

A COMPARISON OF MEXICAN-AMERICAN AND ANGLO-
AMERICAN ADOLESCENTS ON TESTS OF VERBAL FLUENCY

by

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HISTORY AND INTRODUCTION

The problem of the relative inferiority of the intelligence test scores received not only by Mexican-Americans, but by minority groups in general, has undergone an impressive redefinition in recent years.

Sheldon (1924) stated, "It is well established that I. Q. tests enable us to compare...the ability of one child to another...and we probably can do the same with children of different races."

While Oldham cautioned against the acceptance of theories of racial inferiority based on intelligence test scores, his skeptical opinion was disregarded and seemingly ignored by workers in the area, who, while occasionally mentioned the factors contingent upon different racial or cultural group membership, did not generally regard these factors as lessening the validity of their experimental findings.

Sheldon (1924) tested a group of Mexican-American and Anglo-American children in Roswell, New Mexico, using the Stanford revision of the Binet, although many of the Spanish speaking children had such minimal skills in English that they were segregated into separate schools, and spoken to in mongrel Spanish by their teachers. These children were tested by their teachers, whose familiarity with the

Binet was not reported, in mongrel Spanish. These children were reported to be fourteen months retarded compared to the average Anglo child, whom he regarded as normal. He further compiled the results of several investigators who had been engaged in cross-cultural intelligence testing, and listed average I. Q. by race; the American and English 100, Chinese 98-99, Japanese 88, Mexican 85, Slav and Indian 83, Italian 77, and Negro 75, with northern Negroes somewhat more intelligent than southern. Not the least of Sheldon's problems is a tendency to confuse race with nationality. In addition he showed a non-awareness of pertinent, uncontrolled variables.

Koch and Simmons (1926) compared the I. Q. of Mexican-American, Anglo-American, and Negro school children in Texas using the Detroit First Grade Intelligence Test, the Pintner-Cunningham Primary Test, the Meyers Pantomime Intelligence Test, and the National Intelligence Test. They reported that the greatest number of retardates were in the Mexican-American and Negro groups, although urban Mexican-American children were superior to rural Anglo-American children on the Meyers Pantomime Intelligence Test. It was recognized that urban or rural residence was an important variable effecting obtained I. Q. scores.

Yoder (1928) reported Herrick's finding that the Negro is retarded compared to the white child, as well as his suggestion of the formation of a separate Negro state

as the best solution to the problem posed by what he evidently felt was irreversible inferiority.

Garth (1928) studied the intelligence of rural and urban Mexican-American children in Texas, New Mexico, and Colorado using the National Intelligence Test. He found the Mexican-American children retarded by one and one-tenth years as compared to Anglo norms and stated that 85% of the Mexican-American children were retarded when compared to Anglo norms.

Bogardus (1928) attempted to outline the problems of the Mexican-American in the United States as a member of a sub-culture. He suggested that, as the average Mexican-American child is retarded by 25% as compared to the average Anglo child, it would be well to establish segregated schools, which the Mexican population would eventually appreciate. While this work suggests a feeling of helplessness over a seemingly inherent inferiority, it does represent an attempt to understand some of the unique problems of this cultural group. This work was later interpreted (Boas 1940) as indicating the presence of variables which must be controlled in the intellectual assessment of the Mexican-American child.

Garretson (1928) explored the causes of grade retardation among Mexican-American school children. He reported the reason neither as irregular school attendance, nor lack of verbal skills, nor transient living habits, but the lowered M. A. of these children as measured by a group test.

Haught (1931) found a sudden drop in the I. Q. of his Mexican-American subjects at age 10. The mean I. Q. of these subjects as measured by the Terman Group Test of Mental Ability, and the Pintner-Cunningham and National Intelligence tests was 79, as compared to the mean Anglo-American I. Q. of 100.

Garth and Johnson (1935) studied the comparative intelligence of Mexican-American and Anglo-American, using subjects from segregated grammar schools in El Paso and also from a non-segregated rural school, which was also in Texas. They found a "wide discrepancy" between the scores of the Mexican-American and Anglo-American subjects. The Anglo-American subjects achieved higher scores, and the discrepancy between the scores for each group increased with age. They found that the Mexican-American children were retarded in M. A. as compared to the Anglo-American children, with no rural urban differences. It was conceded, however, that the Mexican-American children may have suffered a language handicap.

Garth, et. al. (1936) conducted a study in the Los Angeles public schools "to determine the influence of language on the education... [Mexican] children, when their ability with a non-language test is known." The children were administered a verbal test and an achievement test, the results of which compared unfavorably to Anglo norms,

although the subjects were "nearly equal on the non-language examination." The conclusion reached was that verbal tests may handicap the Mexican-American child. While the role of factors other than bilingualism was still not reported, this may be regarded as an important contribution to the literature.

Garth's work is illustrative of the growing awareness of a possible cultural bias operating in intelligence tests. Sanchez (1934) has cautioned against the acceptance and interpretation of the cross-cultural I. Q. at face value, pointing out that many of the children so tested have had only minimal comprehension, if any, of the language of the test. He urged the usage of "good sense." He argued that, according to Garth's findings, the average Mexican-American child was a moron, but that he had found it possible to raise the average I. Q. of Mexican-American children to 100 with intensive training in language skills. Hill (1936) attempted to determine the effects of bilingualism on the I. Q. Using Italian-American children from English speaking and Italian speaking homes, he found no difference on either a verbal or non-verbal test, concluding that the verbal test is as reliable an indicator as the non-verbal. In another publication (1936), he correlated the intelligence test scores of Italian-American and Anglo children over a period of time as measured by the Stanford Binet, administered in the first grade, the National I. Q. Test administered in the

fifth grade and the Otis which was administered in the sixth grade. He found a significant correlation. As many of the children spoke little or no English at the time of testing with the Binet the correlation possibly reflects continued difficulty with the English language. Hill failed to mention this possible source of invalidity.

During the 1940's and 1950's, there was a growing interest in the study of the background of children of different cultures, the effects of these backgrounds upon intelligence, and in the specific effects of bilingualism.

Boas (1940) defined intelligence as "the ability to adapt...to the problems of life" and stated that he found items on intelligence tests to be culturally biased, accounting for the difference in intelligence between northern and southern Negroes. He stated that judgment of the intellectual capacity of the individual must be based on "observation of the individual behaving with regard to the cultural background determining the motivation of the action."

Altus (1949) found that of illiterate bilingual Mexican-Americans educated in the United States, 18% were completely and 21% partially literate in Spanish, evidence for what she regards as the remarkable tenacity of a culture.

Humphrey (1945) stated that the differing roles of Mexican and Mexican-American children cause a great deal of

conflict within the family, in addition to the problems facing the Mexican-American child outside of the family. He also made an interesting distinction between the sole immigrant, and the immigrant family, the latter clinging more determinedly to older cultural patterns brought from Mexico.

Fernandez-Marina et. al., (1945) described the trends in the Mexican culture as superiority of the male, different expectations for boys and girls, and the self-effacement of the mother, from whom all affection comes.

James (1948) outlined the problem of definition of the Mexican-American. He stated that the wage earner, usually the father or older brother, exerts almost complete authority over the family, extending even to married children.

Gillin (1955) mentioned the great importance placed by all Latin-Americans on the individual, the importance of the macho concept to the males, who must be sure of themselves physically and verbally, and a preoccupation with death.

Seemingly as a result of studies such as these, which describe a very different culture from the Anglo middle class culture, workers in the field became increasingly aware of the invalidity of studies leaving culture, as well as socio-economic level and bilingualism, uncontrolled.

Eels (1953) stated that, on the average, children from better homes do better on standard tests of intelligence, possibly because the tests are not written in language used by the lower class person. Further, regardless of test content, the approach to the test is in part determined by "cultural approaches to problem solving."

This increasing sophistication was probably a result of work such as that of Pasaminck (1951) who criticized earlier studies on the basis of lack of control of relevant variables such as diet, social opportunity, prejudice on the part of examiners, and the doubtfulness of the suitability of non Mexican-American controls, stating that he doubts if the Mexican child ever has an environment similar to the Anglo child. Further evidence in support of these contentions was offered by the work of Darcy (1946) who found in testing Puerto Rican children that the Stanford Binet operates in favor of monolinguals, the Atkins Object Fitting Test in favor of bilinguals, concluding that one test cannot be substituted for the other; and the work of Gellerman and Hays (1951) who tested twenty-one pairs of mental defectives, one group from a high socio-economic level, the other from a low, on ninety-nine culture-loaded items, finding that the subjects from the higher level did better than the other subjects.

Pasaminck and Knobloth (1955) reported Negro children of low socio-economic level were low in language development

compared to white norms. They felt that this may be a function of racial awareness, even with the very young subjects they used.

Halsey (1959) stated that "I. Q. is randomly distributed among social classes, environment produces test scores."

Altus (1953) studied Mexican-American children due for screening for retardation and Anglo children with emotional problems finding a significant difference in verbal I. Q., none in performance I. Q.

Knief (1957) found no relationship between social class and intelligence quotient, but did between social class and achievement, suggesting that a culture fair test is perhaps not suitable for prediction of achievement.

Kidd (1960) tested four groups of children of high and low socio-economic level, including Mexican-American children. She reported a correlation of .68 between the IPAT and the Stanford Binet. After item analysis, she concluded that the Stanford Binet was suitable for testing upper class Mexican-American children.

Norman and Mead (1960) found with their Spanish-American subjects a negative correlation between amount of schooling and bilingual background, with rural subjects achieving the poorest scores.

The foregoing illustrates the development of thinking concerning the I. Q. test used cross-culturally and cross-

racially. From an early confusion regarding culture, nationality and race, a naive assumption that children who in some cases (Garth 1928, Hill, 1936) admittedly could hardly speak English could adequately be tested with materials suitable for middle class Anglo people, a complete disregard for seemingly overwhelming variables, and the application of findings obtained under such conditions with amazing security, we have progressed to a comprehension of the importance of the variables operating in cross-cultural research. We have also achieved a sense of the need for caution in the interpretation and application of test results yielded under such circumstances.

There has been, further, an interest in the nature of bilingualism per se, as well as the relationship of language to culture and personality structure.

According to Lambert et. al., (1958), if a second language is learned in a separate context from the first, there will arise for words subtly different meanings which may not be translated from language to language. Believing that speed would be characteristic of the perception and understanding of the preferred language, he performed a reaction time study with adult French-English bilinguals, instructing them in a simple task in both languages. The results were in the expected direction.

Peterson (1956) found that words of high cultural frequency are learned more quickly than those of low

frequency, suggesting that this may hold when learning a foreign language with words and concepts not present in the first language.

Brown et. al., (1955) found that his subjects could translate words in a foreign tongue unknown to them, on the basis of phonetic spelling, implying a "common sound-meaning convention."

The necessity of the development of an "objective measure of the meanings of concepts" was recognized by Osgood (1949), whose answer to this problem was the semantic differential, essentially a scaling device.

Hoijer (1948) defined culture as "that complex whole which includes knowledge, beliefs, art, mores, customs, and many other capabilities or habits acquired by man as a member of society." He stated further that one of the special capabilities learned by man as a result of his belonging to any given culture is his language, that, therefore, language is a part of culture and cannot be studied separately from it.

In an experiment designed to test the hypothesis that a person tends to conform to the mores of a culture when speaking its language, Ervin (1955) found that adult French bilinguals describing T A T cards gave quantitatively different responses in each language. In French, the subjects tended to emphasize verbal aggression against peers and rejection or assertion of independence, while in English,

they were concerned with physical aggression, escaping blame and in the female subjects, achievement.

Whorf (1956) stated:

Thinking is most mysterious, and by far the greatest light upon it is that thrown by the study of language...the forms of a person's thoughts are controlled by...patterns of which he is unconscious. These patterns are the unperceived intricate systematizations of his own language...and every language is a vast pattern system,..., in which are culturally ordained the forms and categories by which the person... communicates but also analyzes nature, notices or neglects types of phenomena, channels his reasoning, and builds the house of his consciousness.

Linton (1959) stated, "Every culture includes a series of ideas, values, and patterns of behavior of which all members of the culture must be familiar. Language is one of these."

From work of this type, we can see that the problem of bilingualism is an intricate one, not only from the point of view concerned with tested intelligence but as an indication of the two cultures from which the bilingual learns, which may cause in the same person subtly different habits, attitudes and characteristic choice of things to be noticed and expressed, as well as different methods of expression.

Conceptualizations of intelligence have ranged from global definitions such as that of Boas (1940) to the attempts of the factor analysts to isolate the abilities tapped in intelligence tests. In his attempt to delineate and quantify these skills, Thurstone (1938) found a factor W, or word

fluency, which was separate from V, or the ability to deal with meanings. He felt that the factor W may be associated with personality as well as intellectual factors.

In their factor analytic study of intellectual patterning, Guilford and Christensen (1956) describe a factor for word fluency, associational fluency, ideational fluency, and expressional fluency. Word fluency has no relation to meaning. It is the ability to produce words meeting specific structural requirements. French (1951) identified different forms of fluency coinciding with Guilford's, adding that expressional fluency seems to be a function of the number of words used together.

Taylor (1947) stated that fluency correlated with Guilford's surgency factor, while Studman (1935) stated that fluent persons tend to be "independent, extroverted, unstable."

Hemmelwhite (1945) found a relationship between the intelligence-vocabulary ratio and psychiatric diagnosis, the hysterical personality having a high ratio, the depressed low. Balkan and Masserman (1943) report a low verb-adjective ratio in hysterics, and found a high verb-adjective ratio in anxiety states and in obsessive compulsive neurosis.

We find then, an increasing sophistication regarding the intermingling of the formerly discrete categories of culture, economic level, language, intelligence, personality, expression, bilingualism and psychopathology, and a

realization of the necessity of studying the interaction of all these factors. It seems fairly safe to say that these factors work to the disadvantage of those members of a sub-culture whose cultural patterns, in the broadest sense, do not coincide either with the group in which the individual must function, or the group with which he is being compared.

In this present study, an attempt was made to study the language of bilingual Mexican-American adolescents, and monolingual Anglo-American adolescents, establishing comparisons, not norms, with regard to their fluency and method of expression. In order to be sure that any differences in the groups were due to cultural differences in language, the subjects were equated for I. Q., age, sex, socio-economic level, and grade in school.

The study was conducted solely in English, as it was felt by the examiner that having spent at least ten years in the Tucson public school system would give the Mexican-American subjects enough experience with English to understand and be understood. The emphasis of the study was not on quality of response, but rather the manner in which the bilingualism of the Mexican-American subjects influenced spoken English, as well as the fluency of these subjects as compared to Anglo-American subjects.

HYPOTHESES

On the basis of the work of Lewis (1961), who mentioned the fine ability of his Mexican informants to describe their daily lives and their emotional responses to the events of their lives, and the work of Gillin (1955), who mentioned the importance of words to the Latin-American, the hypotheses relevant to this study were made. It was assumed by the author that the cultural biases operating in intelligence tests (Eels, 1953, Darcy, 1946, Pasaminck, 1951, Gellerman and Hays, 1951, and Altus, 1953) may be a function not only of vocabulary or understanding deficit, as seems to be tacitly assumed in the work pointing up the difficulty of use of traditional intelligence tests with bilinguals (Garth, 1928, Hill, 1936), but also of culturally determined qualitative and quantitative differences in expression (Hoijer, 1948, Whorf, 1956, Linton, 1959).

It was further assumed that, if the Mexican-American subjects were allowed freedom in the choice of words in which they were to express themselves, language handicaps would be minimized. It was assumed that the fluency factor of intellect isolated by Thurstone (1938), Guilford and Christensen (1956), and Guilford et. al., (1957) would be increased by the cultural background of the subjects.

In consideration of the above it was hypothesized that:

1. Mexican-American children will be superior to Anglo-American children on tests of verbal fluency.

2. Mexican-American children will be superior to Anglo-American children in verbal fluency, particularly on tests measuring descriptions of emotion as contrasted with description of objects.

The first hypothesis is concerned primarily with sheer productivity, the second with the content of this productivity.

SUBJECTS

A total of 80 students of a local high school, 20 Mexican-American males, 20 Mexican-American females, 20 Anglo-American males and 20 Anglo-American females, were selected for testing of verbal fluency, from a total of 157 sophomores administered the IPAT, form 2.

The students chosen for the study, after preliminary I. Q. testing, were those who could be equated for age, sex, non-verbal I. Q. as measured by the IPAT, and socio-economic level as determined by the occupation of the father, or of the mother if the father were dead or not living in the home of the subject or if the occupation of the father was unknown. The socio-economic status of all subjects was judged to be low. Of the chosen students, two Anglo-Americans and one Mexican-American did not know the occupations of their fathers, three Anglo-Americans had fathers who were retired, three Anglo-Americans and one Mexican-American had fathers who were unemployed. One Anglo-American whose father was unemployed reported that his mother was employed, as did one Mexican-American. Five Anglo-American mothers with employed husbands worked, as did three of the Mexican-American mothers. Sixty-nine fathers were reported as being construction workers, mechanics, truck drivers, or laborers.

The Anglo-American children were all born in the United States, as were their parents. The Mexican-Americans all had Spanish last names, a noticeable Spanish accent, and had one or both parents who were born in Mexico or were born in Mexico themselves. Many of the Mexican-American subjects did not have complete information regarding the last criterion, a lack of knowledge reported as common by Paschal and Sullivan (1925). The subjects did have enough information, however, to make selection possible. It was felt that the possession of a Spanish accent was a fairly adequate measure of the persistence of the culture, an opinion reinforced by the work of Humphrey (1945) and Altus (1949), and by the examiner's own observations that a great deal of Spanish was spoken among the Mexican-American students in the halls and cafeteria of the school.

One systematic bias occurred in the selection of the subjects which was beyond the control of the examiner, the original I. Q. testing was done with the instructions read in English, a factor which probably tended to remove from possibility of selection any student who was so poor in English skills that he could not understand directions. This I. Q. test was timed, which may also have introduced a systematic bias against some of the Mexican-American students.

METHOD OF INVESTIGATION

After discussion with the officials of the high school, it was decided to administer the IPAT in a group setting to eight sophomore homerooms of 25 or fewer students. The examiner was assured that the only systematic effort to structure the homeroom was on a sex basis. The testing took place over a period of three and one-half weeks, and was done during the homeroom periods.

After this group testing, 80 of the matched students were seen individually for a period of 15 minutes each. The school made available a conference room generally used by the school psychologist.

The subjects were summoned with a pass normally used by the guidance counselors, and were greeted at the door of the office by the examiner, who directed them to a chair. A stop watch was visible, as well as a piece of paper and a pen.

If the subject was visibly nervous, the examiner made some social small talk, confined mostly to the weather, before beginning.

The subject was told:

I am studying at the University, and I am talking to you because it is part of the work I have to do for my degree. This has nothing whatever to do with your school work. I am going to

ask you a few questions, and I am going to write down what you say. Is that O. K.? I am also going to time some things, but you will have plenty of time, so don't worry about it.

The subject was then told, "Say as many words out loud as you can. Any kind of words at all will be O. K."

The subject was then instructed, "Tell me something about a flower." The responses were recorded by the examiner, as well as the responses to queries, worded alike, concerning a sunset and their mother.

Following this, they were asked to, "Tell me all the ways a broom can be used, any ways you can think of." The same question was asked regarding a hanger.

When these responses were concluded, the subject was handed a piece of paper and a pen, and asked to write all the words he could think of beginning with the letter P. This test was limited to five minutes. Each subject was given one minute for the first task. The remainder of the tests were not timed.

The subjects were encouraged by the examiner, by being told that they were doing very well. If they were unwilling to talk moderate attempts were made to draw them out.

Because the interest of the examiner was in the gathering of information about spontaneous speech, the interviews were conducted on a conversational level. Several of the subjects were so nervous initially that they were visibly

shaken, but in all but one case, which was not used, rapport was felt to have been established.

The subjects were generally interested in the study, most believing it was a test of intelligence, of personality, or both. If questioned, the examiner would reply that she was interested in neither. Most of the subjects seemed to accept this, although many of them seemed confused by the interview.

As a group the Mexican-American girls were the most difficult to handle in the interview situation. With a few exceptions they were the most resistant. The Mexican-American boys were probably the most courteous, the Anglo girls the most at ease, and the Anglo boys the most skeptical.

It was realized that the presence of an Anglo authority figure would probably have differential effects on the different groups, but this was not felt to invalidate the study in view of the fact that it is an Anglo culture in which all the subjects must function at least part of the time, and that each group probably has developed characteristic ways of dealing with such a situation.

RESULTS

The four groups, Mexican-American males, Mexican-American females, Anglo-American males and Anglo-American females, were matched for age, and for I. Q. as measured by the IPAT, form 2. Table I shows the means of these measures. Tables II and III show how well matching was accomplished. There are no significant differences either in age or I. Q. Table IV shows the mean I. Q. of the 157 subjects administered the IPAT, from whom the final 80 subjects were chosen. The Duncan's Range test for these data appears in Table V. As inspection of the appropriate table indicates, there is no statistically significant difference between the groups even when the subjects were unselected.

The experimental procedures allow a number of comparisons of verbal fluency by cultural group and by sex. The measures used to ascertain verbal fluency are the number of words given orally, in one minute, in a free association situation; the number of words beginning with P written in five minutes; the number of words used in talking about a flower, a sunset, and the subject's mother considered individually; and the total number of words used in talking about these three topics. In addition, a tally was made of the number of ideas given relative to the use of a broom and a hanger.

Table VI shows the raw data for these measures. Table VII summarizes the Duncan's Range test for each of these measures, showing the difference between the means of each group, and the significant studentized range (SSR) appropriate to the comparison. Significance occurs when the difference between means exceeds the SSR. All significant differences are starred. Nine cross-cultural comparisons in fluency were found to be statistically significant. Five of these comparisons reveal differences in favor of the Mexican-American groups: Mexican-American females were superior to Anglo-American females in writing words beginning with P, and to Anglo-American males in oral free association; Mexican-American males were superior to Anglo-American males in oral free association and to Anglo-American females in production of words to describe a sunset and in production of ideas relevant to the use of a broom. Four of the comparisons reveal superiority of the Anglo-American groups over the Mexican-American. Anglo-American males and females were superior to Mexican-American males in oral free association. The Anglo-American males were superior to the Mexican-American males in writing words beginning with P. The Anglo-American males were also superior to the Mexican-American females in production of words to describe a flower. Table VIII summarizes the data by showing the significant differences among groups.

A Pearson Product Moment correlation was performed between I. Q. score and the total number of ideas produced relevant to the use of a broom and a hanger. Evidently the two tasks measure different abilities as shown by the correlation of .04.

The grammatical structure of the content of responses talking about a flower, sunset and mother was analyzed to ascertain differences in the frequency of the use of the passive verb form, the ratio of passive verbs to all verbs and the verb/adjective ratio. Table IX indicates the results of an analysis of variance exploring the occurrence of these usages. Table X indicates that the Mexican-American males and females used significantly more passive verb constructions than the Anglo-American males and females. There were no intra-cultural sex differences. There were no differences among any of the groups in the verb/adjective ratio. No significant difference was found in the number of verb constructions used by each of the groups ($X^2 = .161$).

The responses that each group used to describe flower, sunset and mother were analyzed to ascertain cross-cultural differences in content. Chi square was the statistic employed, corrected for correlated proportions where necessary. Yates' correction formula was employed where appropriate. Table XI shows the raw data of these responses. Table XII shows the values of X^2 for each of these comparisons. As inspection of Table XII indicates, there are six

significant differences in content cross-culturally; between males in description of a flower in terms of use and color, in description of a sunset in terms of the surrounding landscape, and in description of the mother in terms of her personality characteristics and duties as a housewife.

There is one significant difference between females, in use of color to describe a sunset. Table XI indicates that Mexican-American males describe a flower more in terms of use and color than do Anglo-American males and a sunset more in terms of surrounding landscape. Anglo-American males describe their mothers more in terms of personality characteristics and duties as a housewife than Mexican-American males. Inspection of the table indicates that Anglo-American females use more color in their description of a sunset than Mexican-American females.

TABLE I

MEAN AGES AND INTELLIGENCE QUOTIENTS OF THE 80
SUBJECTS SELECTED FOR TESTING OF VERBAL FLUENCY

	X Age	Range	X I. Q.
Mexican-American Males	16-4	15- 3-17-1	91.1
Mexican-American Females	16-1	15- 1-17-1	86.5
Anglo-American Males	15-9	15- 0-16-7	94.4
Anglo-American Females	15-4	14-10-16-3	92.1

TABLE II
 DUNCAN'S RANGE TEST FOR THE AGES OF
 THE EIGHTY SELECTED SUBJECTS

g	Group	Difference	SSR	Conclusion
4	I-IV 16-4-15-4	1-0	5.40	Non-Significant
3	I-III 16-4-15-9	not tested		Non-Significant
2	I-II 16-4-16-1	not tested		Non-Significant
3	II-IV 16-4-15-4	not tested		Non-Significant
2	II-III 16-4-15-9	not tested		Non-Significant
2	III-IV 15-9-15-4	not tested		Non-Significant

TABLE III

DUNCAN'S RANGE TEST FOR THE I. Q.'S OF
THE EIGHTY SELECTED SUBJECTS

g	Groups	Difference	SSR	Conclusion
4	I-IV 95.4-87.8	7.6	100.06	Non-Significant
3	I-III 95.4-87.8	not tested		Non-Significant
2	I-II 95.4-89.0	not tested		Non-Significant
3	II-IV 89.0-87.8	not tested		Non-Significant
2	II-III 89.0-87.8	not tested		Non-Significant
2	III-IV 87.8-87.8	not tested		Non-Significant

TABLE IV
MEAN INTELLIGENCE QUOTIENTS OF ALL SUBJECTS

	X I. Q.
Mexican-American Males	91.1
Mexican-American Females	86.5
Anglo-American Males	94.4
Anglo-American Females	92.1

TABLE V
 DUNCAN'S RANGE TEST FOR
 THE I. Q.'S OF ALL SUBJECTS

g	group	difference	SSR	Conclusion
4	I-II 94.4-86.5	7.9	21.25	Not Significant
3	I-II 94.4-91.1	not tested		Not Significant
2	I-II 94.4-92.1	not tested		Not Significant
3	II-IV 92.1-86.5	not tested		Not Significant
2	II-III 92.1-91.1	not tested		Not Significant
2	III-IV 91.1-86.5	not tested		Not Significant

TABLE VI

MEANS OF THE FOUR SUB-GROUPS ON ALL
MEASURES OF VERBAL FLUENCY

	Words Given Orally in One Minute	Written Words Beginning With P	Words Regarding Flower	Words Regarding Sunset	Words Regarding Mother	Total Words	Ideas for Use of Broom	Ideas for Use of Hanger	Ideas for Broom and Hanger Combined
Mexican-American Males	48.95	25.2	39.80	33.80	42.15	128.85	6.85	4.55	5.70
Mexican-American Females	52.25	29.0	28.50	28.50	42.00	82.65	4.35	3.60	3.98
Anglo-American Males	48.30	30.0	42.00	31.15	37.80	112.25	6.10	4.50	5.30
Anglo-American Females	54.65	23.8	36.85	24.85	46.50	110.20	4.55	4.40	4.48

TABLE VII

SUMMARY OF DIFFERENCES AMONG THE FOUR SUB-GROUPS ON ALL MEASURES OF VERBAL FLUENCY

	Words Given Orally in One Minute		Written Words Beginning with P		Words Regarding Flower		Words Regarding Sunset		Words Regarding Mother		Total Words		Ideas for Use of Broom		Ideas for Use of Hanger		Ideas for Broom and Hanger Combined	
	Difference	SSR	Difference	SSR	Difference	SSR	Difference	SSR	Difference	SSR	Difference	SSR	Difference	SSR	Difference	SSR	Difference	SSR
Mexican-American Males > Mexican-American Females					11.30	8.70*	5.20	7.96	.15	7.64	46.20	38.60*	2.50	2.14*	.90	2.14	1.72	2.14
Mexican-American Males > Anglo-American Males	.60	.2368*	1.4	3.00			2.65	7.64	4.35	8.53	16.65	35.32	.75	1.96			.40	1.81
Mexican-American Males > Anglo-American Females					2.95	8.34	8.95	8.34			18.60	37.53	2.30	2.07*	.15	2.07	1.22	1.83
Mexican-American Females > Mexican-American Males	3.70	.2368*	3.8	3.00*											.05	1.93		
Mexican-American Females > Anglo-American Males	3.95	.2494*							4.20	7.97								
Mexican-American Females > Anglo-American Females			5.2	3.16*			1.65	7.64										
Anglo-American Males > Mexican-American Males			4.8	3.16*	2.20	7.64												
Anglo-American Males > Mexican-American Females			1.0	3.00*	13.50	8.81*					29.60	37.53	1.75	2.07	.90	2.07	1.32	1.93
Anglo-American Males > Anglo-American Females			6.2	3.27*	6.15	8.53	6.15	8.53			2.05	35.32	1.55	1.96	.10	1.96	.82	1.91
Anglo-American Females > Mexican-American Males	5.70	.2494*			8.35	8.34*			4.35	7.64								
Anglo-American Females > Mexican-American Females	2.40	.2368*					2.65	7.64	4.50	7.97	27.55	35.32	.20	1.96	.80	1.96	.50	1.91
Anglo-American Females > Anglo-American Males	6.35	.2698*							8.70	8.70								

*Significant at the .05 level

Blanks indicate that comparisons between those two groups are the same as those already made between appropriate groups.

TABLE VIII

SUMMARY OF SIGNIFICANT DIFFERENCES AMONG GROUPS
IN PRODUCTIVITY MEASURES

Test	Mexican-American > Anglo-American	Anglo-American > Mexican-American	Intra-cultural
1. Binet item Words per Minute	Mexican-American Females > Anglo-American Males	Anglo-American Females > Mexican-American Males	Anglo-American Females > Anglo-American Males
	Mexican-American Males > Anglo-American Males	Anglo-American Females > Mexican-American Males	Mexican-American Females > Mexican-American Males
2. Thurstone's Test of Word Fluency Written Words	Mexican-American Females > Anglo-American Females	Anglo-American Males > Mexican-American Males	
3. Productivity (Flower)	-----	Anglo-American Males > Mexican-American Females	-----
4. Productivity (Sunset)	Mexican-American Males > Anglo-American Females		
5. Productivity (Mother)	-----	-----	-----
6. Total Productivity	-----	-----	Mexican-American Males > Mexican-American Females
7. Uses of Broom	Mexican-American Males > Anglo-American Females	-----	Mexican-American Males > Mexican-American Females
8. Uses of Hanger	-----	-----	-----
9. Uses of Broom and Hanger (com- bined)	-----	-----	-----
total	5	4	4

TABLE IX

ANALYSIS OF VARIANCE FOR RATIO OF PASSIVE TO ACTIVE VERBS,
PASSIVE TO ALL VERBS USED, AND VERB-ADJECTIVE RATIO*

Source of Variation	df	SS	MS	F
Sex, Culture	2	44.65	22.375	
Verb Ratios	8	71.46	8.88	
Interaction	25	55.08	2.05	5.61
Within	<u>684</u>	<u>171.19</u>	3.99	
	719	342.38		

*Significant at .05 level

TABLE X

SUMMARY OF DIFFERENCES IN GRAMMATICAL USAGE
AS MEASURED BY DUN CAN'S RANGE TEST*

	Passive/Active		Passive/All Verbs		Verb/Adj	
	Difference	SSR	Difference	SSR	Difference	SSR
Mexican-American Males > Mexican-American Females	.17	.6909				
Mexican-American Males > Anglo-American Males	1.33	.6909*	.12	.5817	.05	.6237
Mexican-American Males > Anglo-American Females	1.25	.6846*	.22	.6237		
Mexican-American Females > Mexican-American Males			.19	.6237	.23	.6237
Mexican-American Females > Anglo-American Males	1.16	.6846*	.31	.6489	.37	.6489
Mexican-American Females > Anglo-American Females	1.08	.6783*	.41	.6615	.06	.5817
Anglo-American Males > Mexican-American Males						
Anglo-American Males > Mexican-American Females						
Anglo-American Males > Anglo-American Females			.10	.5817		
Anglo-American Females > Mexican-American Males					.26	.5817
Anglo-American Females > Mexican-American Females						
Anglo-American Females > Anglo-American Males					.31	.6447

*Significant at .05 level

TABLE XI
 CATEGORIES AND NUMBER OF RESPONSES USED FOR
 DESCRIPTION BY EACH CULTURAL GROUP

Category	Mexican- American Males	Mexican- American Females	Anglo- American Males	Anglo- American Females
<u>Flower</u>				
use	10	7	2	8
Emotional Response	9	0	3	3
Adjectives	24	24	21	27
Varieties	6	10	14	8
Biological Description	65	26	74	41
Color	37	28	21	25
<u>Sunset</u>				
Personal Reaction	5	6	1	5
Adjectives	32	25	39	37
Colors	27	17	28	37
Surrounding Landscape	48	24	26	28
<u>Mother</u>				
Physical Description	50	52	53	44
Personality Description	26	43	47	36
Marital Relationship	14	4	11	9
Health	6	1	7	4

TABLE XI (continued)

Statistical Information	4	5	0	5
Relationship to Subject	25	28	9	24
Relationship to Others	4	5	1	5
Feelings of SS toward Mother	3	7	4	6
Duties as a Housewife	4	5	13	9
Other Activities	2	7	4	3

TABLE XII

SUMMARY OF DIFFERENCES BETWEEN THE FOUR
CULTURAL GROUPS IN CONTENT OF RESPONSE

Category	X ² Between Males	X ² Between Females
<u>Flower</u>		
Use	4.08*	0.0
Emotional Response	2.08	1.33
Adjectives	.20	.20
Varieties	2.45	.05
Biological Description	.58	2.58
Color	4.24*	.17
<u>Sunset</u>		
Personal Reaction	1.5	0.0
Adjectives	.51	2.32
Colors	0.0	7.40*
Surrounding Landscape	6.27*	.31
<u>Mother</u>		
Physical Characteristics	.09	.59
Personality Characteristics	6.03*	.62
Marital Relationships	.36	1.23
Health	0.0	.40

TABLE XII (continued)

Statistical information	.75	0.0
Relationship to Subject	.75	.31
Relationship to Others	.66	0.0
Subject's Feelings Toward Mother	0.0	0.0
Duties as a Housewife	4.26*	.64
Other Activities	.17	1.6

*Significant at .05 level

DISCUSSION

In the opinion of the author, this study reveals some rather interesting points which are significant in themselves, and which may further illustrate claimed trends in the Mexican-American culture.

The measures used in this present study were derived from measures used by Guilford et. al. (1957), Thurstone (1938), and the AC Test of Creative Ability (1959). Guilford used a task similar to words per minute to measure ideational fluency, and this task appears on the Stanford Binet form L (1960). Thurstone (1938) used the task measuring the number of words that could be written beginning with the letter P, and Guilford has a similar task to measure word fluency. This task consists of asking the subjects to write all the words they can think of meeting various structural requirements. The AC Test of Creative Ability asks subjects to list uses for a broom and a hanger, and Guilford and Christensen (1956) asked their subjects to list uses for a brick.

Guilford (1950) stated that the validity of tests measuring abilities which are factor analytically derived must first be validated by internal means. Only after the test has been derived, can predictive validity be assessed. Guilford's test of creative abilities was developed from the

scores of known creative people on various tasks.

In this present study, out of a possible 36 cross-cultural comparisons of verbal fluency, nine significant differences were found. Five of these nine differences favored the Mexican-American subjects and four favored the Anglo-American subjects. This difference, considering the bilingual training of the Mexican-American subjects, appears to indicate that the Mexican-American high school students tested have a higher level of verbal fluency than the Anglo-American high school students tested.

It is regarded by the author as strong proof of the Latin-American emphasis on verbalization that the Mexican-American subjects were able to perform so well in a language which they speak with poor grammar and accent, and which is evidently not their language of choice.

Other studies (Sheldon 1926, Garth 1928, Altus 1935, Garretson 1928, Kidd 1960) have indicated that Mexican-Americans, and particularly lower class Mexican-Americans, are unduly penalized by the use of verbal tests. However, as Thurstone (1938), Guilford and Christensen (1952), and Guilford et. al. (1957) indicate, fluency is but one factor in the complex of factors measured by intelligence tests. Thurstone and Thurstone (1938) point out, "It is not unlikely that the word fluency factor is indicative of some temperamental traits in addition to its cognitive implications."

Guilford and Christensen (1952) and Guilford et. al. (1957) found four fluency factors in their factor analytic study of creative ability; word, associational, ideational, and expressional fluency. Again, these were only a few of the factors isolated. Guilford (1950) feels that creativity may not be so much an intellectual as a temperamental phenomenon. Taylor (1947) reports that fluency is correlated with Cattell's surgency factor, and Studman (1935) reports that fluent people tend to be "independent, extroverted, unstable." If, as seems to be indicated by this study, fluency is an area of strength in the Mexican-American culture, it may be so because of culturally determined factors in personality, among them a desire to excel in the use of words (Gillin 1955). Gillin ties this desire in with the "macho" concept, or the desire on the part of the males in the Latin-American culture to be sure of themselves physically and verbally. Therefore, it may be that the fluency factor is an area of strength in the Mexican-American culture because it is stressed in that culture.

It is not suggested by these statements that verbal tests of intelligence can indiscriminately be used cross-culturally. It is suggested, however, that the biases inherent in the nature of intelligence tests do not include one which unfairly discriminates against Mexican-Americans on the basis of verbal facility alone. As Eels (1953) pointed out, the detrimental effects of verbal tests of intelligence upon

subjects other than middle class Anglo-Americans may be a function of the nature and phrasing of items, as much as anything. Eels also points out (1953) that the approach to such tests is in part "determined by cultural approaches to problem solving."

The high frequency in the Mexican-American groups of the use of the passive verb form compared to the Anglo-American groups cannot be considered only a result of the Mexican-American subjects' bilingualism. The passive verb is used very rarely in Spanish. When used in English, an attempt at softening statements is implied according to Winston's New World Dictionary of the American language (1951). This usage on the part of the Mexican-American subjects may reflect passivity and self-effacement present in the Mexican culture to a greater degree than in the Anglo culture. We must also recognize that any passivity reflected in this usage may indicate a characteristic means on the part of members of the Mexican-American culture of dealing with representatives of the Anglo-American culture. It can safely be assumed that the usage of the passive form with such frequency is not solely linguistic. The explanation of these data can probably best be made on the basis of cultural and personality factors.

The author noted that each of the teachers to whom she spoke at the high school where testing took place spontaneously mentioned the politeness of the Mexican-American students, with a great deal of approval. At this time, we

cannot know if this is reflective of passivity fostered by the Mexican culture, of passivity fostered by contacts with the Anglo culture, or of an interaction between the two possibilities.

It was surprising to the author that the content of the statements did not show more variation cross-culturally. That they did not may be because the Mexican-American subjects, while speaking English, adhered to the norms of the Anglo-American culture. It may also be because the questions were not crucial enough to draw forth any culturally determined differences. It must be pointed out that the lack of more difference in content of response may be the result of the difficulty in establishing rapport in the short period of the interview.

CONCLUSIONS

It was found that the Mexican-American groups excelled over the Anglo-American groups on five measures of verbal fluency. The Anglo-American groups excelled over the Mexican-American groups on four measures. These results are in the direction of the first hypothesis, which stated that Mexican-Americans would be superior to Anglo-Americans on tests of verbal fluency.

It was found that the Mexican-American groups used a greater number of passive verbs than the Anglo-American groups. This cannot be explained as a linguistic phenomenon, i. e., as a direct translation from Spanish to English, as Spanish discourages the use of the passive verb. It is suggested that this usage may reflect a desire to soften statements, and possibly an attitude toward life in which a passive outlook is the essence.

The second hypothesis, that Mexican-American groups would be superior in their description of emotion, was not borne out.

It is felt that the effects of an Anglo-American authority figure may not be the same for both groups, but that the Mexican-American subjects had had a considerable amount of experience with just such a situation, and had probably developed a restrained way of dealing with it.

The fact that the entire group administered the IPAT showed no significant difference in I. Q. score indicates that there is probably no difference in native ability between the two cultural groups at least as represented in the local high school in which the study was performed.

The low correlation between IPAT scores and the scores for usage of broom and hanger, combined, indicates that the two tasks measure different abilities.

SUMMARY

The IPAT was administered to 157 high school sophomores at a Tucson public high school. Eighty of these subjects were then seen in individual interviews; 20 Mexican-American males, 20 Mexican-American females, 20 Anglo-American males, and 20 Anglo-American females. The subjects were equated for age, sex, school grade, socio-economic level and non-verbal I. Q. They were administered nine tests of verbal fluency; words given orally in one minute, words written in five minutes beginning with P, number of words used in telling about a flower, sunset, and mother, number of ideas given for use of a broom and hanger, and the number of ideas combined.

The Mexican-American groups exceeded the Anglo-American on five of these measures. The Anglo-American groups exceeded the Mexican-American on four.

The Mexican-Americans used significantly more passive verb constructions than the Anglo-Americans. A tentative explanation was offered explaining this phenomenon on the basis of culturally induced passivity.

The content of statements telling about a flower, sunset, and mother were significantly different six times cross-culturally. The Mexican-American groups did not demonstrate greater facility in describing emotions than the Anglo-Americans.

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