

1983

A study of an intervention designed to increase awareness of the effects of sex role socialization on the attitudes, cognitions, and behaviors of black high school girls

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A STUDY OF AN INTERVENTION DESIGNED TO INCREASE AWARENESS
OF THE EFFECTS OF SEX ROLE SOCIALIZATION ON THE ATTITUDES,
COGNITIONS, AND BEHAVIORS OF BLACK HIGH SCHOOL GIRLS

The College of William and Mary in Virginia

Ed.D. 1983

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ATTITUDES, COGNITIONS, AND BEHAVIORS OF BLACK HIGH SCHOOL GIRLS

A Dissertation
Presented to
The Faculty of the School of Education
The College of William and Mary in Virginia

In Partial Fulfillment
Of the Requirements for the Degree
Doctor of Education

by
Mary Hubbard Lewis

June 1983

APPROVAL SHEET

We the undersigned do certify that we have read this dissertation and that in our individual opinions it is acceptable in both scope and quality as a dissertation for the degree of Doctor of Education.

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ACKNOWLEDGMENTS

Completing the requirements for the degree of Doctor of Education has involved the direction, cooperation, and assistance of many individuals. The completion of this dissertation represents the most intensive and time consuming requirement. I, therefore, wish to express sincere appreciation to my many friends--both professional and personal--who have assisted me during the process of preparing this dissertation.

A particular debt of gratitude is owed to the members of my doctoral committee who have been the most important force in determining my progress as a doctoral candidate. Kevin E. Geoffroy, Ed.D., has served as my dedicated advisor since 1974 when I was admitted into the program. Dr. Geoffroy has committed considerable time and effort to guiding me through programs of study leading to a master's degree, an advanced certificate, and finally to the Doctor of Education degree. He was a constant source of encouragement and direction, especially during the preparation of the proposal for the dissertation. His editorial suggestions greatly improved the finished product. Fred L. Adair, Ph.D., has been an advocate and mentor. The door to Dr. Adair's office seemed always open to me for consultation. Charles O. Matthews, Ph.D., carefully read this dissertation and offered suggestions for its improvement.

I am indebted to Roger R. Ries, Ph.D., who patiently and painstakingly guided me through the process of articulating the research design and statistical procedures.

Deep appreciation is extended to Harry Dyche, Principal, Phoebus High School, and to Arnetta Washington, Assistant Principal for

Instruction, who permitted and encouraged me to conduct the research with Phoebus High School students. Their administrative support ensured the success of this sixteen-week research project.

Special thanks is extended to the members of the Phoebus High School Guidance Department, including Martha Woods, director; counselors Ruth Simmons, Gloria Phelps, and Dave Mefferd, who helped identify and encourage the student participants; and secretaries, Ida Haskins and Nancy VanDevender, whose outstanding clerical support throughout the semester ensured student attendance and teacher cooperation.

I am extremely grateful to Linda Epps Browne, who conscientiously and creatively facilitated the group sessions and who served as an empathetic and influential role model.

I wish to extend particular gratitude to the forty Phoebus High School students who enthusiastically and wholeheartedly participated in the study.

I am fortunate to have procured the typing services of Norma J. Brown, a typing teacher by profession, who expertly typed and retyped the manuscript while offering valuable editorial comments.

Finally, I owe a particular debt of gratitude to my dear friends, who also happen to be statistical experts, Ralph J. Muraca, Ph.D., and Richard E. Snyder, Ph.D., who devoted untold hours to meticulously reducing the data and patiently assisting me in the statistical analysis and interpretation thereof. These friends have shared my joys and anxieties throughout the preparation of the dissertation. Their friendship will always be remembered and appreciated.

TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS	3
LIST OF TABLES	7a
Chapter	
1. INTRODUCTION	8
Justification for the Study	8
Statement of the Problem	11
Theoretical Rationale	12
Definition of Terms	17
General Hypotheses	18
Sample and Data Gathering Procedures	19
Summary of Theoretical Rationale and Relationship to the Problem	21
Limitations	24
Dissertation Organization	25
2. REVIEW OF THE LITERATURE	26
Introduction	26
Biological and Psychological Theories of Sex Differences	26
Individual, Familial, and Societal Factors Affecting Sex Role Socialization and Career Development	32
Treatment Procedures	53
Population	59
Group Work with Women	67
Summary of Research and Relationship to the Problem	71
3. METHODOLOGY	74
Population and Selection of the Sample	74

Data Gathering Procedures	76
Treatment Procedures	77
Ethical Safeguards and Considerations	82
Instrumentation	82
Design	91
Specific Hypotheses	72
Statistical Analysis	94
Summary of Methodology	94
4. RESULTS	96
Scale Notation	97
Symbols	97
Validation Hypothesis A	98
Hypothesis I-1	101
Hypothesis II-1	102
Hypothesis III-1	103
Hypothesis I-2	105
Hypothesis II-2	106
Hypothesis III-2	107
Validation Hypothesis B-1	109
Validation Hypothesis B-2	110
Validation Hypothesis B-3	111
Hypothesis IV	113
Summary	114
5. SUMMARY, CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS	117
Summary	117
Conclusions	122

Discussion	123
Recommendations for Future Research	127
APPENDICES	
Appendix A. Parental Permission Form	130
Appendix B. Contract	131
Appendix C. Description of Treatment Sessions	133
Appendix D. Raw Data	178
D-1. Composition of Sample Groups by Grade	179
D-2. Control Group Pre-training Raw Scores	180
D-3. Control Group Post-training Raw Scores	181
D-4. Control Group Pre- and Post-training Score Differences	182
D-5. Experimental Group Pre-training Raw Scores	183
D-6. Experimental Group Post-training Raw Scores	184
D-7. Experimental Group Pre- and Post-training Score Differences	185
D-8. Course Selections	186
BIBLIOGRAPHY	187
VITA	195
ABSTRACT	197

LIST OF TABLES

Table	Page
1. Comparison of Pre-Treatment Population Variances and Means	99
2. Comparison of Pre-Treatment Population Variances and Means for Additional Scales	100
3. ATWS Between Group Comparisons	101
4. ACL Between Group Comparisons	102
5. COPS Between Group Comparisons	103
6. Additional ACL Scales Between Group Comparisons	104
7. ATWS Experimental Within Group Comparisons	106
8. ACL Experimental Within Group Comparisons	106
9. COPS Experimental Within Group Comparisons	107
10. ACL Experimental Within Group Additional Scales Comparisons ..	108
11. ATWS Control Within Group Comparisons	109
12. ACL Control Within Group Comparisons	110
13. COPS Control Within Group Comparisons	111
14. ACL Control Within Group Additional Scales Comparisons	112
15. Between Group Comparisons of Course Selections	114
16. Summary of Conclusions	122

Chapter 1

Introduction

Justification for the Study

As a result of socialization pressures toward traditional sex roles, individuals learn to accept the premise that only certain behaviors and values are appropriate because they are male or female. This premise tends to restrict career options to traditional roles (Hansen & Keierleber, 1978; Hansen & Rapoza, 1978).

Although women aged 16 and over represent 51.6 percent of the civilian labor force (Statistical Abstract of the United States for 1981, U. S. Department of Commerce, Bureau of the Census, p. 381), they are typically concentrated in a small number of low paying, low status occupations ("Women in the Labor Force: Some New Data Series," Report Number 575, U. S. Department of Labor, Bureau of Labor Statistics, 1979). Furthermore, full time female workers earn approximately sixty percent of what men earn. The gap is attributed in part to occupational segregation or women working in low paying jobs (Women in the Labor Force, Some New Data Series," 1979, p. 3). Hackett and Betz suggest one reason for "occupational segregation" is that the career related behaviors of women are influenced by the process of sex role socialization which produces "a response set among women which constricts their consideration of options to traditional roles and occupations" (1981, p. 327).

The following chart (1981 Statistical Abstract of the United States, p. 402) presents the percentage of workers who are female employed in selected occupations. The chart reflects the phenomenon of

occupational segregation.

<u>Occupation</u>	<u>Percentage Female</u>
Engineers	4.0
Computer Specialists	25.7
Life and Physical Scientists	20.3
Chemists	20.3
Engineering and Science Technologists	17.8
Secretary	99.1
Receptionists	96.3
Typists	96.9

A report to the United States Senate Committee on Labor and Human Resources states that "women have been excluded by educational, institutional, and cultural barriers in many areas of our national life, but nowhere is this exclusion more obvious than in science and technology" (Report to the U. S. Senate, Subcommittee on Health & Scientific Research, Committee on Labor & Human Resources, Women in Science & Technologies Equal Opportunity Act, March, 1980, p. 1). According to the report to Senator Metzenbaum, it will take fifty years for women to reach full equality in the fields of engineering, physics, and chemistry, even if the figures were improved by ten percent per year.

Despite the recent trend toward increased enrollment of women in engineering programs, in 1977 women received only five percent of the engineering degrees (Rotter, 1982). According to Rotter (1982), sexism in career guidance and counseling programs in educational institutions perpetuates the low percentage of women employed in science and engineering. The lack of availability or visibility of appropriate female models is another critical factor in girls not pursuing careers in these nontraditional fields (Rotter, 1982).

According to McLure and Piel (1978), a major example of the effects of sex stereotyping is the disproportionate distribution of

the sexes across science and technological occupations, with a relatively small percentage of women employed in these fields. A nationwide sample of talented high school senior girls were questioned regarding their perceptions of barriers, facilitating factors, and information needs related to the consideration of careers in science and technology (McLure & Piel, 1978). The data suggest that relatively few girls choose careers in science and technology because they have doubts about combining family life with a career in science; they see few role models who represent the important role women can play in science; they lack information about ways to prepare for a career in science. The authors emphasize that "it is necessary to approach the problem of promoting a broader career orientation in women by focusing upon precollege women" (p. 173).

Females, and especially black females, are underrepresented in the hard sciences and engineering (E. Smith, 1980a). Minorities earned 5.3 percent of the doctorates in bioscience awarded from 1973 through 1976, with 2.2 percent earned by minority women (E. Smith, 1980a). According to Smith, few minority youth aspire to or major in science and engineering partly because of limited knowledge about careers in science, mathematics, and engineering. "Racial minorities are continuing to pursue courses of study in which there is a dwindling job market, the salaries are low, and the chance of advancement slim" (E. Smith, 1980a, p. 142). In contrast to these careers, career opportunities in science and technology are anticipated to expand. Therefore, "a concerted national effort is needed to pull minority students, particularly Black, Spanish surnamed, and native Americans, out of their current restricted cycle of traditional career patterns into the

more nontraditional career paths of mathematics and science . . ."
(E. Smith, 1980a, p. 142).

"Black women are victims of both racism and sexism" (Chapman, 1973, p. 23). According to Chapman, the black woman is one of the most disadvantaged individuals in American society. The median number of years of formal education obtained by black women exceeds that of black men; however, the quantitative difference by sex is insignificant. Chapman asserts that much of the higher education received by black women has been largely in teacher training programs. According to Chapman, "the Black woman has the greatest access to the worst jobs at the lowest earnings" (p. 23).

"The channeling of girls' interests and vocational preferences into a few socially acceptable, low status occupations represents a major waste of natural talent" (McLure & Piel, 1978, p. 173). Because the average woman, single or married, will work more than thirty-four years of her life (Fleming & Milone, 1980), it is important that she become aware of social and occupational stereotypes which might provide barriers to the development of her full potential. Educators must examine the present status and the future projections of women in the labor force in order to design and implement interventions designed to reduce the effects of sex role stereotyping (Moreland, 1976 & 1979; O'Neil et al., 1980).

Statement of the Problem

The purpose of the study was to assess the impact of sixteen structured group sessions on black high school girls' attitudes toward the rights and sex roles of women, cognitions about the "ideal" woman, and

expressed interests in careers in science and engineering.

Theoretical Rationale

The theoretical rationale for this study was based upon Albert Bandura's social learning theory of sex typing. Bandura's theory is based upon the premise that human behavior is largely acquired and that the principles of learning sufficiently account for the development and maintenance of behavior. Furthermore, learning can take place without the individual having had the opportunity to make the responses and without either the model or the observer having been rewarded for the behavior (Bandura, Ross, & Ross, 1961). Human behavior is explained in terms of behavioral, cognitive, and environmental determinants (Bandura, 1977).

Bandura (1977) describes three distinctive features of social learning theory. First, social learning theory emphasizes the important interplay of vicarious, symbolic, and self-regulatory processes in psychological functioning. The individual and the environment are viewed as reciprocal determinants of each other. "Human thought, affect, and behavior can be markedly influenced by observation, as well as by direct experience . . ." (Bandura, 1977, p. vii). Second, social learning theory emphasizes the capacity of humans to use symbols to represent events, "to analyze their conscious experiences, to communicate with others at any distance in time and space, to plan, to create, to imagine, and to engage in foresightful action" (1977, p. vii). People process and preserve experiences in representational forms that will serve as guides for future behavior. Images of future goals, furthermore, motivate courses of action designed to attain goals. People

use symbols to solve problems without having to enact all the various alternative solutions. People can foresee the probable consequences of actions, and they can alter their behavior accordingly. The third distinctive feature of social theory according to Bandura is the importance placed on self-regulating processes. People are not viewed as simply reactors to external influences; they are capable of self-directed behavior. They select, organize, and transform stimuli. They exercise influence over their behavior through self-generated inducements and consequences.

New response patterns can be acquired by direct experience or by observation. The more rudimentary mode of learning from direct experience results from the positive and negative effects that behavior produces. Consequences of behavior have several functions: imparting information, serving as motivators, and strengthening responses automatically. Reinforcement is an effective means of regulating already learned behavior; however, it is a relatively inefficient way to create new behaviors. According to Bandura reinforcement is assumed to influence what is performed rather than what is learned. People develop cognitive expectations about behavior outcomes and about what they must do to achieve desirable outcomes or to avoid unpleasant ones. Reinforcement guides behavior through anticipation of its future occurrence. Individuals regulate their behavior according to the outcomes they expect will be produced as a result of their behavior. Reinforcement plays an antecedent role rather than a consequent influence. Anticipation of reinforcement is one of many factors that influence what is or is not observed. Observational learning can be achieved more effectively

by informing observers in advance about the benefits of adopting modeled behavior.

Most human behavior is learned observationally through modeling. "Virtually all learning phenomena resulting from direct experience occur on a vicarious basis by observing the people's behavior and its consequences on them" (Bandura, 1977, p. 12). Learning by observation enables individuals to acquire large, integrated patterns of behavior without gradually forming them by tedious trial and error. The process of acquiring new behaviors can be "considerably shortened through modeling" (Bandura, 1977, p. 13).

Modeling influences produce learning through their informative function. During observational learning, observers acquire symbolic representations of the modeled activities. These symbols serve as guides for appropriate performance. Cognitive abilities enable humans to perform novel responses observed but never actually practiced.

Bandura suggests that exposure to models has three types of effects. First, it leads to acquisition of novel behaviors. Second, the model's behavior may serve to elicit the performance of similar responses in the observer's repertoire, especially if the behavior is socially acceptable. Third, a model's behavior may influence an observer when the model is performing socially proscribed or deviant behavior. The observer's inhibitions about performing the behavior may be strengthened or weakened depending upon whether the model's behavior is punished or rewarded (Bandura, 1965).

The success with which an observer will match the behavior of a model results from the following: observation of relevant activities,

adequately coding modeled events for memory, retention of what was modeled, possession of the physical abilities required to perform what was modeled, and sufficient motivation. In other words, observational learning is governed by four component processes: attentional, retention, motor reproduction, and motivational (Bandura, 1977).

A number of characteristics of the model influence vicarious reinforcement (Bandura, 1969b). These factors include: if the model has power or control over a person's life; if the model is a potentially nurturant or affiliative person; if there is similarity between the model and the observer. Boys and girls imitated a cross-sex model when that model controlled the rewards (Bandura, Ross, & Ross, 1963 a & b).

People who are most responsive to modeling influences tend to lack confidence and self-esteem and are dependent individuals who have been frequently rewarded for imitative behaviors in the past (Bandura, 1977). General observation indicates that perceptive and confident people emulate both idealized models and those whose behavior is highly useful. "When modeling is explicitly used to develop competencies, the more talented and venturesome are apt to derive the greater benefits from observation of exemplary models" (Bandura, 1977, p. 89).

A major function of modeling is transmitting information to observers by physical demonstration, pictorial representation, or verbal description. The basic modeling process is the same. However, different forms of modeling are not always equally effective. "Modeling also plays a prime role in spreading new ideas and social practices within a society, or from one society to another" (Bandura, 1977, p. 50). New behaviors are introduced by prominent examples, they are adopted at a

rapidly accelerating rate, and then they stabilize or decline depending upon their functional value.

Many human behaviors are regulated by self-imposed consequences. Internalized standards lead individuals to evaluate their own actions and to reward or punish themselves through self-approval or self-criticism. Individuals rewarding or punishing themselves may reflect the reactions that their behavior has elicited from others. Socializing agents set behavioral standards which are taken over by the individual and then form the basis for self-reinforcement systems. This is known as the reciprocal influence that exists between the person and the environment. Evidence suggests that self-evaluative standards can be acquired vicariously by observing others (Bandura & Kupers, 1964).

According to social learning theory, attitudes and emotional responses are learned from direct experience and acquired observationally. Evaluations of "places, persons, or things often originate from exposure to modeled attitudes" (Bandura, 1977, p. 65). Observers can be emotionally aroused by the emotions conveyed through vocal, facial, and postural cues of a model. According to Bandura, these affective social cues acquire arousal value through correlated interpersonal experiences. Through "vicarious acquisition of classically conditioned emotional responses" (Bandura & Rosenthal, 1966), observers exposed to the emotional responses of a model experienced similar reactions and responded emotionally to stimuli that produced these reactions in the model. An especially influential factor in vicarious emotional learning is similarity of experiences between the model and the observer. The modeled affect generates vicarious arousal through an intervening

self-arousal process in which the observer imagines that the consequences are occurring to himself/herself in a similar situation.

In summary, according to social learning theory, attitudes, cognitions, and behaviors are learned from direct experience and observationally. Learning can occur without the individual having had the opportunity to make the responses and without the model or the observer being rewarded for the responses. The individual adopts new attitudes, cognitions, and behaviors and alters or eliminates old ones as societal expectations and reward contingencies change.

Definition of Terms

Abstract Modeling Observing others performing various responses embodying a certain rule or principle and later being tested under similar conditions, not being able to mimic the specified observed response, but rather having to apply what has been learned to the new or unfamiliar situation.

Observational Learning Referring to the process whereby an observer forms an idea of how new behaviors are performed by observing a model. The observer symbolically codes the modeled behavior, and the coded information serves as a guide for future actions. Observational learning occurs through symbolic processes during exposure to modeled activities and does not necessarily require extrinsic reinforcement.

Sex-Role Socialization Referring to the differential experiences and processes used to prepare females and males for the roles society has defined as being appropriate for their particular sex.

Successive Modeling Referring to the process whereby observers later serve as sources of behavior for new members. This process would most

likely produce a gradual imitative evolution of new patterns of behavior having little resemblance to those exhibited by the original models.

Vicarious Expectancy Learning Referring to the process by which events become evocative through association with emotions aroused in observers by the affective expression of others. Displays of emotions conveyed through vocal, facial, and postural cues of models are emotionally arousing to observers. Modeled affect generates vicarious arousal through an intervening self-arousal process in which the observed consequences are imagined as occurring to oneself in similar situations.

Vicarious Punishment Referring to the process by which observed negative consequences reduce the tendency to behave in similar or related ways.

Vicarious Reinforcement Referring to the process whereby observers increase behaviors for which they have seen others be reinforced.

General Hypotheses

- I. Girls in the experimental group will express significantly fewer stereotypical attitudes toward the rights and sex roles of women as assessed by The Attitudes Toward Women Scale.
- II. Girls in the experimental group will describe the "ideal" woman with significantly fewer stereotypical adjectives as assessed by the Adjective Check List scales for Self-Confidence, Personal Adjustment, Achievement, Dominance, Endurance, Autonomy, and Aggression.
- III. Girls in the experimental group will select significantly

more career choices in science and engineering as assessed by the California Occupational Preference System on two scores (skilled and professional) for science and technology.

- IV. Sophomore and junior girls in the experimental group will select more courses in advanced mathematics and science for the next school year than girls in the control group as measured by course registration.

Sample and Data Gathering Procedures

The sample was selected from a pool of names of black females in grades 10, 11, and 12 who scored between the 50th percentile and the 94th percentile on the Math and/or Science Tests of the SRA Achievement Series. Names were selected from growth scales since growth scales represent interval data and percentiles do not. The scores were those on the SRA Achievement Series administered during the 1978-1979, 1979-1980, or 1980-1981 school years, depending upon the grade level of the student in the 1982-1983 school year. Girls scoring between the 50th and the 94th percentile possess average and above average intellectual ability in these areas and are likely to succeed in math/science/engineering college programs required as preparation for careers in science or engineering. Girls scoring below the 50th percentile are not likely to succeed in college level programs in science or engineering and, therefore, have been omitted from the pool. Girls scoring above the 94th percentile are identified as gifted by guidelines established by the Commonwealth of Virginia Department of Education. For this reason they were omitted from the pool also. Twenty girls were randomly assigned to the experimental group and twenty to the control group.

The dependent variables were attitudes toward the rights and roles of women, cognitions about the "ideal" woman, and expressed interests in careers in science and engineering. Changes, if any, in attitudes and cognitions were assessed by three self-report instruments. The Attitudes Toward Women Scale assessed changes in attitudes toward the rights and roles of women. Specific scales, noted elsewhere, on the Adjective Check List assessed changes in cognitions about the "ideal" woman. Scores on the California Occupational Preference System assessed changes in expressed interests in careers in science and engineering. A fourth dependent variable was actual behaviors which indicated interest in future careers in science and engineering. Behavioral differences were measured by the number of advanced courses in mathematics and science selected by sophomore and junior girls in each group.

All subjects were tested with the three self-report instruments four weeks prior to the first meeting of the experimental group. This four-week interval helped control for the effects of pretesting on subsequent behaviors. All subjects were tested with the same instruments during the week following the final treatment session. Unobtrusive observations of behavioral differences resulting from the intervention were measured by counting the titles of the advanced mathematics and science courses which the girls selected for the 1983-1984 school year.

The independent variable was 16 one-hour weekly sessions designed to increase an awareness of the effects of sex role socialization on attitudes, cognitions, and behaviors related to career choices in

science and engineering. The sixteen treatments were adapted from the BORN FREE Training Packet to Reduce Sex Role Stereotyping in Career Development developed by L. S. Hansen. Black female scientists, engineers, and technicians from NASA Langley Research Center served as real-life role models during one of the treatment sessions, and a visit to the actual work settings of these NASA women augmented the BORN FREE material. The treatment sessions were designed to increase an awareness of the facilitating and inhibiting effects on career choices of (a) existing sex role stereotypes and role expectations, (b) language and the media, (c) structures and practices of educational institutions, (d) parents, family, and community.

In order to control for the experimenter's bias, the group was facilitated by another individual. This individual was Linda Epps Browne, a black female industrial engineer employed by IBM Rochester, Minnesota. Ms. Browne was participating in the Faculty Loan Program sponsored by IBM to provide "temporary faculty and administrative support to institutions and related projects with substantial focus upon the education of minority, handicapped, and disadvantaged students" (diCagno, 1983). Ms. Browne was knowledgeable of group process and group dynamics and the effects of sex role socialization on career choices. She was trained in advance with material outlining the mechanics and processes of each treatment session.

Summary of Theoretical Rationale and Relationship to the Problem

Socialization appears to be a major factor in the acquisition of sex roles, and Bandura's social learning theory helps explain the socialization process. To summarize, children learn to perform sex

appropriate responses because they receive direct and vicarious social and physical rewards for this behavior and avoid sex inappropriate behavior to avoid punishment. In addition, because they are differentially reinforced, both directly and vicariously, for sex appropriate behavior, they develop attitudes, cognitions, and behaviors stereotypical of their sex. Children learn appropriate sex role behavior through imitation of a wide variety of models. Imitation will occur even without the existence of emotional ties and in any situation in which it is reinforced. Children imitate parents, other adults, peers, and heroes in the media according to their ages and the amount of exposure to these models.

The study was based on a process of resocialization. The process of resocialization is a reflection of Bandura's premise that human behavior is largely acquired and that the principles of learning sufficiently explain the development, maintenance, alteration, and elimination of behaviors, attitudes, and cognitions. The resocialization towards fewer stereotypical attitudes, cognitions, and behaviors related to career choices in science and engineering will occur through the process of girls participating in structured group exercises, interacting with real-life role models, and visiting real-life work settings. The sixteen treatment sessions were based upon Bandura's belief that most behavior is learned observationally through modeling and that individuals regulate their behavior according to the outcomes they expect their behavior will produce.

A major function of modeling, according to Bandura, is transmitting information by physical demonstration, pictorial representation, and

verbal description. The structured group treatments consisted of a combination of modeled experiences including the transmission of information through the use of films, books, tapes, real-life role models, and visits to real-life work settings. Through these modeled experiences, the girls should learn vicariously about the facilitating and inhibiting effects on career choices of sex role stereotyping, language and the media, structures and practices of educational institutions, and parents, family, and the community. Through observational learning, their attitudes, cognitions, and behaviors should become less stereotypical.

Many human behaviors are regulated by self-imposed consequences according to social learning theory. Socializing agents set behavioral standards which are internalized by the individual and form the basis for the self-reinforcement system. Evidence suggests that attitudes and self-evaluative standards can be acquired vicariously by observing others. It is necessary, therefore, that the group leader model egalitarian attitudes toward the rights and roles of women. The girls should model similar attitudes as expressed by their responses on one of the criterion measures. Through the process of leading the structured group exercises, she should model standards for high achievement motivation, autonomy, independence, and dominance, all characteristics that lead to selection of and success in nontraditional career fields of science and engineering. The girls should internalize these characteristics as part of their cognitions about the "ideal" woman. In addition, the girls should demonstrate fewer stereotypical behaviors by expressing more interest in scientific and technological careers on an interest

inventory and by registering for more advanced courses in mathematics and science.

According to social learning theory, characteristics of the model must be similar to those of the observer. The group leader was a former Hampton resident who lived in the neighborhood in which the girls currently live. She represented a socioeconomic background similar to the girls. The NASA role models were also black women who shared backgrounds similar to those of the girls. According to social learning theory, the girls should learn vicariously that they also possess the potential for success in science and engineering courses.

Limitations

Several limitations are found in various aspects of the study. These limitations may affect the degree to which the results can be generalized.

The differential effects of the group leader's ability and personality are difficult to account for in the dependent variables. Video tapes and tape recordings were utilized to assess the leader's style.

No studies describing the validity of the California Occupational Preference System have been reported in the literature.

Three of the assessment instruments were self-report instruments. Self-report instruments are inherently weak because respondents may fake responses and/or respond with what they consider to be socially desirable answers. Research indicates, however, that these instruments possess sufficient reliability and validity to justify their use.

Data gathered with the self-report instruments were augmented with unobtrusive observations of the girls' behaviors. However, a limitation

regarding these behavioral observations must also be noted. Although these observations were quantitative in nature, without the corresponding normative data, it is impossible to determine the statistical significance of any difference in scores between the control group and the experimental group. At best, one can only make qualitative statements regarding whether or not these data support or contradict the results from the self-report instruments.

Dissertation Organization

The remainder of this dissertation has been organized in the following manner. Chapter Two reviews literature relevant to biological and psychological theories of sex differences, major factors affecting sex-role socialization and career development, typical treatment procedures, group work with women, and characteristics of the population. Chapter Three presents a discussion of the methodology, including selection of the sample, data gathering procedures, treatment procedures, instrumentation, research design, hypotheses, and statistical analysis. Chapter Four presents the results of the statistical findings by hypothesis. Chapter Five presents the conclusions, a discussion of the conclusions, and recommendations for future study.

Chapter 2

Review of the Literature

Introduction

This chapter attempts to review theoretical concepts relevant to the effects of sex-role socialization on career development, generalized characteristics of the population, and frequently employed methodology. The overview of relevant theoretical concepts includes a discussion of biological and psychological theories of sex differences as well as current knowledge about individual, familial, and societal factors affecting sex role formation as it relates to career development. Typical treatment procedures discussed are curriculum models designed as preventative and consultative interventions. The findings of five research studies assessing the impact of these interventions are reviewed. Characteristics of adolescents, in general, and black adolescents, in particular, are described. Finally, preventative and consultative strategies commonly used with high school students are reviewed. Particular emphasis is placed upon the characteristics of sex-role consciousness raising groups and structured group counseling sessions.

Biological and Psychological Theories of Sex Differences

A thorough study of sex roles must include an investigation as to what extent biological or genetic differences between human males and females determine sex differences in body and behavior. A study of innate factors (Money & Ehrhardt, 1972) begins with the hereditary material known as chromosomes. Chromosomes vary in size with the X chromosome being the fairly large one, while the Y chromosome is a

small one and carries relatively little genetic information. Related in some way to these sex chromosome differences is the fact that more males than females die at all stages of development from conception through old age. The average life expectancy of females (74.9 years) is seven-and-one-half years longer than that of males (67.4) (McCoy, 1977, 9.158).

The presence or absence of hormonal events during gestation causes distinct physical differences in the male and female brain. At puberty these differences in the brain become fully operative. Maturation of the hypothalamus is thought to trigger puberty by acting through the pituitary to bring about sexual maturation. Sex differences in the brain are responsible for male and female sexual behavior. The presence of these brain differences suggests the possibility of as yet undiscovered differences which could be responsible for additional sex differences in behavior (Money & Ehrhardt, 1972).

J. M. Bardwick (1974) has summarized the research on cyclic versus acyclic hormonal activity in women and men and its effect upon the nervous system. Substantial evidence of hormonally related mood swings in women is reported. Bardwick speculates that self-assertiveness, self-esteem, and competitiveness are all highest at midcycle and that anxiety, tenseness, and depression are highest premenstrually and menstrually. An hormonally linked enzyme (monoamine oxidase) affects brain activity which is related to these mental states. A considerable correlation has been found between the level of monoamine oxidase and depression according to Bardwick. High levels of this enzyme are associated with low levels of estrogen and high levels of the enzyme

are associated with depression.

At all ages, the body composition of males and females differs. These apparent physical differences may be the result of evolution in which the male hunted, fought, and protected while the female bore and nurtured the young (McCoy).

To what extent do these physical differences in body and brain relate to or predispose sex differences in behavior? Sources of information which help answer this question arise from studies of males and females who have developed in abnormal hormonal environments because of unusual genetic or environmental circumstances (Money & Ehrhardt, 1972). One of these studies included 10 females whose mothers were given hormones during pregnancy to prevent abortion and fifteen females who were exposed to male hormones during gestation due to adrenogenital syndrome, a genetic defect. The girls ranged in ages from four to sixteen years, the majority in middle childhood. The androgenized girls were matched with twenty-five nonandrogenized girls on the basis of age, I.Q., socioeconomic background, and race. They were found to differ in several ways. The authors report that twenty of the twenty-five androgenized girls called themselves "tomboys." This was reported as significantly different from the nonandrogenized girls. Both groups of androgenized girls were described as significantly more athletic, with stronger preference for male versus female playmates, for toys, cars, and guns. They were said to show significantly more concern with a career than with marriage.

The authors hypothesize that the masculinization in androgenized girls involves masculinization of that part of the brain which mediates

"dominance, assertion (possibly in association with assertion of exploratory and territorial rights) and manifests itself in competitive energy" (Money & Erhardt, 1972, p. 103). These findings should be viewed as "suggestive rather than conclusive" (McCoy, 1977, p. 162) because genital ambiguity was present at birth and was known to their parents. This could have influenced the parents' treatment of the children.

In general there are few documented innately based sex differences between males and females. Nurturance behavior in females and aggressive behavior in males are two such instances (Maccoby and Jacklin, 1966). According to McCoy, these differences may be only indirectly related to differences in the brain. It is possible that the female is more nurturant because it is she who gestates and lactates. Likewise, it is the male who through evolutionary stages protected and hunted for food. Other differences believed to have an innate basis are verbal fluency and articulation in females and spatial abilities in males (Maccoby and Jacklin, 1966; Bee, 1974). The major argument for the innate basis for these differences is that they appear consistently and do not seem to be the product of socialization.

It is a difficult task to separate known sex differences, those with a substantial innate basis, from those more social in origin (McCoy, 1977). Five possible approaches to this task have been reviewed by Norma L. McCoy.

One approach is to assume that those differences which appear in infancy are less likely to reflect socialization, and, thus, more likely to be innate in origin. However, according to McCoy, maturation level

alone may be responsible for sex differences in infants since newborn female infants have slightly more mature skeletons and nervous systems.

One may also argue that puberty is the time when biologically based sex differences will appear. McCoy points out, however, that one of the weaknesses of this argument is that both adolescent males and females experience pressure to conform to adult sex role stereotypes, and this could account for such sex differences.

A third approach is to assume that sex differences which appear in subhuman primates or cross-culturally in humans have an innate basis. McCoy feels this case for an innate basis is rather strong.

The fourth rationale is that sex differences in behavior are social in origin if they can be related to systematic differences in the behavior of parents or other socializing agents. This is a weak approach, according to McCoy, because innately based sex differences are just as likely to give rise to differential treatment by caretakers as differential treatments by caretakers is to produce sex differences.

A final rationale is to assume that those sex differences in behavior not clearly related to differential socialization of the two sexes must have an innate basis. McCoy argues that one cannot rule out the possibility that these sex differences are indirectly related to differential socialization of the two sexes.

McCoy suggests that there is little agreement as to which sex differences have an innate basis, and even when there is agreement, the exact nature of such a basis is still unclear. According to McCoy (p. 166), ". . . even if biologically based sex differences in behavior predispositions exist, social factors such as the sex which the child is

assigned and in which the child is reared can substantially override and obscure them." A case study serves as an illustration of the importance of socialization, sex assignment, and child rearing practices on the development of sexual identity (Money & Ehrhardt, 1972). It is the sex assignment and rearing as opposed to genetic sex or sex of the genitals that is the most significant factor in the development of sexual identity. Money and Ehrhardt report a case of identical male twins. One lost his penis during surgery, and sex reassignment, involving genital reconstruction and hormone replacement therapy, was undertaken. Six years later the girl was reported to behave in ways appropriately female. These twins are genetically identical, yet behave quite differently.

Psychological theories of sex typing vary in the degree to which they emphasize the biological basis for sex differences. Major theories about the development of sex-typed behavior include the psychoanalytic theory, the cognitive theory, and social learning theory. Briefly, Freud believed that the pattern of psychosexual development and the development of sex roles was a normal innate, instinctual, and biologically determined sequence. Kohlberg's theory claims that sex typing begins when a child tells himself/herself "I am a girl" or "I am a boy" and, therefore, "I must behave in a certain way." Self-categorizations of gender are the fundamental organizers of sex role. Bandura's social learning theory proposes that children are directly and vicariously reinforced for behaving according to sex. Parents provide the initial modeling of clearly differentiated male/female behaviors. This initial modeling is consistent with role models presented by other adults, in

the media, in textbooks, and the classroom. Therefore, in the socialization process, children learn relatively specific behaviors which are clearly differentiated as more appropriate for males or for females.

Individual, Familial, and Societal Factors Affecting Sex-Role Socialization and Career Development

A thorough review of the literature suggests that several salient variables operate on sex role socialization and career development. These variables include individual factors, familial factors, and societal factors (O'Neil, Ohlde, and Burke, 1980). Individual factors are personality characteristics which provide the means of internalizing the socializing influences of the familial and societal factors. The individual variables encompass one's self concept; one's need to achieve; one's abilities, interests, and attitudes; and one's career information processing skills. Familial factors refer to experiences in the family of origin. These experiences shape values, attitudes, and behaviors. The family is recognized as a powerful socializing agent in reinforcing sex roles and attitudes. Familial factors encompass childhood experiences with mother and father as a role model. Societal factors refer to influences in society that affect an individual's perceptions of appropriate sex roles and career options. Societal factors include educational and occupational experiences and opportunities; interaction with one's peer group; the influence of mass media; the effects of social class and race; conditions created by the supply and demand of jobs; and unpredictable events which affect an individual's career choices. In summary, individual, familial, and societal factors interact simultaneously in the socialization process.

Several studies (Rust & Lloyd, 1982; Rakowski & Farrow, 1970; and Schlossberg & Goodman, 1972) cite data which indicate that stereotyping of sex roles and occupations occurs early in the socialization of children and still exists in contemporary society.

Schlossberg and Goodman (1972) studied children's sex stereotyping of occupations. These researchers found that kindergarteners and sixth graders felt that a woman's place was not fixing cars or television sets or designing buildings. According to these children, a woman could work as a waitress, nurse, or librarian. They did not feel that a man had to be limited in career choice. According to these authors, the sex typing of occupations by these children both reflects and perpetuates the differential status of men and women. They recommend that "children's early notions of differential achievement for men and women need to be changed" (p. 183). They suggest that "it is much easier for elementary school personnel to keep options open than it is to convince a forty-year-old woman that it is appropriate for her to achieve" (p. 183).

Rust and Lloyd (1982) administered Silvern's Sex-Role Questionnaire to 200 male and female students in grades 7, 8, and 9. The results indicated that male and female adolescents continue to perceive differences in their sex roles and the direction is still toward traditional stereotypes. Both males and females saw positive nonstereotyped words as being more typical of females and negative words as more typical of males. There was no evidence to suggest that grade in school influenced stereotyping or gender desirability.

Rakowski and Farrow (1979) examined the relationship between sex-role stereotyping and career goals of young women from a junior high and

a senior high school located in the suburban-rural area of Niles, Michigan. Three questionnaires were administered to 45 junior high girls and 46 senior high girls. The assessment instruments were The Attitudes Toward Women Scale, the Career Attitudes Scale, and a questionnaire designed to obtain information about the subject's personal, education, and career goals. The results indicated that the students at both schools chose traditional sex-typed jobs (62.6%, n=57). According to these authors, this supports past research which indicates that many men and women develop career interests adhering closely to traditional sex roles. High school students expressed more liberal attitudes toward women and careers than did the junior high school girls. However, proportions of students at both grade levels who chose nontraditional jobs did not differ significantly. Rakowski and Farrow believe, "even though many people subjectively feel that attitudes toward women have moved toward a more liberal direction, the present findings indicate that goal orientations of many young girls correspond with sex-role stereotyping and reveal 'sex-appropriate' career interests" (p. 365). The authors conclude by stating that "individuals may be socialized into sex roles which might limit goal orientation and accomplishments" (p. 365). In order to counteract sex-role stereotyping, they suggest that more vocational information be introduced by the schools at all levels in order to increase awareness of wider options for females and males.

Elaborations of the effects of socialization on the career choice processes have for the most part focused on the barriers faced by women (Farmer, 1976; Harmon, 1977). Farmer (1976) suggested six

internal or self-concept barriers, e.g., fear of success. According to Farmer, achievement and career motivation in girls differs from that of boys. She states that the factors associated with these differences are as yet poorly defined. Some of the factors have been identified in the research literature. These factors include: (a) Reduction in academic self-confidence for girls in college; (b) Fear of success in college and high school women, found in varying degrees depending on the perceived social sanction given to women's careers; (c) Vicarious achievement motivation found to contribute to women's contentment with traditional career roles, such as secretary, elementary school teacher, and nurse; (d) Home-career conflict found in both college women and working women to inhibit career motivation; (e) Myths about women and the world of work and their possible influence on the career exploration process; (f) Risk taking behavior found to be lower in girls than in boys; and (g) Sex role orientation found to affect achievement motivation (p. 13).

According to Farmer, research findings are sufficient to suggest some general directions for counselors interested in increasing career motivation in women. Research points to the powerful influence of exposing girls to nontraditional role models. Farmer cites a study by Plost (1974) which found that presenting a female computer programmer in a career film significantly increased the career motivation of eighth grade girls for that career compared to the interest they expressed when presented with the same film using a male model.

Farmer recommends:

Role models may be presented directly by inviting women in

nontraditional careers to visit with students, or by encouraging students to find part-time work in settings where they would interact with women in nontraditional career roles. Role models also may be presented indirectly through films, printed materials and discussion (pp. 13-14).

Counselors are encouraged to implement parent and teacher inservice education aimed at reducing sex role stereotypic behavior. They can begin by recognizing biased occupational and career information and developing a library of nonbiased materials.

Farmer summarizes by stating, "When girls and women begin to feel that it is all right to be assertive and independent, it is more likely that they will choose careers that require these attributes and that they will begin to contribute to society at levels more commensurate with their talents and potentials" (p. 14).

Several other individuals have researched the influencers on achievement and career motivation in women. A brief discussion of their findings follows.

Maccoby and Jacklin (1974) studied 58 research reports on achievement motivation in women. They found that women are less competitive compared with men and have lower levels of academic self-confidence. This difference between the sexes in self-confidence does not appear usually in elementary school or high school students, but appears first in college. It is speculated that college precipitates a marriage-career conflict.

Astin (1971) found that girls perform as well as boys in math, science, and tests of spatial relationships up to age ten; thereafter their performance becomes increasingly poorer. She suggested that this

effect is due in part to differential reinforcement on the part of parents and teachers.

Maehr (1974) proposed that situational factors play a critical role in achievement motivation as it manifests itself within different racial and cultural groups. Katz (1973) found that women have less "fear of success" when responding to cues which presented women in socially sanctioned achievement situations than when women were presented in nontraditional roles. A contextual change in the stimulus cue had a dramatic effect on these women's fear of success. Monohan, Kuhn, and Shaver (1974) found coeducational versus noncoeducational school settings had a significant effect on the level of fear of success in high school girls. High school girls in coeducational schools had less measured fear of success than comparable girls in noncoeducational schools.

Alper (1974) cited data which suggest that women with traditional female orientations, attitudes, and beliefs score lower on achievement motivation measures than women with nontraditional female orientations. According to Entwisle and Greenberger (1972), high IQ girls generally held more liberal views than average and low IQ girls, and that high IQ girls from blue collar homes were the most liberal about women's roles.

Lipman-Blumen (1972) proposed an operational definition of the lower aspiration level of women through her description of a vicarious achievement ethic. Many women choose indirect achievement satisfaction through the successes of important males in their lives rather than directly through their own successes.

Bettleheim (1969) suggested that education is an enhancement for

boys, whereas it is a form of insurance in case they don't marry for girls. He assumed that women who enter "direct achievement" occupations, such as science, experience a loss of femininity.

Harmon (1972) found it harder to predict the stability of career choice for college women than for college men. According to Harmon, women who aspire to high level careers in their freshman year often changed their choices to less demanding careers by the senior year. She hypothesized that lack of reinforcement for their high aspirations resulted in lowered career aspirations.

Marshall and Wijting (1980) report that the data from their study indicate that the degree to which women manifest their need for achievement through careers or marital lives depends upon the degree to which they have stereotypically feminine self-images. Women with masculine self-images were higher in achievement motivation. Endorsement of sex-role-related personal attributes and cognitive styles was related to college students' differences in decision-making progress when selecting a college, academic major, and occupation (Moreland et al., 1979). According to Moreland (1979, p. 336), "programs designed to facilitate student movement in making and implementing career related decisions may need to . . . help women expand their self concept to include masculine qualities and simultaneously reinforce their feminine traits."

The primary influencers of career development are parents or caretakers. Parents have the strongest influencing effect on their children's occupational choices (Lungstrum, 1973) because they are crucial influencers in conveying attitudes about role expectations. The nature of childhood experiences is complex. It is believed that children are

socialized through reinforcement of appropriate sex role behaviors which affect choices during adolescence and adulthood (Maccoby and Jacklin, 1974).

Oliver (1975) compared career-oriented and homemaking-oriented college women on the variables of parental attitudes of father and mother acceptance, concentration and avoidance, and identification with father or mother. Her findings suggest that a girl's father is more important than her mother in determining the degree of career commitment as an undergraduate. According to Oliver, the career-oriented subjects perceived their fathers as significantly less accepting. The career-oriented subjects were also significantly more highly "father-identified." Perceived greater mother identification and greater father acceptance were seen to be related to the development of a relatively high need for affiliation in the homemaking-oriented subjects. "The results of the investigation supported the proposition that antecedent family variables influence the development of motivational patterns which are associated with career and homemaking orientation in college women" (p. 1). According to Oliver, "it may be that the development of need for achievement and need for affiliation is related to experiences and relationships which women have had in the families of their childhood and adolescence" (p. 3).

Studies indicate that females are reared to assume a conforming and dependent role, while men are reinforced for independent behaviors (Kager and Moss, 1963). Early inhibition of females' independence strivings by primary caretakers results in a pervasive affiliative need in women (Hoffman, 1972).

Maternal preference for a career has a positive effect upon a daughter's self-esteem and feelings of competency, whereas maternal employment was not found to have any significant effect (Baruch, 1973). Maternal employment seems to affect a daughter's perception of sex roles. Women with employed mothers perceived significantly fewer differences between masculine and feminine roles than women with homemaker mothers (Vogel, Broverman, Clarkson, and Rosenkrantz, 1970). Tangri (1972) found that a mother's employment increases a daughter's career orientation, decreases her sex-typing behavior, and increases the probability of her choosing typically masculine career goals. In order to be influential, a female role model must show how achievement may be successfully combined with traditional feminine concerns, such as marriage and family (Almquist and Angrist, 1971).

The father's relationship with his daughter seems important in her sex-role development and her positive acceptance of herself as a female (Biller and Weiss, 1970). Price-Bonharm (1976) reviewed articles since 1964 which discussed the father's role. It is noted that the father is considered a secondary person in the parent-child relationship. The father's personality and behavior seem to affect the daughter directly through his interaction with her and indirectly through his relationship with and attitudes toward his wife and family.

Although parents are the primary influencers of sex role socialization, teachers are the next most influential because they are in positions to encourage divergent choices for students or to perpetuate stereotyped norms (Bem and Bem, 1973). Counselors, like teachers, are individuals who could take the lead in promoting emergent choices and

behaviors. However, counselors do not consistently take the lead in promoting non-sexist options (Hansen, 1978; Hawley, 1976). Female counselors were described in two studies as being more facilitative of emergent behaviors and attitudes than their male counterparts (Englehard, 1969; Thomas and Stewart, 1971).

The American educational system is the source of external and/or environmental restriction cues that reinforce sex-role stereotyping. According to Dobbert (1975), some structural processes encourage role stereotypes for girls and boys. Role grouping in extracurricular student activities--males play the sports while females cheerlead--is an example of this type of sex-role stereotyping. Adult models in school administration are overwhelmingly male. In the high schools, about 3 percent of the principals are women (Taylor, 1973). Girls learn that females either cannot or will not work as administrators.

Textbooks used in American schools portray males and females in traditional stereotypic roles. According to Hurst (1973), women were portrayed as "old maids," and "plotting to catch a man." Males were featured in major roles four times more often than females (Britton, 1973). Britton explains that descriptive words for boys were: daring, intelligent, ingenious, problem solver, doers, achievers, and aggressive. Girls, on the other hand, were portrayed as docile, pleasing, self-effacing, incompetent, inept, passive, nonachieving, and neat and clean.

Sex-role stereotyping in athletics is well defined for boys and girls (Engle, 1973; Sandler, 1975). Reverse socialization problems seem to occur for nonathletic boys in comparison to the athletic girl (Cottle, 1972).

The stereotypic treatment of boys and girls is highlighted in the scientific field (Hardin and Dede, 1973). Factors which seem to perpetuate sex-role stereotyping include the lack of role models to encourage girls to become scientists and the subtle socialization of boys and girls in the types of toys with which they are encouraged to play.

The National Science Foundation (Erlick and LeBold, 1975) sponsored a study to provide information about the reasons why high school students would choose or would not choose to pursue careers in science. The survey from the Purdue Opinion Panel included 2,000 high school students in public and private schools across the United States. The sample was stratified on the basis of census data for sex, grade in school, region of the country, and rural-urban residence. Based on the results of the poll, the authors suggest that "there is a need to identify and to remove the barriers to full utilization of talent in science careers" (p. 2).

In this sample, 59 percent of the males and 41 percent of the females responded that they had given consideration to a career in science, mathematics, or engineering. However, only 5 percent indicated an intent to become a scientist, 6 percent of the males and 3 percent of the females (p. 20). Respondents reported the major reasons for not becoming a scientist were other plans or interests in some other careers and problems related to school subjects. In general, the students said they believed that females are equivalent to males in scientific ability and interest in mathematics. They held positive attitudes toward careers in science for females.

According to this poll, female preferences were greater than those of males in secretarial-clerical jobs (ratio 10 to 1), in teaching and social services (ratio 3 to 1) and in medical and biological sciences

(ratio 3 to 2). Male preferences outnumbered those of females in mechanical and industrial trades (15 to 1), in construction trades (10 to 1), in technical jobs (3 to 1), and in physical sciences, engineering, mathematics, and architecture (3 to 1) (p. 16).

Results indicated that female respondents tended to like the verbally oriented subjects while male respondents tended to like math and physical science subjects. The results indicated large sex differences for some subject areas. Females reported liking: (1) English by a ratio of 3 to 2, (2) typing by a ratio of 7 to 4, (3) bookkeeping 30 percent to 17 percent, (4) art 54 percent to 44 percent (p. 4). Male respondents more frequently reported liking physics (22 percent to 12 percent), mechanical drawing by a ratio of 3 to 1, and auto mechanics by a ratio of 3 to 1.

Students gave self-assessments of their drive to achieve and academic ability. Lowest in rank for all respondents were self-assessments of scientific and mechanical abilities. "Black females less frequently than black males or white females reported above average assessments for math, problem solving, and artistic abilities as well as for drive to achieve" (p. 8).

In spite of the abundance of research, there is much that is not known about sex-role stereotyping and career socialization (Hansen, 1978). "There does seem to be some evidence that sex stereotyping exists, that it occurs at home and school, and that it has considerable impact on the kinds of educational-vocational decisions made by boys and girls and the kinds of life style options they consider" (Hansen, 1977, p. 29). There are several significant studies related to sex-role

stereotyping and career development in the secondary schools.

In an attempt to isolate antecedent factors that predict career choices and to determine the factors that relate to career change and career stability, Astin and Myint (1971) studied the career development of 5,387 women during the five-year period after high school. They utilized data collected by the Project TALENT Data Bank.

The study attempted to answer several specific questions:

1. What personal characteristics of twelfth grade girls predict their vocational choices 5 years after high school?
2. What college and other post-high school experiences affect the plans of women?
3. What are the personal and intellectual traits of women who persist in a career as opposed to the traits of those who change their career plans?

The authors provide a comparison of the findings that result from three discriminant analyses. According to them, four dimensions emerged as orientations to career outcomes. These were: (a) an aspiration for higher education or an intellectual dimension; (b) a marital status or home commitment dimension; (c) an early career commitment dimension; (d) a masculinity-femininity dimension.

The authors report that the most important predictor of career choices for women was the desire for higher education. The single best predictor of plans to pursue careers in natural sciences, the professions, and teaching was attainment of a BA degree.

The study reports that more women who earlier chose teaching, the health fields, office work, the arts, and housewife tended to indicate similar preferences five years later. Women who initially chose the professions or business careers tended to change those choices. Most

women who changed from their initial field tended to shift to teaching careers, office work, or the housewife category. Changes into natural sciences or professions occurred less frequently. Shifts occurred toward choices that are considered feminine or more appropriate for women.

In summary, girls who scored high on scholastic aptitudes, and who planned to pursue higher education and aspired to an advanced degree, usually selected fields that require greater career commitment such as natural and social sciences, the professions, and teaching. The less scholastically capable girls shifted away from careers that require high aptitudes and long, rigorous training. The authors suggest that the more capable students are perhaps more perceptive about their own interests and aptitudes at an earlier age. They are able to choose more realistic careers appropriate to their personal qualities. The intellectually less capable tend to make unrealistic career plans which they change.

In summary, the educational system is an agent of socialization; it reflects and perpetuates the attitudes of sexism (O'Neil, Ohlde, and Barke, 1980). Nevertheless, little experimental evidence demonstrates that sex biased educational practices affect the vocational sex role process. Furthermore, it is difficult to assess the degree to which individuals internalize roles, values, and options in the family and how these familial experiences interact with the socialization process of the school.

Mass media are sources of influence which may affect women's values, attitudes, and behaviors (Hansen and Keierleber, 1978).

Although the media reflect societal values, the importance in sex role learning is not clear. It is possible, however, that the media, including television, books, magazines, and films, contribute to stereotypical views by depicting women in traditional roles (Busby, 1975).

Researchers theorize that developmental and situational differences seem to affect the vocational choice processes of women. Tyler (1964) studied the development of sex differences in play and school and concluded that girls appear to be precocious in social development, while they are behind in career development, especially at the college level. Harmon (1972) suggested that women's vocational interests may crystallize somewhat later than men's.

It appears that the strength of the stereotypic roles seems to increase with age, and these roles appear to be more fully developed in later junior high and senior high school years (Entwisle and Greenberger, 1970; Sparks, 1967; Stein, 1971). Studies (Greenberg, 1973; Sheppard and Hess, 1975) seem to demonstrate that females are more likely than males to give an egalitarian, liberal response. Egalitarian is defined as being more positive and favorable to the concept of social change for women.

Girls were found to be less realistic than boys in their career plans (Douvan and Adelson, 1966; Prediger, Roth, and Noeth, 1974; Rand and Miller, 1972). Girls' educational and career plans revealed a lack of coherence. This was not found to be true of boys (Douvan and Adelson, 1966).

Girls indicate a strong desire and plan to work; however, their career plans are in traditional stereotypic areas such as teacher,

secretary, social worker, and nurse (Prediger, Roth, and Noeth, 1974).

Marriage is a major goal for girls (Rand and Miller, 1972). Hawley (1976) suggests one possible reason for girls being less realistic in their career planning might be that work has a lower priority for girls. Most girls expect to combine marriage, career, and motherhood and feel that working wives are admirable. An equal portion consider working mothers bad for children (Farmer, 1976; Rand and Miller, 1972).

Girls who had expressed strong vocational goals in junior high school switched to marriage goals in senior high according to Matthews and Tiedman (1964). There was also evidence of lack of vocational goals and planning for high school girls (Rapoza and Blocher, 1976). Girls were found to be more dependent upon praise and support from others rather than on their own internalized standard of excellence (Veroff, 1969). Asche (1974) found females to be more field-dependent. Field-dependent girls are unlikely to believe that they are as capable as boys at new tasks and will be unlikely to try them (Lockheed, 1976).

Girls have a more positive attitude toward school and achieve higher grades (Ellis, 1968). Boys tend to experience academic success when accompanied by a more traditional sex-role identity, and girls with a more traditional sex-role identity also achieve better academically (Ponzo, 1973). Junior high girls chose nontraditional college-related goals but changed to more stereotyped choices once in high school. Barnett (1973) found that prestigious occupations and aversion were positively correlated for females.

Differences seem to exist between boys and girls in their information

processing, career planning, and awareness of options. Boys demonstrate a cultural disposition to choose and prepare for career roles. They are viewed as actively engaged in and concerned with career planning and career decisions. A developmental relationship seems to exist between age and realistic planning. Boys' fantasies were similar to their career aspirations, focusing on work and personal satisfaction derived from contributing to a work force (Douvan and Adelson, 1966).

Rotter (1982) attempted to gain insight into social-psychological barriers that inhibit women from entering engineering. She asked 110 male and 84 female engineering students to evaluate male and female liberal arts and engineering majors using a variation of the Semantic Differential questionnaire. Results indicated that female engineering majors were rated as similar to male engineering majors on work related traits and as competent. Female engineering majors were judged as less attractive, less likeable, and less interested in dating than their female liberal arts counterparts. Results revealed reciprocal negative social images held by male engineering students for female engineering students and by female engineering students for male engineering students. Female subjects tended to rate male engineering students as substantially less likeable than female engineering students. Females majoring in math/science perceived male and female engineering majors as lacking an interest in dating.

According to Rotter, one approach to attracting more women with the appropriate aptitude into engineering is to change the social image of female engineering majors as less attractive, likeable, and social (stereotypically feminine traits). She offers several strategies

including the importance of role models. "Perhaps, for those high school females who already show aptitude and achievement in science, role models could more pertinently address social issues such as dating, marriage, and family" (p. 201). Another approach is to focus on the positive competency image associated with female engineering students. "Inform high school students that female engineering students are perceived to be more reasonable, confident, persevering, and useful than liberal arts students either male or female" (p. 201).

The educational level and occupational status of a female's parents exert a strong influence on her occupational choices (Burlin, 1976). Burlin examined the relationship between parents' education and mother's work and occupational status and the occupational aspirations of adolescent females. Her subjects were 139 junior year high school students in a suburban school located in Syracuse, New York. She asked the subjects to select an ideal occupation and a real occupation. An "ideal occupational aspiration" was an occupation they would select if they lived in a society which offered unlimited possibilities for job choice. A "real occupational aspiration" was an occupation they would actually select. The ideal and real choices of occupations were classified as Innovative (an occupation which includes fewer than 30 percent women), Moderate (an occupation which includes 30 to 50 percent women), and Traditional (an occupation which includes more than 50 percent women). These classifications were based on census data. Burlin found that the girls selected more ideal occupations in the Innovative category than they did real occupations in the Innovative category. She suggests, "the desire to pursue a broader range of

occupations is present; however, personal and social forces appear to limit their belief that in real life these occupations could actually be pursued" (p. 102). Burlin states that the mother must currently be employed in an Innovative category in order to inspire her daughter towards an Innovative or Moderate occupation. According to Burlin's study, the father's educational level, not the mother's, was found to be significantly related to Real Occupational Aspirations. This lends support to the assumption that it is socioeconomic status rather than educational level which is associated with the occupational aspirations of adolescent girls, if one assumes that the father's educational level is a good indicator of socioeconomic status.

Burlin suggests some of the reasons why socioeconomic status appears to be related to girls' real occupational aspirations are: (1) the economic realities of availability or unavailability for higher education; (2) the degree of opportunity for role models in the nuclear family ; (3) the degree of opportunity for personal contact with people in various occupations through neighbors, family, and travel.

Turner (1972) studied socialization and career orientation among black (n=28) and white (n=45) college freshmen. She found that blacks were more likely than whites to expect full-time paid employment. Fifty-four percent of the blacks and sixteen percent of the whites expected full-time paid employment; fifty-three percent of whites and twenty-one percent of blacks expected to be homemakers, working only before children were born and after they were grown. According to Turner, socioeconomic status did not lead to differentiation of these expectations. High career expectation among the white women was related to: parental

behavior which stressed competitiveness as opposed to obedient and "good behavior;" equalitarian, self-striving attitudes toward women's roles; less paternal disappointment should the student drop out of college; a tendency toward lower parental aspirations for the student's highest academic degree. Full-time career expectations among black women were related to the perceptions of the preferences and expectations of significant people in their lives regarding their career involvement. These black women also stressed the importance of working in a good job in order to find a high-status husband. The author states that the extent of maternal employment during the women's childhoods did not differentiate high and low career expectations among either race. It was hypothesized that full-time career expectation may imply a deep sense of responsibility more than an anticipation of personal fulfillment for these black students.

Socioeconomic factors relate to one's social, racial, or ethnic group and to the present economic situation. The role of race seems to affect the career choice process. Smith (1975) reviewed the profile of the black individual and concluded that there is little information about the career development of blacks. Most theories are based on the vocational development of white middle-class males.

Sex role learning and socialization are complicated processes to understand (O'Neil and Bush, 1978) and little research has been conducted to determine the relationship between sex role learning and career development. O'Neil and Bush suggest that socialization and sex role learning can have significant effects on women's self concepts and subsequent career choices. According to these authors:

The socialization process can produce and maintain specific career development barriers for adult women that impede and restrict career options. In short, the career development barriers of adult women can be by-products of the socialization process (p. 73).

O'Neil and Bush propose a conceptual model identifying five factors which affect women's socialization, sex role learning, and the career choice process. These factors are: familial, societal, individual, socioeconomic, and situational. The familial factor includes childhood experiences, mother's role model, and father's role model. The societal factors are educational experiences, peer group influences, and the effects of mass media. The individual factor includes self expectancies, abilities, interest, attitudes, and achievement needs. The socioeconomic factor includes social class, race, sex discrimination, and the supply and demand of jobs. The situational factor includes chance and the course of least resistance.

According to O'Neil and Bush, career choice involves the interaction between an individual's psychological characteristics and the effects of society. They refer to the factors involved in this interaction as the psychosocial factors which include fear of success, lack of assertiveness, lack of confidence, and role conflicts.

They recommend several strategies for helping women understand how these psychosocial factors affect their career development. They encourage counselors to develop proactive, preventive programs in the community. According to them, media presentations can be used to communicate information about the effects of socialization on career choices. Assertiveness training programs can facilitate personal growth for women by teaching problem solving skills and risk taking behaviors.

They suggest using a group format because the group process supports change, legitimizes problems, reinforces disclosures, and supports active self exploration.

Treatment Procedures

A review of the literature of the past ten years reflects that counselors have been concerned about the effects of sexism and sex role socialization on the career development of males and females. Most of the data, however, have been gathered from descriptive studies which conclude that gender and sex role attitudes are significant predictors of choice of gender dominant roles and occupations. "Little or no evaluation of educational programs geared to reducing sex role stereotyping and its effect on occupational exploration has been attempted" (Blimline, 1976, p. 210). According to Hansen (phone conversation in November, 1981), there has been no empirical investigation of the BORN FREE program on reducing sex role stereotyping. Five experimental studies reported in the literature since 1976 will be reviewed. These studies represent the types of treatment procedures being conducted in this area of career development.

Carol Blimline (1976) compared a curriculum model designed to help male and female students explore career goals, emphasizing an awareness of sexism and stereotypic attitudes on their occupational choices, to a traditional vocational exploration unit which did not include an examination of stereotypic attitudes.

The subjects of the study were 92 females and 115 males enrolled in eight sections of a course entitled Freshmen Seminar at a Maryland Community College. The eight sections were randomly selected. The

sample consisted of freshmen who resided in a predominantly middle and upper middle class, white suburb of a large metropolitan area. The facilitators were four male counselors, chosen randomly from seven volunteers.

The treatment model consisted of three 50-minute segments designed to reduce sex bias and sex role stereotyping in career exploration. The three segments included information designed to expand the cognitive understanding and raise the consciousness level of the subjects about sex-role stereotyping. Exercises included an exploration of sex related characteristics and their relationship to the world of work; group problem-solving on a hypothetical situation; slide presentations and questionnaires showing the effect of biased information; and a filmstrip outlining nontraditional jobs for both sexes. The comparison group's unit did not include these three 50-minute segments.

Criterion measures were selected to identify the degree of attitudinal and behavioral change. They were the BEM Sex Role Inventory, used to measure psychological androgyny, and the Life Style Index, used to measure differences in career saliency for females. Exploration of nontraditional occupational choices was measured by the percentage of nontraditional briefs selected from a list of 100. The Occupational Daydreams section of Holland's Self-Directed Search was used to determine the uniformity of experimental and comparison groups since randomization was limited by use of intact groups.

Results indicated that no significant differences were found between the experimental and the comparison groups on any of the criteria. Several significant differences were found between sexes on the occupational

daydreams measurement. The females listed significantly more non-traditional choices than did the males.

The author speculates that "women fantasize about nontraditional occupations but give up these fantasies when faced with actual exploration" (p. 214). Also women seem to have more nontraditional occupational daydreams than do men. The author suggests that these women have lower self-concepts than the males and more egalitarian views about occupational choices for men and women. Blimline concludes with, "changing the social climate in which occupational growth takes place may involve earlier and more extensive intervention in the life histories of men and women" (p. 216):

Dorothy Loeffler and Lois Fiedler (1979) report the findings of three evaluations of an intervention which they designed, implemented, and evaluated in a college setting. The goal of the intervention was to facilitate the psychological growth of the women through resocialization and acquisition of skills in self and environment management. Focus was on increased self-esteem and competence through self-awareness, skills development, cognitive changes, and changes in overt behavior. The authors describe three evaluation studies with two populations of college women.

The content of the counseling intervention for the college women consisted of a psychological development curriculum model implemented in a ten week (30 hours) course. The focus was on a process of individuation and resocialization, using a variety of cognitive and experiential procedures: awareness and clarification exercises, communication skills, assertiveness training, body awareness, power simulations, cognitive

restructuring, goal setting, and support groups. The target population was undergraduate and graduate women enrolled in both day and extension courses at the University of Minnesota.

The first study used pretest-posttest measures over the intervention and a follow-up. The sample was 47 women who completed the course and the testing. The women were described as heterogeneous in age, marital, work, and educational status. The criterion measures were the Adjective Check List and the Self Assessment Scale. The assessment instruments were completed during the first session and retaken at the end of the class. The ACL was mailed at an 8-month follow-up.

The results indicated significant pretest-posttest changes on all the scales of the SAS, using a two-tailed t test ($p \leq .05$). Seventeen of the 24 scales on the ACL showed significant changes between pretest-posttest. The changes were on the appropriate scales and in the expected directions. The significant change over the follow-up ($p \leq .05$) was a reduction in the counseling readiness scores indicating increased satisfaction with personal situation. Gains were sustained according to follow-up data.

The second study was a pretest-posttest design with one control and two intervention groups. The intervention groups for the second study were two classes ($n=31$ and $n=30$). This was also a heterogeneous group as in Study One. Another woman's class ($n=42$) "taught in the traditional mode" completed the same measures and served as a control group. The criterion measures were the ACL, Attitudes Toward Women Scale, the Rotter Internal Locus of Control Scale, and the Adult Self-Expression Scale. These instruments were completed by the women in the intervention

and control classes as part of a handout packet at the first meeting and were retaken at the end of the classes. Two-tailed t-tests were run on the pretest and posttest data for each of the four instruments. Significant changes were reported in the intervention groups on all measures and in the control group only on the Attitudes Toward Women Scale.

The population of the third study were regularly matriculated university students (n=33). Nineteen women registered for the class were given a battery of tests ten weeks prior to the beginning of the class (early-pretest group). This group took the instruments three times: ten weeks prior to the intervention, at the beginning of the intervention, and at the end of the intervention. Fourteen other women registered for the class following the regular class schedule procedure (class-only group). This group received only pretest and post-test instruments. The same instruments were used as in Study Two.

Analysis of data used the two-tailed t-tests for the early pretest group over the waiting period and over the intervention period; for the class-only group over the intervention period; and for the two groups combined over the intervention period. There were no significant changes over the waiting period, but there were significant changes over the intervention.

The authors conclude that the intervention class facilitates the personal growth of women. "Such intervention models may be shared among counselors to meet the personal growth needs of women in other settings" (p. 56).

O'Neil et al. (1980) conducted a research study to assess the

effects of a four-week workshop designed to enhance the awareness of college women (n=60) about sex roles and career factors and to expand their current sex role attitudes and self-concepts. Treatment effects were assessed using five career and sex role instruments in a pretest-posttest control-group design. Results indicated that "treatment subjects spent more time thinking about their career planning, described themselves as being more masculine, and reported investigative, social, and enterprising careers as being more appropriate career choices than control group subjects" (p. 355).

The research hypotheses were that the treatment would (a) enhance participants' awareness of the effects of sex role socialization on career planning, (b) expand their sex role attitudes, sex role self-concepts, and attitudes about the appropriateness of nontraditional career areas, (c) increase their satisfaction with career planning and their time spent thinking about it.

The college subjects were a random sample of 38 freshmen, 21 sophomores, and 1 junior living in three residence halls at a large midwestern university. They were assigned to a treatment and a control group contingent upon their available times, group size, and leader's schedule.

The instruments were the Career Factor Checklist, Career Behavior and Attitudes Checklist, Attitudes Toward Women Scale, BEM Sex Role Inventory, and Career Appropriateness Questionnaire. Experimental and control subjects completed the five pretest instruments at the beginning of the first session. Posttest instruments were given at the end of the final session of the workshop. Posttesting of the control group was accomplished through campus mail during the same week as the treatment

group. An analysis of covariance on all dependent measures was employed in a pretest-posttest control-group design to assess differences between treatment and control groups.

The treatment condition was a structured four-week career workshop focusing upon sexism, sex role socialization, career planning, and available campus resources. Included was a videotape to help women understand how sexism, sex role socialization, may affect and restrict their career and life choices. At each session, subjects viewed a portion of the film, responded to questions related to the film, and discussed responses in dyads and in the large group.

Experimental subjects missing any sessions were assigned to an attrition group and were excluded from the analysis.

Workshop leaders were MA level women counselors who had knowledge of women's career development. They were coached prior to the beginning of the sessions.

According to the authors, the results indicate that the workshop "is beneficial in helping freshmen and sophomore college women expand their masculine sex role self-concepts and their attitudes about the appropriateness of nontraditional career areas" (p. 359). They suggest that more frequent and potent interventions than this single workshop over a one-month period may be needed.

Population

The population of this study was between the ages of 15 and 18 years. This period is commonly referred to as "adolescence." The following discussion will focus upon the psychological and vocational characteristics typical of most individuals during this stage of life.

Particular emphasis will be placed upon the characteristics of adolescent females, especially black females with college level ability.

Erik Erikson (1968) refers to adolescence as a stage of identity versus role diffusion. According to Erikson, the search for identity reaches a crisis point during adolescence which is when many significant changes in the total person, especially in the "self," take place. The search for identity follows a developmental course, and the failure to attain a sense of identity is termed "role diffusion." The earliest attempts at forming a sense of identity are based upon achievements. The importance of achievement becomes highly critical during the adolescent years. The adolescent is judged by, and judges himself/herself by, achievements. Through achievements the adolescent finds a place within the social peer group. The formation of a sense of identity in a complex society confronts the adolescent with the problems of realizing that what he/she knows about life is vague; of realizing that there are inequalities in class membership, unequal opportunities, different values, and various deviations from the mainstream culture.

The individual has successfully attained a sense of identity if the individual has the conviction that he/she had to become the way he/she is and that there is no other possible way for him/her to be. This conviction implies that the individual feels integrated and comfortable in relation to the physical and social surroundings. Personal integration is a matter of degree with each individual experiencing divergent trends within himself/herself.

According to Erikson, the adolescent's method of finding his/her "niche in society" is related to an inability to formulate an

occupational identity.

In general it is the inability to settle on an occupational identity which most disturbs young people. To keep themselves together they temporarily overidentify with the heroes of cliques and crowds to the point of an apparently complete loss of individuality . . . (p. 132).

Donald Super has developed a theory of vocational choice which includes a discussion of life stages and vocational characteristics of each stage. According to Super, the Exploration Stage occurs during adolescence and involves self-examination, role tryouts, and occupational exploration which takes place through leisure activities and part-time work. The Exploration Stage is divided into three substages. The first, known as the Tentative Stage, occurs during the age range of 15 years to 17 years. During the Tentative Stage, the individual considers his/her needs, interests, capacities, values, and opportunities. Tentative choices are made and tried out in fantasy, discussion, course work, and actual work experiences (Super, 1957).

In a 1970 study (Broverman, Broverman, Clarkson, Rosenkrantz, and Vogel) practicing psychiatrists, psychologists, and psychiatric social workers, both men and women, were asked to describe a healthy adult (sex unspecified), a healthy male, and a healthy female. According to these authors, mental health workers hold a double standard of mental health. The healthy male was described as being closely similar to the healthy adult (sex unspecified). The healthy female was described as being significantly different from either the healthy adult (sex unspecified) or the healthy male. When compared to men, the healthy female was described by these clinicians as being:

more submissive	less independent
less adventurous	more easily influenced
less aggressive	less competitive
more excitable in minor crisis	more easily hurt (feelings)
more conceited about appearance	less objective
less inclined to math and science	

"Certainly these traits parallel the sex-role stereotypes on which girl-children are weaned" (Hansen and Rapoza, 1978). According to Boverman et al., these characteristics place women in the position of having to decide whether to display characteristics considered desirable for healthy adults and males, and having their femininity questioned, or behaving in the prescribed feminine manner, and accepting second-class status.

It is generally accepted that certain personality traits are ascribed to each sex (Hansen and Rapoza, 1978). When these traits are demonstrated by the appropriate sex, they are socially valued. In a study of outstanding college achievers (Rosenkrantz, Vogel, and Bee, 1968) both men and women agreed on the following socially ascribed traits:

Valued Traits, When Displayed by Men

Aggressive	Adventurous
Independent	Makes decisions easily
Unemotional	Acts as a leader
Hides emotions	Ambitious
Objective	Not dependent
Easily influenced	Direct
Dominant	Self-confident
Likes math and science	Thinks men are superior to women
Active	Not conceited about appearance
Competitive	Able to separate feelings from ideas

Valued Traits, When Displayed by Women

Does not use harsh language	Expresses tender feelings
Talkative	Appreciates art & language
Tactful	Strong need for security

Gentle
 Aware of feelings
 Religious

Quiet
 Neat in habits
 Interested in own appearance

According to this study, both men and women agreed that masculine traits are more socially desirable. These findings reflect that women and men hold negative values toward the worth of women in relation to men.

Helen Hacker (1951) compared the socially ascribed attributes of blacks with those of women:

BLACKS

WOMEN

Ascribed Attributes

Inferior intelligence,
 smaller brain

Inferior intelligence,
 smaller brain

More free in instinctual
 gratifications

Irresponsible, inconsistent,
 emotionally unstable. Lack
 of strong superego. Temptresses.

More emotional, "primitive"
 and childlike. Imagined
 sexual prowess.

Common stereotype, "inferior"

Common stereotype, "weaker"

Rationalizations of Status

Thought all right in his
 place. Myth of contented
 black.

Women's place is in the home.
 Myth of contented woman--
 "feminine" woman is happy in
 subordinate role.

Accommodation Attitudes

Supplicatory whining intonation
 of voice
 Deferential manner
 Concealment of real feelings
 Outwit "white folks"
 Careful study of points at
 which dominant group is
 susceptible to influence
 Fake appeals for directives:
 show of ignorance

Rising inflection, smiles, laughs,
 downward glances
 Flattering manner
 "Feminine wiles"
 Outwit "men-folk"
 Careful study of points at
 which dominant group is
 susceptible to influence
 Appearance of helplessness

Discriminations

Limitations on education-- should fit place in society	Limitations on education-- should fit place in society
Confined to traditional jobs-- barred from supervisory positions. No family precedents for new aspirations.	Confined to traditional jobs-- barred from supervisory positions. No family precedents for new aspirations.
Deprived of political importance.	Deprived of political importance.
Social and professional segrega- tion.	Social and professional segrega- tion.

A number of investigators have observed that the motivations and aspirations of black women follow different patterns from those of white women (Weston and Mednick, 1970). It is believed that forces inherent in the social system have had a deleterious effect on black family life. "It is commonly asserted that this has resulted in a sex-role identity pattern in which women are more dominant and aggressive and permitted and, indeed, encouraged to be aspiring and intellectually striving" (Weston and Mednick, 1970, as cited in Mednick, Tangri, and Hoffman, 1975, p. 231).

Weston and Mednick (1975) have conducted a series of studies related to the personality and motivational dynamics influencing expressed aspirations and actual career planning in black college women. They maintain that the dynamics involved in the achievement motivation of black women may be quite different from those of white women.

In one study they tested the following hypotheses: (1) Black college women will exhibit fewer motives to avoid success responses than white college women; (2) Lower class black women will have fewer motives to avoid success responses than middle class black women.

Criterion instruments used to test these hypotheses were verbal TAT cues and a questionnaire requesting socioeconomic information.

The subjects were 63 undergraduate women enrolled at Bluefield State College and 22 enrolled at American University. The subjects were classified at each university by race and class as follows:

<u>Race</u>	<u>American University</u>		<u>Bluefield State</u>	
	Middle Class	Lower Class	Middle Class	Lower Class
Black	10	1	22	28
White	11	0	13	0

The results indicated that the hypothesis regarding race differences was supported for both cues and at both schools. Class differences within the black group were not significant.

According to these authors,

. . . success in intellectually competitive situations does not elicit similar fear in black college women. This may be related to the different sex role patterns since . . . the nature of American society has placed black women in more dominant roles than those assumed by black men and by white women. Accordingly, intellectual mastery is not threatening and professional achievement may in fact not lead to rejection by the male. A successful woman is an economic asset and attractive rather than threatening to a black man . . . (p. 237 as cited in Mednick, Tangri, and Hoffman, 1975).

The authors report that Horner believes that a black woman must be of upper-middle or upper class status before a fear of success is generated.

The black middle class has been described as "out-middle classing" white middle class in terms of values (Weston and Mednick, 1975). Because middle class black family life is generally more male dominated, black middle class women are expected to be less dominant and less striving than their lower class counterparts (Weston and Mednick, 1975).

Valerie D. George (1981) studied talented black high school girls and their white counterparts to determine if talented black adolescent females expressed higher Ideal and Real levels of occupational aspirations than do white adolescent females from comparable socioeconomic backgrounds. The second purpose of her study was to determine if talented black adolescent females aspired to occupations more non-traditional for women than their white counterparts.

The subjects were 64 talented sophomore high school women (32 black and 32 white) who attended two large coeducational public, two private all female, and two Catholic all female schools in the Cleveland, Ohio, area.

According to the author the talented black and white girls did not differ from each other in levels of aspiration or in the traditionality of occupational preferences. Contrary to Burlin's study (cited earlier in the review of literature), the traditionality of the preferences did not differ significantly from Ideal to Real levels of aspirations. The black girls, however, expressed preferences for more Role Innovation occupations. The greatest instability in the expression of Ideal and Real level of aspirations occurred among upper middle class white and black girls. "It was not clear if their inability to state a preference was related to the SES of their family and the lack of urgency attached to an early career decision, choosing marriage over a career, or the results of being in the exploratory state of career decision making" (George, 1981, p. 143). Most of the talented black girls expressed the desire to enter careers that were not only Role Innovative, but were also located at the two highest levels of the occupational hierarchy. Both

black and white girls preferred occupations classified as moderately traditional.

According to George,

These results seem to indicate that talented black adolescent females have internalized the values of their culture, recognizing that upward mobility may be achieved by success in occupations conferring prestige, financial security, and support of individual abilities and talents (p. 143).

George states that counselors and teachers have a special role in helping talented adolescent females explore nontraditional careers.

Group Work With Women

Methods typically employed to help students understand the multiple factors affecting their sex role socialization and career planning include preventative and consultative programs. These programs emphasize vocational exploration of nontraditional careers and proactive strategies to increase awareness of sex role stereotyping and its effects on career planning (Blimline, 1976; Hansen and Keierleber, 1978).

Participants typically met for several hours a week in small groups patterned after the descriptions of men's and women's sex-role consciousness raising groups available in the literature (Farrell, 1973, 1974, 1975; Kirsch, 1974; Pogrebin, 1973). Women's growth is based on increased confidence through self awareness, skills development (assertiveness, problem-solving, communication); cognitive changes (new ways of viewing old experiences and new attitudes for the present and future); and changes in behavior (facilitated by role playing and goal setting) (Loeffler and Fiedler, 1979).

In consciousness raising groups, discussion generally begins with a focus on what it means to be a man or a woman (Kravetz and Sargent, 1977).

Members discuss how they acquired their sex differences and how they would benefit from changing sex-linked behavior. Topics generally include: models presented by parents; early childhood behaviors that were encouraged, ignored, or forbidden; feelings about one's body; feelings and expectations about marriage, work, competence, affection, child rearing and aging. In addition to increased awareness of sex-linked and role-related behaviors, the group offers a setting to explore new behaviors and ways of relating. According to Kravetz and Sargent, emphasis is placed on valuing qualities that have been devalued as feminine and validating and supporting of traditionally "nonfemale behaviors" such as assertiveness and competence in work.

Composing groups of same sex members contributes to exploration and change of sex-role behavior through several processes. First, status rankings of members in the external world do not necessarily transfer to the culture of a consciousness raising group. Second, the system of rewards and punishments is open to the group for defining and redefining. Members find that behavior which earned rewards in the past, such as submission, for women, is no longer accepted. Third, members can free themselves of programmed behaviors such as flirting (Kravetz and Sargent, 1977).

A major outcome of consciousness raising groups is that women learn to trust and respect other women (Kravetz and Sargent, 1977). Historically, women have been socialized to compete with other women for attention of men. Through the group process women begin to view themselves and other women as intelligent and important. Through the group process women learn to recognize that historically they gained social resources

(power, money, and social recognition) through relationships with men. They recognize that under these conditions it is necessary to compete with other women and to view other women as unimportant. Eastman (1973) found members of a consciousness raising group to have increased autonomy, self-confidence, and self-knowledge.

Sex-role consciousness-raising groups emphasize sharing, support, and mutual caring (Moreland, 1976). These are not therapy groups. However, members may attempt to help each other make personal, interpersonal, and life style changes. Women examine their socially learned attitudes and feelings about femaleness and expand their conceptions so that they can begin to live less stereotypic and more satisfying lives (Moreland, 1976). Any frustrations experienced are related to sex role conflicts. These frustrations are not considered pathological.

According to Moreland (1976) there are important differences between consciousness raising groups and sensitivity/encounter groups. Consciousness-raising groups stress support and mutual sharing more than interpersonal confrontation. The opposite is true for sensitivity/encounter groups. The goals of the two groups are also incompatible. The basic assumptions of sensitivity/encounter groups are aimed at helping men become more human, but serve frequently to reinforce many of the stereotypic qualities of femininity for women. "Women need help in learning to experience their own power, to become more task oriented, to become more invulnerable to feedback, and to value their own personal ambitions" (Moreland, 1976, p. 63). Consciousness-raising groups help women move in these directions, while T-groups serve to reinforce the opposite qualities.

Members of consciousness-raising groups typically have reached a high level of awareness. They usually join these groups to help explore more deeply the effects of their sex-role training on their personal lives.

Facilitators must be aware of sex-role constrictions, be familiar with techniques for helping members increase their awareness, and possess knowledge of group process. The facilitator becomes less and less directive as the group develops norms which foster sharing, acceptance, and mutual concern, and as the members become more aware of the sex-role assumptions they have been socialized to accept (Moreland, 1976).

An approach student personnel workers can use to sensitize high school students is entitled BORN FREE: A Collaborative Consultation Model for Career Development and Sex Role Stereotyping. BORN FREE is "an effort to intervene in educational institutions to help reduce career related sex role stereotyping and expand career options" (Hansen and Keierleber, 1978, p. 396). The program is based upon the concept that boys and girls are born free of stereotypes about their lives and that their attitudes about career choice and career roles are influenced by significant people in their lives.

In secondary schools, preventative programs such as the BORN FREE program are conducted in group counseling sessions. According to Shertzer and Stone (1974):

Group counseling appears to develop members' insights into their problems and feelings and helps them to arrive at some understanding of the causes of their concerns. Members talk about themselves, the things that disturb them and what they can do to improve themselves. Each one learns to express himself in actions, feelings, and attitudes. Members learn that they can interact and discuss with one another and that the group will help each person

draw out his feelings. Alternate ways of behaving may be elicited and tried out in the group (p. 369).

Lewis (1970) states that group counseling is more economical in terms of the counselor's time and effort when compared with individual counseling. He lists several strengths of group counseling: members can gain a better perspective of themselves and their problems through the group experience; reality testing can be accomplished through role playing; members can gain more self-confidence from the support of group members; the group serves as an impetus for change; nonverbal group members can learn vicariously in the group situation.

Summary of the Research and Relationship to the Problem

A thorough review of the literature which discusses sex-role socialization and its effects upon career development indicates that individuals select and enter career fields based partly upon their perceptions that certain career areas are more appropriate for one sex than for another. The resulting phenomenon is known as "occupational sex-typing" or segregation of the sexes by occupation. Occupational sex-typing tends to restrict the opportunities available for full utilization of career interests and capabilities, and, thus, limits options for life styles. Census data indicate that females, especially black females, are underrepresented in career fields such as science and engineering. This study assessed the impact of an intervention designed to reduce the effects of sex-role socialization on the attitudes, cognitions, and behaviors of black adolescent females as they consider career choices in science and engineering.

Factors affecting sex-role socialization and career development of women have been categorized into: individual, familial, and societal.

Career choice is described as a process involving the interaction of the individual's psychological characteristics, experiences within the family structure, and the effects of society.

The literature emphasizes that occupational sex stereotyping occurs early in the socialization of children. Many researchers recommend that appropriate role models who are employed in nontraditional career fields can serve to counteract some of the effects of early sex-role socialization. Therefore, the intervention of the study was based on a resocialization process, fostered by a facilitator and guest speakers who are employed in the nontraditional career fields of science and engineering.

Consciousness-raising groups have proven to be effective methods for resocializing males and females. The intervention of this study consisted of structured group sessions similar to consciousness-raising group sessions.

Adolescence is the stage of development referred to as the "search for identity." It seems that adolescence is a potent time for individuals to experience interventions such as the one described in this study because it is during adolescence that young men and women examine their interests and abilities and explore potential careers. The literature indicates that females, especially black females, are underrepresented in nontraditional career fields such as science and engineering. Therefore, the study attempted to expose black female adolescents to role models and sixteen structured group sessions designed to encourage them to consider careers in science and engineering.

Methods commonly used with high school students are vocational exploration programs. Thus, the intervention of the proposed study

utilized an adaptation of a commercially available program known as BORN FREE, which is designed to reduce the effects of sex-role stereotyping on career development. It was hypothesized that the intervention would produce less stereotypical attitudes, cognitions, and behaviors in the girls who completed the sixteen sessions.

Chapter III

Methodology

Population and Selection of the Sample

The sample was selected from a pool of names of black females in grades 10, 11, and 12 who scored between the 50th percentile and the 94th percentile on the Math and/or Science Tests of the SRA Achievement Series. Names were selected using growth scales since growth scales represent interval data and percentiles do not. The scores were those on the SRA Achievement Series administered during the 1978-1979, 1979-1980, or 1980-1981 school years, depending upon the grade level of the student in the 1982-1983 school year. Girls scoring between the 50th and the 94th percentiles on the Math and Science Tests possess average and above average intellectual ability in these areas and are likely to succeed in college programs required as preparation for careers in science or engineering. Girls scoring below the 50th percentile are not likely to succeed in college level programs in science or engineering, and therefore, have been omitted from the pool. Girls scoring above the 94th percentile are exceptionally bright and probably have already decided to pursue careers in science or engineering. For this reason they were omitted from the pool also. Twenty girls were assigned randomly to the experimental group and twenty to the control group. The experimental group consisted of five sophomores, nine juniors, and six seniors. Likewise, the control group consisted of six sophomores, seven juniors, and seven seniors.

The study was conducted at Phoebus High School in Hampton, Virginia. Hampton is an urban community located on the world's largest natural

harbor, Hampton Roads. Hampton is located on the eastern tip of the peninsula formed by the James River, the York River, and the Chesapeake Bay. Fisheries have provided widespread employment to the area. A large number of residents are employed by the world's largest privately owned shipbuilding center which is located in Newport News, seven miles from Hampton. The city is surrounded by military installations and Civil Service agencies. Fort Monroe is the Headquarters of the United States Army Training and Doctrine Command; Fort Eustis is the Headquarters of the United States Army Transportation Center; Langley Air Force Base is the Headquarters of the Tactical Air Command; the National Aeronautics and Space Administration is contiguous to Langley Air Force Base. These installations bring an influx of people, national and international, to the area. The military installations, fisheries, and shipbuilding industries are responsible for the lower than national average unemployment rate in Hampton.

Phoebus High School opened in 1975 as Hampton's first and only modified open-space secondary school, located on Ireland Street in the eastern section of Hampton, known as Phoebus. The school is staffed by approximately 76 professionals. The enrollment is approximately 1,100 students in grades 10-12.

The student body represents geographically separated areas and represents an economic cross-section of society. As of June, 1982, there were 1,099 enrolled, with a racial balance almost evenly divided between white (49%) and black (51%) students. The students represent families that are 95% Protestant, with Baptist being the predominant denomination. Approximately 18 percent of the students are from families with an income

below the poverty level. A 1979 survey of the student body was conducted to determine the occupational and educational level of parents. The results indicated that 67 percent of the parents are employed in occupations requiring specialized training, and 59 percent of the parents have completed high school or beyond.

Eleven percent of the student body are considered transient due primarily to the location of Fort Monroe within the Phoebus Community.

Academically, the students are considered average and below average (data from Self-Study, 1981). Standardized test results on the SRA Short Test of Educational Ability indicate a mean score at the 32d percentile, with a total Reading and Math score at the 35th percentile.

Approximately 40-45 percent of the graduates attend four year colleges and 20-25 percent attend either two-year colleges, technical schools, or enter the military. Thirty to forty percent enter the work force after graduation.

Data Gathering Procedures

Experimental subjects participated in sixteen, one-hour, weekly sessions designed to increase an awareness of the effects of sex role socialization on attitudes, cognitions, and behaviors related to career choices in science and engineering.

The dependent variables were attitudes toward the rights and roles of women, cognitions about the "ideal" woman, and expressed interests in careers in science and engineering. Three self-report instruments assessed attitudinal and cognitive changes. The Attitudes Toward Women Scale assessed changes in attitudes toward the rights and roles of women. Specific scales, noted elsewhere, of the Adjective Check List

assessed changes in cognitions about the "ideal" woman. Two scores (skilled and professional) for science and technology on the California Occupational Preference System assessed changes in expressed interests in careers in science and technology. Expressed interests in future careers in science and engineering were indicated by a fourth dependent variable which was behavioral. Behavioral differences were measured by the number of advanced courses in mathematics and science selected by sophomore and junior girls.

All subjects were tested with the three self-report instruments four weeks prior to the first meeting of the experimental group. This four-week interval helped control for the effects of pretesting on subsequent behaviors. All subjects were tested with the same instruments during the week following the final treatment session. Unobtrusive observations of behavioral differences resulting from the treatment were measured by counting the titles of the advanced mathematics and science courses which the girls selected for the 1983-1984 school year.

Treatment Procedures

The independent variable was sixteen, one-hour, weekly sessions designed to increase an awareness of the effects of sex role socialization on attitudes, cognitions, and behaviors related to career choices in science and engineering. The sixteen treatments were adapted from the BORN FREE Training Packet to Reduce Sex Role Stereotyping in Career Development, which was developed by L. S. Hansen. A complete description of each treatment session has been included in the appendix. Black female scientists, engineers, and technicians from NASA Langley Research Center served as real-life role models during one of the sessions, and

a visit to the work settings of these NASA women augmented the BORN FREE material. The treatment sessions were designed to increase an awareness of the facilitating and inhibiting effects on career choices of (a) existing sex role stereotypes and role expectations, (b) language and the media, (c) structures and practices of educational institutions, (d) parents, family, and community.

A synopsis of each of the sixteen treatment sessions follows:

Goal I - To expose subjects to sessions designed to increase an understanding of the facilitating and inhibiting effects which existing stereotypes and role expectations have on career choices.

Objective A

To identify traditional and nontraditional female and male roles in the world of work.

- Session One:
1. Introduction of the leader, including educational background and profession.
 2. Explanation of the purpose of the sixteen sessions and an overview of the sessions.
 3. A "community building" activity to break the "ice."
 4. NEA cassette tape entitled "Labels & Reinforcement of Sex Roles." This tape covers: (1) anatomical and physiological differences between the sexes, (2) media reflection of and reinforcement of sex roles, (3) traits associated with femininity and masculinity; (4) variations of sex roles in the U. S. and other countries; (5) ways schools and textbooks maintain sex roles; (6) definition of work; (7) basis for the division of labor between the sexes;

(8) attitudes toward women and "women's work"; (9) vocations into which boys and girls are channelled; (10) ways to end sex-role stereotyping and benefits of ending stereotyping.

5. "Work Force Quiz." This strategy helps raise the awareness of the current status of women and men in the world of work.

Session Two: "Lifestyle Activities and Occupations Survey." This strategy is designed to help the group focus on their own attitudes regarding sex roles for females and males. Students will read a list of lifestyle activities and occupations and then decide which are appropriately done by males, females, or both.

Objective B

To identify the limitations which traditional stereotypes of femininity and masculinity place on career options.

Session Three: NEA cassette tape entitled "Cinderella is Dead." This tape covers: (1) projection about future types of occupations; (2) jobs women have traditionally held; (3) effects of television on business and industry; (4) sources of pressure to marry; (5) non-traditional careers for women; (6) ways parents and teachers perpetuate myths about women's "typical" life patterns.

Session Four: "Early Sex Role Messages." This strategy is designed to help students become aware of the kinds of messages they receive about growing up as a female.

Session Five: "The New Superintendent." This strategy is designed to help subjects explore their unconscious attitudes about men's and women's roles. Subjects will not know that they are responding to different stimuli.

Session Six: "Are Women Persons?" This strategy is designed to have subjects discover the impact of sex-role socialization on how men and women are perceived.

Objective C

To identify factors which influence various female and male career development patterns.

- Session Seven:
1. NEA tape by Louise Jones--a discussion of women's rights
 2. "Magic Circle" This strategy is designed to raise the level of trust and to generate support groups within the group. Pairs of students will share answers to statements like: A time I felt good about being a girl was or I got into trouble for my race when

Session Eight: "Breaking Stereotypes." This activity is designed to provide a lighthearted opportunity to think about concepts of stereotyping in general and sex-role stereotyping in particular.

Session Nine: Role Model Speakers from NASA. This treatment is designed to serve as a modeling session. Black female scientists, engineers, and technologists will discuss how they entered their occupations, factors inhibiting and facilitating their nontraditional career choices; most difficult aspects of their decisions to pursue nontraditional careers; how it feels to be in a field considered inappropriate for one's sex; and their future occupational and career goals. These models will be recently hired and/or cooperative education students.

Goal II - To expose subjects to sessions designed to increase an awareness of how language and the media facilitate or inhibit career choices.

Objective

To investigate the ways in which language and the media (e.g., television, radio, films, books, magazines) reflect, create, and reinforce career-related sex-role stereotypes.

Session Ten: "Collage: Men/Women at Work." This treatment provides an opportunity for students to creatively explore ways which the media and language reinforce sex-role socialization in careers.

Session Eleven: "Media Messages." This treatment provides an opportunity for students to explore the ways advertising reinforces sex role socialization in careers.

Goal III - To expose students to sessions designed to increase an awareness of how schools/teachers facilitate or inhibit career choices.

Objective

Examine subtle and obvious types of behaviors which influence choices made in school by male and female students.

Session Twelve: "The Ideal Female/Male Student." This treatment is designed to help subjects become more aware of the different expectations and rewards for boys and girls in schools.

Session Thirteen: "School Situations: Role Plays." This treatment helps students examine obvious and subtle types of behaviors which influence choices made in school by female and male students. Students will be video-taped as they role play students and school personnel engaged in discussions about nontraditional roles and career choices. Video tapes will be reviewed and discussed.

Goal IV - To expose students to sessions designed to increase an awareness of how parents and family facilitate or inhibit career choice.

Objective A

To relate sex stereotyping to each student's family background and career-related family communications.

Session Fourteen: "Role Playing Family Situations." This treatment is designed to help students think about and understand the impact of parents on career development. Video tapes will be made for review and discussion.

- Session Fifteen:
1. Tape by Patricia Ann Brown on racism
 2. "Occupational Family Tree." This treatment will help subjects become aware of the occupational messages they receive and act on. This strategy is critical for personal clarification and awareness of implications in the transfer of occupational aspirations and values.

Objective B

To identify changing roles of men and women in families and occupations.

Objective C

To identify family and community resources and devise strategies to broaden the range of career models.

Session Sixteen: "Career Roadblocks." This treatment is designed to help subjects identify family and community resources and devise strategies to broaden their range of career models.

A field trip to NASA during the last week exposed students to the occupational settings of the speakers from session number nine.

Students were given copies of literature describing careers in science, engineering, and technology.

Ethical Safeguards and Considerations

Procedures as outlined by the Human Subjects Research Committee of the College of William and Mary and the Hampton City School System were followed. Written parental permission forms are on file for all experimental and control subjects.

Control subjects received the treatment when the experiment was completed.

Instrumentation

Three assessment instruments were employed as measures of the

differential effects of the treatment.

Attitudes Toward Women Scale

The Attitudes Toward Women Scale (ATWS: Spence and Helmreich, 1972) consists of 55 items, each scored from 0 to 3, measuring attitudes towards the rights and roles of women in contemporary society (Beere, Women and Women's Issues: A Handbook of Tests and Measurements, 1979). The scale is self-administered and can be completed in 40 minutes. Test scores range from 0, representing traditional attitudes towards rights and roles, to 165, representing liberal attitudes towards rights and roles. The 55 statements can be categorized into 6 theme areas: (1) vocational, educational, and intellectual roles (17 items); (2) freedom and independence (4 items); (3) dating, courtship, and etiquette (7 items); (4) drinking, swearing, and dirty jokes (3 items); (5) sexual behavior (7 items); and (6) marital relations and obligations (17 items). Each item is accompanied by 4 response options: agree strongly, agree mildly, disagree mildly, and disagree strongly. The scale has been administered to ages 14 and older and is considered appropriate for these ages. Normative data are provided for college students and their parents.

Reliability. Test-retest reliability, with an average interval between testings of 3.8 months, were .93 for sixty-one college women and .92 for fifty-two college men (Etaugh, 1975). Test-retest reliability for three groups of college women, with a three-month interval between testings, were .85 (n=20), .89 (n=23), and .88 (n=34) (Canty, 1977).

Correlated split-half reliability based on the responses from

294 college students was .92 (Stein and Weston, 1976). The corrected split-half reliability based on twenty-seven ninth graders was .80 (Grant, 1977). The corrected split-half reliability based on twenty-two ninth graders who were taking the test for the second time was .86 (Grant, 1977).

Validity. Spence and Helmreich (1972b) report data indicating that women score more liberally than men. College women ($n=768$, $\bar{X} = 98.211$) scored significantly higher than college men ($n=713$, $\bar{X} = 89.261$, $p < .001$).

Spence and Helmreich (1972a) report that college women ($n=768$) responded differently ($p < .05$) from college men ($n=713$) on 47 of the 55 items. On eight of these 47 items, women responded in the more traditional direction. Mothers of college students ($n=292$) responded differently ($p < .05$) from fathers of college students ($n=232$) on 30 of the 55 items. On seven of these 30 items, mothers responded in the more traditional direction.

Lunneborg (1974) obtained significant differences between samples drawn from the North and from the South of the United States. Numerous demographic indices (church affiliation, major, grade point average, marital status, race, size of town, mother employed) have significantly predicted ATWS scores (Beach and Kimmel, 1976; Etaugh, 1975).

Scores on the Belief Pattern Scale for Measuring Attitudes Toward Feminism, which was the basis for the development of the ATWS, were correlated with scores on the ATWS. The correlation for 39 women was .87 ($p < .01$); the correlation for 37 men was .86 ($p < .01$); the correlation of the combined group was .87 ($p < .01$) (Doyle, 1975). The

correlation between scores on the AWS and scores on the Equalitarian Sex Role Preference Scale, a measure of attitudes toward male-female sex roles equality was .90 ($p < .001$) for a sample of thirty boys and thirty girls (Kirsch, Shore, and Kyle, 1976).

The Attitudes Toward Women Scale is not reviewed by Buros.

Adjective Checklist

The Adjective Checklist (ACL; Gough and Heilbrun, 1952-1965) is a 300 adjective inventory yielding 24 scales which were derived empirically and rationally. Fifteen scales represent a disposition within Murray's need press system and 9 scales are other indices, including response style (Beere, 1979). The instrument is said to be appropriate for ages 14 and older. The twenty-four scales are: number checked, defensiveness, favorable adjectives checked, unfavorable adjectives checked, self-confidence, self-control, lability, personal adjustment, achievement, dominance, endurance, order, intraception, nurturance, affiliation, heterosexuality, exhibition, autonomy, aggression, succorance, abasement, deference, and counseling readiness.

Gough and Heilbrun (as cited in Beere, 1979) found that 54 of the 300 adjectives discriminated significantly between masculine college males and feminine college females. Some users measure masculinity-femininity with these 54 adjectives. Other researchers have considered high scores on some sub scales to be indicative of masculinity and high scores on other sub scales to be indicative of femininity (Beere, 1979). The ACL has been used to assess sex stereotyping by asking respondents to indicate whether each adjective is more characteristic of males or females (Beere, 1979).

Buros (1972) cites two reviewers who espouse opposite opinions about the ACL. According to Leonard G. Rorer:

An adjective checklist can be used in many ways; either as the rating instrument itself, or as a device for obtaining samples or reports of behavior from which ratings are subsequently derived. Gough and Heilbrun suggest both uses for the ACL. Unfortunately, the criteria according to which the instrument should be evaluated vary as a function for its use, and an instrument that is optimum from one point of view may not be optimum from the other . . . (p. 76).

Rorer states that the ACL is "neither exhaustive nor representative of any specifiable domain" (p. 76). He concludes by stating:

If you want to use an adjective checklist with moderate, noncontroversial terms appropriate for reasonably intelligent well-educated subjects, you could use the ACL. But you could just as well make up a list of your own (p. 77).

Vance, the second reviewer, characterizes the ACL as primarily a research instrument rather than a diagnostic or selection device. He continues by stating that the ACL represents "the ultimate in item simplicity, and clearly demonstrates that simplicity at the beginning may devolve into complexity very quickly among test developers. A 24-scale profile is not easy to comprehend or interpret" (p. 77). According to Vance, the scale development is sophisticated and sound. However, he questions the organization of the instrument around the framework of need theory. "It has more to offer than just being another device for assessing manifest needs" (p. 77). Vance concludes by saying:

The most interesting aspects of the ACL to this reviewer are its utility for research, its economical assessment of general adjustment, and its potential for development in line with any user's special needs or theoretical preferences (p. 78).

According to the Manual (1965), there are three facets of the reliability of the ACL. The test-retest reliability, of the total list of words; the reliability of scales and scored variables; and the agreement among observers when the ACL is used for recording the observations of psychological assessors will be reviewed.

A sample of 100 men were given the ACL twice, approximately six months apart. The test-retest reliability coefficients varied from a low of + .01 to a high of +.86, with a mean of +.54 and a standard deviation of .19 (Manual, 1965, p. 12).

Four experimental samples were utilized for the determination of test-retest reliability of scales. Fifty-six college males and twenty-three college females were tested ten weeks apart, one hundred adult males were tested six months apart, and thirty-four medical school students were tested five and one-half years apart. According to Gough and Heilbrun (1965), most of the scales appeared to possess adequate reliability over the ten-week interval, and some (Self-confidence, Dominance, and Exhibition) have high stability over the five and one-half year interval. The Lability and Succorance scales do show low reliability and the results with them should be interpreted with caution according to the authors.

In order to test agreement among judges, five cases were drawn from the 100 men discussed above. The five inter-group reliability coefficients obtained were .70, .63, .61, .75, and .61. "These values are satisfactory, and indicate that the ACL can be used by trained observers to describe others with adequate reliability" (1965, p. 13).

The test authors write the following about the nature of validity:

"Although indices of validity for the scales of a multi-variate personality measure should be tangible, concrete, and evidential, there is rarely a single and simple variable which may be taken as a criterion for any one scale" (p. 14). Heilbrun related preliminary versions of the ACL to the Edwards Preference Schedule. The rank order of needs as assessed by the ACL correlated $+0.60$ with the ranking given by the EPPS. Correlations between each ACL scale and its counterpart on the EPPS were calculated. Ten of the fifteen coefficients were significant at or beyond the $.01$ level of confidence. The authors caution that the scores on one test should not be equated with those on the other. In another validation study cited in the Manual, Heilbrun compared personality differences between maladjusted college students and adjusted college students. The ACL need scales were compared with the pooled judgments of experienced psychologists as to what the personality correlates of adjustment for each student should be. Ten of the fifteen differences on the need scales were in the direction specified by the judges for the male subjects. Only five scales showed a significant difference in the appropriate direction for female students. The twenty-four scales of the ACL are not strongly related to measures of intelligence or cognitive functioning, according to the authors. The Manual includes tables representing the correlations between the need scales of the ACL and the MMPI, the CPI, and Welsh's R-scale.

California Occupational Preference System

The California Occupational Preference System (COPS; Knapp, Grant, and Demos, 1966-1971) consists of 14 scores: science professional, science skilled, technological professional, technological skilled,

outdoor, business professional, business skilled, clerical, linguistic professional, linguistic skilled, aesthetic professional, aesthetic skilled, service professional, service skilled. There are 12 items for each of the 14 scales for a total of 168 items (Buros, 1972 and 1978). The instrument is said to be appropriate for grades 9-16 and adults. It is self-administered and can be completed in 30 to 40 minutes. The scales are scored by adding up points of credit on each scale: 3 points for liking an activity very much; 2 points for liking it moderately; 1 point for disliking it moderately; and 0 points for disliking it very much. Activities are keyed to the Occupational Outlook Handbook and the Dictionary of Occupational Titles.

Buros (1972 and 1978) cites several reviews of this instrument.

According to Wilbur Layton:

The authors have devised a system with what might be considerable potential for encouraging career exploration especially at the high school level. However, because they have presented no evidence of concurrent or predictive validity, COPS should be used with considerable caution because there is a danger of leading pupils in the wrong direction in their career exploration (p. 1547).

Jo-Ida Hansen echoes this criticism by writing, "elementary questions regarding stability, validity, susceptibility to faking, and scoring accuracy are unanswered" (p. 1546). According to Hansen, the most serious shortcoming of COPS is the lack of evidence of predictive and concurrent validity.

One of the advantages of this instrument (Hansen) is the immediate feedback from the self-scoring format. She notes that accuracy of the self-scoring has not been reported. Another advantage is that the occupational titles have been changed to eliminate sex-bias titles in

the revised version. Also new items have been added in order to cover a wider range of occupations. The wording of some of the items has been changed to a lower reading level.

According to French (cited in Buros, 1972), the test is designed to help a student learn much about vocations from the process of taking the test, scoring, and interpreting the scores. Emphasis is placed on the choice between professional and skilled employment. Comparing and contrasting college level jobs with vocational school or noncollege jobs is important in counseling high school students. According to French, the free responses have a disadvantage, in that they make it easier to fake a desired score. French concludes by writing:

COPS suffers, along with other free-response inventories, by being rather easily fakable and by being subject to variability of individual standards as to what is meant by "liked" or "disliked." In addition, too little research is reported on concurrent validity and none is reported on predictive validity (p. 1405).

Bauerufeind (cited in Buros, 1972) offers five reasons why students would not fake responses on the COPS. The COPS has a solid rationale, developed and checked through multiple-factor analysis. The items are written in "good clear English." The free response format allows a student to show how he feels about each activity. Twelve of the scores represent six couplets--Science-Professional and Science-Skilled, for example. This assists in determining if the interests would require college or vocational school. The Self-Scoring Booklet is easy for the student to mark. The one error in the instrument is "an error of commission." According to Bauerufeind, the authors have printed

"Typical profiles" (group means, apparently) for very small

occupational groups, with no accompanying information about who was involved, when, where, and under what testing conditions (p. 1406).

According to Bodden (as cited in Buros, 1972), the most serious weakness is the dearth of validity information presented in the manual. No correlations between the COPS and existing inventories are given.

Male and female norms for high school students are based on a nationwide sample of over 7,000 boys and girls from public elementary and secondary schools in the United States. No information is given about exact sampling techniques used, so one cannot make inferences about the adequacy of sampling (Buros, 1978).

Split-half reliability coefficients for the 14 scales, based on an unreported N and grade level, range from .86 to .95. Test-retest coefficients (N=82) range from .77 to .91.

Research Design

A "true" experiment is conducted when subjects are assigned to treatment and experimental groups in a systematic, predetermined way. This study used the pretest-posttest control group design (Campbell and Stanley, 1963).

$$\begin{array}{rcccl} R & O_1 & \times & O_2 & \\ & & & & \\ R & O_3 & & O_4 & \end{array}$$

The pretest-posttest control group design controls for numerous threats to internal validity. The equivalence of groups is achieved through randomization (R). This design controls for history because events which might produce an $O_1 - O_2$ difference will also produce an $O_3 - O_4$ difference. Maturation and testing are controlled because they

are the same for both groups. Regression is controlled because both experimental and control groups are randomly assigned from the same pool of names. The control group will regress as much as the experimental group. Selection is controlled because randomization assures group equality. Experimental mortality is a problem since absences in any of the sessions produce "mortality" which can subtly bias the sample obtained. In order to avoid this sampling bias, all the selected experimental and control subjects who completed both pretest and posttest, including those in the experimental group who did not receive all the treatment, were used. The control group received the treatment at a later date.

In summary, the pretest-posttest control group design controls for: history, maturation, testing, instrumentation, regression, selection, mortality, selection-maturation interaction. It does not control for the interaction effects of testing. This design may not control for interaction of selection and treatment or reactive effects of experimental arrangements (Campbell and Stanley, 1963).

Specific Hypotheses

- I. 1. Girls in the experimental group will show no statistically significant differences from girls in the control group in their attitudes toward the rights and sex roles of women as assessed by the Attitudes Toward Women Scale.
2. Girls in the experimental group will show no statistically significant changes in their attitudes toward the rights and sex roles of women as a result of the treatment as assessed by the Attitudes Toward Women Scale.

- II. 1. Girls in the experimental group will show no statistically significant differences from girls in the control group in their cognitions about the "ideal" woman as assessed by specified scales of the Adjective Check List (Self-Confidence, Personal Adjustment, Achievement, Dominance, Endurance, Autonomy, and Aggression).
2. Girls in the experimental group will show no statistically significant changes in their cognitions about the "ideal" woman as a result of the treatment as assessed by specified scales of the Adjective Check List (Self-Confidence, Personal Adjustment, Achievement, Dominance, Endurance, Autonomy, and Aggression).
- III. 1. Girls in the experimental group will show no statistically significant differences from girls in the control group in expressed career interests in science and engineering as assessed by the California Occupational Preference System on two scores (skilled and professional) for science and technology.
2. Girls in the experimental group will show no statistically significant changes in expressed career interests in science and engineering as a result of the treatment as assessed by the California Occupational Preference System on two scores (skilled and professional) for science and technology.
- IV. Sophomore and junior girls in the experimental group will show no statistically significant differences from girls

in the control group in expressed career interests in science and engineering as measured by the selection of courses in advanced science and mathematics.

Statistical Analysis

All data were expressed as interval data. The data related to attitudes, cognitions, and career interests. T-tests were used to determine if statistically significant differences existed between the groups and within the groups.

In order to ensure equivalency between the experimental group and the control group, two-tailed t-tests were employed using pre-treatment scores. In order to assess statistically significant differences between the two groups due to the training of the experimental group, post-treatment scores from the experimental group were compared with post-treatment scores from the control group using one-tailed t-tests. In order to assess statistically significant changes within the experimental group due to the treatment, one-tailed, paired t-tests were employed using pre-treatment and post-treatment scores. In order to determine if any unknown factors might have affected the control group, two-tailed, paired t-tests were employed using scores from tests administered before and after the experimental group's treatment session.

A one-tailed t-test was employed using quantitative data from the unobtrusive observations to determine if any statistically significant behavioral differences existed between the two groups due to the treatment.

Summary of Methodology

In summary, the study exposed twenty black, adolescent females to

an independent variable consisting of sixteen one-hour, weekly structured group sessions adapted from L. S. Hansen's BORN FREE training material. The intervention was designed to increase awareness of the effects of sex role socialization on attitudes, cognitions, and behaviors related to career choices in nontraditional fields of science and engineering. The design for the proposed study was a pretest-posttest control group design.

The sample consisted of girls in grades 10, 11, and 12 whose math and/or science SRA Achievement scores were between the 50th and 94th percentile. The subjects were assigned randomly to the experimental group and to the control group.

The dependent measures were attitudes toward the rights and roles of women, cognitions about the "ideal" woman, and expressed interests in nontraditional careers in science and engineering. Behavioral changes were measured by unobtrusive observations of registration for advanced courses in mathematics and science for the 1983-1984 school year. Attitudinal and cognitive changes were measured by three self-report instruments. These instruments were the Attitudes Toward Women Scale, the Adjective Check List, and the California Occupational Preference System.

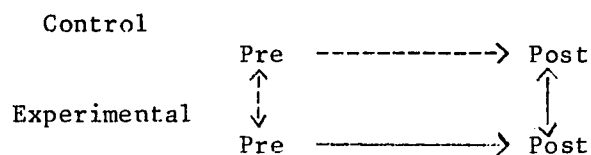
Data were gathered by testing four weeks prior to the beginning of the intervention and following the sixteenth session. Behavioral data were collected following the completion of the intervention when girls had completed registration for the next school year. The data were interval in nature and were analyzed using t-tests.

Chapter IV

Results

The statistical findings of the study are presented in this chapter. All of the raw data are contained in Appendix D. These findings are the result of test data obtained using the Attitudes Toward Women Scale, specific scales from the Adjective Check List, science and technical scales from the California Occupational Preference System and unobtrusive observations of mathematics and science courses selected as subjects for the next school year.

The results are presented and interpreted for each hypothesis. The comparisons which were performed are illustrated in the following diagram:



The solid lines indicate comparisons which were made to test the research hypotheses. The dashed lines indicate comparisons which were made to test hypotheses for required or additional information.

The between-group results (post-post) were analyzed using two-tailed t-tests. The within group (pre-post) results were analyzed using the one-tailed, paired t-test. In addition to presenting the results of the hypotheses evaluations, analysis of the data was performed to: (a) insure that the two samples were drawn from the same population (between groups pre-pre); and (b) determine if any unknown factors might have affected the control group (within group pre-post). Other related scales from the ACL also were analyzed (within group pre-post).

SCALE NOTATION

- ATWS - Attitudes Toward Women Scale
- SCFD - Self Confidence Scale of Adjective Check List
- ACH - Achievement Scale of Adjective Check List
- PERADJ - Personal Adjustment Scale of Adjective Check List
- DOM - Dominance Scale of Adjective Check List
- END - Endurance Scale of Adjective Check List
- AUT - Autonomy Scale of Adjective Check List
- AGG - Aggression Scale of Adjective Check List
- NUR - Nurturance Scale of Adjective Check List
- AFF - Affiliation Scale of Adjective Check List
- SUC - Succorance Scale of Adjective Check List
- ABA - Abasement Scale of Adjective Check List
- DEF - Deference Scale of Adjective Check List
- SIPR - Science, Professional Scale of California
Occupational Preference System
- SISK - Science, Skilled Scale of California
Occupational Preference System
- TEPR - Technology, Professional Scale of California
Occupational Preference System
- TESK - Technology, Skilled Scale of California
Occupational Preference System

SYMBOLS

- F_{crit} - the value of F at the boundary of the critical region
- t_{crit} - the value of t at the boundary of the critical region
- F^* - the computed F-statistic
- t^* - the computed t-statistic
- σ_c^2 - the variance of the control population
- σ_e^2 - variance of the experimental population
- S_c - standard deviation of the control sample
- S_e - standard deviation of the experimental sample
- M_c - mean of the control population
- M_e - mean of the experimental population
- \bar{X}_c - mean of the control sample
- \bar{X}_e - mean of the experimental sample
- n - sample size
- df - degree of freedom
- \bar{d} - mean of the difference between the sample group pre- and
post-treatment scores

$$\bar{d} = \frac{\sum (X_{pre} - X_{post})}{n}$$

M_d = mean of the difference in the population scores before and after treatment
 S_d = standard deviation of the differences between sample group pre- and post-treatment score

Comparison of Pre-treatment Sample Population

To insure that the two samples were drawn from the same population (validation Hypothesis A), pre-treatment scores from the Attitudes Toward Women Scale, specific scales from the Adjective Check List, and science and technical scales from the California Occupational Preference System were compared using the two-tailed t-test. All of the scales shown in Table 1 were evaluated using the following procedures.

Procedures

Null Validation Hypothesis A - The mean of the population from which the control group was drawn is equal to the mean of the population from which the experimental group was drawn.

$$H_0 : M_c = M_e$$

Alternate Hypothesis A - The mean of the population from which the control group was drawn is not equal to the mean of the population from which the experimental group was drawn.

$$H_1 : M_c \neq M_e$$

Assumptions - The populations from which the samples were drawn are normally distributed.

Level of Significance - The 5% significance level was chosen.

Critical Regions - To determine the critical regions for the t-test, it was first necessary to compare the variances of the two populations using the F-test ($F = \frac{S_1^2}{S_2^2}$). The results of the F-test are shown in Table 1. Since it was determined that the two population variances were equivalent,

then the values of t_{critical} could be determined from the t tables where the degrees of freedom, $df = n_c + n_e - 2$. For all scales the critical regions were $t < -1.960$ and $t > 1.960$.

Computations of t^* - A two tailed t -test was used to compare population means. Since $n_c = n_e = 20$, then $t^* = \frac{[(\bar{x}_c - \bar{x}_e) - (M_c - M_e)] \sqrt{n}}{\sqrt{s_c^2 + s_e^2}}$

where $df = 2n - 2$.

The results are shown in Table 1.

Table 1*

Comparison of Pre-Treatment Population Variances and Means

Scales	\bar{x}_c	s_c	\bar{x}_e	s_e	F^*	F_{crit}	t^*	t_{crit}	H_o
ATWS	106.7	14.62	111.25	14.61	1.002	2.5305	-1.010	+1.960	Accepted
SCFD	12.35	3.078	13.8	3.708	1.452	2.5305	-1.346	+1.960	Accepted
PERADJ	10.8	3.792	11.35	3.183	1.418	2.5305	-.497	+1.960	Accepted
ACH	13.4	5.020	13.95	4.718	1.132	2.5305	-.357	+1.960	Accepted
DOM	9.85	4.069	11.10	5.418	1.774	2.5305	-.825	+1.960	Accepted
END	9.90	3.726	10.80	3.968	1.134	2.5305	-.739	+1.960	Accepted
AUT	3.65	3.924	2.55	2.564	2.341	2.5305	-1.050	+1.960	Accepted
AGG	-4.60	3.885	-4.85	3.703	1.100	2.5305	+.208	+1.960	Accepted
SIPR	16.3	9.631	15.25	10.088	1.096	2.5305	+.337	+1.960	Accepted
SISK	14.5	7.884	12.50	9.479	1.445	2.5305	+.726	+1.960	Accepted
TEPR	14.85	9.315	13.95	8.846	1.109	2.5305	+.313	+1.960	Accepted
TESK	7.75	6.051	7.70	7.658	1.603	2.5305	+.756	+1.960	Accepted

*Raw scores from Tables D.2 and D.5

For the F -test $df_c = df_e = 19$

For the t test $df = 38$

In addition to the Adjective Check List scales of primary interest, other scales also were analyzed. The procedures used were the same as those previously described. The results are shown in Table 2.

Table 2*

Comparison of Pre-treatment Population Variances and Means
for Additional Scales

Scales	\bar{x}_c	S_c	\bar{x}_e	S_e	F^*	F_{crit}	t^*	t_{crit}	H_o
NUR	15.65	5.43	17.5	3.9	1.938	2.530	-1.237	+1.960	Accepted
AFF	23.0	7.20	22.9	4.94	2.126	2.530	.051	+1.960	Accepted
SUCC	-1.5	2.44	-2.25	1.68	2.108	2.530	1.132	+1.960	Accepted
ABA	-2.9	2.85	-2.2	2.59	1.210	2.530	-.813	+1.960	Accepted
DEF	0.8	3.72	1.75	2.69	1.913	2.530	-.925	+1.960	Accepted

*Raw scores from Tables D.2 and D.5.

For the F-test $df_c = df_e = 19$

For the t-test $df = 38$

Conclusion For none of the cases does t^* fall in the critical region; therefore, the null hypothesis was accepted. It can be concluded that the two samples were drawn from the same population.

Evaluation of Hypotheses

I-1, II-1, and III-1

In order to assess statistically significant differences between the two groups due to the training of the experimental group, post-treatment scores from the experimental group were compared with post-treatment scores from the control group using one-tailed t-tests.

Procedures The same procedures used to evaluate the pre-treatment data were used to evaluate the post-treatment data.

Null Hypothesis I-1 Girls in the experimental group will show no statistically significant differences from girls in the control group in their attitudes toward the rights and sex roles of women as assessed by the Attitudes Toward Women Scale.

$$H_0 : M_c \geq M_e$$

Alternate Hypothesis I-1 Girls in the experimental group will show a statistically significant improvement from girls in the control group in their attitudes towards the rights and sex roles of women as assessed by the Attitudes Toward Women Scale.

$$H_1 : M_c < M_e$$

Table 3*

ATWS Between Group Comparisons

Scale	\bar{x}_c	S_c	\bar{x}_e	S_e	F*	F_{crit}	t*	t_{crit}	H_0
ATWS	111.1	16.13	115.85	9.11	3.13	2.530	-1.15	-1.729	Accepted

F test df = 19 t-test df = 19

*Raw scores from Tables D.3 and D.6.

Conclusion The null hypothesis was accepted because t* does not fall within the critical region.

Null Hypothesis II-1 Girls in the experimental group will shown no statistically significant differences from girls in the control group in their cognitions about the "ideal" woman as assessed by specified scales of the Adjective Check List (Self-Confidence, Personal Adjustment, Achievement, Dominance, Endurance, Autonomy, and Aggression).

$$H_0 : M_c \geq M_e$$

Alternate Hypothesis II-1 Girls in the experimental group will show a statistically significant improvement from girls in the control group in their cognitions about the "ideal" woman as assessed by specified scales of the Adjective Check List (Self-Confidence, Personal Adjustment, Achievement, Dominance, Endurance, Autonomy, and Aggression).

$$H_1 : M_c < M_e$$

Table 4*

ACL Between Group Comparisons

Scale	\bar{x}_c	S_c	\bar{x}_e	S_e	F*	F_{crit}	t*	t_{crit}	H_0
SCFD	13.95	5.30	14.95	2.80	3.58	2.530	-.74	-1.729	Accepted
PERADJ	11.75	3.90	12.15	2.54	2.36	2.530	-.29	-1.645	Accepted
ACH	12.75	5.30	15.65	4.38	1.46	2.530	-1.89	-1.645	Rejected
DOM	8.85	3.72	11.00	3.64	1.04	2.530	-1.85	-1.645	Rejected
END	9.70	3.53	12.15	3.66	1.08	2.530	-2.15	-1.645	Rejected
AUT	1.90	2.51	2.20	2.95	1.38	2.530	-.35	-1.645	Accepted
AGG	-3.90	2.90	-3.50	3.17	1.19	2.530	-.42	-1.645	Accepted

*Raw scores from Tables D.3 and D.6.

F-test df = 19

t-test df = 38 except for SCFD where df = 19

Conclusion The null hypothesis for SCFD, PERADJ, AUT, and AGG was accepted since t* does not fall within the critical regions. However, the null hypothesis for ACH, DOM, and END was rejected since t* falls within the critical regions.

Null Hypothesis III-1 Girls in the experimental group will show no statistically significant differences from girls in the control group in expressed career interests in science and engineering as assessed by the California Occupational Preference System on two scores (skilled and professional) for science and technology.

$$H_o : M_c \geq M_e$$

Alternate Hypothesis III-1 Girls in the experimental group will show statistically significant improvement from girls in the control group in expressed career interests in science and engineering as assessed by the California Occupational Preference System on two scores (skilled and professional) for science and technology.

$$H_1 : M_c < M_e$$

Table 5*

COPS Between Group Comparisons

Scale	\bar{x}_c	S_c	\bar{x}_e	S_e	F*	F_{crit}	t*	t_{crit}	H_o
SIPR	18.15	10.84	17.8	10.09	1.14	2.53	.11	-1.645	Accepted
SISK	14.35	9.52	14.6	9.37	1.04	2.53	-.08	-1.645	Accepted
TEPR	16.95	10.79	17.95	8.71	1.54	2.53	-.32	-1.645	Accepted
TESK	9.25	7.53	8.55	8.86	1.39	2.53	.27	-1.645	Accepted

*Raw scores from Tables D.3 and D.6.

F-test df = 19

t-test df = 38

Conclusion The null hypothesis for each scale was accepted since t* does not fall within the critical regions.

In addition to the Adjective Check List scales of primary interest, other scales also were analyzed. The procedures used were the same as those previously described. It was expected that the scores of the

subjects in the experimental group would decrease following the treatment. Consequently, $H_0 : M_c \leq M_e$ $H_1 : M_c > M_e$

Table 6*

Additional ACL Scales Between Group Comparisons

Scale	x_c	S_c	x_e	S_e	F*	F_{crit}	t*	t_{crit}	H_0
NUR	16.65	5.31	17.9	2.31	5.29	2.53	-.97	+1.729	Accepted
AFF	21.65	7.26	24.85	4.52	2.59	2.53	-1.67	+1.729	Accepted
SUC	-1.70	1.75	-1.95	1.67	1.10	2.53	.46	+1.645	Accepted
ABA	-1.90	2.86	-3.0	2.64	1.17	2.53	1.26	+1.645	Accepted
DEF	1.6	3.22	1.35	2.85	1.28	2.53	.26	+1.645	Accepted

*Raw scores from Tables D.3 and D.6.

F-test df = 19

t-test df = 38 for SUC, ABA, and DEF and df = 19 for NUR and AFF

Conclusion A comparison of these scales indicates that there are no statistically significant differences between these populations as a result of the treatment since t* does not fall within the critical regions.

Evaluation of Hypotheses

I-2, II-2, and III-2

In order to assess statistically significant changes within the experimental group due to the treatment, one-tailed, paired t-tests were employed using pre-post treatment data. The procedures employed to test the three null hypotheses are identical to those outlined in detail for hypothesis one.

Procedures

Null Hypothesis I-2 Girls in the experimental group will show no statistically significant changes in their attitudes toward the rights and sex roles of women as a result of the treatment as assessed by the Attitudes Toward Women Scale.

$$H_0 : M_d \geq 0$$

Alternate Hypothesis I-2 Girls in the experimental group will show a statistically significant improvement in their attitudes towards the rights and sex roles of women as assessed by the Attitudes Toward Women Scale.

$$H_1 : M_d < 0$$

Assumptions The populations from which the samples were drawn are approximately normal.

Level of Significance The 5 percent significance level was chosen.

Critical Regions $t_{crit} = -1.729$ based upon a one-tailed, paired t-test with $df = 19$.

Computation of t* The one-tailed, paired t-test was used to evaluate t* since the samples are dependent. $t^* = \frac{(\bar{d} - M_d) \sqrt{n}}{S_d}$

where $\bar{d} = \frac{\sum (x_{pre} - x_{post})}{n}$

Table 7*

ATWS Experimental Within Group Comparisons

Scale	\bar{d}	S_d	t^*	t_{crit}	H_o
ATWS	-4.65	9.72	-2.14	-1.729	Rejected

Conclusion The null hypothesis was rejected since the t^* falls within the critical region.

*Data from Table D.7

Null Hypothesis II-2 Girls in the experimental group will show no statistically significant changes in their cognitions about the "ideal" woman as a result of the treatment as assessed by specified scales of the Adjective Check List (Self-Confidence, Personal Adjustment, Achievement, Dominance, Endurance, Autonomy, and Aggression).

$$H_o : M_d \geq 0$$

Alternate Hypothesis II-2 Girls in the experimental group will show a statistically significant improvement in their cognitions about the "ideal" woman as assessed by specified scales of the Adjective Check List (Self-Confidence, Personal Adjustment, Achievement, Dominance, Endurance, Autonomy, and Aggression).

$$H_2 : M_d < 0$$

Table 8*

ACL Experimental Within Group Comparisons

Scale	\bar{d}	S_d	t^*	t_{crit}	H_o
SCFD	-1.15	3.34	-1.54	-1.729	Accepted
PERADJ	-.80	2.55	-1.40	-1.729	Accepted
ACH	-1.70	3.63	-2.09	-1.729	Rejected
DOM	.10	4.49	+.1	-1.729	Accepted
END	-1.35	2.72	-2.22	-1.729	Rejected
AUT	.35	2.28	+.69	-1.729	Accepted
AGG	-1.75	4.39	-1.78	-1.729	Rejected

*Data from Table D.7

Conclusion The null hypothesis for SCFD, PERADJ, DOM, and AUT was accepted since t^* does not fall within the critical regions. However, the null hypothesis for ACH, END, and AGG was rejected since t^* falls within the critical regions.

Null Hypothesis III-2 Girls in the experimental group will show no statistically significant changes in expressed career interests in science and engineering as a result of the treatment as assessed by the California Occupational Preference System on two scores (skilled and professional) for science and technology.

$$H_0 : M_d \geq 0$$

Alternate Hypothesis III-2 Girls in the experimental group will show a statistically significant improvement in expressed career interests in science and engineering as assessed by the California Occupational Preference System on two scores (skilled and professional) for science and technology.

$$H_3 : M_d < 0$$

Table 9*

COPS Experimental Within Group Comparisons

Scale	\bar{d}	S_d	t^*	t_{crit}	H_0
SIPR	-2.55	4.35	-2.62	-1.729	Rejected
SISK	-2.1	4.68	-2.01	-1.729	Rejected
TEPR	-4.0	5.88	-3.04	-1.729	Rejected
TESK	-.85	5.03	-.76	-1.729	Accepted

*Data from Table D.7

Conclusion The null hypothesis SIPR, SISK, and TEPR was rejected since t^* falls within the critical regions. However, the null hypothesis for TESK was accepted since t^* does not fall within the critical

region.

In addition to the Adjective Check List scales of primary interest, other scales were analyzed. The procedures were the same as those previously described. It was expected that the scores of the subjects would decrease following the treatment. Consequently,

$$\begin{array}{l} H_0 \quad M_d \leq 0 \\ H_1 \quad M_d > 0 \end{array}$$

Table 10*

ACL Experimental Within Group Additional Scales Comparisons

Scale	\bar{d}	S_d	t^*	t_{crit}	H_0
NUR	-.4	3.87	-.46	+1.729	Accepted
AFF	-1.95	4.89	-1.78	+1.729	Accepted
SUC	-.4	1.57	-1.14	+1.729	Accepted
ABA	.8	2.26	1.58	+1.729	Accepted
DEF	-.1	3.63	-.12	+1.729	Accepted

*Data from Table D.7

Conclusion The null hypothesis for all scales was accepted since t^* does not fall within the critical regions. There are no statistically significant differences within the group as a result of the treatment.

Evaluation of Pre-post Treatment

Control Group Data

To determine if there were any changes within the control group during the period of time in which the experimental group was receiving the treatment (Validation Hypothesis B), a comparison of test scores was made. In this instance, two-tailed, paired t-tests were performed on each scale.

Procedures

The procedures are identical to those employed for the one-tailed, paired t-tests, except $t_{critical}$ is equal to ± 2.093 .

Null Validation Hypothesis B-1 Girls in the control group will show no statistically significant changes in their attitudes toward the rights and sex roles of women as a result of the treatment as assessed by the Attitudes Toward Women Scale.

$$H_o \quad M_d = 0$$

Alternate Hypothesis B-1 Girls in the control group will show a statistically significant change in their attitudes towards the rights and sex roles of women as assessed by the Attitudes Toward Women Scale.

$$H_1 : M_d \neq 0$$

Table 11*

ATWS Control Within Group Comparisons

Scale	\bar{d}	S_d	t^*	t_{crit}	H_o
ATWS	-4.4	9.60	-2.053	<u>+2.093</u>	Accepted

*Data from Table D.4

Conclusion The null hypothesis was accepted since the t^* falls between the critical regions.

Null Validation Hypothesis B-2 Girls in the control group will show no statistically significant changes in their cognitions about the "ideal" woman as a result of the treatment as assessed by specified scales of the Adjective Check List (Self-Confidence, Personal Adjustment, Achievement, Dominance, Endurance, Autonomy, and Aggression).

$$H_0 : M_d = 0$$

Alternate Hypothesis B-2 Girls in the control group will show a statistically significant change in their cognitions about the "ideal" woman as assessed by specified scales of the Adjective Check List (Self-Confidence, Personal Adjustment, Achievement, Dominance, Endurance, Autonomy, and Aggression).

$$H_1 : M_d \neq 0$$

Table 12*

ACL Control Within Group Comparisons

Scale	\bar{d}	S_d	t^*	t_{crit}	H_0
SCFD	-1.6	4.69	-1.53	+2.093	Accepted
PERADJ	-.95	3.14	-1.35	+2.093	Accepted
ACH	.65	4.21	.69	+2.093	Accepted
DOM	.85	2.76	1.38	+2.093	Accepted
END	.10	2.95	.15	+2.093	Accepted
AUT	1.75	3.34	2.34	+2.093	Rejected
AGG	-.7	3.48	-.9	+2.093	Accepted

*Data from Table D.4

Conclusion The null hypothesis was accepted for all scales except AUT since t^* falls between the critical regions. For AUT the null hypothesis was rejected since t^* falls within the critical regions.

Null Validation Hypothesis B-3 Girls in the control group will show no statistically significant changes in expressed career interests in science and engineering as a result of the treatment as assessed by

the California Occupational Preference System on two scores (skilled and professional) for science and technology.

$$H_0 \quad M_d = 0$$

Alternate Hypothesis B-3 Girls in the control group will show a statistically significant change in expressed career interests in science and engineering as assessed by the California Occupational Preference System on two scores (skilled and professional) for science and technology.

$$H_1 : M_d \neq 0$$

Table 13*

COPS Control Within Group Comparisons

Scale	\bar{d}	S_d	t^*	t_{crit}	H_0
SIPR	-1.85	8.49	-.97	+2.093	Accepted
SISK	.15	7.37	.09	+2.093	Accepted
TEPR	-2.10	7.95	-1.18	+2.093	Accepted
TESK	-1.5	7.0	-.96	+2.093	Accepted

*Data from Table D.4

Conclusion The null hypothesis for all scales was accepted since t^* falls between the critical regions.

In addition to the Adjective Check List scales of primary interest, other scales were also analyzed. The procedures were the same as those previously described. The results are shown in Table 14.

Table 14*

ACL Control Within Group Additional Scales Comparisons

Scale	\bar{d}	S_d	t^*	t_{crit}	H_o
NUR	-2.25	4.54	-2.22	+2.093	Rejected
AFF	1.35	3.92	1.54	+2.093	Accepted
SUC	.20	2.53	.35	+2.093	Accepted
ABA	-1.0	2.62	-1.71	+2.093	Accepted
DEF	-.8	3.07	-1.17	+2.093	Accepted

*Data from Table D.4

Conclusion The null hypothesis for all scales was accepted since t^* falls between the critical regions, except NUR since t^* falls within the critical region.

Evaluation of Hypothesis IV

To determine if any statistically significant behavioral differences existed between the two groups due to the treatment, a one-tailed t-test was employed using quantitative data from the unobtrusive observations of course registration forms.

Procedures

Null Hypothesis IV Sophomore and junior girls in the experimental group will show no statistically significant differences from girls in the control group in expressed career interests in science and engineering as measured by the selection of courses in advanced science and mathematics.

$$H_0 : M_c \geq M_e$$

Alternate Hypothesis IV Sophomore and junior girls in the experimental group will show a statistically significant increase from girls in the control group in expressed career interests in science and engineering as measured by the selection of courses in advanced science and mathematics.

$$H_1 : M_c < M_e$$

Assumptions The populations from which the samples were drawn are normally distributed.

Level of Significance The 5 percent significance level was chosen.

Critical Regions $t_{crit} = -1.708$ based upon a one-tailed t-test where $df = 25$.

Computation of t^*

$$t^* = \frac{(\bar{x}_c - \bar{x}_e) - (M_c - M_e)}{\sqrt{\frac{1}{n_c} + \frac{1}{n_e}} \sqrt{\frac{(n_c - 1)S_c^2 + (n_e - 1)S_e^2}{n_c + n_e - 2}}}$$

Sample Sizes $n_c = 13$

$n_e = 14$

Table 15*

Between Group Comparisons of Course Selections

Scale	\bar{x}_c	S_c	\bar{x}_e	S_e	t^*	t_{crit}	H_o
Number Courses	.77	1.01	1.14	.86	-1.027	-1.708	Accepted

*Raw scores from Tables D.3 and D.6

Conclusion The null hypothesis was accepted since t^* falls outside the critical region.

Summary

Statistical analysis of pre-treatment scores (Validation Hypothesis A) using the two-tailed t-test indicates that the experimental group and the control group were drawn from the same population.

Comparisons of post-treatment scores from the experimental group with those from the control group (Hypotheses I-1, II-1, and III-1) using one-tailed t-tests indicate that: (1) No statistically significant difference was found between the two groups in their attitudes toward the rights and sex roles of women. (2) A statistically significant difference was found between the two groups in their cognitions about the "ideal" woman on the Adjective Check List Scales of Achievement, Dominance, and Endurance. However, no statistically significant difference was found between the two groups for the scales of Self-confidence, Personal Adjustment, Autonomy, and Aggression. (3) No statistically significant difference was found between the two groups in their interests in science and engineering careers. (4) No statistically significant difference was found between the two groups on the

additional Adjective Check List scales of Nurturance, Affiliation, Succorance, Abasement, and Deference.

Comparisons of the experimental group's pre-treatment scores with their post-treatment scores (Hypotheses I-2, II-2, and III-2) using one-tailed, paired t-tests indicate that: (1) A statistically significant difference was found within the group in attitudes toward the rights and sex roles of women. (2) A statistically significant difference was found within the group in their cognitions about the "ideal" woman on the Adjective Check List scales of Achievement, Endurance, and Aggression. However, no statistically significant difference was found within the group for the scales of Self-Confidence, Personal Adjustment, Dominance, and Autonomy. (3) A statistically significant difference was found within the group in interests in science and engineering careers for three of the four scales. However, no statistically significant difference was found within the group for the scale referred to as Technological, Skilled. (4) No statistically significant difference was found within the group on the additional Adjective Check List scales of Nurturance, Affiliation, Succorance, Abasement, and Deference.

A one-tailed t-test using data from unobtrusive observations of behavior (Hypothesis IV) indicates that no statistically significant difference was found between the two groups in the selection of advanced courses in mathematics and science.

Two-tailed, paired t-tests comparing pre-treatment and post-treatment data (Validation Hypotheses B-1, 2, and 3) were employed to determine if there were changes within the control group. No

statistically significant differences were found on any criteria except the Adjective Check List scale of Autonomy. Analysis of additional Adjective Check List scales indicated no statistically significant differences except the Nurturance scale.

Chapter V

Summary, Conclusions, Discussion, and Recommendations

This chapter presents a summary of the research. Conclusions based upon analysis of the data are presented as well as a discussion of the implications of these conclusions. Finally, recommendations for future research are offered.

Summary

The literature indicates that individuals select and enter career fields based partly upon their perceptions that certain career areas are more appropriate for one sex than for another. The resulting phenomenon is known as "occupational sex-typing" or segregation of the sexes by occupation. Occupational sex-typing tends to restrict the opportunities available for full utilization of career interests and capabilities, and, thus, limits options for life styles. Census data indicate that females, especially black females, are underrepresented in career fields such as science and engineering. Consequently, the research subjects were chosen from the black female high school population.

Socialization appears to be a major factor in the acquisition of sex roles and the phenomenon of sex typing of occupations. Bandura's social learning theory helps explain the socialization process. To summarize, individuals learn to perform sex appropriate responses because they receive direct and vicarious social and physical rewards for this behavior and avoid sex inappropriate behavior to avoid punishment. In addition, because they are differentially reinforced, both directly and vicariously, for sex appropriate behavior, they develop attitudes, cognitions, and behaviors stereotypical of their sex. Individuals

learn appropriate sex role behavior through imitation of a wide variety of models. Imitation will occur even without the existence of emotional ties and in any situation in which it is reinforced. Children imitate parents, other adults, peers, and heroes in the media according to their ages and the amount of exposure to these models.

The study was based on a process of resocialization. The process of resocialization is a reflection of Bandura's premise that human behavior is largely acquired and that the principles of learning sufficiently explain the development, maintenance, alteration, and elimination of behaviors, attitudes, and cognitions. It was expected that resocialization towards fewer stereotypical attitudes, cognitions, and behaviors related to career choices in science and engineering would occur through the process of girls participating in structured group exercises, interacting with real life role models, and visiting real life work settings. The sixteen treatment sessions were based upon Bandura's belief that most behavior is learned observationally through modeling and that individuals regulate their behavior according to the outcomes they expect their behavior will produce.

A major function of modeling, according to Bandura, is transmitting information by physical demonstration, pictorial representation, and verbal description. The structured group treatments consisted of a combination of modeling experiences including the transmission of information through the use of films, books, tapes, real life role models, and visits to real life work settings. Through these modeling experiences, it was expected that the girls would learn vicariously about the facilitating and inhibiting effects on career choices of sex stereotyping.

Through observational learning, their attitudes, cognitions, and behaviors would become less stereotypical.

According to social learning theory, characteristics of the model must be similar to those of the observer. Therefore, the group leader (a black female) was a former Hampton resident who was reared in the neighborhood in which the girls currently live. She represents a socioeconomic background similar to the girls. The NASA role models also were black women with backgrounds similar to those of the girls. According to social learning theory, the girls should learn vicariously that, like the real life role models, they possess the potential for success in science and engineering careers.

According to social learning theory, many human behaviors are regulated by self-imposed consequences. Socializing agents set behavioral standards which are internalized by the individual and form the basis for the self-reinforcement system. Evidence suggests that attitudes and self-evaluative standards can be acquired vicariously by observing others. Therefore, the group leader modeled egalitarian attitudes toward the rights and roles of women. It was expected that the girls would internalize these attitudes as expressed by their responses on the criterion measures. Through the process of leading the structured group exercises, the leader modeled standards for high achievement motivation, autonomy, self-confidence, assertiveness, dominance, and endurance, all characteristics which lead to selection of and success in the nontraditional career fields of science and engineering. It was expected that the girls would internalize these characteristics as expressed by their descriptions about the "ideal" woman. In

addition, it was expected that as a result of interacting with NASA scientists and engineers and visiting their work environments, the girls would demonstrate fewer stereotypical behaviors by expressing more interest in scientific and technological careers on an interest inventory and by registering for more courses in advanced mathematics and science in preparation for entrance into appropriate college majors.

Consciousness-raising groups have proven to be effective methods for resocializing males and females. Therefore, the sixteen structured group sessions were fashioned after consciousness-raising group sessions.

Methods commonly used with high school students are vocational exploration programs. The intervention of this study was an adaptation of a commercially available program known as BORN FREE, which is designed to reduce the effects of sex-role stereotyping on career development.

The research design for this study was a pretest-posttest control group design. The samples consisted of girls in grades 10, 11, and 12 whose mathematics and/or science SRA Achievement scores were between the 50th and the 94th percentile. Twenty subjects were assigned randomly to the experimental group and twenty to the control group.

The independent variable consisted of sixteen one-hour, weekly structured group sessions adapted from the BORN FREE training material. The dependent measures were attitudes toward the rights and roles of women, cognitions about the "ideal" woman, and expressed interests in nontraditional careers in science and engineering. Three self-report instruments, the Attitudes Toward Women Scale, the Adjective Check List,

and the California Occupational Preference System, were used to assess changes in the dependent variables. Behavioral changes were measured by unobtrusive observations of registration for advanced courses in mathematics and science for the 1983-1984 school year.

Data were gathered by testing four weeks prior to the beginning of the intervention and two days following the sixteenth session. Behavioral data were collected following the completion of the intervention when girls had completed registration for the next school year. The data were interval in nature and were analyzed using t-tests. A significance level of .05 was chosen for rejection of the null hypothesis.

The results of the research revealed that the intervention had a significant impact on the following scales: ATWS, three (ACH, END, and AGG) of the seven primary scales of the ACL, and three (SIPR, SISK, and TEPR) of the four scales of the COPS. No significant impact was measured on the remaining four (SCFD, PERADJ, DOM, and AUT) scales of the ACL, on the TESK scale of the COPS, nor on the ACL scales analyzed for additional information. No behavioral change was revealed by the number of mathematics and science courses selected by the experimental group.

In summary, the treatment appears to have been beneficial in helping black, adolescent females increase their awareness of the effects of sex role socialization on attitudes, cognitions, and interests relating to career choices in the nontraditional fields of science and engineering.

Conclusions

The summary of conclusions for all of the scales is presented in Table 16.

Table 16
Summary of Conclusions

Scale	Hyp. I-1, II-1, III-1	Hyp. I-2, II-2, III-2	Validating
	Between Group Comparisons	Experimental Within Group Comparisons	Hypotheses Control Within Group Comparisons
	Result	Result	Result
ATWS	N.S.D.*	S.D.**	N.S.D.
Primary Adjective Check List Scales			
SCFD	N.S.D.	N.S.D.	N.S.D.
PERADJ	N.S.D.	N.S.D.	N.S.D.
ACH	S.D.	S.D.	N.S.D.
DOM	S.D.	N.S.D.	N.S.D.
END	S.D.	S.D.	N.S.D.
AUT	N.S.D.	N.S.D.	S.D.
AGG	N.S.D.	S.D.	N.S.D.
COPS Scales			
SIPR	N.S.D.	S.D.	N.S.D.
SISK	N.S.D.	S.D.	N.S.D.
TEPR	N.S.D.	S.D.	N.S.D.
TESK	N.S.D.	N.S.D.	N.S.D.
Additional ACL Scales			
NUR	N.S.D.	N.S.D.	S.D.
AFF	N.S.D.	N.S.D.	N.S.D.
SUC	N.S.D.	N.S.D.	N.S.D.
ABA	N.S.D.	N.S.D.	N.S.D.
DEF	N.S.D.	N.S.D.	N.S.D.
Numbers of Science and Math Courses Selected			
Number	N.S.D.	--	

*N.S.D. - No significant difference

**S.D. - Significant difference

Results from the within-group and between-group hypotheses indicated that the intervention had a significant positive effect on the

experimental group on the scales of ACH and END. However, for some of the scales the results from the within-group and between-group hypotheses were inconclusive. For these scales the results from the validating within-group hypotheses were used for corroboration. The corroborative data indicated that the intervention had a significant positive effect on ATWS; the AGG scale of the ACL; and SIPR, SISK, and TEPR, three of the four scales of the COPS.

Both the within-group and between-group hypotheses indicated that the intervention did not have a significant impact on the experimental group on three ACL scales (SCFD, PERADJ, and AUT), on the TESK scale of the COPS, nor on any of the ACL scales analyzed for additional information. The results from the within-group and between-group hypotheses for DOM scale were inconclusive; however, the validating within-group hypothesis indicated that no change in DOM could be inferred for the experimental group. The intervention did not significantly impact the behavioral dimension of course selection.

Discussion

Since virtually no experimental studies have measured the effectiveness of an intervention such as this on the attitudes, cognitions, and behaviors of black, highly capable females, this research represents a beginning. Results of the research indicate that the treatment had a significant impact on seven of the thirteen primary scales. Therefore, it can be concluded that following the sixteen hours of treatment, significant attitudinal, cognitive, and career interest changes were demonstrated by the experimental subjects. Attitudinal changes towards the rights and sex roles of women were revealed in the reduction of stereotypical responses to items referring to vocational, educational, and

intellectual roles; freedom and independence; dating, courtship, and etiquette; drinking, swearing, and dirty jokes; sexual behavior; and marital relations and obligations. Apparently, the girls internalized the egalitarian attitudes which they observed in the facilitator and which they experienced as participants in the structured group sessions. This is consistent with the significant changes on the ATWS reported by Loeffler and Fiedler (1979).

Cognitive changes about the "ideal" woman were reflected in descriptions of the "ideal" woman as striving to be outstanding and achieving in pursuits of socially recognized significance, as persisting in any task undertaken, as being competitive, and as seeking and sustaining leadership roles. These were characteristics modeled by the facilitator and the NASA scientists and engineers. Furthermore, the girls were positively reinforced by the facilitator when their responses within the group were congruent with these characteristics. These results are consistent with those of Loeffler and Fiedler (1979) whose intervention produced significant changes in the expected direction for seventeen of the twenty-four scales of the ACL.

Attitudinal and cognitive changes were indicated by greater interest in careers in science and engineering. Following the intervention, the girls expressed significant increases in their interests in occupations involving (1) responsibility for the planning and conducting of research and the accumulation and application of systemized knowledge in the related branches of mathematical, life and physical sciences; (b) observation and classification of facts assisting in research and its application in the fields of life and physical sciences;

(c) responsibility for engineering and structural design in the manufacture, construction, or transportation of products or utilities. Greater interest in these areas apparently reflects that the modeling experiences of physical demonstrations at the work sites, pictorial representations in the form of films, books, and tapes, and verbal descriptions had an impact.

Contrary to expectations, the treatment did not foster significant changes in the experimental group's perceptions of the "ideal" woman as more self-confident, dominant, optimistic, dependable, and independent. Nor did the treatment significantly alter the perceptions of the "ideal" woman as being less solicitous of the sympathy, affection, and emotional support of others; less anxious to please; less likely to express feelings of inferiority through self-criticism, guilt, or social impotence; and less likely to seek and sustain subordinate roles in relationships with others. These findings seem to support those of Blimline (1976) who wrote, "Perhaps it takes more than exercises, slide-shows, and information to change ingrained response and behavior patterns" (p. 215). The findings are not consistent with those of Loeffler and Fiedler (1979) who reported significant increases in self-confidence, self-esteem, and autonomy and decreases in deference to others and emotional dependency. These researchers worked with college-level women who would have had a better understanding of the definitions and concepts associated with the adjectives. The girls in this study may not have known the definitions and concepts of the adjectives even though dictionaries were available. This phenomenon would have affected the results. Perhaps the interaction

of friendly support among the group members and with the group facilitator was contra-indicated for decreases in expressions of need for nurturance, affiliation, succorance, abasement, and deference. It is not surprising that there were no significant differences on the Technology, Skilled scale of the COPS since interests associated with this scale are with working with one's hands in a skilled trade concerned with construction, manufacture, installation or repair of products in related fields of construction, electronics, and mechanics. This scale refers more to the work of technicians; whereas, the intervention placed more emphasis on the job responsibilities and duties of scientists and engineers. Hence, the scale may not have been appropriate as a criterion measure.

It is surprising that there were no significant behavioral differences in the selection of future courses. This may be because prerequisite courses had not been mastered in the past.

Discussions with the subjects following the completion of the intervention revealed that the treatment was beneficial in helping the experimental girls think more realistically about career choices and sex role stereotyping. Subjects reported spending more time thinking about their career planning than did girls in the control group.

Written anonymous evaluations revealed that all twenty girls felt that the experience was positive and rewarding. Excerpts from four representative evaluations follow:

It helped me realize that women can play an important role in jobs that men in the society hold today. The group also emphasized the big opportunities in the career of engineering and the need for more black females in the engineering job career (sic).

I felt that this program was very interesting. It made me think more positively about my career. It also made me more aware of all the job opportunities for women. I learned more about the roles of women and the stereotypes. I am know (sic) looking into engineering as a field.

This program taught me a lot about the job force and the problems you may run into. I've learned the value of an education as a black women (sic) would need to get the right job. I enjoyed the trip to NASA and the class in general. This program made me research the career in which I wish to attend very carefully and the college in to (sic) which to get the education I need to get in the field I desire. Most importantly I learned to have more confidence in myself. Instead of saying I can't I not (sic) say I will try harder.

I felt that these group meetings were very enriching. I learnt (sic) quite a few things about myself and friends around me. To me, Mrs. Brown was the cause of these (sic) beautiful happening. She was very understanding and knew what she was doing. This group was very extraordinary. I enjoyed myself very much because it was an experience I will never forget.

It may be years before the experimental girls fully realize the impact of the sixteen sessions on their career choices.

In summary, the treatment appears to have been beneficial in helping black adolescent females expand their awareness of the effects of sex role socialization on attitudes, cognitions, and interests relating to career choices in the nontraditional career fields of science and engineering. Perhaps an increase in the frequency and intensity of the treatment sessions as well as additional emphasis on those areas in which the experimental group showed no significant improvement would produce more complete resocialization.

Recommendations for Future Research

Several recommendations for future research are suggested. First, one limitation of this study was that the differential effects of the

group leader's ability and personality were difficult to account for in the dependent variables. A research design which would overcome this limitation would be to repeat the experiment with two experimental groups, each facilitated by a different leader, and two control groups. Analysis of pre- and post-treatment data could better reveal the impact of personality variables on dependent measures.

Second, the random four-group design, $\begin{matrix} \underline{R} & O_1 & \underline{x} & O_2 \\ & \underline{R} & & O_4 \\ & & \underline{x} & O_5 \\ & \underline{R} & & O_6 \end{matrix}$

has higher prestige than the pretest posttest control group design since it overcomes some of the limitations of the second approach and would be a better research design. The effects of testing and the testing and x interaction could be estimated resulting in increased generalizability and better comparisons: ($\underline{O}_2 \quad \underline{O}_1 \quad \underline{O}_2 \quad \underline{O}_4 \quad \underline{O}_5$, and $\underline{O}_5 \quad \underline{O}_3$). If these comparisons were consistent, the strength of inferences about the treatment is increased.

Third, a six-month follow-up testing might yield information regarding consistency. Also, the treatment might create latent changes which might not be immediately evident but which might be manifested later.

Fourth, it would be interesting to empirically investigate any differences between black and white adolescent females. Additionally, interventions might be empirically investigated as to their impact on the sex role socialization and career choices of black and white adolescent males.

Fifth, the results are limited since most of the data were collected on self-report instruments. It would be beneficial to acquire more behavioral data, particularly documentation with unobtrusive observations indicating attitudinal and cognitive changes.

Appendix A

PARENTAL PERMISSION FORM

_____ has my permission to participate in sixteen structured group sessions designed by Mary H. Lewis, Phoebus counselor, as part of the research required in order to complete her dissertation. This project is endorsed by the school principal and the district superintendent. The title of the project is "A Study of an Intervention Designed to Increase Awareness of the Effects of Sex-Role Socialization on the Attitudes, Cognitions, and Behaviors of High School Girls." The purpose of this project is to determine if the sixteen structured group sessions will have an impact on girls' attitudes, beliefs, and interests in careers in science and engineering.

I understand that my daughter is expected to attend each of the sixteen sessions and that she will miss regularly scheduled classes once a month for four months. The group sessions will be conducted by Mrs. Linda Epps Browne, an engineer from IBM. There will be no risk to my daughter.

My daughter may complete three instruments which will be used to assess the impact of the sessions. The instruments are the Attitudes Toward Women Scale, the Adjective Check List, and the California Occupational Preference Survey. The results will be interpreted to her on an individual basis and will be kept anonymous and confidential. Questions about this project may be directed to Mary Lewis by phoning 851-8411, Extension 348.

Parent/Guardian's Signature

Date

Appendix B

CONTRACT

I, _____, agree to attend each of the sixteen (16) group meetings and field trips which Mrs. Browne will lead. I will complete any classwork I miss as a result of attending the sessions.

Signature

Appendix C

Treatment Session One

"Work Force Quiz"

Goal: PARTICIPANTS WILL GAIN AN INITIAL UNDERSTANDING OF THE FACILITATING AND INHIBITING EFFECTS WHICH EXISTING STEREOTYPES AND ROLE EXPECTATIONS HAVE ON CAREER CHOICES.

Objective: Identify traditional and nontraditional female and male roles in the world of work.

Learning Strategy:

Note to Leader:

This strategy can help raise the participants' awareness of the current status of women and men in the world of work. Appropriate as a thought-provoking and non-threatening activity, it could best be utilized in the beginning of a training sequence. Be sure to allow enough discussion time for the participants following the activity. This is important for idea-sharing and clarification.

Instructions:

- a. Explain the goal and objective of the strategy.
- b. Workshop participants each receive a copy of the "U.S.A. Work Force Information Quiz" and fill in their best estimates of the correct answers.
- c. After everyone has completed the quiz, the group members should reach a consensus on which answers are correct, discussing both the answers and the reasoning which led them to their conclusions.
- d. The consensus answers should be posted on the blackboard or a piece of newsprint before the correct answers are posted.
- e. Discuss the correct answers (see next page).
- f. Reactions to any unexpected results, etc., should then be discussed by the group and considered in the context of existing and ideal career patterns and choices for women and men.
- g. Hand out copies of "Women Workers Today" for use as a follow-up reading.

Minimum Time Required: 1 hour

Resources Needed:

Materials: Pencils, pens, blackboard and chalk or newsprint and felt-tip markers.

Handouts: "U.S.A. Work Force Information Quiz"

Outcome Criterion

After the completion of the Work Force Quiz and the subsequent discussion, participants will write a brief assessment of the current status of women and men in the work force.

Answer Key

- | | | | |
|------|------|-------|---|
| 1. b | 5. d | 9. a | 13. c |
| 2. c | 6. c | 10. b | 14. a (retail sales clerk, secretary, household worker, elementary teacher, bookkeeper, waitress, nurse.) |
| 3. c | 7. b | 11. d | |
| 4. d | 8. c | 12. a | |

U.S.A. WORK FORCE INFORMATION QUIZ

1. _____% of the total United States Work force are women.
 - a. 25 b. 40 c. 60 d. 75

2. Of all women between the ages of 18 and 64, approximately ____% are in the work force.
 - a. 15 b. 35 c. 55 d. 75

3. Of all married women, approximately _____% are in the work force.
 - a. 10 b. 45 c. 60 d. 80

4. Married women, on average, hold jobs outside the home for ____ years.
 - a. 5 b. 10 c. 15 d. 25

5. _____ out of 10 married women will be employed outside the home for some time.
 - a. 3 b. 5 c. 6 d. 9

6. In recent years, more than _____% of mothers held paying jobs.
 - a. 8 b. 25 c. 40 d. 50

7. In 1974, of the more than 37,000 highly-paid airline pilots in the United States, _____ were Black.
 - a. around 10 b. less than 100 c. around 1000
 - d. more than 2,500

8. In the second quarter of 1975, unemployment among all whites in the work force was 8.0%; among all other racial groups, the overall unemployment figure was _____% during this period.
 - a. 8.9 b. 10.5 c. 14.3 d. 20.1

9. In 1975, _____% of all families with both husband and wife living in the home fit the traditional pattern of the husband alone as family breadwinner; both husband and wife held jobs outside the home in _____ of these families.
 - a. 34, 41 b. 45, 30 c. 52, 23 d. 66, 9

10. In recent years, around _____% of all men in the work force earned \$10,000 or more, and around _____% of all women in the work force earned the same amount.
 - a. 32, 25 b. 40, 10 c. 55, 35 d. 30, 30

11. Around _____% of all architects and lawyers in the United States are men.
- a. 45 b. 65 c. 75 d. 95
12. The median income of fully-employed women who have earned a college degree is less than that of the median income of fully-employed men with a/an _____ education.
- a. 8th grade b. high school c. college d. graduate
13. Of all the women in the work force, _____% have clerical or personal service jobs.
- a. 30 b. 40 c. 50 d. 60
14. Of the 23,000 different occupations available in the U.S.A., 1/3 of all working women can be found in _____ of these occupations.
- a. 7 b. 396 c. 3,481 d. 15, 216

Treatment Session Two

"Lifestyle Activities and Occupational Survey"

Goal: PARTICIPANTS WILL GAIN AN INITIAL UNDERSTANDING OF THE FACILITATING AND INHIBITING EFFECTS WHICH EXISTING STEREOTYPES AND ROLE EXPECTATIONS HAVE ON CAREER CHOICES.

Objective: Identify traditional and nontraditional female and male roles in the world of work.

Learning Strategy:

Note to Leader:

This activity is designed to help participants focus on their own attitudes regarding sex roles for females and males. It should be noted that a supportive group may be needed to make this activity successful. If most group members respond in a similar manner (e.g., according to societal stereotypes or in a quite nonstereotyped way), the other group member(s) could feel threatened. The survey is to stimulate thinking and to facilitate the gathering of baseline data, not to label members.

This strategy is related to "Home on the Electric Range."

Instructions:

- a. Explain the goal and objective of the strategy.
- b. Pass out copies of the survey.
- c. Instruct participants that the survey is intended for individual use as a pre and posttest, but that the responses will be discussed in small groups.
- d. Section I (Pretest) will be completed at the beginning of the workshop; participants will complete Section II (Posttest) at the end of the workshop and note if they have changed any of their responses to particular items.
- e. When taking the posttest, participants should cover their pretest answers.
- f. After completion of Section I (Pretest) and Section II (Posttest), discuss the ratings. Some suggested questions for discussion are listed below:
 - (1) Did you rate any particular items as being appropriately done by males only? If so, which items? Do these items refer to roles traditionally assumed by males?

- (2) Did you rate any particular items as being appropriately done by females only? If so, which items? Do these items refer to roles traditionally assumed by females?
- (3) Were there any differences in your ratings for males and females, in general, compared to your ratings of your own ability to perform the various lifestyle activities? Were any of these differences related to your sex? Please discuss.
- (4) In which occupations did you indicate possible interest? Were your occupational choices heavily dominated by your same sex?
- (5) Did any of your answers change from the pretest to the posttest? If so, which ones? Why?

Minimum Time Required: Approximately 1 hour

Resources Needed:

Handout: "Lifestyle Activities and Occupations Survey"

Outcome Criterion:

Fifty percent or more of participants' posttest ratings of lifestyle activities and occupations should be rated as appropriately done by BOTH MALES AND FEMALES.

Lifestyle Activities and Occupations Survey

DIRECTIONS: Please read through the following list of lifestyle activities and decide which are appropriately done by MALES, FEMALES, or BOTH MALES AND FEMALES. Place an M in the blank by those items you feel are appropriately done by MALES, an F by those appropriately done by FEMALES, or a B by BOTH MALES and FEMALES. Mark your answers in the column labeled Pretest which precedes the items. NOTE: Your answers should reflect your own views about what you think is appropriate, not what societal norms say is appropriate.

PART A

Section I Pretest (Mark M, F, or B)	Section II Posttest	Item	Section I Pretest (Mark + or -)	Section II Posttest
_____	_____	1. Sweep floors	_____	_____
_____	_____	2. Clean the garage	_____	_____
_____	_____	3. Wash dishes	_____	_____
_____	_____	4. Fix broken windows	_____	_____
_____	_____	5. Change flat tires	_____	_____
_____	_____	6. Prepare meals	_____	_____
_____	_____	7. Mend clothing	_____	_____
_____	_____	8. Shovel snow	_____	_____
_____	_____	9. Take out garbage	_____	_____
_____	_____	10. Wash floors	_____	_____
_____	_____	11. Make beds	_____	_____
_____	_____	12. Dust furniture	_____	_____
_____	_____	13. Make repairs around the house	_____	_____
_____	_____	14. Knit and sew	_____	_____
_____	_____	15. Build things	_____	_____
_____	_____	16. Make car repairs	_____	_____

Now, whether you have actually done these activities or not, decide which activities you feel you are able to do. Place a + after each of

the above 16 items that you feel you are able to do. Place a - after each item you feel you are not able to do. Mark your answers in the column labeled Pretest, which follows the items.

PART B

DIRECTIONS: Please read through the following list of occupations and decide which are appropriately held by MALES, FEMALES, or BOTH MALES and FEMALES. Place an M in the blank by those items you feel are appropriately held by MALES, an F by those appropriately held by FEMALES, or a B by those activities appropriately held by both MALES and FEMALES. Mark your answers in the column labeled Pretest which precedes the column. NOTE: Your answers should reflect your own views about what you think is appropriate, not what societal norms say is appropriate.

Section I Pretest (Mark M, F, or B)	Section II Posttest	Item	Section I Pretest (Mark + or -)	Section II Posttest
_____	_____	1. Plumber	_____	_____
_____	_____	2. Police Officer	_____	_____
_____	_____	3. Store Sale Clerk	_____	_____
_____	_____	4. Truck Driver	_____	_____
_____	_____	5. Flight Attendant	_____	_____
_____	_____	6. Nurse	_____	_____
_____	_____	7. Farmer	_____	_____
_____	_____	8. Counselor	_____	_____
_____	_____	9. Secretary	_____	_____
_____	_____	10. Doctor	_____	_____
_____	_____	11. Private Household Worker	_____	_____
_____	_____	12. Model	_____	_____
_____	_____	13. School Principal	_____	_____
_____	_____	14. Real Estate Agent	_____	_____
_____	_____	15. Insurance Agent	_____	_____
_____	_____	16. Sewing Machine Operator	_____	_____
_____	_____	17. Molder	_____	_____
_____	_____	18. Restaurant Manager	_____	_____

If you had the necessary training needed for each of the above occupations, which ones would you like to do? Please place a + after each of the occupations you might like to do, or a - after those occupations you would not like to do. Mark each occupation with either a + or a - in the column labeled Pretest which follows the items.

Treatment Session Three

"Cinderella Is Dead"

Resources Needed:

NEA cassette tape entitled "Cinderella is Dead." This tape covers:

- (1) projection about future types of occupations
- (2) jobs women have traditionally held
- (3) effects of television on business and industry
- (4) sources of pressure to marry
- (5) nontraditional careers for women
- (6) ways parents and teachers perpetuate myths about women's "typical" life patterns

Treatment Session Four

"Early Sex Role Messages"

Goal: PARTICIPANTS WILL GAIN AN INITIAL UNDERSTANDING OF THE FACILITATING AND INHIBITING EFFECTS WHICH EXISTING STEREOTYPES AND ROLE EXPECTATIONS HAVE ON CAREER CHOICES.

Objective: Investigate and discuss the limitations which traditional stereotypes of femininity and masculinity place on career options.

Learning Strategy:

Note to Leader:

This learning activity is related to "The Ideal Female/Male Student."

Instructions:

- a. Explain the goal and objective of the strategy.
- b. Divide the participants into heterogeneous groups of 5 to 8 persons.
- c. Distribute newsprint and felt tip markers to all the groups.
- d. Direct each group to respond to one of the following stimulus statements for 20 minutes, with one person from each group to be designated by the group as a recorder. Equal numbers of work groups should respond to each statement. The stimulus statements are as follows:
 - 1) Growing up as a female, I learned that I should
 - 2) Growing up as a male, I learned that I should
 - 3) As a female, my daughter has learned that she should .
 - 4) As a male, my son has learned that he should

Each statement should be completed with as many examples as possible of applicable behaviors, attitudes, and values. (See the guidelines for brainstorming in the introductory section of this packet.)

- e. Bring together all the subgroups responding to stimulus questions d.1) and d.2), and ask them to compare and contrast their responses for 15 minutes. Likewise bring together all the subgroups responding to stimulus questions d.3) and d.4).
- f. Reconvene the full group to make comparisons among the responses of all the subgroups. In particular, emphasis should be placed on comparing the kinds of messages received by participants themselves while they were growing up with those received by their own children. Post the newsprint for the participants to see, and refer

to the suggested discussion questions in g below. A total of 20 to 30 minutes should be allocated for this phase of the activity.

It should be noted that for workshops with large numbers of participants the discussion described above would be more productive in smaller groups rather than in one large group.

g. Suggested discussion questions to aid in the processing of this strategy are as follows:

- 1) What were some feelings you experienced when doing this strategy? Did some of the messages for your sex seem relevant to your childhood experiences?
- 2) What are the assumptions behind the various messages?
- 3) Did you ever wish you were the other sex? When?
- 4) How do you feel the messages would have differed for you, personally, had you been of the other sex? Another race, ethnic group, or socioeconomic class?
- 5) Give some examples of people, institutions, etc., that tend to reinforce these messages.
- 6) Give some examples of people, institutions, etc., that try to reduce stereotypic messages.

h. Summarize.

Minimum Time Required: 1 hour

Resources Needed:

Materials: newsprint, felt tip pens, masking tape

Outcome Criterion:

Participants will list at least eight messages they received during their childhood which were related to expected sex-role behavior, attitudes, or values. Each message should be identified further as facilitating or inhibiting career development.

Treatment Session Five

"The New Superintendent"

Goal: PARTICIPANTS WILL GAIN AN INITIAL UNDERSTANDING OF THE FACILITATING AND INHIBITING EFFECTS WHICH EXISTING STEREOTYPES AND ROLE EXPECTATIONS HAVE ON CAREER CHOICES.

Objective: Investigate and discuss the limitations which traditional stereotypes of femininity and masculinity place on career options.

Learning Strategy:

Note to Leader:

This activity is designed to help participants begin to explore their unconscious attitudes and stereotypes about men's and women's roles. As it involves withholding information from the participants so they do not know that they are responding to different stimuli, the activity should be undertaken only if the leader feels that the overall work of the group would not be adversely affected.

Instructions:

- a. Explain the goal and objective of the strategy.
- b. Divide the group into subgroups of three persons each.
- c. Read the following directions to the participants before passing out the worksheets:

"You should not talk or share information with others while you make written responses on the worksheets which you will receive. I cannot answer questions while you work. You should work fairly quickly; first impressions are going to be the most helpful. Five minutes should be enough time to complete this part of the activity."

- d. Pass out the worksheets. Each subgroup member will receive a different one of the three separate statements on a sheet of 8½ by 11 paper. (The statements should be collated in groups of three beforehand so that distribution can be done quickly and without revealing that each member of the subgroup is receiving a different statement.
- e. The three statements are identical, except for the names. They read as follows:

"D. A. Johnson (or Dorothy A. Johnson, or Donald A. Johnson) has just been hired as the new Superintendent of Schools for Magalopolis

(pop. 500,000) and will be arriving to begin work on July 1."

Fill in responses to the following items which are to be included in the press release.

age _____

salary _____

educational background _____

physical description _____

marital status and family information _____

hobbies _____

- f. When everyone has finished, the subgroups should spend 10-15 minutes (1) sharing their responses to the worksheet items and (2) discussing their assumptions underlying the responses. Each subgroup should be distributed a copy of the "Discussion Questions for 'The New Superintendent'" (attached).
- g. The next 15-20 minutes should then be spent in the full group sharing information about the responses as well as feelings about the activity as a whole.

Minimum Time Required: 45 minutes

Resources Needed:

Materials: Pencils, pens
 Optional: blackboard or newsprint to consolidate data
 Handouts: "PRESS RELEASE" worksheets (3 different ones)
 "Discussion Questions for 'The New Superintendent'"

Outcome Criterion:

After completion of this activity, participants will write a short paragraph discussing previously unconscious sex-related biases and stereotypes.

Discussion Questions for "The New Superintendent"

- (1) What assumptions did you make about the three superintendents in the press release?
- (2) What different kinds of data were elicited for each of the "Superintendents"? What were the reasons for these differences?
- (3) On which items would you have responded differently if you had received either of the other two names? Why?
- (4) What generalizations can you make about how this activity relates to the issue of sex-role stereotyping? Stereotyping of other kinds (race, age, income, physical handicap, marital status)?

PRESS RELEASE

"The New Superintendent"

D. A. Johnson has just been hired as the new Superintendent of Schools for Megalopolis (pop. 500,000), and will be arriving to begin work on July 1.

Fill in responses to the following items which are to be included in the press release:

age:

salary:

educational background:

physical description:

marital status and family information:

hobbies:

previous work experience:

PRESS RELEASE

"The New Superintendent"

Dorothy A. Johnson has just been hired as the new Superintendent of Schools for Megalopolis (pop. 500,000), and will be arriving to begin work on July 1.

Fill in responses to the following items which are to be included in the press release:

age:

salary:

educational background:

physical description:

marital status and family information:

hobbies:

previous work experience:

PRESS RELEASE

"The New Superintendent"

Donald A. Johnson has just been hired as the new Superintendent of Schools for Megalopolis (pop. 500,000), and will be arriving to begin work on July 1.

Fill in responses to the following items which are to be included in the press release:

age:

salary:

educational background:

physical description:

marital status and family information:

hobbies:

previous work experience:

Treatment Session Six

"Are Women Persons?"

Goal: PARTICIPANTS WILL GAIN AN INITIAL UNDERSTANDING OF THE FACILITATING AND INHIBITING EFFECTS WHICH EXISTING STEREOTYPES AND ROLE EXPECTATIONS HAVE ON CAREER CHOICES.

Objective: Investigate and discuss the limitations which traditional stereotypes of femininity and masculinity place on career options.

Learning Strategy:

Note to leader:

Studies by Broverman, et al. (1972) asked mental health practitioners and college students to define a mature adult man, woman, and person. Results showed that the descriptions for a mature adult man and a mature adult person were similar. But a mature adult woman was described as more emotional, irrational, easily excitable, less adventurous, etc.

The purpose of the following strategy is to have participants discover the impact of sex-role socialization on how women and men are perceived by doing a quick study patterned on Broverman's. Note, though, that for a number of reasons, participants may not have the same results as the above study; be ready to discuss the possible reasons for this. It could be because the people in the study somehow know what the purpose was. Or it could be because there is a "new catechism" operating; that, is, that some people have picked up the rhetoric and superficial aspects of equality for women and men, but their beliefs and behaviors haven't really changed. The possibility of a study such as this revealing underlying sex biases in these instances then are limited, but the discussion about these reasons can provide needed insight into the change process.

Prior to the workshop, ask participants to conduct a study at their institution. Give them copies of "Guidelines for Conducting Study" attached. This can be done with a class, advising staff, counselors, department personnel, parent groups, etc.

Instructions:

- a. Explain goal and objective of strategy.
- b. Participants bring their data to the workshop. Then collate characteristics for each list (person, woman, man) by making three columns on the board or on newsprint, with the headings "person," "woman," "man," and having participants share characteristics from their lists.

c. Discuss in large group: Are "woman" and "person" similar or different? "Man" and "person"? "Woman" and "man"?

d. In small groups:

If differences appeared, discuss:

How does this affect your own career development?

If no differences appeared, discuss:

Is there a "new catechism" operating, or have people's beliefs about women changed? Do you feel any pressure, from yourself or others, to be feminine or masculine? If there is a "new catechism" operating, what implications does that have for your counseling or advising? Have you felt this dynamic in your own life?

e. Summarize in large group.

Minimum Time Required: 30-45 minutes during session. (Additional time outside of workshop to conduct study.)

Resources Needed:

Materials: Prior to workshop have participants conduct study. Give them attached handout, "Guidelines for Conducting Study."
Handout: "Guidelines for Conducting Study"

Outcome Criterion:

Participants will summarize data from their own institutions and analyze the effects of femininity-masculinity pressures on one's own career development.

Studies by Broverman, et al. (1972) asked mental health practitioners and college students to define a mature adult man, woman, and person. Results showed that the descriptions for a mature adult man and a mature adult person were similar. But a mature adult woman was described as more emotional, irrational, easily excitable, less adventurous, etc.

You will now be trying to redo the study (though the Broverman, et al. method and instruments will not be used). Select a group--a class, group of advisers, counselors--preferably from your own educational institution. Then put each of the three statements below on a separate ditto and make copies for your group (or perhaps the workshop leader will have done this for you). The statements are:

Sheet #1: Please write down all the characteristics (nouns or adjectives) that describe a mature adult person.

Sheet #2: Please write down all the characteristics (nouns or adjectives) that describe a mature adult woman.

Sheet #3: Please write down all the characteristics (nouns or adjectives) that describe a mature adult man.

Pass out only one of these statements to each person in your study. (Be sure that equal amounts of each sheet of the three sheets are passed out to the total group.) Explain that you are in a workshop that includes a look at psychological development and you want their perceptions of mature adult persons. Do not explain any further and do not use the words "women and men."

Collect the sheets and tabulate the results so that you will be ready to share them during the workshop.

Note: You may also wish to share your results (and the workshop results) with the group(s) who participated in your study.

Treatment Session Seven

"Magic Seminar"

Goal: PARTICIPANTS WILL GAIN AN INITIAL UNDERSTANDING OF THE FACILITATING AND INHIBITING EFFECTS WHICH EXISTING STEREOTYPES AND ROLE EXPECTATIONS HAVE ON CAREER CHOICES.

Objective: Identify factors which influence various female and male career development patterns.

Learning Strategy:

Note to Leader:

This activity is a good one to use to raise the trust level of groups and to generate support groups. Presentations on distinguishing between assertive-aggressive-passive should occur prior to this strategy.

Instructions:

- a. Explain goal and objective of strategy.
- b. Leader establishes rules for seminar: Leader must strictly enforce these rules if the strategy is to be effective.
 - 1) Everyone has his/her own personal space.
 - 2) Everyone will have a chance to talk.
 - 3) No put-downs or evaluations allowed.
 - 4) You may ask contributor to clarify statements.
 - 5) "Own" your feelings and opinions.
 - 6) Everyone should listen attentively and use first names.
- c. Form small groups, and pass out "Rules and Cues" handout to each group. Facilitators are to pick out one of the following cues as topics for discussion (listed on handout also).
 - 1) A time I felt good being a man (male)/woman (female).
 - 2) A time I felt bad being a man (male)/woman (female).
 - 3) A time I felt good and bad being a woman/man.
 - 4) A time I got in trouble for my sex role attitudes.
 - 5) A time I felt uncomfortable in dealing with an aggressive man/woman.
 - 6) A time I felt uncomfortable in dealing with an assertive man/woman.
 - 7) A time I felt uncomfortable in dealing with a passive man/woman.
 - 8) A time I got in trouble for my sex/race role attitudes.
 - 9) Use your own topic.

- d. At end of session, leader and members sum up by noting similarities and differences in contributions.
- e. Summarize.

Minimum Time Required: 45 minutes to 1 hour

Resources Needed:

Handout: "Rules and Cues"

Outcome Criteria:

At end of workshop, participants will write one paragraph about their feelings about the seminars using the following:

- 1) "What I enjoyed most about the seminar was . . . "
- 2) "What I would change about the seminar . . . "

RULES AND CUESMagic Seminar Rules

- 1) Everyone has his/her own personal space.
- 2) Everyone will have a chance to talk.
- 3) No put-downs or evaluations allowed.
- 4) You may ask contributor to clarify statements.
- 5) "Own" your feelings and opinions.
- 6) Everyone should listen attentively and use first names.

Magic Seminar Cues

- 1) A time I felt good being a man (male)/woman (female).
- 2) A time I felt bad being a man (male)/woman (female).
- 3) A time I felt good and bad about being a woman/man.
- 4) A time I got in trouble for my sex role attitudes.
- 5) A time I felt uncomfortable in dealing with an aggressive man/woman.
- 6) A time I felt uncomfortable in dealing with an assertive man/woman.
- 7) A time I felt uncomfortable in dealing with a passive man/woman.
- 8) A time I got in trouble for my sex/race role attitudes.
- 9) Use your own topic.

Treatment Session Eight

"Breaking Stereotypes"

Goal: PARTICIPANTS WILL GAIN AN INITIAL UNDERSTANDING OF THE FACILITATING AND INHIBITING EFFECTS WHICH EXISTING STEREOTYPES AND ROLE EXPECTATIONS HAVE ON CAREER CHOICES.

Objective: Identify factors which influence various female and male career development patterns.

Learning Strategy:

Note to Leader:

This activity provides a lighthearted, creative opportunity to do some initial thinking about the concepts of stereotyping in general and sex-role stereotyping in particular.

Instructions:

- a. Explain goals and objective of strategy.
- b. Hand out copies of "Breaking Stereotypes - Worksheet," and ask each participant to complete form. Directions are on the form but leader may wish to go over them anyway.
- c. In small groups, discuss the responses. Some sample questions are:
 - 1) What kinds of attributes were most helpful in generating the reverse stereotypes?
 - 2) How many of the stereotypes are directly related to the person's being a female or a male? Or a member of a specific racial group?
 - 3) For persons to fill one of the roles listed, how necessary is it for them to fit the criteria of the stereotype (i.e., could a person fill the role without fitting the stereotype?)?
 - 4) What kinds of forces keep stereotypes intact? Are there ever any advantages in stereotyping?
- d. Summarize in large group.

Minimum Time Required: 45 minutes

Resources Needed:

Handout: "Breaking Stereotypes - Worksheet"

"Breaking Stereotypes - Worksheet"

Directions: In each box is listed a person or job that is often stereotyped. Think of how each is stereotyped; then write a description of the person using data as far from the usual stereotype as you can think of. See the first box as an example.

<p style="text-align: center;"><u>Athletic Star</u></p> <p>Female, 6' 6", 180 lbs. Wears glasses Hobbies: fishing, dancing, writing, poetry, painting Married: She and her husband have 3 children</p>	<p style="text-align: center;"><u>News Announcer</u></p>
<p style="text-align: center;"><u>Car Mechanic</u></p>	<p style="text-align: center;"><u>Telephone Operator</u></p>
<p style="text-align: center;"><u>Lifeguard</u></p>	<p style="text-align: center;"><u>Homemaker</u></p>
<p style="text-align: center;"><u>Firefighter</u></p>	<p style="text-align: center;"><u>Welder</u></p>
<p style="text-align: center;"><u>Secretary</u></p>	<p style="text-align: center;"><u>Dentist</u></p>

Outcome Criterion:

Participants will list 10 stereotypic occupations and note whether or not they need to be stereotyped.

Treatment Session Nine

"NASA Role Models Panel"

Goal: PARTICIPANTS WILL GAIN AN INITIAL UNDERSTANDING OF THE FACILITATING AND INHIBITING EFFECTS WHICH EXISTING STEREOTYPES AND ROLE EXPECTATIONS HAVE ON CAREER CHOICES.

Objective: Identify factors which influence various female career development patterns.

Learning Strategy:

Instructions:

- a. Invite six women (NASA scientists, engineers, technicians) who pursue nontraditional occupations to participate in a panel discussion. The panel members should reflect the multi-racial diversity of our society.
- b. Workshop participants submit written questions for the panelists. Examples of topic areas are as follows:
 - 1) How they entered their occupations.
 - 2) What persons and other factors inhibited and facilitated their nontraditional occupational and career choices.
 - 3) What aspects of their decisions to pursue nontraditional occupational and career patterns were most difficult.
 - 4) How it feels to be in a field which is considered inappropriate for one's sex.
 - 5) What further occupational and career goals they have.
- c. Workshop leader moderates discussion involving panelists and workshop participants.

Minimum Time Required: 1 hour

Resources Needed:

Materials: Index cards for questions; sheets of paper for evaluation. If alternative strategy is used, need film.

Outcome Criterion:

Participants will write a short essay discussing the effects which existing stereotypes have had on women and men who have pursued non-traditional careers.

Treatment Session Ten

"Collage: Men/Women at Work"

Goal: PARTICIPANTS WILL INCREASE THEIR AWARENESS OF HOW LANGUAGE AND THE MEDIA FACILITATE OR INHIBIT CAREER CHOICES.

Objective: Investigate and discuss ways in which language and the media (e.g., television, radio, films, books, magazines, songs) reflect, create, and reinforce career-related sex-role stereotypes.

Learning Strategy:

Note to Leader:

This activity provides an opportunity for participants to address creatively a variety of media and language-related issues pertaining to career-related sex-role stereotypes.

Instructions:

- a. Explain the goal and objective of the activity.
- b. Divide participants into groups of four. Distribute magazines, newspapers, and other materials to the group. Assign equal numbers of groups to construct collages depicting either "Men at Work" or "Women at Work."
- c. When the collages have been completed, pair each "Men at Work" group with a "Women at Work" group to compare and contrast their results. Suggested discussion questions are:
 - 1) What types of work are presented in each?
 - 2) Are the depicted careers traditional, nontraditional, or both?
 - 3) To what extent do the print media stereotype occupations for white men and women? For women and men of other racial groups?
 - 4) Do the print media facilitate or inhibit a broad range of career choices for both sexes?
 - 5) Similarly, do the print media facilitate or inhibit a broad range of career choices for members of different racial and ethnic groups?
 - 6) How do the participants feel about the media image of men and women at work?
- d. After the discussion, display the collages around the room.
- e. Summarize.

Minimum Time Required: 1 hour

Resources Needed:

Materials: Magazines and newspapers (preferably with color pictures).
Leader should bring these or ask participants to do so.
Scissors, glue, crayons, magic markers, posterboard sheets
or large sheets of drawing paper.

Outcome Criterion

After each group has constructed a collage and discussed men or women at work, each participant will write a paragraph describing their view of how the media (newspapers and magazines) view men or women at work.

Treatment Session Eleven

"Media Messages"

Goal: PARTICIPANTS WILL INCREASE THEIR AWARENESS OF HOW LANGUAGE AND THE MEDIA FACILITATE OR INHIBIT CAREER CHOICES.

Objective: Investigate and discuss the ways in which language and the media (e.g., television, radio, films, books, magazines, songs) reflect, create and reinforce career-related sex-role stereotypes.

Learning Strategy:

Note to Leader:

Prior to the workshop have participants explore ways in which men and women are shown on TV, in books, and magazines. Magazines and other printed matter could be brought to the workshop by the leader.

Instructions:

- a. Explain goal and objective of the strategy.
- b. View a previously taped soap opera.
- c. In small groups, have participants examine the material for sex bias or share their observations made prior to the workshop.
- d. Discuss, in large group, what the participants discovered. Discussion questions to consider:
 1. How are women/men presented in ads? Does race and/or age make a difference? Socioeconomic level?
 2. What are the characteristics of women? Of men? Of minority women? Of minority men? Of older vs. younger people?
 3. Are the characteristics positive or negative?
 4. Who has the leadership role; who is shown as the person being helped/helping (man or woman) (white or racial minority)?
- e. Summarize.

Minimum Time Required: 1 hour

Resources Needed:

Materials: Old magazines and newspapers

Outcome Criterion:

Participants will point out examples of advertisements that show sex, race, and age stereotyping.

Treatment Session Twelve

"The Ideal Female/Male Student"

Goal: PARTICIPANTS WILL INCREASE THEIR AWARENESS OF HOW INSTITUTIONAL STRUCTURES AND PRACTICES FACILITATE OR INHIBIT CAREER CHOICES.

Objective: Examine obvious and more subtle types of behaviors which influence choices made in school by female and male students.

Learning Strategy:

Note to Leader:

This activity is designed to help participants become more aware of the different expectations and rewards for girls and boys in their schools. As it is an extremely revealing exercise for groups, it is important to follow the guidelines for brainstorming in the introductory section of this packet.

This strategy is related to "Early Sex-Role Messages."

Instructions:

- a. Explain the goal and objective of the strategy.
- b. Divide the participants into heterogeneous groups of five to eight persons.
- c. Distribute newsprint and felt tip markers to all the groups.
- d. Each group will respond to one of the following stimulus statements for 20 minutes, with one person from each group to be designated by the group as recorder. Equal numbers of work groups should respond to each statement. The stimulus statements are as follows:
 - 1) In my school, the students feel that the ideal female student is . . .
 - 2) In my school, the faculty members feel that the ideal female student is . . .
 - 3) In my school, the students feel that the ideal male student is . . .
 - 4) In my school, the faculty members feel that the ideal male student is . . .

Each statement should be completed with as many examples as possible of applicable behaviors, attitudes, and values. (See the

guidelines for brainstorming in the introductory section of this packet.)

e. Depending upon the size of the total group and the time available, the leader(s) should facilitate one of the following:

- 1) Bring together all of the subgroups responding to stimulus questions "d.1" and "d.2," and ask them to compare and contrast their responses for 10 to 15 minutes. Likewise, bring together all of the subgroups responding to stimulus questions "d.3" and "d.4." Then reconvene the full group to make comparisons among the responses of all the subgroups. Post the newsprint, and refer to the suggested discussion questions in f below.
- 2) Reconvene the full group to make comparisons among the response of all the subgroups. Post the newsprint, and refer to the suggested discussions in f below.

f. Suggested discussion questions to aid in processing this exercise are as follows:

- 1) What are major differences and similarities of the idealized students?
- 2) What kinds of rewards (special honors or day-to-day reinforcement) does your school offer to persons who fit their ideals?
- 3) In what ways does your school staff reinforce or break down the stereotypes of the ideal boy and girl (and, therefore, of boys and girls in general)? Be specific.
- 4) In what ways do students' racial, ethnic, and socioeconomic backgrounds affect the identification of the ideal student?
- 5) Discuss and list ways in which school policies and procedures tend to reinforce or break down sex stereotypes (e.g., availability of courses, extracurricular activities, etc.) and other stereotypes.

g. Summarize.

Minimum Time Required: 1 hour

Resources Needed:

Materials: Newsprint, felt tip pens, masking tape

Outcome Criteria:

Participants will list two ways in which boy and girl students are viewed. They also will write a short essay discussing the ways in which these views inhibit or facilitate career choices.

Treatment Session Thirteen

"School Situations: Role Plays"

Goal: PARTICIPANTS WILL INCREASE THEIR AWARENESS OF HOW INSTITUTIONAL STRUCTURES AND PRACTICES FACILITATE OR INHIBIT CAREER CHOICES.

Objective: Examine obvious and more subtle types of behaviors which influence choices made in school by female and male students.

Learning Strategy:

Note to Leader:

This strategy is related to "Role Playing Family Situations."

Instructions:

- a. Explain the goal and objective of the strategy.
- b. Ask for volunteers to role-play students and school personnel engaged in discussing nontraditional role or career choices.
- c. Choose one of the "Role-Play Situations" from the handout (attached) and give each role player a copy of the description. Refer to Guidelines for Role Playing in the introductory section of this packet and give instructions to the role players.
- d. Allow role play to proceed for 10-15 minutes or when a natural break occurs.
- e. Lead discussion with role-play participants and workshop members. Some suggested questions:
 - 1) How did it feel to be in the roles?
 - 2) Did you assume that the individual you played was white? Would the role play have been different if the individual had been from a different race, physically handicapped, or otherwise a minority member?
 - 3) What "fit" about the roles, and what do you think you would change if you were to do the role again?
 - 4) Have any somewhat comparable situations arisen in your own work?
 - 5) What kind of personal relationship or institutional structures would particularly support or inhibit your involvement in an actual situation like this?
- f. Summarize.

Minimum Time Required: Optional--allow 10 minutes for each role-play

situation, 10 minutes for preparation and 10 minutes for discussion of role play.

Resources Needed:

Handout: "Role-Play Situations"

Outcome Criterion:

Participants will list three new ways to facilitate the career development of secondary students.

ROLE-PLAY SITUATIONS

1. High school female wants to become a car mechanic and comes to her teacher to talk about it.
2. Senior high school male plans to be an elementary school teacher and comes to his counselor for more information.
3. Junior high school male wants to go out for cheerleading. Presently all the school cheerleaders are female. He comes to the school administrator to see what his chances for being chosen might be.
4. Junior high school female wants to be on the all male basketball team. There is a girls' basketball team but it is not a conference team. She comes to the male coach to see if she can join.
5. High school female comes to adviser or counselor upset about the sex-biased statements of her math teacher about the unimportance of continuing in math, her favorite subject.
6. High school male comes to counselor upset because of the widespread negative peer pressure from his male friends about his recent acceptance into the local ballet company. He is extremely interested in ballet, but now is questioning his decision.

Treatment Session Fourteen

"Role-Playing Family Situations"

Goal: PARTICIPANTS WILL INCREASE THEIR AWARENESS OF HOW PARENTS AND OTHER FAMILY MEMBERS FACILITATE OR INHIBIT CAREER CHOICES.

Objective: Relate their understanding of sex stereotyping to their family background and career-related family communications.

Learning Strategy:

Note to Leader:

This activity is designed to help participants think about and further understand the impact of parents on the career development of their children.

The leader has several options for making arrangements with participants who will be doing the role playing: the role plays can be prepared between workshop sessions, during a break in the day's schedule, or while another activity is taking place. Time demands and participants' needs both must be taken into account in deciding upon a course of action.

Instructions:

- a. Explain the goal and objective of the strategy.
- b. Discuss with the participants the guidelines for role playing which are found in the introductory section of this packet.
- c. Some possible role-play situations (which must be discussed with the role players prior to the workshop time allocated for the role plays) are listed below:
 - 1) A boy is trying to convince his father it is best for him to study dress designing rather than architecture.
 - 2) A girl is trying to convince her mother that she should enlist in the army rather than attend the local secretary school.
 - 3) A young couple is trying to explain to their parents why the wife is attending medical school while her husband works as an auto mechanic to support them until she graduates.
 - 4) Boy announces to his parents his desire to become a home economics teacher.
 - 5) Daughter/son comes home from school with black eye and story of how she/he defended her/himself.

- d. After each role play, the leader should facilitate a discussion involving the role players and the workshop participants. Some suggested discussion questions are listed below:
- 1) How did it feel to be playing the role which you played?
 - 2) What were the primary messages you were receiving from your role playing partner? How did they make you feel?
 - 3) With whom did the spectators empathize? Why?
 - 4) What alternate directions could the role play have taken?
 - 5) How could the role play have been different if the conversation took place in the context of a single-parent family?
 - 6) What was most striking about the role play? Most surprising?
- e. Summarize.

Minimum Time Required: Optional--allow 10 to 15 minutes for each role play, plus an additional 15 to 20 minutes for discussion.

Resources Needed:

Materials: (Optional) props for role play, and cards or slips of paper with descriptions of individual role-playing situations.

Outcome Criterion:

Participants will list five specific messages which they have given to their children (for parents) or to their students (for educators) regarding the acceptability of various occupational and career choices.

Treatment Session Fifteen

"Occupational Family Tree"

Goal: PARTICIPANTS WILL INCREASE THEIR AWARENESS OF HOW PARENTS AND OTHER FAMILY MEMBERS FACILITATE OR INHIBIT CAREER CHOICES.

Objective: Relate their understanding of sex stereotyping to their family background and career-related family communications.

Learning Strategy:

Note to Leader:

There are some groups or individuals who might not feel comfortable discussing their family or their past history. If you are working with such a group, perhaps this exercise should not be used.

While occupations are no longer passed down from father to son, mother to daughter, there is some evidence that occupational aspirations and values are passed on from generation to generation. This activity will help participants become aware of the occupational "messages" they have received and acted on.

Discussion of the strategy is critical for personal clarification and awareness of implications in the transfer of occupational aspirations and values.

Instructions:

- a. Explain the goal and objective of the strategy.
- b. Ask participants to complete the "Occupational Family Tree" worksheet showing the occupations held by their parents, grandparents, and other relatives.
- c. Discuss the results, in small groups of five to six people, using the questions provided:
 - 1) What occupation is the most common in your family as far as you know?
 - 2) What is the most common occupation on your father's side?
Mother's side?
 - 3) What occupation is most common among the men in the family?
Among the women in the family?
 - 4) Can you see any pattern in the occupational choices of your family? What?
 - 5) If one occupation seems to occur quite frequently, can you give reasons why it might be so?
 - 6) Do your own occupational aspirations bear any relationship to the occupational patterns of your family? How?

- 7) Do you see the pattern of family occupational choices influencing the occupational choices made by your children? How?
- 8) What other things in your family history have influenced you?

Examples:

- economic class
- family interest
- family friends
- relatives
- attitudes of parents
- religious connections
- discipline
- special family events
- places lived
- ethnic background
- racial group
- one-parent households

- 9) What did it mean to be masculine/feminine in your family? How does this vary with other families? By race? By economic class? By ethnicity?
- 10) What kinds of roles did your mother and father play in the family? In parenting? In child care? In cooking? In outdoor chores?
- 11) How do your own attitudes about marriage and family affect your attitudes about occupational options?

d. Summarize.

Minimum Time Required: 45 minutes

Resources Needed:

Materials: Pencils, pens

Handouts: "Occupational Family Tree" worksheet

"Discussion Questions for 'Occupational Family Tree'"

Outcome Criterion:

After completing the "Occupational Family Tree" worksheet, participants will identify and suggest reasons for any trends that may appear in the occupations of their family members.

OCCUPATIONAL FAMILY TREE

Fill in the blanks with the occupation of the relative described

<table border="0" style="width: 100%;"> <tr> <td style="width: 25%; text-align: center;">M</td> <td style="width: 25%; text-align: center;">F</td> <td style="width: 25%; text-align: center;">M</td> <td style="width: 25%; text-align: center;">F</td> </tr> <tr> <td colspan="4" style="text-align: center;">Paternal Great Grandparents</td> </tr> </table>	M	F	M	F	Paternal Great Grandparents				<table border="0" style="width: 100%;"> <tr> <td style="width: 25%; text-align: center;">M</td> <td style="width: 25%; text-align: center;">F</td> <td style="width: 25%; text-align: center;">M</td> <td style="width: 25%; text-align: center;">F</td> </tr> <tr> <td colspan="4" style="text-align: center;">Maternal Great Grandparents</td> </tr> </table>	M	F	M	F	Maternal Great Grandparents					
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Paternal Great Grandparents																			
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Brother																			
Brother																			
Me																			
Sister	Sister																		

DISCUSSION QUESTIONS FOR 'OCCUPATIONAL FAMILY TREE'

1. What occupation is the most common in your family as far as you know?
2. What is the most common occupation on your father's side? Mother's side?
3. What occupation is most common among the men in your family? Among the women in the family?
4. Can you see any pattern in the occupational choices of your family? What?
5. If one occupation seems to occur quite frequently, can you give reasons why it might be so?
6. Do your own occupational aspirations bear any relationship to the occupational patterns of your family? How?
7. Do you see a pattern of family occupational choices influencing the career choices made by your children? How?
8. What other things in your family history have influenced you?
 - family interests
 - economic status
 - family friends
 - relatives
 - attitudes of parents
 - religious connections
 - discipline
 - special family events
 - places lived
 - ethnic background
 - racial group membership
 - one-parent household
 - natural disasters (flood, tornado, etc.)
 - physical or mental handicap of a family member
9. What did it mean to be masculine/feminine in your family? How does this vary with other families? By race? By economic class? By ethnicity?
10. What kinds of roles did your mother and father play in the family? In parenting? In child care? In cooking? In outdoor chores?
11. How do your own attitudes about marriage and family affect your attitudes about occupational options?

Treatment Session Sixteen

"Career Roadblocks"

Goal: PARTICIPANTS WILL INCREASE THEIR AWARENESS OF HOW PARENTS AND OTHER FAMILY MEMBERS FACILITATE OR INHIBIT CAREER CHOICES.

Objective: Identify family and community resources and devise strategies to broaden the range of career models and options.

Learning Strategy:

Instructions:

- a. Explain the goal and objective of the strategy.
- b. Divide the participants into heterogeneous groups of five to six people and ask each group to select a recorder.
- c. Give each group two or more of the occupations from each column listed below and instruct them to make a list of roadblocks which might be encountered when a person of the designated sex plans to enter that field. Allow 15 minutes for this phase of the activity.

Possible occupations for this activity are listed below. Workshop leaders should feel free to substitute other occupations which may be more meaningful for their particular workshop population.

- | | |
|---------------------------|--|
| f1) female airline pilot | m1) male nurse |
| f2) female truck driver | m2) male pre-school or
elementary teacher |
| f3) female veterinarian | m3) male flight attendant |
| f4) female auto mechanic | m4) male secretary |
| f5) female crane operator | m5) male home economics teacher |

- d. Then ask the groups to list ways to counteract the roadblocks discussed in c above. Another 15 minutes should be allocated for this activity.
- e. Finally, ask the groups to identify and list as many sources of support as they can for people making these occupational choices. An additional 15 minutes should be set aside for this phase of the activity.
- f. Summarize.

Minimum Time Required: 30 minutes

Resources Needed:

Materials: Paper; pens or pencils for recorders

Outcome Criterion:

Participants will list five general roadblocks to nontraditional occupations for men and women.

Appendix D

Table D.1

Composition of Sample Groups by Grade

Grade	Control	Experimental
10	6	5
11	7	9
12	7	6

Table D.2

Control Group Pre-training Raw Scores

Subject	ATWS	SCFD	PER					SI PR	COPS Scales				NUR	Additional Scales				#
			ADJ	ACH	DOM	END	AUT		ACG	SI	SK	TE		SK	AFF	SUC	ABA	
1	93	14	12	9	12	10	6	-4	25	17	14	14	18	24	-4	-5	1	86
2	91	12	9	7	8	7	0	-3	25	18	8	6	14	16	0	-1	2	61
3	147	17	14	17	10	11	3	-8	24	13	35	6	24	32	-4	-3	2	131
4	122	17	7	20	18	12	15	5	11	10	13	1	9	26	-2	-11	-9	139
5	102	15	17	23	14	17	2	-9	5	1	15	1	20	32	-3	-6	1	150
6	102	16	15	11	8	9	-1	-6	14	14	14	12	20	27	-2	0	7	106
7	93	11	5	18	5	9	7	-3	21	18	21	9	10	31	5	3	-6	213
8	110	9	13	11	5	7	-2	-6	22	20	14	6	17	21	0	0	6	83
9	110	10	9	13	9	7	3	-4	27	25	19	15	13	16	-2	-3	3	63
10	97	4	3	3	3	3	2	-1	11	11	7	9	6	9	-1	-3	0	34
11	101	14	9	14	8	12	7	-3	3	1	4	3	16	25	-1	-4	0	107
12	99	13	13	17	11	14	0	-6	9	9	1	1	18	24	-2	-3	5	82
13	109	11	8	13	8	8	3	-1	19	20	13	2	12	21	-3	-2	0	74
14	125	15	14	15	10	14	5	-5	7	4	31	1	19	29	-1	-4	-1	102
15	90	13	11	15	8	11	3	-4	26	23	22	16	19	25	3	-3	-1	130
16	125	15	14	12	10	9	6	-4	23	17	19	14	22	25	-3	-3	1	95
17	108	6	5	7	9	3	2	-1	36	33	23	18	3	6	-4	-2	-1	24
18	90	16	14	19	16	14	7	-6	8	12	0	3	18	29	1	-2	1	156
19	104	5	11	8	7	7	-1	-9	8	12	20	16	15	16	-2	-2	5	48
20	116	14	13	16	18	14	6	-14	2	12	4	2	20	26	-5	-6	0	113

Table D.3

Control Group Post-training Raw Scales

Subject	ATWS	SCFD	PER			Primary ACL Scales			COPS Scales			Additional Scales			#	Number of Courses			
			ADJ	ACH	DOM	END	AUT	AGG	SI PR	SI SK	TE PR	TE SK	NUR	AFF			SUC	ABA	DEF
1	104	16	14	14	12	13	2	-4	18	22	14	15	20	23	-1	-3	-3	91	0
2	95	10	14	8	5	6	-1	-4	20	15	6	0	13	17	-3	-1	-3	74	0
3	147	19	15	19	12	12	3	-4	30	23	35	16	22	27	-2	-4	-1	119	n.a.
4	124	15	10	17	12	12	6	1	27	22	22	3	14	28	0	-4	-2	129	n.a.
5	113	16	15	13	11	11	1	-10	4	4	12	1	22	26	-3	-2	7	99	n.a.
6	92	13	11	13	11	8	3	-6	0	0	0	0	22	23	-4	-5	5	83	0
7	111	11	14	16	7	9	3	-8	28	27	34	22	15	29	3	6	-1	181	0
8	108	10	15	9	4	7	0	-8	26	17	25	16	19	20	-4	1	5	92	1
9	108	12	11	12	9	8	1	-1	30	25	14	9	16	20	-1	-2	2	70	n.a.
10	117	5	4	2	2	4	-3	-1	16	5	14	10	12	9	-1	-1	3	40	0
11	92	14	11	13	9	10	1	-4	7	1	17	4	18	20	-2	-5	2	81	n.a.
12	106	10	10	13	8	9	3	-6	3	3	0	0	14	19	-1	-1	6	62	0
13	124	28	4	6	4	6	2	-3	18	17	15	8	7	10	-3	0	3	43	2
14	132	18	13	17	14	14	8	0	13	6	33	0	20	27	-5	-8	-5	102	n.a.
15	92	15	15	17	11	13	0	-6	24	23	21	20	20	28	-2	1	0	150	0
16	130	16	14	17	13	13	4	-2	23	15	26	10	21	23	-2	-3	1	94	n.a.
17	128	3	3	1	2	2	1	0	32	24	28	21	2	4	-1	-1	-2	17	3
18	94	15	15	15	11	9	1	-4	33	25	10	16	22	30	0	-2	2	119	2
19	90	15	12	12	8	13	-1	-4	4	1	4	6	16	20	-1	-1	5	76	1
20	115	18	15	21	12	15	4	-4	7	12	9	8	18	30	-1	-3	3	145	1

Table D.4

Control Group Pre- and Post-training Score Differences

Subject	ATWS	SCFD	PER			AGG	SI PR	SI SK	TE PR	TE SK	NUR	AFF	HET	SUC	ABA	DEF			
			ADJ	ACH	DOM												END	AUT	pre
1	-11	-2	-2	-5	-2	-3	4	0	7	-5	0	0	-1	-2	1	-1	-3	-2	4
2	-4	2	-5	-1	2	1	1	1	5	3	2	6	6	1	-1	-3	3	0	0
3	0	-2	-1	-2	-1	-1	0	-4	-6	-10	0	-10	-2	2	5	2	-2	1	3
4	-2	2	-3	3	0	0	9	4	-16	-12	-9	-2	-5	-2	-2	1	-2	-7	-7
5	-11	-1	2	10	6	6	1	1	1	-3	3	0	-2	-2	6	0	0	-4	-6
6	10	3	4	-2	-2	-1	-4	0	14	14	14	12	-2	4	4	2	2	5	2
7	-18	0	-9	2	2	0	4	5	-7	-9	-13	-13	-5	2	-2	2	2	-3	-5
8	2	-1	-2	2	3	0	-2	2	-4	3	-11	-10	-2	1	1	0	4	-1	1
9	2	-2	-2	1	-2	-1	2	-3	-3	0	5	6	-3	-4	-4	-4	-1	-1	1
10	-20	-1	-1	1	1	-1	5	0	-5	6	-7	-1	-6	0	-2	0	-2	-2	-3
11	9	0	-2	1	3	2	6	1	-4	0	-13	-1	-2	5	0	1	1	-2	-2
12	-7	3	3	4	6	5	-3	0	6	6	1	1	1	-1	2	-1	-2	-1	-1
13	-15	-17	4	7	4	2	1	2	1	3	-2	-6	10	-1	5	0	0	-2	-3
14	-7	-3	1	-2	0	0	-3	-5	-6	-2	-2	1	-5	11	2	2	4	4	4
15	-2	-2	-4	-2	0	-2	3	2	2	0	1	-4	-7	-3	-6	-6	5	-2	-1
16	-5	-1	0	-5	-4	-4	2	-2	0	2	-7	4	-3	2	2	-1	0	0	0
17	-20	3	2	6	1	1	1	-1	4	9	-5	-3	6	2	0	-3	-1	-1	1
18	-4	1	-1	4	3	5	6	-2	-25	-13	-10	-13	-10	-1	-2	1	0	0	-1
19	14	-10	-1	-4	-1	-6	0	-5	4	11	16	10	-7	-4	-1	-1	-1	-1	0
20	1	-4	-2	-5	2	-1	2	-10	-5	0	-5	-6	-2	-4	-3	-4	-3	-3	-3

Table D.5

Experimental Group Pre-training Raw Scores

Subject	ATWS	SCFD	PER				AUT	AGG	SI				NUR	Additional Scales				#
			ADJ	ACH	DOM	END			PR	SI	TE	TE		SK	SK	PR	PR	
1	124	12	11	13	10	12	-3	-3	10	9	10	1	15	17	-2	-1	6	82
2	129	13	15	16	5	16	0	-10	28	29	25	21	19	24	-1	0	4	118
3	140	16	11	16	15	12	9	-1	36	34	34	28	14	23	-6	-7	-5	102
4	113	18	13	19	12	13	1	-7	25	21	22	10	21	29	-2	2	3	122
5	102	10	10	11	9	5	2	-1	31	27	28	7	13	21	-2	-4	0	64
6	71	12	10	13	6	11	-1	-8	12	12	6	2	19	23	-1	3	7	84
7	127	15	11	14	8	11	0	-4	3	5	8	3	14	24	-1	-2	1	121
8	109	12	11	4	6	3	4	-5	20	14	14	5	18	19	-2	-3	2	71
9	102	16	11	16	12	13	4	-4	12	8	8	8	18	27	-4	-2	4	113
10	116	6	9	3	4	4	5	-3	13	11	5	5	14	14	-2	-1	0	60
11	106	14	12	13	11	8	4	-4	12	10	19	22	19	22	-3	-4	1	106
12	119	16	13	15	11	17	2	-3	29	23	24	12	16	22	-5	-3	3	96
13	95	17	14	17	11	15	2	-3	20	11	15	1	22	24	-4	-3	1	115
14	119	7	1	7	5	7	4	3	17	11	11	8	9	13	1	-1	-3	63
15	95	16	10	16	12	10	3	-3	3	2	15	4	14	17	-3	-2	-2	82
16	111	18	15	18	11	15	1	-6	10	9	14	6	20	26	-1	0	4	101
17	111	12	8	14	9	9	3	-3	8	7	10	4	17	25	-3	0	-1	89
18	113	11	13	17	21	10	3	-10	4	2	4	1	20	29	0	-6	0	127
19	113	14	14	15	20	10	3	-12	3	0	4	1	23	29	-3	-6	1	109
20	110	21	15	22	24	15	5	-10	9	5	3	6	25	30	-1	-4	-1	143

Table D.6

Experimental Group Post-training Raw Scores

Sub- ject	Atten- dance	ATMS	PER										SI				NUR				# No. Courses
			SCFD	ADJ	ACH	DOM	END	AUT	AGG	PR	SI	SK	TE	PR	SK	TE	SK	AF	SUC	ABA	
1	94%	120	15	14	14	9	11	-2	-5	18	15	18	4	21	26	-2	-1	6	103	1	
2	94%	127	15	14	14	10	13	1	-5	34	26	30	27	21	28	-1	-3	3	108	2	
3	94%	142	16	8	17	15	12	8	1	29	30	36	36	17	24	-6	-7	-4	126	0	
4	81%	113	15	15	20	9	17	-4	-12	33	29	16	11	21	32	-1	2	0	147	3	
5	88%	114	17	14	19	15	12	1	-2	31	30	34	2	19	29	-3	-6	6	107	n.a.	
6	88%	99	18	13	20	11	16	2	-4	19	16	20	6	19	26	-2	-1	0	108	n.a.	
7	94%	113	10	8	11	5	12	2	-6	6	9	12	5	15	21	-1	0	4	89	1	
8	94%	112	14	11	9	10	6	4	-2	24	13	17	6	16	20	-3	-2	2	88	1	
9	88%	111	19	12	21	16	15	6	3	15	12	12	10	14	28	-2	-8	-5	120	0	
10	81%	108	9	9	5	5	6	1	-4	9	8	5	2	15	15	-4	-1	3	53	n.a.	
11	94%	121	13	11	15	13	10	5	-2	3	3	13	7	17	24	0	-5	-1	89	1	
12	94%	117	20	15	21	16	18	-1	-2	32	27	26	15	18	27	-4	-5	1	132	2	
13	94%	107	14	13	18	9	16	2	-8	23	18	10	2	21	30	-2	-2	5	126	n.a.	
14	100%	113	13	9	12	8	7	4	-5	21	18	26	12	18	22	-1	-2	2	67	1	
15	94%	107	14	11	13	10	12	-1	-3	9	6	22	10	17	25	1	-1	2	95	1	
16	100%	115	16	14	16	10	12	1	-5	8	5	13	6	21	22	0	-1	0	97	n.a.	
17	81%	126	13	9	15	7	9	1	-2	10	5	17	3	15	17	-4	-3	2	73	n.a.	
18	94%	112	14	12	13	10	8	5	-1	13	12	13	3	16	22	-1	-3	0	85	1	
19	75%	119	15	16	20	15	16	5	-4	6	3	14	3	18	29	-2	-4	1	127	2	
20	100%	121	19	15	20	17	15	4	-2	13	7	5	1	19	30	-1	-7	0	143	0	

184

Table D.7

Experimental Group Pre- and Post-training Score Differences

$$d = x_{\text{pre}} - x_{\text{post}}$$

Subject	ATWS	SCFD	PER			DOM	END	AUT	AGG	SI		TE		NUR	AFF	HET	SUC	ABA	DEF
			ADJ	ACH	DOM					PR	SK	PR	SK						
1	4	-3	-3	-1	1	1	-1	2	-8	-6	-8	-3	-6	-9	-3	0	0	0	0
2	2	-2	1	2	-5	3	-1	-5	-6	3	-5	-6	-2	-4	-1	0	3	1	1
3	-2	0	3	-1	0	0	1	-2	3	4	-2	-8	-3	-1	-5	0	0	-1	-1
4	0	3	-2	-1	-4	-4	5	-3	-4	-8	6	-1	0	-3	1	-1	0	-3	-3
5	-12	-7	-4	-8	-6	-7	1	1	0	-3	-6	5	-6	-8	-2	1	2	0	0
6	-28	-6	-6	-7	-5	-5	-5	-4	-7	-4	-14	-4	0	-3	-2	1	4	7	7
7	13	5	3	3	3	-1	-3	2	-3	-4	-4	-2	-1	3	2	0	-2	-3	-3
8	-3	-2	0	-5	-4	-3	0	-3	-4	1	-3	-1	2	-1	-2	1	-1	0	9
9	-9	-3	-1	-5	-4	-2	-4	-7	-3	-4	-4	-2	4	-1	-1	-2	6	9	9
10	8	-3	0	-2	-1	-2	4	1	4	3	0	3	-1	-1	1	2	0	-3	-3
11	-15	1	1	-2	-2	-2	-1	-2	9	7	6	15	2	-2	0	-3	1	2	2
12	2	-4	-2	-6	-5	-1	3	-1	-3	-4	-2	-3	-2	-5	-2	-1	2	2	2
13	-12	3	1	-1	2	-1	0	5	-3	-7	5	-1	1	-6	-1	-2	-1	-4	-4
14	6	-6	-8	-5	-3	0	0	8	-4	-7	-15	-4	-9	-9	-3	2	1	-5	-5
15	-12	2	-1	3	-3	-2	4	0	-6	-4	-7	-6	-3	-8	3	-4	-1	-4	-4
16	-4	2	1	2	1	3	0	-1	2	4	1	0	-1	4	1	-1	1	4	4
17	-15	-1	-1	-1	2	0	2	-1	-2	2	-7	1	2	8	0	1	1	3	-3
18	1	-3	1	4	11	2	-2	-9	-9	-10	-9	-2	4	7	1	1	-3	0	0
19	-6	-1	-2	-5	5	-6	-2	-8	-3	-3	-10	-3	5	0	-2	-1	-2	0	0
20	-11	2	0	2	7	0	1	-8	-4	-2	-2	5	6	0	0	0	3	-1	-1

Table D.8
Course Selections

	Advanced Mathematics Courses	Control Group	Experimental Group	Advanced Science Courses	Control Group	Experimental Group
Algebra I	0	1	1	Introductory Chemistry	1	1
Algebra Phase II	2	2	2	Physics	2	1
Algebra II	2	4	4	Physiology	0	1
Fundamental Geometry	1	1	1			
Geometry	0	1	1			
Trigonometry	0	1	1			
Math Analysis	1	0	0			
Calculus	0	1	1			
Computer Math	1	2	2			

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Abstract

A STUDY OF AN INTERVENTION DESIGNED TO INCREASE AWARENESS OF THE EFFECTS OF SEX ROLE SOCIALIZATION ON THE ATTITUDES, COGNITIONS, AND BEHAVIORS OF BLACK HIGH SCHOOL GIRLS

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The College of William and Mary in Virginia, July 1983

Chairman: Professor Kevin E. Geoffroy

The purpose of this study was to assess the impact of sixteen structured group sessions on black high school girls' attitudes toward the rights and sex roles of women, cognitions about the "ideal" woman, and expressed interests in careers in science and engineering.

The literature indicates that individuals select and enter career fields based partly upon their perceptions that certain career areas are more appropriate for one sex than for another. The resulting phenomenon is known as "occupational sex-typing" or segregation of the sexes by occupation. Occupational sex-typing tends to restrict the opportunities available for full utilization of career interests and capabilities, and, thus, limits options for life styles. Census data indicate that females, especially black females, are underrepresented in career fields such as science and engineering. Consequently, the research subjects were drawn from the black female high school population.

Socialization appears to be a major factor in the acquisition of sex roles and the phenomenon of sex typing of occupations. Bandura's social learning theory helps explain the socialization process. The sixteen treatment sessions were based upon Bandura's belief that most behavior is learned observationally through modeling and that individuals regulate their behavior according to the outcomes they expect their behavior will produce.

The research design for this study was a pretest-posttest control group design. The samples consisted of black girls in grades 10, 11, and 12 whose mathematics and/or science SRA Achievement scores were between the 50th and 94th percentile. Twenty subjects were assigned randomly to the experimental group and twenty to the control group.

The independent variable consisted of sixteen one-hour, weekly structured group sessions adapted from the BORN FREE training material. The dependent measures were attitudes toward the rights and roles of women, cognitions about the "ideal" woman, and expressed interests in nontraditional careers in science and engineering. Three self-report instruments, the Attitudes Toward Women Scale, the Adjective Check List, and the California Occupational Preference System were used to assess changes in the dependent variables. Behavioral changes were measured by unobtrusive observations of registration for advanced courses in mathematics and science for the 1983-1984 school year.

It was hypothesized that the girls in the experimental group would:

- (1) Express significantly fewer stereotypical attitudes toward the rights and sex roles of women as assessed by the Attitudes Toward Women Scale.
- (2) Describe the "ideal" woman with significantly fewer stereotypical adjectives as assessed by the Adjective Check List scales for Self-Confidence, Personal Adjustment, Achievement, Dominance, Endurance, Autonomy, and Aggression.
- (3) Select significantly more career choices in science and engineering as assessed by the California Occupational Preference System on two scores (skilled and professional) for science and technology.
- (4) Select more courses in advanced mathematics and science for the next school year than girls in the control group as measured by course registration.

The results of the research revealed that the intervention had a significant impact on the following scales: ATWS, three (ACH, END, and AGG) of the seven primary scales of the ACL, and three (SIPR, SISK, and TEPR) of the four scales of the COPS. No significant impact was measured on the remaining four (SCFD, PERADJ, DOM, and AUT) scales of the ACL, on the TESK scale of the COPS, nor on the ACL scales analyzed for additional information. No behavioral change was revealed by the number of mathematics and science courses selected by the experimental group. The treatment appears to have been beneficial in helping black, adolescent females increase their awareness of the effects of sex role socialization on attitudes, cognitions, and interests relating to career choices in the nontraditional fields of science and engineering.

Several recommendations for future research are suggested. First, one limitation of this study was that the differential effects of the group leader's ability and personality were difficult to account for in the dependent variables. A research design which would overcome this limitation would be to repeat the experiment with two experimental groups, each facilitated by a different leader, and two controls groups. Analysis of pre- and post-treatment data could better reveal the impact of personality variables on dependent measures. Second, the random four-group design has higher prestige than the pretest posttest control group design since it overcomes some of the limitations of the second approach and would be a better research design. Third, a six-month follow-up testing might yield information regarding consistency. Also, the treatment might create latent changes which might not be immediately evident but which might be manifested later.