

**Modeling the Career Maturity of Hearing and Hearing-Impaired
Adolescents**

by

Suzanne King

Dissertation submitted to the Faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

Educational Research and Evaluation

APPROVED:

James C. Impara, Chairman

Lily P. Bess

Harriett Cobb

Lawrence H. Cross

Thomas H. Hohenshil

Lee M. Wolfle

December, 1987

Blacksburg, Virginia

Modeling the Career Maturity of Hearing and Hearing-Impaired

Adolescents

by

Suzanne King

James C. Impara, Chairman

Educational Research and Evaluation

(ABSTRACT)

The purpose of this study was to determine whether the career development process was the same for hearing-impaired and normally-hearing adolescents. Subjects included 71 deaf and 318 nonhandicapped adolescents and their parents. A literature-based causal model of career maturity (Model 1) was developed that was designed to explain career maturity in terms of background variables, family characteristics, and individual characteristics. The inclusion of these variables was based on family systems theory, social learning theory, and the empirical literature on the career maturity of nonhandicapped adolescents.

The regression of career maturity on the eight predictor variables in Model 1 explained about 20% of the variance in career maturity for the hearing group, and 28% for the deaf. Family cohesion was the strongest predictor of career maturity for both groups.

Despite several similar patterns of influence among the variables, a number of relationships among the variables differed for the two groups. Furthermore, differences were noted between the groups in terms of the

total effects for some of the eight predictor variables such as age and achievement.

A second model was developed to describe the career development of the deaf. Model 2 included all of the variables in Model 1 as well as five additional variables specific to the experiences of the deaf. Model 2 explained 31% of the variance in the career maturity of the deaf subjects. The increase in variance explained was not great enough to be considered significant. The degree of the subject's hearing loss and the degree of mother-child communication were influential in describing the career development process for the deaf in Model 2.

The results suggest that there are similarities and differences in the development of career maturity for deaf and hearing adolescents. The process is more reliant upon background characteristics, such as age, for the hearing. For the deaf, family variables intervene to influence career maturity to a greater extent than for the hearing. For both groups, higher family cohesion scores were associated with greater career maturity. The inclusion of deaf-specific variables contributed to the explanatory power of the basic model, although not to a significant degree.

TABLE OF CONTENTS

Chapter 1: Introduction	1
The Problem	3
The Purpose	4
Research Questions	6
Research Hypotheses	7
Limitations	8
Definitions of Terms	9
Chapter 2: Conceptual Framework	14
Introduction	14
Career Maturity	15
Overview and Definitions	15
Theories of Career Development/Maturity	17
Career Development Theories and the Handicapped	18
Frameworks for Research	20
Measurement of Career Maturity	21
Studies of Career Maturity with Deaf Populations	23
Persons with Hearing Impairments	24
Definitions and Characteristics	24
Language Competence and Cultural Participation	27
Family Dynamics	29
Structural Theory	29
Circumplex Model of Marital and Family Systems	33
Table of Contents	iv

The Family With A Deaf Child	36
Family Dynamics and Career Development	38
Locus of Control	39
Other Factors Related to Career Development	41
Background Variables	42
Family Environment Variables	44
Educational Environment	46
Development of the Models	46
Chapter 3: Methodology	54
Subjects	54
Instruments	64
Procedures	70
Data Analysis	78
Chapter 4: Results	88
Description of Sample	88
Hypothesis Testing	94
Hypothesis 1: Adequacy of Model 1	94
Hypothesis 2a: Individual paths differ in strength	95
Important Paths for the Hearing Group	98
Important Paths for the Deaf Group	101
Indirect Effects for the Hearing Group	104
Indirect Effects for the Deaf Group	106
Testing Hypothesis 2a	106
Hypothesis 2b: Total Effects on Career Maturity Differ	110

Testing Hypothesis 2b.	112
Hypothesis 3: Comparison of Models 1 and 2	114
Correlations with Deaf-Specific Variables	115
Important Paths in Model 2	118
Total and Indirect Effects in Model 2	122
Test of Hypothesis 3	122
Chapter 5: Summary, Conclusions, and Recommendations	127
Summary	127
Discussion	130
The Variables	130
Conclusions	145
Hypothesis 1: Relative Utility of Model 1	145
Hypothesis 2a: Relative Strengths of Paths in Model 1	146
Hypothesis 2b: Relative Magnitudes of Total Effects	147
Hypothesis 3: Model 2 versus Model 1	149
Implications for Practitioners	150
Recommendations for Further Research	152
Chapter Summary	155
Reference List	159
Appendix A. Instruments and Codebook	179
Appendix B. Pilot Study Documentation	200

Appendix C. Correspondence with Schools	205
Appendix D. Parent Permission and Follow-Up Letters	213
Appendix E. Instructions and Forms	223
Appendix F. Human Subjects Committee Forms	227
Appendix G. Standard Errors of Path Coefficients	231
Vita	234

LIST OF FIGURES

	Page
1. Circumplex Model: Sixteen Types of Systems.	35
2. Causal Model of Career Maturity Based on Literature for Nonhandicapped Adolescents.	49
3. Causal Model of Career Maturity Based on Literature for Deaf and Nonhandicapped Adolescents	52
4. Important Paths in Model 1 in Influencing Career Development Attitudes: Hearing Sample	102
5. Important Paths in Model 1 in Influencing Career Development Attitudes: Deaf Sample	105
6. Important Paths in Model 2 in Influencing Career Development Attitudes of Deaf Sample	119

LIST OF TABLES

Table	Page
1. Descriptive Statistics for Hearing, Hearing-Impaired, and Norm Groups.	55
2. Frequency of Responses for Descriptive Variables for Deaf and Hearing.	56
3. Frequency of Responses for Descriptive Family Variables for Deaf and Hearing	58
4. Frequencies for Variables Describing Deaf Sample.	61
5. Responses to Parent-Child Communication Items: Deaf Sample.	63
6. Summary of Parent and Subject Data Collection: Hearing	74
7. Summary of Parent and Subject Data Collection: Deaf Sample	75
8. Frequencies of Subjects With Test Data and Data From Parent Questionnaire.	79
9. Definitions of Variables Used to Build the Models	82
10. Correlations, Means, and Standard Deviations Among Variables in Model 1: Deaf Sample (n=71)	89
11. Correlations, Means, and Standard Deviations Among Variables in Model 1: Hearing Sample (n=318).	90

	Page
12. Percentage of Families in Circumplex Model Categories Based on FACES III Scores: Hearing, Deaf, and Norms.	93
13. Structural Coefficients in Metric Form for Model of Career Maturity: Model 1.	96
14. Structural Coefficients in Standardized Form for Model of Career Maturity: Model 1.	97
15. Total, Direct and Indirect Effects (Metric) for Model 1: Hearing Sample (n=307)	99
16. Total, Direct and Indirect Effects (Metric) for Model 1: Deaf Sample (n=69)	107
17. Tests of Group Differences in Magnitudes of Individual Paths	108
18. Rank Ordering of Total Effects on CDA	111
19. Tests of Group Differences in Total Effects of Variables on Career Maturity.	113
20. Correlations, Means, and Standard Deviations Among Variables in Model 2 Predicting Career Maturity: Deaf Sample	116
21. Structural Coefficients in Standardized Form for Model of Career Maturity: Model 2.	117
22. Total, Direct and Indirect Effects (Standardized) for Model 2 Predicting Career Maturity: Deaf Sample (n=67).	123
23. Rank Ordering of Total Effects on	

CDA for Deaf Sample: Model 1 and 2	124
24. Testing Difference in Variance	
Explained for Deaf Groups: Model 1	
Versus Model 2	125

CHAPTER 1: INTRODUCTION

It is work that binds a person to reality, according to Freudian philosophy. Super (1957) has postulated that the choice of a career is an expression of self. And yet, with all of the self-actualizing potential associated with work, an undemanding job for which one is overtrained, overqualified, and underpaid can be a monumental source of dissatisfaction with life in general (Warr and Wall, 1975). The ability to make satisfying career decisions, termed "career maturity", can, therefore, have major implications for general psychological well-being. Because adolescence is the period when most individuals are learning to plan for their entry into the world of work, career immature adolescents are at high risk for underemployment and life dissatisfaction as adults. Still, it is unknown precisely how the environment and individual potential interact to stimulate the development of career maturity. A hearing impairment, with its associated communication deficiency and isolation from the world of work, is the kind of condition that can stifle a child's growth towards career maturity.

A study of the career maturity of deaf adolescents (Lerman and Guilfoyle, 1970) revealed that, on average, these youngsters were inferior to their hearing siblings on a variety of career-related variables including parental socioeconomic status, level of vocational preference, commitment to preference, reality of preference, knowledge of general occupational information, and awareness of the social aspects of work.

Lower career maturity during adolescence can have profound, long-range implications. As adults, deaf workers tend to take jobs that are mostly in unskilled and semi-skilled occupations that offer little potential for upward mobility (Lacey, 1975; Lerman, 1976). Deaf workers are underrepresented in clerical, service, and professional occupational clusters, resulting in lower incomes for the deaf (Lacey, 1975). The underemployment of the deaf is seen as a "major occupational problem" by Lacey (1975, p. 305). The state of the art in career development theory building and research offers little to help the counselor guide deaf clients towards more successful, fulfilling career goals.

To date, little empirical research has been conducted on the career maturity of the hearing-impaired that goes beyond comparisons of mean differences in career maturity scores between deaf and hearing samples. There is still little empirical evidence to help determine which of the factors hypothesized by Super and others to influence career maturity actually have a significant impact on the career maturity of the hearing-impaired; it is unknown whether the factors that influence career maturity in hearing adolescents function in the same ways to influence the career maturity of the hearing-impaired. No empirical studies have been found that shed light on the manner in which these variables influence career development, either directly or indirectly, for either group.

THE PROBLEM

Hearing-impaired adults are, as a group, not living up to their occupational potential but instead tend to be underemployed or in dead-end jobs. It is during the formative years and adolescence that career attitudes develop and career planning and exploration begin (Super & Overstreet, 1960). Deaf adolescents tend to do less planning and exploring than do their hearing peers. Career development theories aid career counselors in helping their clients plan for, explore, and navigate through the world of work. Counselors have difficulty helping their hearing-impaired clients because the career development theories and research, on which counselors base their practice, do not necessarily relate to the circumstances of "special" groups such as women, blacks, or the deaf (Navin & Myers, 1983; Phillippe & Auvenshine, 1985; Phillips, Strohmer, Berthaume & O'Leary, 1983).

To date, there has been sufficient research to establish the fact that the hearing-impaired are inferior to their hearing peers in terms of career maturity. No empirical work has been done, however, to determine whether the process of becoming career mature differs for hearing-impaired and normally-hearing adolescents; that is, whether the pattern of influence among the antecedent factors that affect career maturity is the same for both groups.

Career immature adolescents are likely to become underemployed adults. It has already been shown that the deaf are at high risk for eventual underemployment. Still, there is no clear picture in the empirical literature that illustrates which factors account for that high risk.

To design effective preventative programs, or to design remedial interventions, we must have a better understanding of the forces that influence career maturity. Furthermore, little is known about between-group differences in the effects of these factors. This is the problem to which the current research was addressed.

THE PURPOSE

The purpose of this study was to determine whether a model of the development of career maturity, drawn from the literature associated with normal adolescents, describes the process of career maturity for hearing-impaired adolescents equally well. Several steps were taken to achieve this purpose. The first step was to conduct a comprehensive literature search for factors shown to influence the career development of nonhandicapped individuals and to develop a causal model (Model 1) that reflects the direct and indirect relationships among these variables. The second step involved testing this model to determine its ability to explain career maturity in nonhandicapped adolescents, and developing a hierarchy of these variables according to the relative magnitude of their total effects on career maturity. Next, LISREL (Joreskog & Sorbom, 1986) was used to determine whether Model 1 is equally useful for both hearing-impaired and nonhandicapped adolescents, and whether the patterns of influence, both direct and indirect, among the background, family, and personality variables are equivalent for the two groups.

Finally, a second model (Model 2) was developed. Model 2 includes all the variables in Model 1 plus variables that are specific to the

experience of hearing-impaired adolescents. This second model was tested using data from the hearing-impaired sample. The results from Model 2 were then compared to the results from Model 1 for the handicapped group.

RESEARCH QUESTIONS

The following questions were investigated by this research.

1. Will a causal model of career maturity, built to explain the development of career maturity for nonhandicapped adolescents, fit the data from a nonhandicapped sample?
2. Will the aforementioned model fit the data from a sample of hearing-impaired adolescents equally well?
3. What are the relative magnitudes of influences from background, environmental and psychological variables on career maturity for each group?
 - When ranked according to magnitude of total effect, are the orderings of variables in the model for the nonhandicapped the same for both the hearing-impaired and nonhandicapped groups? For example, is the family a stronger agent of influence on career maturity for hearing-impaired youth than for their hearing counterparts?
 - In what ways, if any, do the patterns of influence differ for the two groups and how might these differences be explained?

4. Can a greater amount of the variation in the career maturity of hearing-impaired adolescents be explained by the addition to the model of factors unique to their experience?

RESEARCH HYPOTHESES

1. A model of career maturity, built from a consideration of the literature concerned with nonhandicapped adolescents, will not fit data from a hearing-impaired sample of adolescents as well as it fits data from a hearing sample.
2.
 - a. The strengths of the relationships among the variables in the first model will differ for hearing and hearing-impaired adolescents.
 - b. The total effects of each of the variables on career maturity will differ for the two groups. For example:
 - Family cohesion will have a greater total effect on the career maturity of the hearing-impaired than for the hearing sample.
 - Parental expectations will have a greater total effect on the career maturity for the hearing-impaired than for the hearing sample.
3. The second model will explain more of the variance in the career maturity of the hearing-impaired sample than will the first model.

LIMITATIONS

This study has limitations regarding the sample, the measurements, and the design. The sample selection process that was used resulted in the underrepresentation of nonwhites and inner city youth. Due to an emphasis on "time-on-task" in many school systems, there is little representation in the hearing sample of students who do not schedule study halls and students who enroll in vocational classes away from their home schools. The sample is composed solely of volunteers.

The hearing-impaired subjects were selected on the basis of their academic abilities such that their scores on the tests administered would reflect the constructs that the tests were designed to measure rather than serving as proxies for reading tests. The reading requirement eliminated at least 40% of otherwise eligible deaf adolescents. The stipulation of a minimum reading level aided the internal validity of the study; the sample of hearing-impaired subjects had achievement scores above the average for their norm group, as did the hearing sample, making the two groups more comparable than is typical in the population on an important factor. The reading level requirement limits the generalizability of results from the hearing-impaired to those who are relatively higher achievers.

There are limitations centering around the measurements used in the research. The Cultural Participation Scale (Super, 1967) was modified for use in the study but was not specifically validated in its revised form. The modifications were, however, minimal and severe validity problems were not expected. The four items used to estimate socioeconomic

status were not designed in a way that could produce as accurate a representation of a family's socioeconomic status as other sets of items might have provided.

Despite these limitations, this study yielded a number of substantively significant findings related to the modeling of career maturity for both the deaf and the nonhandicapped. Important strengths of the design of this study were the use of multiple sources of data, i. e. , child, parent and school, and the fact that parents themselves were asked to report their expectations for their children rather than using the speculations of the subjects as is frequently done (Hesser, 1981; Khan & Alvi, (1983). Furthermore, the broad theoretical framework on which this study this based, (including family systems theory and social learning theory), allows for a more wholistic perspective.

DEFINITIONS OF TERMS

The chapters that follow contain terms related to family systems theory, career development, causal modeling, hearing-impairment, and locus of control. This section is intended to serve as a convenient source of definitions for many of these technical terms:

Achievement: This composite variable was computed using growth scale scores for reading and math on the SRA or Stanford achievement test, whichever was available for each student. These scores were converted to z-scores using the norm group (nonhandicapped) mean and standard deviation, and then

standardized with a mean of 100 and s.d. of 15. The standardized scores for reading and math were then averaged for each subject.

Career Development: In this dissertation, refers to the process of becoming career mature. Note: In the literature, the term is used to describe a variety of different processes and activities.

Career Maturity: The ability to meet the age-appropriate tasks in life that deal with vocational matters. Operationally defined as the subject's score on the Attitude scale of the Career Development Inventory.

Causal model: A model reflecting the hypothesized causal sequence among several variables based upon theory or logical inference.

Coalition: An overly intense bonding and loyalty between two family members often to the exclusion of others.

Deaf: In this document, refers to individuals with hearing losses pronounced enough to have resulted in special educational identification by the schools.

Disengaged: Describes a family at the low end of the cohesion scale: family members have little to do with each other; outside

interests and people are more important than family members; considered dysfunctional. Indicated by a score between 10 and 31 on the Cohesion scale of the FACES III. (See Table 12 for other FACES III score ranges.)

Endogenous: A variable that has causes that are identified within the model, i.e. have arrows extending towards them from other variable(s) in the model.

Enmeshed: Describes an intensely cohesive family: there are likely to be rigid boundaries between the family and people outside of the family; coalitions between parent and child are likely; tends to inhibit the growth and individuation of family members; generally considered to be dysfunctional. Indicated by a score of between 44 and 50 on the Cohesion scale of the FACES III.

Exogenous: A variable that is caused by forces outside of the model, i.e., has no arrows extending towards it from variable(s) within the model.

Locus of control: The perceived primary cause of events that occur in one's life, whether within the self in the form of actions and beliefs (an internal locus of control), or in the social, spiritual and natural world outside of the self (external locus of control); the extent to which an individual believes he or

she can control the outcomes in his or her life as reflected in the subject's score on the Different Situations Inventory.

Fully Identified: Refers to a causal model for which there are just as many known sample estimates as there are estimated parameters in the model; has a single solution. Also referred to as 'just-identified' or 'exactly identified.'

Hearing-Impaired: (See "Deaf")

Mainstreaming: The extent to which a handicapped student is educated alongside nonhandicapped peers. In this study, a dichotomous variable indicating education in a residential or in a public school setting.

Path analysis: "A method for studying direct and indirect effects of variables hypothesized as causes of variables treated as effects" (Pedhazur, 1982, p. 580).

Planfulness: An orientation to the need to make educational and vocational choices. Operationally defined as the score on the Career Planning subscale of the Attitude scale of the Career Development Inventory.

Predetermined Variables: Variables within a causal model that are assumed to effect other variables in the model; could be either exogenous or endogenous.

Prelingually deafened: Onset of deafness before the development of language skills, i. e. before the age of 2 years.

Recursive: A model in which the causal flow is unidirectional, that is, when all of the paths point in a single direction, i. e., from left to right; no variable is at once a cause and an effect of any other variable.

Triangulation: A process whereby two family members, such as husband and wife, become overly focused on something or someone, resulting in the reduction of tension in the dyad.

Underemployment: Being employed in a position for which one is overqualified, that does not make use of skills and training already acquired or of potential.

CHAPTER 2: CONCEPTUAL FRAMEWORK

INTRODUCTION

Since World War II, much attention has been paid to developing and studying theories of career development. The literature is, however, overflowing with concepts and constructs which overlap grammatically, syntactically, semantically and in every other way. The terms 'career development,' 'vocational development,' 'career maturity,' 'vocational maturity,' and 'career behavior,' to name a few, seem to be used interchangeably. Any and all of these terms have been used in the context of both outcome and process variables. It appears as though the majority of theoretical and empirical work done so far in the field of career development has been in the explanation and prediction of occupational choice: an outcome variable.

As operationally defined by the use of Super's Career Development Inventory (Super, Thompson, Lindeman, Jordaan & Myers, 1981), the term career maturity encompasses attitudes towards career exploration and career planning, decision making, and knowledge about the world of work. The focus of this study is on those process factors that lead an adolescent, handicapped or not, to make rational, informed decisions about his or her career. In this research, the term 'career development' refers to the process of gaining 'career maturity' defined as the ability to meet the tasks in life that deal with vocational matters (Super, 1957).

The purpose of this chapter is to build the rationale for the causal models of career maturity that were tested. The underlying concepts stem from several sources: Super's studies of career development and his conceptualization of career maturity; an understanding of the different life experiences of the hearing-impaired; family systems theory and the construct of family cohesion; locus of control, an idea stemming from social learning theory; and from the empirical research related to background variables relating to career maturity.

CAREER MATURITY

Overview and Definitions

There has long been an interest in breaking the code that determines what a person will become when he or she grows up and how the decisions along the way are made. This is the essence of the career development research movement. Three aspects of career development have been addressed in the literature: occupational choice; the modeling of the construct of career maturity; and factors associated with the development of career maturity. Occupational choice, the first of these aspects, has been the subject of the career development theories of many notable writers in the field such as Ginzberg, Ginsberg, Axelrad, and Herma (1951); Roe (1957); Super (1953, 1963); and Holland (1959, 1966, 1973).

Originally called 'vocational maturity' by Super, career maturity is defined by most investigators as the ability of an individual to make sound career decisions. A second focus of career development research

has been the modeling of the concept of career maturity. This branch of inquiry is primarily concerned with defining the construct of career maturity by describing the various components of career maturity. The conclusions from research in this area have been operationalized in instruments designed to measure career maturity. Super and his colleagues, and Crites are the principal contributors in this area. The Career Development Inventory (CDI) (Super, et al., 1981) was developed after several years of empirical research, most notably the Career Pattern Studies (1957, 1960). The CDI subscales measure those components Super concluded to be the essence of career maturity: career planning, career exploration, decision making, and world of work information. These four components are grouped under the more general headings of career attitudes and career knowledge.

Crites, in his Career Maturity Inventory, emphasizes different components of the construct although he also has two major categories: attitudes and competence. The Attitude scale is comprised of items designed to measure decisiveness, involvement, independence, orientation, and compromise. The Competence scale is subdivided into scales measuring self-appraisal, occupational information, goal selection, planning, and problem solving.

A third focus of career research is concerned with the process factors that encourage the development of career maturity. This is based, of course, on the assumption that it is known what career maturity is and how it can be measured. The principal methodology in this area has been empirical, examining those background, educational, and personality variables that influence the development of career maturity. This is the

aspect of career development with which this study is concerned. As summarized by McHugh (1975), Super suggests that the career pattern of an individual is influenced by his parents' socioeconomic level, his own mental ability and personality characteristics, and by the opportunities to which he is exposed. The research to date has not been organized to form a model of how the variables that have been shown to help explain the development of career maturity interact.

Theories of Career Development/Maturity

Career development theories have been developed that emphasize a variety of personal and environmental characteristics. Ginzberg et al. (1951) postulated that career development occurs most intensively during adolescence and that this development progresses through a series of predictable stages. The process of career development, in this theory, is a function of an individual's efforts to collect data about himself and the world of work and then, using that information, make decisions about his or her personal niche in that world. Roe (1957) emphasized the importance of early childhood experiences, particularly parent-child interactions, in determining the type of work towards which a person would ultimately gravitate. Super (1953, 1963) broadened the concept of career development to include the entire life span. He postulated that people are most satisfied in occupations that help them 'implement' their self-concepts. Holland (1959; 1966; 1973) emphasizes the match between an individual's personal orientation to the world, or personality, and the work environment.

Osipow (1975) argues that the concepts of developmental stages, self-concept implementation, occupational environments and personality types may not function the same for all groups. Lerman (1976), however, states that the same basic principles for guiding career development toward mature vocational functioning may be universal.

Career Development Theories and the Handicapped

Osipow (1975) and others (Conte, 1983; Overs, 1975; Phillips et al., 1983) reviewed these career development theories in light of the needs and characteristics of the handicapped and other special groups and found the theories to be inadequate. Conte (1983) criticizes authors who:

. . . have been primarily superficial in that their discussions do not attempt to integrate observations concerning the vocational development of disabled persons into their previously stated theories. Such attempts at trying to "make the data fit their theory" rather than developing a "theory that fits the data" . . . are obviously limited in their utilitarian value. (p. 326)

Existing theories of career development have been deemed inadequate primarily because the life experiences of special groups of people, including women, are likely to differ appreciably from those individuals around whom the theories were initially developed, namely white, middle-class males of average or greater abilities. Even though ten years old, this criticism has begun to be taken seriously only recently, with some work directed towards the career development of women. Perun and Bielby (1981) discussed the past tendency to ignore the different context

in which women develop and concluded that the traditional vocational development theories do not describe females adequately. Even less study has been done of the vocational development of the handicapped whose life experiences are likely to deviate from the white, middle-class, nonhandicapped males in yet other ways (Overs, 1975).

Osipow (1976) has suggested several possible reasons for the failure of researchers and theorists to actively apply career development concepts to the handicapped. These include the following assumptions allegedly made by some vocational and rehabilitation practitioners:

1. that the construct of career development does not apply to the handicapped;
2. the disability itself is more important than the individual's other characteristics in determining career behavior;
3. the career options of the handicapped are severely limited;
4. that the handicapped person's career development is retarded by the disability; and
5. that the career development of the handicapped is unsystematic and due primarily to chance.

Osipow (1975) believes that membership in one or more 'special,' or 'non-standard,' groups ought to be considered in any theory of career

development but states further that there has not been enough research to know the relative importance of such grouping variables. Although these grouping factors need to be considered when attempting to explain career development, it is unclear which variables are most important.

He writes:

Since individuals usually belong to several groups, which group would seem to be the most important in determining occupational behavior? Is it more important to be a woman, a member of a racial minority, or a member of a certain occupational class? ... How can the proper weight of simultaneous membership in several groups to vocational development be ascertained? Are some memberships so important they cancel the effects of others? (p. 15)

As Brodin (1976) suggests, environmental factors will probably be more important in determining vocational outcomes for the handicapped than inherent or genetic traits. Conte (1983) has written that "a comprehensive theory for disabled persons should provide a mechanism for describing the influences of previous personal, social and vocational factors on subsequent vocational development if it is to adequately describe vocational behavior" (p. 326).

Frameworks for Research

Osipow suggests that the first step in studying the career development of special groups is to examine and weed out those variables that influence uniquely the career development of members of these groups. These factors, and their antecedents, should then be arranged

hierarchically in order of magnitude of contribution. With an understanding of how various factors influence the career development of various groups, a determination can be made whether there is such a thing as a "typical" group and whether separate theories are needed for certain atypical groups. Conte (1983) echoes Osipow's sentiment and states that "a greater understanding of the differences in life experiences encountered by many disabled persons is necessary if vocational practitioners are to be successful in helping persons who are disabled to fulfill their vocational aspirations" (p. 327). Degree of hearing loss, and other characteristics and experiences unique to the deaf, may need to be incorporated into the existing collection of career development-related variables generally included in career development studies with deaf populations.

Measurement of Career Maturity

In attempting to explain the development of career maturity it must be assumed that the outcome variable, e.g., career attitudes, can be measured reliably and validly. Several writers have been critical of the rather dismal reliabilities of most career maturity measures (Hanna & Neely, 1978; Moore & McLean, 1977; Prediger, 1979; Westbrook, Cutts, Madison & Arcia, 1980; Zytowski, 1978). As Westbrook (1983) states in his review of career development measures, the majority of measures are unable to demonstrate internal reliabilities above the .60's and .70's making the demonstration of validity rather difficult. The Career Planning scale of the Career Development Inventory appears to be one of

the more reliable instruments on the market with internal consistency coefficients of .84 or better.

Westbrook (1983) believes that a measure of career attitudes must be both highly reliable and uncorrelated with reading to be considered acceptable, since there is no reason to believe that one's attitudes towards career decision making should be related to reading ability. This is a particularly salient point in the assessment of hearing-impaired adolescents because their measured reading levels tend to be at the third- or fourth-grade level. According to Westbrook's (1983) review of the literature, career maturity measures in the cognitive domain (e.g. CDI - World of Work Knowledge) tend to correlate moderately with scores from standardized achievement tests (median $r = .64$). Career maturity measures in the affective domain, however, such as measures of attitude, tend to be uncorrelated with achievement scores ($r = -.10$ to $.08$). Westbrook concluded that only the following scales have reliabilities of at least .80 and, at the same time, correlate less than .10 with reading: the Career Development Inventory (Career Planning and Career Exploration scales) and the Involvement scale of the Assessment of Career Development (ACD).

The Career Development Inventory has been subjected to factor analyses and three distinct components emerge consistently. The first two factors appear to be attitudinal and the third cognitive. These factors coincide with the theory of the test's authors and with the original subscales of the instrument. Punch and Sheridan (1985) describe their results:

The first factor - Career Planning - covers such aspects as specificity of planning and information, definiteness of plans, and

concern with choice. The second factor - Career Exploration - assesses the resources available for use and considers the quality of their potential and the use made of them. The third factor - Information and Career Decision Making - assesses the knowledge of decision-making principles and possession of information about the world of work and the career development process. (p. 196)

Studies of Career Maturity with Deaf Populations

The single most comprehensive study of career development in deaf adolescents has been the Career Pattern Study of Lerman and Guilfoyle (1970) which was a replication of a portion of Super and Overstreet's (1960) Career Pattern Study. They sampled 185 males and 155 females between the ages of 12 and 20, who were deafened before the age of 2 years. Lerman and Guilfoyle used the Vocational Information and Planning Index (VIP), (the precursor to the Career Development Inventory), as the criterion variable. Three factors emerged from an analysis of the VIP: the first involving general vocational information; the second factor concerning more specific job-related information; and the third reflecting an awareness of the social environment at work.

The independent variables clustered in five factors: intelligence, middle-class environment, language competence, cultural stimulation (or "participation" as Super and Overstreet prefer it be called), and adolescent independence. Language competence, a combination of reading and math achievement, and other variables contributed the most to the VIP total score followed by cultural stimulation, adolescent independence,

intelligence, and middle-class environment. One conclusion drawn by the researchers was:

... that since vocational maturity is essentially an index of an adolescent's fund of vocational information, the contributions of language competence and cultural stimulation can best be understood in terms of source of information (a culturally stimulating environment must necessarily be "vocationally stimulating" as well) and the ability to process information (i.e., language competence). (Lerman & Guilfoyle, 1970, p.63)

On the basis of the results from both Lerman and Guilfoyle (1970) and Super and Overstreet (1960), both cultural participation and language abilities, estimated by achievement scores, were introduced into the causal models tested in this research.

To facilitate an understanding of the difficulties associated with developing a career when one is deaf, the following section is devoted to a description of the hearing-impaired population. Special emphasis is placed on those characteristics that relate to the development of career awareness and attitudes in the deaf.

PERSONS WITH HEARING IMPAIRMENTS

Definitions and Characteristics

At least 12,000 children born with hearing impairments during the rubella epidemic of the 1960's are now between 15 and 25 years of age and entering the rehabilitation process (Austin, 1984). Karchmer, Malone and

Wolk (1979), of the Gallaudet Research Institute, estimated that as many as 67,500 students were enrolled in special education programs for the hearing-impaired in 1979. In 1985-1986 there were approximately 1,200 students in grades K through 12 in public school programs for the deaf in the Commonwealth of Virginia.

Hearing impairments are described by their degree of severity as measured in decibel loss in the better ear. Any loss of 27 decibels or less is considered within normal limits; 27-40 dB is considered a mild loss; 41-55 is considered moderate; 56-70 moderately severe; 71-90 severe; and 91 decibels or greater is considered a profound hearing loss. Nearly one quarter of students in programs for the hearing-impaired have impairments that are classified as severe, and another 44% have profound hearing loss (Karchmer, Malone & Wolk, 1979). The rest have losses that are less difficult to accommodate in a regular classroom.

Although the degree of hearing loss obviously influences the extent to which one is able to interact with the hearing world, the relationship between degree of hearing loss and adjustment is not necessarily linear. Cowen's (1965) research suggests that the physical condition is less important than the individual's perceived "state of marginality" in explaining adjustment. In observing that profoundly deaf adolescents tend to make better school adjustments than the hard-of-hearing, Cowen considered the possibility that difficulties arise when an individual feels he or she is straddling between two worlds, those of the deaf and of the hearing, but belonging fully to neither.

Of those students with severe and profound losses in Virginia, an equal number are educated in residential and regular day programs

(Virginia Council on Deafness, 1980). A nationwide estimate of the education of hearing-impaired students of all severities suggests that about 35% are in residential programs, 17% in day schools, 26.5% in part-time special education, and 21.5% full time in local public schools (Karchmer, Malone & Wolk, 1979). According to a 1979 survey of hearing-impaired children in Virginia (Virginia Council on Deafness, 1980), students in residential programs tend to be somewhat older, come from less wealthy families, are more often deaf from birth (80% versus 60% in regular schools), and are more frequently from rural environments whereas those in regular settings tend to be from suburban homes.

Lacey (1975) describes some of the consequences associated with placement in a residential setting:

At the very least, a youngster is now placed in a social and educational milieu of only deaf youngsters which removes him farther from an integrated environment of deaf and hearing persons. The evolution and maintenance of this restricted life space has these outcomes: 1) fewer exposures to the work lives of parents and significant adults; 2) reduced opportunities for investigation and imitation of appropriate work roles; 3) a high degree of security in a safe and predictable environment; and 4) limited access to and familiarity with the customs, laws and institutions of the larger, host community. (p. 300)

Although McHugh (1975) agrees that students are more isolated from the world of work in residential schools, he suggests that staff in residential schools, who are more likely to communicate well in sign language and who may have more information about careers for the deaf,

are more prepared to communicate with deaf students about the outside world than are the staff in regular schools. By incorporating a measure of the extent of mainstreaming into a causal model, the results of the present study may help address the issue of which type of school experience is more beneficial for which type of children in terms of their career development.

Language Competence and Cultural Participation

Deafness has been referred to as an "invisible" handicap. Whether readily visible to the naive observer or not, it is a devastating condition. As summarized by Bolton (1976):

The inability to hear the spoken word prevents the normal acquisition of the predominant mode of human communication -- language. Thus, deafness as a handicapping condition is manifested as severe linguistic retardation and impaired communication skills.

(p. xi)

Despite normal intelligence and the ability to communicate reasonably well using sign language, the reading comprehension and written communication skills of the deaf tend to be very poor (Bolton, 1976). The average deaf 16-year old, for example, obtains scores on reading competency tests at a grade equivalent of approximately 3.5 (Allen, 1986; Karchmer, Malone & Wolk, 1979). Fewer than 10% achieve reading scores of seventh grade or higher, and at least one third of deaf youth are "functionally illiterate" (Bolton, 1976), generally understood to mean a

reading level of 5th grade or below. No more than 1% of deaf persons ever attain an achievement level of 12th grade (Bolton, 1976).

The underdevelopment of language skills has more far-reaching consequences than simply poor academic achievement. Language "aids in conceptual development, is tied to thinking and other symbolic behavior, and facilitates daily interchange and more precise negotiations with persons, places and things in the environment" (Lacey, 1975, p. 300). Without the ability to communicate well, says Lacey (1975), the deaf adolescent is likely to become frustrated in attempts to: "1) establish meaningful and sustained dialogues within and without the family unit; 2) provide and receive empathy and personal understanding; and 3) test, confirm, or amend hypotheses that he generates about himself and his experiences" (p. 300). In terms related to career development, the deaf adolescent is handicapped in his or her ability to compile information which will be used in decision making about the future (McHugh, 1975). One result is a high degree of unemployment and underemployment. Vernon (1973) describes the type of work typically chosen by deaf workers as manual work in manufacturing, letter press operation, and "other fields where employment opportunities are rapidly diminishing" (p. 96). Those fields that are expanding, such as service industries, government employment, technology, and professional work, have few deaf employees.

Language competence alone is not sufficient for the development of vocational maturity in the deaf. The results of Lerman and Guilfoyle's (1970) study of the career maturity of deaf adolescents suggest that both language competence (which they estimated using math and reading achievement scores, which loaded .693 and .763 on their language

competence factor), and cultural stimulation are required to foster career development. Both are essential since information without the ability to absorb it is useless, as is language competence without information. This is consistent with Super and Overstreet's conclusions from the Career Pattern Study. The two variables that emerged as most important in influencing vocational maturity in that research were grades ($r = .38$) and cultural stimulation ($r = .32$).

Although Lerman and Guilfoyle examined some factors reflective of family climate, their approach was, apparently, without theoretical basis. The following section describes the theoretical framework for studying the family that was used in the current research and its relevance to the hearing-impaired child's career development.

FAMILY DYNAMICS

Structural Theory

Family systems theory offers a perspective that may be helpful in conceptualizing any study that examines the influence of the family on the development of independence in children. As Minuchin (1974) states, the "human experience has two elements: a sense of belonging and a sense of being separate" (p. 47). Structural boundaries within the family, for example, pay tribute to both of these elements by delineating subsystems within the family, many of which overlap, and between the family and the outside world. When the boundaries within the family become too diffuse, the element of separateness of the individual is sacrificed. Independence

cannot be developed and the individual becomes "enmeshed" in an organization that does not permit growth and individuation.

According to Minuchin and other systemic family therapists, any level of stress in one member of the system reverberates quickly throughout the family resulting in efforts to restore the member and the system to its original state of harmony. This process of constant adjustment towards the maintenance and restoration of the status quo is termed 'morphostasis.' The presence of a deaf child in the family may act as source of stress that would result in a more cohesive system, perhaps even to the point of enmeshment. The passage of children from the stage of childhood into adolescence is also thought to be inherently stressful. According to the theory, the more cohesive the family system, the more difficult it should be for individual members to progress through normal developmental stages towards eventual independence.

When intrafamilial boundaries are too rigid, stress in any one member of the system must be at an extremely high level before it can permeate boundaries and have an effect on other family members. Individuals in this 'disengaged' system tend to have distorted views of their own autonomy, lack feelings of family loyalty, and seem unable to request support when it is needed (Minuchin, 1974). Minuchin suggests that the clarity of boundaries between family subsystems is a useful parameter for the evaluation of family functioning. The healthy family system is described by Minuchin as follows:

For proper family functioning, the boundaries of subsystems must be clear. They must be defined well enough to allow subsystem members to carry out their functions without undue interference,

but they must also allow contact between members of the subsystem and others. The composition of the subsystems organized around family functions is not nearly as significant as the clarity of the subsystem boundaries. (p. 54)

Given that the "functional" family has a discernible pattern of subsystems (executive, sibling; male, female; etc.) this offers a viable starting point for examining differences between and within various groups of families. Subsystems within a family, whether formed on the basis of generation, sex, power hierarchy, interest, or function, include such entities as dyads and triads of members. A dyad, which is delicate because of its intensity and lack of support, may devise a triangulation point in times of stress. This third leg may take the form of another person, money, illness, or alcohol. Although the triangle is more stable than the dyad, communication within the original dyad typically becomes distorted in the event of triangulation.

Another homeostatic mechanism, similar to triangulation, is the scapegoat. This member of the family has no positive alliances within the system and is seldom defended by anyone in the family. The purpose of the scapegoat is to insure unity among all the other members of the family; no matter what tensions exist between members of the system, they are in agreement in their displacing of all blame on the scapegoated member. An ill, handicapped or disabled family member would make a convenient candidate for the role of scapegoat or triangulation point. Perosa and Perosa (1981) and Kaslow and Cooper (1978) have found triangulation, scapegoating, parent-child coalitions, overprotection,

enmeshment, and conflict-avoidance in the families of learning-disabled children, for example.

Despite the convenience of considering these relatively tangible components of family structure, the assumption of morphostasis, i.e., that families function primarily to maintain the status quo no matter how dysfunctional, is not universally accepted. Olson, Sprenkle and Russell (1979), for example, believe that "viewing the family as solely maintenance-oriented ... is restrictive and misleading (p.11)." They explain the importance of 'morphogenesis,' the ability to grow, create, innovate, and change, as follows:

It is hypothesized that when there is more free-flowing balance between morphogenesis and morphostasis, there will be a mutually assertive style of communicating; equalitarian leadership; successful negotiation; positive and negative feedback loops; role-sharing and role-making; and rule-making with few implicit rules and more explicit rules. (p. 13)

Olson, Portner and Lavee (1985) contend that the functional, healthy family maintains a balance between morphogenesis and morphostasis; that families at either extreme are characterized by "disorder." Wertheim (1973) and others (Angell, 1936; Hill, 1971; Nye & Rushing, 1969; Wynne, 1958) have expressed similar beliefs, arguing that the ability to adapt to such normal crises as developmental transitions is necessary for healthy family functioning.

Circumplex Model of Marital and Family Systems

Cohesion and adaptability are concepts that have been used by many social science fields for the purpose of describing the nature of small social systems (Olson et al., 1979) and which share many of the same properties as morphostasis and morphogenesis. Cohesion, according to Olson, Sprenkle and Russell (1979) is made up of two components: emotional bonding between family members, and a degree of "personal autonomy" within a family system. At one extreme of cohesion, or morphostasis, is the construct of 'enmeshment,' described as an "overidentification with the family that results in extreme bonding and limited individual autonomy" (p. 5). Handicapped family members, then, who fail to become vocationally competent or aware, may be 'enmeshed' in highly cohesive families which limits their growth towards independence. At the lower extreme of the cohesion dimension, "disengagement" is characterized by "low bonding and a high autonomy from the family" (p. 6).

Adaptability, on the other hand, is described as "the ability of a marital/family system to change its power structure, role relationships, and relationship rules in response to situational stress" (p. 12) (morphogenesis). Because the presence of a handicapped family member appears to be inherently stressful, adaptability is a dimension which relates well to a consideration of these families. At the high end of this dimension is the 'chaotic' family, and at the lower end the 'rigid' family.

Olson capitalized on these two dimensions and developed his Circumplex Model of Marital and Family Systems. This model, shown in Figure 1,

presents a graphic representation of morphogenetic and morphostatic functions of social systems. Although the model was intuitively derived by Olson, it has been empirically validated in at least two separate studies (Russell, 1979; Sprenkle and Olson, 1978). As can be seen in Figure 1, the model is represented by a matrix, describing 16 types of families according to their relative degrees of cohesion and adaptability. The closer to the center of the diagram, the more balanced a family system is on both dimensions, and therefore more functional (Olson et al., 1979). The term "functional" refers not only to the health of the family as a whole but to the healthy development of each individual member as well. The four types in the center [flexible separated, flexible connected, structural separated and structural connected] represent healthy family functioning and none is presented as being any more or less functional than any other. These four balanced types are purported to be more functional than any of the four extreme types, however. The four types in the corners of the model [chaotic disengaged, chaotic enmeshed, rigid disengaged and rigid enmeshed] reflect extreme dysfunction in terms of both individual and family development.

	Low <----- COHESION -----> High			
High	Chaotic Disengaged	Chaotic Separated	Chaotic Connected	Chaotic Enmeshed
A				
D	* * * * *			
A		*		*
P	Flexible	* Flexible	Flexible	* Flexible
T	Disengaged	* Separated	Connected	* Enmeshed
A		*		*
B		*		*
I		*		*
L	Structural	* Structural	Structural	* Structural
I	Disengaged	* Separated	Connected	* Enmeshed
T		*		*
Y	* * * * *			
Low	Rigid Disengaged	Rigid Separated	Rigid Connected	Rigid Enmeshed

Figure 1. Circumplex Model: Sixteen Types of Systems.

A couple that has achieved a proper balance along both the adaptability and cohesion dimensions should, according to Olson, function better and cope more effectively with the stress of raising a handicapped child, or any child for that matter, than a couple in any of the extreme categories. This idea of a 'balance' being healthy for the development of children is echoed by Bronfenbrenner (1961) who states that there is a balance of parental support and control that is optimal for the development of children. He suggests that the relationship between parental behaviors and children's psychosocial development is curvilinear. This relationship was found by Russell (1979) and by Minuchin et. al. (1967) in their studies of cohesion and adaptability.

The Family With A Deaf Child

The family is an important influence on the deaf child's early development, as it is for any child. But there are frustrations associated with raising a deaf child that often place additional strain on the marriage of the parents and on relationships with siblings. The difficulties are exacerbated by the fact that only slightly more than half of all parents with deaf children obtain satisfactory information at the time the loss is discovered that helps them cope with the situation (Virginia Council for the Deaf, 1980). In Deaf Like Me, a book describing the life of his deaf daughter Lynn, Thomas Spradley (1978) writes:

Sometimes Lynn's inability to communicate brought added strain to family relationships. When we struggled unsuccessfully to grasp the meaning behind her insistent gestures, we were all left feeling helpless and angry. When Bruce played with friends, he did not want to be bothered by Lynn's fruitless attempts to make herself understood. "Can't you make her stay away from us?" Bruce would complain. Sometimes Louise and I would blame each other for the frustration we saw building in Lynn, feeling that this recurring problem was due to one of us not working hard enough with her. (pp. 140-141)

This is the kind of stress that can push the dynamics of a family into dysfunction. Furthermore, a handicapped child has obvious potential for being triangled into the parents' relationship if it is troubled. This can act as an effective stabilizing mechanism for the marriage but at the cost of the child's own growth and development towards independence from

the family. As Lacey (1975) indicates, "a deaf person's early experiences in and around his family unit potentially contribute to slowing down implementation of appropriate career behaviors" (p. 299). He suggests that unhealthy family attitudes often take the form of unresolved parental guilt about the birth of an imperfect child. To make matters even worse for most families with a deaf child, the child is likely to become relatively isolated from his or her parents in the absence of a shared means of communication. And it is during the child's teen years that parental attitudes towards their deaf child may take a dramatic swing. Schlesinger and Meadow (1972) write:

The parents may realize for the first time that the vocational choices of their deaf children are strictly limited both by academic underachievement and by the linguistic retardation and the nonoccurrence of the miracle of speech. . . . Their reactions vary. Sometimes they will try futilely to bind the adolescent more closely to the family, in the expectation of a delayed miracle; sometimes their parenting may turn into overt rejection as if to say, "You have not lived up to my expectations, and both of us are doomed."
(p. 22)

For these reasons, it may be that the degree of cohesion in the family has more influence over the career development of a handicapped child than for a normal child who has more in the way of personal resources to allow him to progress in spite of a discouraging family life.

In addition to the degree of cohesion in the family, the extent to which the parents are able to communicate with their deaf child, by whatever means, could be an important factor in the child's view of the

world, sense of self, and personal control. Deaf children tend not to communicate at abstract levels with their parents. In her study, Schlesinger (1972) found that 95% of deaf children and their parents limit conversations to "topics with a visible reference." Among the hearing, however, 45% of children made at least passing comments referring to a nonvisible object, and 15% had prolonged conversations about nonvisible things. For these reasons, measures of aspects of parent-child communication are included in this study.

Family Dynamics and Career Development

Hesser (1981) concluded from his study of normal high school students, using the Career Development Inventory and the FACES II, that a "family's tendency to form coalitions is negatively associated with career exploration" (p. 185). In addition, parental expectations, at least the child's beliefs about what the parents expect, showed a significant relationship with career planning. Super and Overstreet (1960) included a family cohesion variable in their study and found a correlation of .18 with the VIP, their measure of vocational maturity.

Taken together, the concepts of boundaries, dyads and triangulation of the structural perspective, in conjunction with the cohesion and adaptability dimensions of the circumplex model, can offer a valuable frame of reference for studying the development of vocational maturity in handicapped young people. According to this theoretical framework, the stress of having a severely handicapped child may potentially destabilize the parents' marital relationship. In an unconscious attempt

to return the family to homeostasis, the parents may triangle the deaf child into their dyad, or create an enmeshed system, which puts subtle pressure on the child to remain dependent. In this way, the process of that child's career development is delayed. By collecting data on family cohesion this research utilized the circumplex model of marital and family functioning, in tandem with a structural perspective, to study the influence of family interactional patterns on the career development of handicapped adolescents.

Much of the previous research on the role of the family in influencing career maturity has utilized relatively static variables and used the child as the sole source of information about the family (Hesser, 1981; Khan & Alvi, 1983). Such studies have found strong correlations between career development variables and parental aspirations for the child when it was the child himself who was reporting both pieces of data. The validity of this practice is highly questionable. In the current study, parents reported their own and their spouse's aspirations for their child's occupational attainment, as well as other family information such as both parents' occupational and educational attainment and the cultural participation of the child.

LOCUS OF CONTROL

According to Rotter (1954, 1966), locus of control of reinforcement is the single most important concept in social learning theory. The essence of this concept is the belief that consequences are somehow contingent upon one's behavior. As an individual experiences a variety

of situations, he or she gradually builds expectations about the receipt of reinforcement, and draws conclusions about the relationship between behavior and outcome (Rotter, Chance & Phares, 1972). An 'internal' locus of control is the belief that one is in control of one's fate. The alternative is to have the expectation that outcomes are primarily determined by forces outside one's control such as fate or luck, termed an 'external' locus of control. Most locus of control measures yield a score that reflects an individual's place along the continuum between purely internal and purely external control.

Social learning theory predicts that persons with an internal locus of control are more likely to be goal-seeking while externals tend to passively allow life to happen to them. There is some empirical support for this assumption (Joe, 1971; Lefcourt, 1966, 1976; Davis & Phares, 1967; Seeman, 1963; Seeman & Evans, 1962). Although an internal locus of control would appear to be more adaptive than external, people from disadvantaged backgrounds, who have discovered repeatedly that they do seem to have very little power over their situations, may be justified in taking on a more external locus of control (Battle & Rotter, 1963; Joe, 1971; Lefcourt, 1966). Perhaps for similar reasons, deaf adolescents tend to be more external in their locus of control orientation than hearing students (Dowaliby, Burke & McKee, 1983; Blanton & Nunnally, 1964).

As might be expected, one's belief in control of reinforcement is positively related to career maturity. Bernadelli, De Stafano and Dumont (1983) found a low positive but significant correlation between scores on Rotter's Internal-External Locus of Control Scale and Crites' Career Maturity Inventory with 240 normal male and female ninth graders ($r =$

.13). Blevins (1984) studied deaf adolescents and found a correlation of .25 between the Career Development Inventory and the Different Situations Inventory, a locus of control instrument scored in the internal direction. Other positive, significant correlations between locus of control measures and career development measures have supported this relationship for both able and disabled populations (Gelatt, Varenhorst, Carey, & Miller, 1973; Khan & Alvi, 1983; Lokan, Boss, Patsula, 1982; Phillips, Strohmer, Berthaume & O'Leary, 1983).

OTHER FACTORS RELATED TO CAREER DEVELOPMENT

To think that all of the variations in life experience can be incorporated into one model would be naive. An attempt was made, in building the models for this research, to select variables that have been found to be important in determining career maturity and that are also representative of background, physical, family and school environments, and abilities. Yando and Zigler (1984) write:

The caveat, then, is that investigators should choose carefully which child, family, and extended environmental variables they will look at -- bearing in mind that they are overlooking others for the sake of experimental efficiency -- but should not shy away from identifying their concern with causality and with outcome. That the total system in which the severely handicapped child is involved cannot yet be explained does not mean that the relative importance of parts of the system at specific points in time cannot be examined. (p. 412)

Background Variables

A consistent result of many studies of career development is that females tend to score higher than males on measures of career development such as the Career Development Inventory (Hesser, 1981; Lokan, Boss & Patsula, 1982; Neely & Johnson, 1981), the Career Maturity Inventory (Burkehead & Cope, 1984), and others (Super & Nevill, 1984; Westbrook, 1983).

Several studies have concluded that career maturity increases with age for both hearing-impaired (Lerman & Guilfoyle, 1970) and hearing subjects (Super & Overstreet, 1960; Lokan, Boss & Patsula, 1982; O'Neil, Ohlde, Tollefson, Barke, Piggott & Watts, 1980). Because many hearing-impaired adolescents remain in school past the age of 18, the question arises whether age or grade in school would be more reflective of a student's overall level of maturity. Although current grade level may have been more indicative of maturity than age, 49 of the deaf subjects attended a nongraded school. Therefore, age was used as the variable reflecting general maturity.

Consistent with Osipow's (1976) concern with, what he called, special group membership, race has been found to be a significant classification variable in terms of career development (Hesser, 1981; McNair & Brown, 1983; Pelham & Fratz, 1982). Whites tend to score higher on career development measures than do nonwhites. Despite the apparent utility of the race variable in a model of career maturity, the underrepresentation of nonwhite subjects in this study precluded the factor's inclusion in the models tested here.

The child's age at the onset of a hearing impairment and the degree of hearing loss are frequently discussed as important predictors of adjustment for hearing-impaired individuals (Burkehead & Cope, 1984; Cowan, 1965; Karchmer, Malone & Wolk, 1979; Lacey, 1975; Lerman & Guilfoyle, 1970; Overs, 1975). But these two variables are inconsistent in their ability to demonstrate their influence in empirical studies. Researchers from the Gallaudet Research Center concluded from their nationwide demographic studies that "... the factor that has shown itself to play the most pivotal role in a student's personal and educational adjustment has been degree of hearing loss" (Karchmer, Malone & Wolk, 1979, p. 97). In their own examination of demographic data from the commonwealth of Virginia, the Virginia Council for the Deaf (1980) concluded that neither hearing loss nor age at onset are related to achievement. Any effect that degree of hearing loss and age of onset would have on career development would likely be through the language factor; the earlier the loss occurred and the less the individual is able to hear, the less able the person is to pick up information and attitudes about work from the world around him. The relationship between the degree of hearing loss and age at onset variables with career maturity was tested in this study.

Hesser (1981) used education level and occupational status of both parents to estimate socioeconomic status and found correlations of about .30 between SES and scores on the Career Development Inventory with normal adolescents. It should be noted that Hesser used the child's report of his or her parents' educational and occupational levels rather than surveying the parents directly. Super & Overstreet (1960) found a

relationship of similar magnitude ($r = .27$) between SES and their measure of career maturity. Blau and Duncan (1967) concluded from their research that both father's education ($r = .32$) and father's occupation ($r = .40$) have significant influences on occupational success. In their discussion of occupational success Rehberg and Hotchkiss (1979) explain the influence of SES further:

Not only is parental SES a significant predictor of the child's eventual attainment, but this effect is carried to the child by significant others with whom the child associates ... Gottfredson's (1981) model of occupational aspiration, based on a literature review, suggests that by grades 6-8, students are already using the social class variable to circumscribe their occupational choice.
(p. 408)

Family Environment Variables

Hesser (1981) concluded from his study of 262 high school seniors (nonhandicapped) that it is parents who have the greatest influence on their children's occupational aspirations and career development. In studying the CDI subscale scores of normal adolescents he found that the greater the father's expectations for his child, as reported by the child, the greater the child's career maturity scores ($r = .25$ to $.35$). A low, positive correlation was also found between career maturity and the mother's expectations, as reported by the child, ($r = .15$). Hesser's use of the child's report of parental expectations may well have biased the correlations with the child's career maturity scores. Khan and Alvi

(1983) conducted a similar study with 272 Canadian high school students and used the subjects as the only source of a variety of information including the parents' aspirations for the child's educational and occupational attainment. It is unclear whether the significant correlations found between 'parental' aspirations for the child's occupational attainment and various components of career maturity ($r = .14$ to $.24$) were actually reflections of the correlations between their self esteem variable and career maturity components, which ranged from $.12$ to $.24$ according to the same study. In the present study, the parents themselves were surveyed to obtain their expectations for their children's occupational attainment to get a closer approximation of the true scores.

Perhaps related to the family's socioeconomic status is the quality of the cultural stimulation provided for the child in the home. Super and Overstreet (1960) developed a cultural participation scale on the Biographical Inventory and found that scores on this scale correlated significantly with vocational maturity ($r = .32$) for ninth-grade boys. Lerman and Guilfoyle (1970), in their Career Pattern Study of deaf adolescents, revised Super's cultural participation scale to be more applicable to deaf adolescents. They report that this variable's influence ($r = .51$) was second only to that of language competence ($r = .64$) in influencing vocational information and planning. The revised version of the cultural participation scale was used in this research.

Educational Environment

The model describing the development of career maturity in hearing-impaired students that was tested in this study took into account whether a hearing-impaired subject is educated in a mainstreamed program, residential program, or some alternative in between. Because more highly developed career attitudes and behavior are likely to be exhibited and modeled by hearing classmates, the extent to which a deaf student interacts with hearing students and with the outside world in general may impact on his or her attitudes and ability to make sound career decisions.

DEVELOPMENT OF THE MODELS

So far in this chapter, a variety of factors have been discussed in terms of their theoretical and empirical relationships with career maturity. It cannot be assumed that an individual's readiness to make career decisions is the result of a simple additive process of these factors; the development of career maturity, like any other aspect of human growth, is a dynamic process involving interplay among a multitude of personal and environmental factors.

The development of a causal model is an attempt to represent our best understanding of the reality associated with a given outcome which in this case is career maturity. There is considerable debate about the legitimacy of drawing causal inferences from correlational data, no matter what the statistical method employed. Path analysis can be a first step in testing what could be hypothesized as a plausible model of the

causal relationships that lead up to a given outcome variable. Since no variables were, or could possibly have been, manipulated by the researcher in this study, the explanation of how certain factors interrelate to influence career maturity is done by postulating a logical temporal sequence and using path analysis to determine if the hypothesized patterns are supported by the results.

A path diagram is a graphic representation of the hypothesized causal relationships among the variables in a model. A distinction is made between 'exogenous' and 'endogenous' variables. Exogenous variables are those for which there are no causal factors identified within the model; the researcher is not attempting to explain the causes of these variables, thus there are no variables in the model that are antecedent to them. Exogenous variables are situated in the left-most set, or 'block,' of variables in the model. All other remaining variables in the model are 'endogenous' as there are exogenous or other endogenous variables within the system that are assumed to explain some of their variability.

In causal models such as the ones being tested in this study (fully identified, recursive models), it is assumed that there is a causal path from all variables taken as causes (independent), to all variables considered to be effects (dependent). In this way, an endogenous variable treated as an independent variable in one analysis will become a dependent variable in another. In the illustrations of Models 1 and 2 (Figures 2 and 3) there are no paths drawn between pairs of variables. Had all 29 paths been drawn in the diagram of Model 1, it would have been difficult to envision the causal relationships for the jumble of lines. Model 2 has 68 paths. Therefore, the reader must understand that, in Model 1,

each of the six endogenous variables is considered to be caused by all of the exogenous and endogenous variables to its left; each of the eight exogenous and endogenous variables (except for career maturity) is treated as a cause of every one of the variables to the right. The same relationships are true for variables in the second model as well.

The coefficient associated with a given path in the model is the estimate of the 'direct effect' of one variable on another. But if there are one or more variables between the cause and the effect, some of the influence of the first on the second may be filtered through intervening variables. For example, Variable 1 may have a minimal direct effect on Variable 3. But it may also be that Variable 1 has a strong direct effect on Variable 2 which, in turn, has a strong direct effect on Variable 3. The influence of Variable 1 on Variable 3 that is associated with the effect of Variable 1 on Variable 2 and then 2 on 3 is called an 'indirect effect.' The sum of the direct effect and all of the indirect effects, if any, is the 'total effect.'

The placement of factors in a path model must be based upon theory and logic, reflecting temporal sequence and hypothesized causal relationships. All variables in the model should, therefore, be included for a reason. The section that follows presents the rationale behind the variables included in Models 1 and 2.

In the case of the first career maturity model that was tested (see Figure 2), the first variables in the sequence are those for which no particular cause is postulated, i. e., the background variables of sex, age, and parental socioeconomic status. All of these background variables are included in the career maturity models because they are likely to be

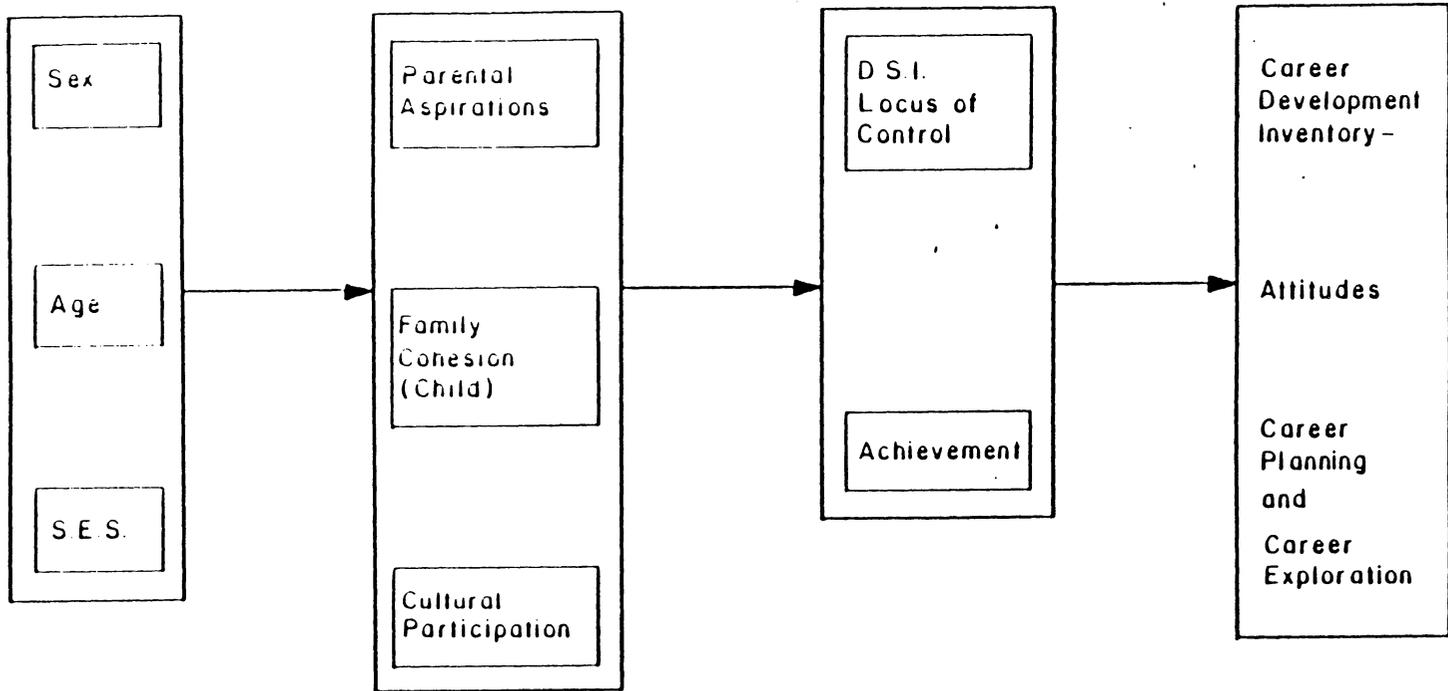


Figure 2. Model 1 Causal model of career maturity based on literature for nonhandicapped adolescents.

associated with the resources available to the subjects, with the perceptions and attitudes of people in the social environment towards them, and to reflect the subjects' general maturational level. These factors have been shown, in previous research, to have effects, ultimately, on career maturity and may well influence the family climate, locus of control, and achievement of the individual. Being factors over which the adolescent has no control, these are placed in the exogenous block.

Adolescence is a time of transition from childhood to adulthood. During this period the adolescent deals with two competing forces within himself: the desire to be an individual apart from his family; and the need to see his life as a continuation of a greater history. To optimize the child's ability to succeed in this attempt to balance the need to be separate and the need to belong, the family must allow the child to venture appropriate distances from the family while at the same time conveying to the child that he is an important member of a loving and accepting family. For this reason, Model 1 includes variables reflective of the closeness of the family as well as of the expectations and resources that encourage the child's independence from the family: parental aspirations for the child's occupational attainment, family cohesion, and cultural participation. These are included in the second block of the model, considered to be influenced by the exogenous variables to the left, and to precede the variables to the right in terms of time and, therefore, in the causal sequence.

The third block contains those endogenous variables that relate to the characteristics and abilities of the child, namely locus of control

orientation, and achievement. An adolescent's locus of control orientation, achievement, and school placement are considered, in this model, to be the result of the gender, socioeconomic status, and age, that he or she had no effect on, plus the characteristics of the family environment.

All eight independent variables in Model 1 are considered to be influential in explaining the variance in career maturity: background characteristics effecting family climate, the family influencing the the personality and achievements of the individual, and all of these factors influencing career maturity, directly and indirectly.

The second model (see Figure 3) is concerned exclusively with the career maturity of the deaf, and includes degree of hearing loss and age at onset as background variables. These are characteristics of the individual that can have a major impact on the person's interactions with the world around him, especially the family, and that may influence personality development and achievement.

It has been estimated that, in the population, fewer than half of all parents of deaf children learn to communicate in the child's most natural language of signs (Virginia Council for the Deaf, 1980). The ability of parents and children to communicate easily using some common language is essential to the passage of career information, attitudes and a world view or philosophy. Model 2 includes two additional family variables in the second block that measure aspects of communication between parents and their deaf children. The sex, age, hearing loss and age at onset may have some effect on the ability of parents and children to communicate. Parent-child communication ability may also have important effects on the

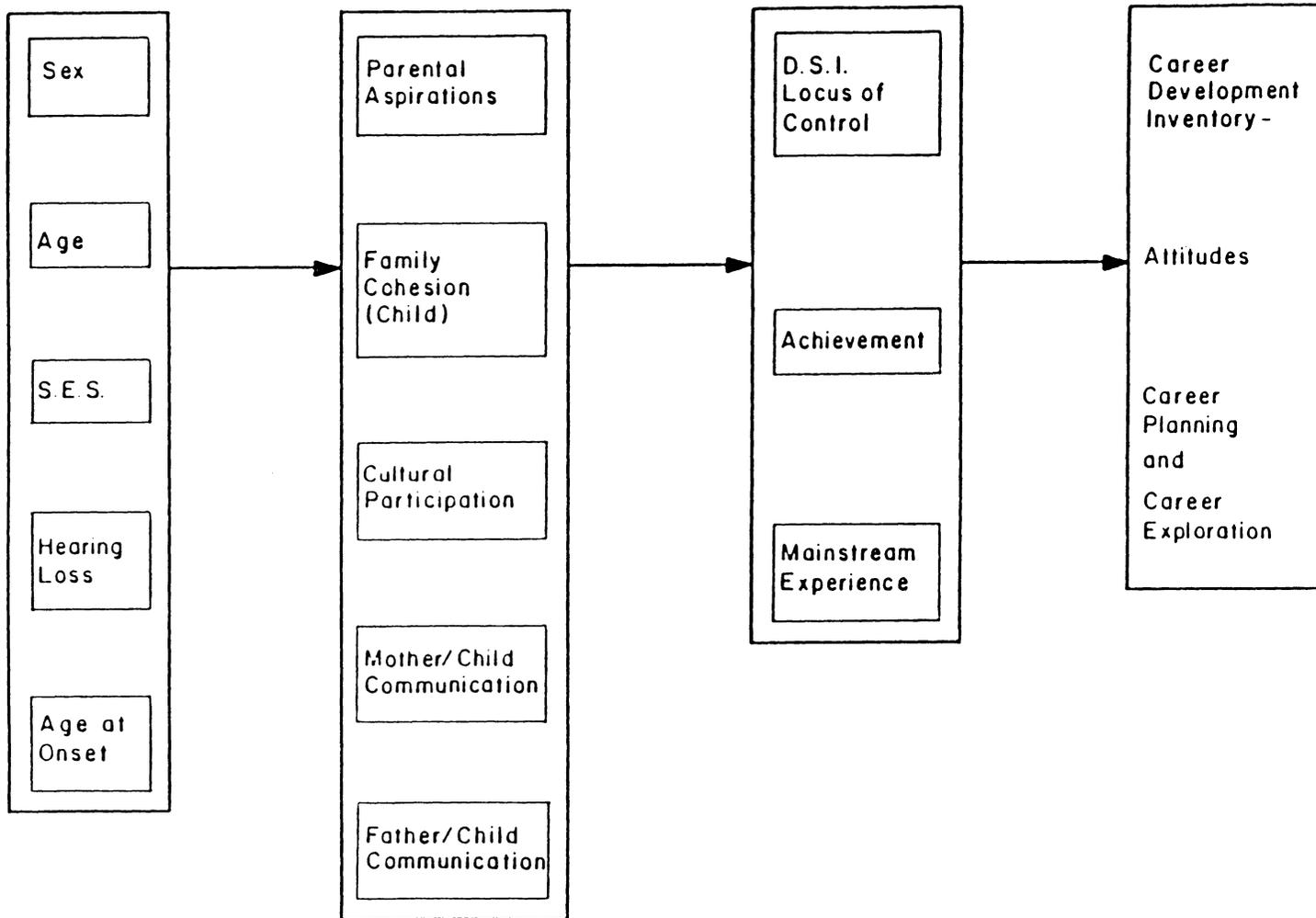


Figure 3. Model 2 Causal model of career maturity based on literature for hearing-impaired and nonhandicapped adolescents.

child's personality, achievement, and the decision to educate in a public school or at a residential setting. Ultimately, the ability of the parents and deaf child to communicate may have direct and indirect effects on the child's career maturity.

Mainstreaming, whether the deaf child is currently being educated in a public or residential school, was added to the third block of variables in Model 2. There are advantages and disadvantages associated with either of these decisions regarding the development of career maturity. These are discussed elsewhere. The decision of where to educate a deaf child may be the result of the degree of his or her loss, the extent to which he or she was able to pick up spoken English before the onset of the deafness, and the closeness of the family. Given that the conditions of the two types of educational system may differ in ways that influence the acquisition of career information and attitudes, mainstreaming was postulated to have an effect on career maturity scores.

In summary, the causal sequence, which is reflected in the placement of variables in a model, is basically an ordering according to a logical temporal sequence. This ordering is an attempt at reflecting what, in 'reality,' is the dynamic interplay among a variety of factors that are believed to explain the development of career maturity. In the two causal models examined in this study, background variables are expected to come before, and to have some influence on, characteristics of the family climate; background variables and family climate are assumed to influence the characteristics and achievement of the child; and career maturity is hypothesized to be the result of the interplay among background, family, and child characteristics.

CHAPTER 3: METHODOLOGY

SUBJECTS

The subjects in this study included both hearing-impaired (also referred to as "deaf") and normally hearing adolescents. The 318 adolescents in the normally hearing, nonhandicapped group averaged 16.5 years in age and were from four schools in the Roanoke County Public School System, and the Central Virginia Magnet School for Science and Technology, which serves nine high schools in the region surrounding Lynchburg. The group was comprised of nearly equal numbers of males and females (see Tables 1 and 2), and was also nearly evenly divided among grades 10, 11 and 12. On the SRA standardized tests of reading and math achievement, the hearing group averaged approximately one standard deviation above the mean of the national norm groups.

The majority of hearing subjects in this study have grown up mainly in cities and suburbs rather than in rural settings, and the vast majority classify their own racial group membership as "White." Most of the families of hearing subjects are intact with both parents living and still married to each other (see Table 3). Nearly two thirds of fathers in this group classify their occupations as "Professional." Nearly all of the parents have high school diplomas or the equivalent and approximately one quarter have college degrees. One quarter of the mothers in this group work in professional occupations while one third do no work outside the home.

Table 1

Descriptive Statistics for Hearing, Deaf and Norm Groups

Variable	Group					
	Hearing (n=318)		Deaf (n=71)		Norms	
	M	SD	M	SD	M	SD
Age	16.45	.91	17.54	1.36	--	--
Reading						
Achievement	112.91	10.79	83.84	14.34	100.00	15.00
Math Achievement	117.97	13.01	93.19	15.25	100.00	15.00
Achievement	115.44	10.67	88.52	13.34	100.00	15.00
CDI - Attitudes	107.73	19.07	103.61	15.23	103.00	20.10
D.S.I.	14.45	2.66	12.96	2.34	13.77	3.05
FACES - Cohesion	33.68	7.55	34.96	5.87	37.10	6.10

Table 2

Frequency of Responses for Descriptive Variables for Deaf and Hearing

Variable	Hearing (n=318)		Deaf (n=71)	
	f	%	f	%
Sex				
Male	156	49.1	40	56.3
Female	162	50.9	31	43.7
Race				
White	291	91.5	53	74.6
Black	2	.6	7	9.9
Hispanic	0	---	3	4.2
Asian	5	1.6	2	2.8
Other	2	.6	3	4.2
No response	18	5.7	3	4.2
Grade				
10	114	35.8	6	8.5
11	117	36.8	11	15.5
12	87	27.4	5	7.0
Ungraded			49	69.0
Curriculum				
Vocational	6	1.9	7	9.9
College-bound	283	89.0	27	38.0
General	27	8.5	3	4.2
No response or n/a	2	.6	34	47.9

There were 71 subjects in the hearing-impaired group. They ranged in age from 15 to 20 years with an average age of 17.5 (see Tables 1 and 2). The slightly greater number of males than females in this sample corresponds closely to the 54% males in the deaf population (Karchmer, 1984). Approximately one quarter of the subjects in the hearing-impaired group were classified in an ethnic group other than "White" by their parents. Two subjects attended regular classes in Roanoke County, another twelve were in resource programs (fewer than three periods of special services per day) or mainstreamed in Fairfax County, Virginia schools. The remaining 57 subjects attended self-contained programs in residential schools: 8 at the Virginia School for the Deaf and Blind (VSDB) in Staunton, and 49 at the Model Secondary School for the Deaf (MSSD) in Washington, D.C.. In the population, 50% of deaf adolescents attend residential programs (Karchmer, 1984) compared to 80% in this sample. The VSDB subjects tended to come from rural parts of western Virginia while the MSSD students were from all over the United States, from both rural and urban settings.

Among the deaf subjects, the Roanoke and Fairfax County subjects had the highest average parental S.E.S. , $M = 1.14$, which was above the average for the total combined sample. This group was followed by the MSSD group, $M = .087$, whose mean S.E.S. score was close to the mean for the total sample, and finally by the VSDB group whose average S.E.S. score (-3.769) was significantly lower than that of subjects from the other two settings, $p < .05$.

On the Stanford Achievement Test ($n = 51$), and the SRA ($n = 20$), this group of hearing-impaired students scored approximately one standard

Table 3

Frequency of Responses for Descriptive Family Variables for Deaf and Hearing

Variable	Hearing (n=318)		Deaf (n=71)	
	f	%	f	%
Locale				
Very rural	17	5.3	0	0.0
Rural	53	16.7	8	11.3
Village/Town	25	7.9	7	9.9
Suburbs	166	52.2	27	38.0
City	35	11.0	25	35.2
No response	22	6.9	4	5.6
Parents' Marital Status				
Together	237	74.5	38	53.5
Separated	9	2.8	4	5.6
Divorced	41	12.9	21	29.6
One deceased	8	2.5	4	5.6
Two deceased	0	---	1	1.4
Never married	1	.3	0	---
No response	22	6.9	3	4.2
Father's Occupation				
Professional	189	59.4	39	54.9
Skilled	91	28.6	18	25.4
Semi-skilled	15	4.7	4	5.6
Unemployed	0	---	1	1.4
Deceased	4	1.3	3	4.2
No response	19	6.0	6	8.5
Mother's Occupation				
Professional	73	23.0	16	22.5
Skilled	118	37.1	20	28.2
Semi-skilled	7	2.2	6	8.5
Unemployed	101	31.8	24	33.8
No response	19	6.0	5	7.0
Father's Education				
Less than H.S.	15	4.7	9	12.7
H.S. Diploma	43	13.5	13	18.3
Some college	85	26.7	11	15.5
College degree	85	26.7	9	12.7
Graduate school	70	22.0	24	33.8
No response	20	6.3	5	7.0

Table 3 Continued

Variable	Hearing (n=318)		Deaf (n=71)	
	f	%	f	%
Mother's Education				
Less than H. S.	10	3.1	7	9.9
H. S. Diploma	82	25.8	17	23.9
Some college	105	33.0	22	31.0
College degree	72	22.6	8	11.3
Graduate school	31	9.7	14	19.7
No response	18	5.7	3	4.2
Father's Aspirations for Child				
Professional	228	71.7	26	36.6
Skilled	48	15.1	22	31.0
Semi-skilled	0	---	1	1.4
Unemployed	0	---	1	1.4
No response	42	13.2	21	29.6
Mother's Aspirations for Child				
Professional	252	79.2	30	42.3
Skilled	37	11.6	33	46.5
Semi-skilled	0	---	2	2.8
Unemployed	0	---	1	1.4
No response	29	9.1	5	7.0

Note. All responses are from parent questionnaire.

deviation above their average deaf peers in both reading and math on the Stanford according to the norms for hearing-impaired students (Allen, 1986). This represents scores that are an average of one standard-deviation below their nonhandicapped norm group peers' in reading, and approximately one-half standard deviation below the mean in math.

Unlike their hearing counterparts, most of whom (75%) have parents who are still married to each other, only a slight majority of the subjects (52%) in the deaf group come from intact families. More than two thirds of fathers in the deaf sample hold occupations they classify as "Skilled" or "Semi-skilled" and the remaining third hold "Professional" occupations. In contrast to fathers in the hearing sample, a greater proportion of these fathers never completed high school. A greater proportion of the fathers of deaf subjects also attended at least some graduate school than did fathers of subjects in the hearing group. This same trend was true for the mother's education.

Table 4 describes some of the deaf-specific variables that characterize the handicapped sample. Karchmer (1984) indicates that 34% of hearing-impaired adolescents in the country have losses that are less than severe (less than 70 dB loss), 21% have severe losses (71 to 90 dB), and 44% have losses in the profound range (91 dB or greater). Hearing losses in the deaf sample ranged from 40 to over 150 decibels (pure tone average) in the better ear with an average loss of 95.8 dB. The group in this study is more heavily weighted towards the more severe losses with 8.6% in the less-than-severe category, 35.7% in the severe

Table 4

Frequencies for Variables Describing Deaf Sample (n=71)

Variable	Sample		Population
	f	%	%
Hearing loss*			
<70 dB	6	8.6	34.0
71 to 90 dB	25	35.7	21.0
91 dB or greater	39	55.7	44.0
Age at onset**			
At birth	29	40.8	71.6
0-1	19	26.8	10.5
2-4	18	25.3	11.6
5-10	2	2.8	5.8
11 or older	0	---	.5
No response	3	4.2	
Cause**			
Prematurity	3	4.4	6.0
Meningitis	5	7.4	9.0
Rubella	15	22.1	28.0
RH factor	2	2.9	2.4
Other	14	20.6	15.9
Unknown	29	42.6	Unavailable
Mainstreaming*			
Mainstreamed	1	1.4	6.1
Resource	13	18.3	42.3
Day at Residential	2	2.8	
Residential	55	77.5	50.0

*Population Data from Karchmer (1984) - National estimates

**Population Data from Virginia Council for the Deaf (1980) -
Virginia estimates

classification, and 55.7% suffering losses great enough to be considered profound.

The age of the child at the onset of the loss has obvious significance for the child's subsequent language development. Most of the subjects in this study (86.8%) lost their hearing at or before the age of 2.5 years. Another 5.9% lost their hearing during their fourth year, 4.4% during their fifth year, and only two subjects in this sample lost their hearing at the ages of 6 and 7, respectively. This profile is very close to that reported in a 1979 survey of hearing-impaired children in Virginia (Virginia Council for the Deaf, 1980) (see Table 4). In 1980 it was reported that 28% of deaf children in Virginia lost their hearing as a result of maternal rubella compared to 22% in the present study. Another 4% of parents of the deaf subjects in the current study listed "Prematurity" as the cause of deafness and 7.4% blamed the deafness on meningitis. These figures are similar to the 1980 statistics. In this sample, however, 63% of parents checked "Other cause" or "Cause Unknown" compared to only 16% of parents in the 1980 study.

The communication patterns between mothers and deaf subjects and fathers and deaf subjects are described in Table 5. Mothers of 41 of the 71 hearing-impaired subjects (62%) have learned to use at least some sign language to communicate with their children. Of these, only 6 have hearing losses in the moderate to profound ranges. In comparison, only 19 of the fathers (27%) have learned at least some sign language. Of these, 7 are moderately to profoundly deaf themselves. Nonetheless, the parents indicated that 45% of father's were able to carry on relatively

Table 5

Responses to Parent-Child Communication Items: Deaf Sample

Variable	Mother		Father	
	f	%	f	%
How parent usually communicates				
Speech	24	33.8	23	32.4
Sign	7	9.9	5	7.0
Speech and Sign	18	25.4	10	14.1
Gestures	0	---	4	5.6
Other combination	19	26.8	22	31.0
No response	3	4.2	7	9.9
Maximum complexity of conversations				
Simple commands	2	2.8	6	8.4
Small talk	2	2.8	3	4.2
Simple conversations	15	21.1	22	31.0
Complex conversations	49	69.0	32	45.1
No response	3	4.2	8	11.3
Parental hearing status				
Normal hearing	56	78.9	57	80.3
Mild loss	4	5.6	2	2.8
Moderate loss	0	---	3	4.2
Severe/profound loss	6	8.5	5	7.0
No response	5	7.0	4	5.6
Time spent conversing when child at home, per day, in minutes				
	M=106	SD=76	M=54	SD=54

Note: Responses from Parent Questionnaire - Hearing-Impaired version.

complex conversations with their children. For mothers, this figure was 69%.

Deaf children tend to have parents with normal hearing. In this sample, 90.9% of mothers have normal hearing or only a mild loss; 9.1% have a severe or profound loss. Among fathers, 88% have normal hearing or only a mild loss, 4.5% have a moderate hearing loss, and 7.5% of fathers of deaf subjects are severely or profoundly deaf themselves.

INSTRUMENTS

Data collection involved both researcher-developed and standardized instruments. Two demographic questionnaires, for parents of hearing and hearing-impaired students, were developed to collect the following information: the child's date of birth, birth order, sex, race, onset of hearing impairment (if handicapped), the size of the family, the parents' socioeconomic status (i.e., parents' education and occupational levels), and the parents' expectations for their child's vocational attainment. The socioeconomic status variable used in this study was a composite of questionnaire items concerning maternal and paternal education, and father's occupation. S.E.S. was computed such that the values of the variable are z-scores with reference to the mean and standard deviations for the total sample, deaf and hearing combined. The questionnaire for parents of hearing subjects has 12 items while parents of the deaf answered 26 items, (see Appendix A for copies of all the instruments used).

A shortened version of the Cultural Participation Scale (Super, 1967) was sent to parents to complete. Versions of the Cultural Participation scale emerged as important predictor variables in both Super's Career Pattern Study (1960) and in the Lerman & Guilfoyle (1970) study. As mentioned in Chapter 2, Lerman and Guilfoyle developed a 45-item version for the deaf. This researcher reduced the 45-item scale to 29 items by eliminating many of the auditory-related items and outdated items. A copy of the shortened version is in Appendix A.

Super (1967) reports the results of a reliability study of the Biographic Inventory, the precursor of the Cultural Participation Scale, which was conducted by Rabinowitz (1965). For subjects at age 18 KR21 reliabilities ranged from .71 to .82 for the 5 scales. For students in grades 11 and 12, the test-retest reliability coefficient for the original Cultural Participation scale with a two-week interval was .93 for boys ($n=40$) and .88 for girls ($n=60$). Rabinowitz tested 70 Career Pattern Study boys at 12th grade and again at age 25 for a stability coefficient of .33 ($p < .05$). In the current study, the internal consistency coefficient (Cronbach's alpha) for the 29-item version was .66 for the hearing group ($n = 261$) and .75 for the deaf ($n = 55$).

The Family Adaptability & Cohesion Evaluation Scales (FACES III) (Olson, Portner & Lavee, 1985) is a 20-item inventory designed to measure the family in terms of its cohesion and adaptability. Both subjects and their parents were asked to complete this instrument. Only the Cohesion scale, as reported by the child, was used in the analyses in this study. The FACES III is based upon the Circumplex Model of marital and family systems. The original 50-item FACES was reduced to 30 items in FACES II

and then to 20 items in the third version. The current version (FACES III) was produced using factor analysis. All 20 FACES III items load on either the cohesion or adaptability factor with loadings between .34 and .69; the ten items on the Cohesion scale have factor loadings of between .39 and .69. The ten Adaptability items have loadings between .34 and .48. While there was considerable association between the two scales on the FACES II ($r=.65$), this was reduced to near zero on the FACES III ($r=.03$).

The FACES respondent is requested to answer each item (e. g. , "Our family does things together") using a four point response scale, with ALL, MOST, SOME, and NONE OF THE TIME options. The cohesion scale is made up of two items in each of 5 subscales: emotional bonding, family boundaries, coalitions, time & friends, supportiveness, and interests & recreation. The adaptability scale is made up of items from 4 subscales: discipline, leadership, control, roles & rules.

The FACES III manual reports internal consistency estimates of .77, .62 and .68 for the cohesion, adaptability and total scores, respectively. Based upon the results from over 2,000 adults and 412 adolescents, norms were devised separately for the following groups: Adults only, parents and children in families with adolescents, and young couples. In the current study, an internal consistency estimate (Cronbach's alpha) for the Cohesion scale was computed to be .83 for the entire sample. The FACES III manual reports test-retest reliability at .83 for the cohesion scale (Olson, Portner & Lavee, 1985). The comparisons of the samples in the present study to the norms are given in Chapter 4.

Circumplex theory would predict a quadratic relationship between scores on the instrument and family functioning. A curvilinear relationship might then be expected between FACES III scores and variables reflecting the level of functioning of the individual. The relationships between the FACES III score used in this study, namely the child's score on the Cohesion scale, and other continuous variables in the models were tested through regression techniques and the examination of scatter plots. Because these relationships were all determined to be linear in nature, no data transformations or alternate scoring procedures were used.

The locus of control orientation of the subjects was measured using the Different Situations Inventory (DSI) (Gardner & Warren, 1977), a 20-item paper-and-pencil test. Subjects were asked to choose one of two possible reactions to each of 20 situations. High scores on the DSI are reflective of an internal locus of control, whereas low scores are indicative of an external locus.

Ifenwanta (1978) reported a test-retest reliability coefficient of .90 on the DSI. With regard to validity, Ifenwanta also reports a correlation of .66 ($p < .01$, $n=40$) between the DSI and scores from the Rotter's Internal-External scale. Gardner, Beatty and Bigelow (1981) reported a correlation ($r=.56$, $p<.001$, $n=48$) between the DSI and the Work Situations Inventory, a measure of locus of control orientation at work. Internal consistency reliability estimate using data from the total sample in the current study was .50.

The dependent variable in this study was career maturity, measured by the Career Development Inventory, School Form (Super et al., 1981).

The purpose of the instrument is to assess the readiness of students to make sound educational and vocational choices. The instrument is divided into five subscales:

Career Planning (CP)

Career Exploration (CE)

Decision-Making (DM)

World-of-Work Information (WW)

Knowledge of Preferred Occupational Group (PO)

These subscales may also be grouped into three scales:

Career Development Attitudes (CP and CE)

Career Development Knowledge and Skills (WW and DM)

Career Orientation Total (CP, CE, WW, and DM)

The Career Attitude Scale, composed of the first two subscales of the CDI, Career Planning and Career Exploration, was the only one used in this study. Aside from time constraints, the rationale for using only these two subscales is given in Chapter 2.

The reliability of the CDI has been well established. Internal consistency alpha coefficients of .89, .77, .64, .84, and .57 have been obtained for the CP, CE, DM, WW, and PO scales respectively (Super et al., 1981). In the present study, a Cronbach's alpha of .90 was obtained for the Career Attitudes scale with the hearing sample, and a coefficient of .86 obtained with the deaf. Instrument validity, although difficult to establish because of difficulties in finding operational definitions for the terms, has been researched and, as concluded by Hilton (1983) "has fared well" for the CDI.

Additional data were obtained from the permanent records of the subjects. Academic achievement was estimated by averaging the available reading and math scores on standardized achievement tests: SRA for all hearing subjects, and SRA or Stanford for hearing-impaired subjects. For all hearing subjects, the 12 Fairfax County and the 2 Roanoke County school deaf subjects, the math and reading SRA "growth scaled scores" were collected. Stanford Achievement Test scaled scores, according to standard norms, were collected for the 51 hearing-impaired subjects from both residential schools. SRA growth scaled scores were collected for the 20 public school subjects. These standardized achievement scores were all transformed to standard scores with mean of 100 and standard deviation of 15, based upon the means and standard deviations of the standard norm group. The standardized math and reading scores were then averaged to produce the final achievement variable used in the analyses.

Degree of hearing loss, in decibels, was also obtained from permanent records of the hearing-impaired subjects. When there was a difference in the degree of hearing loss for the left and the right ears, decibel loss in the better ear was used.

A measure of parental aspirations for the child's occupational attainment was included in this study based upon responses to two items on the parent questionnaire (see Appendix A). Parents were asked to indicate which occupational level they expected their child to enter: professional, skilled, semi-skilled, or not employed outside the home. A response was requested for both the mother's and the father's expectations. Because responses tended to be towards the upper end of the scale (see Table 3), mother's and father's expectations were

classified as either 'professional' or 'non-professional', resulting in more nearly equal sized groups. The parental aspiration variable used in this study was the mean response for the mother and the father.

In the parent questionnaire for parents of deaf subjects, parents were asked about the quality and quantity of each parents' communication with the child (see Appendix A). The quantity item asks the parents to estimate the amount of time, in minutes, each parent spends talking to the child on an average day when the child is home. The quality item asks about the maximum level of complexity possible in their interactions, from "simple commands" to "complex conversations." The Mother-Child communication and Father-Child communication variables were computed by taking the product of the quality and quantity responses for mothers and fathers, respectively.

Socioeconomic status (S.E.S.) was computed by combining responses to three items from the parent questionnaire: mother's education, father's education, and father's occupation. Each variable was reduced to a z-score according to the mean and standard deviation for the total, combined sample. The three z-scores were summed to combine the final S.E.S. values.

PROCEDURES

The CDI, FACES III, and DSI were field tested with four students from VSDB in response to a concern about readability levels. In a telephone conversation on April 9, 1986 Dr. Carolyn Ewoldt, of the Gallaudet University Tutorial Center, expressed skepticism concerning the ability

of hearing-impaired high school students to correctly interpret the items on the three tests to be used in the study. At her suggestion the instruments were administered to the four field test subjects in Staunton, Virginia on April 24th, 1986. These subjects were chosen on the basis of reading level, being between 3.5 and 4.0 grade equivalent. VSDB provided an interpreter, Miss Wolfe to administer all three instruments. Deaf herself and familiar with this particular group of students, she was able to combine American Sign Language (ASL), signed English, and fingerspelling in a way that optimized student comprehension of the items. For each of the three tests, students had a test booklet in front of them in which they marked their answers. Miss Wolfe signed each item while overhead transparencies of the pages of the tests were displayed on a screen. The students were encouraged to ask for clarification or repetition of an item when needed. Appendix B contains the administration instructions given to the interpreter, instructions given to the students, and a letter from Miss Wolfe in which she concludes that all three instruments could be appropriate for similar groups of hearing-impaired youngsters using the same administration techniques.

To administer appropriately to the deaf, Miss Wolfe found it necessary to translate some items containing English idioms into ASL equivalents, ASL being the "native language" for most of these students. During discussions following the administration of each test, these students stated that they had no difficulty interpreting the meanings of items although they did find it difficult at times to select the answer that suited them best, as would any teenager. This was especially true for the CDI, the difficulty being due to the residential students' limited

exposure to employment situations. Thus it was determined that all three instruments were well understood and could be answered without the introduction of systematic error variance associated with their low reading levels. Miss Wolfe and the field test subjects believed that even students with slightly lower reading abilities could deal with all three tests as well as this group had. They also indicated that the sign language interpretation and the overhead projector were helpful in aiding comprehension. The pilot test also verified that all three instruments could be administered in this manner in 50 minutes or less.

Twelve school systems were contacted to request their participation in the study: 3 to seek permission to test nonhandicapped students; 6 for hearing-impaired; and 3 for both. Each system's standard procedures were followed, some requiring committee decisions, others involving less formal channels for approval. Many of the initial contacts with the systems were made the first week of March, 1986. The length of time needed to gain official approval of the research proposal from the school systems ranged from four weeks to eight months. Preliminary approval of the study was received from five of the systems approached for nonhandicapped subjects, but only two of these, Roanoke County and the Central Virginia Magnet School for Science and Technology, cooperated to the point of allowing parents to be surveyed and students to be tested. Three systems approved the study for hearing-impaired students in their schools: Virginia School for the Deaf and Blind in Staunton, Virginia (VSDB); the Model Secondary School for the Deaf (MSSD) on the grounds of Gallaudet University in Washington, D.C.; and Fairfax County Public Schools (FCPS) situated in a northern Virginia suburb of D.C.. Two

additional hearing-impaired subjects were recruited from a high school in Roanoke County. Copies of the approval letters from these systems are found in Appendix C.

After contact had been made with the principals of four Roanoke County high schools, each school provided lists of the names and addresses of students in certain study halls. In one school an advanced-placement (AP) English class was also included. The entire student body of the Magnet School (with 85 students in grades 11 and 12) was contacted for inclusion in the study.

All three of the schools from which hearing-impaired students were recruited preferred to contact the parents of eligible students themselves. Eligibility consisted of a measured reading level of 3.0 or better, placement in grade 10, 11 or 12 or the equivalent, and absence of any visual or physical handicap. The schools then provided the researcher with the names and addresses of consenting parents and their children.

Parents of 1,328 students (1,084 hearing and 244 deaf) were mailed a letter requesting permission for their child to be tested and for their own participation in the study (see Appendix D). Table 6 shows the number of consent forms mailed to and received from the parents of hearing subjects. The overall response rate for this group was 22.4%. Of those contacted 411 (21.8%) agreed to participate and granted permission for their children to be tested and the school records accessed. Table 7 summarizes the process for hearing-impaired subjects. Ninety-one (37%) of the parents of the deaf who received the consent form returned it to the school with an affirmative response. Due to school system policy in

Table 6

Summary of Parent and Subject Data
Collection: Hearing

School	Consent Forms		Permission	Subjects	Parents
	Mailed	Received	Granted	Tested	Participated
Roanoke County					
William Byrd	222	107	95	87	60
Glenvar	219	72	69	45	44
Cave Spring	478	175	169	126	148
Magnet School	85	63	61	60	60
Totals	1,084	417	394	318	339
Percent of					
Forms Mailed		38.5%	36.3%	29.3%	31.3%

Table 7

Summary of Parent and Subject Data Collection - Deaf Sample

School	Estimated Pool	<u>Consent Forms</u>		Permission Granted	Subjects Tested	Parents Participated
		Mailed	Received			
M.S.S.D.	240	163	68	62	49	59
Fairfax County*	81	46	19	18	12	17
V.S.D.B. (Staunton)	60	16	12	8	8	7
Roanoke County	9	9	2	2	2	2
V.S.D.B. (Hampton)	10	10	2	2	0	--
Totals	400	244	103	89	71	85
Percent of Forms Mailed			42%	36.5%	29.1%	34.8%

*Includes subjects from 11 different schools in Fairfax County, Virginia

each of the five participating school divisions there was no follow-up of parents who failed to return the consent forms.

For students in the nonhandicapped group testing began during the last week of October, 1986 and was completed during the second week of December 1986. Students were approached during their study halls (and one group during their AP English class) and given brief instructions (see Appendix E). Most students took between 20 and 40 minutes to complete all three measures: the CDI, the FACES III, and the DSI. In one school, the original list of study hall students included those who would not be in the study halls until the following semester, resulting in nearly half of the students with parental consent being unavailable for testing. The parents of students in this category were not mailed surveys. Although permission was granted for the testing of 411 students, only 336 were finally tested. Included in this process were two hearing-impaired students at one Roanoke County school.

During this same time span, the confidential records of the students who were tested were accessed. The following information was recorded: date of birth, sex, current grade level, SRA growth scale scores for Reading Total, Math Total, Language Total, Composite, and E. A. S. (a general ability score) for both the 8th and 11th grade administrations, if available.

Within one week of the time their children were tested, the parents received their survey package in the mail. Each package contained the following: a personalized letter (see Appendix D); a stamped, addressed return envelope; one copy each of the FACES III, Cultural Participation Index, and the Parent Questionnaire - Nonhandicapped Version. With

follow-up telephone calls, letters and postcards (see Appendix D), 95% of the parent packets were returned for the hearing group.

The process for contacting the parents in the deaf group was the same, the only difference being the inclusion of the Hearing-Impaired Version of the Parent Questionnaire. A 94% response rate was achieved for parents of hearing-impaired subjects. In all three handicapped sites, school employees collected the student data from the confidential records. For this group, the data included date of birth, sex, current grade level (if applicable), race, mainstreaming experience, hearing loss better ear, Stanford Achievement Test - Hearing Impaired version growth scale scores for Reading and Math (for MSSD and VSDB subjects), or SRA Reading and Math scores (for Fairfax County and Roanoke County subjects).

Before testing could begin at MSSD, the students themselves had to be told about the study to decide whether they wanted to participate. Of the 62 students at MSSD with parental permission to participate, six refused to participate, two had been suspended from school, and four never showed up for their testing appointments. The untimely death of the school's principal made follow-up on the four students not tested impossible.

The testing of hearing-impaired subjects was begun in February, 1987, and was completed in April, 1987. At VSDB, one testing session was required to test the 8 subjects from that school, while MSSD required four administrations with from 5 to 20 students per session. Test administration at both of these schools paralleled procedures in the pilot study including the use of test booklets, projection, and sign language

interpretation. Testing time was similar to the pilot study, approximately 50 minutes.

The 19 students in Fairfax County Schools for whom informed consent was received were distributed among 11 schools, only one of these having more than two subjects. The Director of Hearing-Impaired Education in FCPS preferred to assume responsibility for arranging all test administrations. He assigned the task to the schools' special education teachers. The researcher provided the administration instructions, overheads, tests, pencils, and forms for recording data from records (see Appendix E).

Table 8 shows the frequencies of students for whom parental surveys were received and who were ultimately tested (i. e. , had valid scores on the Career Development Inventory). Only those students with valid CDI scores were used in the subsequent data analyses: 318 hearing, and 71 hearing-impaired.

DATA ANALYSIS

The data were coded and entered into Virginia Tech's mainframe computer. All subjects and their parents were assigned code numbers to insure confidentiality. A copy of the codebook is in Appendix A. Edit checking was done by obtaining frequencies for all variables and checking for out-of-range values and data points that were out of place on the records. Cross-checks were also done on the consistency of variables coming from more than one source, such as birth date, which was obtained

Table 8

Frequencies of Subjects With Test Data and Data From Parent Questionnaire

Parent Data	Hearing Sample Test Data				Deaf Sample Test Data			
	No	Yes	Row Total	Row %	No	Yes	Row Total	Row %
No	0	18	18	5.1	2	3	5	5.6
Yes	38	300	338	94.9	17	68	85	94.4
Column Total	38	318	356		19	71	90	
Column Percent	10.7	89.3			21.1	78.9		

both from parents and permanent records. All analyses of this type were conducted using SPSSX (SPSS, 1983).

After the edit checking was complete the linearity of relationships among variables in the model was examined. The expected quadratic relationship between cohesion and career maturity was not found, perhaps because there were very few families at the upper end of the FACES III Cohesion scale (i. e. in the "enmeshed" category). This finding was consistent with the linear relationship between FACES and Career Development Inventory (CDI) scores found by Hesser (1981). No other intervariable relationships were found to deviate significantly from linearity based on the results of multiple regression trend analyses and the examination of scatter plots.

The variables found in the theoretical and empirical literature on the career development of the nonhandicapped were arranged in a recursive, fully identified causal model (see Figure 2 in Chapter 2). Race, although originally considered for inclusion in the model, was not included in the analyses due to the paucity of nonwhite subjects. The variables are arranged from left to right in order of hypothesized temporal sequence; the background (or "exogenous") variables in the far left block are expected to influence all of the other variables (the "endogenous" variables) in the blocks to their right, which in turn influence other endogenous variables in blocks still further to the right. Although not indicated in the drawings of either Model 1 or Model 2 (see Figure 3 in Chapter 2), it is assumed that there is a path from each variable to every other variable to its right. In this path analysis, each endogenous variable in the model was regressed on all of the variables in the blocks

to its left. The "independent" variables in each regression are also referred to as "predictor" or "predetermined" variables. The coefficients that result from these regression analyses are referred to as "path coefficients." The metric coefficients are referenced as "b" and the standardized coefficients as "β." The definitions of the variables associated with the labels in the figures and tables are listed in Table 9.

Path coefficients for this model were calculated using a program called GEMINI (Wolfle & Ethington, 1985). The model was tested first with the data from the 318 hearing subjects, and again with the data from the 71 hearing-impaired. GEMINI accepts a correlation matrix among the variables, vectors of the means and the standard deviations, and the number of subjects in the sample as input. There were, among the 318 and 71 cases, some cases with missing values for one or more variables. For the purpose of all GEMINI and subsequent LISREL runs, sample sizes of 307 and 69 were assumed, (these values being the mean number of cases represented by each variable). The correlation matrices (pairwise), means and standard deviations used in the analyses are shown in Chapter 4.

GEMINI computes a series of multiple regressions, one for each endogenous variable in the model. There were six regressions associated with testing Model 1 and nine for testing Model 2. The coefficients associated with these analyses are the direct effects. The GEMINI program yields tables of total and indirect effects, and tests the significance of the indirect effects. All of these results are reported for both groups in Chapter 4. The overall adequacy of each model was determined

Table 9

Definitions of variables used to build the models.

Label	Definition
SEX	Gender as reported in records. 0=Male, 1=Female.
AGE	Age as of January 1, 1987 in years and months (as decimal). As reported by parents.
FAED	Father's Education as reported by parents. 1=Less than H.S., 2=High School, 3=Some college, 4=College, 5=Some grad school.
MAED	Mother's education as reported by parents. Same codes as FAED.
FAOCC	Father's Occupation as reported in parent questionnaire. Originally coded Professional, Skilled, Semi-skilled, Unemployed. Now 2=Professional, 1=Nonprofessional.
SES	Socioeconomic status of parents. FAED, MAED, and FAOCC were standardized and summed.
ONSET	Child's age at the onset of the hearing loss in years, rounded down.
LOSS	Subject's hearing loss in the better ear, PTA (pure tone average). When data not available from records, parents' estimate used.
CCOHES	Subject's cohesion score from FACES III. Describes subject's opinion of the cohesiveness of the family. Low score is "disengaged", high score means "enmeshed".
PASPIR	Average of mother's and father's aspirations for child. FASPIR and MASPIR coded 1=Not employed outside the home; 2=Semi-skilled; 3=Skilled; 4=Professional.
CULT	Total score on Cultural Participation Scale. Reflects amount of reading child does, as well as material possessions available in home.
TIMEM	Estimate of amount of time mother spends communicating with subject on days when subject is home. In minutes. From parent questionnaire.
TIMEF	Estimate of the amount of time father spends communicating with subject on days when subject is home. In minutes. From parent questionnaire.

Table 9 Continued

Label	Definition
EASEM	Estimate, from parent questionnaire, of the ease with which mother can communicate with the subject easily. 1=Can give commands only; 2=Small talk; 3=Simple conversations; 4=Complex conversations.
EASEF	Estimate, from parent questionnaire, of the ease with which father can communicate with the subject easily. 1=Can give commands only; 2=Small talk; 3=Simple conversations; 4=Complex conversations.
MCCOMM	Mother-child communication. Product of TIMEM and EASEM.
FCCOMM	Father-child communication. Product of TIMEF and EASEF.
DSI	Different Situations Inventory score. High score indicates internal locus of control, low score external.
ACHT	Achievement. Mean of standardized scores on reading and math.
MSTREAM	Mainstreaming experience. Originally coded: 1=Mainstreamed; 2=Resource; 3=Self-contained; 4=Residential; 5=Day at residential. Recoded: 1=Public School program; 2=Residential school program.
CDA	Career Development Attitudes score as computed in Career Development Inventory manual. Composite of Career Exploration and Career Planning subscales. High scores mean greater planning and exploration on the part of the subject.

for each group by examination of the squared multiple correlation coefficient for the regression of the outcome variable, CDA, on the other eight variables in Model 1.

Hypotheses 2 and 3 were tested using the LISREL VI (Joreskog & Sorbom, 1986), a computer program that analyzes linear structural relationships by the maximum likelihood method. Of the eight matrices of parameters that LISREL uses to describe the model, the two of interest in this study are the "gamma" and "beta" matrices. The gamma ("GA") matrix contains the path coefficients from each of the exogenous variables to each of the endogenous variables:

To (Endogenous variables)	From (Exogenous Variables)		
	1. Sex	2. Age	3. S. E. S.
	—		—
1. PASPIR	[GA (1,1)	GA (1,2)	GA (1,3)]
2. CCOHES	[GA (2,1)	GA (2,2)	GA (2,3)]
3. CULT	[GA (3,1)	GA (3,2)	GA (3,3)]
4. DSI	[GA (4,1)	GA (4,2)	GA (4,3)]
5. ACHT	[GA (5,1)	GA (5,2)	GA (5,3)]
6. CDA	[GA (6,1)	GA (6,2)	GA (6,3)]
	[—		—]

The beta ("BE") matrix contains the path coefficients among the endogenous variables:

To	From					
	PASPIR	CCOHES	CULT	DSI	ACHT	CDA
1. PASPIR	[0]
2. CCOHES	[0	0]
3. CULT	[0	0	0]
4. DSI	[BE (4,1)	BE (4,2)	BE (4,3)	0]
5. ACHT	[BE (5,1)	BE (5,2)	BE (5,3)	0	0]
6. CDA	[BE (6,1)	BE (6,2)	BE (6,3)	BE (6,4)	BE (6,5)	0]
	[—					—]

A chi-square statistic is reported that indicates the ability of the program to reproduce the matrix that was input. In the case of a fully identified model the chi-square statistic always equals 0 (with 0 degrees of freedom) since there is only one possible solution. This is also true when running the multi-group procedure for which a single chi-square is reported for the two groups. By constraining the parameters in the deaf group to be equal to the parameters for the hearing, one path at a time, it was determined whether there were any paths in Model 1 that were significantly different for the two groups. This was determined by first running the LISREL multi-group procedure without constraining any of the

parameters to be equal, then comparing the resultant chi-square statistic, which would be zero with 0 degrees of freedom, with that obtained from each of the subsequent runs, each of which constrained a single element of the Beta or Gamma matrices to be equal. The difference between the two chi-squares and their associated degrees of freedom provides the chi-square and degrees of freedom of the difference obtained (see Table 17 in Chapter 4). When the chi-square of the difference is significant, this indicates that the estimates of the constrained parameter are different for the two groups.

The total effects of the independent variables on career maturity were compared for the two groups. This was done by reformulating the LISREL model such that the CDI Attitude score (CDA) was regressed first on the three exogenous (background) variables. Using the LISREL multi-group procedure and constraining each of the three paths to be equal, one at a time, the chi-square term was compared with the chi-square term from the unconstrained test (0, 0 df) (see Table 19 in Chapter 4). Next, career maturity was regressed on the three exogenous variables plus the three variables in the second block with each of the new paths constrained one at a time and the resultant chi-squares compared to zero. Finally, career maturity was regressed on all eight variables in the model and each of the paths from the two final variables constrained and the chi-square compared to zero.

Figure 3 in Chapter 2 shows a model of career maturity developed after consideration of the literature on hearing-impaired adolescents and career development. This model was also tested using the GEMINI program. The results of this analysis is found in Tables 21 and 23 in Chapter 4.

To compare the relative abilities of Model 1 and Model 2 to explain the variance in career maturity for hearing-impaired adolescents, the squared multiple correlation coefficients for the two full models were compared using equation 3.27 in Pedhazur (1982).

CHAPTER 4: RESULTS

This chapter includes, first, a comprehensive description of the sample, then a report of the results of the analyses associated with the testing of each hypothesis.

DESCRIPTION OF SAMPLE

The hearing and hearing-impaired subjects involved in this study were described in some detail in the Subjects section of Chapter 3. The discussion in this chapter is more concerned with those characteristics that relate directly to the variables under investigation. For each of the variables in Model 1, descriptive statistics are presented for the hearing, deaf and, when available, the norm groups. The descriptive statistics are shown in Tables 1, 10 and 11.

On the Career Development Inventory -- Attitude Scale (CDA) the hearing-impaired sample had an average score of 103.61 (SD = 15.23), which is essentially at the mean reported for the norm group of high school students (M = 103.00, SD = 20.10). The hearing students scored slightly higher on career maturity (M = 106.98, SD = 18.48).

The average locus of control score on the DSI for the norm group of high school students is 13.77 (SD = 3.05) according to the Different Situations Inventory manual. Given this reference point, average scores for both groups were near the mean although straddling it from different sides. The hearing subjects in this study tended to be slightly more

Table 10

Correlations, Means, and Standard Deviations Among Variables in Model 1
Predicting Career Maturity: Deaf Sample (n=71)

Variables	1	2	3	4	5	6	7	8	9
1. CDA									
2. DSI	.177*								
3. ACHT	-.351***	.007							
4. PASPIR	.000	-.093	.271**						
5. CCOHES	.306***	.142	-.119	-.116					
6. CULT	-.104	.136	.233**	.381***	-.035				
7. SEX	.003	.004	-.033	-.047	-.067	.200*			
8. AGE	.123	.058	-.113	-.196*	-.207*	-.018	-.119		
9. SES	-.019	.040	.277**	.411***	-.026	.267**	-.101	-.075	
<u>M</u>	103.6	13.0	88.5	.394	35.0	15.1	.437	17.5	-.110
<u>SD</u>	15.2	2.3	13.3	.447	5.9	5.0	.499	1.4	3.0

Note: See Table 9 for variable definitions. SEX: 0=Male; 1=Female.

*p < .10
 **p < .05
 ***p < .01
 +p < .001

Table 11

Correlations, Means, and Standard Deviations Among Variables in Model 1
Predicting Career Maturity: Hearing Sample (n=318)

Variables	1	2	3	4	5	6	7	8	9
1. CDA									
2. DSI	.306***								
3. ACHT	.044	.071							
4. PASPIR	.028	-.045	.346***						
5. CCOHES	.273***	.191*	-.084	-.092					
6. CULT	.026	.119	.246**	.200**	-.037				
7. SEX	.072	-.009	.045	-.060	.057	.134			
8. AGE	.228**	.095	.106	.009	-.005	-.062	-.105		
9. SES	-.070	-.043	.308***	.244**	.028	.123	-.034	.013	
<u>M</u>	107.7	14.5	115.4	.755	33.7	15.5	.509	16.5	.005
<u>SD</u>	19.1	2.7	10.7	.395	7.5	4.8	.501	.9	2.333

Note: See Table 9 for variable definitions. SEX: 0=Male; 1=Female.

*p < .10
 **p < .05
 ***p < .01
 +p < .001

internal in their locus of control orientation than average ($M = 14.18$), being more likely to attribute events to their own behaviors than to forces outside of themselves. The hearing-impaired subjects were slightly more likely than average to feel controlled by other people and events, i. e. , to have an external locus of control ($M = 12.96$).

In both reading and math the hearing sample achieved approximately one standard deviation above their norm group peers (Science Research Associates, 1981), (see Table 1). On the Stanford and SRA math and reading tests, the deaf subjects in this study tended to score about one standard deviation above the norm group of deaf peers in high school. In reading, this represents a score one standard deviation below the mean of the Stanford and SRA published norms, and in mathematics this is approximately one-half standard deviation below the mean from the published norms.

The means and standard deviations for parental aspirations are shown in Tables 10 and 11. A comparison indicates that the parents of hearing subjects expressed higher expectations for their children's occupational attainment ($M = .755$, $SD = .395$) than did the parents of subjects in the hearing-impaired sample ($M = .394$, $SD = .447$). These values mean that 75.5% of the parents of hearing subjects believe their children will eventually enter a "professional" occupation as opposed to an occupation in either the skilled or semi-skilled categories. Of the parents of hearing-impaired subjects, 39.4% expect their children to attain "professional" occupations, and 60.6% believe their children will either work in skilled or semi-skilled occupations, or will not work outside the home at all.

An examination of the average cohesion scores from the FACES III for the two groups (see Tables 10 and 11) and the percentages of subjects in the four cohesion categories (Table 12) suggests that the deaf ($M = 34.96$) and hearing subjects ($M = 33.91$) in this study rated their families similarly. Scores on the cohesion scale can be divided into four categories from the low end of the scale to the high: disengaged, separated, connected, and enmeshed. The two middle categories are considered to be in the "balanced" range while the two end categories are considered "extreme." For both groups, the cohesion of the family tended to be rated slightly lower than the norm group average for families with adolescents ($M = 37.10$) which places the means for both groups in the 'separated' category. For both groups, the sample distribution is positively skewed with fewer than 4% of cases in each group falling in the highest, 'enmeshed' category.

As can be seen in Tables 10 and 11 the two groups are also quite comparable with respect to the Cultural Participation Scale (hearing group: $M = 15.5$; deaf group: $M = 15.1$). No norms are available for comparison.

Hearing-impaired students frequently remain in high school past the age of 18. As noted in Chapter 3, the deaf subjects averaged one year older ($M = 17.54$, $SD = 1.36$) than their hearing counterparts ($M = 16.5$, $SD = 1.09$). The range in age for the deaf group was 15 to 20 years, and 14 to 19 years for the hearing group.

Finally, in terms of the socioeconomic status of the families of these subjects, the families of the hearing-impaired were approximately one-third of a standard deviation lower than the families of hearing

Table 12

Percentage of Families in Circumplex Model Categories
Based on FACES III Scores: Hearing Sample, Deaf
Sample, and Norms

	Norms ¹		Sample ²	
			Hearing	Deaf
	Range	%	%	%
Cohesion				
Disengaged	10-31	18.6	35.8	33.8
Separated	32-37	30.3	43.1	47.9
Connected	38-43	36.4	17.9	16.9
Enmeshed	44-50	14.7	3.1	1.4
Adaptability				
Rigid	10-19	15.9	11.6	4.2
Structured	20-24	37.3	35.2	26.8
Flexible	25-29	32.9	29.6	38.0
Chaotic	30-50	13.9	23.6	31.0
Circumplex type				
Balanced	-	51.1	30.2	42.3
Midrange	-	39.8	44.7	36.6
Extreme	-	9.1	25.2	21.1

¹(Olson, 1985). Norms based on data from 1,315 families with adolescents. Cohesion \bar{M} = 37.1, SD = 6.1. Adaptability \bar{M} = 243, SD = 4.8.

²Based on parent-child average.

subjects. S.E.S., in this case, is a combination of maternal and paternal education, and paternal occupational level (see Table 3 in Chapter 3).

One difficulty in conducting research with deaf subjects is insuring that the subjects' scores on the instruments used are not a reflection of reading ability, but rather reflect the construct, or constructs, of interest. Although the reading ability of deaf subjects in this study is poor relative to the published norms for children their age, this deficit does not appear to have had a negative influence on their performance on any of the three instruments they completed themselves. The correlation between reading and locus of control (DSI) scores for this group was .019, and -.136 between cohesion (CCOHES) scores and reading. These two correlations were similar for the hearing sample, being .051 and -.065, respectively. For the hearing-impaired subjects higher reading scores were associated with lower career maturity (CDA) scores ($r = -.332$, $p < .01$). The corresponding correlation was .054 for the hearing group. A discussion of this unexpected discrepancy between the two groups in the relationship between reading and CDA, and the surprising direction of the relationship for the hearing-impaired group, is presented in chapter 5.

HYPOTHESIS TESTING

Hypothesis 1: Adequacy of Model 1

The first question with which this research was concerned was whether the variables in Model 1 (see Figure 2) describe the career development

process for hearing-impaired adolescents as well as they do for their hearing counterparts. This question was answered by comparing the results for the deaf and hearing groups when career maturity scores (CDA) were regressed on the other 8 variables in the model (see Table 13). For the hearing subjects, these variables explain 20% of the variance in CDA scores ($R^2 = .202$, $p < .001$). These same eight variables in Model 1 explain more of the variance (28%) in career maturity for the deaf group ($R^2 = .277$, $p < .05$).

These results suggest that Model 1 is not inferior in explaining the variance in career maturity for deaf subjects as compared to hearing subjects as had been anticipated. Because the direction of the actual difference in R^2 was the opposite of that hypothesized, i. e. , the variance explained was actually greater for the deaf sample, no statistical test of the difference was called for. Thus, Hypothesis 1 is not supported by the results of this study.

Hypothesis 2a: Individual paths differ in strength

The second hypothesis tested in this study concerned whether the relationships among the variables in Model 1 would differ for the hearing and hearing-impaired samples. The GEMINI program (Wolfe & Ethington, 1985) produced the path coefficients presented in their metric form in Table 13. The standardized path coefficients are presented in Table 14. These coefficients represent the direct effects of the predetermined variables on each of the 6 dependent variables. Standard errors of path coefficients for Model 1 are presented in Table 25 in Appendix G.

Table 13

Structural Coefficients in Metric Form for Model of Career Maturity: Model 1

Predetermined Variables	DEPENDENT VARIABLES											
	HEARING (n = 307)						DEAF (n = 69)					
	PASPIR	CCOHES	CULT	DSI	ACHT	CDA	PASPIR	CCOHES	CULT	DSI	ACHT	CDA
SEX	-.041	.875	1.268**	-.184	1.321	3.197	-.024	-1.159	2.329**	-.090	-1.658	2.411
AGE	.000	.006	-.262	.302*	1.379**	4.489+	-.056	-.963*	.116	.105	-1.084	2.170
SES	.041+	.097	.262**	-.067	1.044+	-.751	.058+	-.103	.483**	.048	.781	.227
PASPIR				-.312	6.874*	3.802				-.861	3.017	7.458
CCOHES				.069+	-.090	.594+				.057	-.281	.806***
CULT				.086***	.366***	-.007				.090	.409	-.447
DSI						1.721+						1.053
ACHT						.039						-.375***
R ²	.062+	.004	.037**	.071***	.219+	.202+	.196***	.054	.124**	.068	.141	.277**

*p < .10
 **p < .05
 ***p < .01
 +p < .001

Table 14

Structural Coefficients in Standardized Form for Model of Career Maturity: Model 1

Predetermined Variables	DEPENDENT VARIABLES											
	HEARING (n = 307)						DEAF (n = 69)					
	PASPIR	CCOHES	CULT	DSI	ACHT	CDA	PASPIR	CCOHES	CULT	DSI	ACHT	CDA
SEX	-.052	.058	.133**	-.035	.062	.084	-.027	-.098	.233**	-.019	.062	.079
AGE	.000	.001	-.050	.103*	.117**	.213 +	-.169	-.222*	.031	.061	-.110	.193
SES	.242 +	.030	.128**	-.059	.228 +	-.092*	.395 +	-.053	.293**	.063	.177	.045
PASPIR				-.046	.254 +	.079				-.164	.101	.219
CCOHES				.197 +	-.064	.235 +				.143	-.124	.311***
CULT				.154***	.164***	-.002				.192	.153	-.146
DSI						.240 +						.162
ACHT						.022						-.328***
R ²	.062 +	.004	.037**	.071***	.219 +	.202 +	.197***	.054	.124**	.068	.141	.277***

*p < .10
 **p < .05
 ***p < .01
 +p < .001

In the sections that follow, the results relating to Hypothesis 2a are presented. The paths in Model 1 that appear to be important in describing the process of becoming career mature are described, first, for the hearing sample, and then for the hearing-impaired. Next, strong indirect effects among variables in the model are discussed for each group. Following that discussion, those paths that differ in magnitude for the two groups are highlighted, and the results of the tests of significance of the differences are presented.

Important Paths for the Hearing Group

The paths shown in Figure 4 represent important chains of influence among the first model's eight predictor variables in effecting the outcome variable, Career Development Attitudes, for the hearing group. Only those paths that were part of a chain of paths leading to CDA are included in the figure. For example, there were four significant paths that ended at the achievement variable, i. e. , those from age, S.E.S. , parental aspirations, and cultural participation. Because achievement does not have either a direct or an indirect effect on the outcome variable, none of these paths are shown in Figure 4. The significant path from S.E.S. to parental aspirations has also been left off the figure since the parental aspirations variable has no effect on CDA. When a significant relationship or path is described in the sections that follow, it is to be understood that it is being discussed in the context of the appropriate regression analysis, with the other predetermined variables in that particular model held constant.

Table 15

Total, Direct and Indirect Effects (Metric) for Model 1: Hearing Sample (n = 307)

From	DEPENDENT VARIABLES																	
	CULT			CCOHES			PASPIR			ACHT			DSI			CDA		
	T	D	I	T	D	I	T	D	I	T	D	I	T	D	I	T	D	I
SES	.262	.262**	-	.097	.097	-	.041	.041	-	1.413	1.044+	.369*	-.050	-.067	.016	-.571	-.751*	.180
AGE	-.262	-.262	-	.006	.006	-	.000	.000	-	1.284	1.379**	-.095	.280	.302*	-.022	5.027+	4.489+	.538
SEX	1.268	1.268**	-	.875	.875	-	-.041	-.041	-	1.426	1.321	.105	-.003	-.185	.182*	3.604	3.197	.407
CULT										.366	.366***	-	.086	.086***	-	.155	-.007	.162*
CCOHES										-.090	-.090	-	.069	.069+	-	.710+	.594+	.116*
PASPIR										6.874	6.874+	-	-.312	-.312	-	3.532	3.802	-.269
ACHT																.039	.039	-
DSI																1.721+	1.721+	-

*p < .10

**p < .05

***p < .01

+p < .001

The first chain of significant paths that can be traced on Figure 4 goes from sex to cultural participation, to locus of control, to CDA. Specifically, females tend to have greater cultural opportunities, in the form of tools and equipment, and to read a greater variety of books and magazines, than do males ($p < .05$); those hearing subjects with greater cultural participation tend to be more internal in their locus of control orientation ($p < .01$); and those with more internal locus of control tend to have greater scores on the CDI Attitude scale ($p < .001$).

The next chain reaches from age, to locus of control, to CDA. Here it can be seen that older hearing subjects tend to have more internal locus of control ($p < .10$), and that more internal locus of control is associated with greater scores on the CDA ($p < .001$). There also exists a significant direct path from age to CDA ($p < .001$). Thus, age influences career development attitudes directly, and indirectly through its association on locus of control.

Another important chain for hearing subjects runs from S.E.S. to cultural participation, to locus of control, terminating at CDA. Those subjects with greater parental socioeconomic status tend to have greater cultural participation scores ($p < .05$); those with greater cultural participation scores tend to have a more internal locus of control ($p < .01$); and, again, those with more internal locus of control score higher on the CDA ($p < .001$).

Two important chains start at the family cohesion variable, one direct and the other indirect. The subject's report of the family's level of cohesion is associated with locus of control, with greater cohesion scores being associated with more internal locus of control ($p < .001$); and more

internal locus of control is associated with greater career maturity. Cohesion also has a direct, positive influence on career maturity ($p < .001$).

The final chain is the single, direct link between locus of control and CDA. As has been seen above, this path has been the final link in several of the previously mentioned chains.

Important Paths for the Deaf Group

The pattern of important paths for the deaf sample, shown in Figure 5, is somewhat different from that for the hearing sample. For example, the effect of achievement on career development attitudes is an important link for the deaf sample, although achievement had a negligible effect for the hearing sample. For the deaf group, lower standardized achievement scores were associated with higher CDA scores ($p < .01$). The direction of this relationship for the deaf group is contrary to what was expected. With nonhandicapped groups, there tends to be no relationship between achievement and career development attitudes (Westbrook, 1983). The implications of this unexpected result are addressed in chapter 5.

Another chain for the hearing-impaired sample goes from age, to cohesion, to CDA. Younger subjects in this group tended to rate their families as more cohesive ($p < .10$); and those students who rated their families more cohesive had higher CDA scores, ($p < .01$). The final chain for this group is the direct link between family cohesion and CDA ($p < .01$).

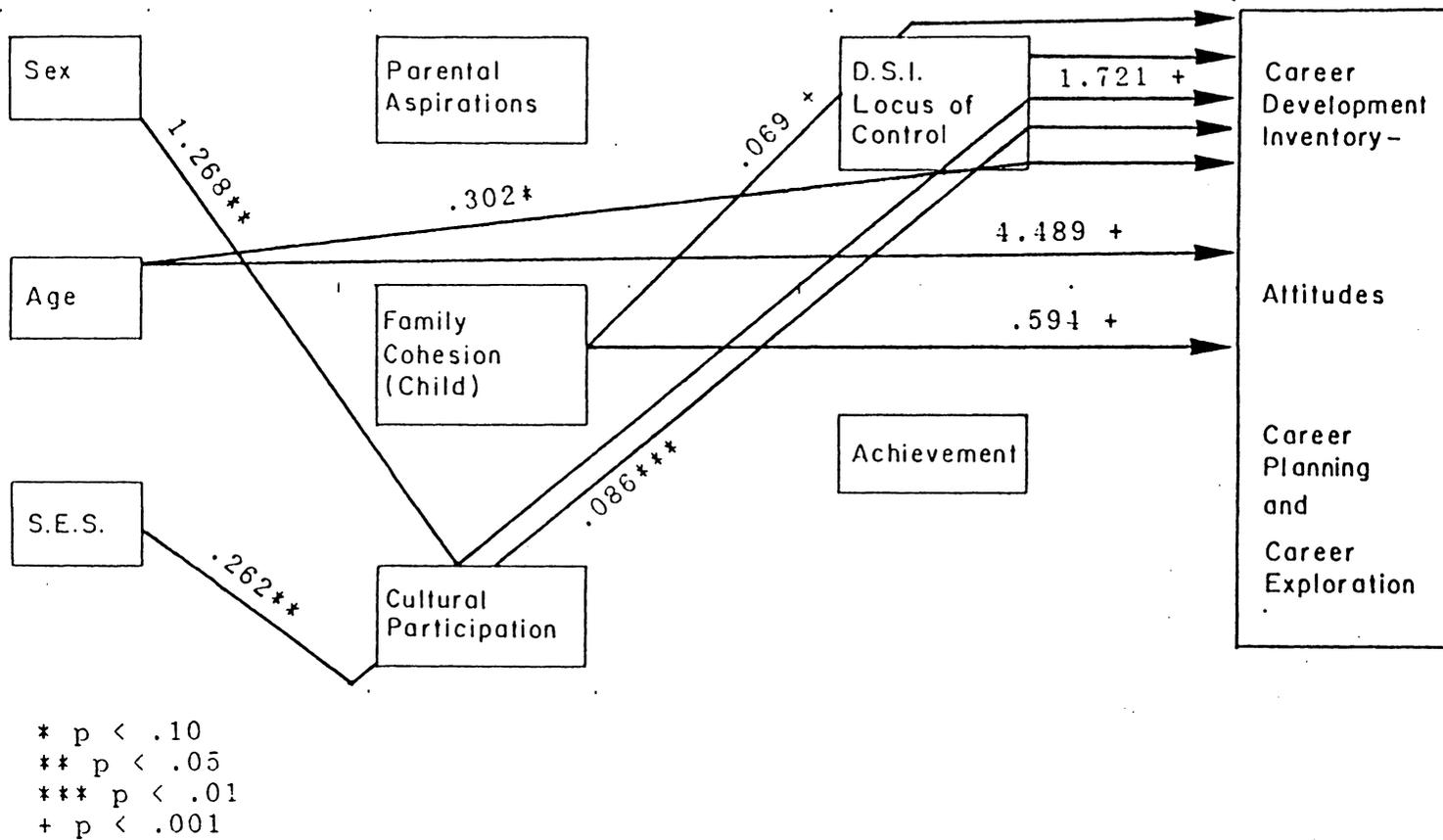


Figure 4. Important paths in Model 1 (with metric values) in influencing career development attitudes: Hearing group.

Because of the small size of the hearing-impaired sample, some potentially important paths proved not to be statistically significant. These paths are shown in Figure 5 with broken lines. The chains including these paths are discussed below. Take, for example, the direct link between age and career development attitudes: older subjects had a tendency to score higher on the CDA ($p = .102$). Although not significant, this result represents an important trend for the hearing-impaired group.

Another such chain for the deaf group runs from S.E.S. to parental aspirations for the subjects' occupational attainment, to Career Development Attitudes. In this case, higher parental S.E.S. was associated with greater parental aspirations ($p < .001$); and those deaf subject's with higher parental aspirations scored higher on the CDA ($p = .101$). The direct effect of parental aspirations on CDA is also included as an important path by itself.

Parental socioeconomic status is the beginning point of two other potentially important chains of influence in Model 1 for the deaf group. Subjects with higher S.E.S. scores tended to score higher on cultural participation ($p < .05$); those with higher cultural participation scores tended to have higher achievement scores ($p = .252$); and those with higher achievement scores had lower scores on the CDA ($p < .01$). S.E.S. also tends to effect achievement directly such that subjects with higher S.E.S. scores tend to have higher achievement scores ($p = .178$); and those with higher achievement scores had lower CDA scores.

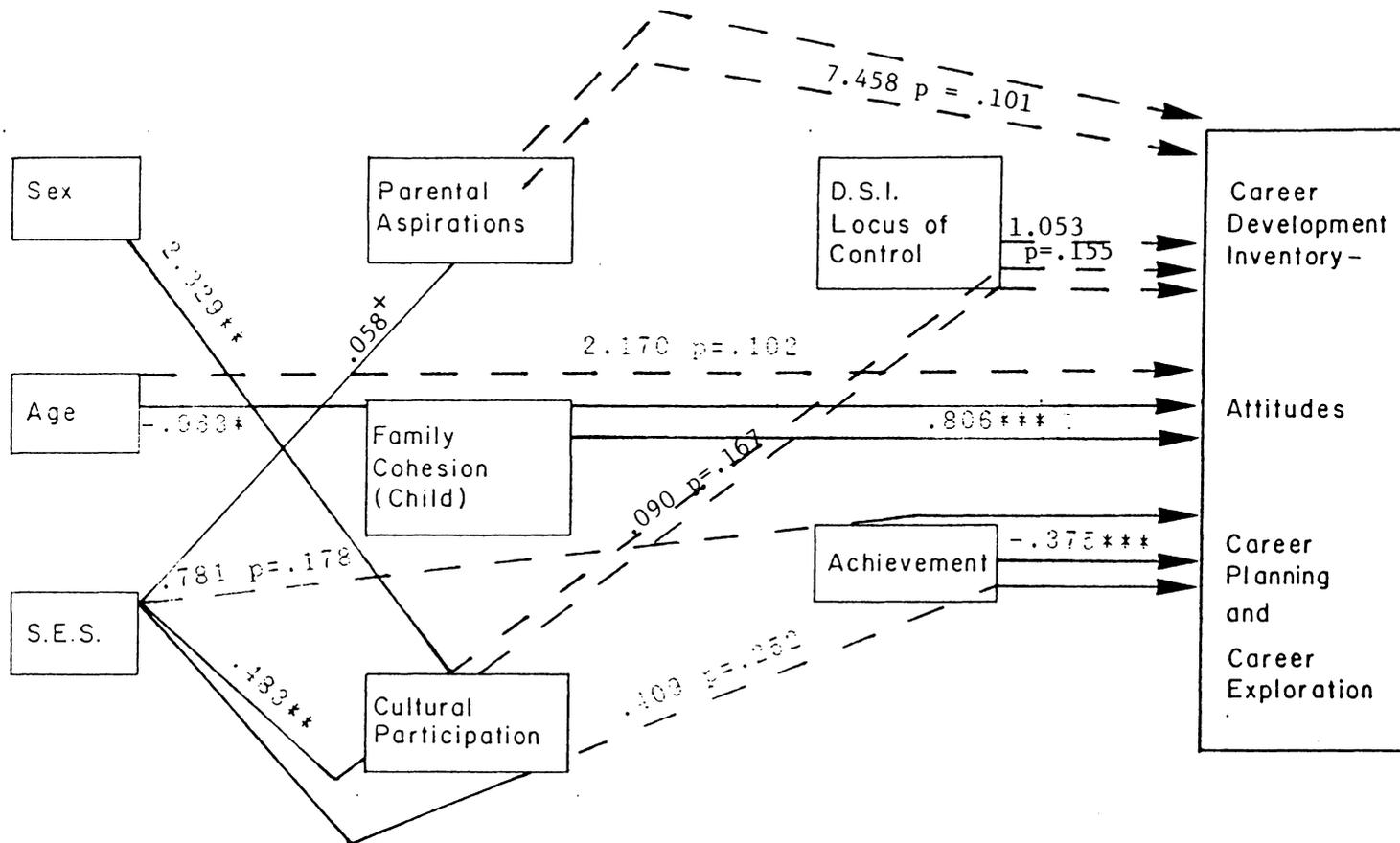
Another potentially meaningful chain goes from sex to cultural participation, to locus of control, to CDA. Females tend to have greater cultural participation scores ($p < .05$); deaf subjects with higher

cultural participation scores tend to be more internally controlled ($p = .167$); and those with more internal locus of control scores tend to have higher CDA scores ($p = .154$). A similar chain can be drawn from S.E.S. to cultural participation to locus of control to CDA. Higher parental S.E.S. is associated with greater cultural participation scores ($p < .05$); and, as above, greater cultural participation scores are associated with more internal locus of control, which is associated with higher CDA scores. One could also count the direct effect of locus of control on CDA as an important chain by itself.

These last two chains are the same as two chains reported for the hearing group for whom every path in both chains was significant. Although the coefficients for two of the links failed to reach statistical significance at the .10 level for the deaf (CULT to DSI; DSI to CDA), an inspection of Table 13 reveals that the metric coefficients of the individual paths in these two chains are nearly identical for both the hearing and the deaf samples.

Indirect Effects for the Hearing Group

Total, direct, and indirect effects for the hearing sample are presented in metric form in Table 15. For the hearing group, four significant indirect effects were noted. There was a significant indirect effect from cohesion to CDA ($p < .01$). As can be seen in Figure 4, locus of control appears to act as an intermediary between cohesion and CDA. Cultural participation had no direct effect on CDA, but the results did reflect an indirect effect ($p < .05$), apparently through the locus of



* p < .10
 ** p < .05
 *** p < .01
 + p < .001

Figure 5. Important paths in Model 1 (with metric values) in influencing career development attitudes: Deaf group.

control variable. The subject's sex effected locus of control indirectly ($p < .05$), most likely by influencing cultural participation. And socioeconomic status had both a direct ($b = 1.044$, $p < .001$) and an indirect effect ($b = .369$, $p < .05$) on the subjects' achievement.

Indirect Effects for the Deaf Group

Table 16 presents the total, direct, and indirect effects in metric form for the deaf sample. There were no statistically significant indirect effects for this group. The effect of S.E.S. on achievement, however, tended to be both direct ($b = .782$, $p = .178$) and indirect ($b = .403$, $p = .139$). This same trend was noted for the hearing sample.

Testing Hypothesis 2a

Although it has been shown that the chains of influence among the eight predetermined variables, culminating in an effect on career development attitudes, are somewhat different for the hearing and deaf samples, hypothesis 2a is concerned with differences in the individual paths themselves. Table 17 presents the results of the multi-group LISREL comparisons.

Two of the 29 paths in Model 1 had coefficients that differed significantly in magnitude for the hearing and deaf samples (see Table 17). For the hearing group, achievement had no effect on CDA ($b = .039$). Greater standardized achievement test scores were associated with lower CDA scores for the deaf, however ($b = -.375$, $p < .01$). The difference

Table 16

Total, Direct and Indirect Effects (Metric) for Model 1: Deaf Sample (n = 69)

From	DEPENDENT VARIABLES																	
	CULT			CCOHES			PASPIR			ACHT			DSI			CDA		
	T	D	I	T	D	I	T	D	I	T	D	I	T	D	I	T	D	I
SES	.483	.483**	-	-.103	-.103	-	.059	.059+	-	1.185	.782	.403	.036	.049	-.013	-.042	.227	-.269
AGE	.115	.115	-	-.961	-.961*	-	-.056	-.056	-	-.935	-1.084	.150	.109	.105	.004	1.393	2.170	-.776
SEX	2.329	2.329**	-	-1.159	-1.159	-	-.024	-.024	-	-.450	-1.658	1.208	.075	-.090	.165	.507	2.411	-1.904
CULT										.409	.409	-	.090	.090	-	-.505	-.447	-.058
CCOHES										-.281	-.281	-	.057	.057	-	.971***	.806***	.165
PASPIR										3.017	3.017	-	-.861	-.861	-	5.421	7.458	-2.037
ACHT																-.375***	-.375***	-
DSI																1.053	1.053	-

*p < .10
 **p < .05
 ***p < .01
 +p < .001

Table 17

Tests of Group Differences in Magnitudes of Individual Paths

From	To	Parameter	$\Delta\chi^2$ ¹	p
SEX	PASPIR	GA (1,1)	.02	.875
AGE	PASPIR	GA (1,2)	1.63	.201
SES	PASPIR	GA (1,3)	.86	.353
SEX	CCOHES	GA (2,1)	1.51	.219
AGE	CCOHES	GA (2,2)	1.88	.170
SES	CCOHES	GA (2,3)	.46	.500
SEX	CULT	GA (3,1)	.70	.404
AGE	CULT	GA (3,2)	.53	.465
SES	CULT	GA (3,3)	1.00	.318
SEX	DSI	GA (4,1)	.02	.884
AGE	DSI	GA (4,2)	.53	.446
SES	DSI	GA (4,3)	.92	.339
PASPIR	DSI	BE (4,1)	.43	.510
CCOHES	DSI	BE (4,2)	.06	.814
CULT	DSI	BE (4,3)	.78	.376
SEX	ACHT	GA (5,1)	.10	.751
AGE	ACHT	GA (5,2)	3.42	.065
SES	ACHT	GA (5,3)	.19	.664
PASPIR	ACHT	BE (5,1)	.81	.369
CCOHES	ACHT	BE (5,2)	.49	.490
CULT	ACHT	BE (5,3)	.01	.905
SEX	CDA	GA (6,1)	.04	.839
AGE	CDA	GA (6,2)	1.94	.163
SES	CDA	GA (6,3)	1.74	.188
PASPIR	CDA	BE (6,1)	.53	.446
CCOHES	CDA	BE (6,2)	.46	.500
CULT	CDA	BE (6,3)	1.06	.303
DSI	CDA	BE (6,4)	.70	.401
ACHT	CDA	BE (6,5)	6.24	.012

¹ χ^2 constrained (1 df) - χ^2 unconstrained ($\chi^2 = 0$, 0 df) = $\Delta\chi^2$ with df = 1.

in the strengths of these path coefficients was great enough to be considered significant at the .05 level ($\Delta\chi^2 = 6.24$).

The second path to differ for the two groups was that between age and achievement. The direct effect of the subject's age on his or her achievement score was positive for the hearing group ($b = 1.379$, $p < .05$), and negative and nonsignificant for the deaf group ($b = -1.084$). This suggests that although older hearing subjects tended to have higher achievement scores, there was a slight tendency for the reverse to be true for the deaf. This difference in the magnitude of the coefficients was significant at the .10 level ($\Delta\chi^2 = 3.42$).

The path from age to CDA was of importance for both groups. The magnitude of the metric path coefficient was more than twice as great for the hearing group ($b = 4.489$, $p < .001$) as for the deaf ($b = 2.170$, $p > .10$). This difference was not statistically significant, however ($\Delta\chi^2 = 1.94$, $p = .163$).

A final, potentially meaningful difference between the two groups in terms of the magnitude of their path coefficients in Model 1 is that of the path from the subject's age to his or her rating of family cohesion. This path was of negligible magnitude for the hearing ($b = .006$) and strongly negative for the deaf ($b = -.963$, $p < .10$). Despite the size of the difference between these two coefficients ($\Delta\chi^2 = 1.88$), it cannot be considered significant ($p = .170$).

In summary, although the two samples shared some of the same chains of influence towards career development attitudes, several differences in chains of influence and in individual paths were also noted. The results of these analyses support the hypothesis that the relationships

among the eight predetermined variables in Model 1 may differ for the deaf and nonhandicapped populations.

Hypothesis 2b: Total Effects on Career Maturity Differ

It was hypothesized in Chapter 1 that the eight predictor variables would differ in the magnitudes of their total effects on career maturity. Specifically, it was suggested that the three family variables would be more important in explaining the career maturity of the deaf subjects than of the nonhandicapped. Table 18 presents the hierarchies of total effects for the two groups in both standardized and metric forms. The standardized coefficients are for within-group comparisons, and the metric coefficients for comparing between groups.

For the hearing sample, family cohesion scores, locus of control, and age showed the strongest total effects on career maturity. Sex, in favor of females, and parental aspirations showed relatively small, positive total effects. S.E.S. had a small negative effect. Both cultural participation and achievement had negligible total effects on career maturity for the nonhandicapped group.

The hierarchy of total effects was quite different for the hearing-impaired sample. Cohesion had the strongest total effect on career maturity and had a somewhat stronger effect than for the hearing sample. Cultural participation, which had the smallest total effect for the nonhandicapped group, had a moderate, negative total effect for the deaf group. Parental aspirations had a moderate, positive effect which was greater in magnitude than that for the hearing group. Locus of

Table 18

Rank Ordering of Total Effects on CDA: Model 1

Hearing (n=307)				Deaf (n=69)			
Rank	Variable	Standard	Metric	Rank	Variable	Standard	Metric
1	CCOHES	.281+	(.710)	1	CCOHES	.375***	(.971)
2	DSI	.240+	(1.721)	2	ACHT	-.328***	(-.375)
3	AGE	.239+	(5.027)	3	CULT	-.165	(-.505)
4	SEX	.095	(3.604)	4	DSI	.162	(1.053)
5	PASPIR	.073	(3.532)	5	PASPIR	.159	(5.421)
6	SES	-.070	(-.571)	6	AGE	.124	(1.393)
7	CULT	.039	(.155)	7	SEX	.017	(.507)
8	ACHT	.013	(.039)	8	SES	-.008	(-.042)

*p < .10
 **p < .05
 ***p < .01
 +p < .001

control appeared to have a moderate, positive total effect, but this was somewhat lower than the effect for the hearing group. The total effect of age on career maturity was considerably lower for the deaf than for the hearing sample. There was a much stronger tendency for hearing females to have higher career maturity than for hearing-impaired females. Finally, family socioeconomic level was less important for the deaf than for the hearing in explaining career maturity.

Visual examination of the total effects of the predictor variables shows that, for each of the three family variables (cohesion, cultural participation, and parental aspirations), the metric path coefficient was greater in absolute magnitude for the deaf sample than for the hearing. The metric coefficients for each of the three exogenous variables (sex, age and socioeconomic status) was of greater magnitude for the nonhandicapped group than for the deaf group. Locus of control appeared to be comparable in degree of importance for both groups, and achievement was considerably more important for the deaf group, with higher scores associated with lower career maturity. This suggests that family variables and achievement are more important for the deaf, and background variables seem to be more important for the hearing in influencing career maturity.

Testing Hypothesis 2b.

The results of the LISREL multi-group procedures used to test the differences in total effects for the two groups are presented in Table 19. These results show that the total effect of standardized achievement

Table 19

Tests of Group Differences in Total Effects of Variables on Career Maturity

Variable	Constrained Parameter	Model	$\Delta\chi^2$ ¹	p
SEX	GA (1,1)	a	.53	.463
AGE	GA (1,2)	a	4.04	.044
SES	GA (1,3)	a	.49	.486
PASPIR	GA (1,1)	b	.13	.719
CULT	GA (1,2)	b	.63	.426
CCOHES	GA (1,3)	b	2.22	.137
DSI	GA (1,1)	c	.71	.401
ACHT	GA (1,2)	c	6.24	.012

Note: $\Delta\chi^2$ (1 df) = χ^2 constrained - χ^2 unconstrained (0, df=0).

a CDA regressed on SEX, AGE, SES

b CDA regressed on PASPIR, CCOHES, CULT, SEX, AGE, SES

c CDA regressed on DSI, ACHT, PASPIR, CCOHES, CULT, SEX, AGE, SES

scores was significantly stronger in influencing career maturity for the deaf than for the hearing ($\Delta\chi^2 = 6.24, p < .05$). Age was a considerably stronger predictor of career maturity for the hearing sample than for the deaf, ($\Delta\chi^2 = 4.04, 1 \text{ df}, p < .05$). Finally, cohesion tended to be somewhat more important in its total effect for the deaf than for the hearing ($\Delta\chi^2 = 2.22, p = .137$) although this difference was not great enough to be considered significant. These results are in partial support of the hypothesis that the variables in Model 1 differ in the magnitudes of their total effects for the two groups.

Hypothesis 3: Comparison of Models 1 and 2

The third major hypothesis was that a second model, with the inclusion of variables specific to the experience of the hearing-impaired, would explain more variance in the career maturity levels of the deaf than did Model 1. The following five variables were added to those in Model 1 in order to create Model 2 (see Figure 3 in Chapter 2): Hearing loss in the better ear in decibels (LOSS); the child's age at which the hearing-impairment became apparent (ONSET); the product of the quality and quantity of communication between the subject and his or her mother (MCCOMM) and father (FCCOMM); and the extent of the subject's mainstreaming during the 1986-1987 school year, coded 0 for public school programs, and 1 for residential (MSTREAM).

The results that relate to the test of Hypothesis 3 are presented in the following sections. First, the correlation coefficients for Model 2 are discussed and are presented in Table 20. The path coefficients are

presented in the next section in Tables 21 and 22, along with a description of the important paths in this model. Standard errors for the structural coefficients are found in Table 26 in Appendix G. Following a discussion of the important paths in Model 2, a rank-ordering of the total effects of the variables in Model 2 on CDA is presented in Table 23 and the results of the test of Hypothesis 3 are reported in Table 24.

Correlations with Deaf-Specific Variables

Table 20 presents the means, standard deviations, and intercorrelations for the 14 variables in Model 2. Hearing loss is correlated with just two other variables in this model: mainstreaming, ($r = .323, p < .01$); and age at onset, ($r = -.283, p < .01$.) This suggests that there is a greater degree of hearing loss among residential students in the sample, and that there is greater hearing loss among those students who lost their hearing at an earlier age. This is consistent with demographic data (Karchmer, 1984).

Age at onset was correlated with hearing loss, and with three other variables. There was a significant negative correlation between onset and academic achievement, ($r = -.272, p < .01$). Those subjects who lost their hearing at a later age also tended to be in public school settings rather than in residential placements, ($r = -.300, p < .01$). Older children in the sample appear to be more likely to have lost their hearing at a younger age or at birth, ($r = -.283, p < .01$).

Table 20

Correlations, Means, and Standard Deviations Among Variables in Model 2Predicting Career Maturity: Deaf Sample (n = 71)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. CDA														
2. DSI	.177*													
3. ACHT	-.351***	.007												
4. MSTREAM	.094	.006	-.219*											
5. PASPIR	.000	-.093	.271**	-.198*										
6. CCOHES	.306***	.142	-.119	.027	-.116									
7. CULT	-.104	.136	.233**	.000	.381***	-.035								
8. MCCOMM	.148	.209*	-.317***	.120	-.066	.021	-.151							
9. FCCOMM	.125	.035	.053	-.011	.206*	-.018	.144	.547+						
10. SEX	.003	.004	-.033	.222*	-.047	-.067	.200*	.001	-.259**					
11. AGE	.123	.058	-.113	.144	-.196*	-.207*	-.018	-.113	-.010	-.119				
12. SES	-.019	.040	.277**	-.226*	.410+	-.026	.267**	-.049	.104	-.101	-.075			
13. LOSS	.008	-.110	-.302***	.323***	-.081	.003	-.094	.190*	-.015	.016	.008	-.122		
14. ONSET	-.068	.113	.030	-.300**	.100	-.007	.176*	.087	-.099	.053	-.280**	.159	-.283**	
M	103.6	13.0	88.5	1.80	.394	35.0	15.1	396.7	186.6	.437	17.5	-.110	95.8	1.15
SD	15.2	2.3	13.3	.40	.447	5.9	5.0	312.4	205.2	.499	1.4	3.0	22.3	1.46

Note: See Table 9 for variable definitions. SEX: 0 = Male; 1 = Female. MSTREAM: 1 = Public; 2 = Residential

*p < .10
 **p < .05
 ***p < .01
 + p < .001

Table 21

Structural Coefficients in Standardized Form for Model of Career Maturity: Model 2

PREDETERMINED VARIABLES	DEPENDENT VARIABLES								
	PASPIR	CCOHES	CULT	MCCOMM	FCCOM	DSI	ACHT	MSTREAM	CDA
SEX	-.026	-.096	.229*	-.025	-.251**	-.089	.008	.196	.140
AGE	-.174	-.240*	.066	-.083	-.069	.106	-.174	.098	.168
SES	.393***	-.046	.271**	-.052	.090	.043	.168	-.112	.058
LOSS	-.037	-.018	-.028	.223*	-.036	-.171	-.213*	.217*	-.073
ONSET	-.020	-.067	.131	.137	-.130	-.003	-.068	-.229*	-.001
PASPIR						-.121	.049	-.108	.193
CCOHES						.143	-.130	.043	.302**
CULT						.276*	.063	.121	-.204
MCCOMM						.415**	-.384**	.132	-.135
FCCOMM						-.234	.215	-.034	.240
DSI									.182
ACHT									-.382***
MSTREAM									.039
R ²	.198**	.058	.142*	.066	.088	.174	.305**	.260*	.313*

*p < .10

**p < .05

***p < .01

Although mother-child communication (MCCOMM) and father-child communication (FCCOMM) were relatively highly correlated with each other, ($r = .547, p < .01$), these two communication variables have differential relationships with some of the other variables in the model. The time and quality of communication between mother and child appears to be unrelated to the child's sex, ($r = .001$) whereas fathers seem to spend more and better time communicating with their sons than with their daughters, ($r = -.259, p < .05$). MCCOMM seems to be more positively related to the child's internal locus of control than does FCCOMM. Fathers' communications with their children appear to be positively associated with the parents' level of vocational aspiration for the child, where no relationship seems to exist for mother's communication. There was a negative relationship between MCCOMM and cultural participation, ($r = -.151$), and a positive relationship for FCCOMM, ($r = .144$). Finally, mothers tend to have higher communication scores when their child's hearing loss is greater. For fathers, however, there is no association between communication scores and hearing loss.

Important Paths in Model 2

As can be seen from an examination of Table 21 and from Figure 6, there are several significant paths in Model 2 that are not parts of important chains that terminate at the outcome variable. For example, hearing loss and age at onset both have significantly strong paths to mainstreaming, but the direct effect of mainstreaming on CDA is negligible. Also, sex has a significant path towards father-child communication, but this

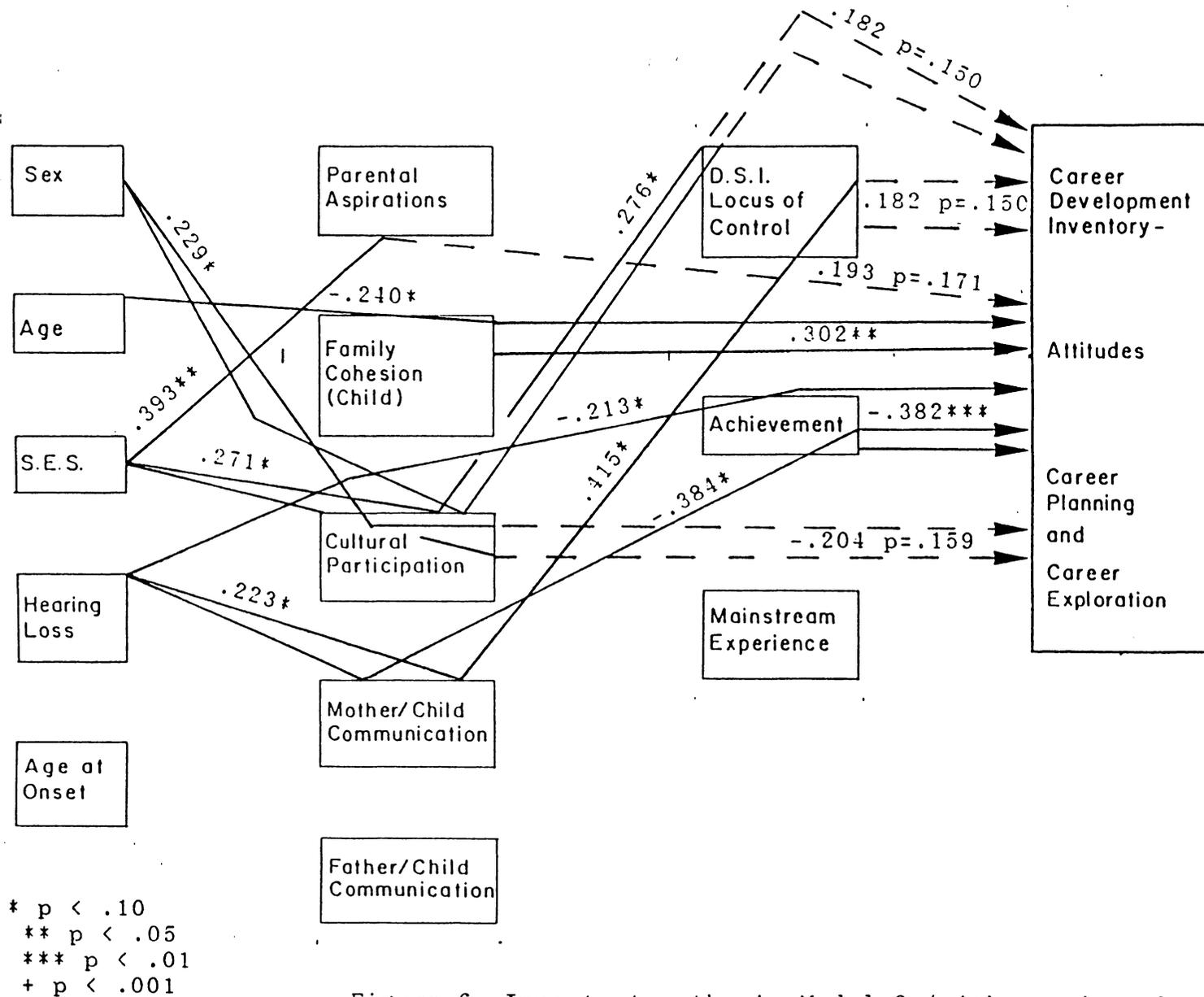


Figure 6. Important paths in Model 2 (with metric values) in influencing career development attitudes of deaf subjects.

latter variable is not part of any significant routes that end at the outcome variable. Since these paths have no significance in terms of describing the career development process for the deaf, they have not been included in Figure 6.

The first important chain of significant paths starts from age then goes to cohesion, then to CDA. Specifically, when the other exogenous variables are held constant, age has a significantly negative effect on cohesion scores ($p < .10$) with younger deaf subjects reporting greater family cohesion than older subjects; and those subjects with higher cohesion scores tending to score higher on the CDA ($p < .05$). The direct path from cohesion to CDA can also be considered a separate chain. Both the indirect chain from age, and the direct path from cohesion, were seen in Model 1 although the magnitudes of the path coefficients differ due to the inclusion of the five additional variables in Model 2.

The degree of the subjects' hearing loss is the starting point for two other important chains of influence. One chain goes from hearing loss to achievement, to CDA: subjects' with greater losses having lower achievement scores ($p < .10$), and those subjects with lower achievement scores scoring higher on the CDA ($p < .01$). The second chain that starts at the hearing loss variable uses mother-child communication as an intermediary between loss and achievement. In this chain, greater hearing losses are associated with greater scores on mother-child communication ($p < .10$); greater mother-child communication scores are associated with lower achievement scores ($p < .05$); and lower achievement scores are associated with higher CDA scores ($p < .01$). The direct effect of

achievement on CDA is also counted as a significant chain as it was in Model 1.

There are four potentially important paths, shown in broken lines in Figure 6, that use the path from locus of control to CDA. This path did not prove to be significant, given the small size of the deaf sample, but is of interest nonetheless. For example, subjects with greater hearing losses tended to have greater mother-child communication scores ($p < .10$); subjects with higher mother-child communication scores tended to be more internal in their locus of control orientation ($p < .05$); and those with more internal locus of control scored higher on the CDA ($p = .150$). The second chain that uses the locus of control to CDA path goes from S.E.S. to cultural participation, to locus of control to CDA. Higher parental S.E.S. was associated with higher cultural participation scores ($p < .05$); higher cultural participation scores were associated with more internal locus of control ($p = .150$). The third chain is identical to the second except that it begins at sex, with females having greater cultural participation ($p < .10$); greater cultural participation being associated with more internal locus of control, as above; and more internal locus of control being associated with greater CDA scores. These last two chains are identical to chains in Model 1 for the deaf, except that in Model 2 the link between cultural participation and locus of control is significant. As with Model 1, the direct effect of locus of control on CDA is also considered to be an important, separate path.

There are two other potentially important paths. The first is that from S.E.S. to cultural participation, and cultural participation to CDA ($p = .159$). The second runs from socioeconomic status to parental

aspirations ($p < .01$), and parental aspirations to CDA ($p = .171$). This second chain is identical to a chain shown in Model 1 for the deaf.

Total and Indirect Effects in Model 2

The total, direct, and indirect effects for Model 2 are shown in Table 22. There was only one significant indirect effect among the 14 variables in this model: the effect of mother-child communication had a significant indirect effect on career development attitudes ($p < .05$). This indirect effect appears to be primarily through the locus of control variable, i. e. mother-child communication effects locus of control, which effects CDA. Mother-child communication has no direct effect of its own on CDA.

Table 23 presents the total effects in standardized form of all the predetermined variables on CDA, in rank order for both Model 1 and Model 2. The inclusion of the five extra variables did not change the hierarchy of total effects greatly. None of the total effects for these five extra variables were statistically significant, and four of the five were among the six least important variables for this model. Hearing loss and mother-child communication did, however, contribute to three additional significant chains of influence in Model 2.

Test of Hypothesis 3

The hypothesis that Model 2 explained more variance in career maturity for hearing-impaired subjects than did Model 1 was tested by an F-test comparing the squared multiple correlation coefficients for the two

Table 22

Total, Direct and Indirect Effects (Standardized) for Model 2 Predicting Career Maturity: Deaf Sample (n = 67)

From	DEPENDENT VARIABLES																										
	FCCOMM			MCCOMM			CULT			CCOHES			PASPIR			MSTREAM			ACHT			DSI			CDA		
	T	D	I	T	D	I	T	D	I	T	D	I	T	D	I	T	D	I	T	D	I	T	D	I	T	D	I
ONSET	-.130	-.130	-	.137	.137	-	.131	.131	-	-.067	-.067	-	-.021	-.021	-	-.191	-.229	.038	-.133	-.068	-.065	-.076	-.171	.095	-.038	-.001	-.037
LOSS	-.036	-.036	-	.223	.223	-	-.028	-.028	-	-.018	-.018	-	-.037	-.037	-	.248	.217	.031	-.308	-.213	-.095	.021	.043	-.022	-.004	.058	-.062
SES	.090	.090	-	-.052	-.052	-	.271	.271	-	-.046	-.046	-	.393	.393	-	-.134	-.112	-.022	.250	.168	.082	.093	.106	-.013	.114	.168	-.054
AGE	-.069	-.069	-	-.083	-.083	-	.066	.066	-	-.240	-.240	-	-.175	-.175	-	.106	.098	.008	-.131	-.174	.044	.012	-.089	.100	.018	.140	-.122
SEX	-.251	-.251	-	-.025	-.025	-	.029	.229	-	-.096	-.096	-	-.026	-.026	-	.227	.196	.031	-.011	.008	-.019	-.234	-.234	-	.114	.240	-.126
FCCOMM															-.034	-.034	-	.215	.215	-	.415	.415	-	.092	-.135	.227	
MCCOMM															.132	.132	-	-.385	-.385	-	.276	.276	-	-.173	-.204	.031	
CULT															.121	.121	-	.063	.063	-	.143	.143	-	.379	.302	.077	
CCOHES															.043	.043	-	-.130	-.130	-	-.121	-.121	-	.148	.193	-.045	
PASPIR															-.109	-.109	-	.049	.049	-				.039	.039	-	
MSTREAM																									-.382	-.382	-
ACHT																									.182	.182	-
DSI																											

Table 23

Rank Ordering of Total Effects on CDA for Deaf Sample: Model 1 & 2

Model 1			Model 2		
Rank	Variable	Total Effect	Rank	Variable	Total Effect
1	CCOHES	.375***	1	ACHT	-.382***
2	ACHT	-.382***	2	CCOHES	.379**
3	CULT	-.165	3	DSI	.182
4	DSI	.162	4	CULT	-.173
5	PASPIR	.159	5	PASPIR	.148
6	AGE	.124	6	FCCOMM	.114
7	SEX	.017	7	AGE	.114
8	SES	-.008	8	MCCOMM	.092
			9	MSTREAM	.039
			10	ONSET	-.038
			11	SEX	.018
			12	LOSS	-.005
			13	SES	-.004

Note. Total effects are reported in standardized form.

- *p < .10
- **p < .05
- ***p < .01
- +p < .001

Table 24

Testing Difference in Variance Explained For Deaf Group: Model 1 Versus Model 2

Model	R^2	F	df	ΔR^2	F	df
Model 1: CDA regressed on SEX, AGE, SES, CCOHES, PASPIR, CULT, DSI and ACHT ¹	.277	2.874	8, 60			
Model 2: CDA regressed on variables in Model 1 plus LOSS, ONSET, FCCOMM, MCCOMM, and MSTREAM ²	.313	1.855	13, 53	.036	<1.0	5, 54

¹n=69

²n=67

regression analyses predicting career maturity. The results shown in Table 24 indicate that the increase in R^2 from .277 to .313 is not great enough to be considered significant given this sample size ($F < 1.0$). Thus, although Model 2 explained 3.6% more of the variance in career maturity than did Model 1, the statistical test does not support Hypothesis 3. The implications of the results presented in this chapter will be discussed in chapter 5.

CHAPTER 5: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter begins with a brief summary of the study's methods and results and is followed by a discussion of the utility of each of the thirteen predictor variables considered in Models 1 and 2 in explaining career development. The conclusions related to each of the hypotheses are outlined in the third section. The final sections list the implications for practitioners and recommendations for further research.

SUMMARY

The consequences of low career maturity in adolescence can be underemployment, even unemployment, in adulthood. This is particularly important for handicapped adolescents, particularly the deaf, who tend to be career immature relative to their nonhandicapped peers. Yet little is known how young people with handicaps come to be ready to make age-appropriate career decisions. The purpose of this study was to determine whether the career development process was the same for hearing-impaired and normally-hearing adolescents. Towards that aim, 71 deaf and 318 nonhandicapped adolescents were administered measures of locus of control orientation, career maturity, and family cohesion. Data on the family and on the cultural participation of the child were collected from their parents, and achievement scores from school records. For the hearing-impaired subjects, mainstreaming status and degree of hearing loss were also collected.

Path analysis was used to determine the extent to which career maturity could be explained by a variety of background, family, and personal factors. From a search through the literature for likely predictor variables, and from a consideration of family systems theory, two models of career maturity were developed. Model 1 included eight predictor variables: sex, age, socioeconomic status, parental aspirations, family cohesion, cultural participation, locus of control, and achievement. Model 2 included five additional variables specific to the experiences of the deaf: degree of hearing loss, age at onset of the loss, mother-child communication, father-child communication, and current mainstreaming status.

Three hypotheses were investigated. The first research hypothesis stated that Model 1 would explain more variance in career maturity for the hearing than for the hearing-impaired sample. The results suggested that Model 1 did not explain a smaller amount of variance in career maturity for the deaf group. Model 1 explained 20% of the variance for the hearing group and nearly 28% for the deaf, suggesting that the same set of 8 variables was appropriate in describing the process for both groups.

The second hypothesis concerned the patterns among the variables in the first model for the two groups, that is, that individual paths in the first model would be equivalent for the two groups, and that the total effects of the variables on career maturity would fail to differ. Although only two of the 29 paths in Model 1 differed significantly in magnitude for the two groups, there were other differences observed in the patterns of influence among the eight predictor variables in the first

model. In terms of total effects, all three family variables (cohesion, cultural participation and parental aspirations) as well as achievement had stronger total effects for the deaf than for the hearing. The difference in total effect was significant for the achievement variable which was near-zero for the hearing and negative for the deaf. All three background variables (sex, age, and S.E.S.) and locus of control were stronger in total effect for the hearing sample, age significantly so.

The final hypothesis was that the second model would explain the same amount of variance in career maturity for the deaf subjects as did the first model. Model 2 explained 31% of the variance in the career maturity of the deaf as opposed to 28% explained by Model 1. Although this difference was not great enough to be considered significant, the second model may be a more accurate reflection of the process for the deaf. Of the 5 added variables, none had significant direct, indirect, or total effects on career maturity. But the degree of hearing loss and mother-child communication were links in important chains of influence among the variables in Model 2 that resulted in an effect on career maturity. Other changes in the chains of significant paths were noted as a result of adding these 5 variables.

The results suggest that career development is a more classically developmental process for the hearing, meaning that as nonhandicapped children get older they become increasingly ready to make career decisions. For the deaf, however, intervening variables, such as family cohesion, appear to have greater influence on career maturity than does age or any other background variable. There also appears to be some merit to taking into account those life experiences that are unique to the

special group being studied, although the strength of the influence of these variables was less than had been anticipated.

DISCUSSION

The results presented in the preceding chapter were intended to shed light on the nature of the career development process for samples of hearing and hearing-impaired adolescents, both of which tended to be above average in achievement compared to their respective norm groups. The limited size of the deaf sample precludes overreliance on probabilistic findings; thus much of the discussion that follows is based on trends rather than upon probability theory. At the very least, the results of this study provide a starting point from which future efforts at career maturity model building can depart.

The conclusions are presented along two directions. Between Models 1 and 2, a total of thirteen variables were considered for their potential to explain the variance in career maturity for the two groups under study. First, the merits of each of these variables are considered individually. Next, the discussion focuses on the hypotheses that were tested.

The Variables

Osipow (1976) believed that one of the first steps needed to be taken in furthering the knowledge base about the career development of the handicapped and nonhandicapped alike is to determine which factors are associated with scores on outcome variables such as career maturity. He

was specifically concerned with which "grouping" variables were important in influencing the career development of individuals. For example, is it more important to be a female, to be from a particular ethnic group, or to be with or without a given handicapping condition? The discussions that follow are intended to shed light on the utility of each of the 13 variables considered in this study for their ability to influence the outcome variable, career maturity, as measured by the attitude scale (CDA) on the Career Development Inventory.

Sex Consistent with previous research (Lokan, Boss & Patsula, 1982; Hesser, 1981; Super & Nevill, 1984), females in both groups in this study scored higher on career maturity. The direct effect of sex on career maturity was nonsignificant for both groups. The total effect of sex on career maturity was considerably lower for the deaf group than for the hearing. For both groups, however, sex played an important role in Model 1, and again for the deaf in Model 2, with females having higher cultural participation scores which were related to an internal locus of control and higher CDA scores. Sex should continue to be a controlling variable in future modeling attempts for both handicapped and nonhandicapped populations.

Age Age was one of two variables in Model 1 that could be shown to have a different total effect on career maturity for deaf and hearing samples. The positive, direct effect of age on career maturity was considerably greater for the hearing group than for the deaf. The results suggest that as hearing children get older they become more career mature. This is

consistent with previous studies (Lokan et. al., 1982; O'Neil, Ohlde, Tollfson, Barke, Piggott, & Watts, 1980). The same age effect was true for the hearing-impaired sample, although the relationship was significantly weaker than for the hearing group in Model 1, and disappeared as a direct effect in Model 2. It would appear that other forces in the child's family or school environment must intervene to help the deaf child take steps towards exploring and planning for a place in the world of work; getting older is not enough.

The difference in the effect of age on career maturity can be explained by the differential influence of age on the other intervening variables in Model 1. For the hearing subjects, greater age was associated with more internal locus of control which is conducive to career development. For the deaf, however, older subjects rated their families as less cohesive, but it was those subjects with more cohesive families who scored higher on the CDA. As explained by Schlesinger and Meadow (1972) it is when the deaf child reaches adolescence that parents may finally grasp the reality of the permanence of their child's condition. Faced with the career decisions of young adulthood, their child has not learned to speak normally, hear normally, nor to read and write on a par with their nonhandicapped peers. Schlesinger and Meadow have observed that many parents respond to this realization by binding the child closer to them, while many respond instead with rejection. In this sample, it appears that the older deaf subjects sense less closeness in their families. This trend may be a result of the parental disappointment noted by Schlesinger and Meadow. Thus, although the deaf tend on average to be more career mature with age, the associated

loosening of family bonds impedes this progress. In conclusion, age is an important variable to consider when building a model of career development, but is more important for the nonhandicapped than for the deaf population.

Parental Socioeconomic Status The role of S.E.S. in this model of career maturity is unclear. Its total effect is negative and nonsignificant for both groups although greater in magnitude for the hearing. The direct effect of S.E.S. on CDA is negative for the hearing group and positive for the deaf. For both groups, and in both models 1 and 2, higher S.E.S. was associated with higher cultural participation scores which were associated with more internal locus of control and, consequently, greater career maturity. For the deaf group alone, S.E.S. was positively related to parental aspirations which influenced career maturity in a positive way. Thus, although S.E.S. was associated with CDA through both positive and negative paths, and although the total effects were minimal, S.E.S. appears to be a valuable controlling variable in explaining career development for both groups of adolescents.

Parental Aspirations Hesser (1981) found stronger zero-order correlations between career maturity and parental aspirations for children's occupational attainment for nonhandicapped adolescents ($r = .25$ to $.35$) than did this investigator, ($r = .03$). This may well be due to differences in the way the aspiration variable was measured. Hesser surveyed adolescents about what they believed their parents expected of their future careers. The strong connection between a child's scores on

a career maturity measure and his own projections of his parents' expectations is obvious. In the current research, the parents themselves were questioned about their expectations for their children's occupational attainment. Furthermore, Hesser used 8 categories of occupations which translated more easily into socioeconomic levels than did the dichotomized variable used in this study.

For the deaf subjects, parental aspirations are positively associated with the child's career maturity in a direct effect. This trend was not noted for the hearing sample for whom parental aspirations were not involved in any important chains of influence leading to career maturity. The results of this study suggest that parental aspirations for their children's occupational attainment are an important addition to a model of career development for the deaf.

Cohesion Family cohesion (as rated by the subjects) was the variable with the greatest total effect on career maturity in Model 1 for the hearing, and in both Models 1 and 2 for the deaf. The effect was a good deal stronger for the hearing-impaired group as had been predicted. The direction of the effect, that is, greater cohesion associated with greater career maturity, is counter to systems theory but consistent with previous research on nonhandicapped adolescents (Hesser, 1981). In contrast to the characteristics of the present sample, Hesser's sample of 262 adolescents was skewed in the opposite direction with respect to cohesion, with 21% of families in the enmeshed category as opposed to the 14% in the norm group. In the current study, there were fewer than 4% of families in the highest category of the cohesion scale for both the

hearing and deaf samples. Despite having samples that were skewed in opposite directions, the results of both studies indicate that the relationship between cohesion and career maturity, as measured by the Career Maturity Inventory, is positive and linear, with the disengaged family being more likely to have a retardant effect on the child's career planning and exploration than the more cohesive family.

As described in the FACES III manual (Olson, Portner & Lavee, 1985), enmeshed families are expected to be characterized by extreme closeness, high demands for loyalty, weak marital coalitions, more parent-child coalitions, and a tendency for all decisions, both personal and relationship, to require family approval. The disengaged family, on the other hand, is said to lack closeness and loyalty, to spend little time together, have a weak marital coalition, and be characterized by individual rather than group decision-making. A multitude of studies have supported the hypothesis that family functioning is lowest at either end of the cohesion continuum and highest in the balanced range. Nearly all of these studies have compared groups of problem families with those without major problems. Whether comparing families with and without juvenile delinquents (Roderick, Henggler & Hanson, 1985), sex offenders (Carnes, 1985), alcoholics (Olson & Killorin, 1985) schizophrenics (Clark, 1984) or adolescent runaways (Bell, 1982), researchers have found that problem families tend to fall at either extreme end of the cohesion continuum, while nonproblem families fall in the balanced range.

The quadratic relationship between cohesion and family functioning does not necessarily hold for families not experiencing major difficulties, according to Olson et al. (1985). He writes:

In contrast to the curvilinear relationship found on these dimensions of problem families, there appears to be a linear relationship between cohesion and change in family functioning with "normal" families. More specifically, higher levels of cohesion . . . seem to be associated with better family functioning. These results were found in a national survey with 1,000 families across the life cycle . . . A primary reason for this is that normal families represent only a narrow spectrum of the range of behavior on these two dimensions. As a result, there are very few "normal" families that legitimately fall into the extreme types. (p.14)

This statement seems somewhat contradictory, and is based on the assumption that the "nonproblem" families in dozens of incidence studies are less "normal" than the "normal" families in Olson's survey.

Despite Olson's finding of a linear trend, the reasons why a more cohesive family should be more conducive to the career development of an adolescent than a disengaged family remains. Perhaps the more cohesive family fosters the self-confidence the adolescent needs to contemplate a future life outside of the family, particularly for the deaf child. Keep in mind that the adolescent is attempting to deal with two competing needs: the need to belong, and the need to be establish individuality. The child from a disengaged family may lack the feelings of belonging and continuity needed to be able to extrapolate into his own future as an independent individual. At any rate, if highly cohesive families do evidence more parent-child coalitions and triangulations, they either are not involving the deaf family member to an appreciable degree, or the triangulations and coalitions that do exist are not as pernicious for

individual development as had been believed. But for whatever reason, family cohesion is decidedly a factor worth considering for any model of career maturity, especially for hearing-impaired young people.

Cultural Participation Despite previous research with nonhandicapped (Super & Overstreet, 1960) and hearing-impaired adolescents (Lerman & Guilfoyle, 1970) that found strong, positive relationships between cultural participation and career maturity, the direct and total effects of cultural participation were negligible for the hearing and negative for the deaf in this study. The variable reflecting the variety of reading material and the educational supplies and tools available to subjects played a similar role in Model 1 for both the hearing and the deaf. For both groups, females and those with higher parental S.E.S. tended to have higher cultural participation scores which were associated with an internal locus of control and higher CDA scores. For the deaf group alone, cultural participation was positively related to achievement in Model 1. In Model 2, the direct effect of cultural participation on career maturity was negative. Particularly by virtue of the variable's association with locus of control, the results of this study suggest that cultural participation does have an important contribution to make in describing the career development process for the hearing and the deaf alike.

Locus of Control (DSI) The Different Situations Inventory is scored in such a way that high scores indicate internal locus of control and low scores indicate an external locus of control. Results of previous

empirical research consistently indicates that the more internal an adolescent's locus of control, the more career planning and exploration he or she is likely to have done (Blevins, 1984; Lokan, Boss & Patsula, 1982; Phillips et. al, 1983).

The variables in Model 1 associated with locus of control are similar for the two groups. An internal locus of control is associated with greater cultural participation for both deaf and hearing groups and with an average or higher family cohesion for the hearing. It is more true of hearing than of deaf adolescents in this study that older subjects tend to be more internally controlled than younger subjects. An internal locus of control may be slightly less adaptive for the deaf; as young hearing-impaired people get older and interact directly with the outside world to an increasingly greater extent, they may be learning that the world around them has more control over them than they had previously believed. Thus a shift in locus of control in the external direction may, for the hearing-impaired, be warranted. This is consistent with research on locus of control that has been done with people from disadvantaged backgrounds (Battle & Rotter, 1963; Joe, 1971; Lefcourt, 1966).

In sum, locus of control has a relatively strong association with career maturity especially for the handicapped. Of particular interest for future study is the positive relationship that was noticed between locus of control and family cohesion for the hearing.

Achievement The role of achievement in explaining career maturity appears to be complex. Relative to their deaf and hearing norm groups, both samples have above average academic achievement. Despite this

similarity, the role of achievement in Model 1 is quite different for the two groups. For the hearing group, achievement appears to play a negligible role in explaining career maturity. This may be because, within limits, all hearing adolescents have the same opportunities to pick up information about careers and career planning through both written and spoken English. Furthermore, hearing adolescents are able to pick up career information informally by overhearing conversations between parents or among other adults, working friends, and the media regardless of their math and reading abilities. Westbrook (1983) reviewed dozens of studies of career maturity measures and concluded that, for average subjects, correlations between measures of career attitudes and standardized achievement tests range from $-.10$ to $.08$.

Achievement has a strong, negative association for the hearing-impaired with high achieving students getting lower scores on the CDA than low achievers. This is puzzling given that Lerman and Guilfoyle (1970) found a positive relationship between scores on the VIP (the precursor to the CDI) and their "language competence" factor of which math and reading were important components. This relationship may be less related to the negative relationship in the current study since their "language competence" factor included other variables besides achievement and since that study used the VIP rather than the CDI attitude scale as the outcome measure.

The key to the difference in career maturity of high and low achievers found in the current study may be in educational programming. Unlike their hearing peers, deaf students have greater difficulty picking up career information casually from extracurricular reading, the media and

from other people. Thus, formal presentation of career information is critical. If low achievers were exposed to more career education and life skills courses than those deaf students expected to be college bound, this could give them a distinct advantage. This explanation is unlikely, however, given the commitment to career development expressed by the counseling staff at the Model Secondary School for the Deaf from which more than half of the deaf subjects in this study were recruited. All graduates of MSSD complete 6 credits of a career development course whose objectives are identical regardless of the achievement level of the students in the class. Thus, some other educational, environmental, or personality factor or factors must be responsible for the surprising direction of the difference in career maturity between high and low achievers.

Hearing Loss The degree of the deaf child's hearing loss was incorporated into Model 2. This is the variable that, more than any other in Model 2, truly reflects the influence of the handicapping condition, with hearing losses in the sample ranging from mild to profound. The total effect of this variable on career maturity was negligible, but this cannot be taken to mean that hearing loss had no impact in the model; its indirect effects on career maturity through other variables in the model ($\beta = .068$) and its direct effect on CDA ($\beta = -.078$) canceled each other out resulting in the near-zero total effect.

An examination of the important chains of influence that start at the hearing loss variable suggests that a more profound hearing loss tends to be associated with higher scores on the CDA. A more profound hearing

loss, for example, is associated with poorer achievement scores and, consequently, with greater CDA scores. Greater hearing losses are associated with higher mother-child communication scores. Higher MCCOMM scores are associated, first, with more internal locus of control and thus greater career maturity, and, secondly, with poorer achievement and greater career maturity.

Given this configuration of effects, the reported total effect of hearing loss on career maturity is likely to be an underestimate. The contradictory conclusions in the literature about the effect of degree of hearing loss on career maturity may be due to the complexity of the relationship between hearing loss and other variables, sometimes positive, sometimes negative. The studies that found no effect of the degree of the hearing loss (e. g. Saur, Coggiola, Long and Smithson, 1986) may have had patterns in the data similar to those in this study, but without the ability to examine indirect effects, were unable to detect the true effect. In light of the findings of this study, degree of hearing loss does appear to have an effect on career maturity, albeit in an unexpected direction. The key to this puzzle may be connected to the surprisingly negative relationship between achievement and career maturity for the deaf.

Age at Onset of the Hearing Loss The important aspect of this variable is the extent to which the child was able to acquire normal language skills before the loss of hearing. Of the 71 hearing-impaired subjects in this study, 86% are considered to be prelingually deafened, i. e. ,

having lost their hearing before the age of two years. Only 9 subjects in this study lost their hearing after the age of 2.

Perhaps due to the skewed nature of this variable's distribution, age at onset had a significant effect on only one other variable in the model: mainstreaming. Consistent with demographic information (Allen and Osborn, 1984), those subjects who were deafened at an earlier age were more likely to be in residential settings. Since mainstreaming had no impact on career maturity, the results suggest that age at onset of deafness is not a valuable addition to a model of career development for the deaf. This conclusion needs to be verified, however, by repeated studies in which the distribution of the variable is more normal.

Parent-Child Communication Schlesinger and Meadow (1972) have suggested that, for deaf children to adjust and develop successfully, the family environment must be warm and nurturant and it must be a source of "varied sensory and cognitive input." In other words, the parents must both have valuable information to share and the means to communicate it to the child. This contention is partially supported by the results of the current study.

The mother-child (MCCOMM) and father-child (FCCOMM) communication variables used in this study were each the product of two items on the parent questionnaire. The first question concerned the approximate number of minutes per day spent by the parent communicating with the deaf child on a day when the child is at home. For the second item, the parent was asked to indicate the complexity of conversation the parent and child were capable of engaging in given the degree of the child's hearing loss

and the mode of communication used. It was originally thought that these two variables could be combined into a single composite variable. Preliminary analyses showed that, although correlated with each other ($r = .547$), these two variables function differently in the context of Model 2. The path analysis results suggest that MCCOMM has a positive relationship with locus of control and a negative relationship with achievement. The opposite is true for FCCOMM. And whereas MCCOMM has a positive association with mainstreaming, and negative with career maturity, the opposite trends were observed for FCCOMM. Thus, the two variables were entered separately into Model 2.

Being greater with subjects whose hearing loss is more profound, mother-child communication was significantly related to two other variables in Model 2. Greater mother-child communication was associated with a more internal locus of control which facilitated career development. Higher MCCOMM scores were also associated with lower achieving students who had higher CDA scores. The direct effect on career maturity was not significant but the indirect effect on CDA was the only significant indirect effect in Model 2. These results, with the exception of the negative relationship between mother-child communication and achievement, are consistent with research conducted by Sporkowski and Eubanks (1976) that found that positively adjusting students indicated more favorable communication with mothers. Negatively adjusting students in that study confided in neither parent.

The total effect of FCCOMM ($\beta = .114$) was greater than that of MCCOMM ($\beta = .092$). Yet, the father-child communication variable demonstrated less utility than MCCOMM in influencing career maturity in Model 2.

Influenced only by the subject's sex, it had no part in any important chains leading to career maturity in Model 2.

These results suggest that the degree to which the parents communicate with their deaf child does play a role in influencing the child's career maturity. This is especially true for mother-child communication. The exact nature of the influence, however, warrants further research. Specifically, the negative direct effect of MCCOMM contrasted with the positive indirect effects need greater clarification.

Mainstreaming Experience The relative merits of residential and public school placement for the deaf has long been an issue of great contention in the field of deaf education (Kluwin & Moores, 1987; Allen & Osborn, 1984). One side of the argument has been that, because of differential placement criteria for different educational settings, it is difficult to say how much of any observed differences in outcome measures is due to the 'treatment' and how much to preexisting characteristics of students in the two types of settings.

A simple t-test revealed that the career maturity of residential students ($M = 105.4$) is greater than that of students who live at home ($M = 89.5$), $t = -1.97$, $p < .10$. However, the results of the path analyses suggest that, when the other twelve variables in the model are held constant, no difference in CDA scores exist between the two groups. Admittedly, however, neither intellectual ability nor the quality of instruction could be controlled for in this study. Kluwin (1987) concluded from his research into the relationship between mainstreaming and achievement that "more attention should be paid to the quality of the

placement and its match with student ability than to the type of placement" (p. 9). For the purposes of this study, it can be concluded that, when other background, family, and personality variables are controlled for, mainstreaming becomes of insignificant importance in a model of career development for the deaf.

Conclusions

Hypothesis 1: Relative Utility of Model 1

The first research hypothesis suggested that Model 1 would explain more of the variance in career maturity for the hearing group than for the deaf. The basis for this expectation was not that the variables in Model 1 would not be important predictors of career maturity for the deaf, but that Model 1 fails to include a number of variables needed to describe the experiences of the deaf. However, the results were in the opposite direction and suggested that Model 1 does not fit the data for the deaf group less well than for the hearing. One can conclude from this that, if indeed Model 1 represents our best guess at the factors that influence career maturity, the estimate applies fairly well to two groups who, despite equivalent career maturity scores, must have very disparate lifestyles and experiences. Of course, this says nothing about the interrelationships among those variables found to be important, nor does it say anything about the relative total strengths of the variables in Model 1 for the two groups. The results related to Hypothesis 2 address the issue of these interrelationships.

Hypothesis 2a: Relative Strengths of Paths in Model 1

There are 29 different paths linking the variables in Model 1. An examination of the tables and figures in Chapter 4 suggests that there are similarities as well as differences in the patterns among these variables for the deaf and for the hearing. For both groups, parental socioeconomic status and sex are both associated with cultural participation which is associated with locus of control which, in turn, has a significant relationship with career maturity. Also seen in the pattern of influence for both groups is the direct effect of age on CDA, which is positive for both groups, and the positive effect of family cohesion on CDA.

There were two paths seen in the results for the hearing that were not seen in the results for the deaf sample. One was the positive effect of age on locus of control, with older subjects being more likely to be internally controlled, a characteristic that facilitates career development. The other is the positive effect of family cohesion on locus of control, with those subjects rating their families as more cohesive having a more internal locus of control.

By the same token, there were patterns seen in the results for the deaf that were not evidenced for the hearing. In both Models 1 and 2, for example, older subjects tended to rate their families as less cohesive, a trend not seen in the hearing sample to a significant degree. Although parental aspirations for their children's occupational attainment did not figure into any important chains for the hearing, there was a sizeable, positive direct effect on CDA for the deaf. In Model 1

for the deaf, both S.E.S. and cultural participation had direct effects on achievement in a positive direction while achievement itself had a negative association with career maturity. These patterns were not evidenced in the results from the hearing sample.

Partly due to the small size of the deaf sample, only two of the 29 paths in Model 1 could be shown to differ significantly for the two samples, those being the paths from age to achievement (positive for the hearing, negative for the deaf), and from achievement to career maturity (near-zero for the hearing, and negative for the deaf). Other paths in Model 1 differed for the two groups to an extent that, while not statistically significant, were great enough to warrant research interest. Age had a nonsignificant relationship with family cohesion for the hearing, and a significant negative relationship for the deaf.

Therefore, despite the fact that these eight variables explain a similar amount of the variance in career maturity, and despite the fact that both groups represented students who were above average in achievement for their respective norm groups as well as having equivalent career maturity scores, the process of becoming career mature has both similarities and real differences for the two groups. The discussion of Hypothesis 2b contributes to an understanding of the nature of these differences.

Hypothesis 2b: Relative Magnitudes of Total Effects

It was Osipow (1976) who suggested arranging career maturity-related variables into hierarchies as a way of portraying the relative importance

of the predictors. And it was Brolin (1976) who suggested that it is environmental factors, rather than inherent characteristics, that are most influential for the career development of handicapped persons. When working with path analysis, it seems most appropriate to use the total effects of the predictors as the estimates to be ranked. The LISREL program offered a method for testing the hypothesis of equivalent total effects for the individual variables in Model 1. Cohesion is ranked first for both groups, but is somewhat (although not significantly) stronger for the deaf than for the hearing. In fact, the other two family variables, parental aspirations and cultural participation, are also ranked more highly for the hearing-impaired than for the nonhandicapped group. In addition, achievement had a stronger total effect for the deaf than for the hearing. Rather than family variables, it was the total effects of the background variables and locus of control that tended to be more influential for the hearing group than for the deaf. Age was the background variable that was significantly more influential, in terms of total effect, for the hearing than for the deaf.

The significance of the varying hierarchies of total effects seems to be that the process of career development, of becoming career mature, is a more classically developmental process for the hearing; the older one gets, the more ready one is to take on the tasks associated with merging into the world of work. For the hearing-impaired, however, the family intervenes in a significant way to influence the child's readiness for independence outside of the family. The child's perception of the closeness in his family is associated with readiness on his part to begin planning for his life in the outside world. He is also more greatly

influenced by his parents' aspirations for him than is his hearing counterpart.

Furthermore, the strength of family cohesion in explaining career maturity for both groups, relative to the more popular variables for study such as S.E.S. and achievement, may come as a surprise to career development researchers who have almost totally ignored family systems theory in their studies of career maturity.

Hypothesis 2b was supported by the results of this study: although Model 1 explains career maturity no less well for the deaf than for the hearing, two groups that have equivalent career maturity scores and who are both relatively high achievers, the variance accounted for seems to be explained by different patterns and hierarchies of the same set of variables in the model for the hearing and the deaf.

Hypothesis 3: Model 2 versus Model 1

Conte (1983) has suggested that the inclusion of variables reflecting the life experiences specific to a given handicapped group should increase the appropriateness of a model of career maturity for that group. The second model tested in this study included five variables specific to the experience of the hearing-impaired. The addition of these five variables increased the amount of career maturity variance explained from 28% to 31%, and resulted in a few changes in the patterns of influence seen in Model 1. Two paths that had been important, but not significant, in the first model dropped out in the second. The positive direct effects of age on CDA and of cultural participation on achievement were considerably

weaker with the addition of the five new variables. Five new, important paths were introduced in Model 2: the negative direct effect of cultural participation on CDA; the negative effect of hearing loss on achievement; the positive association between loss and mother-child communication; the positive effect of MCCOMM on locus of control; and the negative effect of MCCOMM on achievement.

Despite the fact that only two of the five deaf-specific variables became incorporated into the pattern of important chains of influence, and despite the fact that the increase in variance explained was not significant, the results suggest that a greater understanding of the career development process can be gained by considering the degree of the adolescent's handicap, and his or her ability to communicate with parents. Thus, although the statistical comparison of the coefficients of determination for Models 1 and 2 supported the null hypothesis of no difference in the explanatory power of the two models for the deaf, observed changes in the patterns of influence among the predictor variables suggest real advantages to including handicap-specific variables into models of career development.

IMPLICATIONS FOR PRACTITIONERS

Because the problems of the hearing-impaired were the focus of this study, the implications that follow are aimed specifically at those who work with the deaf. Although this study did not find the career maturity of the hearing-impaired sample to be significantly poorer than that of the hearing sample, the results are nonetheless suggestive of ways in which

the process of career maturity could be different for all groups of deaf youngsters, including those with reading skills poorer than those represented in the current sample. Thus, despite the fact that I may be extrapolating beyond my own data, the following suggestions are intended for those who work with deaf students of all achievement levels.

A trend that was noted for both samples was that parental aspirations were positively associated with CDA scores. For the hearing group, there was a strong, positive relationship between parental aspirations for the child's occupational attainment and the child's academic achievement. This suggests that parents of hearing children have aspirations that are consistent with their children's demonstrated ability. Yet, for the deaf sample, parental aspirations and the child's achievement were not significantly related, although the trend was still in the positive direction. If, in fact, there is no relationship between achievement scores and occupational attainment of deaf students, then this lack of correlation is a legitimate reflection of reality. On the other hand, it may be that parents of the deaf could be better informed about their children's potential vis a vis the range of career opportunities available to the deaf. This is particularly important for deaf students in public schools who have fewer opportunities to see deaf adults in professional occupations. Because of the difficulties associated with the employment of deaf adults, that are certainly obvious to the parents of hearing-impaired adolescents, career awareness programs for the deaf may need to target both deaf students and their parents. Parents with more realistic occupational aspirations for their deaf children may better

encourage the development of "planfulness" in their children as is the case with parents of normally-hearing adolescents.

For all students, regardless of handicap, an internal locus of control is associated with greater readiness to meet the challenges of life after high school. Those in charge of career education programs could keep this fact in mind in planning curricula. The inclusion of activities designed to increase children's awareness of their own power to influence the events in their lives may encourage career maturity as well.

The degree of cohesion in a student's family is generally not within the power of a school counselor to manipulate. The importance of a closely-knit family to a child's career development, especially for a deaf child, could aid the counselor trying to understand an individual student's level of career planning and exploration. The adolescent from a disengaged family may need additional support, encouragement, and information from the school.

RECOMMENDATIONS FOR FURTHER RESEARCH

This study has shown that, despite equivalent career maturity scores, there are similarities and differences in the process of career development for nonhandicapped adolescents and deaf youth. Future research efforts should be directed at the replication of this design by exploring the same, or similar, models with data from more representative samples of deaf adolescents or those from other handicapped groups such as the visually impaired or physically disabled. It would be helpful to know if the trends observed here are specific only to hearing-impaired

adolescents, or whether these phenomena are descriptive of all children who are in a minority due to a physical, sensory, mental, or intellectual impairment.

Given the strength of the family cohesion variable in explaining the variation in career maturity in both the hearing and deaf samples in this study, it is recommended that future researchers make an effort to incorporate measures of family dynamics into their career maturity models. The inclusion of variables that influence cohesion could also be examined. In addition, since it seems that enmeshed families may be selecting themselves out of family studies when given the option not to participate, researchers may wish to find ways to include these families.

One explanation considered for the unexpectedly negative relationship between achievement and career maturity for the deaf was that the better achieving students may not be given access to the same life skills classes that poorer achievers are scheduled into. It seems logical that a deaf student would need systematic exposure to career information in order to enhance his level of career awareness; no matter how well he reads, his inability to casually pick up world of work information auditorily leaves him at an extreme disadvantage compared to his hearing peers. Follow-up contacts with counseling personnel at MSSD indicates, however, that exposure to career education is identical for all MSSD students, irrespective of their scores on achievement tests. Thus, some other difference between high- and low-achieving deaf students must account for the unexpected tendency of the low-achievers to have higher career maturity scores than the high achievers. These differences may be related

to personality, attitudes, or to environmental differences, and would be an important subject for further research.

Regarding measurement concerns, a few suggestions are warranted. If including a measure of socioeconomic status, future studies should use educational and occupational categories that are more numerous, and that translate directly into Socioeconomic Index (SEI) categories. The parent-child communication variables could be better refined to include the general mode of communication and, perhaps, the extent to which the content of conversations between parents and deaf children relate to the world of work.

Due to the error introduced into the achievement variable by equating the SRA and Stanford scores for the public and residential school deaf subjects, there is some ambiguity in the interpretation of the results for the hearing-impaired. Further study, using a single measure of achievement for all hearing-impaired subjects, is needed before more definitive conclusions about the effect of reading and math skills on career maturity can be made for hearing-impaired adolescents.

It is doubtful whether children can give accurate, unbiased estimates of their parents' aspirations for their (the child's) achievements. As was done in this study, researchers should collect such information from original sources whenever possible.

It is possible that there exists some specification error in the model tested in this study. Other factors that may prove to enhance the explanatory power of a career maturity model include race, self-esteem and self concept. It may also be useful to survey the students about their employment experiences, both paid and unpaid. There may well be

variables that could have been included in the second model for the deaf but which were outside the scope of the current design. The literature suggests that the expressive and receptive skills of the deaf student, although difficult to measure, could contribute a significant amount to any study of the development of the deaf (Lerman & Guilfoyle, 1970). The age-appropriateness of social skills, generally underdeveloped for the deaf (Bolton, 1972) may also be worth investigating as a contributor to career maturity. In addition, as was suggested by Kluwin (1987), future research should concern itself less with the actual educational placements of deaf students, i. e. mainstreaming, and more with the actual characteristics of the learning environment that are important.

CHAPTER SUMMARY

In Chapter 2 it was noted that Lerman (1976) argued that the same career development principles may be universal. Osipow (1976), on the other hand, postulated that the same set of career development related factors may not operate in the same ways for different groups of people. The results of this research suggest that both positions are correct. In this study, a model of career maturity was examined for its ability to fit the data from a sample of deaf and a sample of hearing adolescents. Although the two groups were both superior to their peer groups in math and reading scores, their average levels of career maturity were nearly identical and the degree of fit of the model to the two groups was very similar as well. But, despite equivalence on the dependent variable and overall fit of the model, the patterns among the variables that influence

career maturity had both similarities and notable differences for the two groups.

Few of the observed differences were statistically significant, perhaps due to the reduced size of the deaf sample, yet confidence in the interpretation of the results is gained by the trends in the data being consistent with those predicted on the basis of theory. As Brolin (1976) and Osipow (1976) had suggested, factors relating to the environment, such as school placement and family, should be more important than background or intrinsic factors for the handicapped. Consistent with this prediction, in this study, the total effects for all three of the family variables were greater for the deaf than for the hearing; the hearing-impaired adolescent appears to be influenced by the dynamics of his family more than do hearing adolescents. The results also apply to a long-standing dispute among educators of the deaf. McHugh (1975) and Lacey (1975) disagreed about the merits of residential versus public schooling. The results suggest that, when other factors are held constant, residential school students are equally ready to plan and explore careers despite the greater contact with the world of work experienced by the public school student. Other results respond to a serious criticism of career maturity theories in relation to handicapped populations. Conte (1983) suggested that including factors that are specific to the experience of the special group under study can aid in the explanation of how career maturity is developed. Although the inclusion of such variables in the current model did little to increase the variance in career maturity explained, these variables did contribute

to a more detailed and personalized picture of the career development process for the deaf.

One important conclusion drawn from the results of this study is contrary to expectations based on family systems theory. Olson has suggested that families scoring at the upper end of the cohesion scale on the FACES III are more likely to experience triangles and parent-child coalitions, both of which are believed to act as barriers to individual growth towards independence (Olson et al., 1985). Yet the results of this study are consistent with Hesser's (1981) findings. The relationship between family cohesion and career maturity is positive and linear, with greater cohesion being conducive to greater career maturity in both handicapped and nonhandicapped adolescents. These and other results of this study may be helpful to others attempting to explain more of the variance in career maturity for adolescents.

Through the use of path analysis, and the ability to examine not only the direct but the indirect and total effects as well, the prejudicial attitudes of some towards the career development of the handicapped (Osipow, 1976) can be confronted. Of major importance to those concerned with the career development of the handicapped is the conclusion that the construct of career development does apply equally well to nonhandicapped adolescents and to at least one handicapped group. The results further suggest that the disability does not appear to be more important than other factors in the handicapped person's life in determining career attitudes. And the handicapped person's career development does not necessarily have to be retarded by the disability. With continued research into the the effects of family and school characteristics on

career maturity, appropriate interventions will become apparent that will keep more handicapped people from experiencing the dissatisfaction that accompanies immature career planning.

REFERENCE LIST

- Allen, G. H. (1967). Aspirations and expectations of physically impaired high school seniors. Personnel and Guidance Journal, 46, 59-62.
- Allen, T.E. (1986). Understanding the scores: Hearing-impaired students and the Stanford Achievement Test (7th ed.). Washington, DC: Gallaudet Research Institute.
- Allen, T.E. & Osborn, T.I. (1984). Academic integration of hearing-impaired students: Demographic, handicapping, and achievement factors. American Annals of the Deaf, 129(2), 100-113.
- Anderson, G. & D. Watson (Eds.). (1984). Proceedings of National Conference of the Habilitation and Rehabilitation of Deaf Adolescents. Washington, D.C.: The National Academy of Gallaudet College.
- Angell, R.C. (1936). The family encounters the depression. New York: Scribners.
- Austin, G. (1984). Demographic summary of the rubella-deafened population. Journal of Rehabilitation of the Deaf, 18, 9-11.
- Battle, E., & Rotter, J. B. (1963). Children's feelings of personal control as related to social class and ethnic group. Journal of Personality, 31, 482-490.

- Bell, R. (1982). Parent-adolescent interaction in runaway families. Unpublished doctoral dissertation. University of Minnesota, St. Paul, Minnesota.
- Bernadelli, A., DeStefano, J., & Dumont, F. (1983). Occupational information-seeking as a function of perception of locus of control and other personality variables. Canadian Counselor, 17, 75-81.
- Blacher, J. (1984). Severely handicapped young children and their families. Orlando, FL: Academic Press.
- Blanton, R. L., & Nunnally, J. C. (1964). Evaluational language processes in the deaf. Psychological Reports, 15, 891-894.
- Blau, P. M. & Duncan, D. O. (1967). The American occupational structure. New York: John Wiley.
- Blevins, B. A. (1984). The effects of career decision-making skills intervention on locus of control and career maturity of adolescent deaf students. Unpublished doctoral dissertation, Virginia Polytechnic Institute and State University, Blacksburg, Virginia.
- Bolton, B. (1976). Psychology of deafness for rehabilitation counselors. Baltimore, MD: University Park Press.
- Booth, A., Johnson, D., & Edwards, J. (1983). Measuring marital instability. Journal of Marriage and the Family, 45, 387-393.

- Brolin, D.E. (1976). Vocational preparation of retarded citizens. Columbus, OH: Charles E. Merrill.
- Bronfenbrenner, U. (1961). Toward a theoretical model for the analysis of parent-child relationships in a social context. In J.D. Clidewell (Ed.), Parental attitudes and child behavior. Springfield, IL: Charles C. Thomas.
- Burkhead, E. J., & Cope, C. S. (1984). Career maturity and physically disabled college students. Rehabilitation Counseling Bulletin, 27, 142-150.
- Buros, O. K. (Ed.). The Eighth Mental Measurements Yearbook. NJ: Gryphon Press.
- Carnes, P. (1985). Counseling sexual abusers. Minneapolis, MN: Compcare Publications.
- Clark, J. (1984). The family types of schizophrenics, neurotics and "normals." Unpublished doctoral dissertation. Family Social Science, University of Minnesota, St. Paul, Minnesota.
- Clidewell, J.D. (Ed.). (1961). Parental attitudes and child behavior. Springfield, IL: Charles C. Thomas.

- Conte, L. E. (1983). Vocational development theories and the disabled person: Oversight or deliberate omission? Rehabilitation Counseling Bulletin, 26, 316-328.
- Cowan, E. (1965). Adjustment to auditory disability in adolescence. In U.S. Department of Health, Education, and Welfare, Vocational Rehabilitation Administration, Research on behavioral aspects of deafness: Proceedings of a national research conference. Washington, D.C..
- Crites, J. O. (1984). Instruments for assessing career development. In N. C. Gyspers (Ed.), Designing careers (pp. 248-274). San Francisco, CA: Jossey-Bass.
- Davis, W. L., & Phares, E. J. (1967). Internal-external control as a determinant of information-seeking in a social influence situation. Journal of Personality, 35, 547-561.
- Dowaliby, F. J., Burke, N. E., & McKee, B. B. (1983). A comparison of hearing-impaired and normally hearing students on locus of control, people orientation, study habits, and attitudes. American Annals of the Deaf, 128, 53-59.
- Farrugia, D. L. (1982). Deaf high school students' vocational interests and attitudes. American Annals of the Deaf, 127, 753-762.

- Forrest, D. J. & Thompson, A. S. (1974). The Career Development Inventory. In D. E. Super (Ed.), Measuring vocational maturity for counseling and evaluation. Washington, DC: National Vocational Guidance Association.
- Gardner, D. C., Beatty, G. J. & Bigelow, E. A. (1981). Locus of control and career maturity. Adolescence, 16, 557-562.
- Gardner, D.C. & Warren, S.A. (1978). Careers and disabilities: A career education approach. Stamford, CT: Greylock Press.
- Gelatt, H. B., Varenhorst, B., Carey, R., & Miller, G. P. (1973). Decisions and outcomes: A leader's guide. New York: College Entrance Examination Board.
- Ginzberg, E., Ginsberg, S. W., Axelrad, S., & Herma, J. L. (1951). Occupational choice. New York: Columbia University Press.
- Gottfredson, L. S. (1982). Vocational research priorities. Counseling Psychologist, 10, 69-84.
- Gyspers, N. C. (1984). Designing careers. San Francisco, CA: Jossey-Bass.
- Hadden, J. & Borgatta, E. (1969). Marriage and family. Itasca, IL: Peacock.

- Hanna, G. S., & Neely, M. A. (1978). Reliability of the CMI attitude scale. Measurement and Evaluation in Guidance, 11, 114-116.
- Hansen, J. C. (1985, January). Career Development Inventory: Review. Measurement and Evaluation in Counseling and Development, 220-224.
- Harren, V. A. (1979). A model of career decision making for college students. Journal of Vocational Behavior, 14, 119-133.
- Helbing, J. C. (1984). Vocational maturity, self concepts and identity. International Journal of Applied Psychology, 33, 335-350.
- Herr, E. L., & Leer, P. B. (1984). The family as an influence on career development. Family Therapy Collections, No. 10, 1-15.
- Hershenson, D. B. (1970). Life-stage vocational development system. In R. M. Roth, D. B. Hershenson and T. Hilliard (Eds.), The psychology of vocational development. Boston, MA: Allyn and Bacon.
- Hesser, A. (1981). Adolescent career development, family adaptability and family cohesion. Unpublished doctoral dissertation, Virginia Polytechnic Institute and State University, Blacksburg, Virginia.
- Hill, R. (1971). Modern systems theory and the family: A confrontation. Social Sciences Information, 10, 7-26.

- Hilton, T. L. (1983). Review of the Career Development Inventory. In J.T. Kapes, & M.M. Mastie (Eds.) A counselor's guide to vocational guidance instruments. Falls Church, VA.: National Vocational Guidance Association.
- Holland, J. L. (1959). A theory of vocational choice. Journal of Counseling Psychology, 6, 35-45.
- Holland, J. L. (1966). The psychology of vocational choice. Waltham, MA: Blaisdell.
- Holland, J.L. (1973). Making vocational choices. Englewood Cliffs, NJ: Prentice-Hall.
- Ifenwanta, S. (1978). Locus of control, career maturity, and perceived needs for lifelong education of Nigerian students in the United States. Unpublished doctoral dissertation, Boston University.
- Joe, V. C. (1971). Review of the internal-external control construct as a personality variable. Psychological Reports, 28, 619-640.
- Joreskog, K.G. & Sorbom, D. (1986). LISREL VI: Analysis of linear structural relationships. Chicago, IL: National Educational Resources.

Kapes, J. T. & Mastie, M. M. (Eds.). (1983). A counselor's guide to vocational guidance instruments. Falls Church, VA: National Vocational Guidance Association.

Karchmer, M. A. (1984). Demographics and deaf adolescents. In G. Anderson & D. Watson (Eds.), Proceedings of National Conference of the Habilitation and Rehabilitation of Deaf Adolescents (pp.28-47). Washington, DC: The National Academy of Gallaudet College.

Karchmer, M. A., Milone, M. N., & Wolk, S. (1979, April). Educational significance of hearing loss at three levels of severity. American Annals of the Deaf, 97-109.

Kaslow, F., & Cooper, B. (1978). Family therapy with the learning disabled child and his/her family. The Journal of Marriage and Family Counseling, 4(1), 41-49.

Khan, S. B., & Alvi, S. A. (1983). Educational, social, and psychological correlates of vocational maturity. Journal of Vocational Behavior, 22, 357-364.

Kluwin, T.N. (1987). Teacher-student instructional groupings and achievement. Paper presented at the meeting of the American Educational Research Association, Washington, D.C.

- Kluwin, T.N. & Moores, D.F. (1987). The effect of mainstreaming on the mathematics achievement of hearing-impaired adolescents. Paper presented at the meeting of the American Educational Research Association, Washington, D.C.
- Koelle, W. H., & Convey, J. J. (1982). The prediction of the achievement of deaf adolescents from self-concept and locus of control measures. American Annals of the Deaf, 127, 769-779.
- Lacey, D. (1975). Career behavior of deaf persons: Current status and future trends. In J. S. Picou & R. E. Campbell (Eds.), Career behavior of special groups. Columbus, OH: Charles E. Merrill.
- Lefcourt, H. M. (1966). Belief in personal control: Research and implications. Journal of Individual Psychology, 22, 185-195.
- Lefcourt, H. M. (1976). Locus of control: Current trends in theory and research. Hillsdale, NJ: Lawrence Erlbaum.
- Lerman, A. (1976). Vocational development. In B. Bolton (Ed.), Psychology of deafness for rehabilitation counselors. Baltimore: University Park Press.
- Lerman, A., & Guilfoyle, G. R. (1970). The development of prevocational behavior in deaf adolescents. New York: Teachers College Press.

- Lokan, J. J. , Boss, M. W. , & Patsula, P. J. (1982). A story of vocational maturity during adolescence and locus of control. Journal of Vocational Behavior, 20, 331-342.
- McHugh, D. F. (1975). A view of deaf people in terms of Super's theory of vocational development. Journal of Rehabilitation of the Deaf, 9, 1-11.
- McNair, D. , & Brown, D. (1983). Predicting the occupational aspirations and occupational expectations and career maturity of black and white male and female 10th graders. Vocational Guidance Quarterly, 32, 29-36.
- Minuchin, S. (1974). Families and family therapy. Boston, MA: Harvard University Press.
- Minuchin, S. , Montalvo, B. , Guerney, B.G. , Rossman, B.L. , & Schumer, F. (1967). Families of the slums. New York: Basic Books.
- Moore, T. L. , & McLean, J. E. (1977). A validation study of the Career Maturity Inventory attitude scale. Measurement and Evaluation in Guidance, 10, 113-116.
- Navin, S. , & Myers, J. E. (1983). A model of career development for disabled adults. Journal of Rehabilitation of the Deaf, 14, 38-43.

- Neely, M. A., & Johnson, C. W. (1981). The relationship of performance on six scales of the Career Development Inventory to sex, father's education, and father's occupation. Educational and Psychological Measurement, 41, 917-921.
- Nye, F.I. & Rushing, W. (1969). Toward family measurement research. In J. Hadden & E. Borgatta (Eds.) Marriage and family. Itasca, IL: Peacock.
- Olson, D.H. & Killorin, E. (1985). Chemically dependent families and the circumplex model. Unpublished manuscript. Family Social Science, University of Minnesota, St. Paul, Minnesota.
- Olson, D. H., Portner, J., & Lavee, Y. (1985). FACES III: Family Adaptability and Cohesion Evaluation Scales. St. Paul, MN: University of Minnesota.
- Olson, D.H., Sprenkle, D.H., and Russell, C.S. (1979). Circumplex model of marital and family systems II: Empirical studies and clinical intervention, in J.P. Vincent (Ed.), Advances in family intervention, assessment, and theory (pp.129-176). Greenwich, CT: JAI Press, 1.

O'Neil, J. M. , Ohlde, C. , Tollefson, N. , Barke, C. , Piggott, T. , & Watts, D. (1980). Factors, correlates, and problem areas affecting career decision making of a cross-sectional sample of students. Journal of Counseling Psychology, 27, 571-580.

Osipow, S. H. (1975). The relevance of theories of career development to special groups: Problems, needed data, and implications. In J. S. Picou & R. E. Campbell (Eds.), Career behavior of special groups. Columbus, OH: Charles E. Merrill.

Osipow, S. H. (1976). Vocational development problems of the handicapped. In H. Rusalem & D. Maliken (Eds.), Contemporary vocational rehabilitation. New York: New York University Press.

Osipow, S. H. (1983). Theories of career development. Englewood Cliffs, NJ: Prentice-Hall.

Overs, R. P. (1975). Career behavior of the physically and mentally handicapped. In J. S. Picou & R. E. Campbell (Eds.), Career behavior of special groups. Columbus, OH: Charles E. Merrill.

Pedhazur, E. J. (1982). Multiple regression in behavioral research (2nd ed.). New York: Holt, Rinehart and Winston.

Pelham, J. P. , & Fratz, B. R. (1982). Racial differences and attributes of career choice unrealism. Vocational Guidance Quarterly, 31, 36-42.

- Perosa, L.M. & Perosa, S.L. (1981). The school counselor's use of structural family therapy with learning disabled students. The School Counselor, 152-155.
- Perun, P.J. & Bielby, D.D.V. (1981). Towards a model of female occupational behavior: A human development approach. Psychology of Women Quarterly, 6(2), 234-252.
- Phillips, S. D., Strohmer, D. C., Berthaume, B. L., & O'Leary, J. C. (1983). Career development of special populations: A framework for research. Journal of Vocational Behavior, 32, 12-29.
- Picou, J. S., & Campbell, R. E. (1975). Career behavior of special groups. Columbus, OH: Charles E. Merrill.
- Pound, R. E. (1978). Using self-concept subscales in predicting career maturity for race and sex subgroups. Vocational Guidance Quarterly, 28, 61-68.
- Punch, K. F. & Sheridan, B. E. (1985). Some measurement characteristics of the Career Development Inventory. Measurement & Evaluation in Counseling and Development, 17, 196-202.
- Rabinowitz, M. (1965). The relationship of self-regard to the effectiveness of life experiences. Unpublished doctoral dissertation, Teachers College, Columbia University, New York, New York.

Roe, A. (1956). The psychology of occupations. New York: John Wiley & Sons, Inc..

Rodick, Hengler, S.W., & Hanson (1985). An evaluation of family adaptability and cohesion evaluation scales (FACES) and the circumplex model. Journal of Abnormal Child Psychology, in press.

Roe, A. (1957). Early determinants of vocational choice. Journal of Counseling Psychology, 4, 212-17.

Roth, R. M., Hershenson, D.B., & Hilliard, T. (Eds.). (1970). The psychology of vocational development. Boston, MA: Allyn and Bacon.

Rotter, J. B. (1954). Social learning and clinical psychology. Englewood Cliffs, NJ: Prentice-Hall.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 80, (1, No. 609).

Rotter, J. B., Chance, J. E., & Phares, E. J. (1972). Applications of a social learning theory of personality. New York: Holt, Rinehart and Winston, Inc.

Rusalem, H., & Maliken, D. (Eds.). (1976). Contemporary Vocational Rehabilitation. New York: New York University Press.

- Russell, C. S. (1979). Circumplex model of marital and family systems: III. Empirical validation with families. Family Process, 18, 29-45.
- Safilios-Rothschild, C. (1970). The sociology and social psychology of disability and rehabilitation. New York: Random House.
- Saur, R., Coggiola, D., Long, G., & Simonson, J. (1986). Educational mainstreaming and the career development of hearing-impaired students: A longitudinal analysis. The Volta Review, February/March, 79-88.
- Schein, J. D., & Delk, M. T. (1974). The deaf population in the United States. Silver Spring, MD: National Association of the Deaf.
- Schlesinger, H. S., & Meadow, K. P. (1972). Sound and sign. Berkely, CA: University of California Press.
- Science Research Associates (1981). SRA achievement series: Technical report #2. Chicago: Author.
- Seeman, M. (1963). Alienation and social learning in a reformatory. American Journal of Sociology, 69, 270-289.
- Seeman, M., & Evans, J. W. (1962). Alienation and learning in a hospital setting. American Sociological Review, 27, 772-783.
- Spradley, T. S. (1978). Deaf like me. New York: Random House.

- Sporakowski, M.J. & Eubanks, J.M. (1976). Parent-adolescent communication and school adjustment. The School Counselor, 23, 185-190.
- Sprenkle, D.H. & Olson, D.H. (1978). Circumplex model of marital and family systems IV: Empirical study of clinic and non-clinic couples. Journal of Marital and Family Therapy, 4, 59-74.
- SPSS (1983). SPSSx User's Guide. Chicago, IL: SPSS.
- Super, D. E. (1953). A theory of vocational development. American Psychologist, 8, 185-90.
- Super, D. E. (1957). The psychology of careers. New York: Harper.
- Super, D. E., Crites, J. O., Hummel, R. C., Moser, H. P., Overstreet, P. L. & Warnath, C. F. (1957). Vocational development: A framework for research. New York: Teachers College Press.
- Super, D. E., & Kidd, J. M. (1979). Vocational maturity in adulthood: Turning a model into a measure. Journal of Vocational Behavior, 14, 255-270.
- Super, D.E. & Nevill, D.D. (1984). Work role salience as a determinant of career maturity in high school students. Journal of Vocational Behavior, 25(1), 30-44.

Super, D. E. & Overstreet, P. (1960). The vocational maturity of ninth grade boys: Career pattern study . New York: Teachers College Press.

Super, D. E. & Thompson, A. S. (1979). A six-scale, two-factor measure of vocational maturity. Vocational Guidance Quarterly, 28, 6-15.

Super, D. E. , Thompson, A. S. , Lindeman, R. H. , Jordaan, J. P. , & Myers, R. A. (1981). Career Development Inventory. Palo Alto, CA: Consulting Psychologists Press, Inc.

United States Department of Health, Education and Welfare, Vocational Rehabilitation Administration (1965). Research on behavioral aspects of deafness: Proceedings of a national research conference. Washington, D.C..

Vincent, J.P. (Ed.). (1980). Advances in family intervention, assessment, and theory. Greenwich, CT: JAI Press.

Virginia Council for the Deaf (1980). Virginia's hearing-impaired children: A needs assessment. Richmond: Author.

Walsh, W. B. & Osipow, S.H. (Eds.). (1983). Handbook of vocational psychology: Vol. I. Hillsdale, NJ: Erlbaum

Wertheim, E. (1973). Family unit therapy and the science and typology of family systems. Family Process, 12, 361-376.

- Westbrook, B. W. (1983). Career maturity: The concept, the instrument, and the research. In W. B. Walsh & S. H. Osipow (Eds.), Handbook of vocational psychology: Vol. I. Hillsdale, NJ: Erlbaum
- Westbrook, B. W., Cutts, C. W., Madison, S. S., & Arcia, M. (1980). The validity of the Crites model of career maturity. Journal of Vocational Behavior, 16, 249-281.
- Wolfle, L.M. & Ethington, C.A. (1985). GEMINI: Program for analysis of structural equations. Behavior Research Methods, Instruments & Computers, 17(5), 581-584.
- Wynne, L., Ryckoff, I.M., Day, J. & Hirsch, S.I. (1958). Pseudo-mutuality in the family relations of schizophrenics. Psychiatry, 21, 205-222.
- Yando, R. & Zigler, E. (1984). Severely handicapped children and their families: A synthesis. In J. Blacher (Ed.), Severely handicapped young children and their families: Research in review. Orlando, FL: Academic Press.
- Young, R. A. (1983). Career development of adolescents: An ecological perspective. Journal of Youth and Adolescence, 12, 401-417.
- Zieziula, F. R. (Ed.). (1982). Assessment of hearing-impaired people. Washington, DC: Gallaudet College Press.

Zytowski, D. G. (1978). Review of the Career Maturity Inventory by J.O. Crites. In O. K. Buros (Ed.), The Eighth Mental Measurements Yearbook pp.1565-1567. NJ: Gryphon Press.

APPENDIX A. INSTRUMENTS AND CODEBOOK

RECORDED 1

(1-4)	Identification number	(22-24)	READB	(50-52)	IQ11
(5)	1	(25-27)	MATH8	(53)	*EDIT3*
(7)	GRADE: 1=10 2=11 3=12	(28-30)	LANG8		
(8-9)	MONTH	(31-33)	COMP8		
(10-11)	DAY	(34-36)	IQ8		
(12-13)	YEAR	(37)	*EDIT2*		
(14)	SEX 1=male 2=female	(38-40)	READ11		
(15)	RACE	(41-43)	MATH11		
(16)	CURRIC	(44-46)	LANG11		
(17)	STREAM 1=mainst. 2=resource 3=self-c. 4=res.				
(18-20)	LOGS	(47-49)	COMP11		
(21)	*EDIT1*				

DIFFERENT SITUATIONS INVENTORY (D-S-I SELF)

ID: _____

DSI1-DSI20 Please consider your observations of your own behavior in the past and indicate how you think you would respond in the different situations described below. Even though both alternatives may seem appropriate to you, please choose the one you think most fitting for you. If you are not certain, please guess.

CIRCLE EITHER A OR B BUT NOT BOTH

- (54) 1. In buying new shoes, I would be more influenced by:
- A. Current fashions.
 - B. Personal preferences.
- (55) 2. If I received an unexpected bonus, I might say:
- A. "This is my lucky day!"
 - B. "Hard work pays off!"
- (56) 3. After doing a very good job, I would feel:
- A. Proud that it was such good work.
 - B. Proud that someone praised the work.
- (57) 4. I tend to believe that an ideal future career depends most on:
- A. Hard work toward the goal, more than luck.
 - B. Good luck along with the work.
- (58) 5. Asked to volunteer for a community service job, I would want to know:
- A. How much time and effort would be required.
 - B. If significant peers had already agreed to help.
- (59) 6. When confronted by another person's disagreement, I would:
- A. Withdraw gracefully.
 - B. Try to clarify the issue.

DIFFERENT SITUATIONS INVENTORY (D-S-I SELF)

- 50 7. Given a complex task, I would probably:
- A. Try to complete the task without help.
 - B. Seek consultation at each stage.
- 61 8. If asked to estimate time required to bicycle five kilometers, I would:
- A. Tend to approximate the estimates of peers.
 - B. Hold to own estimate even if it differs from those of peers.
- 62 9. My reaction to learning that a radio just purchased had poor tone:
- A. "That clerk sold me a bill of goods!"
 - B. "Next time I'll know not to buy the cheapest one!"
- 63 10. I would prefer a TV detective show in which:
- A. The hero works alone
 - B. The police consult a famous detective.
- 64 11. After failure on a test, I might attribute blame to:
- A. The test itself.
 - B. Lack of preparation.
- 65 12. When somebody gets angry at me, I might feel:
- A. Maybe he'll get over it after a while.
 - B. A nice letter of explanation might clear the air.
- 66 13. I might attribute difficulty in learning to improve at tennis to:
- A. Poor teaching by the coach.
 - B. Not enough practice.
- 67 14. In studying for an exam, I would prefer:
- A. Studying with another student.
 - B. Studying in private.
- 68 15. If another person says critical things about me, my most likely reaction might be to think:
- A. "I wonder if others think the same thing about me."
 - B. "Well, I'm not so sure I agree with that opinion."

- 69 16. Type of game I prefer:
- A. A game of chance.
 - B. A game of skill.
- 70 17. I would feel that to reach my goal in my life, it's important to know:
- A. The right people.
 - B. What I really want from life.
- 71 18. When people are mean to me, I might feel:
- A. Very concerned because it is important to have lots of friends.
 - B. Very concerned, but that it is possible to get along without such people.
- 72 19. In a baseball game, I might attribute my excellent performance to:
- A. Having "a good day."
 - B. Rigorous practice.
- 73 20. Not finding a personal item in an expected place, I might say:
- A. "I wonder if I left it somewhere else?"
 - B. "I wonder if somebody took it by mistake?"

(c) 1978 D. C. Gardner & S. A. Warren

RECORD 2

FACES III

David H. Olson, Joyce Portner, and Yoav Lavee

ID: _____ (1-4)

2 (5)

* * (6)

Instructions

Please respond to all questions as accurately as possible. Your responses will be kept strictly confidential.

FAMILY SOCIAL SCIENCE, 290 McNeal Hall,
University of Minnesota, St. Paul, MN 55108

(c) D.H. Olson, 1985

FACES III

David H. Olson, Joyce Portner, and Yoav Lavee

CFACES1-CFACES20

-
- 1 = ALMOST NEVER
2 = ONCE IN A WHILE
3 = SOMETIMES
4 = FREQUENTLY
5 = ALMOST ALWAYS
-

DESCRIBE YOUR FAMILY NOW:

- 7 ___ 1. Family members ask each other for help.
- 8 ___ 2. In solving problems, the children's suggestions are followed.
- 9 ___ 3. We approve of each other's friends.
- 10 ___ 4. Children have a say in their discipline.
- 11 ___ 5. We like to do things with just our immediate family.
- 12 ___ 6. Different persons act as leaders in our family.
- 13 ___ 7. Family members feel closer to other family members than to people outside the family.
- 14 ___ 8. Our family changes its way of handling tasks.
- 15 ___ 9. Family members like to spend free time with each other.
- 16 ___ 10. Parents and children discuss punishment together.
- 17 ___ 11. Family members feel very close to each other.
- 18 ___ 12. The children make the decisions in our family.
- 19 ___ 13. When our family gets together for activities, everybody is present.
- 20 ___ 14. Rules change in our family.
- 21 ___ 15. We can easily think of things to do together as a family.
- 22 ___ 16. We shift household responsibilities from person to person.
- 23 ___ 17. Family members consult other family members on their decisions.
- 24 ___ 18. It is hard to identify the leader(s) in our family.
- 25 ___ 19. Family togetherness is very important.
- 26 ___ 20. It is hard to tell who does which household chores.
- 27 EDITT4



ID: _____

School Form

Developed by Drs. Donald E. Super, Albert S. Thompson,
Richard H. Lindeman, Jean P. Jordaan, and Roger A. Myers
at Teachers College, Columbia University

Career Development Inventory

DIRECTIONS

The Career Development Inventory asks you about school, work, your future career, and some of the plans you may have made. Answers to questions like these can indicate what kind of help may be useful to you in planning and preparing for a job after graduation, for vocational and technical school training, or for going to college before pursuing your occupational career.

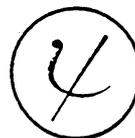
The Inventory consists of two parts. The person who administers it will indicate whether you should complete the first part, the second part, or both parts. Part I (Career Orientation) begins on the next page.

All of your answers go in this booklet. Please circle the appropriate letter for the answer to each question.

When directed to do so, open this booklet and begin. Please answer every question. If you are not sure about an answer, guess; the first answer that comes to you is often the best one. Work rapidly, but be careful to make your marks in the right place for each question.

Consulting Psychologists Press, Inc., Palo Alto, California

©Copyright, 1979, by Consulting Psychologists Press, Inc., 577 College Ave., Palo Alto, CA 94306. All rights reserved. No portion of this material may be reproduced without written permission of the Publisher.



PART I. Career Orientation

CP1-CP14

A. CAREER PLANNING

How much thinking and planning have you done in the following areas? For each question below choose the answer that best tells what you have done so far.

- 28 1. Finding out about educational and occupational possibilities by going to the library, sending away for information, or talking to somebody who knows.
- A. I have not yet given any thought to this.
 - B. I have given some thought to this, but haven't made any plans yet.
 - C. I have some plans, but am still not sure of them.
 - D. I have made definite plans, but don't know yet how to carry them out.
 - E. I have made definite plans, and know what to do to carry them out.
- 29 2. Talking about career plans with an adult who knows something about me.
- A. I have not yet given any thought to this.
 - B. I have given some thought to this, but haven't made any plans yet.
 - C. I have some plans, but am still not sure of them.
 - D. I have made definite plans, but don't know yet how to carry them out.
 - E. I have made definite plans, and know what to do to carry them out.
- 30 3. Taking classes which will help me decide what line of work to go into when I leave school or college.
- A. I have not yet given any thought to this.
 - B. I have given some thought to this, but haven't made any plans yet.
 - C. I have some plans, but am still not sure of them.
 - D. I have made definite plans, but don't know yet how to carry them out.
 - E. I have made definite plans, and know what to do to carry them out.
- 31 4. Taking classes which will help me in college, in job training, or on the job.
- A. I have not yet given any thought to this.
 - B. I have given some thought to this, but haven't made any plans yet.
 - C. I have some plans, but am still not sure of them.
 - D. I have made definite plans, but don't know yet how to carry them out.
 - E. I have made definite plans, and know what to do to carry them out.
5. Taking part in school or out-of-school activities which will help me in college, in training, or on the job.
- A. I have not yet given any thought to this.
 - B. I have given some thought to this, but haven't made any plans yet.
 - C. I have some plans, but am still not sure of them.
 - D. I have made definite plans, but don't know yet how to carry them out.
 - E. I have made definite plans, and know what to do to carry them out.
6. Taking part in school or after-school activities (for example, science club, school newspaper, volunteer nurse's aide) which will help me decide what kind of work to go into when I leave school.
- A. I have not yet given any thought to this.
 - B. I have given some thought to this, but haven't made any plans yet.
 - C. I have some plans, but am still not sure of them.
 - D. I have made definite plans, but don't know yet how to carry them out.
 - E. I have made definite plans, and know what to do to carry them out.

Go on to the next page.

- 34 7. Getting a part-time or summer job which will help me decide what kind of work I might go into.
- I have not yet given any thought to this.
 - I have given some thought to this, but haven't made any plans yet.
 - I have some plans, but am still not sure of them.
 - I have made definite plans, but don't know yet how to carry them out.
 - I have made definite plans, and know what to do to carry them out.
- 35 8. Getting money for college or for job training.
- I have not yet given any thought to this.
 - I have given some thought to this, but haven't made any plans yet.
 - I have some plans, but am still not sure of them.
 - I have made definite plans, but don't know yet how to carry them out.
 - I have made definite plans, and know what to do to carry them out.
- 36 9. Working out problems that might make it hard for me to get the kind of training or the kind of work I would like.
- I have not yet given any thought to this.
 - I have given some thought to this, but haven't made any plans yet.
 - I have some plans, but am still not sure of them.
 - I have made definite plans, but don't know yet how to carry them out.
 - I have made definite plans, and know what to do to carry them out.
- 37 10. Getting the kind of training, education, or experience I will need to get the kind of work I would like.
- I have not yet given any thought to this.
 - I have given some thought to this, but haven't made any plans yet.
 - I have some plans, but am still not sure of them.
 - I have made definite plans, but don't know yet how to carry them out.
 - I have made definite plans, and know what to do to carry them out.
- 38 11. Getting a job once I have finished my education and training.
- I have not yet given any thought to this.
 - I have given some thought to this, but haven't made any plans yet.
 - I have some plans, but am still not sure of them.
 - I have made definite plans, but don't know yet how to carry them out.
 - I have made definite plans, and know what to do to carry them out.
- 39 12. Doing things that will help me be a good worker, one who is most likely to be sure of a job.
- I have not yet given any thought to this.
 - I have given some thought to this, but haven't made any plans yet.
 - I have some plans, but am still not sure of them.
 - I have made definite plans, but don't know yet how to carry them out.
 - I have made definite plans, and know what to do to carry them out.

The next questions concern the kind of work you would like to do when you complete your education. At this stage, you probably have not definitely decided on a specific occupation, but you probably can think of a field of work or type of job you would like to work at. *Keeping in mind the type of job you think you might like to be in after you finish your schooling*, choose the one best answer which tells the amount of knowledge you already have about these jobs.

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>40 13. What people really do on the job.</p> <ol style="list-style-type: none"> Hardly any knowledge. A little knowledge. An average amount of knowledge. A good deal of knowledge. A great deal of knowledge. | <p>41 14. The abilities needed for the occupation.</p> <ol style="list-style-type: none"> Hardly any knowledge. A little knowledge. An average amount of knowledge. A good deal of knowledge. A great deal of knowledge. |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

CP15-CP20

- 43 15. The working conditions on such jobs.
A. *Hardly any* knowledge.
B. *A little* knowledge.
C. *An average amount* of knowledge.
D. *A good deal* of knowledge.
E. *A great deal* of knowledge.
- 44 16. The education or training needed to get such a job.
A. *Hardly any* knowledge.
B. *A little* knowledge.
C. *An average amount* of knowledge.
D. *A good deal* of knowledge.
E. *A great deal* of knowledge.
- 45 17. The need for people on that kind of job in the future.
A. *Hardly any* knowledge.
B. *A little* knowledge.
C. *An average amount* of knowledge.
D. *A good deal* of knowledge.
E. *A great deal* of knowledge.
- 46 18. Different ways of getting into that occupation.
A. *Hardly any* knowledge.
B. *A little* knowledge.
C. *An average amount* of knowledge.
D. *A good deal* of knowledge.
E. *A great deal* of knowledge.
- 47 19. The chances of advancing in that kind of job or occupation.
A. *Hardly any* knowledge.
B. *A little* knowledge.
C. *An average amount* of knowledge.
D. *A good deal* of knowledge.
E. *A great deal* of knowledge.
- 48 20. What sort of working day and work week I might have in the occupation.
A. *Hardly any* knowledge.
B. *A little* knowledge.
C. *An average amount* of knowledge.
D. *A good deal* of knowledge.
E. *A great deal* of knowledge.

B. CAREER EXPLORATION

Questions 21 through 30 have four possible answers. Choose the *one best* answer for each question to show whether or not you would go to the following sources for information or help in making your plans for work or further education.

CE21-CE40

- 49 21. Father, mother, uncles, aunts, etc.
A. Definitely not.
B. Probably not.
C. Probably.
D. Definitely.
- 50 22. Brothers, sisters, or cousins.
A. Definitely not.
B. Probably not.
C. Probably.
D. Definitely.
- 51 23. Friends.
A. Definitely not.
B. Probably not.
C. Probably.
D. Definitely.
- 52 24. Coaches of school or other teams.
A. Definitely not.
B. Probably not.
C. Probably.
D. Definitely.
- 53 25. Teachers.
A. Definitely not.
B. Probably not.
C. Probably.
D. Definitely.
- 54 26. School counselors.
A. Definitely not.
B. Probably not.
C. Probably.
D. Definitely.
- 55 27. Other adults who know things and can help people.
A. Definitely not.
B. Probably not.
C. Probably.
D. Definitely.
- 56 28. College catalogues, books, guidance materials, etc.
A. Definitely not.
B. Probably not.
C. Probably.
D. Definitely.
- 57 29. People in the occupation or at the institute or college I am considering.
A. Definitely not.
B. Probably not.
C. Probably.
D. Definitely.
- 58 30. TV shows, movies, or magazines.
A. Definitely not.
B. Probably not.
C. Probably.
D. Definitely.

4

Go on to the next page.

Questions 31 through 40 also have four possible answers. This time choose the *one best* answer to show how much useful information the people or sources listed below have already given you or directed you to in making your plans for the future.

- | | | | |
|----|-----------------------------------------------|----|-------------------------------------------------------------------------------|
| 59 | 31. Father, mother, uncles, aunts, etc. | 64 | 36. School counselors. |
| | A. <i>No useful information.</i> | | A. <i>No useful information.</i> |
| | B. <i>Some useful information.</i> | | B. <i>Some useful information.</i> |
| | C. <i>A good deal of useful information.</i> | | C. <i>A good deal of useful information.</i> |
| | D. <i>A great deal of useful information.</i> | | D. <i>A great deal of useful information.</i> |
| 60 | 32. Brothers, sisters, or other relatives. | 65 | 37. Other adults who know things and can help people. |
| | A. <i>No useful information.</i> | | A. <i>No useful information.</i> |
| | B. <i>Some useful information.</i> | | B. <i>Some useful information.</i> |
| | C. <i>A good deal of useful information.</i> | | C. <i>A good deal of useful information.</i> |
| | D. <i>A great deal of useful information.</i> | | D. <i>A great deal of useful information.</i> |
| 61 | 33. Friends. | 66 | 38. College catalogues, books, guidance materials, etc. |
| | A. <i>No useful information.</i> | | A. <i>No useful information.</i> |
| | B. <i>Some useful information.</i> | | B. <i>Some useful information.</i> |
| | C. <i>A good deal of useful information.</i> | | C. <i>A good deal of useful information.</i> |
| | D. <i>A great deal of useful information.</i> | | D. <i>A great deal of useful information.</i> |
| 62 | 34. Coaches of school or other teams. | 67 | 39. People in the occupation or at the institute or college I am considering. |
| | A. <i>No useful information.</i> | | A. <i>No useful information.</i> |
| | B. <i>Some useful information.</i> | | B. <i>Some useful information.</i> |
| | C. <i>A good deal of useful information.</i> | | C. <i>A good deal of useful information.</i> |
| | D. <i>A great deal of useful information.</i> | | D. <i>A great deal of useful information.</i> |
| 63 | 35. Teachers. | 68 | 40. TV shows, movies, or magazines. |
| | A. <i>No useful information.</i> | | A. <i>No useful information.</i> |
| | B. <i>Some useful information.</i> | | B. <i>Some useful information.</i> |
| | C. <i>A good deal of useful information.</i> | | C. <i>A good deal of useful information.</i> |
| | D. <i>A great deal of useful information.</i> | | D. <i>A great deal of useful information.</i> |

FACES III

David H. Olson, Joyce Portner, and Yoav Lavee

ID: _____ (1-4)
3 (5)

Instructions

Please respond to all questions as accurately as possible. Your responses will be kept strictly confidential.

ONLY ONE PARENT SHOULD RESPOND TO THESE ITEMS. Please do not get help from other family members.

This questionnaire is being answered by the child's:

- 1 a. mother only
- 2 b. father only
- 3 c. other female guardian only
- 4 d. other male guardian only
- 5 e. other (specify) _____

RECORD 3

FHCH
6

FAMILY SOCIAL SCIENCE, 290 McNeal Hall,
University of Minnesota, St. Paul, MN 55108

(c) D.H. Olson, 1985

FACES III

David H. Olson, Joyce Portner, and Yoav Lavee

FFACES1-FFACES20

-
- 1 = ALMOST NEVER
2 = ONCE IN A WHILE
3 = SOMETIMES
4 = FREQUENTLY
5 = ALMOST ALWAYS
-

DESCRIBE YOUR FAMILY NOW:

- 7 ___ 1. Family members ask each other for help.
- 8 ___ 2. In solving problems, the children's suggestions are followed.
- 9 ___ 3. We approve of each other's friends.
- 10 ___ 4. Children have a say in their discipline.
- 11 ___ 5. We like to do things with just our immediate family.
- 12 ___ 6. Different persons act as leaders in our family.
- 13 ___ 7. Family members feel closer to other family members than to
 people outside the family.
- 14 ___ 8. Our family changes its way of handling tasks.
- 15 ___ 9. Family members like to spend free time with each other.
- 16 ___ 10. Parents and children discuss punishment together.
- 17 ___ 11. Family members feel very close to each other.
- 18 ___ 12. The children make the decisions in our family.
- 19 ___ 13. When our family gets together for activities, everybody is present.
- 20 ___ 14. Rules change in our family.
- 21 ___ 15. We can easily think of things to do together as a family.
- 22 ___ 16. We shift household responsibilities from person to person.
- 23 ___ 17. Family members consult other family members on their decisions.
- 24 ___ 18. It is hard to identify the leader(s) in our family.
- 25 ___ 19. Family togetherness is very important.
- 26 ___ 20. It is hard to tell who does which household chores.
- 27 *EDITG*

RECORDS cont'd

Modeling the Development of Career Maturity in Adolescents

Parent Questionnaire (Form III)

ID: _____

Instructions

Please respond to all questions as accurately as possible. Your responses will be kept strictly confidential and will not be shared with school staff, students, nor anyone else. Although your name is on this questionnaire, its only purpose is to link the information we get from you with the information from your child. All names and other identifying information will be removed once the data are recorded.

When you have completed the questionnaire, please seal it in the envelope provided. If an envelope without a stamp is included in this packet please return this questionnaire to the school with your child. If the envelope is addressed and stamped, please return it by mail.

12.000
28

This questionnaire is being answered by the child's

- a. mother only
- b. father only
- c. mother and father
- d. other female guardian
- e. other male guardian
- f. other (specify) _____

1. What is the child's date of birth?

Month: MONTH Day: DAY Year: YEAR
29-30 31-32 33-34

SIBS
35

2. How many living siblings does the child have? (Only include step siblings and half siblings if they live at home with you.)

____ Brothers and sisters.

ORDER
36

3. Which of the following best describes the child's family position?

- 1 ____ a. An only child (no brothers or sisters)
- 2 ____ b. The oldest child (at least one sibling but none older)
- 3 ____ c. Middle child (at least one older and younger brother or sister)
- 4 ____ d. Youngest child (at least one older brother or sister but none younger.)

STATUS
37

4. What is the status of the child's biological parents?

- ____ a. Living together.
- ____ b. Separated.
- ____ c. Divorced.
- ____ d. One parent deceased.
- ____ e. Both parents deceased.

ETHNIC
38

5. Which of the following best describes your family's ethnic status:

- ____ a. Asian
- ____ b. Black
- ____ c. Hispanic
- ____ d. White
- ____ e. Other (specify) _____

SETTING
39

6. My child grew up in:

- ____ a. a rural area some distance from other houses.
- ____ b. a rural area but near other houses.
- ____ c. a village or town (not a suburb).
- ____ d. a suburb.
- ____ e. a city.

How far did the child's parents, or guardians, go in school?
Darken the circles that most nearly answer the question:

FATHER
40

7. Father, Step-father, or male guardian

8. Mother, Step-mother, or female guardian

MOTHER
41

- | | | | | | |
|---|-----------------------|-------|-----------------------|-------|-------------------------------------------------------------|
| 1 | <input type="radio"/> | | <input type="radio"/> | | Less than high school. |
| 2 | <input type="radio"/> | | <input type="radio"/> | | Completed high school. |
| 3 | <input type="radio"/> | | <input type="radio"/> | | Attended college or technical or special school, no degree. |
| 4 | <input type="radio"/> | | <input type="radio"/> | | Finished college. |
| 5 | <input type="radio"/> | | <input type="radio"/> | | Attended or completed graduate school. |

EDIT7
4.

Check the category that best describes the occupations of the child's mother and father while the child was growing up.

- | | | | |
|-------------|------------------------------------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| FACCC
43 | 9. Father, Step-father, or male guardian | 10. Mother, Step-mother, or female guardian | FACCC
44 |
| | 1 <input type="radio"/> | <input type="radio"/> | PROFESSIONAL (e.g., accountant, physician, registered nurse, manager, engineer, commissioned officer) |
| | 2 <input type="radio"/> | <input type="radio"/> | SKILLED WORKER (e.g. police officer, sales, beautician, clerical, mechanic, foreman, licensed practical nurse) |
| | 3 <input type="radio"/> | <input type="radio"/> | SEMI-SKILLED WORKER (e.g. laborer, hospital aide, assembly line worker, domestic) |
| | 4 <input type="radio"/> | <input type="radio"/> | HOMEMAKER, or NOT EMPLOYED OUTSIDE THE HOME. |
| | 5 <input type="radio"/> | <input type="radio"/> | DECEASED OR ABSENT |

Which of categories below best describes the kind of work the child's mother (or guardian) and father (or guardian) EXPECT the child to enter?

- | | | | |
|-------------|-------------------------------------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| FACCC
45 | 11. Father, Step-father, or male guardian | 12. Mother, Step-mother, or female guardian | FACCC
46 |
| | 1 <input type="radio"/> | <input type="radio"/> | PROFESSIONAL (e.g., accountant, physician, registered nurse, manager, engineer, commissioned officer) |
| | <input type="radio"/> | <input type="radio"/> | SKILLED WORKER (e.g. police officer, sales, beautician, clerical, mechanic, foreman, licensed practical nurse) |
| | <input type="radio"/> | <input type="radio"/> | SEMI-SKILLED WORKER (e.g. laborer, hospital aide, assembly line worker, domestic) |
| | 4 <input type="radio"/> | <input type="radio"/> | HOMEMAKER, or NOT EMPLOYED OUTSIDE THE HOME. |

FACCC
47

21135b
62-64

20. When together with your child for the day, what's the TOTAL amount of time the MOTHER usually spends communicating with the child?

About _____ minutes a day.

21135f
65

21. In which of the following ways does the child's FATHER (step-father, or male guardian) communicate with the child most of the time?

- a. Writing
- b. Speech
- c. Sign Language (Signed English, ASL, etc.)
- d. Speech and sign language at the same time
- e. Gestures

21135f
66

22. By communicating in this way, can the child's FATHER easily:
(Circle Y for YES, N for NO)

- Y N a. ask the child for information or ask him or her to do something?
- Y N b. make small talk (the weather, activities, etc.)?
- Y N c. have a short, simple conversation?
- Y N d. have a long, complex conversation?

21135f
67-68

23. How old was the child when his or her FATHER (step-father, or male guardian) first began to use sign language?

- a. The FATHER does not use sign language.
- b. The child was _____ years old.

21135f
69-71

24. When together with your child for the day, what's the TOTAL amount of time the FATHER usually spends communicating with the child?

About _____ minutes a day.

21135f
72

25. Is the child's MOTHER hearing-impaired?

- a. No, she has normal hearing.
- b. Yes, she is mildly hearing-impaired.
- c. Yes, she is moderately hearing-impaired.
- d. Yes, she is severely or profoundly deaf.

21135f
73

26. Is the child's FATHER hearing-impaired?

- a. No, he has normal hearing.
- b. Yes, he is mildly hearing-impaired.
- c. Yes, he is moderately hearing-impaired.
- d. Yes, he is severely or profoundly deaf.

Thank you for completing this portion of the packet.

Please complete the FACES III next.

8/13/86

For each of the following questions, CHECK ONLY ONE RESPONSE to indicate your child's possessions and activities.

BOOKS
7

1. The number of books the child owns amounts to about:

- a. two or more bookcases full.
- b. one bookcase full.
- c. more than 6 books but less than a bookcase full.
- d. not more than 6 books.
- e. none.
- f. I have no way of knowing.

	1	2	3
	YES	NO	DON'T KNOW

My child regularly reads the following kinds of magazines:				
8	1. comics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	2. hobby magazines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	3. Popular Mechanics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	4. story magazines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	5. picture-news magazines like Life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	6. news magazines like Time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	7. humor or current events magazines like New Yorker...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	8. business magazines like Forbes, Fortune.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	9. travel magazines like Holiday, National Geographic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	10. movie or people magazines...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	11. romance magazines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	12. fashion magazines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

EDIT 110
20

	1	2	3
	YES	NO	DONT KNOW

Of the following, my child has:

13	work or hobby space.....	___	___	___
14	a movie camera	___	___	___
15	other photo equipment	___	___	___
16	a typewriter	___	___	___
17	a microcomputer	___	___	___
18	stereo.....	___	___	___
19	pop, rock or semi-classical records or tapes	___	___	___
20	Jazz or folk records/tapes..	___	___	___
21	classical records/tapes	___	___	___
22	a musical instrument	___	___	___
23	original paintings or sculpture	___	___	___
24	art reproductions	___	___	___
25	religious books.....	___	___	___
26	biographical books.....	___	___	___
27	popular fiction or mysteries	___	___	___
28	classics (like Shakespeare).	___	___	___
29	membership to a book club...	___	___	___

9/3/86

40-59 N.Mc
60-72 P.O.L.

APPENDIX B. PILOT STUDY DOCUMENTATION

Letter From Pilot Test Administration

March 10, 1986

Suzanne King
Dept. of Educational Research
292 U.C.O.B.
Virginia TECh
Blacksburg, Virginia 24061

Dear Miss King

In response to your request, what follows are my impressions of the CDI, DSI and FACES III. These are the three tests that I administered to four hearing-impaired seniors here at VSDB on April 24 using American Sign Language along with overhead transparencies of the tests. The measured reading levels of these students ranged from 3.5 to 4.0. I encouraged the students to ask questions when they needed further explanation and I feel confident that they did in fact express all of their difficulties with the instruments. My impressions of these three tests are based on the students' questions during the actual testing as well as their responses to additional questioning after completing each test.

The Different Situations Inventory - Self was administered first. In interpreting this test, it was necessary to interpret idioms rather than finger spell them word for word in order to be sure the students would understand. The best example of this is question 9. Response A reads: "That clerk sold me a bill of goods." Although the students understood the nature of the problem in question 9, the idiom "bill of goods" is unfamiliar so I used an equivalent expression in ASL. With the exception of idioms, which I interpreted in a way they would understand readily, the only difficulties the students had with this test was in choosing which response suited them best. Given the ASL interpretation, I don't believe their scores were influenced by their relatively low level language skills; these students had no more difficulty understanding this test than a hearing student probably would.

Although all four students live at VSDB full time, except for summers and some weekends, they had no difficulties responding to questions about their families on the FACES

Page 2
PilotTest
March 10, 1986

III. Again, ASL was used to interpret each item and only two items, numbers 4 and 8, needed to be repeated. Language skills were not a barrier to their understanding of this test.

The Career Development Inventory seemed to be the most difficult of the three tests, but not because they didn't understand the items that were interpreted in ASL. These students have very little work experience and so had difficulty knowing how to answer questions about work environment, for example. Again, because the items were interpreted to them in a way I knew they would understand, language deficits did not enter into any problems they may have had.

In summary, since these students, most of whom have measured reading levels below 4.0, had very little problem understanding the items in these three tests, I don't think you will have any problem giving these tests to other hearing impaired students. This will be especially true if you limit your sample to students with reading levels of 4.0 or better. VSDB freshmen may have more difficulties than upperclassmen. I do think it's important, however, for the tests to be interpreted to them in a way they are familiar with. Having the tests on overheads was also helpful.

Sincerely yours,

Bobbie Wolfe
Virginia School for the Deaf and Blind
Staunton, Virginia 24401

Instructions to Students: Pilot Study

Thank you for participating

My name is Suzanne King

Interested in how adolescents think about work

The real study will be in the fall

You will be helping me get ready by trying out 3 tests

I need to know how difficult these tests are for deaf students to take

Your answers will not be used in the study although I will look at them

- please don't put names on paper

There are 3 tests, one test has 2 parts

After completing each test, we will talk about it

- o Was it hard?
- o What was hard about it?
- o how could it be made more understandable by deaf students?

You will have the test in front of you, (on the overhead), and each question will be interpreted by _____

If you can read the test quickly, you do not need to wait for the interpreter to read each item: work at your own pace but PLEASE RAISE YOUR HAND WHEN YOU ARE FINISHED WITH EACH TEST.

This might take as long as 2 hours, but I think it will not take that long.

When we are half way through, we will take a break with refreshments.

I am videotaping this session so that I don't have to take notes now...

Questions?

Instructions for Pilot Test Administration

GENERAL DIRECTIONS FOR TEST ADMINISTRATION

- o You may answer questions about items, but DO NOT give examples.

If an item is not understood, try to say it another way without giving a specific meaning to the item.

For example: (FACES, #3) WE APPROVE OF EACH OTHER'S FRIENDS.

This could be restated: You like your siblings' friends and your parents' friends, and they like yours, and so on.

- o Use American Sign or Signed English in whatever combination you think the students will understand best.
- o Move steadily through each test, but make sure all students are ready before you move to the next item.

APPENDIX C. CORRESPONDENCE WITH SCHOOLS



A LAND-GRANT UNIVERSITY

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061

(703) 961-5578

EDUCATIONAL RESEARCH
& EVALUATION

March 11, 1986

Mr. Sheldon O. Melton
Superintendent
Virginia School for the Deaf
East Beverly Street
Staunton, Virginia 24401

Dear Mr. Melton,

As you know, the transition of students from school to work has become a topic of widespread concern in public education. The assimilation of handicapped youth into the world of work is a difficult goal to attain not only because of environmental barriers and prejudices, but because the young people themselves are often unprepared for the challenge. Their preparation must not only be technical or academic but attitudinal as well.

To be assured that career education programs are addressing the needs of specific groups of students it is necessary to know whether the process of becoming career mature varies among groups such as hearing-impaired, learning disabled, gifted, and average adolescents. The attached summary describes a piece of research which is intended to help answer questions about how various background, educational, family, and personality factors interact to influence the career maturity of two groups of secondary students: the hearing-impaired and the nonhandicapped.

Your cooperation in this endeavor would be valuable and greatly appreciated. I would like permission to collect data from approximately 50 hearing-impaired students at V.S.D.B. in grades 9 through 12 and their parents during the month of May, 1986. Data collection from students would involve approximately one class period of test administration. Moreover, access to data in cumulative files and names and addresses of the parents of participating students will be needed. All information collected will be kept strictly confidential.

Page 2
Research proposal
March 11, 1986

As per our telephone conversation of March 5, I am enclosing a proposal summary for your consideration. I will keep in touch with you to discuss the rest of the permission-acquisition process.

Sincerely yours,

Suzanne King, Ed.S.
Dept. of Educational Research
Virginia Tech
Blacksburg, Virginia 24061

Encl: (1)



G A L L A U D E T

PRE-COLLEGE PROGRAMS
CENTER FOR CURRICULUM DEVELOPMENT, TRAINING, and OUTREACH
(202) 651-5399

KENDALL GREEN
800 FLORIDA AVENUE NE
WASHINGTON, DC 20002

October 13, 1986

Suzanne King
Virginia Tech
University City Office Bldg. 292
Blackburg, VA 24061

Dear Ms. King:

I am pleased to inform you that your proposal, "Modeling the Career Development of Hearing and Hearing-Impaired Adolescents" has been approved by the Pre-College administration. The database on MSSD students is currently being reviewed to select those students that meet your project specifications. When that sample has been identified, we will mail information about your project, a consent form and a cover letter from Peter Hobbs, the principal at MSSD, endorsing your project and the parent questionnaires to each of the parents. When we receive the consent forms from the parents, we will request permission from the students, then schedule the testing. In the interim, we can use this time to acquaint the participating faculty and staff at MSSD with your project.

The person you will be working with is Judy LeNard, the Evaluation Utilization Specialist for PreCollege. Her number is (202) 651-5504.

We are glad to participate in your research. I wish you success in your work.

Sincerely,

Linda Thiel, Ph.D.
Coordinator of Research and Evaluation
Pre-College Programs

cc: Mike Deninger
Margaret Hallau
Peter Hobbs
Lil Tompkins
Judy Berglund



Roanoke
City Public Schools

Office of Governmental Relations and Planning P. O. Box 13145
Roanoke, Virginia 24031 703-981-2124

August 18, 1986

Ms. Suzanne King
Doctoral Candidate
Virginia Polytechnic Institute
and State University
Educational Research and Evaluation
Blacksburg, VA 24061

Dear Suzanne:

Please note Mr. Parsons', Assistant City Attorney, notations on your proposed Career Maturity Study Consent Form. I don't foresee any reason why we cannot proceed with this project. I would appreciate it if you would call my secretary, Fran Dickerson, 1-703-981-2124, as soon as possible to set up an appointment for the first week in September, preferably September 3 or 4, around 11:00 a.m.

Thank you.

Sincerely,

Lana M. Paolillo
Director of Grants/Research

ljd

Attachment



COMMONWEALTH of VIRGINIA

DEPARTMENT OF EDUCATION

Virginia School for the Deaf and the Blind

Staunton

Post Office Box 2069

STAUNTON, VIRGINIA 24401

WILLIAM D. MENEFEE
Superintendent

March 24, 1986

(703)885-9533 (Voice & TTY)
866-9533 (Seals)

Ms. Suzanne King
Department of Educational Research
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061

Dear Ms. King:

This is to advise you of our acceptance of and a willingness to participate in your research project.

As per our discussion, your contact here from now on will be Ms. Nancy Gordon, Vocational Supervisor. Please contact her should you have any questions. Her telephone number is (703)885-9560.

Best of luck to you with your project. If I may be of assistance, please do not hesitate to contact me.

Sincerely,

Will Menefee
Educational Director

WDM:kwg



OFFICE OF DIVISION SUPERINTENDENT
ROANOKE COUNTY SCHOOLS
526 SOUTH COLLEGE AVENUE
SALEM, VIRGINIA 24153

November 18, 1986

Ms. Suzanne King
Department of Educational Research
292 University City Office Building
Virginia Tech
Blacksburg, Virginia 24061

Dear Ms. King:

Authorization is given to you to conduct a study of Career Maturity at four secondary schools in Roanoke County.

It is my understanding that the project is progressing well, and it is my hope that it continues to do so, and information derived from it proves beneficial to you.

Sincerely,

Eddie L. Kolb, Ed.D.
Director - Pupil Personnel Services
and Special Education

E.L.K:mc



FAIRFAX COUNTY
PUBLIC SCHOOLS

Department of Staff Development, Planning, and Evaluation

Office of Planning and Organizational Development
Walnut Hill Center
7423 Camp Alger Avenue
Falls Church, Virginia 22042

December 18, 1986

Miss Susan King
Department of Educational Research
Virginia Polytechnic Institute
and State University
Blacksburg, Va 24061

Dear Ms. King:

Your proposal for a research study Modeling the Development of Career Maturity in Hearing and Hearing - Impaired Adolescents, remains in our active file.

Please advise us if you have completed the study. We request two copies of the research for the office and for the Professional Library located at Fairfax High School.

We look forward to the submission of your results.

Sincerely,

Claudia Chelle, Chairman
Research Screening Committee

/tn

APPENDIX D. PARENT PERMISSION AND FOLLOW-UP LETTERS

REQUEST TO CONDUCT
RESEARCH AND/OR TESTING
LYNCHBURG PUBLIC SCHOOLS

Name: Raymond King College or Organization: L.P.S. # 118
(703) Home: 701-1530
Office: 701-5573 Date: Sept 5 1986

I. Objective or Purpose of Research or Testing:

To determine the exercises that influence aerobic intensity in adolescents.

II. Participants - Number and Amount of Time:

Students: No. 30-40 Time: 30 minutes

Teachers: No. --- Time: ---

Others: No. --- Time: ---

III. School(s) requested to participate:

Lynchburg

IV. Date of Research and/or Testing:

Beginning: Sept 1 1986 Completion: Nov 1 1986

V. Benefits to student(s) in the Lynchburg Public Schools:

to see a more healthy environment only to make a better environment

Office Use Only

Approved: ✓ Not Approved: _____

Principal

Director of Research and Planning

2/28/74 lm

Prince George's County Public Schools

UPPER MARIHORO MARYLAND 20772-0001



September 17, 1986

Ms. Suzanne King
Virginia Tech
University City Office Bldg. 292
Blacksburg, Virginia 24061

Dear Ms. King:

Your request to conduct a study in the Prince George's County Public Schools has been reviewed. You asked for permission to collect data from 150 or more students in grades ten through twelve in the fall of 1986. Also you indicated a need to have parents of students included in the study complete a questionnaire.

After reviewing your proposal and considering the activities that are taking place during the fall of the school year, the introduction of your study into our school system's calendar of activities would create an undue burden on the staff and students in the schools where you might best conduct your study. Therefore your request is denied.

I should like to take this opportunity to say "thank you" for considering Prince George's County as a site for the study. The topic is certainly important.

Sincerely,

F. L. Loh
Department of Evaluation
and Research

cc: Mr. Robert Coombs

Board of Education of Prince George's County



G A L L A U D E T

MODEL SECONDARY SCHOOL FOR THE DEAF

(202) 651-5801

KENDALL GREEN
800 FLORIDA AVENUE NE
WASHINGTON, DC 20002

November 14, 1986

Dear Parent:

Model Secondary School for the Deaf has agreed to cooperate with a request from Suzanne King of Virginia Polytechnic Institute and State University to study career development in hearing and hearing-impaired adolescents. As a model school, MSSD has targeted career education and enhanced career decision-making by students as program priorities this school year. Ms. King's well-designed study has the potential for helping us better understand what influences student career decisions. The enclosed letter from Suzanne King explains more about her research including the parent questionnaire and student testing involved in the project. All testing of the students would be done by faculty at MSSD and completed during classes related to career development. Judy LeNard, the Evaluation Specialist for Pre-College will be monitoring the progress of this project for MSSD.

If you agree to let your child participate in this study, please complete the enclosed parent consent form and return it in the stamped envelope. If you have any questions, feel free to contact Ms. King (703) 961-1230 or Ms. LeNard (202) 651-5504 or indicate a request for a phone contact on the consent form.

We hope you give permission for your child to participate in this project.

Sincerely,

Peter Hobbs
Principal, MSSD

Enclosures



OFFICE OF DIVISION SUPERINTENDENT
ROANOKE COUNTY SCHOOLS

526 SOUTH COLLEGE AVENUE
SALEM, VIRGINIA 24153

October 9, 1986

Dear Parents,

This letter is to request your permission to include your child in a study of career maturity. He or she will spend one study hall period answering questions about himself or herself and perceptions about forming a career. The study will also involve collecting information from your child's permanent school record about achievement test scores and the type of school program he or she has chosen. Your participation in the study will involve filling out some questionnaires that will take about 35 minutes of your time at home at your convenience. These will be mailed to your home and will include questions about how your child spends free time, what kinds of books he or she reads, and questions about the family. All of the test scores and information from you and from your child will be kept strictly confidential.

Attached to this letter is a consent form for you to sign to indicate the level of involvement for you and your child. Please return it in the enclosed envelope by Monday, October 20. If you have any questions about the study, please feel free to call the principal of your child's school for more information, or indicate on the enclosed form that you would like me to call you to discuss the study in more detail.

This study will be helpful in improving career guidance activities for high school students. I encourage you and your child to participate in this effort.

Sincerely yours,

James Gallion, Ed.D., Principal
Northside High School

Suzanne King,
Doctoral Candidate
VPI & SU

JAG:SK:mc

Enclosure



COLLEGE OF EDUCATION

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061

DIVISION OF ADMINISTRATIVE AND EDUCATIONAL SERVICES

November 10, 1986

Dear Parents,

Roanoke County Schools and Virginia Tech are cooperating in a study of how teenagers become able to make good decisions about their futures. We need your permission for your child to spend about 20 minutes during one study hall period answering questions about himself or herself and about career planning. We would also like you to participate by filling out some forms that would be mailed to you at home. These would take about 30 minutes to complete and would include questions about your child's activities at home and about the family. Some achievement test scores and background information from your child's permanent school record would also be collected. All of the information from you and from your child will be kept strictly confidential.

Enclosed is a form for you to sign to indicate the level of involvement for you and your child. Please fill it out and send it to Miss King in the return envelope by Friday, November 21. If you would like Miss King to call you to answer questions about the study before you decide whether or not to give your permission, you may indicate that on the enclosed form. Or you may call her collect any evening or weekend day at (703) 961-1230.

This study will be helpful in improving career guidance activities for high school students. Because only a limited number of students have been chosen to participate, your cooperation is important to the success of the study. We encourage you and your child to participate in this effort.

Sincerely yours,

Mr. Robert A. Patterson, Principal
William Byrd High School

Suzanne King
Virginia Tech

RAP:SK:sk

Enclosure

CAREER MATURITY STUDY CONSENT FORM

I, (print your name) _____

(Check one) DO DO NOT give my permission for Miss Suzanne King of Virginia Polytechnic Institute to review my child's school records, to collect information from such records, and to administer the Career Development Inventory Attitude Scales, the Different Situations Inventory, and the Family Adaptability and Cohesion Evaluation Scales III to my son/daughter (name) _____ in the Fall of 1986.

I (Check one) WOULD WOULD NOT be willing to fill out questionnaires on my child's activities, background, and family life.

I (Check one) WOULD WOULD NOT like to have someone call me at (phone number) _____ to answer questions about the study before I decide whether to participate.

Signed _____ Date _____

Parent or Guardian

Address: _____

_____ zip _____



A LAND GRANT UNIVERSITY

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061

(703)961-5578

EDUCATIONAL RESEARCH
& EVALUATION

October 31, 1986

Dear Parents,

Thank you for participating in this study of career maturity in adolescents. Enclosed, are three forms for you to fill out. The questions refer to you, your family, and to _____ . About one-half hour will be needed to fill out all three forms. Please note that the FACES III is to be filled out by one parent working alone.

Your answers will be kept strictly confidential; no one will ever know how you responded. There is an identification number on the forms which will be used by me to link your answers to those from your child, and to let me know whose packets have been returned. Once everyone's forms are returned, the list that links your name and address to the I.D. number will be destroyed.

For your convenience, a stamped, addressed return envelope is included. Please mail the completed forms to me by Friday, November 14. Return all of the materials even if there are parts that you do not complete.

Again, thank you very much for taking time to contribute to this study. If you have any questions, please call me collect at (703) 961-1230 any evening or weekend day.

Sincerely yours,

Suzanne King
Dept. of Educational Research



A LAND GRANT UNIVERSITY

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061

December 16, 1986

Thomas
4000 Street
Bedford, Virginia 24523

Dear Parents,

It has been several weeks since I first sent you three questionnaires to fill out for the career development study being conducted by Virginia Tech with the help of Roanoke County Schools and the Magnet School in Lynchburg. Since I have not yet received your completed forms, I am assuming that they have been lost either in the mail or among the holiday preparations at your home. I have enclosed another set of the three questionnaires for you to fill out. The questions refer to you, your family, and to Jo. About one-half hour will be needed to fill out all three forms. Please note that the FACES III is to be filled out by one parent working alone.

Your answers will be kept strictly confidential; no one will ever know how you responded. There is an identification number on the forms which will be used by me to link your answers to those from your daughter, and to let me know whose packets have been returned. Once everyone's forms are returned, the list that links your name and address to the I.D. number will be destroyed.

For your convenience, a stamped, addressed return envelope is included. Please mail the completed forms to me by Monday, December 22, if possible. Return all of the test materials even if there are parts that you do not complete. If you have any questions, please call me collect at (703) 961-1230 any evening or weekend day.

Sincerely yours,

Suzanne King
Dept. of Educational Research

VIRGINIA TECH

Dear Parents,

January 19, 1987

I hope your holidays were enjoyable. The new year is not too old for your completed questionnaires to make a valuable contribution to my study. If your surveys were accidentally thrown out with the gift wrap and party hats, I will be happy to send you a new set. Just call me collect at 703-961-1230. If you have already mailed yours back, please accept my most sincere thanks for your help.

Sincerely yours,

Suzanne King

Dept. of Educational Research

ID: _____

APPENDIX E. INSTRUCTIONS AND FORMS

INSTRUCTIONS TO STUDENTS

ID: _____

NAME: _____

Dear Student,

THANK YOU FOR BEING A PART OF THIS STUDY!

The half hour that you spend today will help people in career guidance understand teenagers better, and help them help young people make good decisions about their futures. Here are your instructions:

1. You may erase your name from the surveys if you wish.
2. Use a pencil so that you can change answers easily if you need to. Raise your hand if you need a pencil.
3. Answer honestly. Your answers will not be shared with anyone.
4. If you don't understand a question, raise your hand and someone will come to help you.
5. When you are finished with all three forms, attach them with the paper clip and turn them in.

BEFORE BEGINNING, PLEASE ANSWER THESE TWO QUESTIONS:

What kind of school program are you in? (Check one)

- a. Vocational or business
- b. Academic or college bound
- c. General (neither vocational nor college bound)

What grade are you in? (Check one)

- a. 10th
- b. 11th
- c. 12th

YOUR PARTICIPATION IS GREATLY APPRECIATED!

DATA SHEET -- HEARING-IMPAIRED ADOLESCENTS

NAME: _____ ID: _____ [1-4]

SCHOOL: _____ GRADE: _____

BIRTH DATE: ____ / ____ / ____

SEX: ____ 1. Male ____ 2. Female

RACE: ____ 1. White ____ 2. Black ____ 3. Other

CURRICULUM: ____ 1. Academic (College bound)
____ 2. Vocational or Business
____ 3. General (neither college bound nor vocational)

Mainstreaming status during 1986-1987 school year:

- ____ 1. Mainstreamed (no special services)
- ____ 2. Resource (fewer than 3 periods per day of service.)
- ____ 3. Self-contained (3 or more periods of service)
- ____ 4. Residential

SRA Achievement Test scores: (Instead, you may attach photocopy)

	8th GRADE	11th GRADE
Total Reading GSV:	_____	_____
Total Math GSV:	_____	_____
Total Language GSV: ...	_____	_____
Composite GSV:	_____	_____
E. A. S. GQUO:	_____	_____

Hearing Loss in decibels:

Left Ear: _____ dB
Right Ear: _____ dB

Child's age at the onset of the hearing loss (if known): _____ years.

Test Administration Instructions For Teachers

Dear Teacher,

The following instructions should be seen as general guidelines. The most important thing is that the students understand the questions they are being asked and are not penalized for low reading abilities. If you believe the students are capable of completing all three instruments without assistance, then let them complete them without help. If the only way to insure understanding is to translate every item into ASL, then this would be the method of choice. Since you know your own students better than anyone else, this decision will be left to you.

I have attached one extra copy of each of the instruments so that you can familiarize yourself with the tests more easily. If you have any questions before doing the administration, call (703) 961-1230, leave your name, number, and a good time to call and I will get back to you as soon as possible.

1. It is important that students fill out the tests with their name on them so that I can match their answers with their parents'.
2. Say nothing to the students about the order of the tests. The tests are ordered differently from one packet to the next. reason to make the order uniform across students. Once they have received the tests, the students may answer them in any order they wish. If you are interpreting the tests, any order of administration will do.
3. Encourage the students to use pencils so that they can change answers easily.
4. Encourage the students to read the test directions.
5. You may answer questions about the meanings of items or words but please be careful to explain WITHOUT GIVING EXAMPLES. Most of the items are general, and to give a specific example may bias the responses.
6. There is no time limit, but hearing students do all three tests in 20-30 minutes. It takes approximately 50 minutes when interpreting the items in ASL.

Again, THANK YOU VERY MUCH FOR YOUR TIME AND EFFORT!!

Sincerely yours,

Suzanne King

APPENDIX F. HUMAN SUBJECTS COMMITTEE FORMS

INVESTIGATION INVOLVING HUMAN SUBJECTS

Principal Investigator(s) Suzanne King Department Educational Research
 Project Title Modeling the Career Development of Hearing and Hearing-Impaired
 Sources of Support: Departmental Research Sponsored Research Proposal No. _____

1. The criteria for "expedited review" by the Institutional Review Board for a project involving the use of human subjects and with minimal risk* is one or more of the following. Please initial all applicable conditions and provide a substantiating statement of protocol.
- a. Collection of:
 - a) hair or nail clipping in a non-disfiguring manner;
 - b) deciduous teeth;
 - c) permanent teeth if patient care indicates need of extraction.
 - b. Collection of excreta and external secretions: sweat, uncanaluted saliva, placenta removed at delivery, amniotic fluid obtained at time of rupture of the membrane.
 - c. Recording of data from subjects 18 years or older, using noninvasive procedures routinely employed in clinical practice. Exemption does not include exposure to electromagnetic radiation outside the visible range.
 - d. Collection of blood samples by venipuncture (not exceeding 450 ml/3 week period, and no more than twice a week) from subjects 18 years or older, in good health and not pregnant.
 - e. Collection of supra- and subgingival dental plaque and calculus, provided the procedure is no more invasive than routine scaling of the teeth.
 - f. Voice readings.
 - g. Moderate exercise by healthy volunteers.
 - h. Study of existing data, documents, records, pathological specimens or diagnostic specimens.
 - i. Research on drugs or devices for which an investigational exemption is not required.
2. If the project involves human subjects who are exposed to "more than minimal risk" and are not covered by the criteria above (a to i), the IRB review must involve the full IRB board. Please check if the research involves "more than minimal risk" and provide a substantiating statement of protocol.
3. Human subjects would be involved in the proposed activity as either:
 Minors and/or Children* Fetuses Infants Pregnant Women Prisoners
 Mentally Retarded Mentally Disabled

Note that if children are involved in the research as human subjects, they may have to provide consent as well as their parents.

Whether or not the project may undergo "expedited review" or must be reviewed by the full Institutional Review Board, it is necessary that the required informed consent forms also be reviewed. These should be submitted with the proposal. However, if there is insufficient time to meet the sponsor's deadline, submission can be delayed up to thirty days after submission of the proposal without jeopardizing the IRB certification to the prospective sponsor.

* Minimal risk means that the risks of harm anticipated in the proposed research are not greater, considering the probability and magnitude, than those encountered in daily life or during performance of routine physical or psychological examinations or tests.

** Subject at risk is an individual who may be exposed to the possibility of injury as a consequence of participation as a subject in any research, development or related activity which departs from the application of those established and accepted methods necessary to meet his needs, or which increases the ordinary risks of daily life, including the recognized risks inherent in a chosen occupation or field of science.

This is to certify that the project identified above will be carried out as approved by the Human Subject Review Board, and will neither be modified nor carried out beyond the period approved below without express review and approval by the board.

1/18/86
 Signature: Principal Investigator/Date Signature: Departmental Reviewer/Date

The Human Subjects Review Board has reviewed the protocol identified above, as it involves human subjects, and hereby approves the conduct of the project for _____ months, at which time the protocol must be resubmitted for approval to/continue.

Signature: Board Chairman/Authorized Reviewer Date

CERTIFICATION OF EXEMPTION OF PROJECTS
INVOLVING HUMAN SUBJECTS

Principal Investigator(s) Suzanne King

Department(s) Educational Research

Project Title Modelling Career Development of Hearing-Impaired and Hearing Adolescents

Source of Support: Departmental Research Sponsored Research Proposal No. _____

1. The criteria for "exemption" from review by the IRB for a project involving the use of human subjects and with no risk to the subject is listed below. Please initial all applicable conditions and provide the substantiating statement of protocol.

- a. The research will be conducted in established or commonly established educational settings, involving normal education practices. For example:
 - a) Research on regular and special education instructional strategies;
 - b) Research on effectiveness of instructional techniques, curricula or classroom management techniques.
- b. The research involves use of education tests (cognitive, diagnostic, aptitude, achievement), and the subject cannot be identified directly or through identifiers with the information.
- c. The research involves survey or interview procedures, in which:
 - a) Subjects cannot be identified directly or through identifiers with the information;
 - b) Subject's responses, if known, will not place the subject at risk of criminal or civil liability or be damaging to the subject's financial standing or employability;
 - c) The research does not deal with sensitive aspects of subject's own behavior (illegal conduct, drug use, sexual behavior or alcohol use);
 - d) The research involves survey or interview procedures with elected or appointed public officials, or candidates for public office.
- d. The research involves the observation of public behavior, in which:
 - a) The subjects cannot be identified directly or through identifiers;
 - b) The observations recorded about an individual could not put the subject at risk of criminal or civil liability or be damaging to the subject's financial standing or employability;
 - c) The research does not deal with sensitive aspects of the subject's behavior (illegal conduct, drug use, sexual behavior or use of alcohol).
- e. The research involves collection or study of existing data, documents, records, pathological specimens or diagnostic specimens, or which:
 - a) The sources are publicly available; or
 - b) The information is recorded such that the subject cannot be identified directly or indirectly through identifiers.

2. I further certify that the project will not be changed to increase the risk or exceed the exempt condition(s) without filing an additional certification or application for approval by the Human Subjects Review Board.

Note: If children are in any way at risk while this project is underway, the chairman of the IRB should be notified immediately in order to take corrective action.

3/18/86

Signature: Principal Investigator(s) _____ Date _____ Signature: Principal Investigator(s) _____ Date _____

Optional Approval: Signature: Board Chairman _____ Date _____



COLLEGE OF EDUCATION

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061

DIVISION OF ADMINISTRATIVE AND EDUCATIONAL SERVICES

M E M O R A N D U M

TO: Dr. Lawrence McCluskey
FROM: Suzanne King
SUBJECT: Human Subjects Committee Approval

This memo is to clarify a point about the research I am proposing. During the actual data collection activities, there will be a master list linking subjects and their parents to their identification numbers. Once all of the data has been collected and entered into a computer file, this master list, and anything else linking subjects to their responses, will be destroyed. The confidentiality of all subjects will be safeguarded.

APPENDIX G. STANDARD ERRORS OF PATH COEFFICIENTS

Table 25

Standard Errors of Path Coefficients for Model 1

Predetermined Variables	DEPENDENT VARIABLES											
	HEARING (n = 307)						DEAF (n = 69)					
	PASPIR	CCOHES	CULT	DSI	ACHT	CDA	PASPIR	CCOHES	CULT	DSI	ACHT	CDA
SEX	.044	.869	.540	.301	1.109	2.016	.101	1.439	1.174	.608	3.326	3.550
AGE	.024	.480	.299	.164	.605	1.111	.037	.528	.430	.226	1.234	1.325
SES	.009	.186	.115	.066	.242	.453	.017	.237	.193	.106	.580	.628
PASPIR				.395	1.455	2.739				.770	4.212	4.551
CCOHES				.020	.073	.135				.051	.279	.302
CULT				.032	.118	.220				.065	.357	.390
DSI												.740
ACHT												.135

Table 26

Standard Errors of Structural Coefficients for Model 2 for the Deaf

Predetermined Variables	Dependent Variables (n=67)								
	PASPIR	CCOHES	CULT	MCCOMM	FCCOMM	DSI	ACHT	MSTREAM	CDA
SEX	.104	1.482	1.200	78.478	50.940	.650	3.400	.105	4.063
AGE	.040	.566	.458	29.945	19.437	.235	1.227	.038	1.474
SES	.017	.248	.200	13.106	8.507	.106	.553	.017	.660
LOSS	.002	.034	.028	1.819	1.181	.014	.073	.002	.091
ONSET	.039	.549	.444	29.079	18.875	.231	1.205	.037	1.447
PASPIR						.776	4.059	.126	4.800
CCOHES						.051	.265	.008	.317
CULT						.070	.366	.011	.444
MCCOMM						.001	.007	.001	.009
FCCOMM						.002	.011	.001	.013
DSI									.821
ACHT									.157
MSTREAM									5.044

**The vita has been removed from
the scanned document**