change without incurring certain consequences. Although the pace and nature of change may be subject to influence by the members of the community, it will do no good to say, as in the title of a recent musical and motion picture, "Stop the world; I want to get off." Change will continue to take place, whether generated within the village, imposed from the outside, or through some combination of internal and external forces. Furthermore, changes will form no neat pattern, but they will tend to be in the direction students have called "modernization" or "westernization."

One would therefore expect that those who are more willing and

able to accept the direction of change will experience less psychological strain than those who are either unable or unwilling to accept this direction. The pattern of these findings supports this general conclusion.

Younger people who have less investment in the old ways, who should be more flexible, and who, objectively, have better opportunities to cope with new conditions, show markedly lower indices of strain than older people. Single individuals have less of a problem of coping with new conditions than those who must be concerned with the adjustment of their families as well as of themselves.

The widows and widowers, having experienced a severe disruption of their personal lives, can be expected to show more strain than others.

Regarding the sex difference, in rural Peru, where the females traditionally have had more barriers to fulfillment as a consequence of a socially defined inferior role, they may be less able than males to take advantage of new conditions. However, the fact that this same sex difference has been found in a number of studies in different cultures suggests the need for further analysis of sex roles under conditions of change.

Increasing education should have two effects: to orient the individual toward more modern ways and to equip him better to cope with or take advantage of changing conditions.

Social integration should cushion the effects of stress upon individuals, as indicated by the finding that those belonging to organizations evidence less strain than non-members.

Attitudinally, the two worlds of cultural dualism can be counterposed in these terms:

Traditional	Modern
fatalism	activism
rejection of change	acceptance of change
pessimism	belief in progress
little confidence in institutions beyond community	more confidence in institutions beyond community

Since the traditional world known to the villagers is in fact dis-

integrating, those who are still oriented toward that world can be expected to suffer more severe psychological strain than those who have turned around to face the world that is coming in. The figures presented support this general interpretation in an exceptionally consistent fashion.

APPENDIX

PSYCHOLOGICAL STRAIN ITEMS

How do you feel most of the time? Would you say . . . ?
1........in good spirits
2........neither in good nor poor spirits
3........in poor spirits

Are you suffering from any physical malady at present?
1........yes
2........no

Note: the remaining 13 items all have the same three response categories: often, sometimes, never.
Do you feel depressed?
How often do you have stomach upsets?
Have you been bothered by your heart beating hard?
Do you tend to feel tired in the mornings?
Do you have any trouble getting to sleep and staying asleep?
Do you have a bad taste in your mouth?
Do you have nightmares?
Are you sometimes bothered by cold sweats?
Do you feel bothered by different kinds of ailments in different parts of your body?
Do you sometimes lose your appetite?
Does poor health reduce the amount of work you do?
Do you feel very weak?
Have you sometimes been bothered by headaches?

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