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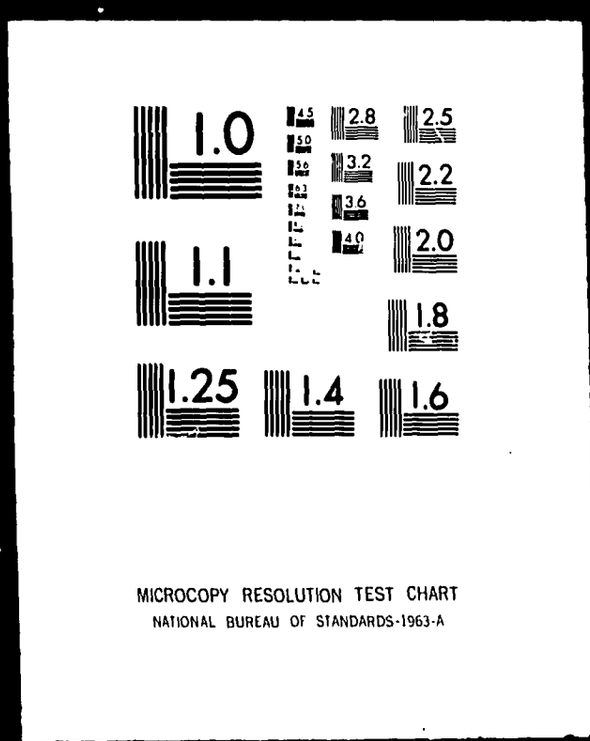

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ABSTRACT

Through use of a random sample of 148 Anglo and 154 Mexican American subjects, this study sought to examine the factor structure of the College and University Environment Scales (CUES) for the bilingual/bicultural full-time unmarried undergraduate student population at the University of Texas at El Paso, to compare the Mexican American students' perceptions of the university environment with the perceptions of Anglo American students, and to test the theory of cognitive dissonance in the field of student affairs. Statistical procedures utilized were factor analysis, Hotelling's T2 statistic, Cochran's test for homogeneity of variance, Bartlett's test for homogeneity of variance, Student's t test, Kendall rank correlation coefficient, analysis of variance, and Pearson product-moment correlation. Although it was not possible to reject the null hypotheses of either equal means or variances, it was noted that the factor structure on the CUES was lower than those for the national sample, that Anglo Americans perceived the university environment as more scholarly than did the Mexican American students, that men scored higher on the awareness scale than did women, and that Mexican American students who report conflict between Mexican and American ways and who report no conflict between Mexican and American ways did not differ on the 4 dimensions of the CUES. Data results are shown in 21 tables, and 2 figures; the 3 appendixes include the data-gathering instruments, the factor structure for the 100-item CUES, and a questionnaire. (Author/MJB)

ETHNIC AND SEX DIFFERENCES AS RELATED TO STUDENT PERCEPTIONS OF A UNIVERSITY ENVIRONMENT

BY

WAYNE ROBERT MURRAY, B.S.Ed., M.A.

A Dissertation submitted to the Graduate School
in partial fulfillment of the requirements
for the Degree
Doctor of Philosophy

Major Subject: Educational Research

Related Area: Statistics

New Mexico State University
Las Cruces, New Mexico

July 1972

"Ethnic and Sex Differences as Related to Student Perceptions of a University Environment," a dissertation prepared by Wayne Robert Murray in partial fulfillment of the requirements for the degree Doctor of Philosophy, has been approved and accepted by the following:

Dean of the Graduate School

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The writer also wishes to express his gratitude to his wife, Norma, for her assistance in proofreading the document.

The writer would like to dedicate this study to his parents, Joseph and Hilda Murray.

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ABSTRACT

ETHNIC AND SEX DIFFERENCES AS RELATED TO STUDENT PERCEPTIONS OF A UNIVERSITY ENVIRONMENT

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Purposes and Hypotheses of the Study

The purposes of this study were to: (a) examine the factor structure of the College and University Environment Scales (CUES) for the bilingual/bicultural full-time unmarried undergraduate student population at the University of Texas at El Paso (U.T. El Paso); (b) compare the perceptions of the university environment by full-time unmarried undergraduate Mexican-American students with the perceptions of full-time unmarried undergraduate Anglo students; and (c) test the theory of cognitive dissonance in the field of student affairs. Hypotheses tested were:

1. The factor structure obtained on the CUES using a sample of U.T. El Paso students will not differ from the factor structure found by Pace using a national sample.

2. The groups Mexican-American males, Mexican-American females, Anglo males, and Anglo females will not differ on the four dimensions of the CUES.

3. Mexican-American students who report conflict between Mexican and American ways and who report no conflict between Mexican and American ways will not differ on the four dimensions of the CUES.

Procedures

A stratified nonproportional random sample of 480 full-time unmarried undergraduate students was selected from the U.T. El Paso student body. Nearly 70% of the sample responded to a telephone request and participated in the study by completing the CUES questionnaire and a demographic information questionnaire.

In addition to testing the three hypotheses, two procedures were used in an attempt to determine whether or not the non-respondents differed from the respondents. Statistical procedures used were: (a) factor analysis; (b) Hotelling's T^2 statistic; (c) Cochran's test for homogeneity of variance; (d) Bartlett's test for homogeneity of variance; (e) Student's t test; (f) Kendall rank correlation coefficient; (g) analysis of variance; and (h) Pearson product-moment correlation.

Findings

The information available on the respondents and non-respondents indicated that the groups were not different. However, since the information for the above conclusion was made using limited data, generalizations to the defined population should be made with caution.

Other findings were: (a) Hypothesis one--While the overall patterns of responses were similar, the factor loadings for the U.T. El Paso sample were lower than were the factor loadings for the national sample; (b) Hypothesis two--Anglo students perceived the U.T. El Paso environment as more scholarly than did the Mexican-American students; also, men scored higher on the awareness scale than did women; and (c) Hypothesis three--No differences were found for this hypothesis.

Conclusions

The lower factor loadings for the U.T. El Paso sample were attributed to the use of the individual as the unit of measure rather than using the institution as the unit of measure. The two differences found when testing hypothesis two were attributed to ethnicity and sex, respectively. It was felt that hypothesis three was not rejected because either no relationship existed between reported conflict between Mexican and American ways and environmental perceptions, or the instruments and sample sizes were not adequate to detect existing differences.

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CHAPTER I

INTRODUCTION

Researchers have found that schools have a climate or "personality" that is unique to each institution. Halpin & Croft (1963) found six different climates in their study of 71 elementary schools: open, autonomous, controlled, familiar, paternal, and closed. Investigating the personality of institutions of higher learning, C. Robert Pace (1967) found that these schools could be successfully described using five scales or dimensions. These dimensions are Practicality, Community, Awareness, Propriety, and Scholarship. Measures of variables making up each of these dimensions are obtained by a questionnaire which is administered to the students. The students answer items true or false, depending on their perception of the school. From these responses a profile of the school on the five dimensions can be constructed. The information provided in the profile can then be used as a basis of making decisions concerning administrative or curricula changes. Using Pace's College and University Environment Scales (CUES), researchers have found that sub-populations within a given institution perceive the institution in different ways (Pace, 1966).

The CUES has, for example, been used to study the perceptions of men versus women, residents versus commuters, and successful

versus unsuccessful students (Pace, 1966). However, few studies have been conducted to determine if students of different ethnic backgrounds have different perceptions of the university environment. At this point in time it can only be hypothesized whether or not differences in the perception of the university environment exist between Mexican-American students and Anglo students. Decisions made by university faculty and administrators should be made using documented information rather than conjecture.

The Problem

Statement of the Problem

University administrators are in need of more information from which to make pertinent decisions. The recent uprisings on the nation's campuses indicate that there is a lack of understanding between college administrators and their students. The College and University Environment Scales (CUES) has been used to obtain a picture or profile of a university as perceived by its students. Also the CUES has been used to study differences between student subpopulation perceptions at different colleges and universities. However, few studies have been conducted to determine if differences in perception of the university environment exist between students of different ethnic backgrounds. More specifically, no studies involving the perceptions of the campus environment by Mexican-American students were found.

Need for the Study

The administration of a modern college or university is based on the philosophy that the institution is concerned with all aspects of student life. In order to make rational decisions concerning curriculum offerings and personnel services, it is necessary for the administrators of the institution to understand its students and the differences that exist between subpopulations of the student body.

In addition to the routine collection of basic demographic data such as age distribution, geographic origin, high school grades, and grades on standardized tests, many institutions are attempting to investigate their students at a higher level. This higher level information involves such areas as student attitude towards themselves and their campus, student perceptions of the college or university environment, and other studies that look at specific groups of students and their problems (Bolton & Kammeyer, 1967; Crossland, 1971; Feldman & Newcomb, 1969).

In order to provide administrators with information necessary for intelligent planning, a greater understanding of the differences which exist between student subcultures should be acquired. Deutsch (1963) pointed out that there has been little effort to prepare administrators to assist the student in the transition from one cultural context to another. This is especially true at the college level where there is a paucity of research dealing with the problems of Spanish-speaking students. Deutsch (1963)

continued on to say:

> This transition (from one culture to another) must have serious psychological consequences for the child, and probably plays a major role in influencing his later perceptions of other social institutions as he is introduced to them [p. 163].

The increased commitment to minority group education but lack of concomitant evaluation was elaborated on by a Ford Foundation Task Force (Newman, Cannon, Cavell, Cohen, Edgerton, Gibbons, Kramer, Rhodes, & Singleton, 1971) when they reported:

> Today, prodded by the civil rights revolution and concern for the disadvantaged, colleges and universities, from the most to the least selective, in all regions, profess a responsibility to meet the educational needs of minorities.
>
> We as a nation are thus engaged in the most far-reaching reform in higher education of the postwar period, one that tests the capacity of our institutions to transform themselves to serve all students better. Yet, to date, only a few studies evaluating the results are available [p. 44].

Y. Arturo Cabrera (1967) pointed out that:

> Recent publications, though providing a historical orientation, do not make substantial contributions to our knowledge of what is happening to Mexican-Americans today, nor do these sources provide sound bases for projection and planning of programs for this ethnically different minority group [p. 102].

Some researchers (Anderson & Safar, 1967; DeBlassie & Healy, 1969; Demos, 1962) have found differences on various dependent variables for elementary and secondary school Mexican-American students when compared with Anglos. However, the extent to which these differences remain in college students is unknown.

Until this information is available, decisions concerning these students will have to be made with less than complete information.

In addition to the practical significance of solving the previously stated problem, the study also tested the cognitive dissonance theory in a new context (Festinger, 1957). It was felt that Mexican-American students who reported difficulties functioning in both Mexican and American cultures would attempt to reduce this dissonant relationship by distorting their perceptions of the university's environment. Thus, according to the theory of cognitive dissonance, these students would report that the university was an unfriendly place where people were unaware of the social and political realities of the bicultural student population. Extension of the theory of cognitive dissonance into the field of student affairs further justified the need for the study.

Purposes of the Study

The purposes of the study were: (a) to examine the factor structure of the CUES for the bilingual/bicultural student population at the University of Texas at El Paso (U.T. El Paso); (b) to provide U.T. El Paso administrators with information concerning the perceptions of the university environment by full-time unmarried undergraduate Mexican-American students when compared with full-time unmarried undergraduate Anglo students; and (c) to test the theory of cognitive dissonance in the field of student affairs.

Objectives of the Study

The objectives of the study were to:

1. Determine the factor structure of the CUES for the bicultural/bilingual full-time unmarried undergraduate student population at U.T. El Paso and compare it with the factor structure reported by Pace (1967);

2. Determine and compare perceptions of the university environment for Mexican-American and Anglo full-time unmarried undergraduate students at the U.T. El Paso; and

3. Test the theory of cognitive dissonance by comparing perceptions of the university environment for full-time unmarried undergraduate Mexican-American students who report conflict between Mexican and American ways of life with full-time unmarried undergraduate Mexican-American students who report no conflict between Mexican and American ways of life.

Limitations of the Study

The study was limited to:

1. Unmarried full-time undergraduate Mexican-American and Anglo students at U.T. El Paso.

2. The constructs measured by the CUES.

Assumptions of the Study

The assumptions of the study were:

1. The findings would be generalizable, with some caution, to all full-time unmarried undergraduate students at U.T. El Paso.

2. The students would respond to the CUES honestly.

3. Factor analysis is a valid procedure for determining constructs measured by a questionnaire.

Definitions of Terms

College or university environment. The "personality" of a college or university. The personality is determined by all aspects of the college: its courses, professors, books, tests, lectures, rules and regulations, location, type of student body, etc.

Environmental dimensions Practicality, Community, Awareness, Propriety, and Scholarship. Different aspects of the college environment. The definition of each of these constructs appears on page 14 of this dissertation.

Factor analysis. A statistical procedure used to identify constructs which are similar, opposite, or unrelated to each other. The procedure is often used to classify a number of variables in terms of fewer and more general relationships (Harman, 1960).

Factor scores. Scores for each subject on each factor obtained as part of the factor solution. The scores are uncorrelated ($r=0$) between factors.

Mexican-American. A person with a surname which appeared on the Census Bureau's list of typical Spanish surnames and who speaks both Spanish and English.

Perceptions. The way in which the student expresses his interpretation of the college environment.

The 66+/33- scoring procedure. The scoring procedure used by Pace (1967) which gives an institution the score of one for an item if 66% of the respondents mark the item in the keyed direction, a score of minus one if less than 33% of the respondents mark the item in the keyed direction, and a score of zero otherwise.

Organization of the Report

Chapter II presents a comprehensive review of the literature and research related to the problem. The review centered on: (a) Mexican-Americans in college, (b) measurements of college and university environments, (c) studies involving precollege Mexican-American students, and (d) the theory of cognitive dissonance.

Chapter III discusses the sampling procedures, statistical design, and procedures used in carrying out the study. First, the standard 100-item CUES was factor-analyzed using the data from the U.T. El Paso sample. Characteristics of the factor structure for the U.T. El Paso sample were then compared with selected characteristics of the structure for the national sample. Factor analysis was then used in a scoring procedure to obtain a factor solution to the 160-item form of the CUES. Factor scores obtained from the four-factor solution were then used in two-way analyses of variance to test the hypotheses.

Chapter IV first presents the results of comparing the factor structures for the national sample with the U.T. El Paso sample. The four-factor solution of the 160-item CUES is presented next.

Finally, the comparisons between Mexican-Americans and Anglos and between Mexican-Americans reporting different degrees of conflict between Mexican and American ways are reported.

The study is summarized in Chapter V. Findings of the study are discussed with respect to related research. This is followed by a statement of conclusions based upon the outcomes of the study. From these conclusions, recommendations for further research and to U.T. El Paso administrators are made.

CHAPTER II

REVIEW OF THE LITERATURE

There are four general areas reviewed in this chapter. Each topic was chosen for its relevance to the problem and purpose of the study. The first section describes the characteristics of Mexican-American college students; the second reviews the area of college and university environments. Section three focuses on studies involving precollege Mexican-American students, while the fourth section covers the theory of cognitive dissonance.

Mexican-Americans in College

Probably the most outstanding reason little research has been done concerning Mexican-Americans in higher education is that there are relatively few Mexican-Americans in higher education. Of the 15,533 undergraduates at the University of Texas at Austin in the fall of 1958, only 518 were Spanish-surnamed. By the fall of 1967, the total enrollment at this school rose to 22,559 students while the Spanish-surnamed population increased to only 634 (Carter, 1970). Thus, while the number of Mexican-American students increased by 116 during this 11-year period, the percent of Mexican-Americans in the student body decreased from 3.3% to 2.8%.

However, 1966 marked the beginning of a major effort to incorporate members of ethnic minorities into the mainstream

institutions of American higher education (Newman et al., 1971). Despite the importance of this commitment to the minority groups, little effort was made to evaluate the results of this major change in higher education. Consequently, the Ford Foundation Task Force claimed that much confusion has developed regarding these changes (Newman et al., 1971). They recommended that:

1. Dissemination of the modest amount of information now available on the members of minority groups be initiated;

2. An immediate effort be made to collect more data, evaluate practices, estimate cost, and develop more effective programs for minority group students; and

3. A major national study of minority group participation in higher education be made.

Since Black Americans represent the most numerous minority group in higher education, most of the information concerning minority groups has involved these students.

In 1969, estimates indicated 470,000 Black Americans and 50,000 Mexican-Americans were enrolled in institutions of higher education (Crossland, 1971). These numbers represented respectively 5.8% and 0.6% of the total enrollment in institutions of higher education in the United States. Stated in another way, 2.0% and 1.0% of the Black- and Mexican-American populations and 4.3% of the total nonminority population were enrolled in institutions of higher education. Thus the minority groups in general and the Mexican-Americans in particular were

underrepresented in higher education. To eliminate such an underrepresentation, an increase of 165,000 Mexican-American college students would have been required.

While the Mexican-Americans remain underrepresented, Carter (1970) suggested that their numbers were increasing and the younger generation of Mexican-Americans were remaining in school longer. The University of Texas at El Paso (U.T. El Paso) enrolled approximately 11,300 students during the fall semester of 1971. Of this total, approximately 36% or 4,100 students were Spanish-surnamed.[1] The percent of Mexican-American students at U.T. El Paso can be compared with the following data reported by Carter (1970) for a sample of other colleges in the Southwest. The composite average student body percent of Mexican-Americans at the University of Arizona, the University of California at Riverside, the University of Colorado, California State College at Los Angeles, Northern Arizona University, the University of Texas, and New Mexico Highlands University in the school year 1966-67 was approximately 10%. Thus, U.T. El Paso with its 4,100 Spanish-surnamed students has approximately 8.2% of all the Mexican-American students enrolled in institutions of higher education in the United States.

---

[1]These and other data concerning U.T. El Paso were compiled by the author when he was employed by U.T. El Paso.

In summary, it can be said that Mexican-Americans, while underrepresented in higher education, represent the second largest minority group in higher education. It is clear that more programs for this group of students must be developed and that information concerning these students is not adequate for the efficient and effective development of these programs.

Measurement of College and University Environments

There are three procedures which have been used by researchers to describe university environments. The first involves the tabulation of descriptive information such as the total number of students, the number of males and females, the number of students from various geographic regions, etc. A second procedure tabulates the types of activities students engage in while in school. Using this method of description, researchers can, for example, examine the differences in social, athletic, and religious attendance patterns for student groups within and between colleges. The third method of environmental description involves the students' perception of the environment. The third procedure was used in the present study and is described in detail in the following section of this report (Centra, 1972).

The College and University Environment Scales

The College and University Environment Scales (CUES) was developed by Pace (1967) from a factor analysis and an item analysis of Pace and Stern's (1958) College Characteristics Index (CCI) (Astin, 1971). Five factors or scales were obtained

from this statistical process. These environmental dimensions were named and defined by Pace (1967) as follows:

1. Practicality - the extent to which the campus environment is characterized by enterprise, organization, material benefits, and social activities. Orderly supervision in the administration and classwork are characteristic of schools with a high practicality score.
2. Community - This scale describes the extent to which the campus is friendly, cohesive, group-oriented. Life on a campus with a high community score is characterized by togetherness and sharing rather than by privacy and cool detachment.
3. Awareness - the extent to which the ideas of self-awareness, awareness of society, and the awareness of aesthetic stimuli are stressed by the environment. Political activity, self-expression, and personal expressiveness will be tolerated and encouraged on a campus which scores high on this scale.
4. Propriety - This scale describes the extent to which the environment is polite, considerate, and mannerly. A school which scores high on this scale would be described as cautious, mannerly, considerate, proper, and conventional.
5. Scholarship - the extent to which intellectuality and scholastic ability are stressed. The pursuit of knowledge and theories, scientific or philosophical, is carried on rigorously and vigorously at schools which score high on this scale.

The primary purpose of the CUES is to obtain a profile of the institution based on the five scales defined above. Using this procedure, Pace (1967) obtained different profiles for eight types of institutions of higher learning: Teachers Colleges, General Universities, Selective Colleges, Denominational Liberal Arts Colleges, General Liberal Arts Colleges, Engineering Schools, Selective Universities, and Selective Liberal Arts Colleges. To the individual knowledgeable in the field of higher education,

the profiles were not surprising. For example, Selective Universities scored very high on Scholarship and Awareness but scored very low on Practicality. Almost diametrically opposed to these schools were Teachers Colleges, which scored low on Scholarship and Awareness and high on Practicality (Pace, 1967).

In addition to the primary descriptive function of the CUES, Pace (1966) indicated that the CUES could be used to compare perceptions of different groups about the university. Pace (1966) also reviewed and synthesized several of the studies utilizing the CUES for comparison of groups within a college or university:

1. Analyzing data from 11 schools, it was found that men and women perceive the dimensions Scholarship and Practicality virtually the same. However, women scored higher on the other three scales. Thus women tend to find the college environment a more congenial, friendly, and considerate community than men. Also, women are more aware of the esthetic and political aspects of campus life than men.

2. Sixteen other colleges reported scores for both students and faculty. The faculty scored higher on all dimensions than did the students. One interpretation of this phenomenon might be that the faculty tends to be more idealistic than the students. Also, the two groups bring to the environment different sets of needs and their perception of the environment is colored by these different needs. Regardless of the reasons for these differences,

they can be used as a measure of possible conflict between faculty and students. At the very least the scores can be used as an information base for the school counseling center.

3. Sophomores, juniors, and seniors reported similar perceptions of the school's environment, but freshmen tended to report higher scores on all scales. This was probably because these new students had not yet formed reliable opinions concerning the campus environment.

4. Using data from four schools, Pace (1966) reached the tentative conclusion that the perceptions of residents and commuters were basically the same. The one trend that might be emerging from these limited data was that residents had slightly higher scores on the Community scale. The scores on the other scales did not differ appreciably among groups. Students with different majors had different scores on the Scholarship scale, but the scores on the other scales were similar.

5. No differences were found between successful and unsuccessful students. Although only four schools reported this type of data, Pace reached the tentative conclusion that groups of students who differ in academic success nevertheless perceive the college environment in similar terms.

6. Summarizing the results of eight correlational studies involving the constructs academic ability and personality characteristics as compared with environmental perception, Pace reported

that no important or meaningful relationships existed between these constructs.

In addition to the results reported by Pace, other researchers have reported the results of college environment studies. Lynch & Sedlacek (1971) compared the CUES scores of administrators' perception of the ideal college, administrators' perception of their own college, freshmen expectations of the college environment, and freshmen perceptions of the environment. It was found that the administrators' ideal and freshmen expectations were similar, differing significantly only in that administrators desired more Propriety than the freshmen expected. Freshmen and administrator actual perceptions were similar, except that the administrators had higher scores on the Practicality and Awareness scales.

Studying the environment of seven small, religiously oriented colleges, Boyer & Michael (1968) found that the perceptions of seniors and faculty members were almost identical. This finding at first seems contradictory to the results reported by Pace (1966) where the faculty scored higher than the students on all scales. However, when one considers the very homogeneous populations at small, religiously oriented colleges, the results of this study are not surprising.

Sasajima, Davis, & Peterson (1968) studied the relationships among six indices of student protest and the five dimensions of the CUES. The six general areas of student protest were determined

by a factor analysis of responses from 849 institutions and were named: Quality of Instruction, Faculty Affairs, Administrative Paternalism, Politically Extremist Visitor, Civil Rights, and U.S. Militarism. The first four of these factors involved campus problems, while the last two represented national and international problems. The results showed that none of the CUES dimensions could be used to predict the protesting of campus problems, but the CUES dimensions of Awareness and Propriety were successful predictors of Civil Rights protest problems. In addition, the CUES dimensions Awareness and Community were good predictors of protest against U.S. Militarism. The authors concluded that the types of questions asked in the CUES were not conducive to the prediction of campus-related problems.

Other College and University Environment Studies

Buckley (1971) compared freshmen and transfer students' expectations of the college environment using Stern's College Characteristics Index (CCI). The freshmen and transfer students had very similar expectations of the environment as measured by the eight dimensions of the CCI. However, these expectations of the environment were considerably different from those reported by juniors and seniors at the school.

Ivey & Wilson (1971) also used the CCI in a longitudinal study to measure the changes in the perceived environment at Colorado State University. During the period from 1964 to 1968, the university added approximately 6,000 new students, increased

faculty size and graduate student enrollment considerably, and saw the growth of an emerging student activism in student affairs. The first interesting result of the study was that in the 1964 study, 161 of the 190 students invited to take the questionnaire did so, but in the 1968 study only 100 of the 274 students completed the questionnaire. Keeping this limitation in mind, the authors reported finding significant differences on four of the 11 environmental measures. Significantly lower scores were recorded for the dimensions aspiration level, self-expression, social form, and vocational climate. These differences were attributed to changes in size and structure of the university.

Comparison of Environmental Measurement Instruments

In comparing several instruments used to establish environmental profiles, Boyer & Michael (1965) found the CUES superior because it provided: (a) a more parsimonious evaluation of institutional differences, (b) greater score reliability, and (c) scores that could be compared across institutions. Pace (1967) used Cronbach's (1951) coefficient alpha as a measure of reliability. The alpha coefficients for the scales Practicality, Community, Awareness, Propriety, and Scholarship were .89, .92, .94, .89, and .90, respectively.

The validity of the CUES has been established by researchers who have correlated the dimensions of the CUES with measures of student behavior, performance, and perception. Astin (1971) correlated the eight scales of the Inventory of College Activities

(ICA) with the five scales of the CUES. These intercorrelations are presented in Table 1. In general, the highest correlations exhibited between constructs are consistent with the semantic meaning of the scales. For example, Scholarship correlates highest positively with Academic Competitiveness and highest negatively with Emphasis on Social Activities. These high correlations between semantically related constructs, along with the low correlations between semantically unrelated constructs, support the validity of the CUES.

In addition to the above validity study, Astin (1962) correlated five institutional factors with the five scales of the CUES. The results are presented in Table 2. Again the data support the validity of the CUES. For example, the size of the student body is negatively correlated with the Community scale, that is, the larger a school becomes, the less the students perceive the environment as friendly and congenial. The institutional factor "Technical emphasis" is negatively related to both Community and Awareness, suggesting that students at technical schools do not perceive their institutions as having either a group-orientation or esthetic emphasis.

Finally, Pace (1967) collected data relevant to student aptitude and correlated these data with the five dimensions of the CUES. The results are presented in Table 3. Pace reported only those correlations which were significant at the .01 level.

TABLE 1

Correlations Between ICA Image Factors and CUES Scales (N=59 Institutions)

ICA Image Factor	CUES Scale					R^{2a}
	Practicality	Community	Awareness	Propriety	Scholarship	
Academic Competitiveness	-.40	-.29	.07	-.12	.59	.56
Concern for the Individual Student	-.39	.42	.14	.12	.23	.49
School Spirit	.17	.34	.30	.06	.02	.23
Permissiveness	-.49	-.39	.42	-.42	.31	.53
Snobbishness	-.31	-.08	.44	-.24	.02	.41
Emphasis on Athletics	.23	.12	-.30	.20	.05	.26
Flexibility of the Curriculum	-.03	.20	.47	-.20	.05	.38
Emphasis on Social Activities	.38	-.03	-.05	-.33	-.50	.44
R^{2b}	.65	.66	.59	.44	.61	

Note.--Source: Astin (1971, p. 170).

[a]Squared multiple correlation between ICA factor and all CUES scales.

[b]Squared multiple correlation between CUES scale and all ICA factors.

TABLE 2

Correlations Between CUES Scale Scores and Institutional Factors

Institutional Factors	CUES Scale Scores				
	Practicality	Community	Awareness	Propriety	Scholarship
Affluence	-.65	-.03	.46	-.38	.65
Size	.22	-.65	-.01	-.27	-.08
Masculinity	.15	-.26	-.24	-.30	-.02
Homogeneity	-.32	-.16	-.25	.28	.14
Technical Emphasis	.23	-.40	-.30	-.16	-.13

Note.--Source: Astin (1962, p. 228).

TABLE 3

Correlations Between Aptitude Variables and CUES Scale Scores

Aptitude Variable	CUES Scale Scores				
	Practicality	Community	Awareness	Propriety	Scholarship
Mean SAT scores of entering freshmen	-.74		.53		.60
Intellectuality	-.62		.28	-.33	.60
National Merit Scholarship Qualifying Test	-.55	-.44		-.47	.38
Member of top 10% of high school class			.35		

Note.--Source: Pace (1967, p. 47).

Supporting the validity of the CUES are the high positive correlations between the four aptitude variables and the Scholarship and Awareness factors.

Studies Involving Precollege Mexican-American Students

As was mentioned earlier, there has been little research concerning Mexican-American college students and none involving their perceptions of the university environment. However, there has been some research conducted with elementary and secondary school Mexican-American students. For the most part, this research has taken the form of comparisons of Anglos with Mexican-Americans across both cognitive and affective domains.

In investigating the self-concept of Mexican-American students, Carter (1968) reported that "most educators who deal with Mexican-American children are convinced that the group contains a larger than normal percentage of individuals who view themselves negatively [p. 217]." In order to test this hypothesis, a group of ninth-grade students rated themselves on the personality traits of personal intelligence, goodness, happiness, and power. The adjectives "wise-foolish," "good-bad," "happy-sad," and "strong-weak" were used on a five-point semantic differential scale to rate the personalities of the students. Carter found that no significant differences existed between Mexican-American and Anglo students.

DeBlassie & Healy (1969) investigated the self-concepts of Negro, Anglo, and Mexican-American adolescents. Using the

Tennessee Self Concept Scale, they found that the total score was unaffected by the ethnicity factor. However, differences were found on some of the subscales. Mexican-American students were the most satisfied with the way they perceived themselves, and the Anglos were least satisfied with their self-perceptions. Also, Mexican-American and Negro students were less willing to convey derogatory information about themselves than were Anglo students. Finally, DeBlassie & Healy (1969) reported that Negro and Mexican-American students exhibited a greater amount of defensive distortion in their self-descriptions than Anglo students. It appears that Mexican-American adolescents have established a position which tends to be protective and supportive of a positive self-concept.

The present-time and fatalistic outlook of Mexican-Americans reported by Zintz (1963) was also found to exist in third and fourth generation twelfth-grade Mexican-American students (Justin, 1970). This information could be used to explain the high attrition rate of Mexican-American students reported by Carter (1970) and Manuel (1965).

Anderson & Johnson (1971) attempted to identify unique characteristics of Mexican-American families that affected the educational achievement of their children. In addition to finding that parents of Mexican-American children had a low socioeconomic status, it was also found that Mexican-American children had less confidence in their ability to succeed than

their classmates. Further, a child's achievement in both English and mathematics was found to be highly affected by his confidence in his ability to succeed in school. The student's mastery of English was found to be related to the language spoken in the home and the father's educational background. Finally, it was found that achievement in mathematics appeared to be related to the student's desire to achieve in school.

In studying Mexican-American, Negro, and Anglo children in the Berkley, California, area, Jensen (1972) found that Anglo children received significantly higher scores on the variables verbal I.Q., achievement, and socioeconomic status than Mexican-American and Negro children. Mexican-American and Anglo students scored similarly on both nonverbal I.Q. and rote memory tests. Negro children scored significantly lower than both Mexican-American and Anglo children on the nonverbal I.Q. tests. This research by Jensen adds to the evidence that by the time students of different ethnic backgrounds are tested in the elementary schools, differences do, in fact, exist between the groups.

Hishiki (1969) reported finding significant differences between the self-concepts of sixth-grade girls of Mexican-American descent when compared with Anglo sixth-grade girls. Also, differences have been found in attitudes toward school and achievement when Mexican-American and Anglo children were compared (Anderson & Safar, 1967; Demos, 1962).

In summary, it appears that differences between Mexican-American and Anglo students exist prior to the students' matriculation at an institution of higher learning. The extent to which these differences, which were attributed to ethnicity, influence the students' perceptions of the environment was investigated in this study.

The Theory of Cognitive Dissonance

The theory of cognitive dissonance concerns itself with the conditions that evoke dissonance (discord) in an individual and with the ways in which dissonance can be reduced (Brehm & Cohen, 1962). Cognitive elements or cognitions are items of information or knowledge concerning the individual or his environment. A dissonant relationship exists between cognitions when an individual possesses one which follows from the obverse of another that he possesses. For example, if A and B are facts and if A implies B, then holding A and the obverse of B is dissonant. Thus, a dissonant relationship exists when an individual smokes and knows it will cause poor health and at the same time desires good health. In order to reduce dissonance, the person can change his behavior by no longer smoking or change his perception of the situation by convincing himself that the studies have not adequately established a relationship between smoking and poor health.

The core of the theory of cognitive dissonance holds that:

1. Individuals may hold dissonant or "nonfitting" relations among cognitive elements.

2. The existence of dissonance in an individual gives rise to pressure to reduce the dissonance and to avoid increases in dissonance.

3. These pressures influence the individual's behavior, perceptions, and cognitions (Festinger, 1957).

A Mexican-American student lives in two worlds. First, there is his life at home where his parents and grandparents speak a great deal of Spanish and observe many Mexican traditions. When the student leaves home and travels to the university, he enters a different world--the world of the Anglo middle class society. It is the contention of the writer that Mexican-Americans who find Mexican and American ways dissonant will attempt to reduce this dissonance by perceiving the university environment as a less friendly and congenial place than the way Mexican-American students who do not consider the two cultures dissonant perceive the university environment.

Summary

Four areas were reviewed in this chapter. The first described the Mexican-American college student population as the second largest minority group. The second section reviewed the college and university environment with respect to

instrumentation and studies using these descriptive instruments. In particular, attention was focused on the CUES. Section three showed that differences between precollege Mexican-American and Anglo students have been found on a variety of measures. The last section covered the theory of cognitive dissonance and showed how it relates to the present study.

CHAPTER III

RESEARCH METHODS AND PROCEDURES

The purpose of this chapter is to describe the research methods and procedures used to conduct the study. The chapter is divided into three sections. The first section involves a discussion of the sampling design, collection of the data, the respondents, and the procedures used to compare the respondents and the nonrespondents. The instrumentation used in the study is dealt with in the second section. The last section presents a discussion of the analytical procedures used to test the hypotheses.

Sampling Procedures

A discussion of the sampling design, the respondents, and the two procedures used to compare respondents and nonrespondents are presented in this section.

Sampling Design

The subjects for this study consisted of a stratified non-proportional random sample of all full-time unmarried undergraduates at the University of Texas at El Paso (U.T. El Paso). The sample was stratified on the following basis:

1. Ethnicity
    A. Anglo
    B. Mexican-American

2. Sex
   A. Male
   B. Female
3. Classification
   A. Freshman
   B. Sophomore
   C. Junior
   D. Senior

This stratification was selected in consideration of the population and the instrument. Selltiz, Jahoda, Deutsch, & Cook (1959) recommended a stratified sample when differences exist, or are thought to exist, between strata.

The Office of Institutional Studies at U.T. El Paso assigned a number to each unmarried full-time undergraduate student and then divided the numbers into 16 categories based on the stratification. The 1960 Census Bureau's list of typical Spanish surnames was used to determine a subject's ethnicity. In a few cases, individuals were reclassified after completion of a demographic information instrument.

Using a random number table, 30 numbers were drawn for each category. The numbers were matched with the names; the subjects were called on the telephone, advised of the nature of the study, and asked to report to the Office of Institutional Studies for the administration of the instrument. A secretary at the Office

of Institutional Studies administered the College and University Environment Scales (CUES), repeating the same set of instructions to all students who took part in this study.

The Respondents

Of the 480 students who were contacted by telephone, 313 (approximately 66% of the students) responded by participating in the study. Three of these respondents did not complete the instrument, and 8 were either graduate students or married. Thus, the usable sample was 302 students. The number of subjects in each of the 16 basic categories and the 4 and 2 supra-categories is shown in Table 4.

TABLE 4

Distribution of Responding Students

Classification	Anglo		Mexican-American	
	Male	Female	Male	Female
Freshmen	17	20	21	14
Sophomores	15	19	14	20
Juniors	12	18	21	22
Seniors	21	26	19	23
	65	83	75	79
Totals	148		154	
	302			
Nonusable Responses	3 Incomplete			
	8 Misclassified			
Grand Total	313			

Comparison of Respondents and Nonrespondents

In order to determine whether or not the nonrespondents differed from the respondents, two procedures were used. First,

the Verbal Scholastic Achievement Test (V-SAT) scores, Mathematics Scholastic Achievement Test (M-SAT) scores, high school rank (by quartile), and current college grade point average (GPA) were recorded for both respondents and nonrespondents. The data were obtained from the students' permanent record files in the Registrar's Office. Because some of this information was not available on all students and because several records could not be located, these data were not complete. Univariate Student's t tests were conducted on each of these measures to determine the degree of similarity between the two groups. The hypothesis of equal means would be tenable if the calculated Student t values were less than the tabled t value with $\alpha = .05$. Alpha, the probability of a type one error, was set at .05 for all analyses in the study.

While the procedure discussed above was an indirect method of comparing the two groups, the next procedure involved a comparison of the respondents and a sample of the nonrespondents on the dependent variables derived from the factor analysis of the 160-item version of the CUES.

An attempt was made to contact by phone all the nonrespondents. The same telephone procedure that was employed in the original data-gathering effort was used in the follow-up study. Of the 178 nonrespondents, 40 were no longer students at U.T. El Paso, 31 were not interested in participating in the study, 59 could not be reached (moved, no answer, not at home, etc.), and

48 said they would participate in the study. Of the 48 students who indicated they would participate, only 20 responded by taking the CUES. The distribution of these 20 students and the distribution of all students responding to the CUES are listed in Table 5.

TABLE 5

Distribution of Follow-Up Study Respondents and All Responding Students

Classification	Anglo		Mexican-American	
	Male	Female	Male	Female
	Follow-Up Study Respondents			
Freshmen	--	--	--	1
Sophomores	2	--	1	1
Juniors	--	4	2	3
Seniors	1	1	2	2
	3	5	5	7
Totals	8		12	
	20			
	All Responding Students			
Freshmen	17	20	21	15
Sophomores	17	19	15	21
Juniors	12	22	23	25
Seniors	22	27	21	25
	68	88	80	86
Totals	156		166	
	322			
Nonusable Respondents	3			
	8			
Grand Total	333 = 69.4% of the sample			

The CUES responses for the nonrespondents were added to the data for the original respondents and factor analyzed.

The rationale, techniques, and results of the factor analysis procedures are discussed later in this chapter and in Chapter IV. Factor scores were found for each factor for both respondents and nonrespondents. These factor scores were then used as dependent measures to determine the degree of similarity between the two groups.

The two groups were considered similar in the dependent measures if the hypothesis of equal group means could not be rejected with the probability of a type one error set at 5 percent.

Hotelling's T^2 statistic (Morrison, 1967) was used to compare the two groups on the four factors obtained from the factor analysis of the instrument. The T^2 statistic involves the computation of the following formulas:

$$(1) \quad T^2 = \frac{N_1 N_2}{N_1 + N_2} (\bar{X}_1 - \bar{X}_2)' S^{-1} (\bar{X}_1 - \bar{X}_2)$$

and

$$(2) \quad F = \frac{N_1 + N_2 - p - 1}{(N_1 + N_2 - 2)p} T^2$$

where equation (2) has the $\underline{F}$ distribution with $p = 4$ and $N_1 + N_2 - p - 1 = 317$ degrees of freedom and where the other variables in the formulas are defined in Table 6, and where

$$A_i = \sum_{h=1}^{N_i} X_h X_h' - N_i \bar{X} \bar{X}' \quad ; \; i = 1,2$$

and X_h is the response vector for student h, $h = 1,2,\ldots,N_i$.

The hypothesis of equal means was accepted for values of $\underline{F}$ (in formula (2)) less than the tabled $F_{.05,4,317}$ value.

TABLE 6

Components of the Two-Sample T^2 Statistic

	Sample of Nonrespondents	Respondents
Sample Size	$N_1 = 20$	$N_2 = 302$
Mean vector (4 dependent variables)	$\bar{X}_1 = [\bar{X}_{11},\ldots,\bar{X}_{14}]$	$\bar{X}_2 = [\bar{X}_{21},\ldots,\bar{X}_{24}]$
Matrix of sums of squares and products	A_1	A_2
Pooled covariance matrix	$S = \frac{1}{N_1 + N_2 - 2}(A_1 + A_2)$	

The procedure used to test the equality of covariance matrices is a generalization of the Bartlett test for the homogeneity of $\underline{k}$ variances and involved the computation of the following formulas:

$$(3) \qquad S = \frac{N_1 S_1 + N_2 S_2}{N_1 + N_2}$$

where $$S_i = \frac{A_i}{N_i - 1}$$

and

$$(4) \qquad M = N_1 + N_2 \ln |S| - N_1 \ln |S_1| + N_2 \ln |S_2|$$

and

$$(5) \quad C^{-1} = 1 - \frac{2p^2 + 3p - 1}{6(p + 1)(k - 1)} \left(\sum_{i=1}^{2} \frac{1}{n_i} - \frac{1}{N_1 + N_2} \right)$$

where $p = 4$, $k = 2$, $N_1 = 20$, $N_2 = 320$.

The quantity MC^{-1} is approximately distributed as a chi-squared variate with $(k - 1)p(p + 1)/2 = 10$ degrees of freedom. The assumption of equal covariance matrices is tenable if $MC^{-1} < \chi^2_{.05,10}$.

Instrumentation

There were two data-gathering instruments used in this study. The primary instrument was the College and University Environment Scales (CUES). In addition to the CUES, one item from a socio-linguistic questionnaire was used to classify subjects for testing hypothesis three. The CUES and the one-item classification variable are listed in Appendix A of this report.

The College and University Environment Scales (CUES)

A discussion of the development, uses, and research conducted involving the CUES was presented in Chapter II. It was also demonstrated that the factors delineated by this instrument had high reliability coefficients. The concurrent validity, also discussed in Chapter II, was established by comparing this instrument with other environmental measurement instruments.

Development of the CUES--Second Edition

In constructing the second edition of the CUES, Pace (1967) factor-analyzed the 150-item first edition of the instrument, using a principal components solution, with unity in the diagonal and orthogonal rotation to eight factors. The unit of measure for the factor analysis was the institution rather than the individual. One hundred schools received a score of minus one, zero, or one, on each of the scales based on the 66+/33- scoring system of Pace. This scoring procedure gives an institution the score of one for an item if 66% or more of the respondents mark the item in the keyed direction, a score of minus one if less than 33% of the respondents mark the item in the keyed direction, and a score of zero otherwise. The scores from 100 institutions were used by Pace in the factor analytic development of the second edition of the CUES.

Three pairs of factors were combined to form the five scales of the instrument. One hundred of the original 150 items were retained for the second edition. Each of the five scales on the second edition contained 20 items.

The 100 items from the first edition of the CUES plus 60 experimental items comprise the second edition of the CUES. To test hypothesis one, the 100 items retained from the first edition were used. Hypotheses two and three involved all 160 items of the second edition.

Methods of Analysis Used in Hypotheses Testing

In reporting the results of CUES and College Characteristics Index (CCI) studies, researchers have used several statistical tests and procedures. Ivey & Wilson (1971) and Lynch & Sedlacek (1971) used repeated Student's t tests on the means to test for differences. Buckley (1971) used a series of analyses of variance to compare three groups over eight independent variables. Astin (1971) and Marks (1968) used correlations to make comparisons between instruments. Other researchers (Boyer & Michael, 1968) reported results without statistical tests. In the present study both multivariate and univariate techniques were employed. Factor analysis was first utilized to obtain a set of factor loadings which were then used for comparisons made in evaluating hypothesis one. Secondly, factor analysis was used in a scoring procedure to obtain a set of four dependent variables for each subject in the sample. Two-way univariate analysis of variance was used to test hypotheses two and three.

The following techniques of statistical analysis are presented in the order of hypotheses tested. Data used in these techniques were the CUES scores for each student.

> Hypothesis one: The factor structure obtained on the CUES using a sample of U.T. El Paso students will not differ from the factor structure found by Pace using a national sample.

In developing the second edition of the CUES, Pace factor-analyzed the first edition of the CUES and retained 100 of the

original 150 items. A principal components factor analysis with unity of the diagonals and rotation to eight factors was used. The eight factors were then collapsed to form five scales or dimensions. Six statistical criteria were used for the retention of items:

1. The retained items should have good positive correlation with the score for the scale in which they are located, if possible an item-scale score correlation of .40 or higher.

2. The retained items should have a higher correlation with the score for the scale in which they are located than with any other scale score.

3. The retained items should have a loading of $|.40|$ or higher on the factor in which they are classified.

4. The retained items should have a higher loading on the factor in which they presumably belong than on any other factor.

5. The average percent agreeing with the keyed response across the sample should be at least 10% and no higher than 90%, that is, each item should describe neither too rare nor too common a characteristic of college environments.

6. There should be a reasonable spread in the item marginals across the population, specifically, a standard deviation for the distribution of percentages of at least 10 points, and preferably 15 points or more.

Pace (1967) presented the results of the factor analysis on each of the six criteria. The number of violations for each

criterion were also reported. The same type principal components factor analysis program used by Pace, a principal components solution, with unity in the diagonals and orthogonal rotation to eight factors, was used to compare the sample from U.T. El Paso with the national sample.

The comparison between the national sample and the U.T. El Paso sample was made difficult because the unit of measure for the national sample was the institution and the unit of measure for the U.T. El Paso sample was the student. Generally the correlations between scores which are the average of other scores will be higher than the correlations between raw data. This is because variability is reduced when scores are averaged. Thus the correlation matrix using the institution as the unit of measure will generally have higher off diagonal elements than the correlation matrix using the student's response as the unit of measure. Since factor analysis is a statistical process which seeks out relationships between variables based on a correlation matrix, it was expected that the factor pattern found by Pace would have larger item-factor correlations than the item-factor correlations for the U.T. El Paso sample. In addition, the first, second, and sixth criteria involved institutional scores based on Pace's 66+/33- scale scoring system with the institution as the unit of measure. Since the present study involved only one institution, the factor structure could not be compared on these criteria.

In comparing factor structures, Rummel (1970) reported that intuitive comparisons of factor structures are the most common. This type of comparison usually involves the visual comparison of factor loadings and a judgment of their similarity.

A more precise method for the comparison of two factor structures is to compare the factor loadings of the two structures. However, in order to use this procedure, both factor matrices must be known. Several attempts were made to obtain the information from the author of the CUES, but the data were not provided. Therefore, the decision concerning the similarity of the factor structure was based on the criteria published by Pace (1967) and listed earlier in this chapter.

> Hypothesis two: The groups Mexican-American males, Mexican-American females, Anglo males, and Anglo females will not differ on the four dimensions of the CUES.

In order to test this hypothesis, several procedures were followed. Since the information obtained from hypothesis one indicated that the factor structure of the CUES did not remain stable for the sample of U.T. El Paso students, it was decided to re-factor the instrument in order to maintain construct validity. In addition, in order to gain as much information as was possible, it was decided to use all 160 items in the second edition of the CUES. Thus, the 100 items representing the five scales and the 60 experimental items were included in the factor analysis. Once the factor solution was determined, the dependent variables were analyzed using two-way analysis of variance.

The factor solution. A series of principal components factor analyses, with varimax rotational solutions, were performed on the data. The program used for the analyses was written by Don B. Croft and modified by the writer to include up to 165 variables. The principal components factor analysis procedure, with orthogonal rotation, was used because this method permits the extraction of the maximum amount of variance for each of the obtained factors, and also condenses the correlation matrix into the smallest number of orthogonal factors. The works of Harman (1960) and Rummel (1970) should be referred to if further clarification of this statistical procedure is desired.

The varimax rotational solution used in analyzing the data was based upon a technique developed by Kaiser (1958). In supporting the use of this procedure, Rummel (1970) stated:

> The varimax criterion for orthogonal rotation comes closest to the graphical structure solution, or, in other words, Thurstone's sample structure goal. Varimax is now generally accepted as the best analytic orthogonal rotation technique [p. 392].

This rotational procedure permits the placement of items in clusters resulting in a high loading on one factor and concomitant low loadings on all other factors used in the solution.

In computing the principal components factor analysis, it is necessary to first place a value for the estimated communality in the diagonal of the correlation matrix. Based upon a recommendation made by Kaiser (1958), and following the pattern

established by Pace, the value 1.00 was chosen as the estimate of the communality.

The goal in using a series of principal components factor analyses was to eliminate semantically ambiguous items and to construct a set of independent factors which could be used to represent the various dimensions of the college environment as perceived by U.T. El Paso students. Through the use of this procedure, items which failed to sufficiently correlate with any factor were eliminated. It was felt that the five factors found by Pace, along with an additional factor, would emerge from this procedure. This conclusion was reached because of the nature of the 60 experimental items. The first 50 experimental items were semantically related to the existing scales of the CUES, while the last 10 items appeared to be related to student involvement in university affairs.

The decision to perform a series of factor analyses on the data was based upon a procedure used by Halpin & Croft (1963) in their construction of the Organizational Climate Description Questionnaire. Similar procedures have also been used by Barber (1971) and Van Meter (1971) in the construction of survey instruments. This procedure, as it was applied to the present study, was to develop a scoring procedure rather than a new instrument.

In an attempt to replicate the work of Pace, a nine-factor solution was used for the first analysis of the data. In the development of the 100-item CUES, Pace (1967) rotated eight

factors and combined several factors to form five scales. The additional factor used in the first analysis was included in consideration of the last 10 items of the questionnaire. Based on the results of this first analysis, 47 items were omitted from further analyses because their correlations with factors were low, indicating that students at U.T. El Paso did not perceive the items in a consistent manner. A conservative approach was adopted for the first analysis, resulting in the deletion of items with item-factor correlations less than .30. Since the nine factors expected on the first analysis did not appear, it was decided to rotate fewer factors on the second analysis.

After the second analysis it became clear that the Practicality dimension, which was the weakest of the factors found by Pace, was not present for the U.T. El Paso population. Therefore, in subsequent analyses attempts were not made to extract this dimension from the data. Because of the dissimilarity of factor structures found in hypothesis one and because the Practicality factor did not emerge, further attempts to replicate the work of Pace were abandoned. Instead, it was decided to rotate four factors in future analyses and to delete items which failed to correlate at least .35 with a semantically meaningful factor. In testing hypotheses two and three, only those items which remained would be considered in the analysis. After 10 analyses, 56 items remained. At this point it was decided to delete items

which failed to correlate at the .40 level with a semantically meaningful factor or which correlated at least at the .30 level with more than one factor. After six further analyses, 38 items remained. Ten items were retained for the dimensions Scholarship, Awareness, and Propriety, while eight items were retained for the Community scale. The items, along with the correlation with the appropriate scale, are listed in Chapter IV.

Since the scoring procedure involved the development of factors which differed in the number of items and in some cases the classification of items, it was decided to calculate reliability coefficients for the factors. Coefficient alpha, based upon a formula devised by Cronbach (1951), was used to determine the reliability of the factor solution. This type of reliability was selected because it required only one test administration rather than a pre- and posttest sequence. In addition, prior to the computation of the reliability scores, the raw data were multiplied by the beta weights used to determine the factor scores. Thus, the reliability was based on the students' factor scores rather than on the raw data.

Analysis of variance. The dependent variables used for testing hypothesis two were the factor scores based on the final form of the instrument. The factor scores were computed using the regression estimate procedure described in Rummel (1970). In this procedure the factor scores were computed by multiplying

each student's standardized response to every item of the four identified CUES factors by its derived beta weight.

Factor score regression estimates make use of all the information contained in the data and the factor loadings. Noting this, Rummel (1970) stated that "they [regression estimates] are therefore better estimates of the true common factor scores than the composite and basic variable estimate . . . [p. 438]." In addition, the use of regression estimates permitted a weighting of each item in each factor in relation to the amount the item correlated with the factor. Thus, items with high factor loadings were weighted higher in determining the factor score than were those items which had lower loadings. A computer scoring program, initially developed by Stanley Mulaik at the University of Utah and subsequently modified by Don Croft, was used to compute the factor scores. The beta weight computed by this program used the formula $\beta = (FF')^{-1}$ where F is the n by p factor matrix, n equals the number of variables, and p equals the number of factors. Thus, the beta weights depend only on the factor solution and not on the original correlation matrix.

The factor scores, standardized to a mean of 50 and a standard deviation of 10, were then used in a two-way analysis of variance for the four dependent variables. The nonadditive model

$$Y_{hijk} = \mu_h + \alpha_{hj} + \beta_{hk} + (\alpha\beta)_{hjk} + e_{hijk}$$

was used to relate the observed data to the population parameters. In this model,

Y_{ijkl} = the score for the i^{th} subject in the j^{th} level

of sex and the k^{th} level of ethnicity and the h^{th} dependent variable.

μ_h = the average of all scores for dependent variable h

$\alpha_{jh} = \mu_{jh} - \mu_h$, the main effect for sex.

$\beta_{kh} = \mu_{kh} - \mu_h$, the main effect for ethnicity.

$(\alpha\beta)_{jkh} = \mu_{jkh} - \mu_{jh} - \mu_{kh} + \mu_h$, the interaction effect of sex and ethnicity for dependent variable h.

$e_{ijkh} = Y_{ijkh} - \mu_{jkh}$, the error component for dependent variable h.

The subscripts are defined respectively as follows:

$h = 1,2,3,4$; (community, scholarship, propriety, awareness).

$i = 1,2,\ldots,N_{jk}$; (subjects within cell j, k).

$j = 1,2$; (male, female).

$k = 1,2$; (Anglo, Mexican-American).

The data matrix for the analysis is shown in Table 7.

Since the cells were of unequal size, the least-squares analysis of variance discussed by Harvey (1968) was used to process the data. The FORTRAN program for this statistical procedure was written by Richard M. Glaze of the New Mexico State University Statistics Center.

Prior to testing the hypothesis, Cochran's statistic, $C = S^2(\text{largest})/\Sigma S_j^2$, was used to test the homogeneity of variance assumption for each of the criterion variables. When cell sizes are unequal but relatively close, Winer (1971)

TABLE 7

Data Matrix for Hypothesis Two

Independent Variables		Dependent Variables			
Ethnicity	Sex	Community	Scholarship	Propriety	Awareness
Anglo	Male	$Y_{1,1,1,1}$ ⋮ $Y_{68,1,1,1}$	$Y_{1,1,1,2}$ ⋮ $Y_{68,1,1,2}$	$Y_{1,1,1,3}$ ⋮ $Y_{68,1,1,3}$	$Y_{1,1,1,4}$ ⋮ $Y_{68,1,1,4}$
	Female	$Y_{1,2,1,1}$ ⋮ $Y_{88,2,1,1}$	$Y_{1,2,1,2}$ ⋮ $Y_{88,2,1,2}$	$Y_{1,2,1,3}$ ⋮ $Y_{88,2,1,3}$	$Y_{1,2,1,4}$ ⋮ $Y_{88,2,1,4}$
Mexican-American	Male	$Y_{1,1,2,1}$ ⋮ $Y_{80,1,2,1}$	$Y_{1,1,2,2}$ ⋮ $Y_{80,1,2,2}$	$Y_{1,1,2,3}$ ⋮ $Y_{80,1,2,3}$	$Y_{1,1,2,4}$ ⋮ $Y_{80,1,2,4}$
	Female	$Y_{1,2,2,1}$ ⋮ $Y_{86,2,2,1}$	$Y_{1,2,2,2}$ ⋮ $Y_{86,2,2,2}$	$Y_{1,2,2,3}$ ⋮ $Y_{86,2,2,3}$	$Y_{1,2,2,4}$ ⋮ $Y_{86,2,2,4}$

recommends using the largest n_j for the degrees of freedom for this statistic. The recommendation was followed in this test. For each of the four dependent variables the following null hypotheses were tested:

(1) $H_{oa} : \alpha_1 = \alpha_2$,

(2) $H_{ob} : \beta_1 = \beta_2$, and

(3) $H_{oab} : (\alpha\beta)_{11} = (\alpha\beta)_{12} = (\alpha\beta)_{21} = (\alpha\beta)_{22}$

The null hypothesis was rejected if the calculated F ratio was greater than the tabled F value with $\alpha = .05$ and with degrees of freedom equal to one and 318.

Hypothesis three: Mexican-American students who report conflict between Mexican and American ways and who report no conflict between Mexican and American ways will not differ on the dimensions of the CUES.

Prior to answering the CUES questionnaire, the students were asked to complete a demographic information instrument. Based on the responses to one of the items of this instrument, all but three of the Mexican-American students were classified by their own responses as feeling a conflict between Mexican and American ways either frequently, sometimes, seldom, or never. The distribution of responses is presented in Table 8.

In order to determine whether or not a proportionate number of male and female students reported the same frequency of conflict between Mexican and American ways, the χ^2 test for two independent samples was performed on the data in Table 8.

An estimate of the test-retest reliability for the classification item was established using a sample of U.T. El Paso

students. Students in four classes were asked to complete a five-item questionnaire (Appendix D) which contained the classification item used in the present study and four similar items. After a two-week interval the students were asked to complete a second form. Ninety-eight students responded to at least one of the two tests, while 78 responded to both the test and retest. Thus, the usable sample was 78 students.

TABLE 8

Number of Students Reporting Frequency of Conflict Between Mexican and American Ways

	Conflict			
Group	Frequently	Sometimes	Seldom	Never
Male	10	34	27	7
Female	21	38	20	6
Total	31	72	47	13

To test the null hypothesis, $H_o : \rho = 0$, the statistic $t = \hat{\rho}\sqrt{n - 2}\,/\sqrt{1 - \hat{\rho}^2}$, which is distributed as a Student's t variate with $n - 2 = 76$ degrees of freedom, was used.

To test the hypothesis, a two-way univariate analysis of variance was used on each of the four dependent variables. The nonadditive model

$$Y_{ijkh} = \mu_h + \alpha_{ih} + \beta_{kh} + (\alpha\beta)_{ikh} + e_{ijkh}$$

was again used to relate the observed data to the population parameters. In the model above, Y_{ijkh}, μ_h, and e_{ijkh} hold the

same definition as the model for testing hypothesis two, while

$\alpha_{jh} = \mu_{jh} - \mu_h$, the main effect for sex,

$\beta_{kh} = \mu_{kh} - \mu_h$, the main effect for frequency of conflicts, and

$(\alpha\beta)_{jkh} = \mu_{jkh} - \mu_{jh} - \mu_{kh} + \mu_h$, the interaction effect of conflicts and sex for dependent variable h.

For hypothesis three, the subscripts are defined respectively as follows:

$h = 1,2,3,4$; (community, scholarship, propriety, awareness),

$i = 1,2,\ldots,N_{jk}$; (subjects within cell j, k),

$j = 1,2$; (male, female), and

$k = 1,2,3,4$; (frequently, sometimes, seldom, or never feel a conflict between Mexican and American ways).

The data matrix for the hypothesis is presented in Table 9.

Hypothesis three was tested using the same program employed in testing hypothesis two. Because the cell sizes varied from a low of six to a high of 37, it was felt that Cochran's test for the homogeneity of variance assumption was not appropriate. Instead, Bartlett's test which weights each variance according to its cell size was deemed a more suitable procedure.

The following null hypotheses were tested for each criterion measure:

$H_{oa} : \alpha_1 = \alpha_2$

$H_{ob} : \beta_1 = \beta_2 = \beta_3 = \beta_4$

TABLE 9

Data Matrix for Hypothesis Three

Independent Variables		Dependent Variables			
Sex	Frequency of Conflict	Community	Scholarship	Propriety	Awareness
Male	Frequently	$Y_{1,1,1,1} \cdots Y_{10,1,1,1}$	. . .	. . .	$Y_{1,1,1,4} \cdots Y_{10,1,1,4}$
	Sometimes	$Y_{1,1,2,1} \cdots Y_{34,1,2,1}$	. . .	. . .	$Y_{1,1,2,4} \cdots Y_{34,1,2,4}$
	Seldom	$Y_{1,1,3,1} \cdots Y_{27,1,3,1}$	. . .	. . .	$Y_{1,1,3,4} \cdots Y_{27,1,2,4}$
	Never	$Y_{1,1,4,1} \cdots Y_{7,1,4,1}$	. . .	. . .	$Y_{1,1,4,4} \cdots Y_{7,1,2,4}$
Female	Frequently	$Y_{1,2,1,1} \cdots Y_{10,2,1,1}$	. . .	. . .	$Y_{1,2,1,4} \cdots Y_{10,2,1,4}$
	Sometimes	$Y_{1,2,2,1} \cdots Y_{34,2,2,1}$	. . .	. . .	$Y_{1,2,2,4} \cdots Y_{34,1,2,4}$
	Seldom	$Y_{1,2,3,1} \cdots Y_{20,2,3,1}$	. . .	. . .	$Y_{1,2,3,4} \cdots Y_{20,2,3,4}$
	Never	$Y_{1,2,4,1} \cdots Y_{6,2,4,1}$	. . .	. . .	$Y_{1,2,4,4} \cdots Y_{6,2,4,4}$

$H_{oab} : (\alpha\beta)_{ij} = (\alpha\beta)_{i'j'}$ for $i,i' = 1,2$ and $j,j' = 1,2,3,4$.

For H_{ob} and H_{oab} the null hypothesis was rejected if the calculated F value was greater than the tabled F value with $\alpha = .05$ and with degrees of freedom equal to three and 155. The hypothesis H_{oa} was rejected if the calculated F value was greater than the tabled F value with $\alpha = .05$ and degrees of freedom equal to one and 155.

CHAPTER IV

ANALYSIS OF THE DATA

The analyses presented in this chapter are: (a) comparisons of respondents and nonrespondents; (b) testing hypothesis one; (c) testing hypothesis two; and (d) testing hypothesis three.

Comparison of Respondents and Nonrespondents

As discussed earlier, the respondents and nonrespondents were compared on both indirect and direct measures. The results of the indirect comparisons are presented first.

Indirect Comparison of Respondents and Nonrespondents

A summary of the results of the indirect comparison is presented in Table 10. The maximum number of subjects for the respondents and nonrespondents was 313 and 167, respectively. The number of subjects was less than the possible maximum because either the information was not recorded on the students' permanent records or because the records could not be located. The inability to locate student records was attributed to student name changes and clerical misfiling.

Using the F statistic (Winer, 1971), the homogeneity of variance assumption was tenable for all four dependent variables. In addition, the null hypothesis of equal means could not be rejected. Thus, it was concluded that, on the basis of this type of information, the two groups were not statistically different.

TABLE 10

Comparison of Respondents and Nonrespondents on Four Measures

Measure	Group	Number of Subjects	Mean	Variance	F Statistic[a]	t Statistic[b]	Range High	Range Low
Verbal SAT	Responders	209	457.66	10218.38	1.025	1.67	731	202
	Nonresponders	120	438.27	10473.92			773	277
Mathematics SAT	Responders	209	457.91	10857.69	1.309	0.71	761	49
	Nonresponders	120	449.88	8289.82			710	263
High School Rank	Responders	181	1.74	.95	1.231	1.23	4	1
	Nonresponders	92	1.90	1.17			4	1
College GPA	Responders	277	2.47	.47	1.130	1.24	4.0	.2
	Nonresponders	141	2.38	.53			4.0	.5

[a]Homogeneity of variance assumption tenable for all measures.

[b]Equality of means hypothesis not rejected at $\alpha = .05$.

Direct Comparison of Respondents and Nonrespondents

The second comparison of respondents and nonrespondents is called direct because the dependent variables used in this comparison were the same as those used to test hypotheses two and three.

Hotelling's T^2 statistic was computed for the respondents and sample of nonrespondents. The multivariate analog of the univariate homogeneity of variance assumption is the assumption of equal covariance matrices. The test was carried out using a generalization of Bartlett's test for equal variances (Morrison, 1967). The hypothesis of equal covariance matrices was not rejected and the hypothesis of equal means was tenable. The results of hypothesis testing are presented in Table 11 and graphically in Figure 1.

While the direct comparison has the advantage of using the most meaningful dependent variables, it has the disadvantage of using information from only 20 of the 167 nonrespondents. It does, however, lend further support to the contention that the reasons for nonresponse did not bias the results of the study.

> Hypothesis one: The factor structure obtained on the CUES using a sample of U.T. El Paso students will not differ from the factor structure found by Pace using a national sample.

Introduction

The 100-item CUES was factor-analyzed replicating, as much as possible, the techniques used by Pace. A principal components

TABLE 11

Direct Comparison of the Respondents and Nonrespondents

Group	Statistic	Factor			
		Community	Scholarship	Propriety	Awareness
Respondents	Mean	49.99	49.93	49.78	49.73
	Variance	99.58	101.22	99.76	98.57
Non-respondents	Mean	49.60	50.73	53.62	53.35
	Variance	120.09	80.66	111.79	119.09
Test for Equality of Covariance Matrices		Calculated χ^2 7.60		Tabled χ^2 .05,10 18.30	
Test for Equality of Means		Calculated F 1.32		Tabled F .05,4,317 2.42	

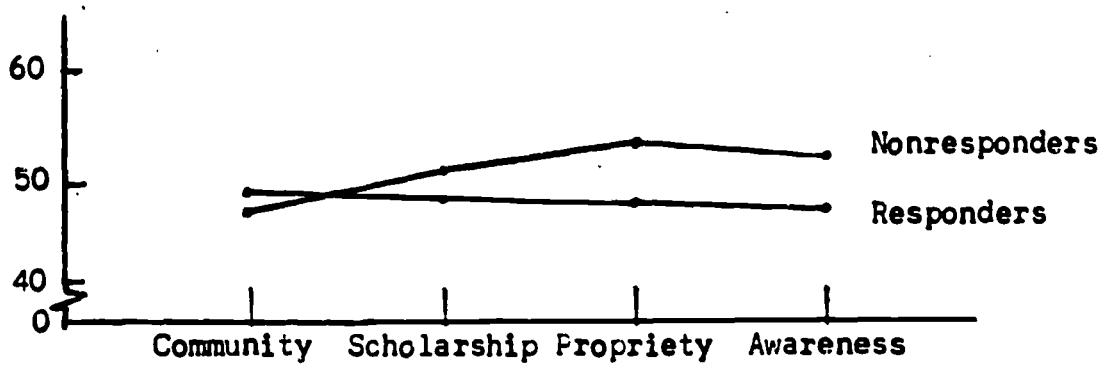

FIG. 1. Direct comparison of the respondents and non-respondents.

solution with unity on the diagonal and varimax rotation to eight factors was used in the replication attempt. In working with CUES, Pace used the term "scale" to mean a factor or combination of two factors to form one of the five dimensions of the CUES. Thus, the terms "scale" and "factor" do not necessarily have the same meaning. This difference is important because in Pace's development of the CUES, only six of the eight factors were combined to form the five scales of the CUES.

In the replication, however, it was felt that the best solution consisted of using all eight factors to form the five scales. The 100 by eight factor matrix determined in the replication is presented in Appendix B. In addition to this difference, the replication used the individual as the unit of measure rather than the institution which was the unit of measure in Pace's study.

Comparisons

The remainder of this section will consist of a discussion of the similarities and differences found as a result of the replication. The framework for the discussion will be the three applicable criteria set forth by Pace for retention of items for the second edition of the CUES.

The comparisons for criteria three, four, and five (see page 40) are presented below:

(3) The retained items should have a loading of $|0.40|$ or higher on the scale in which they are classified.

Table 12 presents a summary of the number of items which load at least |0.40| on the five scales of the CUES. The table shows, for example, that Pace found that 14 Practicality items loaded at least |0.40| on the Practicality scale and that a total of 20 items loaded at least |0.40| on the Practicality scale. Thus, 70% of the items designed to measure Practicality loaded at least |0.40| on the Practicality scale. Comparing the results, it is evident that, while the loadings for the national sample are higher, the pattern of responses, indicated by the columns labeled "% of total from specified scale," are similar, and in four out of the five scales higher for the U.T. El Paso sample. It is also important to note that the Scholarship scale could be classified, for both samples, as a "strong" scale in terms of the number of items loading on that factor and in terms of the percent of total items from the specified scale. Using the same definition of strength, the Practicality scale was weakest for both samples.

Another comparison can be made between the two samples using all the loadings. Table 13 shows the item-scale loadings for both the national sample and the U.T. El Paso sample. Although the loadings for the U.T. El Paso sample were considerably lower, the pattern of "strength" of the loadings is consistent. In this context, a "strong" factor is one with high loadings. To compare the order of the strength of the factors, the loadings were added and compared for the national sample and the U.T. El Paso sample.

TABLE 12

Summary of the Number of Items with Factor Loadings of |0.40| or Higher on the Five Scales of the CUES

Scale	Number of Items from a Specific Scale		Total Number of Items		% of Total Items from a Specified Scale	
	National Sample	U.T. El Paso Sample	National Sample	U.T. El Paso Sample	National Sample	U.T. El Paso Sample
Practicality	14	3	20	4	70	75
Community	20	3	30	3	67	100
Awareness	20	9	26	10	77	90
Propriety	17	7	20	11	85	63.6
Scholarship	20	13	23	15	87	90
Total	91	35	119	43	76	81

TABLE 13

Distribution of Item-Scale Loadings

Loadings	Practicality		Community		Awareness		Propriety		Scholarship	
	National Sample	UTEP Sample	National Sample	UTEP Sample	National Sample	UTEP Sample	National Sample	UTEP Sample	National Sample	UTEP Sample
.90-.99									1	
.80	1		5		7		6		7	
.70	3		7		4		3		3	
.60	2		3		6		5		6	1
.50	5		2	1	2	3	3	1	3	5
.40	3	3	3	2	1	6	3	6		7
.30	2	2		5		4		5		3
.20	4	4		7		5		3		2
.10		5		4		2		2		2
0-.09		6		1				3		
Number of Items	20	20	20	20	20	20	20	20	20	20

The factor whose loadings were the largest was operationally defined as the strongest factor. The sum of the factor loadings and the rankings according to strength are listed in Table 14.

TABLE 14

Sum of the Factor Loadings for Both Samples

Scale	Sum of the Loadings		Rank	
	National	U.T. El Paso	National	U.T. El Paso
Scholarship	14.50	8.38	1	1
Awareness	14.21	7.18	2	2
Community	13.83	5.73	3	4
Propriety	13.34	5.84	4	3
Practicality	10.03	4.11	5	5

While no precedent has been set for a comparison of this type, it does provide information concerning the degree of similarity between the two structures. Three of the five scales held the same rank for both samples and the difference in the two scales which interchanged ranks was slight.

In addition to the above intuitive discussion of the equality of the ranks, the Kendall Rank Correlation Coefficient, τ, was calculated for the rankings. The value obtained was $\tau = 0.8$. Coefficient τ is calculated using the formula $\tau = S/\frac{1}{2}N(N - 1)$ where N is the number of ranks and S is the number of pairs of ranks in the second variable that are in the same order as the first variable. In this case, $S = 8$ and $\frac{1}{2}N(N - 1) = 10$. Siegel (1956) has published a table of exact probabilities for values

of N < 10. Using this table, the probability of obtaining the calculated τ was determined to be .042. Thus, the null hypothesis, $H_o : \tau = 0$, was rejected when the probability of a type one error was set at approximately 5%. Therefore, it was concluded that the rankings of the strengths of the factors were positively related.

The fourth comparative criterion states that:

(4) The retained items should have a higher loading on the factor in which they presumably belong than on any other factor.

Since in the two studies different numbers of factors were combined to form the five scales, the results will be presented for scales rather than for factors. The results are displayed in Table 15. For the national sample, 13 of the Practicality items loaded highest on the Practicality scale, while three loaded on the Community scale, one on the Scholarship scale, and three on factors not combined with other factors to form a scale. The similarity of the structures is indicated by the large numbers in the diagonal positions. As before, the factors for the national sample are more strongly defined by their items. In addition, the "weakness" of the Practicality scale appears for both samples.

The fifth criterion states that:

(5) The average percent agreeing with the keyed response across the sample of 100 colleges should be at least

TABLE 15

Location of the Highest Factor Loadings

Scale	Practicality		Community		Awareness		Propriety		Scholarship		Other		Total	
	Natl	UTEP	Natl	UTEP	Natl	UTEP	Natl	UTEP	Natl	UTEP	Natl	UTEP[a]	Natl	UTEP
Practicality Items	13	8	3	1		2		4	1	5	3		20	20
Community Items		4	18	10	1	1	1	3		2			20	20
Awareness Items				3	20	15				2			20	20
Propriety Items	1	4	1	1			16	13		2	2		20	20
Scholarship Items	1	1				1		1	19	17			20	20

[a]Since all factors were classified as a scale, these cells are all empty.

10% and no higher than 90%. Thus, each item should describe neither too rare nor too common a characteristic of the college environment.

For the U.T. El Paso sample to violate this criterion, less than 10% or more than 90% of the sample would have had to score an item in the same direction. Thus, an item with a mean less than .10 or greater than .90 would violate the criterion. The largest means for the sample was .89 and the smallest was .20, indicating that the criterion was completely satisfied for the sample. Pace found that the national sample also completely satisfied the criterion.

Conclusion

While the hypothesis is not of a statistical nature and therefore not the type which can be flatly accepted or rejected, it can be dealt with on a more informal basis.

The analyses carried out in this section emphasized two characteristics of the two samples:

1. The loadings for the national sample were considerably higher than for the U.T. El Paso sample.
2. The overall pattern of responses and strength of factors were similar for the two populations.

Four Factor Rotation of the CUES

The decision to refactor the instrument to compare the environmental perceptions of Mexican-Americans and Anglos and

to compare the perceptions of Mexican-Americans reporting different frequency of conflict between Mexican and American ways of life was based, in part, on the conclusions reached in the previous section. However, a more important consideration was the desire to obtain, as much as possible, a set of factorially pure (in terms of Thurston's simple structure criteria) factors using all 160 items of the CUES.

Therefore, rather than using the preexisting CUES grading procedure, a factor analytic scoring procedure was adopted. The factor analytic scoring procedure has the advantage of considering only those items which were responded to in a consistent manner by all students and which were semantically meaningful. The results of the factor analytic scoring procedure are presented next.

The Scoring Procedure

Factor analysis was used to determine which variables on the 160-item CUES were viewed by the students in a consistent manner. A series of factor analyses were performed in which items with low loadings on a factor were deleted. As a result of this process, the Practicality scale was entirely deleted, while eight items were retained for the Community dimension and 10 items were retained for each of the scales Scholarship, Propriety, and Awareness. Thus, there were four factors and 38 items retained for use in testing hypotheses two and three. The retained items and their factor loadings are presented in Table 16.

TABLE 16

The Four Factor Solution[a]

New No.	Original No.	Item	Loadings I	II	III	IV	Communality
		Community					
1.	22.	The school helps everyone get acquainted.	39	-12	10	14	20
2.	71.	This school has a reputation for being very friendly.	56	-10	16	- 1	35
3.	77.	It's easy to get a group together for card games, singing, going to the movies, etc.	65	- 7	-18	12	48
4.	78.	Students commonly share their problems.	64	- 3	- 7	12	43
5.	80.	There is a lot of group spirit.	45	-24	14	11	30
6.	125.	Most of the students here are pretty happy.	48	- 4	34	13	36
7.	127.	In most classes the atmosphere is very friendly.	51	- 3	12	27	35
8.	128.	Groups of students from the college often get together for parties or visits during holidays.	55	- 6	-20	22	40

CONTINUED

Coefficient α = .58.

[a]The decimal points for correlations have been omitted.

TABLE 16 (continued)

New No.	Original No.	Item	Loadings I	II	III	IV	Communality
		Scholarship					
9.	13.	Most courses require intensive study and preparation out of class.	1	-69	- 5	1	47
10.	14.	Students set high standards of achievement for themselves.	20	-58	18	5	41
11.	18.	It is fairly easy to pass most courses without working very hard.	9	64	-14	3	44
12.	19.	The school is outstanding for the emphasis and support it gives to pure scholarship and basic research.	14	-57	9	15	37
13.	20.	Standards set by the professors are not particularly hard to achieve.	13	50	11	- 2	27
14.	62.	Most courses are a real intellectual challenge.	10	-63	10	20	46
15.	63.	Students put a lot of energy into everything they do in class and out.	22	-56	17	3	39
16.	68.	There is a lot of interest in the philosophy and methods of science.	16	-45	9	17	26
17.	69.	People around here seem to thrive on difficulty--the tougher things get, the harder they work.	10	-47	16	17	28
18.	114.	Excellence in scholarship is the dominant feature of this institution.	13	-50	11	6	28

CONTINUED

Coefficient $\alpha = .65$.

TABLE 16 (continued)

New No.	Original No.	Item	Loadings I	II	III	IV	Communality
		Propriety					
19.	10.	Anyone who knows the right people in the faculty or administration can get a better break here (from Practicality).	-17	- 3	-40	3	19
20.	26.	There is a great deal of borrowing and sharing among the students (from Community).	34	4	-47	- 4	34
21.	42.	Most student rooms are pretty messy.	-13	12	-43	8	23
22.	43.	People here are always trying to win an argument.	-11	- 5	-46	9	23
23.	50.	Students are conscientious about taking good care of school property.	- 8	-18	48	8	28
24.	93.	There always seem to be a lot of little quarrels going on.	- 1	- 9	-55	6	32
25.	94.	Students rarely get drunk and disorderly.	- 2	-12	55	- 4	32
26.	95.	Most students show a good deal of caution and self-control in their behavior.	- 1	-13	46	19	27
27.	97.	Students pay little attention to rules and regulations.	16	21	-46	- 3	29
28.	149.	Faculty members are always polite and proper in their relations with students.	8	- 8	45	3	22

CONTINUED

Coefficient α = .60.

TABLE 16 (continued)

New No.	Original No.	Item	Loadings I	II	III	IV	Communality
		Awareness					
29.	34.	There are a good many colorful and controversial figures on the faculty.	15	-15	-10	46	26
30.	82.	The expression of strong personal belief or conviction is pretty rare around here.	- 7	9	-12	-48	26
31.	86.	Course offerings and faculty in the social sciences are outstanding.	- 4	-18	- 2	49	28
32.	90.	Modern art and music get little attention here.	- 7	4	- 4	-46	22
33.	107.	Many faculty members are involved in services or consulting activities for outside groups--business, adult education, etc. (from Community).	0	- 1	- 2	58	33
34.	111.	New ideas and theories are encouraged and vigorously debated (from Scholarship).	26	-24	- 4	54	42
35.	124.	There are courses which involve students in activities with groups or agencies in the local community (from Community).	5	- 6	- 2	49	24
36.	130.	There are courses or voluntary seminars that deal with problems of social adjustment.	11	3	-14	57	36
37.	137.	Many student groups invite faculty members to lead special discussions.	8	3	- 2	61	38
38.	152.	Students have real authority to determine some campus policies and procedures.	13	-12	14	48	28
		EIGENVALUE	5.33	3.04	2.02	1.83	
		VARIANCE	14.03	22.04	27.35	32.17	

Coefficient α = .61.

All of the Community and Scholarship items obtained in the grading scheme were also defined as Community and Scholarship items by Pace. One "new" Propriety item came from Pace's Practicality scale and one came from Pace's Community scale. Two of the new Awareness items came from Pace's Community scale and one came from Pace's Scholarship scale. In Table 16 these items are indicated by parentheses indicating the original scale classification. Thus, five of the 38 items were reclassified and all are semantically meaningful on the new factors.

Reliability of the Factors

Since the scoring procedure involved a change in both the number of factors and in the items associated with the factors, it was decided to recalculate the reliability estimates for the factors. The recalculated reliabilities are given in Table 17.

TABLE 17

Reliability Estimates

Factor	Coefficient α
Community	.58
Scholarship	.65
Propriety	.60
Awareness	.61

Hypothesis Two

Hypothesis two: The groups Mexican-American male, Mexican-American female, Anglo male, and Anglo female would not differ on the dimensions of the CUES.

Hypothesis Testing

Using the final form of the instrument, factor scores were computed for each student. The scores were standardized to a mean of 50 and a standard deviation of 10. A graph of the distribution of scores for each of the four dependent measures is presented in Appendix C. From the graph of the distribution, the scores appear to be normally distributed. The test for the homogeneity of variance assumption was carried out using Cochran's C statistic. The results in Table 18 show that the homogeneity of variance assumption was tenable. The means for each group are also listed in Table 18. A summary of the analyses of variance is given in Table 19. No differences were found on the Community and Propriety scales. An ethnicity difference was found on the Scholarship scale with the Anglo students perceiving the environment as more scholastic than the Mexican-American students.

Differences were also found on the Awareness dimension with males scoring higher on this scale than women. Thus, two of the eight subhypotheses were rejected causing the rejection of the overall null hypothesis.

TABLE 18

Group Means and Homogeneity of Variance Test for Hypothesis Two

Dependent Variable	Group	Variance	Means	Number in Group	df	Cochran's C[a]
Community	Mexican-American male	119.94	50.25	80	88	.299
	Mexican-American female	107.78	49.77	86		
	Anglo male	99.70	52.13	68		
	Anglo female	73.05	48.24	88		
Scholarship	Mexican-American male	111.93	48.47	80	88	.284
	Mexican-American female	92.72	48.29	86		
	Anglo male	101.70	51.85	68		
	Anglo female	87.81	51.57	88		
Propriety	Mexican-American male	88.35	49.58	80	88	.276
	Mexican-American female	103.52	48.86	86		
	Anglo male	99.03	49.87	68		
	Anglo female	110.88	51.66	88		
Awareness	Mexican-American male	115.26	51.21	80	88	.290
	Mexican-American female	89.68	49.51	86		
	Anglo male	89.76	51.50	68		
	Anglo female	101.91	48.25	88		

[a] $C = \dfrac{S^2_{\text{largest}}}{\sum_{j=1}^{4} S_j^2}$ and $C_{.05;4,88} = .3420$.

TABLE 19

Summary of Tests for Hypothesis Two

Dependent Variable	Source of Variation	df	Sum of Squares	Mean Squares	F Ratio
Community	Total	321	32264.14		
	Reduction	3	592.27		
	Ethnicity	1	2.44	2.44	.024
	Sex	1	380.86	380.86	3.820
	Ethnicity x Sex	1	233.23	233.23	2.340
	Error	318	31671.86	99.60	
Scholarship	Total	321	32012.23		
	Reduction	3	889.40		
	Ethnicity	1	884.60	884.60	9.040*
	Sex	1	4.33	4.33	.044
	Ethnicity x Sex	1	.18	.18	.002
	Error	318	31122.83	97.87	
Propriety	Total	321	32492.89		
	Reduction	3	368.94		
	Ethnicity	1	189.37	189.37	1.870
	Sex	1	22.86	22.86	.227
	Ethnicity x Sex	1	125.86	125.86	1.250
	Error	318	32060.95	100.82	
Awareness	Total	321	32171.10		
	Reduction	3	562.24		
	Ethnicity	1	18.65	18.65	.190
	Sex	1	489.83	489.83	4.930*
	Ethnicity x Sex	1	48.28	48.28	.485
	Error	318	31608.86	99.40	

*$p < .05$.

Hypothesis Three

Hypothesis three: Mexican-American students who report conflict between Mexican and American ways and who report no conflict between Mexican and American ways will not differ on the dimensions of the CUES.

Distribution of the Responses

A χ^2 test for two independent samples was performed on the data in Table 8 (page 51) to determine whether or not a proportionate number of male and female students reported the same frequency of conflict between Mexican and American ways. The calculated χ^2 value was 4.95, while the associated tabled $\chi^2_{.05;7}$ was 14.07. Therefore, the null hypothesis of equal distribution of responses for male and female students was not rejected.

Reliability of the Classification Item

The test-retest item correlation for the degree of felt conflict classification item was $\hat{\rho} = .71$. The t statistic to test the null hypothesis, $H_o : \rho = 0$, was 8.83, which indicates that the null hypothesis should be rejected in favor of the alternative hypothesis, $H_1 : \rho > 0$. The tabled t value with 76 degrees of freedom is 1.96. Thus, it was concluded that the classification item was reliable.

Hypothesis Testing

Using the final form of the instrument, factor scores were computed for each Mexican-American student responding to the classification item. The scores were standardized to a mean of 50 and a standard deviation of 10. A graph of the distribution

of scores for each of the four dependent variables is presented in Appendix C. As was the case for the scores used in hypothesis two, the graphs indicate that the scores for hypothesis three appear to be normally distributed.

Since the cell sizes varied from six to 38, it was decided to use Bartlett's procedure to test the homogeneity of variance assumption. This procedure weights the variance of each cell according to the number of observations in the cell. The results, which are presented in Table 20, show that the homogeneity of variance assumption was tenable for all dependent variables. The means for each group are also listed in Table 20.

A summary of the analyses of variance is given in Table 21. No differences were found on any of the dependent variables. Thus, the null hypothesis could not be rejected. It appears that the reported frequency of conflict between Mexican and American ways is not related to the perception of the U.T. El Paso environment.

TABLE 20

Group Means and Homogeneity of Variance Test for Hypothesis Three

Group		Community		Scholarship		Propriety		Awareness		Number in Group
Sex	Frequency of Conflict	Mean	Variance	Mean	Variance	Mean	Variance	Mean	Variance	
Male	Frequently	52.13	123.71	48.48	181.92	52.92	111.22	51.64	134.67	10
	Sometimes	49.02	129.71	51.38	94.48	49.65	90.34	52.71	130.24	34
	Seldom	52.29	101.76	51.69	105.96	47.57	84.41	49.03	95.92	27
	Never	51.41	187.30	56.47	165.07	52.36	83.50	51.33	148.42	7
Female	Frequently	48.08	92.19	50.50	99.84	49.06	104.22	51.69	114.08	21
	Sometimes	50.34	125.63	51.84	86.77	49.84	103.25	46.49	50.11	38
	Seldom	52.08	113.83	51.33	111.92	47.09	87.68	51.58	131.39	20
	Never	46.28	25.78	56.23	77.68	49.50	176.33	51.65	40.17	6
Bartlett's[a] χ^2 for Homogeneity of Variance Test		5.36		3.31		1.80		11.56		

[a] $\chi^2_{.05,7} = 14.1$.

TABLE 21

Summary of Tests for Hypothesis Three

Dependent Variable	Source of Variation	df	Sum of Squares	Mean Squares	F Ratio
Community	Total	162	18434.70		
	Reduction	7	484.97		
	Sex	1	24.27	24.27	.210
	Conflict	3	355.02	118.34	1.020
	Sex x Conflict	3	116.26	38.75	.335
	Error	155	17949.74	115.80	
Scholarship	Total	162	16646.26		
	Reduction	7	423.26		
	Sex	1	5.82	5.82	.056
	Conflict	3	413.16	137.72	1.320
	Sex x Conflict	3	257.91	8.59	.082
	Error	155	16223.00	104.66	
Propriety	Total	162	15528.65		
	Reduction	7	400.05		
	Sex	1	60.12	60.12	.620
	Conflict	3	326.96	108.99	1.170
	Sex x Conflict	3	85.92	28.64	.290
	Error	155	15128.60	97.60	
Awareness	Total	162	16632.55		
	Reduction	7	899.82		
	Sex	1	18.20	18.20	.170
	Conflict	3	103.70	34.57	.340
	Sex x Conflict	3	602.09	200.70	1.980
	Error	155	15732.73	101.50	

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter contains a summary of the study, including the purposes, the procedures, and the findings. Conclusions based on the findings and recommendations for further research are also presented.

Summary

The purposes, procedures, and findings associated with the study are briefly reviewed in this section.

Purposes

The purposes of the study were to: (a) examine the factor structure of the College and University Environment Scales (CUES) for the bilingual/bicultural student population at the University of Texas at El Paso (U.T. El Paso); (b) provide U.T. El Paso administrators with information concerning the perceptions of the university environment by full-time unmarried undergraduate Mexican-American students when compared with full-time unmarried undergraduate Anglo students; and (c) test the theory of cognitive dissonance in the field of student affairs.

Procedures

In consideration of the purposes of the study, the following procedures were employed:

1. A sample was selected from a segment of the U.T. El Paso student population and administered the data-gathering instruments.
2. The standard 100-item form of the CUES was factor-analyzed in order to obtain a factor structure for the U.T. El Paso sample. The obtained structure was then compared with the structure obtained by Pace.
3. Factor analysis was then used as part of a scoring procedure to obtain a set of factors which best represented the U.T. El Paso environment. The standard 100 items plus the 60 experimental items were used in the scoring scheme.
4. Factor scores based on the factor analytic scoring procedures were then used as dependent variables for testing hypotheses two and three.

Findings

The generalizability of the findings from the sample to the defined population is presented first.

Question. Since approximately 30% of the sample failed to participate in the study, are the results generalizable beyond the actual respondents?

In both the indirect and direct comparisons between respondents and nonrespondents it was not possible to reject the null hypotheses of either equal means or variances. However, the

indirect comparison had a weakness in the relevancy of the dependent measures, while the direct comparison was carried out using only 20 of the nonrespondents. Thus, while it seems unlikely that the nonrespondents would have appreciably altered the results of the study, caution in generalization should be exercised.

> Hypothesis one: The factor structure obtained on the CUES using a sample of U.T. El Paso students will not differ from the factor structure found by Pace using a national sample.

While the hypothesis was not of a statistical nature and therefore not the type that could be flatly rejected or accepted, the following differences and similarities were discovered. The factor loadings for the national sample, using the institution as the unit of measure, were higher than for the U.T. El Paso sample using the student as the unit of measure. However, the overall pattern of responses, as indicated by the factor loadings, was similar for both groups. Using the sum of the factor loadings as an operational definition of the strength of a factor, it was discovered that the rankings of the factors by strength did not differ between samples.

The differences found in the structure could be attributed to:

1. Using the student rather than the institution as the unit of measure.
2. The ways in which students in a bilingual/bicultural environment interpret the items.

3. Changes which have occurred in the life style of college students since the instrument was originally constructed in 1962. Increased student activity in politics, the interest in and improvement of the minority condition, and the reported surplus of college graduates are three important changes that have taken place in the last 10 years.

Hypothesis two: The groups Mexican-American males, Mexican-American females, Anglo males, and Anglo females will not differ on the four dimensions of the CUES.

Figure 2 presents a pictorial summary of the results of testing hypothesis two. An ethnicity difference was found on the Scholarship scale with Anglos perceiving the environment as more scholastically oriented than did Mexican-Americans. In the figure this difference is indicated by separate rectangles around the groups that differ. A sex difference was found on the Awareness scale with males perceiving the environment as more political and esthetic than females.

Although not statistically significant, there appears to be an indication of a sex difference on the Community scale. The male students in the sample perceived the environment as a more friendly place than the sample of female students. This trend is indicated by a dashed rectangle around the groups in Figure 2.

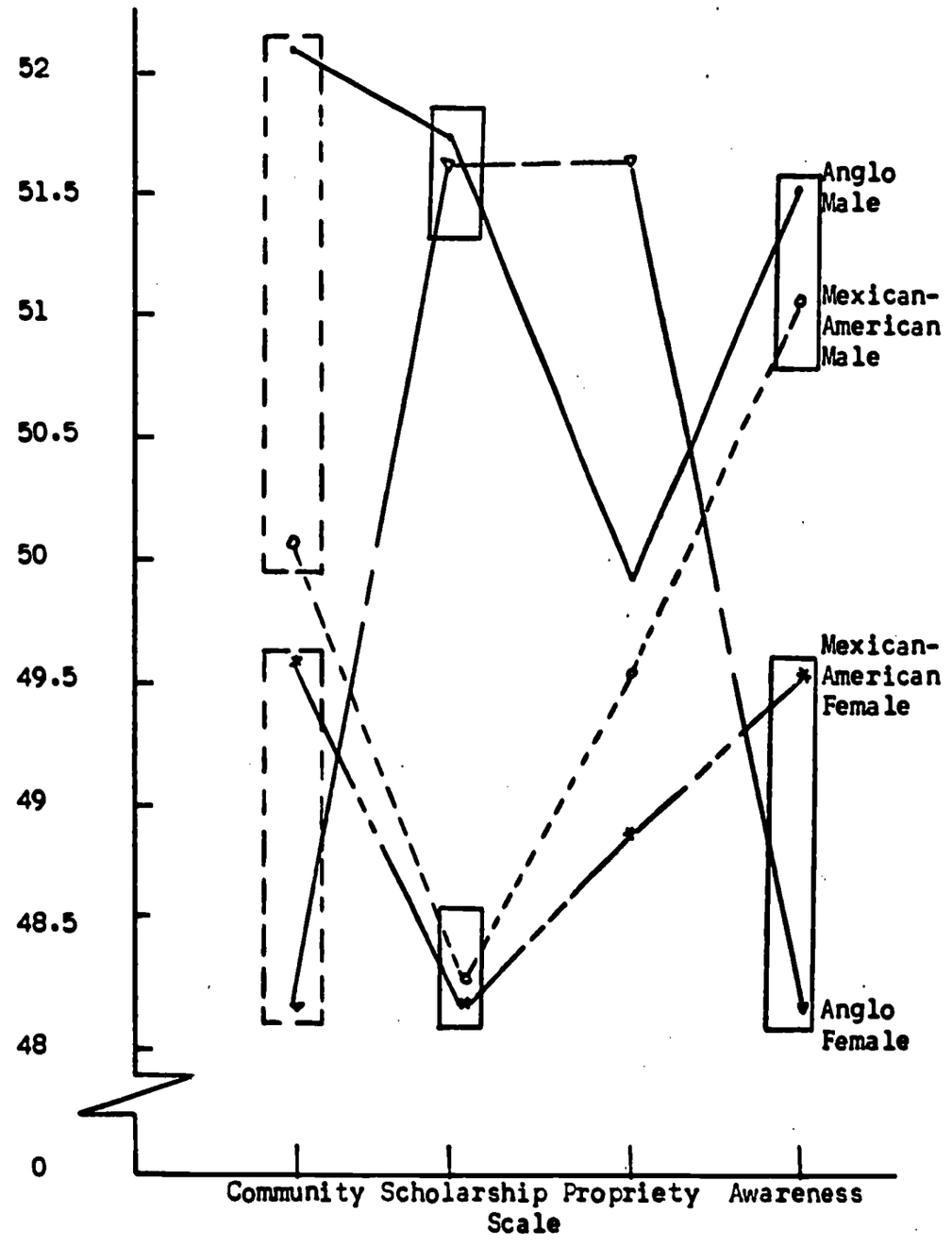

FIG. 2. Summary of the results of testing hypothesis two.

Hypothesis three: Mexican-American students who report conflict between Mexican and American ways and who report no conflict between Mexican and American ways will not differ on the four dimensions of the CUES.

Hypothesis three was not rejected. The most striking difference in the sample groups was found on the Scholarship scale between Mexican-American students who reported frequent conflict between Mexican and American ways and Mexican-American students who reported never having found conflict of this type. Students reporting no conflict averaged more than six points higher on the Scholarship scale than students reporting frequent conflict. It was felt that the difference was not reflected in the analysis because of the small sample size (see Table 20, page 78) for these groups.

Conclusions

The conclusions stated here were derived from the findings of Chapter IV and must be viewed with the limitations of the study in mind.

Hypothesis One

The similarities found between the CUES factor structure for the national sample and the U.T. El Paso sample support the notion that the instrument has maintained its validity as an environmental measurement instrument. However, the differences which existed between the factor structures for the two samples indicated that some of the items were interpreted differently by the U.T. El Paso students than by the students in the original sample. The differences in interpretation of items by the 1962 national

sample and the 1971 U.T. El Paso sample were attributed to either the bilingual/bicultural student population at U.T. El Paso or to changes in student life styles from 1962 to 1971. In a four-year longitudinal university environmental study, Ivey & Wilson (1971) found that students scored lower on four of 11 environmental measures. The authors attributed these changes to the increased size and more complicated structure of the university. The present study suggests that semantic interpretation of items by students may also have been a factor contributing to the observed differences.

Hypothesis Two

When comparing Mexican-Americans and Anglos, some researchers (Carter, 1970; DeBlassie & Healy, 1969) reported no overall differences between the groups, while others (Anderson & Johnson, 1971; Jensen, 1972; Justin, 1970) reported finding differences between the groups. Unfortunately, many studies which show no differences between Mexican-American and Anglo students probably are not reported in the literature because of the lack of significant findings. In the present study an ethnicity difference was found on one of the four dependent measures. Anglo students from the defined population perceived the U.T. El Paso environment as more scholarly than did Mexican-American students. Related to this was Anderson & Johnson's (1971) finding that Mexican-American elementary school children expressed less confidence in their ability to succeed than did

their Anglo classmates. Also, differences were found in attitudes toward achievement when Mexican-American and Anglo children were compared (Anderson & Safar, 1967; Demos, 1962).

Male students from the defined population reported higher scores on the Awareness dimension than did female students. After analyzing data from 11 schools, Pace (1967) reported that there was a trend for women to score higher on the Awareness dimension than men. The differences between the findings of the two studies can be attributed either to changes which have occurred in student life styles or to the uniqueness of the U.T. El Paso student population.

Hypothesis Three

It was felt that Mexican-American students who reported a feeling of conflict between Mexican and American ways of life would attempt to reduce this dissonant relationship by altering their perceptions of the university environment. Following this reasoning, Mexican-American students who reported frequent conflict between Mexican and American ways of life should have reported lower scores on the dimensions of the CUES. The analysis of the data did not verify this hypothesis. It was therefore concluded that either a student's perceptions are not affected by the problems he has functioning in two cultures or that the instruments and sample sizes were not adequate to measure the effects.

Recommendations for Further Research

The following recommendations for further research are made:

1. The preexisting grading schemes for subtest scores provided with standardized instruments should be validated with factor analytic techniques.

2. If the structure of an instrument differs greatly for a local population when compared with a national population, then the advantages of a local scoring system outweigh the disadvantages of loss of comparability with national norms and the local scoring system should be used when comparing groups from the local population.

3. An instrument similar to the CUES should be developed using a four- or six-point Likert scale. The instrument should be designed with the student rather than the institution as the unit of measure. The instrument should contain not more than 50 items so that it could be efficiently administered.

4. Similar studies should be carried out at other colleges or universities with large Mexican-American student populations to determine whether or not the results remain constant over different geographical regions.

5. Hypothesis three, the environmental comparisons of Mexican-Americans reporting differing frequency of conflict between Mexican and American ways of life, should be repeated using a larger sample size.

6. Based on the results of comparing environmental perceptions of Mexican-Americans and Anglos, U.T. El Paso administrators should establish, implement, and evaluate programs designed to improve the Mexican-American students' feelings concerning the university's academic environment. Strong programs in the Spanish language, Latin-American history and politics, and a department of Mexican-American studies are possible means of implementing this change.

7. Based on the sex difference found on the Awareness scale, programs should be established to encourage women to become more involved in the political and esthetic aspects of college life. Inviting prominent women to speak, appointment of women to high administrative positions, appointment of female students to faculty committees, appointment of female students to student committees, and encouraging female students to become active in campus politics are some of the steps that could be taken to minimize this existing difference if it is deemed desirable to do so.

8. Finally, financial resources should be made available for the periodic monitoring of student attitudes toward the university's environment.

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APPENDIX A

DATA-GATHERING INSTRUMENTS

Part I

The College and University Environment Scales

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APPENDIX A

DATA-GATHERING INSTRUMENTS

Part II

The Classification Item for Hypothesis Three

95/96

Part II

The Classification Item for Hypothesis Three

DO YOU FEEL A CONFLICT BETWEEN MEXICAN WAYS AND AMERICAN WAYS?

(Circle One)

1. Frequently
2. Sometimes
3. Seldom
4. Never

APPENDIX B

FACTOR STRUCTURE FOR THE 100-ITEM CUES

FACTOR STRUCTURE FOR THE 100-ITEM CUES[a]

Code	Scale	Factors
1	Awareness	I
2	Propriety	II, VII
3	Scholarship	III, V
4	Community	IV
5	Practicality	VI, VIII

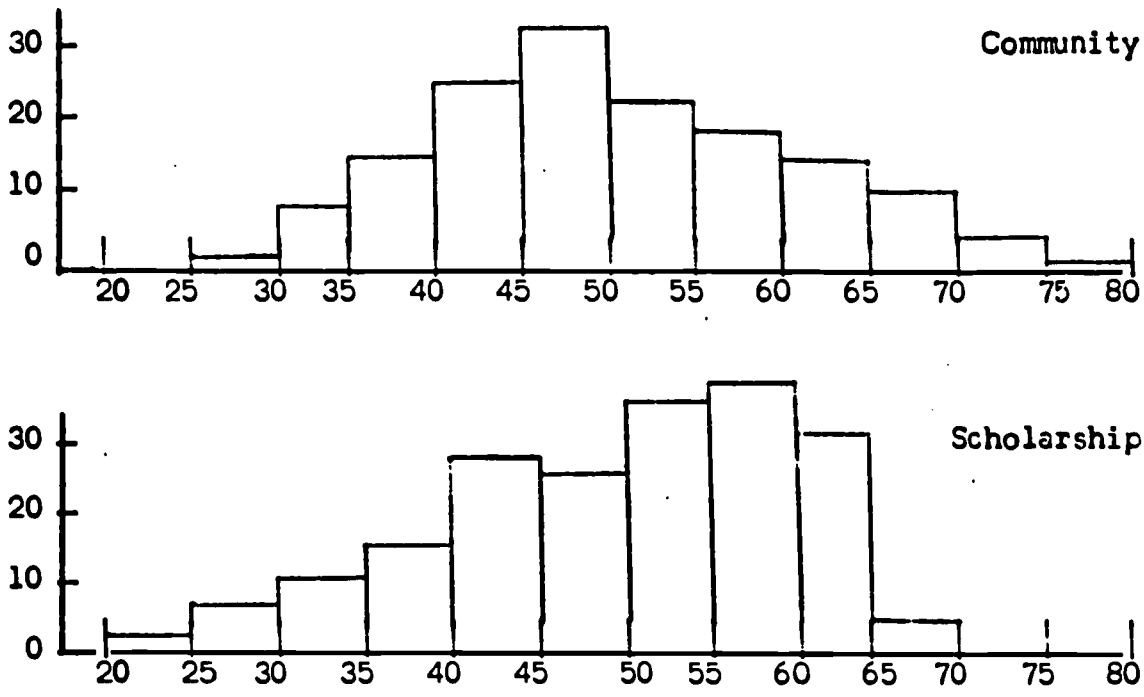
[a]Decimal points for tabled correlations have been omitted.

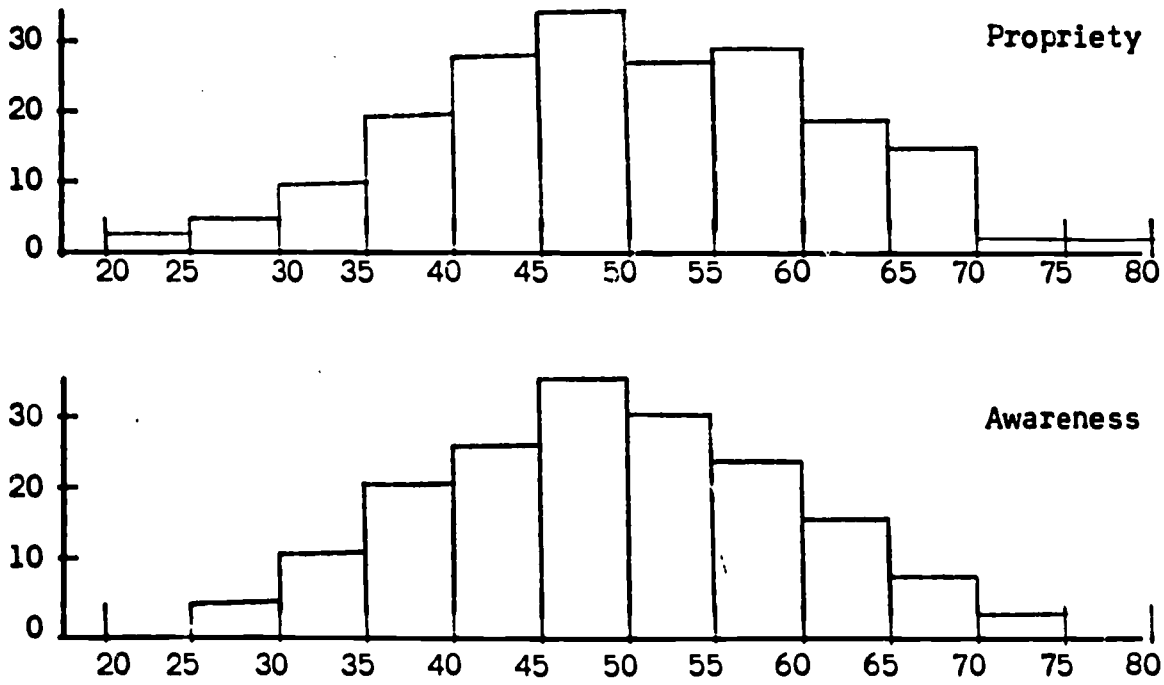
ITEM	SCALE NUMBER I	II	III	IV	III	V	II	V	Communality
1	05	06	-04	-13	00	48	-11	-08	27
2	19	01	27	30	-05	08	-01	-02	20
3	21	22	08	13	00	-06	15	-16	17
4	06	-01	25	-10	04	-36	12	05	23
5	-15	18	00	15	30	06	-03	-22	22
6	08	24	23	16	37	-01	-01	-06	28
7	11	-05	-09	08	21	05	14	47	31
8	06	03	06	-03	-22	10	33	28	25
9	-30	-15	06	-22	-07	23	02	02	23
10	01	03	01	04	-21	-20	57	04	42
11	-06	-08	32	-04	34	01	28	10	32
12	13	18	26	-07	48	-11	-13	07	38
13	14	-05	64	-07	17	04	08	06	48
14	09	04	55	24	13	17	-14	03	43
15	07	-08	10	22	22	-29	11	16	24
16	-47	-12	-17	01	-11	01	10	-04	29
17	28	-07	15	-02	40	-02	-11	03	28
18	-09	-12	-59	08	-10	-01	13	-04	40
19	16	05	46	28	12	06	06	08	34
20	-12	-01	-44	09	01	04	-13	-01	23
21	02	05	-08	-06	49	14	-15	-08	30
22	09	05	01	58	11	-04	03	-02	37
23	-06	-04	04	32	-16	-17	22	03	21
24	10	-03	19	20	-01	12	06	03	11
25	17	01	-05	24	36	-22	-24	12	34
26	00	-43	-07	18	-09	-03	08	07	24
27	29	03	17	37	-06	00	-07	04	26
28	16	-05	13	49	01	-03	-07	04	30
29	-06	03	26	24	11	27	03	-06	22
30	-23	-15	-29	-15	06	-12	03	06	21
31	28	21	-09	28	26	-16	-03	-14	33
32	32	09	-08	20	17	-01	21	-18	26
33	46	-08	22	-02	14	04	02	-20	33
34	27	-06	11	18	19	-24	15	-15	26
35	31	-03	26	22	14	03	04	-25	29
36	22	13	-19	31	-02	-15	03	-11	23
37	45	03	19	17	08	08	11	-20	33
38	29	07	17	33	24	-01	-03	01	28
39	51	-06	20	08	14	02	-10	09	35
40	44	-01	21	16	-01	03	-12	11	29
41	-25	29	08	21	10	14	14	15	27
42	-06	-25	-03	-17	-02	-14	41	-05	29
43	05	-24	04	-11	-09	07	47	01	30
44	-08	-16	-16	-06	03	-02	20	-37	24
45	-02	-37	-05	11	15	-06	15	-27	27
46	17	-17	02	07	13	07	-10	-26	16
47	10	-43	-08	-02	20	15	03	-27	33
48	-11	-01	27	02	-02	09	05	-06	10
49	-17	-34	06	02	-20	16	12	15	25
50	07	46	18	04	09	14	-13	00	29

	SCALE NUMBER								
ITEM	I	II	III	IV	III	V	II	V	Communality
51	-02	-01	03	-02	-01	16	29	-03	11
52	10	14	34	20	02	-09	-05	-12	21
53	09	-16	23	27	34	00	-22	00	32
54	03	-07	-12	00	05	04	10	07	04
55	13	05	05	07	10	31	07	27	21
56	05	-09	03	14	22	19	29	-14	22
57	18	-20	26	00	09	12	14	-18	21
58	-09	-20	05	02	02	-11	-01	40	22
59	33	-07	09	04	22	07	-07	-04	19
60	-30	00	02	25	11	-05	31	-07	27
61	06	06	30	04	56	-12	-10	-01	44
62	21	01	55	08	30	-12	-04	13	48
63	-01	06	49	38	18	04	-10	15	46
64	08	05	17	12	38	03	04	-03	20
65	14	-07	20	13	11	-14	-13	02	13
66	-12	-16	-16	06	-08	-08	47	00	30
67	-14	-15	-33	-07	02	11	21	-13	23
68	31	-04	41	22	-01	-05	-13	13	35
69	10	16	48	12	17	00	02	01	31
70	23	23	53	21	04	-03	-20	06	47
71	02	-17	10	39	14	-08	-22	-13	29
72	01	-06	04	-16	11	06	-05	07	05
73	31	02	09	12	49	22	03	08	42
74	32	05	07	38	16	05	-02	18	31
75	-15	-06	00	-22	-27	29	15	-14	28
76	06	13	07	25	01	43	18	03	31
77	22	-42	03	38	06	12	-07	00	39
78	24	-33	00	29	17	14	-11	-10	32
79	-07	05	10	-23	09	35	10	05	21
80	10	-06	23	48	12	-01	-16	-07	34
81	19	-04	10	24	17	-17	-09	-16	20
82	-43	-06	-13	-02	-12	19	03	23	31
83	29	07	39	22	23	-08	-02	-19	38
84	14	-11	38	07	-09	-24	12	-16	29
85	56	09	22	00	-05	-02	-12	09	39
86	41	01	05	-04	39	-20	17	10	40
87	33	04	-08	20	20	-11	22	06	26
88	42	-11	00	27	09	-03	08	00	27
89	31	-02	02	12	03	11	02	01	13
90	-55	-02	02	-07	03	09	07	01	32
91	13	06	09	27	00	14	05	21	17
92	17	-01	05	25	08	11	02	-39	27
93	00	-35	05	-05	-07	-06	32	07	24
94	-11	42	14	25	00	07	-24	10	35
95	02	44	10	17	21	08	-07	-16	31
96	-04	-38	-04	20	-01	-09	10	01	20
97	-09	-56	-11	-11	-01	-03	-02	-06	35
98	-20	20	15	-04	08	03	-11	23	18
99	-14	-14	-17	-17	-06	24	34	20	31
100	09	-18	-28	09	-01	05	04	12	14
EIGENVALUE	10.23		3.97	2.95	2.41		2.26	2.05	1.99	1.90
VARIANCE	10.23		14.20	17.14	19.56		21.82	23.87	25.85	27.75

APPENDIX C

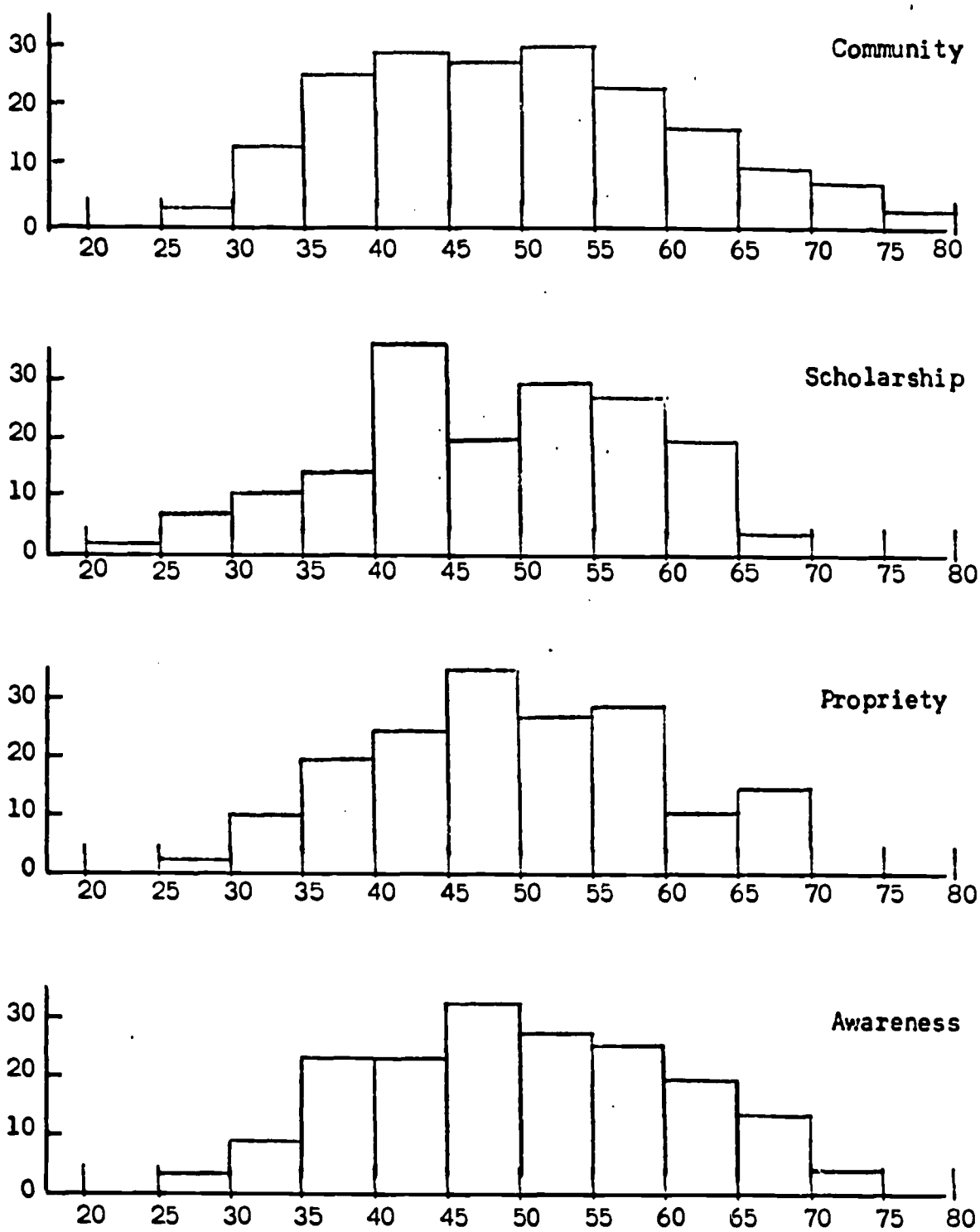
DISTRIBUTION OF SCORES FOR HYPOTHESES TWO AND THREE





Distribution of scores[a] for hypothesis two.

[a]Mean = 50
Standard Deviation = 10



Distribution of scores for hypothesis three.

APPENDIX D

QUESTIONNAIRE FOR CLASSIFICATION ITEM RELIABILITY STUDY

Name _____

Please answer the following questions by circling the answer that best fits your situation. All answers will be strictly confidential. Thank you for your cooperation.

1. Do you think that the Mexican-American family is breaking down?
   (Circle one) 1. Yes
   2. No

2. Do you feel a conflict between Mexican ways and American ways?
   (Circle one) 1. Frequently
   2. Sometimes
   3. Seldom
   4. Never

3. If you left El Paso, would you continue to speak Spanish?
   (Circle one) 1. Yes
   2. No

4. If you left El Paso, would you contine to use Mexican-American customs?
   (Circle one) 1. Yes
   2. No

5. Do you resent militant Mexicans?
   (Circle one) 1. Yes
   2. No