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THE DEVELOPMENT OF NORMS FOR BILINGUAL FIRST-, SECOND-, AND THIRD-GRADE CHILDREN'S RESPONSES TO THE HAND TEST AND PEABODY PICTURE VOCABULARY TEST

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

DOCTOR OF EDUCATION

BY

FAYE TUCKER PUTHOFF

Norman, Oklahoma

1972

THE DEVELOPMENT OF NORMS FOR BILINGUAL FIRST-, SECOND-, AND THIRD-GRADE CHILDREN'S RESPONSES TO THE HAND TEST AND PEABODY PICTURE VOCABULARY TEST

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ACKNOWLEDGMENTS

In our Western Civilization, the very fact of existence demands documentation before validity is accepted. This has extended into the realm of the value and worth of the individual. Demonstration in writing is a pre-requisite of recognition of ability to observe, to think, to read, and to draw conclusions.

I wish to acknowledge Professors P. T. Teska, George Letchworth, and Mary Clare Petty who contributed to the completion of this study, but special appreciation is extended to Dr. Omer John Rupiper, Chairman of the committee, who not only directed this study but whose constructive guidance, confidence, and encouragement throughout the writer's entire program was so essential for its completion.

A special expression of gratitude is given to Jean Downer who aided the writer in testing and to Ada Love and Frank Duran who acknowledged worth and value in me. I gratefully return this recognition. To these believers, thank you.

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CHAPTER I

INTRODUCTION

Man possesses that distinctive quality of wanting to understand why. Becuase of this possession many methods have been implemented to test man's intelligence, sensory involvement and development, and physical and mental health in an attempt to understand himself and his behavior better. Consequently, subjective, objective and projective techniques of cognitive, affective, and psychomotor assessment have evolved as an approach to understand why. The greatest concern of this study involved the area of projection.

Projection, as defined by Freud (Brill, 1938), was a defense mechanism. A person projected when he ascribed to another person or object a desire, characteristic, emotional structure or social relationship of his own that would be painful for him to admit. Rabin's (1960) statements on projection have offered a high degree of relevancy to the term, assuming the process of projection as fundamental to projective tests. He has pointed out that the broader term of "externalization"

was more appropriate in the case of projective techniques. He thought it avoided the constricting misconception of projection as a mere defense mechanism.

The projective test has evolved out of art and scientific investigations as a measure of personality. Early artists noted associations made with blots of paints. At the turn of the 20th Century, psychologists attempted to systematically explore the use of pictures, words, and ink blots as stimuli which would elicit responses. Rorschach first published his test results with inkblots in 1921. The Thematic Apperception Test (TAT), introduced by Murray in 1953, was another initial contribution to projective tests in this century. Still later projective methods of psychodiagnosis have included puppetry, psychodrama, completion, and paper and pencil methods. These have added development and refinement to the use of projectives.

More recently the Hand Test, a projective technique, originated by Wagner in 1959, received recognition and study. In an attempt to differentiate normals from schizophrenics, Bricklin, Piotrowski, and Wagner (1962) provided the rationale and original scoring system for the Hand Test. Later, Wagner published the first manual with a slightly modified scoring system which was revised in 1969 (Wagner, 1969). A majority of the research conducted using the Hand Test has dealt with schizophrenics and juvenile delinquents. There had been no research with the Hand Test using early elementary bilingual

children. In contrast, the Peabody Picture Vocabulary Test had been used to a great extent as a measurement of intelligence among school children. As a method of projective appraisal the Hand Test looked promising for use with bilingual children since it appeared to have overcome generally the definciencies of the more conventional tests.

The intent of this study is to provide information on the performance of one segment of the bilingual population on the Hand Test and Peabody Picture Vocabulary Test, i.e., bilingual children in grades one, two, and three. The gist of the rationale underlying this investigation is that many differences found between bilingual and English-speaking children on available instruments stem from characteristics of the instrument and its administration and the normative data that are shaped exclusively for application to only English speaking children. The results of evaluation with such conventional formal measures tend to confirm the very pattern of differences that are a logical outcome of the deprivation undergone by bilingual children. The effect may be conceived of as a form of "bias" introduced in the process of construction and interpretation of a measure which serves to distort performance on the behavioral dimension intended.

The Hand Test was chosen because it is entirely nonverbal in format and could verify the limitations of the subjects' particular cultural background and verbal

inadequacies. The results could be culturally biased because of experience and concepts generated through oral presentation and response difficulties.

The Peabody Picture Vocabulary Test was chosen because of its wide use in assessing verbal ability. It was translated into Spanish for purposes of this study.

Statement of the Problem

Studies have been conducted with the Hand Test using fourth, fifth, and sixth grade children and Seig (1965) reported a study employing four to six year old boys and girls, but the literature revealed no studies conducted with bilingual children. Hundreds of studies of the effects of bilingualism have been made since the early 1920's (Jensen, 1962). Despite the profusion of studies in bilingualism, however, no correlational study of intelligence and the results obtained from the administration of a projective technique had been reported.

The present study was undertaken to obtain data on the Hand Test from bilingual children in grades one, two and three and to establish norms, therefrom. Also, Peabody Picture Vocabulary Test scores will be obtained for purposes of specific dimensions of personality.

For the purpose of this study, the operational definition of bilingual children are those who speak and/or understand two languages. The primary language is Spanish with English as the second language.

No statistically significant correlations between intelligence as measured by the Peabody Picture Vocabulary Test and dimensions of personality as measured by the Hand Test for bilingual children is hypothesized. Correlations between the variables will be determined by sex within each grade level.

CHAPTER II

REVIEW OF RELATED LITERATURE

A great deal of research has been conducted using the Hand Test since its conception. In a speech to the Eastern Psychological Association in 1962 Wagner reported on the Hand Test as an indicator of antisocial, inflexible, and interpersonal aggression among delinquents. Wagner and Hawkins (1964) hypothesized that the Acting Out Ratio scores would differentiate between assaultive and non-assaultive delinquents. The Hand Test successfully differentiated 47 out of the 60 subjects (78 percent), which was statistically significant at the .001 level of confidence. Shaw and Linden (1964) criticized the Hand Test and its predictive validity. They felt confusion was caused by Wagner's failure to discriminate between predictive and concurrent validity. The critiquing authors felt, "Before these claims of predictive validity can be taken seriously it would seem preferable to complete at least one study specifically designed to determine the predictive qualities of the test (p. 284)." With this purpose in mind Wetsel, Shapiro, and Wagner (1967) initiated a study to predict recidivism among juvenile delinquents using the Hand Test. The investigation reported, "In the predictive validity of the Hand Test, the AOS significantly differentiated

delinquent recidivists from non-recidivists correctly categorizing 66 percent of the Ss. The AGG scores also significantly differentiated the two groups (p. 69)."

There have been attempts to utilize the Hand Test as a predictive instrument for "good workers." Wagner and Cooper (1963) hypothesized that the ACT score would differentiate between satisfactory and unsatisfactory workers. The experiment was conducted at Goodwill Industries in Akron, Ohio. Evaluations by the workers immediate supervisors and the personnel director were used as the criterion. The Hand Test correctly differentiated 45 out of 50 workers which was statistically significant at the .001 level. In an attempt to cross-validate the findings Huberman (1964) reported on a study in a large Douglas Fir plywood mill on the Canadian West Coast. None of the three hypotheses he formulated was supported by his results and "none of the other scores, examined subsequently showed any significant relationship with the original criterion (p. 282)."

Wagner and Hawver (1965) implemented the ACT scores of the Hand Test along with seven other tests, in a battery to develop predictors of workshop success for severely retarded adults. The results were highly significant for the predictive value of each of the eight tests. They urged caution in interpretation of the results because of no opportunity for cross-validation, the sample used was small and that, conceivably, the test may simply have measured present

performance rather than skills which existed prior to admittance to the workshop.

Further attempts at validation were made by Wagner and Capotosto (1966). At the Lincoln State School in Illinois successful discrimination was obtained between a group of poor workers who required too much supervision to be occupationally productive and a group of good workers who required only occasional supervision and who were occupationally productive. The ACT score was able to correctly differentiate 74 percent of the subjects. This was significant at the .01 level of confidence.

Of the research conducted a majority has been in an attempt to classify or diagnose schizophrenics on the basis of their responses to the Hand Test. Wagner (1961, 1962, 1966, 1970), Wagner and Medvedeff (1963), and Hodge and Wagner (1964) have published studies indicating that basic personality attributes are identified by the Hand Test and that the Hand Test successfully discriminates aggressive and non-aggressive patients from among a population of undifferentiated schizophrenics.

Drummond (1966) attempted to cross-validate Wagner's experiments in the discrimination of aggressive from non-aggressive behavior on the basis of the Acting Out Score and the Withdrawal Score of the Hand Test. Her subjects (66 undifferentiated schizophrenics) were rated aggressive or non-aggressive according to certain definite criteria. The

results of her study were notably similar for both groups. She concluded, "Since it is in the very nature of their disorder for schizophrenics to be unpredictable in their behavior, it is perhaps not surprising that the results of the present study have not proved significant (p. 279)."

Wagner (1963) also conducted a study, using the Hand Test, which attempted to identify male neurotics with marked overt psychosexual problems on the basis of content indicators. His conclusion was that they produced significantly (.02 level of confidence) more content indicators of sexual maladjustment (CYL and SEX) than a control group of neurotics without pronounced sexual aberration.

Seig (1965) reports on the Hand Test in German-speaking areas. Bonk (Seig, 1965) undertook to experiment with four to six year old boys and girls in order to ascertain the age at which sensible answers could be obtained. Seven year olds generally reacted adequately and gave action to the hands, but younger children did not relate as well. The answers of the younger children were generally only descriptive.

Steinmetz (Seig, 1965) implemented the AGG scores of the Hand Test along with five other tests in the diagnosis of aggressiveness. Her study was based on 16 youths, with a mean age of 10.9 years, from four elementary schools. A combination teacher and peer rating served as external criterion for the establishment of two extreme groups (aggressive, non-aggressive) of eight children each. A questionnaire, the

Rorschach, and the Color Pyramid Test were not able to discriminate between these contrasted groups; in contrast, the Disfigures Test, the TAT, and the Hand Test proved discriminatory.

Since the publication of the first edition of the Hand Test (1962) additional data has been presented. Capotosto (Wagner, 1971) established means on imbeciles and morons; Gloss (Wagner, 1971) assembled means on nine age groups of students (seven through 15 years) in the Tallmadage Ohio School District; Loftus (Wagner, 1971) reported means on a stratified sample of boys (mean age = 14.6) from a technical high school in Adelaide, Australia; dyslexic children as opposed to normal was reported by Daugherty (Wagner, 1971). Children for these groups were selected from fourth, fifth, and sixth grades. In this study the dyslexic group had more TEN responses than the normal group (significant to the .01 level of confidence).

Norms for 197 children from kindergarten through third grade were amassed by Viers (Wagner, 1971).

Roberts (1971) attempted to develop norms for mentally retarded and bright children on the Hand Test. She used 60 mentally retarded (mean C.A. = 10.5) and 60 "bright" children (mean C.A. = 10.5). Her conclusions state, "The Hand Test appeared to be effective in measuring differences between the frequency of responses of mentally retarded children and bright children in this study (p. 40)."

Azcarte and Gutierrez (1969) furnished means obtained on 100 boys at the National Training School, Virginia. They felt MAL and AOR scores could be used to predict overt, aggressive behavior.

Neuber's (Wagner, 1971) study presented data on samples of natives from the island of Guam. These samples (elementary school children, high school students, college students, and Guamanian adults) consistently produced more responses than United States samples. Wagner (1971) stated, "It is difficult to ascribe a definitive interpretation to this unexpected finding, but it does seem relevant to note that the Hand Test can reflect, in an objective way, intercultural differences (p. 67)."

Since it was first published in 1959, the Peabody Picture Vocabulary Test has been the subject of many studies testifying to the reliability and validity of the instrument. Research studies have involved both normal and atypical subjects.

Dunn and Harley (Dunn, 1965) correlated Forms A and B (r - 0.97) using cerebral palsied children; Hedger (Dunn, 1965) administered the PPVT, among other tests, to 150 orally trained deaf children, aged six to twenty years, with the results of r = 0.80 (equivalence of raw scores); Shaw (Dunn, 1965) administered both forms of the PPVT and the WAIS to 70 schizophrenics and arrived at a correlation of r = 0.87.

Moed, Wight, and James (1963) explored the possibility

of substituting a picture vocabulary test for the WISC with physically disabled children. All eligible children, six to sixteen years of age, at Children's Seashore House, Atlantic City, New Jersey, comprised the subjects for their study. Subjects were given the Wechsler Intelligence Scale for Children (WISC), the Ammons Full Range Picture Vocabulary, Form A (FRPV), and the Peabody Picture Vocabulary Test, Form A, (PPVT). Results indicated sixteen out of twenty correlations of the PPVT with the WISC were higher than the respective correlations of the FRPV with the WISC and significantly higher in six of the comparisons. They concluded, "The PPVT was more difficult than the other tests but showed greater concurrent validity with the WISC (p. 363)."

Neville (1965) conducted a study involving 148 children in upper-lower urban schools. One of the questions he posed was to determine if a short, easily administered test of intelligence, the PPVT, could neutralize the influence of poor reading ability to approximately the same degree as a longer, more difficult to administer test, the WISC. A correlational technique was employed to examine the relationship between scores. His conclusion was that the data "indicate that the Peabody Picture Vocabulary Test can serve as substitute for the administratively more complicated WISC (p. 261)."

Moss and Edmonds (1960) conducted a study on the utility of the PPVT with English children. They stated, "The general conclusions reached by the present authors is that

the PPVT is potentially a useful instrument for use with English children (p. 82)."

Cartwright (1968) conducted a study at Linapuni School, Honolulu, Hawaii, during the 1966-1967 school year to provide reliability and validity data for the PPVT when used with disadvantaged children. Linapuni School, at the time of the experiment, served approximately 360 children in grades kindergarten through third. All students resided in an adjacent housing project which limited the income level of the tenants ($3,000 annual income was the maximum for a family of four). Population of the school was made up of a variety of ethnic groups including Japanese, Chinese, Polynesian, Hawaiian, Portuguese, Filipino, Caucasian, Negro, and various combinations. As a part of the study the PPVT, Form B, was administered to all children in September, 1966. Form A was administered to all children in May, 1967. Also in May, 1967, the Revised Stanford-Binet was administered to a 10 percent random sample of students. Means, as reported, were PPVT (Form B), Fall = 83.92; PPVT (Form A), Spring = 90.97; RSB, Spring = 98.64.

Norris, Hottel, and Brooks (1960) concluded from their study that when both forms of the PPVT were administered in counterbalanced order to children of normal intelligence, their average scores were not a function of the form administered nor of having the test administered individually or in a group.

DiLorenzo and Brady (1969) concluded from their study with disadvantaged preschool children (two years, six months through four years, six months) that, "sizable discrepancies exist between means and standard deviations for the two measures despite their rather high correlations (p. 117)." The PPVT was correlated with the Revised Stanford-Binet in this experiment.

Rieber and Womack (1968) using a group of 568 Negro, Latin-American, and Anglo preschool children from families with incomes in the lowest 20 percent for the community stated, "the Peabody Test correlates fairly highly with the Stanford-Binet and the Wechsler Intelligence Scale for Children (WISC), and because of this it can be assumed to be a good predictor of school success (p. 613)."

CHAPTER III

METHOD

The Subjects

The subjects selected for this study comprised the entire population of first, second, and third grade children in three independent rural schools in West Texas. All children included in the study were bilingual. None were Anglo and none were Negro. All three schools were located in similar socio-economic areas, i.e., rural, cotton farming settings. The sample (N = 312) was distributed as follows: school number one, 48 first graders (27 boys and 21 girls), 50 second graders (22 boys and 28 girls), 57 third graders (33 boys and 24 girls); school number two, 40 first graders (25 boys and 15 girls), 22 second graders (13 boys and 9 girls), 40 third graders (19 boys and 21 girls); and school number three, 15 first graders (7 boys and 8 girls), 20 second graders (9 boys and 11 girls), 20 third graders (11 boys and 9 girls).

The Instruments

The Hand Test consists of a series of ten cards. On nine of these a hand is drawn, while the tenth is a blank card. The hands are depicted in different ambiguous poses, and the task is to state what each hand might be doing.

The reliability and validity of the Hand Test were ascertained by Wagner (1969), using the records compiled for his original norms (N = 1,020). The Spearmen-Brown split-half method of computing reliability coefficients was used independently by each of three scorers with the following results: scorer A, r = .85; scorer B, r = .84; scorer C, r = .85. Concurrent validity was established by comparing the results obtained in the normative groups to results of "known groups." Wagner (1969) stated that the meanings and interpretations of the scoring categories were based on a logically deduced projective rationale, validated against empirical data.

The other instrument used in this study is the Peabody Picture Vocabulary Test (PPVT) developed by Lloyd M. Dunn, Ph.D. It was first published in 1959. The test kit for the Peabody Picture Vocabulary Test consists of a spiral-bound book containing 150 numbered plates (four illustrations to each plate) preceded by three example plates, the one series of plates being used for both Forms A and B of the test, a manual of directions for administering and scoring the test, and separate individual test record forms. Stimulus words and keys to correct responses are listed in the individual test records. The PPVT was standardized on 4,012 subjects from two years-six months to eighteen years of age. Alternate form reliability coefficients for the PPVT were obtained by calculating Pearson product-moment correlations on the raw scores of the standardization subjects for Form A and Form B at each age level.

Between 1959 and 1964 additional studies were conducted with regular classroom subjects, deaf, emotionally disturbed, community trainable retardates, institutionalized retardates, community educable retardates, and the physically handicapped. The coefficients were comparable to those found for the standardization population.

Validity data for the PPVT were obtained both for individual items and the total test. There are two main types of validity evident--rational and statistical. PPVT mental age scores have correlated with 1937 Binet mental age scores with a median of 0.71. On the adult Wechsler (WAIS) the correlation with verbal I.Q. scores was r = 0.84.

The Procedures

All children in each of the three grade levels were individually administered the Peabody Picture Vocabulary Test (Form B) and the Hand Test according to the published standardized procedures. No subject refused to take the tests or even expressed reluctance to do so.

All the Hand Tests and the Peabody Picture Vocabulary Tests were administered by the researcher and three others trained by the researcher. All had had considerable training and experience in administering, scoring, and interpreting individual diagnostic instruments.

On the Peabody Picture Vocabulary Test a basal was established for each subject, then, according to instructions

for administering of the PPVT, testing was continued until the subject had made six errors in any eight consecutive presentations. This last item presented was his ceiling on the PPVT. Administration time for the PPVT was approximately five to ten minutes per student.

Administration time for the Hand Test was approximately ten minutes for each subject. Every response on the test was then categorically scored as predominately exhibiting one of the following, as defined by Wagner (1969):

Affection (AFF): Interpersonal responses involving an interchange or bestowment of pleasure, affection or friendly feeling, e.g., "Saying 'hi!' in a gesture of friendship."

Dependence (DEP): Interpersonal responses involving an expressed dependence on or need for succor from another person, e.g., "A drowning person calling for help."

Communication (COM): Interpersonal responses involving a presentation or exchange of information, e.g., "Describing something to somebody."

Exhibition (EXH): Interpersonal responses which involve displaying or exhibiting oneself in order to obtain approval from others or to stress some special noteworthy characteristic of the hand, e.g., "A ballet dancer with graceful hand movements."

Direction (DIR): Interpersonal responses involving influencing the activities of, dominating, or directing others, e.g., "Policeman saying stop."

Aggression (AGG): Interpersonal responses involving the giving of pain, hostility, or aggression, e.g., "A punch in the mouth."

Acquisition (ACQ): Environmental responses involving an attempt to acquire or obtain a goal or object. The movement is on-going and the goal is as yet unobtained and, to some extent, still in doubt, e.g., "Trying to catch a football."

Active (ACT): Environmental responses involving an action or attitude designed to constructively manipulate, attain, or alter an object or goal. ACT responses are distinguished from ACQ responses in that the object or goal has been, or will be, accomplished and the issue is therefore not in doubt, e.g., "Writing with a pencil."

Passive (PAS): Environmental responses involving an attitude of rest and/or relaxation in relation to the force of gravity, and a deliberate and appropriate withdrawal of energy from the hand, e.g., "Hand folded in your lap."

Tension (TEN): Energy is being exerted but nothing or little is accomplished. A feeling of anxiety, tension or malaise is present. TEN responses also include cases where energy is exerted to support oneself against the pull of gravity accompanied by a definite feeling of strain and effort, e.g., "Holding something very tight."

Crippled (CRIP): Hand is crippled, sore, dead, disfigured, sick, injured, or incapacited, e.g., "Been in an

accident. Hanging out the car window."

Fear (FEAR): Responses in which the hand is threatened with pain, injury, incapacitation, or death. A FEAR response is also scored if the hand is clearly perceived as meting out pain, injury, incapacitation, or death to the subject or to a person with whom the subject identifies, e.g., "My father's hand . . . like he's going to hit me."

Description (DES): Subject can do no more than acknowledge the presence of the hand with perhaps a few accompanying inconsequential descriptive details or feeling tones, e.g., "Just a hand."

Bizarre (BIZ): A response predicated on hallucinatory content, delusional ideation or other peculiar, pathological thinking. The response partially or completely ignores the drawn contours of the hand and/or incorporates bizarre, idiosyncratic or morbid content. One genuine BIZ response is pathognomic of serious disturbance, e.g., "A crocodile creeping along the wall."

Failure (FAIL): Subject can give no scorable response whatsoever to a particular card. A FAIL is tabulated in computing summary scoring, but it is not included in the response total, R, since it is not really a response but a failure to respond.

In addition to the fifteen scoring categories listed, Wagner (1969) defines four summation symbols which represent combinations of the symbols defined above. These are:

Interpersonal (Σ INT): AFF + DEP + COM + EXH + DIR + AGG = Σ INT. These responses are involved in relations with other people. An absence or dearth of Σ INT always has a negative connotation.

Environmental (Σ ENV): ACQ + ACT + PAS = Σ ENV. Environmental responses (Σ ENV) are assumed to represent generalized attitudes toward the impersonal world, i.e., a readiness to respond to or come to grips with the environment in a characteristic fashion.

Maladjustive (Σ MAL): TEN + CRIP + FEAR = Σ MAL. This represents difficulty, of which the individual is at least partially aware, in successfully carrying out various action tendencies, and failure to achieve need satisfactions.

Withdrawal (Σ WITH): DES + FAIL + BIZ = Σ WITH. Withdrawal responses (Σ WITH) represent those who have found realistic interaction with people, objects, and ideas so traumatic, difficult, and non-reinforcing that meaningful, effective life-roles have been partially or completely abandoned.

Although the major use of the Hand Test is a personality assessment, a primary goal in the development of the test was the prediction of overt aggressive behavior. For this measurement the Acting Out Ratio (AOR) must be employed. The AOR is an approximate measure of the probability of behaving in an overt, hostile, anti-social manner. To obtain the AOR, the total number of AFF + DEP + COM responses are

placed in ratio opposite the total number of DIR + AGG responses. It might be seen that the AOR is obtained by comparing those action tendencies which reflect a heightened readiness for aggressive overt behavior against those which imply a strong sense of social cooperation or fear of overt aggressive activity.

Wagner (1969) also specifies symbols which retain enough interpretative consistency to be listed as qualitative content indicators. He feels these symbols are designed to supplement, not replace, the established scoring categories. These nine symbols are as follows:

Sexual Content (SEX): This is the most reliable of all content symbols. It is restricted to gross, non-symbolic sexual responses and occurs only in individuals who are pathologically preoccupied with sex.

Immature Content (IM): This occurs mostly in connection with Σ INT responses and its interpretive significance is restricted to adult protocols.

Inanimate Content (INAN): When the hand has been reduced to an inanimate object such as a statue or a poster drawing, it is hypothesized that the subject has sublimated, etherealized, and subjectified action tendencies.

Hiding Content (HID): It is postulated that hands perceived as hiding or concealing something represent a deliberate or partially deliberate attempt to prevent exposure of psychological traits, tendencies or experiences of which the subject is fully or partially aware.

Sensual Content (SEN): Immature, self-centered, and pleasure-seeking individuals give responses which emphasize tactual sensitivity.

Internalization Content (IN): This involves the turning of a feeling or action inward, toward the respondent.

Homosexual Content (HOM): Although it is not possible to predict the exact nature of the psychosexual difficulty, the (HOM) response is a reliable indicator or regressive and/or preverse sexual tendencies, latent or manifest.

Denial Content (DEN): When a subject deliberately denies, rejects, or expresses a doubt over a percept, he is projecting his ambivalence concerning the advisability of carrying out such an action tendency.

Movement Content (MOV): This response entails senseless, non-productive activity.

The content indicators have been deliberately excluded from the summary scoring because the list is intended to be suggestive rather than definitive. Wagner (1969) hoped that future research will confirm or disconfirm the present content indicators and suggest others.

The Scoring

Each subject's record blank of the Peabody Picture Vocabulary Test was scored three times--once by the administrator of the test and twice by the researcher for any correction of errors. The summary sheets (Hand Test) were scored

once by the administrator and twice by the researcher. When a questionable response occurred, it was evaluated on the basis of available guidelines as suggested by the Hand Test Manual (1969).

This researcher did not agree with Roberts (1971) who found it "extremely difficult to score responses by adhering strictly to the Hand Test Manual (p. 18)," or with Oswald and Loftus (1967) who "found difficulties consistently associated with the distinction to be made between DIR or ACT or COM (p. 67)." Instead this researcher felt as did Huberman (1964) that "the responses are--relatively easily--scored . . . as indicated in the test manual (p. 280)."

Wagner (1969) suggested that, "In general, nothing is said to encourage or discourage response productivity," but the subject " . . . is permitted and encouraged to take the cards and examine the drawings (p. 3)." The subjects in this study were encouraged to respond freely, and each of their responses were recorded, but only the first response to each card was used in scoring. The focus of this investigation was centered on the initial response to each card, and it was beyond the scope, or intention, of this study to pursue more than one response to each card.

CHAPTER IV

RESULTS AND DISCUSSION

One hundred sixty-six males and 146 females in first, second and third grades completed the test. At first grade the median chronological age for boys was seven years, zero months; for girls, six years, nine and one half months. At second grade the median chronological age for boys was seven years, eleven months; for girls, eight years, zero months. At third grade the median chronological age for boys was nine years, three months; for girls, eight years, eleven and one half months.

The median mental age was three years, eleven months for first grade boys and three years, nine months for first grade girls. The median mental age was five years, six and one half months for second grade boys and four years, ten months for second grade girls. The median mental age was six years, two months for third grade boys and six years, one half month for third grade girls. The results are shown in Table 1. This summary table was developed from the original data which appear in Tables 5 through 10 in the Appendix.

The largest discrepency in median mental age appeared between girls and boys in grade two. Differences in grades one and three were relatively small.

TABLE 1

MEANS, MENTAL AGES, AND CHRONOLOGICAL AGES ON PPVT
FOR 312 BILINGUAL ELEMENTARY SCHOOL CHILDREN

	1st Grade				2nd Grade				3rd Grade			
	Girls		Boys		Girls		Boys		Girls		Boys	
	Mdn	Q_3-Q_1	Mdn	Q_3-Q_1	Mdn	Q_3-Q_1	Mdn	Q_3-Q_1	Mdn	Q_3-Q_1	Mdn	Q_3-Q_1
Raw Score	39.0	12.5	41.0	12.0	48.0	10.5	52.5	12.0	56.0	13.0	56.0	14.0
MA	45.0	14.0	47.0	14.0	58.0	20.0	66.5	13.0	72.5	26.0	74.0	30.0
CA	81.5	8.5	84.0	12.0	96.0	11.0	95.0	10.5	107.5	20.0	111.0	20.0

The response to each card was scored and tabulated by scoring category for each subject according to grade and sex. The tabulations are presented in Tables 11 through 16 in the Appendix. In an effort to present the results in the same statistical forms as reported by Wagner (1971, pp. 63 and 68), medians and quartiles were computed. Table 2 shows the norms which were developed in the form of medians and quartile ranges ($Q_3 - Q_1$) for each scoring category and for the Acting Out Ratio (ADC : DA).

Among the 59 males sampled at first grade level, the INT score comprised the largest major scoring category. Expressed as percentages of the total number of responses (592), INT equalled 39 percent; WITH, 31 percent; ENV, 29 percent; and MAL one percent. Among the 44 females at first grade level, the WITH score comprised the largest major scoring category. Expressed as percentages of the total number of responses (438), WITH equalled 45 percent; INT, 28 percent; ENV, 25 percent; and MAL, 2 percent.

Percentages of replies for both males and females of second and third grades followed the same order of descending percentages. Thus with males at both second and third grades, the INT score comprised the largest major scoring category. Expressed as percentages of the total number of responses (second grade = 439, third grade = 630), INT equalled 42 percent at second grade and 43 percent at third, ENV, 33 percent at second grade and 38 percent at third

TABLE 2

NORMS FOR 312 BILINGUAL CHILDREN IN GRADES 1, 2, & 3
ON ALL MAJOR SCORING CATEGORIES OF THE HAND TEST

Scoring Category	1st Grade				2nd Grade				3rd Grade			
	Girls		Boys		Girls		Boys		Girls		Boys	
	Mdn	Q_3-Q_1	Mdn	Q_3-Q_1	Mdn	Q_3-Q_1	Mdn	Q_3-Q_1	Mdn	Q_3-Q_1	Mdn	Q_3-Q_1
AFF	0.0	2.0	0.0	2.0	0.0	2.0	1.0	2.0	1.0	1.0	1.0	2.0
DEP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COM	0.0	0.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
EXH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DIR	0.0	2.0	1.0	3.0	1.0	2.0	1.0	1.0	1.0	2.0	1.0	1.0
AGG	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0
INT	3.0	4.0	3.0	4.0	3.0	3.0	4.0	4.0	3.0	2.0	4.0	3.0
ACQ	0.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	1.0
ACT	2.0	3.5	2.0	2.0	4.0	3.0	2.0	2.0	4.0	3.0	3.0	2.0
PAS	0.0	0.5	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
ENV	2.0	3.0	3.0	3.0	4.0	2.5	3.0	3.0	4.0	3.0	4.0	3.0
TEN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRIP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0
DES	3.0	3.0	2.0	3.0	0.0	1.0	1.0	2.0	0.0	2.0	1.0	2.0
FAIL	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
BIZ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WITH	4.0	3.0	2.0	4.0	0.0	3.0	1.0	4.0	1.0	3.0	1.0	2.0
ADC	1.0	2.5	1.0	2.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0
DA	1.0	2.0	2.0	3.0	2.0	1.0	1.5	1.0	1.0	2.0	2.0	2.0
R	10.0	1.0	10.0	0.0	10.0	0.0	10.0	0.5	9.34	0.45	10.0	0.0
AIRT	9.1	3.9	7.1	5.75	8.65	5.75	6.8	4.3	9.8	3.1	9.8	2.3
H-L	4.0	2.0	6.0	4.0	6.0	3.5	7.0	1.0	5.0	3.0	5.0	4.0
PATH	8.0	6.5	4.5	8.0	1.0	6.0	3.5	8.5	1.5	6.0	2.0	5.0
AGE	81.5	8.5	84.0	12.0	96.0	11.0	95.0	10.5	107.5	20.0	111.0	20.0

grade; WITH, 21 percent at second grade and 15 percent at third grade; and MAL, 4 percent at both second and third grade levels. The females' ENV score comprised the largest major scoring category. Expressed as percentages of the total number of responses (second grade = 486, third grade = 539), ENV equalled 46 percent at second grade and 43 percent at third grade; INT, 36 percent at both second and third grades; WITH, 16 percent at second grade and 18 percent at third grade; and MAL, 2 percent at second grade and 3 percent at third grade (see Table 3).

There were numerous zeros in most of the scoring categories, and as a result, many medians were zero (see Table 2). The largest median number of responses occurred in three of the summation scoring classifications (Σ INT, Σ ENV, Σ WITH), but not in the Σ MAL. Large median numbers of responses also occurred in ADC and DA (Acting Out Ratio) and PATH. The subjects' responses were diversified and did not tend to accumulate in only one or two scoring categories, and as a result most medians of the scoring categories were consistently small. Only two subjects (first grade students) gave a total of 10 responses in a single scoring category.

The two groups of Σ INT and Σ ENV were placed first in order by Wagner (1971) because they are the most often used scoring categories in the Hand Test. This was not quite the case in median responses among Mexican-American children. At first grade level the Σ WITH responses were first in distribution with the females and second with the males.

TABLE 3

PERCENTAGE OF RESPONSES BY GRADE, SEX, AND SCORING CATEGORY

Scoring Category	First Grade		Second Grade		Third Grade	
	Boys	Girls	Boys	Girls	Boys	Girls
AFF	11	11	13	10	14	13
DEP	1	- 1	3	2	1	1
COM	3	3	7	3	4	4
EXH	- 1	1	3	1	1	2
DIR	17	9	8	13	11	10
AGG	7	4	8	7	12	5
INT	39	28	42	36	43	36
ACQ	2	3	6	7	6	1
ACT	22	19	24	34	28	36
PAS	5	3	3	5	4	6
ENV	29	25	33	46	38	43
TEN	- 1	1	2	1	1	1
CRIP	1	1	1	1	2	2
FEAR	0	0	1	0	1	0
MAL	1	2	4	2	4	3
DES	26	37	14	11	12	12
FAIL	4	8	7	4	2	6
BIZ	- 1	0	0	0	0	- 1
WITH	31	45	21	16	15	18
ADC	15	15	24	16	18	22
DA	24	13	16	20	24	16
Total Responses	592	438	439	486	630	539

In a comparison of this writer's results with Viers' (Wagner, 1971) large differences appear between the samples of elementary children in Summit County, Ohio public school system and rural bilingual children. The large discrepancy between the Ohio school children (first grade, female; Mdn = 5.25) and the Mexican-American children (first grade, female; Mdn = 2.0) on the Σ ENV variable would seem to indicate that

the normal first graders were better able to adjust to the environment and more inclined to exert themselves to reach environmental goals. All of Viers' median scores, in each area, were higher than those obtained by this examiner with the exception of Σ WITH. Here Viers' medians were lower. This is in keeping with Wagner's interpretation of responses; that the adjusted individual has achieved behavior patterns which are workable and satisfying. It would appear that the bilingual child's potential has been interfered with--has been supressed, if you will--and this lowers the interpersonal and environmental tendencies.

Viers' table (Wagner, 1971) contains no zeros for median Σ MAL responses. All of the examiner's medians in this category were zero with the exception of boys at second and third grade levels. The median score in this category was 1.0 at both grade levels, Table 2. MAL responses connote apprehension and distress arising from a failure to achieve need satisfactions. Wagner (1971) states that any individual who suffers from subjective feelings of insufficiency may produce MAL responses, and the presence of even one MAL response in an otherwise normal record might indicate some adjustment difficulty. Other factors must be considered in the interpretation of MAL responses. In combination with other factors, such as feelings of tension or apprehension, MAL may not be clearly evident in terms of inefficient behavior. With these bilingual elementary children, MAL constituted the lowest percentage of responses, Table 3.

Wagner (1971) discusses AOR. In the normal adult he states that the ratio is "approximately balanced, 2.7 : 2.5 (p. 26)." He feels there is a slight imbalance with children and teenagers. The Acting Out Ratio (AOR) is one of the most significant Hand Test predicators. It is not considered a devise to predict specific motor acts, but rather a tendency to act out in an aggressive kind of way. The AOR is simply the ratio of the sum of the socialized interpersonal tendencies (AFF + DEP + COM) to the sum of less socialized interpersonal tendencies (DIR + AGG). No conclusions could be reached using the AOR with these bilingual children (see Table 2).

Mexican-American children are genuinely concerned with providing an answer, any answer, to those they view as figures of authority. Testing behavior was consequently absorbed and cooperative. It must be understood that this concern (providing an answer) is placated with one response. These children are shy, yet they want to please. The evidence of "macho" and a tendency toward matriarchal control is part of the training of the young Mexican-American child, but not generally noted in behavior until late adolescence.

Since the PATH score (Σ MAL + 2Σ WITH), distributed itself continuously over the 312 protocols and provided a meaningful, quantitative summary score, it was utilized in determining the relationship with the PPVT raw score. The Spearman rank-order correlation was used to test for

significant correlations between PPVT raw scores and PATH scores on the Hand Test. The obtained Spearman rank-order correlations are presented in Table 4.

TABLE 4

SPEARMAN RANK - ORDER CORRELATIONS BETWEEN PPVT RAW SCORES AND PATH SCORES ON HAND TEST BY GRADE AND SEX

First Grade		Second Grade		Third Grade	
Male (n=59)	Female (n=44)	Male (n=44)	Female (n=48)	Male (n=63)	Female (n=54)
-.06	-.43*	-.37*	-.21	-.058	-.103

*Significant < .05 level

The writer computed "t" values of the rank-order correlation coefficients. The following formula for testing the significance of correlation coefficients was used:

$$t = \frac{r\sqrt{N - 2}}{\sqrt{1 - r^2}}$$, where N is the number of pairs, N - 2 = degrees of freedom, and r = Rho (rank-order correlation coefficient).

Only two statistically significant rank-order correlations were obtained, i.e., Rho = -.43 for first grade females and Rho = -.37 for second grade males. The remaining rank-order correlations were not significant. The statistically significant correlations between PATH scores and PPVT suggest that the female bilingual children in grade one and

males in grade two who scored high on the PPVT did not have difficulty in carrying out action tendencies in order to achieve need satisfactions although some of the interactions were unrealistic.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The problem of this study was to establish norms on the Hand Test for rural first, second and third grade bilingual children in West Texas, since no norms seemed to have been reported for these groups. A total of 312 bilingual children were individually administered the Hand Test and the Peabody Picture Vocabulary Test. The PATH score was utilized in determining the relationship with the PPVT raw score.

Medians and quartile points were calculated for each scoring category for each grade level by sex. The statistics were appropriately tabulated according to Wagner and presented as a Table of norms.

The norms and the results of this study, i.e., the pattern of responses in the summation scoring categories appeared to be similar to Viers, although at times there were slight differences in the sizes of medians. No statistical procedures were attempted because of the smallness in variations that did occur.

Also, percentages of responses by grade, sex and scoring categories were calculated. Raw scores, mental ages and chronological ages for all subjects were calculated using the Peabody Picture Vocabulary Test and presented in tabular form.

Only two statistically significant negative correlation coefficients were obtained between PPVT raw scores and PATH responses on the Hand Test. This finding suggested that female bilingual children in grade one and male children in grade two did not have difficulty in carrying out action tendencies in order to achieve need satisfaction.

The Hand Test appeared to be effective in measuring differences between the frequency of responses of Mexican-American children, Anglo children and Guamanian elementary school children. The children who employed English as a second language responded with the least amount of responses to each category while the Guamanians consistently produced more responses than United States samples (Wagner, 1971). This might indicate that the Hand Test does reflect intercultural differences.

Recommendations for Further Study

The Peabody Picture Vocabulary Test has been well researched and numerous experiments have been conducted using it as a variable, but because of the comparative newness of the Hand Test there are many possibilities for the design of new studies using the Hand Test. As a direct continuation to this examiner's study, the Hand Test might be correlated with the PPVT in upper primary, junior high and secondary schools with bilingual children. This would provide a comparative set of norms in determining if the test is discriminating in the age differences.

Another study could be made on qualitative responses on the Hand Test. This would prove very informative if subjects were of different cultures. Responses might reflect, in an objective way, inter-cultural differences.

There is a need for wider and more representative norms. Research studies might be conducted with neurologically impaired children, educable retarded children, trainable retarded children, children with learning dysfunctions, and normal children at different age and/or grade levels. High minus low score (H-L) which reflects the maximum differential hesitation in responding to the cards and average initial reaction time (AIRT) which is an overall estimate of time needed to organize and verbalize a perception should prove to be two other interesting topics for research.

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APPENDIX

TABLE 5

RAW SCORES, MENTAL AGES, AND CHRONOLOGICAL AGES ON PPVT FOR 1ST GRADE BILINGUAL MALES

Subject	Raw Score	CA	MA	Subject	Raw Score	CA	MA
1	40	100	46	31	43	94	50
2	48	90	59	32	24	77	32
3	50	83	63	33	28	81	35
4	34	83	41	34	36	91	43
5	34	84	41	35	57	85	76
6	43	77	50	36	47	75	57
7	46	81	55	37	22	100	31
8	43	79	50	38	21	77	30
9	41	97	47	39	41	88	47
10	49	79	61	40	43	74	50
11	20	87	30	41	45	89	54
12	34	89	41	42	56	84	74
13	41	90	47	43	48	84	59
14	48	76	55	44	38	91	44
15	41	90	47	45	34	78	41
16	39	79	45	46	49	88	61
17	44	85	52	47	25	76	33
18	39	87	45	48	25	104	33
19	37	75	44	49	47	90	57
20	35	84	42	50	35	86	42
21	51	76	64	51	24	91	32
22	38	73	44	52	34	79	41
23	45	87	57	53	58	90	78
24	51	80	64	54	45	98	54
25	26	73	34	55	42	76	48
26	44	76	52	56	42	81	48
27	46	75	55	57	19	81	29
28	44	74	76	58	43	96	50
29	38	78	44	59	56	80	74
30	30	83	36				

TABLE 6

RAW SCORES, MENTAL AGES, AND CHRONOLOGICAL AGES ON PPVT FOR 1ST GRADE BILINGUAL FEMALES

Subject	Raw Score	CA	MA	Subject	Raw Score	CA	MA
1	42	84	48	23	13	92	26
2	39	84	45	24	33	84	40
3	39	76	45	25	39	85	45
4	46	95	55	26	42	86	48
5	43	79	50	27	39	78	45
6	35	82	42	28	41	92	47
7	44	75	52	29	24	87	32
8	45	82	54	30	44	81	52
9	30	74	36	31	34	85	41
10	49	95	55	32	27	85	34
11	45	76	54	33	60	85	82
12	32	80	38	34	36	76	43
13	40	85	46	35	17	99	28
14	37	79	44	36	37	83	44
15	40	75	46	37	36	79	43
16	40	91	48	38	23	98	32
17	46	79	55	39	22	75	27
18	54	77	70	40	18	75	29
19	37	75	44	41	49	82	61
20	40	84	46	42	21	74	30
21	42	77	58	43	53	80	68
22	27	76	34	44	24	81	32

TABLE 7

RAW SCORES, MENTAL AGES, AND CHRONOLOGICAL AGES ON PPVT FOR 2ND GRADE BILINGUAL MALES

Subject	Raw Score	CA	MA	Subject	Raw Score	CA	MA
1	46	112	55	23	50	90	63
2	54	99	70	24	46	95	55
3	39	107	45	25	51	90	64
4	53	90	68	26	30	126	36
5	55	89	67	27	53	98	68
6	61	90	84	28	43	91	50
7	33	93	40	29	58	95	78
8	58	88	78	30	24	89	32
9	40	105	46	31	57	87	76
10	59	99	80	32	66	103	97
11	53	100	68	33	46	109	55
12	66	89	96	34	48	93	59
13	45	105	53	35	56	84	74
14	39	90	45	36	45	91	53
15	53	101	68	37	42	105	48
16	58	86	78	38	70	97	105
17	64	92	91	39	51	116	64
18	53	99	68	40	57	91	76
19	47	89	57	41	55	98	71
20	42	97	48	42	39	106	45
21	61	97	84	43	55	90	71
22	48	97	59	44	52	93	66

TABLE 8

RAW SCORES, MENTAL AGES, AND CHRONOLOGICAL AGES ON PPVT FOR 2ND GRADE BILINGUAL FEMALES

Subject	Raw Score	CA	MA	Subject	Raw Score	CA	MA
1	43	95	50	25	47	110	57
2	44	94	52	26	53	87	68
3	46	90	55	27	48	98	58
4	42	108	48	28	47	105	57
5	46	94	55	29	47	93	57
6	51	102	64	30	38	113	44
7	32	110	38	31	52	94	66
8	62	87	87	32	43	94	50
9	46	84	55	33	34	114	41
10	62	93	87	34	40	89	46
11	45	99	54	35	57	95	76
12	57	98	76	36	23	126	32
13	50	92	63	37	56	97	74
14	46	104	55	38	47	101	57
15	53	104	68	39	49	93	61
16	34	105	41	40	46	111	55
17	50	92	63	41	48	93	59
18	42	88	48	42	72	96	109
19	56	93	74	43	51	96	64
20	74	97	114	44	33	93	40
21	56	90	74	45	54	103	70
22	53	96	68	46	59	100	88
23	48	95	58	47	70	91	105
24	44	105	52	48	75	104	118

TABLE 9

RAW SCORES, MENTAL AGES, AND CHRONOLOGICAL AGES ON PPVT FOR 3RD GRADE BILINGUAL MALES

Subject	Raw Score	CA	MA	Subject	Raw Score	CA	MA
1	54	100	70	33	49	100	61
2	54	106	70	34	62	108	87
3	50	115	63	35	68	108	100
4	65	131	94	36	65	97	94
5	54	111	70	37	56	108	74
6	57	125	76	38	61	97	84
7	78	96	124	39	68	106	100
8	58	134	78	40	51	129	64
9	67	100	98	41	52	118	66
10	52	93	66	42	51	112	64
11	52	113	66	43	46	95	55
12	55	102	71	44	67	115	98
13	41	112	47	45	63	111	89
14	56	120	74	46	42	113	48
15	63	110	89	47	53	114	68
16	68	103	100	48	57	153	76
17	57	96	76	49	51	122	64
18	75	118	118	50	75	118	118
19	70	97	105	51	74	99	114
20	61	100	84	52	49	108	61
21	60	102	82	53	48	101	59
22	74	118	114	54	54	100	70
23	59	106	80	55	50	122	63
24	50	95	63	56	51	118	64
25	74	125	114	57	61	89	84
26	52	116	66	58	62	126	87
27	53	101	68	59	56	122	74
28	66	121	96	60	45	124	54
29	49	116	61	61	46	124	55
30	63	108	89	62	44	121	52
31	58	126	78	63	69	98	104
32	51	128	64				

TABLE 10

RAW SCORES, MENTAL AGES, AND CHRONOLOGICAL AGES ON PPVT FOR 3RD GRADE BILINGUAL FEMALES

Subject	Raw Score	CA	MA	Subject	Raw Score	CA	MA
1	46	129	55	28	66	141	96
2	49	115	61	29	51	121	64
3	63	103	89	30	58	118	78
4	46	111	55	31	48	108	59
5	60	99	82	32	40	110	46
6	67	96	98	33	51	103	64
7	57	99	76	34	48	98	59
8	62	100	87	35	51	104	64
9	54	115	70	36	48	100	59
10	68	105	100	37	57	111	76
11	50	105	63	38	64	131	91
12	66	109	96	39	53	105	71
13	57	107	76	40	47	99	58
14	56	116	74	41	50	132	63
15	65	101	94	42	59	121	80
16	69	96	102	43	19	128	26
17	59	102	80	44	69	121	102
18	58	102	78	45	52	162	66
19	55	113	71	46	63	135	89
20	65	114	94	47	49	102	61
21	50	98	63	48	51	100	64
22	52	112	66	49	59	101	80
23	52	105	66	50	48	110	59
24	50	132	63	51	64	123	91
25	52	105	66	52	59	125	80
26	65	92	94	53	56	99	74
27	45	123	54	54	64	97	91

TABLE 11

ITEM ANALYSIS OF RESPONSES ON THE HAND TEST
FOR 1ST GRADE BILINGUAL MALES

Subjects	AFF	DEP	COM	EXH	DIR	AGG	INT	ACQ	ACT	PAS	ENV	TEN	CRIP	FEAR	MAL	DES	FAIL	BIZ	WITH	ADC	DA	R	AIRT	H-L	PATH
1	0	0	0	0	3	1	4	0	1	1	2	0	0	0	0	4	0	0	4	0	4	10	4.8	7	8
2	0	0	0	0	3	1	4	0	1	2	3	0	0	0	0	3	0	0	3	0	4	10	14.0	11	6
3	1	0	1	1	1	1	6	0	3	0	3	0	1	0	1	0	0	0	0	3	2	10	6.8	5	1
4	0	0	1	0	1	0	2	0	6	1	7	0	0	0	0	1	0	0	1	1	1	10	8.7	12	2
5	4	0	0	1	0	0	4	3	2	1	6	1	0	0	0	0	2	0	0	4	0	10	8.8	9	0
6	2	0	0	1	0	4	0	7	0	1	1	2	0	0	0	0	2	0	0	2	3	4	10	5.0	7	4
7	0	0	0	2	0	6	0	1	8	1	0	1	2	0	0	0	0	0	0	0	2	6	10	2.5	3	0
8	1	0	0	0	0	1	0	3	1	0	2	0	4	0	0	0	3	0	0	3	1	2	10	1.3	12	6
9	0	0	0	0	0	7	1	8	0	0	2	0	0	0	0	0	2	0	0	2	0	8	10	4.9	6	4
10	0	0	0	1	0	5	1	4	0	0	1	0	1	0	0	0	1	0	2	3	1	5	10	15.2	10	6
11	1	0	0	1	0	0	1	7	1	0	1	0	2	0	0	0	1	0	0	1	1	6	10	4.3	5	2
12	2	0	0	1	0	0	0	3	1	0	1	0	5	0	0	0	2	0	0	2	3	0	10	7.4	7	4
13	0	0	0	1	0	0	1	3	0	0	5	0	5	0	0	0	2	0	0	2	1	2	10	5.4	5	4
14	1	0	0	1	0	0	1	3	0	0	4	1	5	0	0	0	2	0	0	2	2	1	10	1.3	5	4
15	2	0	0	0	0	0	2	4	0	0	1	0	1	0	0	0	5	0	0	5	2	2	10	4.5	7	10
16	0	0	0	0	0	0	1	2	0	0	4	0	4	0	0	0	3	1	0	4	0	2	9	2.3	4	8
17	0	0	0	0	0	0	1	3	0	0	2	0	2	0	0	0	5	0	0	5	0	3	10	10.0	3	10
18	2	0	0	0	0	0	1	4	0	0	4	0	4	0	0	0	2	0	0	2	2	2	10	7.8	6	4
19	0	2	0	0	0	0	0	2	0	0	3	0	6	0	0	0	2	0	0	2	2	0	10	5.6	8	4
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	10	0	0	10	3.1	4	20
21	3	0	0	0	0	0	3	1	0	2	1	3	0	0	0	0	0	0	0	0	3	4	10	4.0	10	0
22	1	0	1	0	0	0	2	3	0	0	5	0	0	0	0	0	1	0	0	1	2	2	10	9.9	3	2
23	0	0	0	0	0	0	3	1	4	0	0	0	5	0	0	0	6	0	0	6	0	4	10	8.9	5	12
24	0	0	0	1	0	0	0	2	3	0	0	0	5	0	0	0	2	0	0	2	1	2	10	10.8	8	4
25	2	0	0	0	0	0	0	4	2	0	0	0	3	0	0	0	3	0	0	3	2	2	10	3.7	5	6
26	6	0	0	0	0	3	0	9	2	0	0	0	1	0	0	0	0	1	0	1	6	3	9	9.4	2	2
27	0	0	0	0	0	2	1	0	0	0	1	0	0	0	0	0	7	0	0	7	0	2	10	5.2	5	14
28	1	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	5	3	0	8	1	1	7	10.5	6	16

TABLE 11--Continued

Subjects	AFF	DEP	COM	EXH	DIR	AGG	INT	ACQ	ACT	PAS	ENV	TEN	CRIP	FEAR	MAL	DES	FAIL	BIZ	WITH	ADC	EA	R	AIRT	H-L	PATH
29	0	0	0	0	0	1	1	0	2	0	2	0	0	0	0	2	5	0	7	0	1	5	19.8	6	14
30	0	0	1	0	0	1	2	0	3	1	4	0	0	0	0	4	0	0	4	1	1	10	6.7	8	8
31	0	0	0	0	3	1	4	0	1	0	1	0	0	0	0	4	1	0	5	0	4	9	4.1	4	10
32	0	0	1	0	6	1	7	0	0	0	0	0	0	0	0	3	0	0	3	1	6	10	10.6	2	6
33	0	0	0	0	8	0	8	0	0	0	0	0	0	0	0	2	0	0	2	0	8	10	3.9	6	4
34	0	0	0	0	1	0	1	0	3	0	3	0	1	0	1	4	1	0	5	0	1	9	6.9	4	11
35	0	0	0	0	0	1	1	0	3	0	3	0	0	0	0	5	1	0	6	0	1	9	4.1	5	12
36	2	0	0	0	0	1	3	0	5	0	5	0	1	0	1	0	1	0	1	0	1	9	7.7	8	3
37	2	0	0	0	0	1	3	0	1	0	1	0	0	0	0	6	0	0	6	2	1	10	9.4	3	12
38	8	0	1	0	1	0	10	0	0	0	0	0	0	0	0	0	0	0	0	9	1	10	3.3	4	0
39	2	0	0	0	1	0	3	0	2	0	4	1	1	0	2	0	0	0	1	2	1	10	9.7	4	4
40	0	1	0	0	0	0	1	0	1	0	1	0	0	0	0	8	0	0	8	1	0	10	3.3	7	16
41	0	0	0	0	4	1	5	0	3	1	4	0	0	0	0	1	0	0	1	0	5	10	9.5	4	2
42	0	0	0	0	3	0	5	0	2	0	4	0	0	0	0	1	0	0	1	0	5	10	13.0	15	2
43	1	1	0	0	0	0	2	0	2	1	3	0	0	0	0	5	0	0	5	0	2	10	8.2	6	10
44	0	0	1	0	1	0	3	0	4	0	5	0	0	0	0	1	1	0	2	1	2	9	19.9	15	4
45	0	0	0	0	0	0	4	0	2	0	3	0	0	0	0	6	1	0	7	0	0	9	7.2	6	14
46	3	0	0	0	0	1	4	0	1	0	1	0	0	0	0	5	0	0	5	3	1	10	6.2	5	10
47	2	0	1	0	0	1	4	0	3	0	3	0	0	0	0	3	0	0	3	3	1	10	9.9	4	6
48	0	0	0	1	1	1	3	0	6	0	7	0	0	0	0	0	0	0	0	0	2	10	6.5	9	0
49	0	0	2	0	0	1	9	0	0	0	0	0	0	0	0	1	0	0	1	2	7	10	5.1	6	2
50	1	0	0	0	0	0	1	0	3	0	4	0	0	0	0	2	2	0	4	1	1	8	6.9	15	8
51	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	4	4	0	8	0	0	6	27.0	20	16
52	0	0	0	0	0	0	0	1	2	1	4	0	0	0	0	6	0	0	6	0	0	10	10.3	7	12
53	5	0	2	0	0	0	7	0	3	0	3	0	0	0	0	0	0	0	0	7	0	10	13.2	8	0
54	0	0	0	0	0	1	1	0	5	0	5	0	0	0	0	4	0	0	4	0	1	10	4.6	8	8
55	0	1	0	0	0	0	1	1	6	1	8	0	0	0	0	1	0	0	1	1	0	10	4.7	6	2
56	4	0	0	0	5	0	9	0	1	0	1	0	0	0	0	0	0	0	0	4	5	10	6.3	4	0
57	5	0	0	0	0	0	5	0	4	0	4	0	0	0	0	0	1	0	1	5	0	9	11.0	5	2
58	1	0	0	0	6	1	8	0	1	0	1	0	0	0	0	0	1	0	1	1	7	9	16.3	13	2
59	0	0	0	0	2	1	3	0	3	1	4	0	0	0	0	3	0	0	3	0	3	10	13.6	7	6

TABLE 12

ITEM ANALYSIS OF RESPONSES ON THE HAND TEST
FOR 1ST GRADE BILINGUAL FEMALES

Subject	AFF	DEP	COM	EXH	DIR	AGG	INT	ACQ	ACT	PAS	ENV	TEN	CRIP	FEAR	MAL	DES	FAIL	BIZ	WITH	ADC	DA	R	AIRT	H-L	PATH
1	2	0	0	0	0	1	3	0	4	0	4	0	0	0	0	2	1	0	3	2	1	9	6.5	7	6
2	2	0	0	1	0	0	2	0	1	0	1	0	0	0	0	5	2	0	7	2	0	8	14.1	14	14
3	0	0	1	0	3	0	5	0	1	2	3	0	0	0	0	2	0	0	2	1	3	10	4.7	4	4
4	2	1	0	0	0	0	3	0	4	1	5	0	0	0	0	2	0	0	2	3	0	10	10.8	4	4
5	0	0	0	0	1	2	3	0	2	2	4	0	0	0	0	1	2	0	3	0	2	8	18.2	5	6
6	2	0	0	0	3	0	5	0	0	0	0	0	1	0	1	2	2	0	4	2	3	8	9.1	3	9
7	2	0	0	0	2	0	4	0	2	0	2	0	0	0	0	3	1	0	4	2	2	9	7.8	7	8
8	0	0	0	0	0	1	1	2	4	0	6	0	0	0	0	3	0	0	3	0	1	10	13.0	4	6
9	1	0	0	1	0	0	2	0	4	3	7	0	0	0	0	1	0	0	1	2	0	10	17.5	4	2
10	3	0	0	0	3	0	6	0	4	0	4	0	0	0	0	0	0	0	0	3	3	10	8.5	8	0
11	0	0	0	0	0	0	0	0	6	1	7	0	0	0	0	3	0	0	3	0	0	10	9.8	4	6
12	0	0	1	0	0	0	3	0	0	1	1	0	0	0	0	6	0	0	6	1	0	10	4.7	5	12
13	4	0	0	0	0	1	5	0	2	0	2	0	0	0	0	2	1	0	3	4	1	9	8.2	4	6
14	1	0	0	0	3	0	4	0	3	0	0	0	0	0	0	3	3	0	6	1	3	7	5.5	5	12
15	0	0	0	1	0	0	1	0	3	0	3	0	0	0	0	6	0	0	6	1	0	10	9.6	2	12
16	1	0	0	2	0	0	5	0	0	0	0	1	0	0	1	3	1	0	4	3	2	9	4.2	6	9
17	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	10	0	0	10	0	0	10	9.7	1	20
18	2	0	0	1	0	0	9	1	1	0	2	0	0	0	0	1	0	0	1	3	6	12	6.7	4	2
19	0	0	0	1	0	0	1	0	1	1	2	0	0	0	0	5	2	0	7	1	0	8	12.5	6	14
20	0	0	0	0	2	0	0	2	1	0	4	0	0	0	0	2	0	0	2	0	2	10	5.2	5	4
21	3	0	0	0	0	0	2	1	4	3	5	0	0	0	0	1	0	0	1	3	1	10	10.0	4	2
22	0	0	0	0	0	0	2	1	3	1	6	0	0	0	0	1	0	0	1	0	3	10	10.7	3	2
23	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	9	0	0	9	0	1	10	9.2	18	18
24	0	0	0	0	0	0	0	1	0	1	2	0	0	0	0	8	0	0	8	0	0	10	7.1	8	16
25	2	0	1	0	0	0	3	0	1	0	1	0	0	0	0	3	0	0	3	3	3	10	9.2	4	6
26	3	0	2	0	0	0	1	1	0	0	0	0	0	0	0	4	0	0	4	5	1	10	4.7	6	8
27	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	5	0	0	5	0	1	10	8.7	4	13
28	0	0	0	0	0	1	1	1	3	0	4	0	0	0	0	5	0	0	5	0	1	10	9.1	2	10

TABLE 12--Continued

Subject	AFF	DEP	COM	EXH	DIR	AGG	INT	ACQ	ACT	PAS	ENV	TEN	CRIP	FEAR	MAL	DES	FAIL	BIZ	WITH	ADC	DA	R	AIRT	H-L	PATH
29	1	0	0	0	0	1	2	1	4	0	5	0	0	0	0	3	0	0	3	1	1	10	6.6	4	6
30	0	0	0	0	0	1	1	3	2	1	6	0	0	0	0	1	2	0	3	0	1	8	12.1	4	6
31	2	0	0	0	1	0	3	2	2	0	4	0	0	0	0	2	1	0	3	2	1	9	16.1	5	6
32	0	2	0	0	0	0	1	1	4	1	6	0	0	0	0	4	0	0	4	0	0	10	7.6	5	8
33	2	0	0	0	2	0	1	1	2	0	3	0	0	0	0	1	1	0	2	0	3	9	9.6	6	4
34	8	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	8	0	10	3.2	3	4
35	0	0	0	0	2	0	1	3	0	0	1	0	0	0	0	1	5	0	6	0	3	5	19.2	7	12
36	0	0	0	0	0	0	1	0	4	0	4	0	0	0	0	5	1	0	6	0	0	9	10.2	4	12
37	0	1	0	0	0	0	1	0	2	0	2	0	0	0	0	7	0	0	7	1	0	10	6.0	8	14
38	2	0	0	0	1	0	1	4	0	0	0	0	0	0	0	3	3	0	6	1	1	7	10.8	7	12
39	2	0	1	0	0	0	2	3	0	0	0	0	0	0	0	7	0	0	7	3	0	10	6.8	4	14
40	0	0	0	0	2	0	2	0	0	0	1	0	2	0	2	4	1	0	5	0	2	9	10.4	3	12
41	3	0	0	0	1	0	0	4	0	3	0	1	3	0	0	0	3	0	0	3	3	1	10	8.2	3	6
42	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	5	3	0	8	0	1	7	5.1	6	16
43	0	0	0	0	0	0	0	0	2	0	2	1	0	0	0	1	7	0	0	7	0	0	10	9.2	10	15
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	1	0	10	0	0	9	9.1	4	20

TABLE 13

ITEM ANALYSIS OF RESPONSES ON THE HAND TEST
FOR 2ND GRADE BILINGUAL MALES

Subject	AFF	DEP	COM	EXH	DIR	AGG	INT	ACQ	ACT	PAS	ENV	TEN	CRIP	FEAR	MAL	DES	FAIL	BIZ	WITH	ADC	DA	R	AIRT	H-L	PATH
1	2	0	0	0	0	0	2	0	1	0	1	0	0	0	0	7	0	0	7	2	0	10	11.0	5	14
2	3	0	0	0	1	2	5	0	0	0	0	0	1	0	1	4	0	0	4	3	2	10	4.2	5	9
3	0	0	0	1	2	0	2	1	4	0	5	0	1	0	1	2	0	0	2	0	1	10	5.0	8	5
4	0	0	0	2	1	1	6	1	3	0	4	0	0	0	0	0	0	0	0	2	2	10	4.4	6	0
5	0	0	0	1	1	3	6	1	2	1	4	0	0	0	0	0	0	0	0	1	5	10	6.4	8	0
6	0	2	0	1	2	1	6	2	1	1	4	0	0	0	0	0	0	0	0	1	3	10	4.5	6	0
7	2	1	0	1	2	1	7	0	2	0	2	0	0	0	0	1	0	0	1	3	4	10	6.0	7	2
8	2	0	0	1	1	1	5	0	3	0	3	0	0	0	0	2	0	0	2	5	2	10	7.0	7	4
9	0	1	0	0	0	1	1	1	3	0	4	0	0	0	0	0	5	0	5	0	1	5	23.0	19	10
10	1	1	0	1	0	0	0	2	3	0	5	0	0	0	0	1	0	0	1	3	1	10	10.4	2	2
11	2	0	0	0	0	1	0	2	1	1	4	0	0	0	0	1	3	0	4	2	0	7	6.8	7	8
12	2	0	0	1	0	0	1	2	3	0	5	0	0	0	0	0	3	0	0	3	2	10	7.4	6	0
13	2	0	0	0	1	0	0	0	3	0	3	0	0	0	0	2	3	0	5	2	0	7	6.1	3	10
14	2	0	0	0	1	0	0	0	1	0	1	0	0	0	0	6	0	0	6	2	0	10	17.6	6	12
15	2	1	0	0	1	0	0	0	2	1	3	0	0	0	0	3	0	0	3	3	1	10	10.6	3	6
16	1	0	1	0	0	1	0	1	3	2	6	0	0	0	0	0	0	0	0	2	2	10	5.2	3	0
17	0	3	0	2	1	0	1	1	0	4	5	0	1	0	0	2	0	0	2	3	0	10	6.4	5	4
18	0	0	2	0	0	1	1	0	1	2	2	1	0	0	1	2	0	0	2	2	1	10	3.7	7	5
19	3	0	2	0	0	1	1	1	2	0	3	0	0	0	0	1	0	0	0	5	2	10	7.2	9	0
20	1	0	0	0	1	1	2	0	3	0	3	0	0	0	0	0	4	0	5	1	1	6	5.3	3	10
21	6	0	0	0	0	2	10	0	0	1	0	0	0	0	0	0	0	0	0	8	2	10	6.8	10	0
22	0	0	1	0	0	1	6	2	1	0	4	0	0	0	0	0	0	0	0	0	5	10	8.0	7	0
23	0	1	0	4	0	0	1	0	5	1	6	0	0	0	0	3	0	0	3	1	0	10	10.9	7	6
24	4	0	4	0	0	0	8	0	0	0	0	2	0	0	2	0	0	0	0	8	0	10	8.9	7	2
25	1	1	0	0	0	0	2	0	3	0	3	0	0	0	0	4	1	0	5	2	0	9	10.3	5	10
26	0	1	0	0	0	0	0	0	3	1	4	0	0	0	0	6	0	0	6	0	0	10	7.3	5	12
27	1	0	0	0	1	1	6	0	1	0	1	2	0	0	2	1	0	0	1	2	2	10	6.6	6	4
28	1	0	0	2	2	1	4	0	5	0	5	0	0	0	0	0	1	0	1	1	3	9	8.6	7	2

TABLE 13--Continued

Subject	AFF	DEP	CON	EXH	DIR	AGG	INT	ACQ	ACT	PAS	ENV	TEN	CRIP	FEAR	MAL	DES	FAIL	BIZ	WITH	ADC	DA	R	AIRT	H-L	PATH
29	1	0	2	0	1	0	4	2	1	0	3	1	1	0	2	1	0	0	1	3	1	10	5.2	5	4
30	1	2	0	0	2	0	5	3	2	0	5	0	0	0	0	0	0	0	0	3	2	10	7.2	12	0
31	0	1	0	0	1	1	3	1	4	0	5	0	2	0	2	0	0	0	0	1	2	10	10.9	7	2
32	0	0	0	0	1	2	3	0	4	0	4	0	0	0	0	1	2	0	3	0	3	8	5.5	6	6
33	3	0	0	2	1	1	7	1	2	0	3	0	0	0	0	0	0	0	0	5	2	10	6.7	6	0
34	3	0	0	2	1	1	7	1	2	0	2	1	0	0	0	0	0	0	0	5	2	10	4.5	6	1
35	2	0	0	0	1	2	5	0	2	1	5	0	0	0	1	0	0	0	0	2	3	10	6.5	7	0
36	0	1	0	0	1	0	3	0	2	1	1	0	0	0	1	6	2	0	8	0	0	8	18.1	8	17
37	1	0	0	1	0	1	7	0	1	0	2	0	0	0	1	0	5	0	5	2	1	5	21.2	20	10
38	2	0	1	1	0	2	7	0	1	0	1	1	0	0	0	1	0	0	1	3	3	10	6.5	6	3
39	3	1	0	0	1	1	5	0	0	0	5	0	0	0	0	0	0	0	0	4	1	10	5.3	7	0
40	3	0	0	0	1	3	7	0	1	0	2	0	0	0	1	0	0	0	0	3	4	10	7.3	6	1
41	0	0	0	1	2	0	3	0	5	0	2	0	0	0	0	1	1	0	2	0	2	9	14.8	14	4
42	0	0	0	0	0	1	1	0	2	0	8	0	0	0	1	2	5	0	7	0	1	5	4.6	6	14
43	0	0	0	0	1	1	7	1	7	0	1	0	0	1	1	0	0	0	0	0	1	10	8.0	7	1
44	0	2	4	0	1	0	7	0	1	1	2	1	0	0	1	0	0	0	0	6	1	10	13.3	7	1

TABLE 14

ITEM ANALYSIS OF RESPONSES ON THE HAND TEST
FOR 2ND GRADE BILINGUAL FEMALES

Subject	AFF	DEP	COM	EXH	DIR	AGG	INT	ACQ	ACT	PAS	ENV	TEN	CRIP	FEAR	MAL	DES	FAIL	BIZ	WITH	ADC	DA	R	AIRT	H-L	PATH
1	0	0	0	0	1	0	1	0	6	1	7	0	1	0	1	1	0	0	1	0	1	10	8.7	5	3
2	4	0	0	0	0	1	5	1	4	0	5	0	0	0	0	0	0	0	0	4	1	10	9.1	8	0
3	1	0	0	1	0	2	1	1	3	1	5	0	0	0	0	0	0	0	0	2	3	10	8.6	10	0
4	0	1	0	0	0	1	0	0	1	0	1	0	0	0	0	8	0	0	8	0	1	10	10.2	3	16
5	1	0	0	0	1	0	1	0	6	0	6	0	0	0	0	0	2	0	2	1	0	8	6.6	6	4
6	0	1	1	0	0	2	5	0	4	0	4	0	1	0	1	0	0	0	0	2	3	10	6.4	8	1
7	0	0	0	0	0	2	1	0	2	1	4	0	0	0	0	5	0	0	5	0	2	10	19.9	5	10
8	3	0	0	0	0	1	1	0	2	1	5	0	0	0	0	0	0	0	0	3	2	11	9.4	2	0
9	0	1	0	0	0	1	1	0	1	1	5	0	0	0	0	0	0	0	0	1	2	10	4.8	5	0
10	0	0	0	0	0	0	1	0	1	0	5	0	0	0	0	0	0	0	0	0	10	10	4.5	4	0
11	0	0	0	1	0	1	1	0	3	1	7	0	0	0	0	0	0	0	0	1	2	10	12.6	5	0
12	1	0	0	1	0	1	1	0	3	0	6	0	0	0	0	0	0	0	0	2	2	10	9.1	6	0
13	2	0	0	0	0	1	1	0	3	1	7	0	0	0	0	0	0	0	0	2	1	10	8.8	8	0
14	0	0	0	0	0	0	1	0	3	0	7	0	0	0	0	0	0	0	0	0	10	10	2.8	4	0
15	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	9	0	0	9	0	0	10	10.1	3	18
16	1	0	0	0	0	1	2	0	4	0	4	0	0	0	0	0	4	0	4	1	1	6	15.2	9	8
17	2	0	0	0	0	1	2	5	0	2	2	1	5	0	0	0	0	0	0	2	3	10	4.8	11	0
18	1	0	0	0	0	0	1	0	2	2	0	2	0	0	0	1	5	0	6	1	1	5	7.2	3	12
19	1	0	0	1	0	0	1	1	3	2	2	1	5	0	1	1	0	0	1	1	1	10	8.9	3	3
20	2	0	0	0	0	0	1	1	3	1	2	0	3	0	0	3	0	0	3	2	2	10	7.2	6	6
21	1	0	0	0	0	0	1	1	3	1	2	0	3	0	0	4	0	0	4	1	2	10	10.2	4	8
22	2	0	1	0	0	0	1	1	4	1	3	0	4	0	1	0	0	0	0	3	2	10	11.3	9	1
23	1	0	0	0	0	0	1	1	3	0	4	0	4	0	0	0	3	0	3	1	2	7	8.5	7	6
24	1	0	0	0	0	0	0	1	2	0	4	0	1	0	0	3	4	0	7	1	1	6	19.8	13	14
25	0	0	0	0	0	0	0	0	1	0	3	0	5	0	0	5	0	0	5	0	0	10	12.7	10	10
26	1	0	0	0	0	0	1	0	2	0	3	0	9	0	0	0	0	0	0	1	0	10	2.5	3	0
27	2	0	0	0	1	0	3	0	4	0	4	0	4	0	0	3	0	0	3	2	1	10	10.6	4	6
28	0	0	1	0	2	2	5	0	5	0	5	0	0	0	0	0	0	0	0	1	4	10	6.6	4	0

TABLE 14--Continued

Subject	AFF	DEP	COM	EXH	DIR	AGG	INT	ACQ	ACT	PAS	ENV	TEN	CRIP	FEAR	MAL	DES	FAIL	BIZ	WITH	ADC	DA	R	AIRT	H-L	PATH
29	3	1	1	1	0	0	6	0	4	0	4	0	0	0	0	0	0	0	0	5	0	10	8.2	13	0
30	0	1	0	1	2	0	4	2	4	0	6	0	0	0	0	0	0	0	0	1	2	10	6.3	8	0
31	1	1	1	0	1	1	5	0	4	0	4	0	1	0	1	0	0	0	0	3	2	10	14.2	5	1
32	2	0	1	0	1	2	8	0	1	0	1	0	0	0	0	1	0	0	1	2	6	10	19.1	7	2
33	0	1	1	0	0	0	2	1	6	0	7	0	0	0	0	1	0	0	1	2	0	10	5.0	14	2
34	0	0	1	0	0	0	1	0	8	1	9	0	0	0	0	0	0	0	0	1	0	10	9.0	23	0
35	2	0	1	0	0	1	4	1	5	0	6	0	0	0	0	0	0	0	0	3	1	10	7.8	5	0
36	1	0	0	0	0	0	1	0	2	0	4	0	0	0	0	5	0	0	0	1	0	10	4.9	4	10
37	0	0	0	0	0	1	0	1	10	2	10	0	0	0	0	0	0	0	0	0	0	10	4.8	6	0
38	0	0	0	0	1	1	2	1	5	2	8	0	0	0	0	0	0	0	0	0	2	10	4.6	6	0
39	1	0	0	0	5	1	7	2	0	0	2	0	1	0	1	0	0	0	0	1	6	10	9.7	5	1
40	2	0	1	0	0	1	4	1	5	0	6	0	0	0	0	0	0	0	0	3	1	10	10.8	6	0
41	1	2	0	0	2	0	5	0	4	0	4	0	0	0	0	0	1	0	1	3	2	9	1.5	11	2
42	3	0	1	0	0	1	5	1	4	0	5	0	0	0	0	0	0	0	0	4	1	10	9.2	6	0
43	2	0	0	0	0	1	3	0	5	1	6	0	0	0	0	0	1	0	1	3	1	9	10.4	5	2
44	0	0	0	0	2	0	2	0	4	0	4	0	1	0	1	3	0	0	3	0	2	10	4.1	4	7
45	1	0	2	0	2	1	6	0	4	0	4	0	0	0	0	3	0	0	0	3	3	10	3.3	5	0
46	1	0	0	1	1	1	4	0	3	0	3	1	0	0	1	2	0	0	2	1	2	10	12.1	5	5
47	1	1	1	0	2	1	6	2	0	0	4	0	0	0	0	0	0	0	1	3	3	10	8.1	5	0
48	2	0	0	0	1	2	5	4	0	0	4	0	0	0	0	0	1	0	1	2	3	9	5.7	8	2

TABLE 15

ITEM ANALYSIS OF RESPONSES ON THE HAND TEST
FOR 3RD GRADE BILINGUAL MALES

Subject	AFF	DEP	COM	EXH	DIR	AGG	INT	ACQ	ACT	PAS	ENV	TEN	CRIP	FEAR	MAL	DES	FAIL	BIZ	WITH	ADC	DA	R	AIRT	H-L	PATH
1	0	0	0	0	2	2	4	0	3	2	5	0	0	0	0	1	0	0	1	0	4	10	11.2	4	2
2	0	0	0	0	2	3	5	2	3	0	5	0	0	0	0	0	0	0	0	0	5	10	10.9	4	0
3	0	0	2	0	2	0	4	1	2	1	4	1	0	0	1	0	1	0	1	0	2	9	11.1	7	3
4	1	0	0	0	1	0	2	1	5	1	7	1	0	0	1	0	0	0	0	1	1	10	11.5	5	1
5	2	0	0	0	1	1	4	0	5	1	6	0	0	0	0	0	0	0	0	2	2	10	10.2	3	0
6	1	0	0	0	1	0	2	1	4	1	5	0	0	0	0	2	1	0	3	1	1	9	9.2	7	6
7	2	0	2	0	1	1	6	0	4	0	4	0	0	0	0	0	0	0	0	4	2	10	9.5	4	0
8	0	0	0	0	1	1	2	0	3	1	4	0	1	0	1	3	0	0	3	0	2	10	7.3	4	7
9	2	0	0	0	1	0	3	3	4	0	7	0	0	0	0	0	0	0	0	2	1	10	10.6	3	0
10	2	0	0	0	1	3	6	1	3	0	4	0	0	0	0	0	0	0	0	2	4	10	10.5	7	0
11	0	2	0	0	0	3	5	1	3	1	5	0	0	0	0	0	0	0	0	2	3	10	9.3	2	0
12	3	1	1	0	1	1	7	1	2	0	3	0	0	0	0	0	0	0	0	5	2	10	11.5	5	0
13	1	0	0	0	0	1	1	0	8	0	8	0	0	0	0	1	0	0	1	1	0	10	9.8	3	2
14	2	0	0	0	1	0	3	0	1	2	3	0	0	0	0	2	2	0	4	2	1	8	8.1	8	8
15	2	0	0	0	0	2	4	0	2	2	4	0	0	0	0	1	1	0	2	2	2	9	19.1	7	4
16	2	1	2	0	0	3	8	0	1	0	1	0	1	0	1	0	0	0	0	5	3	10	9.1	2	1
17	0	0	0	0	7	1	8	0	1	0	1	0	0	0	0	0	1	0	1	0	8	9	10.4	4	2
18	0	0	1	0	5	1	7	1	2	0	3	0	0	0	0	4	0	0	0	1	6	10	12.8	5	0
19	0	0	0	0	1	0	1	0	3	1	4	1	0	0	1	4	0	0	4	0	1	10	7.1	7	9
20	1	0	0	0	1	2	4	1	2	0	3	0	1	1	2	1	0	0	1	1	3	10	10.9	7	4
21	2	0	0	0	1	2	5	2	2	0	4	0	0	0	0	1	0	0	1	2	3	10	8.6	9	2
22	2	0	0	0	0	1	3	3	4	0	7	0	0	0	0	0	0	0	0	2	1	10	9.8	4	0
23	4	0	2	0	0	1	7	0	1	0	1	1	0	0	1	1	0	0	1	6	1	10	11.1	7	3
24	1	1	0	0	0	2	4	2	2	1	5	1	0	0	1	0	0	0	0	2	2	10	10.7	2	1
25	0	0	0	0	0	2	2	0	3	0	3	0	0	0	0	5	0	0	5	0	2	10	12.6	7	10
26	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	7	2	0	9	1	0	8	15.6	10	18
27	0	0	3	0	3	1	7	0	1	0	1	0	0	0	0	2	0	0	2	3	4	10	5.2	7	4
28	1	0	0	0	0	2	3	1	4	0	5	0	1	1	2	0	0	0	0	1	2	10	8.4	3	2

TABLE 15--Continued

Subject	AFF	DEP	COM	EXH	DIR	AGG	INT	ACQ	ACT	PAS	ENV	TEN	CRIP	FEAR	MAL	DES	FAIL	BIZ	WITH	ADC	DA	R	AIRT	H-L	PATH
29	2	0	0	0	1	2	5	0	2	0	2	0	0	0	0	3	0	0	3	2	3	10	11.3	6	6
30	1	0	0	0	1	2	4	0	1	1	2	0	0	0	0	3	1	0	4	1	3	9	11.6	9	8
31	1	0	1	0	1	1	4	0	4	0	2	0	1	0	1	1	0	0	1	2	2	10	9.8	3	3
32	4	0	0	0	0	1	5	0	1	1	2	0	0	0	0	3	0	0	3	4	1	10	13.4	7	6
33	0	0	0	0	1	1	2	0	2	0	2	0	0	0	0	6	0	0	6	0	2	10	5.7	7	12
34	2	0	0	0	0	1	3	0	5	0	2	1	2	0	0	0	0	0	0	2	1	10	6.3	6	2
35	4	0	0	0	0	1	5	2	2	1	4	0	0	0	2	1	0	0	0	4	1	10	9.7	1	1
36	2	0	0	0	1	2	3	0	2	0	3	0	0	0	1	1	0	0	3	2	1	10	5.9	6	7
37	2	0	0	0	1	2	4	1	3	0	4	0	0	0	0	3	0	0	0	2	2	8	8.8	4	4
38	1	0	0	0	1	2	4	0	5	0	5	0	0	0	1	0	0	0	0	1	3	10	11.6	4	1
39	3	0	0	1	0	3	8	0	2	0	2	0	0	0	0	0	0	0	0	4	3	10	10.3	3	0
40	1	0	0	0	0	1	1	0	0	0	5	0	0	0	0	9	0	0	9	1	0	10	2.6	4	18
41	0	0	0	0	0	1	5	0	3	0	5	0	0	0	0	0	0	0	0	0	5	10	8.8	5	0
42	4	0	0	0	1	1	4	0	5	0	5	0	0	0	0	0	0	0	0	4	1	10	9.3	2	0
43	1	0	0	0	0	2	1	0	3	0	6	0	0	0	0	0	0	0	0	1	3	10	11.4	3	0
44	1	0	0	0	0	1	6	0	2	0	3	0	0	0	0	7	1	0	7	1	0	10	13.6	7	14
45	4	0	0	0	0	2	7	0	2	0	2	0	0	0	0	0	0	0	1	4	2	10	9.9	5	2
46	1	0	0	0	0	1	6	0	1	0	3	0	0	0	0	0	1	0	1	3	4	9	9.7	2	1
47	1	0	0	0	0	1	3	0	1	0	2	0	0	0	0	1	0	0	1	2	4	10	9.6	2	2
48	1	0	0	0	0	1	3	0	5	0	3	0	1	0	0	0	2	0	0	2	1	10	10.0	2	2
49	3	1	1	0	0	1	2	0	2	0	2	0	0	0	0	0	0	0	1	5	3	10	9.9	4	0
50	4	0	1	0	1	1	2	0	5	0	2	0	0	0	0	1	0	0	0	4	1	10	8.8	6	3
51	0	0	1	0	1	2	1	0	1	0	2	0	0	0	0	0	0	0	1	4	3	10	8.1	4	0
52	3	0	0	0	0	1	2	0	2	0	2	0	0	0	0	2	1	0	2	3	2	10	10.9	5	5
53	2	0	1	0	1	1	2	0	3	0	2	0	0	0	0	1	0	0	1	2	6	10	11.2	3	2
54	0	0	1	0	1	2	2	0	2	0	4	0	0	0	0	2	0	0	0	2	2	10	15.1	13	4
55	1	0	0	0	0	1	2	0	3	0	5	0	1	0	0	0	1	0	1	2	2	8	6.0	6	5
56	1	0	1	0	1	2	3	0	2	0	6	0	0	0	0	2	0	0	2	1	2	10	11.0	4	2
57	1	0	1	0	0	2	4	0	4	0	5	0	0	0	0	1	0	0	0	2	2	10	10.9	4	1
58	1	0	0	0	1	2	4	0	3	0	4	0	0	0	0	0	0	0	2	2	2	10	11.3	7	2
59	1	0	0	0	0	1	4	0	3	0	3	0	0	0	0	1	0	0	0	1	2	9	9.5	7	4
60	0	0	0	0	1	2	1	0	3	0	3	1	0	0	0	0	0	0	0	0	1	10	9.3	4	11
61	1	0	0	0	2	1	7	0	5	0	3	0	0	0	0	1	0	0	0	0	7	10	9.0	2	0
62	1	0	0	0	1	2	3	0	5	1	6	0	0	0	0	1	0	0	1	1	2	10	7.8	6	2
63	1	0	1	0	0	2	4	0	5	0	5	0	0	0	0	1	0	0	1	2	2	10	9.8	17	2

TABLE 16

ITEM ANALYSIS OF RESPONSES ON THE HAND TEST
FOR 3RD GRADE BILINGUAL FEMALES

Subject	AFF	DEP	COM	EXH	DIR	AGG	INT	ACO	ACT	PAS	ENV	TEN	CRIP	FEAR	MAL	DES	FAIL	BIZ	WITH	ADC	DA	R	AIRT	H-L	PATH
1	2	0	0	0	0	1	3	0	2	2	4	0	0	0	0	3	0	0	3	2	1	10	6.6	7	6
2	2	0	0	0	1	2	5	0	2	2	4	0	0	0	0	1	0	0	1	2	3	10	6.7	10	2
3	1	0	0	0	0	1	2	0	8	2	8	0	0	0	0	0	0	0	0	1	1	10	10.1	6	0
4	5	0	0	2	0	1	8	0	1	4	2	4	0	0	0	0	0	0	0	7	1	10	5.3	6	0
5	0	3	0	0	0	1	6	4	5	0	0	4	6	0	0	0	0	0	0	3	3	10	9.2	4	0
6	3	0	0	0	0	1	4	3	1	4	5	6	0	0	0	0	0	0	0	3	1	10	11.9	6	0
7	0	0	1	0	2	0	3	1	4	5	7	2	0	0	0	0	1	0	1	2	1	9	10.0	4	2
8	0	4	1	0	0	0	1	4	7	2	9	3	0	0	0	1	0	2	0	1	4	10	13.1	8	0
9	4	3	0	0	0	0	2	1	2	4	4	6	1	0	0	0	0	0	2	4	3	8	12.8	8	5
10	3	0	0	0	3	1	6	4	4	2	4	2	0	0	0	0	0	0	0	3	0	10	8.5	5	0
11	0	1	0	0	1	0	6	4	2	2	0	2	0	0	0	0	0	0	4	2	2	10	12.1	5	0
12	1	3	0	0	1	0	4	3	2	2	0	2	0	0	0	0	0	0	4	2	3	6	8.3	12	8
13	3	0	0	0	1	0	3	4	2	0	0	2	0	0	0	0	1	0	4	3	1	8	7.4	11	8
14	0	2	1	0	0	1	4	3	0	2	2	0	0	0	0	0	1	0	6	1	3	8	7.5	7	12
15	2	1	0	0	1	0	2	4	1	2	0	2	0	0	0	0	0	0	0	3	4	10	10.4	3	0
16	3	1	0	0	1	0	2	0	3	1	3	0	0	0	0	0	0	0	3	3	0	10	20.7	19	6
17	1	2	0	0	1	0	0	3	4	1	5	0	0	0	0	0	2	0	2	2	1	8	14.1	8	4
18	2	1	0	0	0	0	3	5	4	1	5	0	0	0	0	0	0	0	0	2	3	10	7.1	7	0
19	1	0	0	0	1	0	3	4	1	0	1	0	0	0	0	0	0	0	5	1	3	10	8.5	7	10
20	0	3	0	0	1	0	1	3	4	0	4	3	0	0	0	0	2	0	3	1	1	8	7.6	7	6
21	3	2	0	0	1	0	4	5	3	0	5	3	0	0	0	0	1	0	3	3	1	9	15.7	8	0
22	2	0	0	1	0	0	5	3	5	0	6	3	0	0	0	0	0	0	0	1	2	10	8.5	9	0
23	0	2	0	1	0	0	3	2	6	0	1	0	0	0	0	0	1	0	1	2	1	9	11.0	5	2
24	2	1	0	0	0	0	2	3	1	0	6	1	0	0	0	0	0	0	7	2	0	10	3.6	5	14
25	1	1	0	0	1	0	3	2	5	1	6	1	0	0	0	1	0	0	0	2	1	10	9.7	3	1
26	3	0	0	1	4	0	1	3	1	0	1	0	0	0	0	0	0	0	0	4	5	10	10.2	4	0
27	0	0	0	0	5	1	2	3	0	3	3	0	0	0	0	0	0	0	1	0	6	10	9.4	3	2
28	0	0	0	0	0	2	2	0	5	1	6	0	0	0	0	2	0	0	2	0	2	10	5.0	7	4

TABLE 16--Continued

Subject	AFF	DEP	COM	EXH	DIR	AGG	INT	ACQ	ACT	PAS	ENV	TEN	CRIP	FEAR	MAL	DES	FAIL	BIZ	WITH	ADC	DA	R	AIRT	H-L	PATH
29	1	0	1	0	0	0	2	0	1	2	3	0	0	0	0	3	2	0	5	2	0	8	10.0	2	10
30	0	0	1	0	1	0	2	0	5	0	5	0	1	0	1	2	0	0	2	1	1	10	5.2	7	5
31	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	9	0	0	9	0	1	10	9.2	2	18
32	1	0	0	0	0	0	1	0	9	0	9	0	0	0	0	0	0	0	0	1	0	10	9.9	3	0
33	2	0	0	0	0	0	1	0	5	0	5	0	0	0	0	1	0	0	1	2	0	10	6.0	7	4
34	2	0	0	0	1	1	4	0	5	1	6	0	0	0	0	0	0	0	0	2	2	10	11.4	5	0
35	0	0	1	0	1	0	2	0	1	1	2	0	0	0	0	6	0	0	6	1	1	10	10.9	4	12
36	1	0	1	1	3	0	6	0	4	0	4	0	0	0	0	0	0	0	0	2	3	10	13.1	3	0
37	1	0	0	1	1	0	3	0	3	1	4	1	0	0	1	0	2	0	2	1	1	8	12.1	10	5
38	0	0	0	0	1	0	3	0	4	1	6	0	1	0	1	0	0	0	0	0	3	10	8.9	5	1
39	1	0	0	0	3	0	4	0	1	2	1	0	0	0	0	2	3	0	5	1	3	7	5.6	4	10
40	1	0	0	0	0	0	1	0	3	2	5	0	0	0	0	4	0	0	4	1	0	10	10.3	3	8
41	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	8	0	8	0	0	2	17.5	5	16
42	3	0	0	0	0	0	3	0	6	1	7	0	0	0	0	0	0	0	0	3	0	10	10.8	6	0
43	0	0	0	0	0	0	0	0	5	1	6	0	0	0	0	4	0	0	4	0	0	10	8.0	10	8
44	0	1	0	0	0	0	1	0	3	0	3	0	3	0	3	3	0	0	3	1	0	10	9.1	3	9
45	0	1	0	0	1	1	3	0	4	0	4	0	2	0	2	1	0	0	1	1	2	10	10.2	6	3
46	2	0	0	0	1	1	4	0	5	0	6	0	0	0	0	0	0	0	0	2	2	10	9.1	3	0
47	1	1	0	0	1	0	4	0	6	0	6	0	0	0	0	0	0	0	0	3	1	10	11.3	3	0
48	1	0	0	0	2	1	4	0	5	0	5	0	1	0	1	0	0	0	0	1	3	10	11.1	6	1
49	0	0	0	0	3	0	3	0	2	1	6	0	1	0	1	0	0	0	0	0	3	10	11.1	4	1
50	2	0	1	0	0	1	4	0	4	0	5	0	1	0	1	0	0	0	0	3	1	10	10.4	4	1
51	1	0	1	0	2	1	5	0	4	0	4	0	1	0	1	0	0	0	0	2	3	10	9.2	4	1
52	5	0	0	0	0	1	6	0	4	0	4	0	0	0	0	0	0	0	0	5	1	10	6,7	7	0
53	0	0	2	0	0	1	3	0	6	0	7	0	0	0	1	0	0	0	0	2	1	10	12.1	4	0
54	1	0	0	1	0	1	3	0	6	0	6	0	1	0	1	0	0	0	0	1	1	10	9.6	4	1