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CORRELATION OF ACHIEVEMENT OF DEAF ADOLESCENTS WITH THE
ENGAGEMENT STYLE MEASURE

The University of Arizona

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CORRELATION OF
ACHIEVEMENT OF DEAF ADOLESCENTS
WITH THE ENGAGEMENT STYLE MEASURE

by
Howard Ray Busby

A Dissertation Submitted to the Faculty of the
DEPARTMENT OF COUNSELING AND GUIDANCE
In Partial Fulfillment of the Requirements
For the Degree of
DOCTOR OF PHILOSOPHY
In the Graduate College
THE UNIVERSITY OF ARIZONA

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THE UNIVERSITY OF ARIZONA
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As members of the Final Examination Committee, we certify that we have read
the dissertation prepared by Howard Ray Busby

entitled Correlation of Achievement of Deaf Adolescents
with the Engagement Style Measure

and recommend that it be accepted as fulfilling the dissertation requirement
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Final approval and acceptance of this dissertation is contingent upon the
candidate's submission of the final copy of the dissertation to the Graduate
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I hereby certify that I have read this dissertation prepared under my
direction and recommend that it be accepted as fulfilling the dissertation
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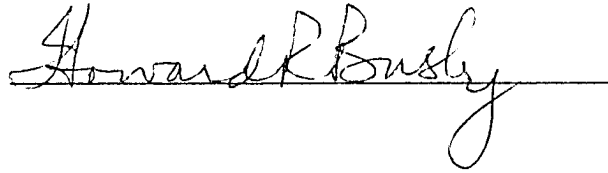
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SIGNED:

A handwritten signature in cursive script, reading "Howard R. Busby", is written over a horizontal line.

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ABSTRACT

The purpose of this study was to determine if deaf adolescents who scored as Reactive on the Test of Engagement Style would score significantly lower on the Stanford Achievement subtests of Reading, Math Concepts, Math Computations, Math Applications, and Language than would deaf adolescents who scored as Active on the same test.

The Test of Engagement Style is a locus of control construct which utilizes a non-verbal, open-ended format. Subject responses are recorded as either Active or Reactive.

The subjects of this study were 111 deaf adolescents who attended the Arizona School for the Deaf and Blind in Tucson.

Cross-tabulation of data between sexes was utilized as was hypothesis testing procedures utilizing one-way analysis of variance with males and females combined in Active and Reactive dimensions for the following variables: IQ, onset of hearing loss, degree of hearing loss (in decibels), age, and the five Stanford Achievement subtests. Split-half procedures were utilized to test for significant correlation in item analysis of the Test of Engagement Style.

The TES showed significant internal consistency with an alpha of .74 at the .05 level of significance. The following results were found: (1) There was no significant difference between males and females on the TES scores. (2) There was significant difference on mean scores in the subtests of Reading, Math Computations, Math Applications, and Language between Active and Reactive students. (3) There was no significant difference between Active and Reactive subjects on onset of deafness, degree of hearing loss, age, and the Math Concepts subtests. (4) There was significant difference in IQ scores between Active and Reactive subjects.

This study suggests that the Test of Engagement Style is useful for making comparisons between Stanford Achievement Test scores and locus of control perceptions.

CHAPTER 1

RATIONALE FOR THE STUDY

Researchers in the area of deafness have demonstrated that the largest single contributor to deafness as a handicap is the problem of communication. Brill (1970), Denton (1970), Schlesinger and Meadow (1972), and Vernon and Koh (1970) have argued that deafness itself does not impair intelligence but there are socially or environmentally imposed barriers of communication which prevent a great number of deaf individuals from functioning fully in what is often called a "hearing world".

Much has been written about the intellectual potential of deaf subjects and the concurrent subpar achievement performance of these same subjects. This gap has been of puzzling and extensive interest for researchers in deafness. The intellectual potential of deaf school-age children does not appear to correspond well with expected achievement when compared to hearing population norms (Furth, 1973; Myklebust, 1966; Vernon, 1968).

The advent of a philosophy of education known as Total Communication appears to have contributed to a reduction in the gap between intellectual potential and

academic achievement (Brill, 1974; Denton, 1970; Moores, 1978). Total Communication, which is generally defined as the utilization of sign language, speech, speech-reading, finger-spelling, gestures, auditory training, and writing (based mostly on the needs and requirements of the individual child) has been studied in a number of settings from the home through the schools to the college and has been credited with improving academic achievement in deaf children (Hester, 1963; Meadow, 1968; Moores, 1978; Schlesinger & Meadow, 1972; Vernon & Koh, 1970).

There is little doubt that Total Communication has contributed to the academic development of deaf adolescents (Moores, 1978) and has probably been a factor in the improvement of mental health in deaf populations (Brauer, 1980; Sussman & Stewart, 1971). It would be too simplistic, nevertheless, to give Total Communication the status of Cause Celebre. There are deaf individuals who continue to achieve below expectations even under educational conditions of Total Communication.

Need for This Study

There is a need to identify factors which explain the underachievement of intellectually normal deaf adolescents who function in a Total Communication setting. The deaf adolescent's perceived locus of control may be one

factor which accounts for low achievement under supposedly ideal conditions.

There is a need to analyze the predictability of achievement among deaf adolescents who are placed in programs under the conditions of Total Communication. The academic and supportive aspects of these conditions do not appear sufficient for predicting academic achievement and underachievement. There seems to be another variable that must be accounted as valid in predictability.

The locus of control construct has become increasingly popular as a research tool in education and psychology. However, it does have limitations for use with deaf populations, especially those instruments which utilize a forced-choice, language-based format. McCrone (1977) used the locus of control construct to study the effects of learned helplessness in deaf residential school adolescents. This study focused on low-achieving deaf adolescents who attended a residential school in Arizona. Although no locus of control instrument was used in the McCrone study, subjects were given tasks which induced learned helplessness. One such task was a bogus WISC-R Block Design task which permitted no correct solutions, thus causing possible frustrations or helplessness.

In addition to the McCrone study previously mentioned, one other significant study of deaf populations using the locus of control construct was conducted by

Koelle and Convey (1982). This study used achievement of deaf adolescents (ages 13-19) as the dependent variable. The Rotter Internal-External Locus of Control Scale was administered to 90 deaf adolescents from four residential schools. Another independent variable, the self-concept rating as measured by the Piers-Harris Children's Self-Concept Scale was also utilized. The locus of control scale and the self-concept scale were modified to compensate for the language, syntax, and vocabulary difficulties encountered by the deaf subjects. The conclusion was that prediction of achievement increase was due particularly to the locus of control variable.

The present study will differ from the McCrone and the Koelle and Convey studies in that there will be no experimentally-induced variables and there will be no dependency on forced-choice and language-based formats. Additionally, there will be no arbitrary modifications of a test instrument.

The Test of Engagement Style (McKinney, 1981) is a locus of control construct which utilizes an open-ended format, thus permitting responses in the examinee's own language. Engagement Style, as used in this study is defined as the manner in which an individual experiences his or her interaction with the environment; that is, the way an individual engages with the environment. Engagement

Style was proposed in this study as one of the variables which predicted achievement of deaf adolescents. Therefore, the Test of Engagement Style (TES) was utilized to find a correlation with achievement scores of adolescents. This study was limited to an examination of the interaction between engagement style and the academic achievement of deaf adolescents in a residential school. Very little, if anything at all, has been written about the possible impact of engagement style on the lives of deaf people. The general question was: Does the deaf adolescent's scores on the TES correlate with his or her score on the Stanford Achievement Test?

This study differs from previous Engagement Style research in the following areas:

1. Deaf subjects were used;
2. Terminology differs: This study used the term Active instead of Active Agent and the term Reactive instead of Reactive Patient or Patient.

Purpose of the Study

The purpose of the study was to examine the scores of deaf adolescents on a locus of control construct, namely, the Test of Engagement Style, to see whether these scores correlate with performance on standardized achievement tests.

Foundations of Engagement Style

Under the construct of Engagement Style there seems to be two contrasting styles of interaction: the Active Agent style on one end and the Reactive Patient style on the other. McKinney (1981) asserts that there is a composite style which he calls communion. This represents a style under which the individual interacts with the environment in a more communicative way: for example, talking and hearing.

Experiments utilizing the locus of control construct also fall into the Active-Reactive dimension of personality which has been explored as a behavioral science construct in developmental theories (Baer, 1976; White, 1976). The Active-Reactive variable provides important clues to the understanding of control. McKinney (1981) developed a locus of control construct which incorporated the language and theories of the Active-Reactive dimension and labeled it the Test of Engagement Style.

The Active-Reactive concept is not new. Much of its beginnings can be traced to Greek philosophy where debate over the primacy of object versus activity occurred. A more recent history of the Active-Reactive dimension in psychological perspective occurred in the writings of William James (1948) in relation to the self as subject (Active) and the self as object (Reactive).

Langer (1969) discussed the mechanical mirror theory in the following manner:

The view most closely associated with a passive model of man is that which we shall call the mechanical mirror theory. At the core of this perspective is the thesis that man grows to be what he is made to be by his environment.

(p. 4, italics Langer's)

Mechanical mirror theory is a Lockean concept. That is, it derives chiefly from Locke's concept of tabula rasa. The opposite of this view, according to Langer, is the organic lamp theory which describes man as an active agent and postulates that development is a self-constructive process. Langer's theories derive, again, from Greek philosophical models: Aristotelian for the mechanical mirror theory, and Platonian for the organic lamp theory.

Zigler and Child (1973) observed that developmental psychology no longer views the infant or child as a passive organism, helpless and at the mercy of its environment. The emerging view is that the child is a self-directing agent mastering its own environment.

Historical Development of Engagement Style

McKinney (1981) observed that engagement style assumed a dialectical perspective in its development. This is also true of developmental psychology as a whole. When addressing the relationship between the organism and its

environment, researchers can hardly avoid the implication that objects (including organisms) are in motion and not in isolation.

A dialectical perspective assumes that there will be dynamic movement in the following areas:

- 1) The relationship between the organism and its environment.
- 2) The implication of objects in motion and interaction as opposed to the assumption of a static state and objects in isolation.
- 3) The unity of opposites. (After McKinney, 1981, p. 363)

Engagement Style easily meets the criteria of this dialectical perspective. There is the construct of a core role, which is defined as focusing on the way in which the individual views his or her world and his or her place in it. This meets the first prerequisite as outlined for a dialectical perspective.

This same core construct enables Engagement Style to be viewed as responsible for changes in the self as functions of experience and maturation. This meets the second prerequisite of a dialectical perspective.

The construct of Active and Reactive which are central to engagement style are bipolar opposites. Engagement style focuses on the midpoint of this polarity,

thus meeting the third prerequisite of a dialectical perspective. This is similar to being in a paradoxical state of being both object and subject at the same time. This is the human dilemma of Rollo May (1967).

A number of researchers have chosen a less than conservative course in locus of control studies. These studies avoided the trap of positioning locus of control scales as indicators of general characteristics or traits. Several of these investigators created variations of the Rotter Scale or devised altogether new scales for measuring the locus of control phenomenon. Some of them accounted for motivational aspects; others focused on phenomenological and existentialistic conceptions of control. Among the early non-conservative investigators was Levenson (1972, 1975) whose I, P, C, scales differentiated control among Internality (I), Powerful Others (P), and Chance (C).

Gregory (1978) investigated expectancies for controllability and developed a Malevolent-Benevolent Questionnaire for the study of the expectancy variable. Reid and Zigler (1977) developed a scale which investigated psychological adjustment in the desired locus of control direction. These positions were based on Social Learning Theory. Nomological networks of perceived control were developed by Paulhaus and Christie (1978). They proposed three major spheres of influence other than the sphere

of the self. These are Personal Efficacy (PE), Interpersonal Control (IP), and Sociopolitical Control (SP). The developers of this scale subscribed to the theory that locus of control is perceived and this perception occurs at different times on different levels within three major spheres.

McKinney (1981) describes Engagement Style as differing from other locus of control constructs primarily in terms of theory and derivation: locus of control derives from social learning theory, while Engagement Style is an experimentally based notion deriving chiefly from existential philosophy and psychology. Where locus of control is defined by its extremes, internal or external, Engagement Style tends to include the mid-range of scores along with the extreme scores on a measurement scale and gives these scores as much importance as the extreme scores. Engagement Style further refers to the experiential variable; that is, it refers to the person as an Active Agent or as a Reactive Patient. This appears to be no different from the locus of control construct of internal (controlling the environment) and external (being controlled by the environment). McKinney explains that the difference lies in the fact that locus of control is an expectancy variable and stresses reinforcement as an important function of a person's perception of control.

By contrast, Engagement Style refers to acting or the experience of acting regardless of outcome expected or reinforcement of the acting.

Construct Comparisons from the Literature

Engagement Style and locus of control are nearly identical in that the active agent dimension is similar to internal locus of control and the reactive patient dimension is similar to external locus of control. However, there are differences.

Locus of Control

Within the locus of control constructs is the expectancy variable. Engagement Style is a more primitive construct and does not account for the expectancy variable; one simply acts or reacts. In effect, the internal person is both Active and Reactive, an inter-acting person (McKinney, 1981). Locus of control emphasizes extremes such as internal vs. external, although several experimenters have tried to account for variables within extremes, such as Levenson's (1972, 1975) Internality, Chance and Powerful Others. The last two, Chance and Powerful Others, are actually sub-scales of the external factor. Engagement Style posits a polarity similar to locus of control but also gives psychological importance to the midpoint, communion.

Self-efficacy

Bandura (1977) discusses two types of expectancy which influence locus of control perceptions: outcome expectancy and efficacy expectancy. Outcome expectancy is the expectation that a given behavior will lead to a particular outcome. Efficacy expectancy is defined as the belief that one can do the job or perform the behavior which will lead to the expected outcome. Engagement Style does not address issues of outcome and efficacy.

Research on Engagement Style from the Literature

This section deals with research utilizing the Test of Engagement Style. Three areas of research are reported: effects of family size, childhood and adolescence, and sex differences.

Effects of Family Size

McKinney (1980) predicted that large families would have both more active agents and passive (Reactive) patients than small families. In a study of 50 college males, McKinney found no difference in Engagement Style scores between small families and large families. However, in large families there was a significant difference in variance between active and reactive subjects. Another experiment with school-age children showed that this same tendency of large families to produce significant variance

(bipolarity rather than interaction) also occurred. Analysis of birth order showed that this had no cause-effect impact. Additional research in this area was suggested.

Childhood and Adolescence

In an experiment to test the hypothesis that early adolescence may tend to produce reactive scores on the Test of Engagement Style, McKinney (1980) found that seventh graders (age 11 to 13) scored more often in the patient (Reactive) range than second graders and twelfth graders. Students from two different communities were tested and there were no significant differences across age, sex, and location of community. McKinney concluded that his research provided support to two aspects of early adolescence: the prevalence of self-consciousness and a tendency toward egocentricity.

Sex Differences

Two studies by McKinney and an associate attempted to determine whether there was a higher TES score among males than among females. The first study (McKinney & Moore, 1978) found that there were no significant differences in TES scores between males and females. However, an analysis of responses indicated that females tended to have higher scores whenever the test picture depicted the

main female character (Sally) interacting with a female peer as contrasted to lower scores whenever the female interacted with male peers. This study was done with college students.

To test the hypothesis that females were projecting less active agency to the main female character in the first experiment due to the apparent conformity by female subjects to what they perceived as male expectations, Moore and McKinney (1979) conducted another experiment. The Bem Sex Role Inventory (Bem, 1974) was also administered to subjects in this study. The conclusion was that females did indeed project on the main female character according to male expectations. That is, they perceived that males did not view active agency as a feminine trait.

Summary of Research Comparisons from the Literature

Research with the locus of control construct during the last two decades has increased with such rapidity that it has forced at least three of the foremost authorities (Lefcourt, 1976; Phares, 1976; Rotter, 1975) in this area of research to warn future researchers about the potential misuse of locus of control scales. The greatest concern is the tendency of investigators to assume that a measuring device such as Rotter's I-E scale (Rotter, 1966) serves as the only definition of a construct.

Most investigators have conducted conservative studies of the locus of control paradigm and made careful selection of scales which were supportive of their predictions (Lefcourt, 1981). Koelle and Convey (1982) modified the Rotter I-E scale to account for the language difficulties of deaf subjects. This modification followed no previous guidelines and could have been conducted with the intent to elicit specific responses.

Research Validation from the Literature

This section is a review of the literature related to deafness, including intelligence testing with deaf people, academic achievement of deaf students, and the social-emotional development of deaf individuals.

Intelligence testing with deaf people

Perhaps one of the earliest forms or methods of testing the intelligence of deaf people was developed by the Spaniard, Jacob Rodriques Periere, during the latter part of the eighteenth century. His techniques of direct observation, close attention to case history, sensory substitution, reinforcement, educational plans according to social needs, and individual treatment plans continue to be used today (Oakland & Goldwater, 1979).

In 1905, a revolutionary path away from sensory or motor measurements and toward the measurement of

abilities or of mental tasks was pursued by Binet and Simon (Robb, Bernardoni & Johnson, 1972). Eventual revisions of the Binet scales in 1908 and 1911 by Binet and Simon; in 1916 and 1937 by M. L. Terman of Stanford University; and in 1960 by Terman's associates at Stanford resulted in an intelligence test that focused primarily on mental abilities. The 1937 and 1960 versions of the Stanford-Binet Scales had only one index of intelligence (the M.A. and I.Q. are derived from each other) and there was no index for non-verbal performance. The Stanford-Binet would substantially penalize deaf subjects (Levine, 1960; Sullivan & Vernon, 1979; Vernon & Brown, 1964). The Stanford-Binet is not widely used with deaf subjects. There has always been a need to find or develop non-discriminatory assessment instruments for use with the deaf.

Several studies cite an historical and repetitious occurrence of hearing impaired subjects being erroneously labeled mentally retarded on the basis of scores on verbally loaded assessment instruments (Moore, 1978; Rosen, 1967).

Pinter and Patterson (1917) developed a performance scale which did not correlate highly with the 1916 Stanford-Binet (Anastasi, 1961); however, many items from this test were copied or adapted in other and later tests which were widely used with deaf subjects. A few of these

were the Pintner Non-Language Mental Test (1929); The Arthur Point Scale of Performance (Arthur, 1943); The Porteus Maze Test (Porteus, 1924); the Goodenough Draw-A-Man Test (Goodenough, 1926); and the Army Performance Scale (Army Examination Beta, 1918). The Army Beta was the first of the nonlanguage group tests to be used with individuals who could not be tested well with verbal instruments.

Even with a plethora of nonlanguage or performance based tests or intelligence scales, early researchers labeled the deaf as mentally inferior (Pintner, Eisenson & Stanton, 1941).

In summarizing the investigations of over 50 independent researchers, Mindel and Vernon (1971) conclude that "All available evidence demonstrates that there is no direct relationship between hearing loss and intelligence" (p. 71).

Wechsler (1949, 1955) began a lifetime series of intelligence scale development and revisions which consistently proved high validity between the verbal and performance scales of his intelligence tests. Although the early form of the WISC did not adequately measure the intelligence of deaf children, the WAIS proved to be a valid instrument for use with deaf adults (Sullivan &

Vernon, 1979). The revised version of the WISC has become more acceptable for use with deaf children today.

Hiskey (1966) developed a nonlanguage scale which also provided hearing impaired norms. The Hiskey-Nebraska Test of Learning Aptitude is gaining widespread acceptance among workers with the deaf.

Furth (1973) investigated the performance of deaf subjects on Piagetian type tasks and found deaf subjects capable of performance equal to their hearing peers in spite of the communication and language problems inherent in deafness. The lack of opportunity to assimilate and accommodate through experience is suggested as one cause of some of the deficits in intelligence test scores or results of deaf children (Furth, 1973; Schlesinger & Meadow, 1972).

Academic achievement of deaf students

Studies or research about the academic achievement of deaf subjects reveal an almost stark contrast from studies regarding the intelligence of deaf subjects, notably in the gap between expectancy based on intelligence and the actual scores of achievement tests.

For decades, beginning with Reamer (1921), there was agreement that there was an average educational lag

of five years for deaf students when compared with the achievement of hearing subjects.

Even students entering Gallaudet College, which at that time was the only college in the world exclusively for deaf students, were achieving below the ninth grade on tests of achievement (Hall, 1929).

A survey by Boatner (1965) in which New England area deaf students 16 years or older were studied, 30% were considered to be functionally illiterate. Only five percent of the students were achieving at the tenth grade level or above.

McClure (1966) reported that the top 10% of graduates of 26 residential schools for the deaf showed an advancement of only two grades between the ages of 12 and 18. The average grade equivalent level for these students was 7.7.

The Babbidge Report of 1965, in which a massive survey of the educational status of more than 23,000 deaf children was conducted, showed a median Stanford Achievement Test equivalency of 5.9 for school leavers who completed at least 12 years of education (Babbidge, 1965). The Office of Demographic Studies of Gallaudet College (Gentile & DiFrancesca, 1970) published a survey which showed that 17 year old deaf students attained an average SAT grade level of 5.88 on the Reading subtest.

This survey covered 11,544 deaf children representing 70 schools and 39 day classes.

Moore (1978) states that achievement test scores among deaf populations tend to be lowest in subtest areas that depend on a knowledge of English such as reading, language, social studies, and science. Their scores tend to be higher in arithmetic computation.

Sullivan and Vernon (1979) charge that achievement tests presuppose an ability to master and process standard English, but little attention has been devoted to designing curricular methods to meet the achievement needs of the hearing impaired. The authors conclude that the SAT is currently the best available achievement test for use with hearing impaired students.

It is obvious from the cited studies above, that there is a major discrepancy between the intellectual potential and the achievement level of deaf subjects.

Social-Emotional Development of Deaf Individuals

Moore (1978) postulates that there have been two basic approaches to the social-emotional adjustment of deaf individuals. The most commonly used approach is called the deviancy model. This model emphasizes identification of ways in which deaf persons are different from standards established for hearing populations. Deviancy

tends to be associated with deficiency, Moores asserts. This deviancy model has served as the basis of a "psychology of deafness".

The second approach or model discussed by Moores is beginning to receive more attention and support. This approach focuses on the conditions which should contribute to healthy individual development, whether deaf or hearing. Moores did not give this approach or model a name, but it could very well fit the term Holistic. Implicit in this term is the assumption that emphasis is on the development of a healthy, whole, well-integrated person.

The issue of the effect of deafness on development has been addressed through an Eriksonian perspective by Schlesinger and Meadow (1972). Deafness is viewed as a phenomenon in which intellectual, linguistic, emotional and social patterns of development are closely bound to each other. Implied here is that educational lag and psychological retardation or deviancy are frequent among deaf populations.

Levine (1956) conducted an investigation into a psychology of deafness and discovered that this psychology consists of underdevelopment in conceptual formation, emotional aspects and interpersonal relationships, greater egocentric characterizations, and a markedly constricted life area.

Myklebust (1966) found that the deaf are deficient in empathetic understanding, or "caring for others". Characteristics of egocentricity, low empathy, coercive dependency, impulsivity, and poor introspective skills were frequently observed by Altshuler (1964) among deaf individuals.

Moore (1978) believes that those so-called characteristics of a "deaf personality" evolve from situations where communication between parent and child may not exist. Such unsatisfactory environmental conditions may have developed due to the lack of assistance provided parents when they encountered deafness for the first time.

Psychological measurement instruments, especially projective tools, may not be valid for assessing the personality of a deaf subject. For example, findings of paranoia, maladjustment, or neurotic characteristics may indicate healthy feelings, not psychological reactions. Knapp (1968) challenges the negative conclusions of many of the early personality studies of deaf individuals and argues that deaf people may be only reflecting reality. They are paranoid, because they are aware of the derogatory view others have of them.

It may be safe to conclude from the foregoing that projective techniques for assessing the personality of a

deaf individual should be done only by a qualified and competent professional who is fluent in the language used by deaf subjects and does not allow himself to fall into the relatively easy practice of labeling or categorizing his clients. Moores (1978) cautions researchers about the twin evils of nominalism and reification. Nominalism consists of labeling or categorizing a person and then allowing this to explain the behaviors of the person. Reification refers to the belief that a concept or characteristic actually exists simply because there is a label or a term for it.

Expectations of the Study

This study was expected to show that instruments which utilize a non-verbal or open-ended format would provide a more accurate picture of a deaf adolescent's perceptions than would those instruments which were highly verbal and forced-choice oriented (Rosen, 1967).

The testing situation may be viewed as a threat by the deaf adolescent. In addition to the unfamiliar vocabulary, unfamiliar English structure, and unfamiliar examiner in most assessment situations, there is the haphazard and sometimes insurmountable barrier imposed by the communication modes used or preferred by examiner

and examinee. Donoghue (1968) in reference to the Rorschach states:

The only really important criterion, aside from the examiner's professional proficiency, is the determination of whether the language employed is the one the client and the examiner can adequately use in discussing the percept seen. This is a most important consideration where the deaf are concerned.
(p. 43)

The TES was expected to be a non-threatening instrument and the examiner is proficient in the language used by his subjects. It was expected that there would be equal numbers of subjects who scored in the two categories of Active and Reactive, respectively.

The ultimate goal of this research was to provide a method for counselors to identify individuals who might score low on achievement tests. Intervention in educational programming and counseling would be indicated for such individuals. Training a deaf adolescent would involve appropriate directions as indicated by results. How this could be effected is for future research.

Statement of the Problem

This study was designed to address the following research question: How does the score of a deaf student on The Test of Engagement Style relate to his or her score on the Stanford Achievement Test?

Research Hypotheses

The following null hypotheses were tested at the .05 level of significance:

1. There will be no significant difference in mean scores on The Test of Engagement Style between males and females in this study:

$$H_{o_1} : \bar{X}_{\text{male}} - \bar{X}_{\text{female}} = 0.$$

2. There will be no significant mean score difference in the Reading subtest of the Stanford Achievement Test between Active and Reactive subjects as measured by The Test of Engagement Style.

$$H_{o_2} : \bar{X}_{\text{RS (Active)}} - \bar{X}_{\text{RS (Reactive)}} = 0$$

3. There will be no significant mean score difference in the Math Concepts subtest of the Stanford Achievement Test between Active and Reactive subjects as measured by The Test of Engagement Style.

$$H_{o_3} : \bar{X}_{\text{MCON (Active)}} - \bar{X}_{\text{MCON (Reactive)}} = 0.$$

4. There will be no significant mean score difference in the Math Computation subtest of the Stanford Achievement Test between Active and Reactive subjects as measured by The Test of Engagement Style.

$$H_{o_4} : \bar{X}_{\text{MCOMP (Active)}} - \bar{X}_{\text{MCOMP (Reactive)}} = 0.$$

5. There will be no significant mean score difference in the Math Application subtest of the Stanford

Achievement Test between Active and Reactive subjects as measured by The Test of Engagement Style.

$$H_{O_5} : \bar{X} \text{ MAPPL (Active)} - \bar{X} \text{ MAPPL (Reactive)} = 0.$$

6. There will be no significant mean score difference in the Language subtest of the Stanford Achievement Test between Active and Reactive subjects as measured by The Test of Engagement Style.

$$H_{O_6} : \bar{X} \text{ LANG (Active)} - \bar{X} \text{ LANG (Reactive)} = 0.$$

7. There will be no significant difference in degree of hearing loss (measured in decibels between Active and Reactive subjects as measured by The Test of Engagement Style.

$$H_{O_7} : \bar{X} \text{ dB (Active)} - \bar{X} \text{ dB (Reactive)} = 0.$$

8. There will be no significant difference in mean duration of hearing loss (onset) between Active and Reactive subjects as measured by The Test of Engagement Style.

$$H_{O_8} : \bar{X} \text{ onset (Active)} - \bar{X} \text{ onset (Reactive)} = 0.$$

9. There will be no significant difference in mean IQ scores between Active and Reactive subjects as measured by The Test of Engagement Style.

$$H_{O_9} : \bar{X} \text{ IQ (Active)} - \bar{X} \text{ IQ (Reactive)} = 0.$$

Definition of Terms

Engagement Style

Engagement style (McKinney, 1978, 1980, 1981) refers to the manner in which an individual experiences his or her interaction with the environment. It is an experiential variable in which the individual perceives himself as either acting on the environment (active agency) or perceives himself as being acted on by the environment (passive agency).

Test of Engagement Style (TES)

The Test of Engagement Style (McKinney, 1978, 1981) is a semi-projective measure which consists of 30 drawings of a young boy or a young girl engaged in a variety of peer interactions. The young boy (Billy) and the young girl (Sally) are always depicted as interacting with one other peer, either male or female. The Billy set is used with male subjects and the Sally set is used with female subjects. The possible top score on the TES is 24. Only Active agency type responses were scored.

Active

Deaf adolescents who scored in the top half of the TES were designated as Active for purposes of this study.

Reactive

Deaf adolescents who scored in the bottom half of the TES were designated as Reactive for purposes of this study.

Deaf Adolescent

For the purpose of this study, deaf subject is defined as an individual who meets the following criteria:

1. Has a tested bilateral unaided hearing loss of 70 decibels or more in the better ear across standard speech frequencies of 1,000 to 2,000 Hz on standard audiometry (Davis & Silverman, 1970).
2. Has a chronological age between 12 and 20.
3. Onset of deafness occurred before age 5.
4. Uses American Sign Language (ASL) as his or her acknowledged primary mode of communication.
5. Has no documented or suspected secondary sensory handicaps.
6. Has attended a program for the deaf for at least five years.

Stanford Achievement Test

The Stanford Achievement Test (SAT) is an educational test developed to measure knowledge and skills thought to have been achieved by elementary and secondary school students (Madden, R., Gardner, E., Rudman, H., Karlson, B., & Merwin, J., 1973).

Brill (1974) and Levine (1960) regard the SAT as the most commonly used, if not the most reliable, test for measuring the academic achievement of deaf subjects.

The SAT has a high reliability coefficient (.90) among normal populations (Buros, 1965). Hearing-impaired norms have been developed (Gentile & DiFrancesca, 1970).

Duration of Hearing Loss (Onset)

For purposes of this study, duration of hearing loss is defined as the number of months a subject has been deaf since inception.

Degree of Hearing Loss

Degree of hearing loss is defined as the amount of hearing that has been lost in terms of decibels as measured by audiometry.

IQ

Intelligence quotient for purposes of this study is defined as the score a subject receives on the Performance Scale of the Wechsler Intelligence Scale for Children-Revised (WISC-R) or on the Wechsler Adult Intelligence Scale (WAIS).

Summary

This chapter dealt with a rationale of the present study, the need for the study, the purpose of the study,

the foundations of Engagement Style, and the historical development of Engagement Style. Additionally, from the literature reviews, construct comparisons, research of Engagement Style and research validation were discussed. Expectations of the study, a statement of the problem, research hypotheses and a definition of terms were also presented.

In reviewing the literature, it was found that no studies utilizing the Test of Engagement Style were used with deaf adolescents. Only one study was found in which a locus of control construct was utilized for correlational studies with achievement scores of deaf adolescents.

The next chapter deals with procedures used in this study.

CHAPTER 2

PROCEDURES

This chapter will address the procedures which were used in the research. Specifically, sampling and data gathering procedures, research design, description of the instruments, testing procedures, analysis of data, and the limitations of the study will be discussed.

Sampling Procedures

Subjects for this study were all of the 130 secondary students enrolled in the educational program in the Deaf Department of the Arizona State School for the Deaf and the Blind. One hundred eleven (111) subjects were selected who met the criteria of deaf adolescents as described in Chapter 1.

Parental permission for child participation was solicited on registration day. Since many students commuted from distant cities and towns, this procedure was functional. All parents (of students in this study) signed the permission form (Appendix A). The school from which the subjects were drawn serves a total population of 230 deaf students, of which 70 are of elementary school age (6-11 years), and 130 are of junior high and high school

age (12-20 years). The rest are preschoolers and multi-handicapped students in special programs. Approximately 130 of these students live in residence halls on the school campus and another 100 commute from Tucson area homes as day students.

The school provides instruction within a Total Communication framework with emphasis on language and speech development. Students have opportunity to participate in sports programs which offer competition with teams composed of hearing students in southern Arizona. Students also have opportunity to secure COOP and work experience education through the vocational program. The school is similar to most other Tucson area schools with the exception that instruction incorporates sign language and special auditory apparatus.

Data Gathering Procedures

All subjects were administered The Test of Engagement Style (TES). Testing was administered by the investigator of this study, and required approximately 25 minutes for completion for each subject.

Stanford Achievement Test (SAT) scores for each of the subjects were searched and recorded. Any scores more than two years old were rejected. Nearly all subjects had been administered the SAT yearly, thus making very recent scores available.

Since the students did not all take the same level of the SAT, it was necessary to use raw scores so that scores from different levels could be compared and prevent confounding due to the age or maturity factor (Koele & Convey, 1982). The SAT subtests utilized are Reading Comprehension, Math Concepts, Math Computation, Math Applications, and Language. Social Science, Science, Vocabulary, and Spelling subtests were not utilized since they are dependent on language and reading comprehension and the Language and Reading subtests serve as sufficient representation for this area of achievement (Kasdon, 1974; Moores, 1978).

The scores recorded on the data sheet were percentages. That is, a student's raw score (number correct) was calculated as a percentage of the maximum possible score on a given subtest. These percentage scores were necessary for standardization since not all subtests had the same number of items on each level.

The SAT levels utilized were: Primary III (grades 3.5-4.4), Intermediate I (grades 4.5-5.4), Intermediate II (grades 5.5-6.9), and Advanced (grades 7.0-9.5).

Audiograms and audiological records of each subject were studied and recorded. These records provided the most recent data, since they are required for the state

voucher system yearly. The degree of hearing loss in decibels (dB) was recorded; as was the age of onset of hearing loss.

The age of each subject was readily available from student files and this was included in the data base. The sex of each student was also recorded.

Wechsler Intelligence Test data (WAIS and WISC-R) were searched and recorded. These data were available since state requirements under the voucher system include intelligence test data. Since a variety of examiners, regardless of competency, administered these tests, some of the scores might be suspect (Jensen, 1980; Sattler, 1974). However, the majority of the testing was done by ASDB's psychology department and could be regarded as reliably administered by examiners trained in working with the deaf. The scores from the WAIS or WISC-R were derived solely from the Performance Scores of these two tests.

Wechsler (1974) found that the WAIS Performance Scale and WISC-R Performance Scale correlate at .83. It may be concluded that a child's score on the WAIS could change little or produce no significant change from the WISC-R (on the Performance Scale) as the child gets older.

General Design of the Study

Since this study was designed to address the question of whether or not Engagement Style scores significantly related to scores on the Stanford Achievement Test, the effects of extraneous variables such as age, sex, onset of hearing loss, degree of hearing loss, and IQ needed to be statistically controlled (Kratochwill, 1978).

Since the Test of Engagement Style was considered to be semi-projective (McKinney, 1978, 1981), it was subjected to reliability and validity testing. Therefore, internal consistency estimates were generated to establish reliability for the TES measure. The only attempt at validity was an analysis of convergent validity (as described in Chapter 3), furthermore, validity or non-validity is implied in the hypothesis testing results.

One-way analysis of variance was employed to examine the relationship between TES and Stanford Achievement scores, age, sex, onset of hearing loss, degree of hearing loss, and IQ among subjects selected for the study. A cross-tabulation analysis of the Test of Engagement Style by sex was calculated to determine the accuracy of classification of subjects and to find the number and percentage of subjects in each dimension.

Description of the Instrument

The Test of Engagement Style (TES) consists of 30 pictures plus two practice pictures (Appendix B). There are two forms (one for males and one for females). Twenty-four of these pictures are scored with six others (depicting the main character in an active role) as fillers. The pictures (in card form) are presented in alphanumeric order. Packet A contains cards A1 through A5, which are presented first after the two practice cards, then packet B, C, D, E, and F are presented in an identical manner.

The TES pictures depict children approximately ten years old in activities typical of that age. The content of the activities is designated to be neutral in regard to sex stereotyping. The pictures include affiliative play in twelve instances, nurturance in six, teaching in four, and aggressive play in two. Sex of the peer is evenly divided within these activity categories.

The male form consists of a boy who wears a cap and has the name Billy. The female form has as its main character a girl who sports a bow in long hair and she is called Sally.

In reliability studies, McKinney (1978) reported the following:

1) Odd-even reliabilities involving 103 boys in grades 2, 5, 9, and 12: .93, .97, .91, and .74 respectively.

2) Test-Retest reliability (after six weeks) for fifth graders was .74 and for ninth graders .79.

3) Split-half reliability coefficients ranged from .83 to .91 in a study of 300 elementary and high school students.

Testing Procedures

Subjects were tested individually in the same room by the same examiner throughout the testing phase. The test normally required 20-25 minutes to complete.

The examiner presented the first practice card by laying it on the table in front of the subject and the following instructions were given in American Sign Language:

This card shows two persons and I have thirty other cards similar to this in this stack (examiner points to stack of cards). In each card there are two persons, not one, or three, or four, who are doing something together. In each card there is always this one boy/girl, (examiner points to the boy or girl) and s/he is wearing a cap/bow, see? His/her name is Billy/Sally. What I want you to do is look at each picture and tell me what is happening with Billy/Sally and the other person.

(Adapted from McKinney, 1978)

If the subject had any questions about the procedure, these were answered during the administration of the two practice cards. It was sometimes necessary to provide prompts at these practice administrations to elicit the name of Billy or Sally in each response. Occasionally, the subject responded with a name of Billy or Sally's Peer. This was not corrected or denied.

However, when a subject asked for the name of the peer, the answer was invariably: "Just another child whose name I do not know." It was important that the subject identify with Billy or Sally, not the peer.

Each set of cards was inserted back into its envelope as soon as the last card of the set was presented. This was important to ensure sufficient pauses to prevent responses patterning or response set (Jensen, 1980).

Scoring Procedures

The test was scored as the subject responded. Check marks were placed under the Active or Reactive column of the scoresheet (Appendix C). Twenty-four of the thirty test cards, excluding practice cards, were scored. One card in each of the six envelopes is a filler card and was not scored. However, a check mark was placed under Active or Reactive for the filler cards to maintain a consistent pace and was used as a later reference for analysis of individual responses.

The twenty-four cards were scored either Active or Reactive according to the following criteria:

In each picture, Billy/Sally could be perceived either as doing (e.g., Billy/Sally is getting on the horse) or as being done to (e.g., the other boy is helping Billy/Sally on the horse). These two perceptions were scored as Active and Reactive respectively.

Active Scores

A response was scored active when the primary character was:

1) the subject of an active verb: "Billy/Sally is catching a ball."

2) the subject of an active verb and the direct object is the peer who is also active: Billy/Sally is learning while his friend is acting as teacher."

3) the subject of a verb suggesting "desire", "wish", or "thought": "Billy/Sally wants to be friends with the other person."

4) simply described: "Billy/Sally is angry."

5) included in the plural subject of an active verb: "They are playing ball." (Q) "Billy/Sally and his/her friend."

A check mark was placed under the Active column for each of the responses which met the active criteria. Responses which described the peer as active after the initial response was Active for the main character served as Active score. An example of this is: "Billy is running and his friend is chasing him."

Reactive Scores

A response was scored Reactive when the primary character was:

1) the object of another's action: "The boy/girl is throwing the ball to Billy/Sally."

2) the object of sentences such as: "There is a rope in front of Billy/Sally."

3) the object of a preposition: "The boy/girl is reading to Billy/Sally."

4) the object of a verb suggesting "desire", "wish", or "thought" on the part of a peer: "The boy/girl wants Billy/Sally to look at something."

5) the subject of a passive verb: "Billy/Sally has his/her picture taken."

6) having something done to him/her: "Billy/Sally is receiving a frisbee."

Half Active and Half Reactive Scores

A response was scored 1/2 Active when the primary character was:

1) both a subject and an object of sentences such as: "Billy/Sally is drowning or fell overboard (Active) and his/her friend pulls him out (Reactive) or "She is reading to Billy/Sally (Reactive) and he/she is listening (Active)."

2) doing and being done to: "Billy/Sally is listening to his friend (doing; Active) read to him/her (done to; Reactive)." Only Active and half Active scores

were tallied and recorded. This was referred to as the subject's TES score. The maximum possible TES score is 24 and the minimum is 0.

Analysis of Data

Means and standard deviations were calculated for each variable: TES scores, onset of deafness, degree of hearing loss, IQ, age, sex, and achievement subtest scores.

Treatment of the data focused on analysis of mean score differences for each variable between Active and Reactive groups. Intergroup differences on all variables between sexes were also examined.

Subjects were assigned to the Active or Reactive group on the basis of their scores on The Test of Engagement Style (TES). Subjects scoring between 0 and 7 were classified as Reactive and subjects scoring above 8 were classified as Active. Thus, the data were dichotomized between these two groups for analysis of variance procedures.

It should be noted that there is a great disparity in range of scores between these two groups. As was discussed in the review of the literature, there is a cluster of scores which was labeled Communion by McKinney (1981). These scores are the midpoint of the Engagement Style continuum. That is, they would range from 8 to 12 on the TES scale. However, since Communion is not an

undesirable trait according to McKinney, it was assumed for purposes of this study that Communion scores would best fit the Active dimension.

Limitations of the Study

1. The subjects selected for the study represent only one school (ASDB).
2. The subjects do come from cultural backgrounds unique to Arizona, thus limiting generalization only to the population from which this sample is taken.
3. The communication skills in sign language of subjects' family members were not investigated and this variable may have mediated these results.
4. Experimenter bias may exist because the investigator was the only administrator of the TES. The rationale for using the experimenter as the only administrator is that proficiency in receptive and expressive use of ASL is mandatory, and consistency in observing and recording responses in ASL is very important. The examiner was experienced in objectively administering tests.

Summary

This chapter dealt with sampling procedures which described the population of 130 deaf adolescents, the setting from which the population was drawn, the data

gathering procedures in which Stanford Achievement Test Scores, audiological records, age, sex, and IQ records were recorded. Testing procedures with the Test of Engagement Style and analysis of the data in which analysis of variance procedures were used to test each of the hypotheses was also discussed in this chapter.

The next chapter deals with the results of the study and provides a discussion of the results.

CHAPTER 3

RESULTS AND DISCUSSION

The major focus of this chapter is on a brief discussion of reliability studies of the Test of Engagement Style, convergent validity analysis of the instrument, and discussion of the hypothesis testing results.

Reliability

Reliability studies conducted by McKinney (1978) on the Test of Engagement Style (TES) reported correlations ranging from .83 to .91 for 300 elementary and high school students on split-half analysis. On a Test-Retest (after six weeks) reliability study of fifth graders, McKinney (1978) found a coefficient of .74, and for ninth graders a coefficient of .79 was calculated. In the same study, McKinney revealed odd-even reliability coefficients for boys in the following manner: grade 2, .93; grade 5, .97; grade 9, .91; grade 12, .74.

An estimate of the internal consistency of the Test of Engagement Style was obtained for the present study by applying a coefficient-alpha formula (KR-20) to

the 30 item instrument. The resultant alpha was .73 for the 110 subject scores utilized in this study. Additional analysis of the Test of Engagement Style utilizing the Guttman Split-half method resulted in a correlation coefficient of .73 for the same 110 subject scores. Additional analysis (with the Spearman-Brown formula) resulted in a reliability coefficient of .74, indicating that the items included in the instrument measure with a moderately high degree of consistency. Statistical evidence indicates that the Test of Engagement Style is appropriate for this research sample.

Convergent Validity

Convergent validity estimates were not available from the McKinney studies. Estimates of convergent validity for the present study were obtained by correlating each of the variables in this study with one another. As shown in Table 1, Reading, Math Concepts, Math Computations, Math Applications, and Language sub-tests of the Stanford Achievement Test are highly correlated. This suggests that scores in these sub-tests have moderate to high predictability for each other. The low and negative correlations between IQ and degree of hearing loss, IQ and age of the subject and IQ with onset of hearing loss indicate there is no utility for predicting these variables on the basis of intelligence quotients. Age,

degree of hearing loss and onset of hearing loss also shared low correlations with each other and all variables in the study. The Test of Engagement Style scores share low positive and negative correlations with all variables. This indicates very little convergent validity.

Analysis of Variance

One-way analysis of variance techniques were utilized to detect differences between males and females on each independent measure in the study. The results of this analysis indicate that there are no significant differences between males and females on all measures (See Table 2).

Analysis of the data on Math Concepts for males and females indicate that males scored higher than females on Math Concepts sub-test of the Stanford Achievement Test (Table 3). However, this difference failed to achieve an acceptable significance level.

Table 2. Summary table for the analysis of variance between male and female deaf adolescents on ten measurement variables.

Source	Males		Females		F	p
	\bar{X}	SD	\bar{X}	SD		
Reading*	33.4	14.6	34.0	14.2	.042	NS
Math Conc*	39.9	18.4	33.6	13.7	4.01	NS
Math Comp*	55.8	25.6	51.9	18.9	.78	NS
Math Appl*	26.1	19.1	27.5	14.9	.18	NS
Language*	32.6	14.4	35.1	12.5	.96	NS
IQ	95.4	13.4	96.3	11.1	.14	NS
dB (Hearing loss)	95.9	12.1	94.9	12.9	.175	NS
Age (Years)	16.5	2.1	16.2	1.0	.305	NS
Onset (years)+	13.0	6.4	13.9	5.6	.56	NS
TES	7.8	3.8	8.6	4.3	.91	NS

*Number correct in percentages

+Average number of years subject has been deaf

Table 3. Summary table for the analysis of variance of Math Concepts mean scores between male and female deaf adolescents.

	df	SS	MS	F	p
Between Groups	1	.11	.11	4.006	N.S.
Within Groups	109	2.95	.03		
Total	110	3.07			

In a cross tabulation analysis of the Test of Engagement Style by sex, the percentages of males who scored as Active and Reactive, respectively were compared to the percentages of females who scored as Active and Reactive, respectively. Table 4 shows that percentages were almost identical for all dimensions. Three males and three females were not classifiable, leaving a total of 47 females and 53 males to be classified as Active or Reactive on the Test of Engagement Style. Subjects scoring in the range between 0 and 7 were classified as Reactive. Those subjects scoring within the range of 8 to 24 were classified as Active.

Table 4. Cross tabulation of Test of Engagement Style by sex.

		Female		Male		Total	
		N	%	N	%	N	%
Reactive	N	23		32		55	
	%		41.8		52.8		49.5
Active	N	24		26		50	
	%		48		52		45.0
Unclassified	N	3		3		6	
	%		50.0		50.0		55
Total	N	50		61		111	
	%		45.0		55.0		100.0

Five percent of the 111 subjects were not included in the tabulation, possibly due to the scores falling between 7 and 8 on the Test of Engagement Style. Further examination of the tabulation showed that among females, 45% scored as Reactive and 48% scored as Active with 6% (3 subjects) not included. Among males 52% scored as Reactive and 43% scored as Active with 5% (3 subjects not included).

Another look at Table 4 indicates that among Reactive subjects, 42% (23 subjects) were female and 53% (32 subjects) were male. Among Active subjects, 48% (24 subjects) were female and 52% (26 subjects) were male; apparently indicating that males and females are similar on this dimension; almost as many males as females are classifiable as Reactive on the Test of Engagement Style and as many males as females scored as Active on the same test. In other words, there is an apparent 50-50 split between males and females in both dimensions (Active vs. Reactive) of the Test of Engagement Style.

Hypothesis Testing

Each of the stated hypothesis was subjected to analysis of variance techniques utilizing identical procedures. The results of these analyses are presented separately for each hypothesis.

H_{01} : There will be no significant difference in mean scores on the Test of Engagement Style between males and females in this study.

As previously shown in Table 2, males obtained a mean score of 7.8 and females obtained a mean score of 8.6 on the Test of Engagement Style. Analysis of variance, as shown in Table 5 indicates that there was no significant difference between males and females in mean scores on the Test of Engagement Style.

Table 5. Summary table for the analysis of variance of mean Test of Engagement Style scores between male and female deaf adolescents.

Source	df	SS	MS	F	p
Between Groups	1	14.98	14.9	.912	NS
Within Groups	105	1723.23	16.41		
Total	106	1738.21			

Because the analysis of variance of Test of Engagement Style scores between males and females showed no significant difference in mean scores, the hypothesis of no significant difference in mean scores on the Test of Engagement Style between males and females in this study was retained.

Scores of males and females were combined for the remainder of hypothesis testing. Since six scores were not included in this study due to difficulty of classification in either dimension of the Test of Engagement Style, 105 subjects were included in the hypothesis testing; 55 subjects of both sexes were classified as Reactive and 50 were classified as Active.

H_{O_2} : There will be no significant mean score difference in the Reading subtest of the Stanford Achievement Test between Active and Reactive subjects as measured by the Test of Engagement Style.

As shown in Table 6, the analysis of variance between Active and Reactive groups showed that there was a significant difference between these two groups in their mean scores on the Reading subtest on the Stanford Achievement Test. Students classified as Active achieved significantly higher reading scores ($\bar{X}=38.2\%$) than the Reactive subjects ($X=29.99\%$ $F(1,109)=9.003$, $p<.003$). The hypothesis that there will be no significant difference in mean scores between the two groups in Reading was rejected. The mean scores of both groups for all hypotheses are summarized in Table 14, page 61.

Table 6. Summary table for the analysis of variance of the Reading subtest mean scores between Active and Reactive groups.

Source	df	SS	MS	F	p
Between groups	1	.175	.1756	9.003	.003
Within groups	103	2.003	.019		
Total	104	2.178			

H_{03} : There will be no significant mean score difference in the Math Concepts subtest of the Stanford Achievement Test between Active and Reactive subjects as measured by the Test of Engagement Style.

As shown in Table 7, there was no significant difference in mean scores on Math Concept subtests between Active and Reactive subjects. As shown in

Table 14, the mean scores of 40.3 for Active subjects and 34.9 for Reactive subjects was not significantly different through analysis of variance procedures [F(1,104)=2.67;p=n.s.]. Therefore, the hypothesis that there will be no significant mean score difference in the Math Concept subtest of the Stanford Achievement Test between Active and Reactive subjects was retained.

Table 7. Summary table for the analysis of variance of Math Concepts subtest mean scores between Active and Reactive groups.

Source	df	SS	MS	F	p
Between groups	1	.075	.075	2.67	NS
Within groups	103	2.883	.028		
Total	104	2.958			

H_{04} : There will be no significant mean score difference in the Math Computation subtest of the Stanford Achievement Test between Active and Reactive subjects as measured by the Test of Engagement Style.

Inter-group comparisons resulted in a significant mean score difference between Active and Reactive subjects on the Math Computation subtest. Results from analysis of variance between the two groups are presented in Table 8. As Table 14 shows, the mean scores of 48.0 for Reactive subjects and 60.1 for Active subjects were statistically significant beyond the .95 level of confidence. The

hypothesis of no difference in mean scores on Math Computation between Active and Reactive subjects was rejected since there was a significant difference at the acceptable level.

Table 8. Summary table of the analysis of variance of the Math Computation subtest mean scores between Active and Reactive groups.

Source	df	SS	MS	F	p
Between groups	1	.326	.326	5.361	.013
Within groups	103	5.285	.0513		
Total	1-4	5.611			

H_{05} : There will be no significant mean score difference in the Math Application subtest of the Stanford Achievement Test between Active and Reactive subjects as measured by the Test of Engagement Style.

The Active group scored significantly higher ($\bar{X}=31.7$) than the Reactive group ($\bar{X}=23.3$) on Math Applications. The analysis of variance results for this analysis are presented in Table 9. The hypothesis that there will be no significant difference in mean scores between Active and Reactive subjects on the Math Applications subtest was rejected at the .01 level of significance.

Table 9. Summary table for the analysis of variance of the Math Application subtest mean scores between Active and Reactive groups.

Source	df	SS	MS	F	p
Between groups	1	.182	.182	6.19	.015
Within groups	103	3.028	.029		
Total	104	3.210			

H_{06} : There will be no significant mean score difference in the Language subtest of the Stanford Achievement Test between Active and Reactive subjects as measured by the Test of Engagement Style.

Analysis of inter-group comparisons between Active and Reactive subjects on the Language subtest yielded a higher mean score for the Active group ($\bar{X} = 37.3$), when compared to the Reactive subjects ($\bar{X} = 30.4$) and analysis of variance revealed that the difference was statistically significant (Table 10). The hypothesis that no difference in mean scores on the Language subtest would be observed was rejected.

Table 10. Summary table for the analysis of variance of the Language subtest mean scores between Active and Reactive groups.

Source	df	SS	MS	F	p
Between groups	1	.123	.123	6.76	.011
Within groups	103	1.868	.018		
Total	104	1.991			

H_{07} : There will be no significant difference in hearing loss (measured in decibels) between Active and Reactive subjects as measured by the Test of Engagement Style.

As shown in Table 11, Active and Reactive subjects displayed no significant difference in hearing loss as measured in audiometry decibels. Table 14, page 61, shows that the mean decibel hearing loss between Active and Reactive subjects was nearly identical (\bar{X} Active = 94.6; \bar{X} Reactive = 95.7).

The hypothesis for no significant difference in hearing loss between Active and Reactive subjects was retained.

Table 11. Summary table of the analysis of variance for mean decibels of hearing loss between Active and Reactive groups.

Source	df	SS	MS	F	p
Between groups	1	35.57	35.57	.229	NS
Within groups	103	25998.62	155.33		
Total	104	16034.19			

H_{08} : There will be no significant difference in mean duration of hearing loss (onset) between Active and Reactive subjects as measured by the Test of Engagement Style.

Duration of hearing loss was calculated in number of years and months from the time the subject became deaf (onset) to the time of the subject's present age. Table 14, page 61, illustrates the mean duration of hearing loss for Active and Reactive subjects. The difference in mean duration between these two groups was not significant, as illustrated in Table 12.

Table 12. Summary table for the analysis of variance of the duration of hearing loss since onset between Active and Reactive groups.

Source	df	SS	MS	F	p
Between groups	1	28.443	28.443	.744	NS
Within groups	103	3940.233	38.25		
Total	104	3968.687			

Since the analysis shows that mean duration of hearing loss between Active and Reactive subjects was not significant, the hypothesis of no difference in duration (onset) of hearing loss between Active and Reactive subjects was retained.

H_{09} : There will be no significant difference in mean IQ scores between Active and Reactive subjects as measured by the Test of Engagement Style.

Inter-group comparisons for IQ differences between Active and Reactive subjects resulted in significant differences between the two groups (Table 13). Both groups scored within the average range of IQ scores as measured by the Wechsler scales; Active subjects obtained a mean IQ of 99.4 on the Performance Scales of the WAIS and the WISC-R and Reactive subjects obtained a mean IQ of 92.2 on the same scales (Table 14). Analysis of variance between

the two groups illustrated that there was a significant difference in IQ scores between Active and Reactive subjects. Therefore, the hypothesis for no significant mean IQ differences between Active and Reactive groups was rejected.

Table 13. Summary table for the analysis of variance for mean IQ scores between Active and Reactive groups.

Source	df	SS	MS	F	p
Between groups	1	1359.086	1359.086	9.61	.003
Within groups	103	14564.247	141.40		
Total	104	15923.333			

Summary of Results

The summary table of group comparisons (Table 14) presents the means and standard deviations for all nine dependent variables for both the Active and Reactive groups.

Table 14. Summary of comparisons of mean scores and analysis of variance for the Test of Engagement Style and eight variables between Active and Reactive groups.

	Test of Engagement Style					
	Reactive		Active		F	p
	\bar{X}	SD	\bar{X}	SD		
Reading	29.9	14.4	38.2	14.3	9.03	.003
Math Con	34.9	17.9	40.3	15.2	2.67	NS
Math Comp	48.0	25.0	60.1	19.5	6.36	.013
Math App	23.3	16.8	31.7	17.5	6.19	.015
Language	30.4	14.8	37.3	11.9	6.76	.011
dB	95.7	11.4	94.6	13.5	.229	NS
Onset	13.7	5.8	12.7	6.6	.774	NS
IQ	92.2	11.6	99.4	12.2	9.61	.003

As indicated by Table 14, five of the nine comparisons indicated significant mean differences between groups. There were significant difference in mean scores computed in percentages for Reading, Math Computations, Math Applications, and Language subtests of the Stanford Achievement Test between Active and Reactive subjects. There was no significant mean score difference in Math Concepts between Active and Reactive subjects. Hearing loss, as measured in decibels, showed no significant effect on Test of Engagement Style scores, since Active and Reactive subjects displayed nearly identical degrees of hearing loss. Table 14 also illustrates that there is no

significant difference in number of years Active and Reactive subjects had been deaf (onset of hearing loss). Comparison of mean Test of Engagement style scores between males and females resulted in no significant differences as well.

CHAPTER 4

GENERAL SUMMARY

A review of the literature demonstrated that the Test of Engagement Style was used with numerous populations (i.e., elementary and secondary school students and college students). The effectiveness of the TES as a locus of control construct predictor had been demonstrated by McKinney (1981) for normal hearing populations. However, a computer search revealed no studies utilizing the TES with deaf adolescents.

Hence, the present research was focused on the effectiveness of the TES in predicting achievement scores of deaf adolescents.

Description of the Study

The purpose of the study was to examine the scores of deaf adolescents on a locus of control construct, namely the Test of Engagement Style, to see whether these scores were useful in finding a relationship with performance on standardized achievement tests. The variables of IQ, onset of hearing loss, degree of hearing loss, and sex were also explored.

One hundred eleven subjects participated in this study. The subjects were 50 female and 61 male deaf adolescents attending the Arizona School for the Deaf and Blind in Tucson. Their ages ranged from 12 through 19, with a mean age of 16 for both males and females.

The entire school population of deaf students ranging in age from 12 through 20 which met the IQ criterion was administered the Test of Engagement Style. No treatment procedures occurred. A search of records produced recent data on the eight measures subjected to examination in this study: the five subtests of the Stanford Achievement Test, degree of hearing loss, onset of deafness, and IQ. Complete data were available for 111 of the 130 subjects tested.

The treatment of the data focused on one-way analysis of variance between Active and Reactive subjects on all measures adopted for the study. Reliability studies were conducted on the items of the Test of Engagement Style.

Only one examiner administered the Test of Engagement Style and this must be considered as a limitation in that there could be a possibility of examiner bias.

Generalizability of the findings is limited to the population from which this sample was drawn and to the

institution in which the subjects were found. Also, the potential for randomization on nine measure variables were limited for such a small number of subjects.

Ethnic and cultural differences (Native Americans and Mexican Nationals were involved in the study) could have been a confounding factor in the results, thus producing statistical conclusions unique to this institutional setting.

Results

Significant differences in mean scores between Active and Reactive groups were observed on five of the nine null-hypotheses: Reading, Math Computation, Math Application, Language, and IQ. Therefore, these null-hypotheses were rejected. The remaining null-hypotheses (Math Concepts, degree of hearing loss, onset of deafness, and sex) were retained.

Conclusions

From the analysis of the study data, the following conclusions were developed:

1. Male and female deaf adolescents did not differ significantly on scores of the Test of Engagement Style. This indicates that the Test of Engagement Style does not discriminate against either sex for this study.

2. Males and females did not differ significantly in mean percentage scores on subtests of the Stanford Achievement Test selected for this study. This finding indicates that combining male and female scores would not have a confounding effect.

3. Males and females did not differ significantly in onset of hearing loss, degree of hearing loss and IQ scores. It would appear from this finding and the two earlier results discussed above that reliability and validity for the Test of Engagement Style holds true for both males and females in this study. The following conclusions, in this study, assumed the stance that it was valid to make inferences from the data regardless of the number of males or females in a given group. That is, an all-male Active group score could be said to be the score of an all-female Active group on all given measure variables except sex, of course.

4. Subjects whose scores were in the Active dimension of the Test of Engagement Style produced consistently higher mean scores on all Stanford Achievement subtests except Math Concepts. There was no significant differences in mean scores between Active and Reactive subjects on the Math Concepts subtest.

5. Onset of hearing loss and degree of hearing loss do not appear to contribute to a difference in TES

mean scores. Active subjects had about as much hearing loss, as measured in decibels, as Reactive subjects. Duration of hearing loss was nearly identical for subjects in both dimensions of the TES. This indicates that neither degree of hearing loss nor onset of hearing loss indicates correlation with a TES score.

6. Active subjects demonstrated higher IQ scores than Reactive subjects. The implication is that IQ does have some bearing on the score a subject will achieve on the Test of Engagement Style.

7. The benefits of using the Test of Engagement Style for predicting achievement scores are two-fold. One, it is not time-consuming and is non-threatening. Two, it will indicate which clients will need counseling to assist them in acquiring an Active viewpoint, or at least a move toward Communion. The obvious corollary here is that perceived locus of control does have some effect on performance on achievement test scores.

8. The findings do not suggest that degree of hearing loss and onset of hearing loss have any effect on a subject's performance on the Test of Engagement Style. This seems to suggest that deafness has no bearing on deaf persons' perception of locus of control.

9. The Test of Engagement Style should not be viewed as the only instrument utilizing the locus of control construct for valid and effective correlation with academic achievement of deaf subjects. There are other instruments which have not been extensively researched with deaf populations.

10. Based on Hypotheses 3, 4 and 5, it appears certain that in an educational setting for deaf subjects, there will be a large number of deaf individuals who will score as Reactive on the Test of Engagement Style, thus becoming significantly low-achieving on the Stanford Achievement Test. This number of low-achievers would be about half of the population tested. TES does have potential as a brief, non-threatening instrument for early intervention in achievement problems.

Recommendation for Future Research

Future research should include large numbers of subjects from more different geographical areas. The age level should be lowered to include subjects in elementary school programs. This type of research should also be

utilized with deaf subjects in mainstreamed programs or day classes. Also, deaf subjects in non-Total Communication settings should be researched with this instrument. It would be interesting to see how deaf subjects in oral programs and non-residential settings compare to residential Total Communication subjects.

More than one administrator of the Test of Engagement Style should be employed to provide inter-observer reliability. Additionally, test-retest reliability procedures should be utilized along with instrument validity studies. One such method would be comparing a modified Rotter Scale with the Test of Engagement Style.

The Test of Engagement Style should be utilized to study deaf adolescents in the following areas:

1. Self-concept;
2. Perceived level of communication in the home;
3. Perception of how the hearing would view them;
4. Feelings of powerlessness or helplessness;
5. Assertiveness training;
6. Neurotic or psychotic behaviors;
7. Sex and sexuality;

It is further suggested that the Test of Engagement Style be utilized in studying professionals who work with deaf adolescents to ascertain whether or not the locus of control perceptions of adults have any effect on the performance of deaf adolescents on various tasks or tests.

Lastly, it is suggested that the instrument be incorporated in single subject research designs to provide for more detailed and accurate measurements of perceived engagement or locus of control dimensions.

APPENDIX A
PARENT CONSENT FORM

Parent Consent Form

Research Description

Some research will be done by Howard Busby as part of his work toward a doctorate at The University of Arizona.

One part of the research will have Mr. Busby give a special test called the Test of Engagement Style to a group of students. This test has no right or wrong answers and is used to find out whether a person feels he or she is in control of the environment or whether the environment is in control.

These students' scores will be compared to their scores on the Stanford Achievement Test.

The purpose of this research is to see if students who feel that the environment has control over them will have low scores on an achievement test such as the Stanford Achievement Test.

The research might help with finding students who will need extra help and counseling in dealing with their view of the environment.

Mr. Busby has been at ASDB for seven years as Principal and Counselor. He is currently Head Counselor in the Department of the Deaf.

PERMISSION FOR RESEARCH

I hereby grant permission for my child _____ to participate in a research project conducted by Howard R. Busby during the 1982-83 school year.

I understand that all professional codes of research and confidentiality will be followed by the researcher and my child's name will not be made public in any way whatsoever. I have read a description of the research.

Signed: _____
Parent or Guardian

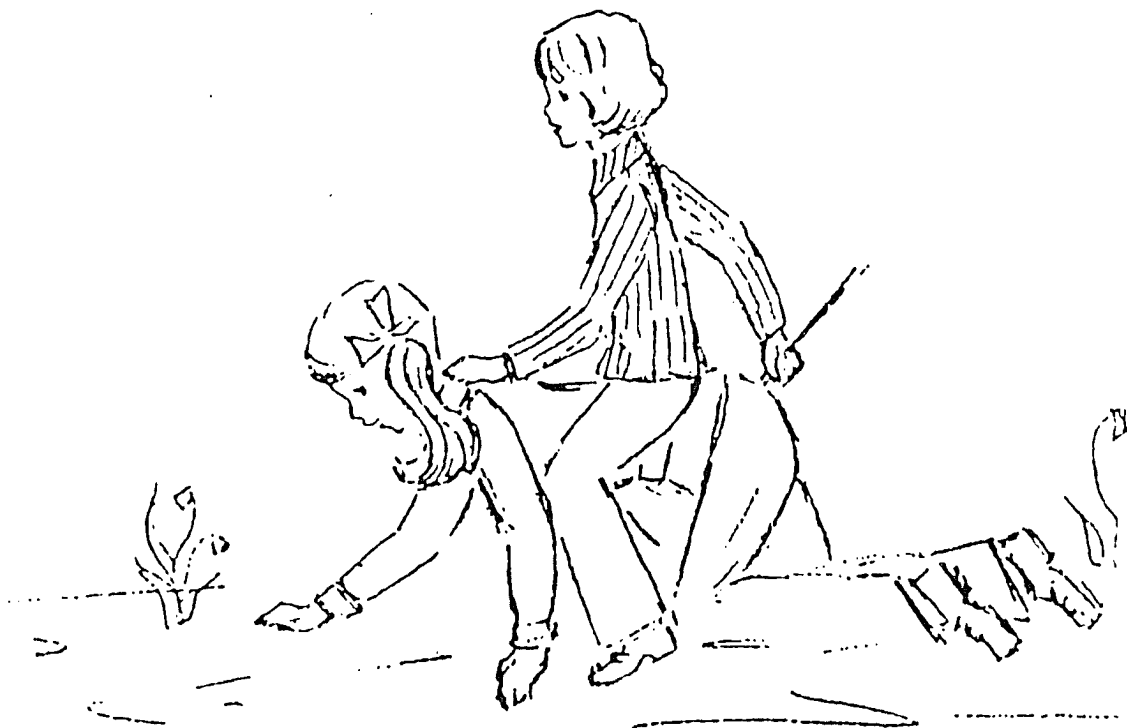
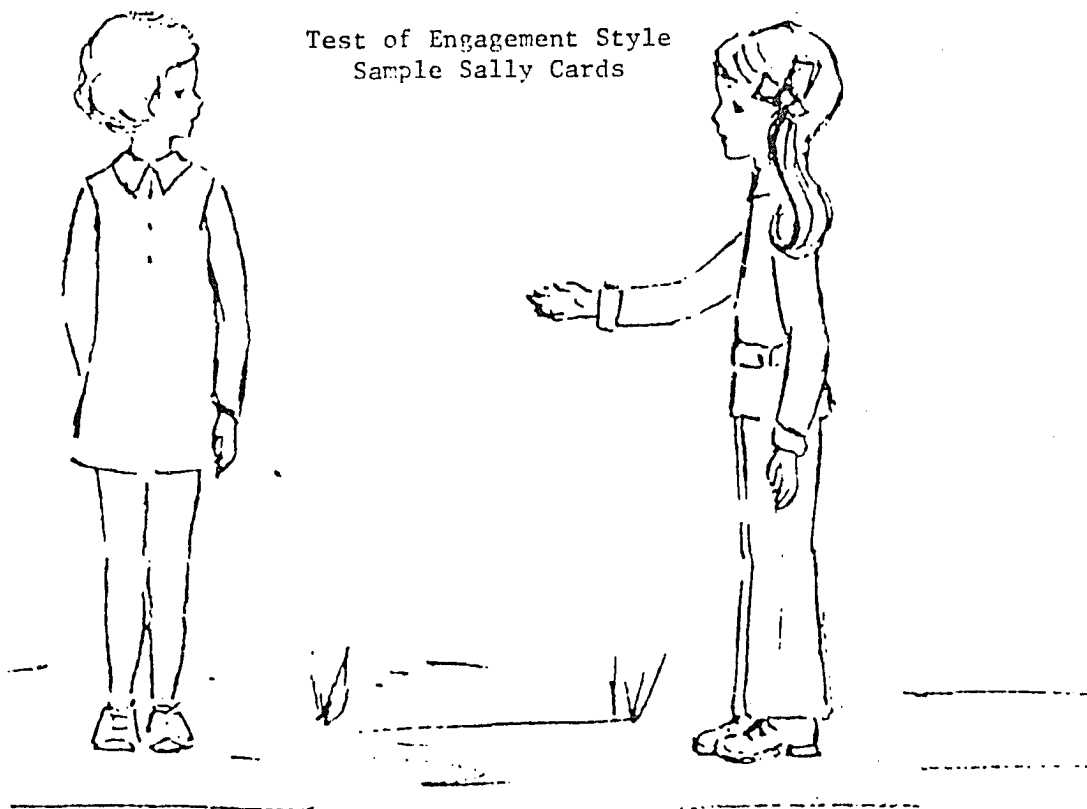
Date: _____

APPENDIX B

TEST OF ENGAGEMENT STYLE SAMPLE

SALLY CARDS

Test of Engagement Style
Sample Sally Cards

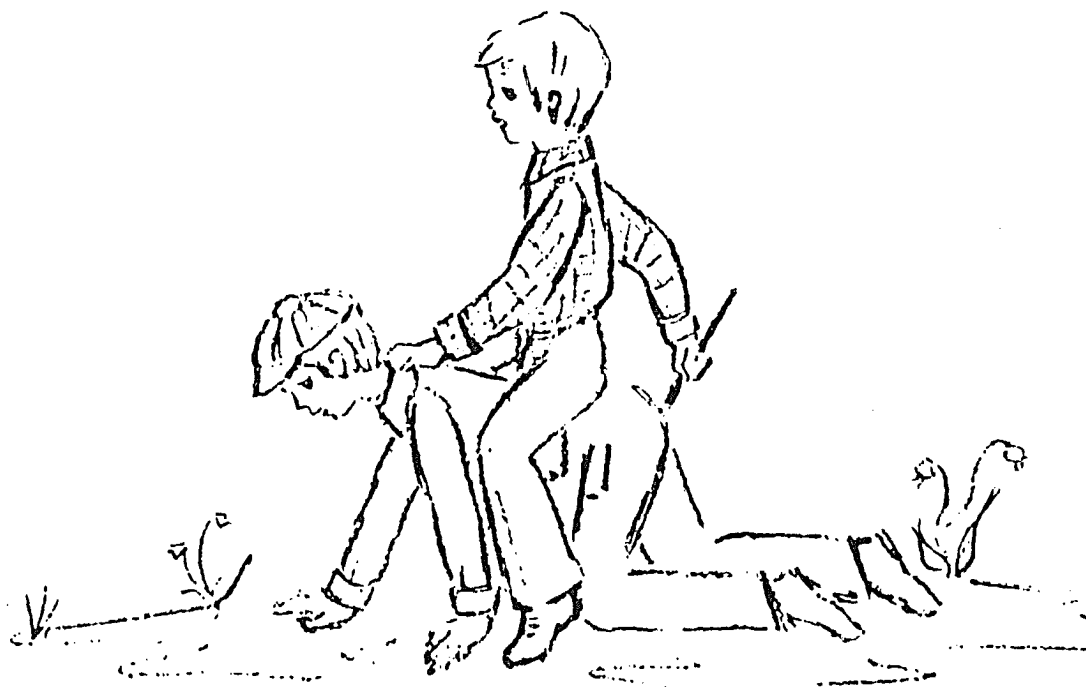
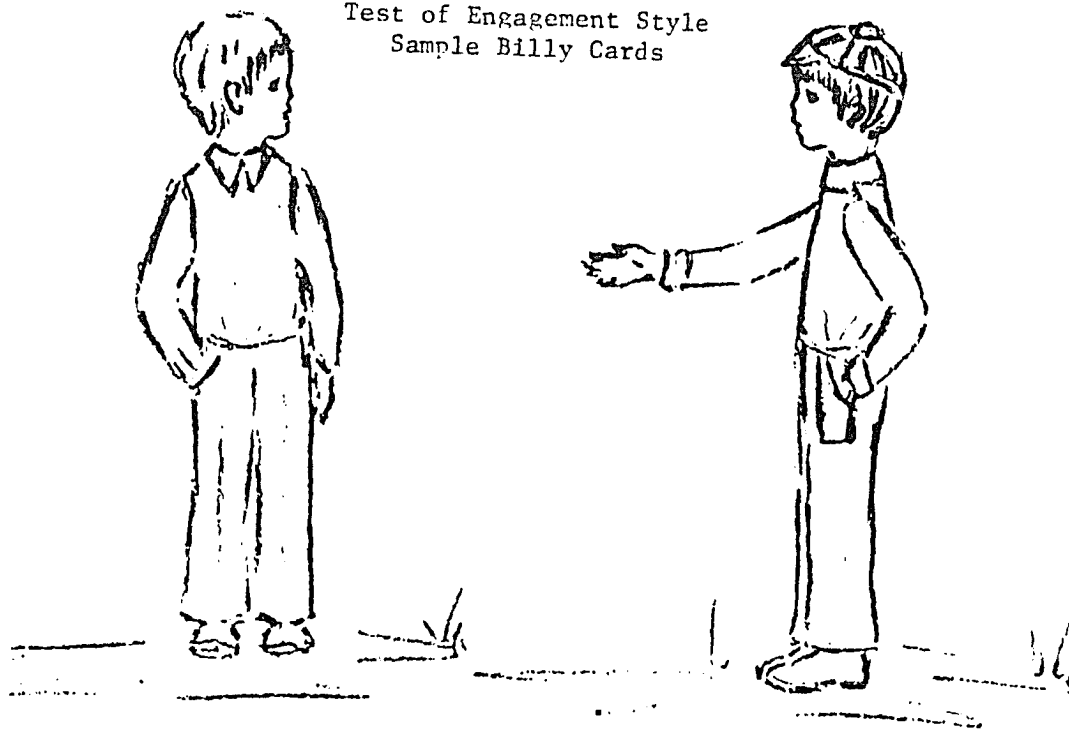


APPENDIX C

TEST OF ENGAGEMENT STYLE SAMPLE

BILLY CARDS

Test of Engagement Style
Sample Billy Cards



APPENDIX D

TEST OF ENGAGEMENT STYLE SCORING SHEET

Test of Engagement Style*
Scoring Sheet for Deaf Adolescents

by
Howard R. Busby

PACKET

	A	B	
A.	1. _____	_____	
	2. _____	_____	
	3. <u>FILLER</u>	_____	
	4. _____	_____	
	5. _____	_____	
B.	1. <u>FILLER</u>	_____	
	2. _____	_____	
	3. _____	_____	
	4. _____	_____	
	5. _____	_____	
C.	1. <u>FILLER</u>	_____	
	2. _____	_____	
	3. _____	_____	
	4. _____	_____	
	5. _____	_____	
D.	1. <u>FILLER</u>	_____	
	2. _____	_____	
	3. _____	_____	
	4. _____	_____	
	5. _____	_____	
E.	1. <u>FILLER</u>	_____	
	2. _____	_____	
	3. _____	_____	
	4. _____	_____	
	5. _____	_____	
F.	1. <u>FILLER</u>	_____	
	2. _____	_____	
	3. _____	_____	
	4. _____	_____	
	5. _____	_____	

A = Active

B = Reactive

A score: _____

B score: _____

$\frac{1}{2}$ score: _____

Total Active score: _____

*McKinney, J. P. Test of Engagement Style: A Measure of Agency - Patience. A manual purchased from the author. Copyright 1978. Permission granted by author to modify and reproduce.

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