RELATIONSHIPS BETWEEN SELF-CONCEPTS OF THE YOUNG DRIVER AND RATINGS OF BEHAVIOR BY DRIVER EDUCATION INSTRUCTORS AND THE MANN INVENTORY

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ABSTRACT

RELATIONSHIPS BETWEEN SELF-CONCEPTS OF THE YOUNG DRIVER AND RATINGS OF BEHAVIOR BY DRIVER EDUCATION INSTRUCTORS AND THE MANN INVENTORY

By

William Howard Covert

Recent studies have indicated that students can be placed into behavior categories by, either, driver education instructors or by the Mann Inventory and subjects in these categories will have significantly different subsequent driving behavior.

The purpose of this study was to investigate the relationship of students in high school driver education programs who were grouped into behavioral classifications of average, over-controlled and under-controlled by either the driver education instructors or by the Mann Inventory and their self-concepts of certain personality characteristics they possess as measured by the 16 PF Questionnaire.

Another purpose was to investigate the relationship of self-concept as measured by the 16 PF Questionnaire of students who were characterized as having either disturbed or non-disturbed personality adjustment problems.

The sample of 332 male and 336 female driver education students were chosen from three large city high schools in Central Michigan. These high schools were chosen because each school had a large student body representative of a broad cross-section of the general population. Cooperative and competent driver education instructors and comparable quality programs were available in each school.

Students took the 16 PF Questionnaire and were rated on behavior by observers and the Mann Inventory during the last week of their summer programs in 1971.

The hypotheses were tested using a two-way multivariate analysis of variance. Males and females were tested separately. The .05 level of confidence was required for significant results of the effects of the independent variables, schools and behavior groups on dependent variables, i.e., the 16 PF scores.

Statistical analysis of the data revealed:

1. Significant differences do exist in male student self-concepts of personality characteristics they possess when they are categorized into behavior groups by either teacher raters or the Mann Inventory.

2. Males who were characterized as under-controlled and having disturbed personalities indicated they were: expedient, forthright, affected by feelings,

suspicious, assertive, self-sufficient, apprehensive and as having undisciplined self-conflict.

3. Males who were classified as average and having non-disturbed personalities saw themselves as: humble, conservative, relaxed, sober, adventuresome, emotionally stable, conscientious and more intelligent.

4. Those males categorized as over-controlled indicated strengths on the following personality dimensions: conscientious, emotionally stable, controlled, shrewd and self-sufficient.

5. Significant differences do exist in female student self-concepts of personality characteristics they possess when they are grouped by the Mann Inventory.

6. Females in the under-controlled group indicated they were: expedient, suspicious, had undisciplined self-conflicts, assertive, tense, venturesome, and affected by feelings.

7. Females classified as over-controlled indicated they they possessed the following personality characteristics: shy, emotionally stable, and sober.

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CHAPTER I

THE PROBLEM

Background of the Problem

Youthful drivers between the ages of 15 and 24 have historically been involved in death on the highway far in excess of the numbers which should occur from the projection of their percentage of the total driving population in the United States.

In 1970[1] automobile accidents claimed the lives of 54,800 human beings. There were 111 million licensed drivers at the time. Drivers age 15 to 24 represent 23.6 per cent of all drivers and account for a disproportionate 33.9 per cent of the fatal accidents and are involved in 34.7 per cent of all reported accidents in motor vehicles occurring in the American transportation system. This represents an excess loss of some 7,800 young lives; that is, there occurred 7,800 more fatalities among their age group than would be probable if they maintained a fatality rate comparable to that of persons aged 25 or

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[1]National Safety Council, Accident Facts, 1970 Edition (Chicago: The Council, 1970).

over. This excess number represents 43 per cent of the total loss in the 15 to 24 age group. Youthful drivers are involved in accidents where fatalities occurred 60 per cent more frequently than their proportion of the driving population.

The necessity for mobility in the American "life style" and widespread desire to drive, for both social and economic reasons, is evidenced by the fact[2] that 94 per cent of males and 63 per cent of females of driving age obtained a license to drive in 1970. This massive over-representation of this age group in both fatal and non-fatal accidents also, implies youthful drivers almost certainly involve older drivers in accidents.

It can be concluded that driving and riding with other young drivers constitutes the greatest hazard to survival that American youth must pass successfully to reach adulthood according to a special study[3] recently reported by the National Transportation Safety Board.

National, state, and local activities have been on the increase for the improvement and comprehensive application of highway engineering, traffic enforcement

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[2]Personal communication from the Office of Vital Statistics, Mortality Statistics Branch, Public Health Service, U.S. Department of Health, Education and Welfare, November, 1971.

[3]National Transportation Safety Board, Special Study Youth and Traffic Safety Education (Washington: Report Number NTSB-STS-71-3, 1971).

services, automotive safety developments and traffic safety education programming at all levels of government. However, citizens are still destined to face a discouraging future with general predictions of ever-increasing tragic losses in life and property. The price our society pays for the simple expediency of moving from point to point using a motor vehicle in our transportation system seems incomprehensible and has reached an exceedingly serious level.

Driver education is very prominent in the Highway Safety Act of 1966.[4] Driver education, as a means to achieve basic highway safety objectives, was highlighted and uniquely singled out by having a standard[5] developed for its expansion and improvement.

Traffic safety education is found to some degree in all states with 74 per cent of the secondary United States school systems offering a course involving about 67 per cent of eligible driving age youth.[6]

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[4]Highway Safety Act of 1966, Public Law 89-564, 89th Congress, September 9, 1966.

[5]Highway Safety Program Standard 4.4.4 Driver Education Office of Highway Safety Planning, Department of State Police, East Lansing, Michigan.

[6]National Safety Council, 1970 Driver Education Progress Report (Chicago: National Safety Council, 1971).

Mann[7] has appropriately divided the growth of traffic safety education into three broadly defined phases:

1. Pre-Jackson Mills (1949)--a period of selling the need for driver education, collecting materials, and organizing a curriculum.
2. 1950-1970--a period of consolidation and standardization of the curriculum; refinement of materials and methods.
3. 1970--a period of delving more deeply and broadly into the total problem of achieving our goals.

Driver education has existed for some thirty-five years in the high school context with varying degrees of success. National safety and a few curriculum development leaders collected an array of safety education teaching materials and proceeded to the First National Conference on Driver Education at Jackson's Mills, West Virginia, in 1949. An expanding body of teaching materials and important educational experience dictated the need for more time to be devoted to a high school driver education course. A mystic thirty hours in a formal classroom and six hours of behind-the-wheel experience for a course was the consensus of this group. This was to be a minimum allocation of time and experience to meet the objectives. As history displays, minimum generally becomes the maximum. This original teaching model has, to a large degree, been sustained as the criterion around which national and local

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[7]W. A. Mann, "Wider and Deeper" (Highway Traffic Safety Center, Continuing Education Service, Michigan State University, 1972).

regulations have evolved for driver education programs. The other constrictive and self-defeating pronouncement emanating from that initial group was the concept that traffic safety education should only be provided at or immediately before a legal driving age. It seems to have stifled the development of relevant safety experiences at pre- and post-licensing ages for youth through their entire school experience.

Subsequent development of materials centered around those needed for the support of knowledge and skill development in the behind-the-wheel experience. There was an over-abundance of classroom materials related to the mechanics of the automobile.

Much later in the developmental history of traffic safety education curriculum and teaching strategies, a major curriculum resource[8] was contending for recognition and broader national acceptance. This new effort clearly suggested that teaching related to successful functioning in the highway transportation system should concern learning in the domains of cognitive (knowledge and intellectual skills), affective (attitudes, values and emotional sets), and psycho-motor (neuromuscular coordination).

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[8]Automotive Safety Foundation, A Resource Curriculum in Driver and Traffic Safety Education (Washington: Automotive Safety Foundation, 1970), p. 4.

These three learning areas were in the minds of those dominating curriculum development during phase two, the 1950-1970 era.

For the most part it was postulated that if skills and knowledge were successfully developed and imparted, the objectives for the affective domain would surely be fulfilled.

As a result, the materials and methodologies to implement them in the areas of "what to do" and "how to do" became well organized and solidified, even entrenched. The concept of "will they do" was nearly overlooked by this young fast-moving discipline.

At this stage of this developing discipline instructional programs in the secondary schools expanded at an unprecedented rate surpassing that of other disciplines. This amazing growth was stimulated by larger student enrollment in the nation's schools, and the felt need for mobility, and firm belief in its value with a generous support from concerned agencies.

Research of the hypothesized beneficial effects of this burgeoning young traffic safety education enterprise came under suspect because of poor statistical research models involved in most studies which pointed to its successes.

Failure to maintain programs up to even minimum standards[9] in quality instruction, teacher training and poor administration and supervisory efforts at all levels caused further erosion of its effectiveness and position in the education spectrum.

There remains a national consensus that adverse involvement within the transportation system by the youthful driver, considering the volatile combination of a major use of autos, declining family control, more fun time and rather easy access to intoxicants, could be projected much higher had not traffic safety education been a major factor.

It is now imperative that traffic safety education delve more deeply into the underlying problems of adverse youthful driver behavior.

A massive array of current literature is shedding light on the likely prospect that more and more individuals are losing employment opportunities, getting divorces and becoming heavily involved with alcohol and narcotics because they cannot function effectively as people.

They may possess highly technical skills and still be very insecure because of a various array of personality factors or a poor self-concept.

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[9]National Education Association, Policies and Practices for Driver and Traffic Safety Education (Washington: National Education Association, 1964).

Today's youth most assuredly manifests a quantity of personal adjustment varients in his quest for the frustrating who am I, where am I going and nobody cares for or understands me syndrome.

Personality factors and adequate self-concept are extremely important inputs in the development of the affective domain or adequate driver behavior.

Imparting knowledge and developing skills to perform the driving task have been markedly improved by innovative teaching models. Most traffic safety education literature clearly presents an indictment of educators in the area of developing and nuturing adequate attitudes and the associated driver behavior.

The classic concept, "You drive as you live," was reespoused by Senator Ribicoff[10] with poignant clarity concerning its plausibility.

It seems safe to postulate that the inadequate personality, the disturbance resulting from a poor concept of self, will be interwoven in most social interactions.

Driving is predominantly social interaction in one of its most dynamic forms.

An objective of this study is to shed possible light and stimulate thinking of how the young potential

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[10] A. Ribicoff, "You Drive As You Live," Analogy (Winter, 1966-67), pp. 16-18.

driver sees himself in personality adjustment areas which have a bearing on his subsequent behavior as a driver.

Purpose of the Study

The purpose of this study is to investigate the relationships of youthful potential drivers in four large high school driver education programs who are grouped into behavioral classifications of average, over-controlled and under-controlled by either their instructor raters or by the Mann Inventory and their perceptions of certain personality characteristics they possess as measured by the 16 PF Questionnaire.

Another purpose of the study is to investigate the relationships of self-concept as measured by the 16 PF Questionnaire of students who were characterized as having either disturbed or non-disturbed personality adjustment problems.

Importance of the Study

Traffic Safety leaders concur that good driving attitudes or well adjusted personal behavior are extremely important to successful participation in the highway transportation system.

Brody,[11] in concert with many other traffic safety educators concluded that the problem of safe, lawful,

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[11] L. Brody, "The Accident Phenomena," Personnel Administration (November-December, 1963).

courteous driving was primarily a function of emotional make-up and social adequacy.

Most writers indicate that probably 85 per cent of all accidents can be positively correlated with human failure. Mann[12] judiciously asserted:

> My own estimate is as we investigate the 15 per cent more thoroughly, we will raise our estimates and conclude that 95 per cent may be the result of poor personal adjustment and subsequent inadequate necessary interactions.

A young driver's personality as manifested in behavior patterns exhibited during his experiences in driver education programs are very significant to future driving performances.

Pelz[13] reported that the youthful drivers up to age twenty-six are in a decade of frustration and mental turmoil. In this nervous transitional period, teens strive for adult status but society blunts their progress towards this privilege, thus resulting in emotional unrest and aggressive anti-social impulses which manifests themselves in clearly observable deviant personal interactions with others.

There have been a number of investigations where students were observed by qualified driver educators

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[12] W. A. Mann, "Building Attitudes for Safety" (a presentation at the National Safety Congress, 1960).

[13] D. C. Pelz, "Who Are the Dangerous Drivers?" Analogy (Spring, 1968), pp. 13-15.

during the driver education program experience and grouped into preconceived behavioral classifications.

This has also been achieved a number of times using the Mann Inventory.[14]

The most notable investigation was done by Kenel[15] who found that individuals who would have poor driving records could be identified on the basis of driver education instructor observed behavior and/or a personality inventory.

In a follow-up investigation of those relationships found by both observed behavior and the Mann Inventory between future driving performance on the Kenel study, O'Leary[16] studied their endurance over a period of five years. This investigation substantiated the predictive validity of behavior grouping and future driving violations.

Many relationships have been drawn between the developing self-concept of young people and elements of

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[14]W. A. Mann, "Mann Personal Attitude Survey" (Highway Traffic Safety Center, Continuing Education Service, Michigan State University, 1964).

[15]F. Kenel, "The Effectiveness of the Mann Inventory in Classifying Young Drivers into Behavioral Categories and Its Relationship to Subsequent Driver Performances" (unpublished Doctoral dissertation, Michigan State University, 1967).

[16]P. J. O'Leary, "An Assessment of the Mann Inventory as a Predictor of Future Driving Behavior" (unpublished Doctoral dissertation, Michigan State University, 1971).

behavior possessed by those in the various behavior classifications used as driver behavior predictors.

An excellent constellation of these self-concept studies with many suggested interpersonal educational experiences for sustaining a positive self-concept are presented in writings by Hamachek[17] and Wylie.[18]

Thus, it is asserted that a measure of progress in the affective learning domain in traffic safety education may be encouraged by an investigation of how the youth sees himself in certain personality characteristics, especially in the light of our capability to place him into behavioral classifications which relate to future driving behavior. No studies have attempted to investigate these bi-lateral relationships.

Hypotheses

The three research hypotheses in the study are:

Hypothesis 1: There will be significant differences among groups rated average behavior, over-controlled behavior or under-controlled behavior by their driver education instructors and self-concept as measured by factors on the 16 PF Questionnaire

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[17] D. E. Hamachek, Encounter With the Self (New York: Holt, Rinehard and Winston, Inc., 1971).

[18] R. C. Wylie, The Self Concept, A Critical Survey of Pertinent Research Literature (Lincoln, Nebraska: University of Nebraska Press, 1961).

Hypothesis 2: There will be significant differences among groups classified average behavior, over-controlled behavior or under-controlled behavior by the Mann Inventory sub-scores on dimensions of self-concept as measured by the 16 PF Questionnaire.

Hypothesis 3: There will be significant differences between groups classified as non-disturbed or disturbed by the Mann Inventory total scores and self-concept dimensions as measured by the 16 PF Questionnaire.

Definition of Terms

Mann Inventory

A sixty-three item personality inventory which attempts to assess the interactive feelings of an individual toward himself, significant and insignificant others and established social mores and expectations (hereafter, it may be referred to as the "MI"). Subjects responding to the "MI" reflect their feelings about each item by checking an appropriate area for--always, usually, sometimes, rarely, or never.

The 16 PF Questionnaire

The 16 PF Questionnaire is an objectively-scorable test designed to yield a rather complete coverage of the personality domain in a brief time. There are 187 items which are related to 16 personality dimensions. Three alternate answers are provided for each test item which removes the two-alternative "forced choice" situation.

Instructor Rater

A driver education instructor in the classes in this investigation who possesses the formal education and experience background in student behavior to enable him to observe subjects and place them into behavioral classifications.

Instructor Ratings

Average.--Behavior characterized by well-adjusted interaction with persons and consistent with the mores of the society in which the individual functions within the educational/institutional norms, with the absence of tendencies toward extremes in personality.

Over-controlled.--Behavior characterized by withdrawal from communication with other persons with efforts to have everything under control so that they cannot be criticized by others.

Under-controlled.--Behavior characterized by forceful, outgoing action or vigorous efforts to assert oneself over others, with little consideration of the results.

Delimitations

Four pertinent delimitating factors existing in this investigation are:

1. The four high schools involved have rather large enrollments which may not be representative of the small high school.
2. This study is looking at only those concepts of self which can be revealed by the dimensions of the 16 PF.
3. The observation period was short but much more intense than a semester or total school year look at student behavior.
4. The self-concept of those within the sixteen year old age bracket in driver education classes in the only age level being studied.

Basic Assumptions

The investigation of this problem is based on the following assumptions.

A knowledge of how the youthful driver sees himself in some critical personality dimensions is essential to developing a variety of teaching materials and methods.

Teacher raters with competencies in the behavioral sciences and traffic safety education can place students into behavioral categories which distinguish their potential for poor driver habits in an intensive teacher/student interactive period of time.

Selected self-concept dimensions can be operationally defined in personality terms represented by the 16 factors of the 16 PF Questionnaire.

Overview of the Dissertation

In Chapter II a review of literature is found, pertinent to the elements considered in this study.

Chapter III includes the design of the study, sample and rater descriptions and testing instrument analyses, also an account of the method of collecting, tabulating and organizing data and a description and brief analysis of the statistical model applied to analyze it.

Chapter IV will present an analysis of the data and the degree of relationships found between student behavior groups and dimensions of personality in statistical and descriptive form, where pertinent.

This investigation is summarized in Chapter V with relevant discussion developed, conclusions made and recommendations advanced for further study.

Possible Applications

Should this study result in significant general relationships between student behavior classifications with the associated subsequent driving behavior and certain concepts of self the students may possess, programming for increased attention to developing motivation may have an added dimension.

CHAPTER II

A REVIEW OF RELATED LITERATURE

The references selected for review revealed numerous relationships between pre-driving behavior classifications and subsequent driving behavior. There was some indication that the 16 PF was used to discern personality dimensions and a relationship with driver behavior.

There was no evidence in the literature of an investigation of the inter-relationships of self-concept, personality factors and driver behavior.

It seems appropriate and necessary to relate studies concerning the youthful driver. In order to disclose background information pertinent to the study, in a comprehensive manner, it was necessary to consider selected literature related to the following general areas:

1. Pre-driving behavior grouping.
2. Driving behavior and human factors.
3. Self-concept and driver personality aspects.
4. The 16 PF Questionnaire as an instrument.

The theme of this study would seem to preclude a specific look at the literature across the ages of all drivers. They have been rather thoroughly highlighted recently by Adams,[1] Arthur D. Little, Inc.,[2] Goldstein,[3] and McFarland.[4] The findings reviewed conclude that most biographical variables have only very low correlations with subsequent accident involvement. The best predictors of accident behavior have been found to be such variables as convictions for traffic law violations, mileage (adjusted on various exposure factors), age, sex, martial status and various measures of social deviancy. The findings are often further characterized as "a man drives as he lives."

Most of the literature reports ex post facto studies of driving behavior comparing those who had been participating in the highway transportation system for

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[1] J. R. Adams, "Personality Variables Association With Traffic Accidents," Behavioral Research in Highway Safety, I (1970), 3-16.

[2] A. D. Little, Inc., The State of the Art of Traffic Safety (Cambridge, Mass.: Arthur D. Little, Inc., 1966).

[3] L. G. Goldstein, "Human Variables in Traffic Accidents: A Digest of Research," Traffic Safety Research Review, VIII (1964), 26-31.

[4] R. A. McFarland, "Psychological and Behavioral Aspects of Automobile Accidents," Traffic Safety Research Review, XII (1968), 71-80.

stated periods of time to pose driving analyses of psychological characteristics.

This investigation focuses on procedures for pre-driving psychological investigation and driving behavior projection.

Pre-driving Behavior Grouping

Kenel[5] found that individuals who would be characterized as poor drivers in the future could be identified during their classroom driver education experience on the basis of their observed behavior and/or a paper-pencil personality survey.

A longitudinal study of 523 males and 534 females who were in the driver education program at a Lansing, Michigan public high school was set up by grouping these students into behavioral classifications by instructor observations. They were rated in the last sessions of their program and were given the Mann Inventory[6] (MI) during that same period of time. An item analysis was performed to ascertain the relationships between "MI"

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[5] F. Kenel, "The Effectiveness of the Mann Inventory in Classifying Young Drivers Into Behavioral Categories and its Relationship to Subsequent Driver Performances" (unpublished Doctoral dissertation, Michigan State University, 1967).

[6] W. A. Mann, "Mann Personal Attitude Survey" (Highway Traffic Safety Center, Continuing Education Service, Michigan State University, 1964.

responses and the classifications into which the driver education instructor placed the students.

The "MI" was validated using this procedure and the evolution of sub-scoring mechanisms permits grouping into a number of behavioral categories. When students were grouped on the basis of instructor observed behavior, response to items in the "MI" were significantly different for each behavioral category, with sixty of sixty-three items at a .10 level of confidence.[7]

In Kenel's effort to ascertain whether or not the instructor observed behavior which identified an individual within a behavioral category would be reflected in subsequent behavior, he found by looking at violations and accident records covering a twenty-six month period that relationships existed at significant levels. The relationship between behavioral categories and driving records for both males and females went from excellent to poor as their ratings deviated from well-adjusted behavior classifications to the more extreme classification of evidence of problems of adjustment. The "MI" total score relationship with subsequent driving behavior was of comparable direction and magnitude.[8]

It would appear that youthful subjects will express how they see themselves by responding to items on

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[7] Ibid., p. 43.

[8] Ibid., pp. 75-76.

a paper-pencil form which would seem to reflect their observer's views of their behavior.

The concurrence of instructor rated behavior classifications and the "MI" categorization into the same behavior characterizations was very successful in a study by Quane.[9] He investigated a sample of 494 males and females in public school driver education classes in Lansing, Michigan to determine if a significant relationship existed between driver behavior categories and visual perception capabilities. While this correlation did not exist, it was most notable that the "MI" survey and instructor rating agreement on behavior classifications gave further credence to both of these methods of behavior rating.

In an attempt to identify individuals who were having personal adjustment problems in driver education classes Sinkoff[10] studied 500 Detroit high school students. He used the Mann Inventory to discover if significant differences existed in how both black males and females view themselves, their peer group and society in general as compared to their counterparts, the white male and

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[9] W. L. Quane, "The Relationship of Visual Perceptual Capabilities as Measured by the Perception of Traffic Hazards Test and Behavioral Categories as Measured by the Mann Inventory" (unpublished Doctoral dissertation, Michigan State University, 1970).

[10] A. Sinkoff, "A Comparison of Two Cultural Groups Through the Use of the Mann Inventory" (unpublished Doctoral dissertation, Michigan State University, 1969).

female high school pupils. When these groups were categorized by the "MI" into over-controlled, under-controlled and average behavior classifications, it was concluded that inter-city black students were significantly over-represented in poor adjustment areas.

This study expressed some thought that further experimentation would identify some teaching models to help these groups with personal adjustment problems.

A most significant follow-up study to ascertain whether the subjects included in Kenel's[11] research who were grouped by Mann Inventory ratings and teacher observed ratings sustained comparative driving behavior over a number of years was done by O'Leary.[12] He concluded after analyzing the driver records of 464 randomly selected males from the original group that violation experience was not significantly different after five years but accident experience no longer correlated with various behavior classifications.

Brazell[13] studied the driving and high school records of 2,775 males. An attitude rating had been given

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[11]Kenel, op. cit.

[12]P. J. O'Leary, "An Assessment of the Effectiveness of the Mann Attitude Inventory as a Predictor of Future Driving Behavior" (unpublished Doctoral dissertation, Michigan State University, 1971).

[13]R. E. Brazell, "A Comparison of Various Behind-the-Wheel Training Methods" (unpublished Doctoral dissertation, University of Michigan, 1962).

through observation by their driver education teachers. Those with good attitudes had better accident and conviction records than those with poorer attitudes.

In a very comprehensive investigation[14] by the California Department of Motor Vehicles of 14,000 young (age 16-20) California drivers whose life histories and driving records were followed for four years, the following pertinent conclusions were made: (1) Poor school adjustment and deviant social activities correlated with greater involvement with poor driving behavior; (2) Those with good scholastic grades had fewer accidents. With citizenship grades, a rating by teachers, was the best single predictor of a young driver's traffic conviction and accident record. The citizenship grade was a measure of work habits, cooperation and classroom behavior. Grades were standardized separately for each sex within each high school, with high scores indicating good citizenship; (3) A general conclusion of the study asserted that personality studies outweigh driver training.

Levonian[15] studied 1,080 tenth grade students in driver education classes in California, few of whom were

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[14]California Department of Motor Vehicles, The Young Driver Follow-Up Study (an evaluation of the Role of Human Factors in the First Four Years of Driving, Sacramento: California Department of Motor Vehicles, 1971).

[15]E. Levonian, "Personality Characteristics of Juvenile Driving Violators," Accident Analysis and Prevention, I (1969), 9-16.

eligible for a license. The students were administered an eighty-three item questionnaire measuring five scales--Determination, Adaptiveness, Expediency (oriented towards self-benefit at the expense of others), Defensiveness, and Ambivalence. The greater number of traffic violations was correlated with higher scores on the Expediency scale.

A study[16] in California indicated that driver education teachers, by observation and minimal oral interaction, could discriminate between success or failure on the license examination for a particular student much better than chance would indicate.

Since an individual "drives as he lives," it would seem most appropriate in the prediction of future driving behavior to ask the person himself, and those who know him best, such as teachers, parents and friends, what kind of a person he is. These considerations suggest the desirability of more research with ratings such as citizenship grade at lower age levels to provide a continuum for maintenance of opportunities to support the affective learning domain.

Driver Behavior and Human Factors

The literature reviewed under this general heading focuses on personality dimensions related to this

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[16] D. M. Harrington, An Evaluation of Waiving the Driving Tests for Selected Graduates of Driver Training (Sacramento: California Department of Motor Vehicles, 1970).

investigation and driver behavior observed as the driver participates in the highway transportation system.

Nader[17] contends that society knows much more about building safer machines than it does about controlling the behavior of people in driving their motor vehicles. Fisher[18] proposes that if attempts are to be made to control the actions, attitudes and habits of human beings who operate motor vehicles, then the basic principles of psychology will have to be applied in any remedies proposed. He mentions that a host of investigations of the traffic accident problem have brought us into direct contact with the "human element" which is the key to solving the problem area.

In a report of the National Commission on Safety Education[19] on the ten highest ranking experimental studies proposed by college safety researchers and educators, safety education supervisors, and driver educators, 60 per cent concluded that more research was needed on personality factors and other human characteristics of the good and poor driver.

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[17]R. Nader, Unsafe at Any Speed (New York: Grossman Publishers, 1965), p. 344.

[18]E. C. Fisher, Vehicle Traffic Law (Evanston, Ill.: The Traffic Institute, Northwestern University, 1961), p. 53.

[19]National Commission on Safety Education, Research Needs in Traffic Education (Washington, D.C.: National Education Association, 1956), p. 20.

Mann concluded in a report[20] reviewed for national leaders of driver improvement programs that poor driving behavior is clearly a projection of undesirable personality traits and that this concept must be taken into account when planning and developing activities in driver improvement programs.

Additional evidence which supports the need for more investigation of personality structure and driving behavior is mentioned in several reliable and respected reports.[21, 22, 23]

These sources unanimously called for: (1) investigation of the relationship between personality and behavior problems and deviant driving behavior; (2) investigations which will reveal more factual data that can be utilized in the design of models for education, correction

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[20]W. A. Mann, "The Nature of the Problem Driver" (a paper presented to the National Driver Improvement School Conference, Kellogg Center, Michigan State University, East Lansing, December, 1965).

[21]Center for Safety Education, Research in Safety Education (A report of the National Safety Council's School and College Research Committee, 1956), p. 6.

[22]National Commission on Safety Education, A Critical Analysis of Driver Education Research (Washington, D.C.: National Education Association, 1957), p. 60.

[23]R. McFarland and R. Moore, Youth and the Automobile (New York: Association for the Aid of Crippled Children, 1960), p. 16.

and rehabilitation in regard to the use of motor vehicles by youth.

It appears both appropriate and necessary to report some of the more notable studies which reveal the relationship between personality factors and driving behavior. Comprehension and a belief in this relationship is basic to the extension of a discussion of how a youth views himself on dimensions which seem to relate to better performance as a highway user.

Beamish and Malfetti[24] studied two matched groups of adolescent male drivers in Cleveland, Ohio. The groups included violators assigned to juvenile court and non-violators selected from secondary and vocational schools of the city. A battery of psychological measuring instruments was utilized to determine the personality differences of the violator and non-violator groups. Violators were found to differ significantly in conformity, objectivity, and emotional stability.

LaShon[25] examined the characteristics of several hundred younger drivers who had compiled what was deemed to be unfavorable violation and accident records. Those

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[24] J. Beamish and J. Malfetti, "A Psychological Comparison of Violator and Non-violator Automobile Drivers in the 16 to 19 Year Group," Traffic Safety Research Review (March, 1962), p. 13.

[25] L. LaShon, "Dynamics in Accident Prone Behavior," Psychiatry, XV (February, 1952), 73-78.

personality dimensions which were prevalent were impulsive, emotionally unstable, egocentric, and aggressive.

It was also reported by Lykes[26] that faulty attitudes, lack of emotional stability and poor adjustment were more prone to be the cause of inadequate functioning relative to the driving task than poor sensory or physical characteristics.

The writings of Dunbar and Brody[27] have constantly maintained that although the lack of knowledge and inadequate skills contributed to some accidents, the principal causes were associated with undesirable projection of deviant personality traits.

Driving is clearly a social interaction with a host of opportunities to express a driver's personality, asserts social psychiatrist Turfboer.[28] Expressive behavior on the part of a driver manifests itself in well-defined actions which may bespeak how that individual sees himself in relation to his fellow citizens.

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[26]N. Lykes, Psychological Approach to Accidents (New York: Vantage Press, Inc., 1954), pp. 130-34.

[27]F. Dunbar and L. Brody, Basic Aspects and Applications of the Psychology of Safety (Center for Safety Education, Division of General Education, New York University, 1959.

[28]R. Turfboer, "Do People Really Drive as They Live?" Traffic Quarterly, XXI (January, 1967), 101-02.

An investigation[29] of problem drivers in California comparing accident repeaters and chronic violators with matched better-than-average drivers showed that those in accident-violation groups saw themselves as more self-assertive, more adventuresome and self-reliant, while those in the violations group exhibited less self-reliance, were more emotionally unstable and more adventuresome.

In a study involving young airmen, Rainey[30] found that when the Allport, Vernon and Lindzey Study of Values was employed, the results for the high accident group did show an inordinate emphasis on self-determination and self-sufficiency, which would tend to give credence to a rejection of generally accepted social and driving conventions.

An extensive ten year study involving young bus drivers was conducted by Shaw[31] in Johannesburg, South Africa. A most interesting outcome of this often reviewed study was that it enabled her to establish general

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[29]D. Shuster and J. Guilford, "The Psychometric Prediction of Problem Drivers," Traffic Safety Research Review, VI (December, 1962), 16-21.

[30]R. Rainey, et al., "An Investigation of the Role of Psychological Factors in Motor Vehicle Accidents," Bulletin 212, Highway Research Bulletin, 1959.

[31]L. Shaw and H. Sichel, "The Reduction of Accidents in a Transport Company by the Determination of the Accident Liability of Individual Drivers," Traffic Safety Research Review, V, 4 (December, 1961), 2-12.

descriptions of accident risks on which potential accident liability could be projected.

A partial listing of these general descriptions follows:

The Potentially Bad Accident Risk

The badly integrated or maladjusted person.
The person with a distorted appreciation of life and a distorted sense of values.
The person who is emotionally unstable and extremistic.
The person who lacks controls, and particularly the person who exhibits uncontrolled aggression.
The highly ambitious and competitive person.
The over-confident, self-assertive person.
The person who harbors grudges, grievances, and resentments.
The intolerant and impatient person.
The person with a marked antagonism to, and resistance against authority.
The inadequate person with a driving need to prove himself.
The helpless and inadequate person who is constantly in need of guidance and support.
The person who is very lacking in personal insight and an appreciation of his own limitations.
The person who exhibits the personality characteristics commonly associated with immaturity, such as: foolhardy impetuosity, irresponsibility, exhibitionism, inability to appreciate the consequences of his actions, hypersensitivity, easily aroused by emotionalism, unrealistic goals and a general lack of self-discipline, personal insight, worldly wisdom and common sense.

The Potentially Good Accident Risk

The balanced and mature and well-controlled person with a healthy and realistic outlook, satisfactory interpersonal relations, a kindly and tolerant attitude to others, a well-developed social and civic conscience and an ingrained sense of responsibility.
The person, who as yet, cannot be said to be quite mature but whose motivations are sound and who demonstrate an ability to learn quickly by experience and profit by his mistakes. (This sort of a person will undoubtedly have a learning period

before his record stabilizes itself at an acceptable level.)

The contented person who is in no way outstanding but who is friendly, cheerful, adaptable and accepting . . .

The rather withdrawn . . . provided that he is not extremely maladjusted.

The person who has his weaknesses and limitations but is realistically aware of them and who is careful and cautious and moderates his behavior according to his limitations.

It was asserted, however, that these general descriptions would not be a concise formula for basing accident risk, but that the total personality must be considered. If, when considering the total personality picture, there is a pronounced imbalance of any kind, accident probability may be higher.

A degree of consistency relative to psychological factors and deviant driving behavior is found in the literature. There appears to be an ever-increasing amount of evidence that personality traits and their associated projection by the driver are underlying causes of most violations and accidents even though causes involve a complex interaction of many variables.

Considerable evidence has been compiled substantiating what has been termed the "multiple cause theory" for accident causation.

Forbes puts causation into an acceptable perspective as he recognizes that the study of personality factors was an extremely important contribution to the hoped for reduction of highway transportation system inadequacies but he also stated:

> . . . it is necessary to recognize that psychological factors are usually critical in accident causation as one part of a combination of environmental and highway factors which may suddenly increase the difficulty of the task for the driver. Important as psychological factors are, we cannot look at them as the one cause for an accident.[32]

Self-concept and Driver Personality Aspects

The need of traffic safety educators to be concerned with how the driver sees himself is revealed often in the literature.

The conclusions of Dr. Irmagene Holloway,[33] a veteran driver educator, now with U.S. Public Health Service, speaks to this youthful dilemma of self-identification, knowing who he is and what he is about. She asserts that one cause of teenager involvement in traffic problems is related to his concept that no one cares if he has an accident. He sees his parents and other adults as too busy making a living and finding ways to express their own frustrations, that, especially, "significant others" would not care if he were involved in an accident. She further concluded that these potential young drivers as well as those driving have a self-image

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[32] T. Forbes, "Human Factors in Highway Safety," Traffic Safety Research Review, IV, 1 (March, 1960), 8-11.

[33] I. N. Holloway, "The Dilemma: Teenagers, Cars, and Accidents," The Caldea Calendar, XIII (January, 1966) 9.

of poor worth as persons due to our "many numbers" social security, zip code, automation, as life becomes more complex and youthful self-concepts reflect the image of "nothingness."

In his discussion of the behavior of young drivers Aaron[34] suggests that an area that invites investigation in the case of the "young" vehicle operator is his level of emotional development. The suggestion is that where control is better, the conflict would be less; where conflicts are less, poor driving behavior caused by acting-out immature responses should be less. A pertinent change area is that of the self-concept which is a make-up of the image a person has of himself and his goals.

During adolescence and his applying of how he "sees himself" in a developing pattern of driving behavior the concept of self is constantly being adjusted by pressures exerted by both biological change and the ever present institutions of socialization.

The mechanisms for coping with life are largely developed during this period, with or without our help. It is the task of the driver educator to aid in the development of realistic image of self, hopefully positive, or it will certainly perpetuate reactions which are not appropriate to nor adequate for the handling of adult

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[34]J. E. Aaron, "Behavior and Attitudes of Young Drivers" (a paper, Southern Illinois University, Safety Center).

responsibilities, which most assuredly includes driving a motor vehicle.

Dr. F. D. Kelly, Chief of the Traffic Epidemiology Section of the Pennsylvania Bureau of Traffic Safety, concludes in an article[35] that the driver who is well adjusted, emotionally undisturbed, not resentful of authority or society, and is courteous and considerate of other people, is relatively accident-free. By comprehensive research and study we hope to be able to determine the personality chracteristic and self-images of individuals who seem to be accident-susceptable.

The writings of Mann[36] maintain that the youngster who comes to us for driver education purposes is not a nice clean page upon which can be developed our standards of behavior without concern for other previous and current influences. Rather, he further asserts, the young potential vehicle operator is an individual whose attitudes, behavior and concepts of self are in the process of being rather definitely developed.

Some of the determinants of these attitudes are:

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[35] O. D. Shipley, "I Say Re-examine All Auto Drivers," The Saturday Evening Post, CCXXXIV (July 29, 1961), p. 11.

[36] W. A. Mann, "Building Attitudes for Safety" (a presentation at the National Safety Congress, 1960).

1. The feelings of emotional security or insecurity that have developed during his early life.
2. The type of his reactions to stress and frustration.
3. His perceptions of the attitudes and feelings of others toward him. Is he accepted and admired, or rejected and belittled?
4. His image of the traffic safety education instructor as a person interested in his welfare or as a critical individual who responds to his own feelings of inadequacy by ridiculing or punishing his students.
5. His self-concept in terms of personal adequacy, self-respect, feelings of acceptance and control of emotions.
6. His self-concept as a responsible member of the community or as a person who is not respected by either the peer or adult groups.

It was pointed out rather clearly nearly three decades ago in the expressions of Dr. Herbert Stack, Director, Center for Safety Education at New York University, that a great psychologist once asserted that our intellect was like a speck on the sea of our emotions. He holds that we are guided in so many of our life activities by our emotions, attitudes and self-image, rather than by our knowledge and intelligence. Extremes in the expression of the emotions anger, impatience, anxiety, timidity, and bravado lead to driving behavior.[37]

Hamachek[38] reports that acquiring a self-concept involves a slow process of differentiation as a person gradually emerged into focus out of his total world of

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[37]H. J. Stack, "What Makes Drivers Act That Way," The Traffic Quarterly, LXIII (January, 1947), 30.

[38]D. E. Hamachek, Encounters With the Self (New York: Holt Rinehart and Winston, Inc., 1971), p. 8.

awareness and defines progressively more clearly just who and what he is.

It is through the door of self that one's personality is expressed.

Jersild speaks clearly to what the self is all about when he says:

> A person's self is the sum total of all he can call his. The self includes among other things, a system of ideas, values, commitments and attitudes. The self is a person's total subjective environment; it is the distinctive center of experience and significance. The self constitutes a person's inner world as distinguished from the outer world consisting of all other people and things.[39]

Hamachek concludes that the self-concept theory suggests strongly that a person will "act like" the sort of individual he conceives himself to be. As this person becomes involved in new experiences he will reject or internalize them as he perceives their compatibility in terms of his present evaluation of himself and thereby maintains his individuality and reduces conflict. Although all attitudes are important determinants of behavior, attitudes toward self are usually more potent in determining the course of behavior.[40]

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[39]A. T. Jersild, In Search of Self (New York: Teachers College Press, Columbia University, 1952), p. 41.

[40]Hamachek, op. cit., p. 67.

The writings of Bishop[41] and McFarland[42] further support the contention that self-attitudes and their associated behavior patterns will not change when an individual takes the wheel, but will be translated into operative behavior in the highway transportation system--poor or adequate.

Coopersmith[43] relates that whether a youth sees himself as being of worth or his self-esteem is closely related to an aggressive reaction in most social interactions; driving certainly being a social enterprize.

Sooner or later, if all goes normally, a conscience is acquired by each individual, a system of ideas, attitudes, and inner controls that decree what his duties and responsibilities are and which are right or wrong. Hamachek suggests that this is a significant aspect of a person's self-concept since it reflects one's acceptance of values concerning right and wrong behavior.[44]

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[41] R. W. Bishop, "A Theory of Driving Behavior" (unpublished material, Michigan State University, Highway Traffic Safety Center, 1960).

[42] R. A. McFarland, "The Role of Preventive Medicine in Highway Safety," American Journal of Public Health, XLVII, 3 (March, 1959), 288-96.

[43] S. Coopersmith, The Antecedents of Self-Esteem San Francisco: W. H. Freeman and Company, 1967), pp. 96-101.

[44] Hamachek, op. cit., p. 153.

Bishop[45] would assert that these values will be related to right and wrong driver decisions as they become possible operational driving errors on our highways.

Many psychologists and educators are becoming keenly aware of the fact that a person's idea of himself, or self-concept, is closely related to, not only how he behaves, but to the important area of how he learns.

Lecky[46] was one of the first to point out the possible relationship between student self-concept and ability to learn in the cognitive domain. He was supported by Shaw,[47] Combs,[48] and Williams[49] whose writings and research point out most academic achievers have a positive self-concept. Their students with poor self-images saw themselves as less adequate and less acceptable in relationship with both peers and adults. Emotional

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[45]Bishop, op. cit.

[46]P. Lecky, Self-Consistency--A Theory of Personality (New York: Island Press, 1945).

[47]M. Shaw, K. Edson, and H. Bell, "The Self-Concept of Bright Under-Achieving High School Students as Revealed by an Adective Check List," The Personnel and Guidance Journal, XXXIV (March, 1960), 193-96.

[48]C. Combs, "Self-Perception and Scholastic Underachievement in the Academically Capable," The Personnel and Guidance Journal, XXXV (June, 1964), 47-51.

[49]R. Williams and S. Cole, "Self-Concept and School Adjustment," The Personnel and Guidance Journal, XLVII (October, 1968), 478-81.

adjustment had positive relationships with self-concept, with those having high self-concept more likely to be emotionally well-adjusted and enjoying high social status.

The positive relationship between anxiety and self-concept was presented often in the literature. A most notable study was reported by Mitchell[50] wherein a solid relationship between self-concept and anxiety existed; with a conclusion that, the better the self-concept the less the anxiety.

The traffic safety educator must take cognizance of anxiety when it is seen in the light of panicking or "clutching" during anxiety-provoking situations. Hamachek[51] points out that the ability to engage in deliberate thinking and anxiety is closely interrelated. He further pointed out that low self-image persons when faced with situations loaded with anxiety are inclined to make hasty, impulsive judgments with subsequent inadequate actions and reactions.

This certainly bespeaks the importance of self-concept, anxiety and potential inadequate driving behavior.

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[50] J. Mitchell, Jr., "Goal-setting Behavior as a Function of Self-Acceptance, Over- and Under-Achievement, and Related Personality Variables," Journal of Educational Psychology, L (April, 1959), 93-101.

[51] Hamachek, op. cit., p. 180.

Brookover[52] and associates in research involving students saw self-concept as positively related to the perceived evaluations that significant others held of the student. They concluded that this literally means that if persons "significant" (valued, prized, important) to a student think highly of him, then he is apt to have a quality self-image of himself. These research findings further remind educators of the impact of significant others which should be considered when developing teaching experience models. The effect of this impact should, also, be heeded by traffic safety education curriculum planners and practitioners.

The writings of Combs, Kelly, Maslow, and Rogers in the ASCD Yearbook, Perceiving Behaving Becoming,[53] allude to the optimal person as one with a fully functioning personality who sees himself as liked, wanted, acceptable, trusting, and able. An adequate self-image enables a student to identify well with others and produce a deep sensitivity to the feelings and attitudes of others.

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[52]W. Brookover, S. Thomas, and A. Patterson, "Self-Concept of Ability and Academic Achievement," Sociology of Education, XXXVII (November, 1964), 271-78.

[53]Association for Supervision and Curriculum Development, Perceiving Behaving Becoming, Yearbook, (Washington, D.C.: National Education Association, 1962), pp. 17-109.

They point out that the self-concept is one of the most important factors affecting the way in which an individual will behave. They conclude if this is true, then any educational program which hopes to make a difference in the affective domain of learning or any other domain must be concerned with the nature of the self and its development.

The traffic safety educator will have to take cognizance of the perplexing question of which comes first, a positive self-concept with a fully functioning personality or success. Hamachek concludes that it is not possible to give an answer to this as we do not know for sure. He further asserts that it is not unreasonable to suggest that each is mutually reinforcing to the other to the extent that a positive change in one facilitates a positive change in the other.[54]

It would seem to bode failure for the safety educator to ignore the relationship between personality factors and the developing self-concept as he deals with the affective as well as the cognitive and skill domain in the educational enterprize.

The 16 PF Questionnaire as an Instrument

The 16 PF Questionnaire was chosen as one of the instruments for this investigation because of its ability

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[54]Hamachek, op. cit., p. 187.

to measure the major dimensions of human personality comprehensively, for individuals from sixteen years to late maturity. Cattell[55] asserts that the 16 PF is not a questionnaire composed of arbitrary scales, but was one of the few published in the last forty years which have been founded on factor-analytic experiments with the simple structure criterion. He contends that the separate traits or dimensions of personality which test scales measure to correspond to uniquely definable, functionally unitary, and psychologically significant source traits.

In its comprehensiveness in relation to general personality it provides the investigator with a "wide net" in his first search in a field. The author of the scale relates that over forty years use has demonstrated that the questionnaire will determine the relative prominence of each of the sixteen dimensions in a particular personality. Cattell[56] asserts that the best way to begin research or applied work in any new domain is to take cognizance of the total personality, in all of its main dimensions.

It was felt by the investigator that a search of personality factors related to inadequate driving behavior

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[55] R. Cattell, H. Eber, and M. Tatsvoka, Handbook for the Sixteen Personality Factor Questionnaire (Champaign, Ill.: Institute for Personality and Ability Testing, 1970).

[56] Ibid., pp. 5-6.

which might, also, relate to selected behavior groups would require an instrument which would not be confined to a unitary dimension.

It was hypothesized that a proper perspective would more likely evolve when a test would discover what is happening on other personality dimensions at the same time; the 16 PF seemed to afford this possibility.

Cattell[57] reports that concrete validities have been established for the 16 PF in relation to numerous clinical, educational, industrial, and social real-life criteria.

The author of the 16 PF Questionnaire reports that the source trait, intelligence (factor B) has shown after years of use that there is a moderate tendency for the more intelligent person to have a higher morale, persistence and strength of interest. It is further related that the principal object in measuring intelligence in the 16 PF is not to add personality information as such, but to complete the supply of data on the range of source traits important in most predictions, for general ability is an important dimension in individual differences.[58]

The source trait uncontrolled and controlled (factor Q 3) is of importance to these investigations as Cattell reports that it represents the strength about an

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[57] Ibid., p. 14.

[58] Ibid., p. 82.

individuals self-concept and social image. He concludes that a high score on the controlled trait has over the years shown a significant relationship to freedom from automobile accidents and, quite strongly, to success in school.[59]

It was pointed out that persons who score at the high end of factor Q 4 indicate they are tense and that this trait contributes significantly to automobile accident proneness.[60]

In a study of commercial drivers Suhr[61] used the 16 PF Questionnaire to investigate differences on the questionnaire results between groups rated high and rated low in driving behavior. The drivers were grouped against three criteria: (1) Supervisors subjective estimate, (2) Supervisors objective rating, and (3) Accident records from company files.

Two of the personality factors, M and Q 3 consistently showed differences between the groups. These traits were associated with a driver being practical and controlled.

It was, also, reported that the test did differentiate as effectively from the supervisors ratings as it did from the accident records.

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[59] Ibid., pp. 106-07. [60] Ibid., p. 108.

[61] V. W. Suhr, "The Cattell 16 PF Test as Prognosticator of Accident Susceptibility," Proceedings of the Iowa Academy of Science, 1953, pp. 558-61.

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The Cattell 16 PF Questionnaire was utilized to measure the traits of accident susceptible individuals by J. W. Freeman in 1952.[62] He was concerned with the general pattern of psycho-sociological factors of accident-free and accident-liable automobile drivers. The accident-liable group had been responsible for two or more accidents in one year.

The statistical comparison of the mean scores on the 16 PF of the two groups showed two source traits significantly discriminating between the two groups. The accident-liable group scored high on assertiveness and experimenting.

A German translation[63] of the 16 PF Questionnaire was used in a study to discern personality factors which might be related to a number of discriptive criteria for drivers. Those who were described as "offensive" drivers scored significantly on the traits of assertiveness and happy-go-lucky.

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[62] J. W. Freeman, "Certain Psycho-sociological Factors of Accident-Free and Accident-liable Automobile Drivers of Cedar Rapids, Iowa" (unpublished Master's thesis, Iowa State College, Ames, Iowa, 1952).

[63] D. Klebelsberg, B. Biehl, J. Furhramm, and V. Seydel, "Fahrverhalten, Beschreibung, Beurteilung and Diagnostiche Erfassung" (Wein: Kuratorium fuer Verkehrs-sicherheit, 1970).

Summary

The literature indicates that a degree of success has been achieved in grouping individuals into behavior categories associated with future driver violation experiences.

This grouping can apparently be done by objective tests or by subjective observation by competent driver education instructors.

Several writers concurred that there is a very positive relationship between certain human factors and driver performance.

The literature concerning the self-concept and driver personality aspects supports the contention that the important area of how an individual sees himself is intimately involved with a driver's adjustment relative to personality.

Most researchers concluded that the 16 PF Questionnaire was of practical value in searching for personality traits which may be associated with how a driver performs.

Hence, the review of literature has disclosed the need, purpose and possibilities of bringing together these concepts and testing instruments to further our understanding of the driver.

CHAPTER III

DESIGN AND METHODOLOGY

The purpose of this study was to investigate: (1) differences on self-concept dimensions as measured by the 16 PF Questionnaire among male and female subjects rated average, over-controlled or under-controlled behavior by their driver education instructors; (2) differences on self-concept dimensions as measured by the 16 PF Questionnaire among male and female subjects classified as average, over-controlled or under-controlled in their behavior by the Mann Inventory (MI) sub-scores; and (3) differences on self-concept dimensions as measured by the 16 PF Questionnaire among male and female subjects classified as non-disturbed or disturbed by the Mann Inventory (MI) total scores.

Hypotheses

Included in this study are three hypotheses, all of which are stated in the null form.

Hypothesis 1: There are no significant differences among groups rated average behavior, over-controlled behavior or under-controlled behavior by their driver education instructors and self-concept as measured by factors on the 16 PF Questionnaire.

Hypothesis 2: There are no significant differences among groups classified average behavior, over-controlled behavior or under-controlled behavior by the Mann Inventory sub-scores on dimensions of self-concept as measured by the 16 PF Questionnaire.

Hypothesis 3: There are no significant differences between groups classified as non-disturbed or disturbed by the Mann Inventory total scores and self-concept dimensions as measured by factors on the 16 PF Questionnaire.

Sample

Subjects

The sample population for this study consisted of 668 subjects. There were 332 males and 336 females enrolled in four public high schools. The subjects being studied were all in the 1971 summer driver education programs at the various schools. The number of students from each school was not equal since the enrollments in each school driver education program varied.

Both males and females ranged in age from 16 years and 4 months to 16 years and 10 months.

All subjects were taking the summer driver education course because school scheduling policies precluded

their being involved with this experience at an earlier date. Scheduling policies would include: age, schedule conflicts, and terminal numbers in regular school day periods. It was concluded that the subjects in the summer program were a cross section of the normal school population which would be expected to be in any scheduled driver education program.

Each school had an enrollment of 1,500-2,000 students which afforded a comprehensive cross section of the ethnic and socio-economic groups of the cities in which the schools were situated. The number of subjects in each sex and in the predominent minority group did not vary appreciably from the ratios[1] in the driver education classes held during the regular day school year programs.

Minority students represented approximately 17 per cent of the class enrollment across both sexes and all four schools.

Table 3.1 presents the frequency distribution of males and females in each of the four schools used in this investigation.

Schools

There were 216 subjects from School I; 168 students from School II; 135 students from School III; and 149

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[1]Demographic school data reported from the respective school records for 1970-71 school year.

TABLE 3.1.--Frequency Distribution of Sample Population Classified According to School and Sex.

Schools	Males	Females	Totals
I	105	111	216
II	86	82	168
III	68	67	135
IV	73	76	149
Totals	332	336	678

students from School IV for a total of 678 in the study. Subjects were nearly evenly divided between sexes.

These schools maintain approximately the same numerical enrollment. The driver education programs at the various schools were similar. All their regular school day programs extend over the full year and each offers a seven week summer course, both laboratory and classroom, concurrently.

The schools were selected because of the teaching experience and formal education of the driver education instructors. A favorable factor for the inclusion of these particular schools was the policy of the predominant assignment of students to one instructor for their driver education experiences in classroom, multiple-car, simulation and on-the-street. This system provides a maximum opportunity for each instructor to observe the behavioral growth of each of his driver education students.

This program organizational arrangement was deemed very important to the subsequent instructor rating process.

Source of Data

Instructor Ratings

Each driver education instructor who handled the various educational experiences was asked to rate each subject as exhibiting average behavior, over-controlled behavior or under-controlled behavior. All instructors were presented behavior classifications description material which the investigator developed with the guidance and critical analyses of Dr. William A. Mann and other associates who have been involved with using the Mann Inventory in classroom experiences.

The "Behavior Descriptions" (Appendix A) suggested ten descriptions of identifiable manifestations of behavior which would characterize the under-controlled student. This classification, generally, would identify behavior characterized as forceful, outgoing action or vigorous efforts to assert oneself over others, with little consideration of the results.

The over-controlled behavior classification had a descriptive list of ten manifested activities which could be identified as those which would characterize behavior as withdrawal from communication with other persons with efforts to have everything under control so that they

cannot be criticized by others. This is a general description of the over-controlled subject.

A general description of the behavior of those rated average would be characterized as well-adjusted interaction with persons and consistent with the mores of society in which the individual lives; functions within the educational institution norms, with the absence of tendencies towards extremes in personality.

The behavioral description lists could never be exhaustive and needed clarification and expansion. The instructors at each school were involved in a one hour session with the investigator where instructions for the use of the "Behavior Description" materials and the subsequent behavior rating process were expanded and clarified.

Instructor Raters

Each of the raters had several years' teaching experience with a minimum of seven years in the driver education classroom and laboratories. Eight of the eleven driver education instructors instructing in the summer programs had earned Master's degrees in Traffic and Safety Education with an emphasis on the behavioral sciences.

All had been involved with the "Personality Factors in Driver and Traffic Education" course offered at Michigan State University in the College of Education by Highway Traffic Safety Center professors.

Two of the raters were pursuing doctoral degrees and all of the driver education instructors who were involved in the rating process were employed as full-time teachers in this field at the four high schools.

As a result of experience and professional preparation all of the raters would seem to be qualified to sense overt and subtle behavior manifestations which students may exhibit daily in their various driver education experiences and in other circumstances where a student/teacher relationship may occur.

The Mann Inventory

The MI is a personality inventory consisting of sixty-three items designed to attempt a measure of an individual's feelings toward himself, others, and socially established conventions. His survey employed the following response pattern: (1) always, (2) usually, (3) sometimes, (4) rarely, and (5) never.

Scoring consists of the progressive assignment of points for each response deviating from the established accepted responses. Consequently, a higher score indicates a greater degree of personal adjustment problems.

Research applications of the MI by Kenel,[2] Quane,[3] and Sinkoff[4] have provided for the evolution of a reliable methodology to group students into average, over-controlled and under-controlled behavioral classifications using MI sub-scores. These sub-scores are derived from responses on items of the MI which have been found to significantly discriminate among the behavior classifications. Again, a progressive assignment of points for each response on the discriminating items deviating from that stipulated are assigned to the over-controlled or to the under-controlled category. The higher the score in either category indicates a subject has characterized himself as belonging in an appropriate classification.

The present form of the MI (Appendix B) and the response sheet (Appendix C) is comparable to the form in the dissertations cited previously.[5]

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[2]F. Kenel, "The Effectiveness of the Mann Inventory in Classifying Young Drivers Into Behavioral Categories and Its Relationship to Subsequent Driver Performance" (unpublished Doctoral dissertation, Michigan State University, 1967).

[3]L. Quane, "The Relationship of Visual Perceptual Capabilities as Measured by the Perception of Traffic Hazards Test and Behavioral Categories as Measured by the Mann Inventory" (unpublished Doctoral dissertation, Michigan State University, 1970).

[4]A. Sinkoff, "A Comparison of Two Cultural Groups Through the Use of the Mann Inventory" (unpublished Doctoral dissertation, Michigan State University, 1969).

[5]Kenel, Quane, Sinkoff, Ibid.

The reliability of the MI was established for the form given to teenagers in this investigation and in the same geographical area by Kenel:[6]

> The reliability of the MI was determined by application of product moment coefficient of correlation to two separate administrations of the instrument. Correlation values of .697-.986 were derived. With 63 degrees of freedom, these values indicate a high to very high correlation with marked or dependable relationships.

A rather concrete validity was established[7] in relationship to instructor observed behavior for the responses to items in the MI with sixty of the sixty-three items significantly different for each behavioral category at or better than the .10 level of confidence for a comparable teenage group.

Based upon the preceding research cited, it was concluded that the MI would sufficiently discriminate among behavior groups in this investigation.

The 16 PF Questionnaire

The 16 PF Questionnaire ("The 16 PF") is an objectively-scorable test designed to yield a rather complete coverage of personality in a brief time.

The personality factors measured have been established as unitary, psychologically meaningful entities which are psychological realities in various life situations.

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[6]Kenel, op. cit., p. 72. [7]Ibid, p. 69.

There are 16 dimensions or scales with 10 to 13 items for each dimension in "The 16 PF" form A Questionnaire consisting of a total of 187 questions to be checked.

The items were distributed among the sixteen personality measuring factors; namely, (a) reserved--outgoing, (b) less intelligent--more intelligent, (c) affected by feelings--emotionally stable, (e) humble--assertive, (f) sober--happy-go-lucky, (g) expedient--conscientious, (h) shy--venturesome, (i) tough-minded--tender-minded, (l) trusting--suspicious, (m) practical--imaginative, (n) forthright--shrewd, (o) self-assured--apprehensive, (Q1) conservative--experimenting, (Q2) group dependent--self-sufficient, (Q3) undisciplined self-conflict--controlled, and (Q4) relaxed--tense.

Reliability coefficients for the factors on "The 16 PF" most recently determined[8] by test-retest procedures were factor: (a) .81, (b) .58, (c) .78. (e) .80, (f) .79, (g) .81, (h) .83, (i) .77, (l) .75, (m) .70, (n) .61, (o) .79, (Q1) .73, (Q2) .73, (Q3) .62, and (Q4) .81.

The lower figure for intelligence (factor b) is due to subjects' solving these test items by reminiscence between testings.

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[8]R. Cattell, H. Eber, M. Tatsuoka, Handbook for the Sixteen Personality Factor Questionnaire (Champaign, Ill.: Institute for Personality and Ability Testing, 1970), p. 30.

The validity coefficients reported by Cattell[9] were: (a) .79, (b) .35, (c) .70, (e) .63, (f) .83, (g) .67, (h) .92, (i) .70, (l) .49, (m) .44, (n) .41, (o) .71, (Q1) .62, (Q2) .70, (Q3) .68, and (Q4) .57.

The short length of the intelligence scales (factor b) prevents reaching the validities of the personality scales.

Validity coefficients were obtained by means of correlations between scores obtained by numerous concrete performances on several external tests.

It was concluded that both the reliability and validity coefficients were sufficiently high for test performances associated with this study.

Three alternative answers were provided for each of the 187 test items. Catell asserts:

> The two alternative "forced-choice" situation, forbidding any "middle of the road" compromise, tends to force a distorted distribution and may produce aversion to the test on the part of the examiner.[10]

A parallel personality test to the 16 PF Questionnaire is the High School Personality Questionnaire (HSPQ). The centering age for the HSPQ was at age 16 while the centering age for the 16 PF was 17. It was not clear in

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[9] Ibid., p. 36.

[10] R. Cattell and H. Eber, Manual for Forms A and B, Sixteen Personality Factor Questionnaire (Champaign, Ill.: Institute for Personality and Ability Testing, 1962), p. 5.

the literature which should be used for the study purposes; the test (16 PF) had been normalized in some instances on both 16 year olds and those in the 17 year group.

The investigator consulted with authorities at IPAT and discussed the characteristics of the intended study sample and was subsequently advised[11] to use the 16 PF Questionnaire for the purpose of this study.

Form A of the 16 PF Questionnaire was chosen to attempt to reveal various traits of self-concept in this investigation.

Collection of Data

Two types of instrument data were obtained from each student in the study: their responses to the 63 items on the MI and their responses to the 187 items on the 16 PF Questionnaire.

The subjects taking these entered their age, sex, and student class number on the top of each response sheet.

Each subject was assured by his instructor and the investigator that if they would respond as honestly as possible to the test instruments the results would be used only for the present research project. Instructions were then given for taking them. Tests were administered with the assistance of the regular instructor by the investigator

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[11]A telephone conversation with A. Karen Cattell, Director, Institute for Personality and Ability Testing, Champaign, Illinois, April, 1971.

in the regular classroom settings during the last week of the driver education classes in July, 1971. There was ample time in one class period to administer both instruments. While neither instrument had a time limit placed on them for completion, the MI required an average of twenty minutes to finish and the 16 PF required about fifty-two minutes for the average subject to complete.

At the completion of the testing process in each class, response sheets for the MI for each subject who took it were left with the instructor of that driver education class section.

As near to the end of all educational experiences in the course as instructor obligations would allow, the teachers placed each of the subjects in the category of average, over-controlled or under-controlled behavior according to their observations. This gave them access to a maximum observational period.

A preliminary study of thirty-nine subjects was conducted to establish the feasibility of the testing instruments, especially the amount of time required to administer them.

Procedures and forms were further developed and expanded for instrument scoring, data compilation and analysis.

Contacts, testing instruments, timing, testing arrangements, data processing techniques and behavior

classification ratios appeared to promise a yield of the information needed to bring the investigation to a conclusion.

When these seemed feasible, the educational research consultants suggested the investigator project the study to cover four schools and the possible 668 subjects.

Procedure for Data Analysis

All tests were hand-scored and the results entered on data collection forms along with instructor rated behavioral classification, sex and school for each subject.

From the results of the Mann Inventory the following data were obtained: total scores which provided classification into disturbed and non-disturbed categories; sub-scores which placed subjects into the categories of average, over-controlled and under-controlled behavior.

The test scores from the 16 PF Questionnaire yielded a total score for each of the 16 factors ranging from 0 to 26 for each subject.

All data were then placed into dichotomous groups of male and female.

A new set of student numbers was assigned for each subject on the computer data card, thus completing the anonymity for each subject.

Computer data cards were then punched for 336 females and 332 males in the study. Each computer card contained data as follows:

1. Subject identification number
2. Instructor rated category
3. MI sub-score classification
4. MI total score classification
5. MI master or total score
6. MI over-controlled sub-score
7. MI under-controlled sub-score
8. School in which subject enrolled
9. Scores for each of the sixteen personality factors

Computer data control cards were then punched for programs which would yield distribution, means and percentage analyses for the various classifications on the CDC 6500 Computer and for two-way multivariate analysis of variance and correlation coefficients on the CDC 3600 Computer. All computer analyses were performed separately for male and female subjects. This seemed desirable as they are markedly different in their driving performances in the transportation system.

Michigan State University educational research consultants reviewed the elements and objectives of the proposed study and concluded that the Fenn[12] multivariate

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[12]A multivariate analysis of variance statistical model programmed by Jeremy Fenn, State University of New York at Buffalo, a program in the data program files for

analysis of variance computer program should be employed. The statistical model programmed seemed appropriate to address the question of relationships existing between two multifaceted concepts and whether several groups would differ in any way on a set of dependent variables.

In his discussion of statistical models for behavioral research, Cattell[13] asserted that multivariate procedures are preferred over a proliferation of univariate tests if several variables possessing some psychological cohesiveness are to be measured in much the same manner as the analysis of variance is preferred over several "t" tests.

Most responses should not be viewed in isolation but as a conjunctive display.

This model may give significant multivariate results without obtaining significant univariate F-ratios (the reverse is also possible). Such a statistical procedure will give a pattern of order among the sixteen dependent variables and significant relationships or interactions between the independent variables which will add to the construct validity and interpretation of the sixteen personality factors themselves.

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the CDC 3600 Computer at Michigan State University Computer Laboratory.

[13]R. Cattell (ed.), Handbook of Multivariate Experimental Psychology (Chicago: Rand McNally, 1966).

A useful yield of this model was thought to be a provision for considering the inter-correlations among the dependent variables and the interaction of the independent variables which would allow for an examination of a more global personality or self-concept display rather than artificially excising these variables outside of their natural context.

Schools and behavior categories were chosen as the independent variables and 16 PF scores are termed the dependent variables for this investigation.

Only the main effects of the independent variable, behavioral groups, will be used to sustain or reject the three hypotheses pertaining to either males or females in the investigation.

Since this MANOVA research model allows the two independent variables, schools and behavioral classifications, to be justaposted in order to study their independent and interactive effects on the dependent variable scores, confidence levels must be set for the significance of each of these effects.

An .05 level of significance was used to determine the acceptance or rejection of the three hypotheses for the males, and the three similar hypotheses for the females.

The .05 confidence level was chosen for the significance of the multivariate main effects of the

independent variable, schools in the 16 PF Questionnaire results.

Where the school multivariate F-ratios are significant, those dependent variables, i.e., sixteen personality factors, which have a probable univariate F-ratio of .10 or less will be analyzed and tables depicting this variance will be presented.

The univariate F-ratios of dependent variables of .10 or less where the multivariate F-ratios for among group effects were significant will be discussed and presented in appropriate tables.

The univariate confidence levels are not true alpha levels since the sixteen factors may be inter-dependent as they discriminate between categories and schools.

Inter-correlation matrix tables will be presented where non-independence of dependent variables is found.

The confidence level of .10 or less was chosen for considering the factors which may differentiate between groups or between schools to provide a relatively "wide net" for identifying the total spectrum of personality dimensions in this new domain, self-concept, as well as what is happening on other dimensions at the same time.

When interaction occurs between independent variables, it precludes considering the main effects of either variable on the results among the dependent variables.

When a two-way multivariate F-ratio reaches the .05 level of confidence for interaction between schools

and behavioral classifications, the possible effects of either independent variable will not be presented as they would be statistically meaning less. Where interaction does occur, each of the sixteen dependent variables will be separately graphed to display where interaction has occurred.

Summary

The sample population was obtained from four public high schools: two from Ingham County and two from Genessee County. All subjects were enrolled in regularly scheduled summer driver education programs. Responses to the Mann Inventory and the 16 PF Questionnaire were collected during the last week of the driver education courses in July, 1971.

Each driver education teacher through his observations during all student/teacher interactions for the duration of the class experiences placed each student in his class into behavioral categories of average, over-controlled or under-controlled behavior according to the pre-discussion of these concepts.

Students were, also, placed into the behavioral classifications by using the results of the MI sub-scores. Subjects were further categorized as disturbed and non-disturbed by using MI total scores.

A two-way MANOVA was employed to analyze differences between the various groups which was reflected among scores of the 16 PF.

The .05 level of confidence was chosen to reject the three hypotheses for both males and females. A level of confidence at .05 was, also, used to sustain significant interaction and to accept or reject the possible effects of the schools on the 16 PF scores.

Further elaboration of these procedures and the analysis of statistical results are presented in Chapter IV.

CHAPTER IV

ANALYSIS OF RESULTS

The results of data analysis are presented in this chapter. The analysis of the following are presented: (1) the differences on self-concept dimensions as measured by the 16 PF Questionnaire among male and female subjects rated as exhibiting average, over-controlled or under-controlled behavior by their driver education instructors; (2) the differences on self-concept dimensions as measured by the 16 PF Questionnaire among male and female subjects classified as average, over-controlled or under-controlled in their behavior by the Mann Inventory (MI) sub-scores; (3) the differences on self-concept dimensions as measured by the 16 PF Questionnaire among male and female subjects classified as non-disturbed (reasonably well-adjusted) or disturbed (problems of adjustment) by the Mann Inventory total scores.

The total number of subjects in the final statistical analysis was 668, 332 males and 336 females.

The data collected from the 668 subjects in the study included the school in which they were enrolled in

the driver education course, sex, age, ratings of behavior by driver education instructors, scores of Mann Inventory, and scores from the 16 PF Questionnaire.

Preparation of Data for Statistical Analysis

Computer data cards were punched for 668 subjects. The data were prepared for distribution, means and percentage analysis for the various classifications on the Michigan State University Control Data Corporation 6500 Computer and for two-way multivariate analysis of variance (MANOVA) and correlation coefficients on the CDC 3600 Computer. Computer analyses were performed separately for males and females.

Table 4.1 presents the composition of the sample population by instructor rated behavior classification, sex and school in numbers and percentages.

An inspection of this table will show that there are smaller percentages of subjects in over-controlled and under-controlled categories for both males and females as these classifications represent subjects who have problems of adjustment and should represent a smaller proportion of the population and sample.

In School III the percentage of males classified average by the instructor was low (37 per cent). The instructor rated the females average in only 48 per cent of the cases in School III. These were the lowest

TABLE 4.1.--Number and Percentage Distribution of Males (N=332) from Four School Samples into Average, Over-controlled and Under-controlled Classifications by Instructors.

School		Average			Over-Controlled			Under-Controlled			Total	
		Male	Female		Male	Female		Male	Female		Male	Female
I	N	54	81	N	18	19	N	33	11	N	105	111
	P	52	73	P	17	17	P	31	10			
II	N	47	48	N	17	18	N	22	16	N	86	82
	P	55	59	P	20	22	P	25	19			
III	N	25	32	N	21	18	N	22	17	N	68	67
	P	37	48	P	31	27	P	32	25			
IV	N	35	50	N	13	14	N	25	12	N	73	76
	P	48	63	P	18	18	P	34	16			
Total	N	161	211	N	69	69	N	102	56	N	332	336
	AP	48	63	AP	21	20	AP	31	17			

Note: N = number
P = per cent
AP = average percentage

percentage of either males or females classified as average by any instructor in any school. Only 48 per cent of all males in all schools were rated average by their driving instructors. The average classification for all females in all schools totalled 63 per cent with the largest percentage (73 per cent) in School I.

The instructors consistently rated a higher percentage (31 per cent) of males than females (17 per cent) as displaying behavior characterized as under-controlled. The instructors rated males and females as exhibiting over-controlled behavior at nearly the same percentage level, 21 per cent for males and 20 per cent for the females in all schools.

Difference Among Instructor Rated Categories for Males

The following is the null hypothesis which was tested for each of the categories of behavior for males:

H_o1: There are no significant differences among groups rated average behavior, over-controlled behavior or under-controlled behavior by their driver education instructors and self-concept as measured by factors on the 16 PF Questionnaire.

Table 4.2 presents the two-way MANOVA of 16 PF scores of males for interaction between the two independent variables, i.e., four schools and the three instructor ratings. An F-statistic of 1.20 with the associated significance level of .10 indicates that this interaction

TABLE 4.2.--Two-way MANOVA of the 16 PF Scores and Interaction Between Schools and Ratings for Males (N=332).

Multivariate Test of Equality of Mean Vectors
Multivariate F-Statistic 1.20

With 96 and 1734.8 Degrees of Freedom

Level of Significance P < .10

Factor	Between MS	Univariate F-Statistic	P Less Than[a]
A	7.13	0.98	.44
B	3.87	0.88	.51
C	23.28	1.79	.10
E	12.04	1.18	.31
F	7.51	0.42	.86
G	5.10	0.52	.79
H	23.50	1.01	.42
I	10.30	1.00	.42
L	8.21	0.91	.48
M	12.09	1.36	.23
N	13.34	1.91	.08
O	6.48	0.57	.75
Q1	9.95	1.26	.28
Q2	18.93	1.75	.11
Q3	4.89	0.61	.73
Q4	44.03	2.74	.01

Note: Degrees of freedom: Interaction 6, error 320.

[a]These may not be true levels of significance.

was not significant. The interactions between schools and ratings did not significantly reflect differences on the dependent variables, 16 PF scores.

It was then possible to investigate further and interpret statistically, differences on dependent variable scores which may be attributable to either the independent variable instructor rating effects or the independent variable school effects.

The differences on 16 PF scores which were attributable to school main effects are presented in Table 4.3. A multivariate F-statistic of 1.06 was obtained by a two-may MANOVA.

This represented a .36 level of significance. The main effect of the independent variable school did not significantly reflect differences on the 16 PF scores, the dependent variables.

Using a two-way MANOVA on the scores of all factors of the 16 PF Questionnaire for all males (N=332) placed into the categories of average, over-controlled and under-controlled behavior by their driver education instructors, a value of 1.83 was obtained for the multivariate F-statistic for category main effects on the dependent variables. This multivariate F-ratio represented significance at the .004 confidence level. The .05 confidence level was chosen for rejecting the null hypothesis. Table 4.4 presents the results of the two-way MANOVA for

TABLE 4.3.--Two-way MANOVA of the 16 PF Factor Scores and the Schools for Males (N=332).

Multivariate Test of Equality of Mean Vectors
Multivariate F-Statistic 1.06

With 48 and 907.9 Degrees of Freedom

Level of Significance P < .36

Factor	Between MS	Univariate F-Statistic	P Less Than[a]
A	10.22	1.41	.24
B	3.25	0.74	.53
C	46.98	3.62	.01
E	7.33	0.72	.54
F	6.72	0.38	.77
G	13.64	1.40	.24
H	19.24	0.83	.48
I	22.56	2.19	.09
L	23.08	2.57	.05
M	3.95	0.44	.72
N	3.75	0.54	.66
O	18.76	1.65	.18
Q1	1.50	0.19	.90
Q2	14.91	1.38	.25
Q3	4.37	0.54	.65
Q4	50.38	3.13	.03

Note: Degrees of freedom for univariate F-statistic: Between schools 3, error 320.

[a]These may not be true levels of significance.

TABLE 4.4--Two-way MANOVA of the 16 PF Factors for Instructor Ratings for Males (N=332).

Multivariate Test of Equality of Mean Vectors
Multivariate F-Statistic 1.83

With 32 and 610 Degrees of Freedom

Level of Significance P < .004

Factor	Between MS	Univariate F-Statistic	P Less Than[a]
A	8.75	1.21	.30
B	7.62	1.74	.18
C	33.88	2.61	.08
E	61.38	5.99	.003
F	12.67	0.71	.49
G	60.04	6.15	.003
H	28.88	1.24	.29
I	7.16	0.70	.50
L	23.63	2.63	.07
M	3.11	0.35	.71
N	22.65	3.24	.04
O	21.90	1.93	.15
Q1	33.53	4.25	.02
Q2	4.64	0.43	.65
Q3	3.55	0.44	.64
Q4	47.38	2.95	.05

Note: Degrees of freedom for univariate F-statistic: Between ratings 3; error 320.

[a]These may not be true levels of significance.

the main effects of instructor ratings. On the basis of the data presented in Table 4.4, the null hypothesis of no significant differences among males in the three categories of instructor rated behavior on factors of the 16 PF Questionnaire was rejected.

The univariate F-statistic for each dependent variable presented in Table 4.4 may not be true levels of significance since the sixteen factors are not independent of each other. Each factor along with one or more other factors combine to effect the collective difference of all scores on all factors among each behavior classification. Table 4.5 presents the statistical correlation coefficients among the factors of the 16 PF Questionnaire for 332 males categorized by their driver education instructors. A correlation coefficient of plus or minus .25 was significant at the .01 confidence level with over 100 degrees of freedom.

Many of the factors correlated significantly, directly and inversely. There were 120 possible intercorrelations among the 16 PF factors of which 22 were significant at the .01 level in the data presented in Table 4.5. It was concluded that the sixteen dependent variables were, in fact, not independent.

Factors with relatively low univariate probability levels in Table 4.4 were identified as individually accounting for most of the total difference on the 16 PF

TABLE 4.5.--Sample Correlation Matrix for Factors of 16 PF Questionnaire for Behavior Classifications of Average, Over-Controlled and Under-Controlled by Driver Instructor Ratings (Male N=332).

Factor	A	B	C	E	F	G	H	I	L	M	N	O	Q1	Q2	Q3	Q4
A																
B	01															
C	10	07														
E	06	28*	-04													
F	26*	09	16	30*												
G	13	06	22	-14	03											
H	30*	02	27*	34*	53*	13										
I	21	01	-04	05	-04	06	10									
L	-01	05	-28*	36*	20	-16	-03	01								
M	-03	19	11	11	01	-05	04	13	-08							
N	-05	-18	02	-25*	-19	10	-08	03	-12	-08						
O	-02	-12	-35	-08	-11	-10	-18	-01	20	-10	14					
Q1	-01	07	-03	33*	06	-24	02	-02	22	08	-22	-11				
Q2	-38*	10	-14	07	-31*	-07	-36*	-01	06	04	02	01	13			
Q3	12	01	25*	-17	-03	41*	16	05	-25*	-14	15	-15	-14	-03		
Q4	-08	09	-49*	20	01	-21	-19	-01	40*	-14	-04	31*	04	13	-29*	

Note: For clarity the decimal point before each number has been omitted.

*Correlation coefficient of .25 P < .01 with over 100 degrees of freedom.

scores by males among the three instructor rated behavioral classifications.

Factors E and G contributed to a great extent, the reflected differences among instructor rated categories. Factors N, Q1, and Q4 individually contributed to the differences among groups at an intermediate level. Factors C and L represented a contribution of a lower amount to the classification score differences. The remaining dependent variables contributed relatively little to the total significant differences among ratings on the 16 PF scores.

Table 4.6 presents directional descriptions of the 16 PF factors and mean scores for each factor in each classification of instructor rated behavior.

A mean of 14.15 in the under-controlled category on factor E indicated that male subjects in this classification were more assertive (E) than male subjects in the average and over-controlled classifications. A mean of 12.76 for males characterized as displaying average behavior by their instructors would indicate that these males were the least assertive of those in the three categories.

The male subjects classified under-controlled with a mean of 10.22 on factor G were much less conscientious than those males in other behavior categories. A mean of 11.82 on factor G would indicate that males in the

TABLE 4.6.--Means for 16 PF Scores of Males Categorized by Instructor Ratings and Polarized Factor Descriptions.

Factor	Low Score Description*	High Score Description*	A[a]	O[b]	U[c]
A	Reserved	Outgoing	8.47	8.54	8.99
B	Less intelligent	More intelligent	7.39	7.39	6.93
C	Affected by feelings	Emotionally stable	14.70	15.07	13.88
E	Humble	Assertive	12.76	13.13	14.15
F	Sober	Happy-go-lucky	14.59	14.17	14.96
G	Expedient	Conscientious	11.30	11.82	10.22
H	Shy	Venturesome	12.69	12.39	13.44
I	Tough-minded	Tender-minded	8.94	8.97	9.40
L	Trusting	Suspicious	9.09	9.86	9.83
M	Practical	Imaginative	10.64	10.48	10.86
N	Forthright	Shrewd	9.37	10.10	9.05
O	Self-assured	Apprehensive	11.43	11.30	12.17
Q1	Conservative	Experimenting	9.40	10.27	10.71
Q2	Group dependent	Self-sufficient	10.56	11.00	10.72
Q3	Undisciplined self-conflict	Controlled	11.68	11.61	11.35
Q4	Relaxed	Tense	12.15	12.86	13.64

[a]Average behavior.

[b]Over-controlled behavior.

[c]Under-controlled behavior.

*A more complete factor description is found in Appendix D.

category of over-controlled saw themselves as least expedient.

Table 4.6 shows males who were classified as under-controlled were more forthright (factor N) with a mean of 9.05 than those in the other classifications. Males who were more shrewd (factor N, mean 10.10) were classified as over-controlled.

Factor Q1 with a mean of 10.71 for males categorized as under-controlled indicated that they were more experimenting as opposed to being conservative. Those males classified average were the most conservative (factor Q1) with a mean of 9.40.

Those males in the under-controlled classification with a mean of 11.35 on factor Q4 indicated that they were the most tense. Those in the average classification with a mean of 12.15 indicated they were more relaxed (factor Q4).

The most emotionally stable (factor C) males were in the over-controlled classification with a mean of 15.07. Those males most affected by feelings (factor C) with a mean of 13.88 were found in the under-controlled category.

Those males indicating they were the most trusting (factor L) had a mean of 9.09 and were found in the average instructor rated classification.

Difference Among Instructor Rated Categories for Females

The following is the null hypothesis which was tested for each of the categories of behavior for females:

H_o1: There are no significant differences among groups rated average behavior, over-controlled behavior or under-controlled behavior by their driver education instructors and self-concept as measured by factors on the 16 PF Questionnaire.

Table 4.7 presents the two-way MANOVA of scores on the 16 PF Questionnaire for females and interaction between the instructor classifications and the four schools which the subjects attended. A multivariate F-ratio of 0.74 was obtained. This indicated a level of significance of .97. The data substantiated no significant interaction between the independent school variables and the independent instructor rating variables. The interaction effect of schools and instructor ratings did not significantly reflect possible differences among instructor rated classifications on the 16 PF scores.

It was then possible to further investigate and statistically interpret dependent variable differences attributable to the effects of each of the two independent variables, instructor ratings and schools.

Differences on 16 PF scores for females in the four sample schools classified into behavior categories by instructor raters which could be accounted for by school main effects is presented in Table 4.8. Using a two-way

TABLE 4.7.--Two-way MANOVA of 16 PF Scores and Interaction Between Schools and Instructor Ratings for Females Classified as Average, Over-Controlled or Under-Controlled by Instructors.

Multivariate Test of Equality of Mean Vectors
Multivariate F-Statistic 0.74

With 96 and 1757.5 Degrees of Freedom

Level of Significance P < .97

Factor	Between MS	Univariate F-Statistic	P Less Than[a]
A	4.02	0.49	.82
B	3.45	0.86	.53
C	15.37	1.07	.38
E	30.67	2.54	.02
F	4.59	0.29	.94
G	3.62	0.35	.91
H	16.19	0.68	.67
I	2.18	0.32	.93
L	12.55	1.32	.25
M	5.46	0.56	.76
N	8.43	1.17	.32
O	2.05	0.18	.98
Q1	8.00	1.12	.35
Q2	13.15	0.42	.87
Q3	12.36	1.31	.25
Q4	24.72	1.21	.30

Note: Degrees of freedom for univariate F-Statistic: Interaction 6; error 324.

[a]These may not be true levels of significance.

TABLE 4.8.--Two-way MANOVA of the 16 PF Scores and the Schools for Females Classified as Average, Over-Controlled or Under-Controlled by Instructors (N=336).

Multivariate Test of Equality of Mean Vectors
Multivariate F-Statistic 1.60

With 48 and 919.8 Degrees of Freedom

Level of Significance P < .007

Factor	Between MS	Univariate F-Statistic	P Less Than[a]
A	6.08	0.74	.53
B	6.22	1.54	.20
C	45.28	3.14	.03
E	1.39	0.11	.95
F	27.28	1.75	.16
G	31.25	3.04	.03
H	46.90	1.96	.12
I	34.77	5.06	.002
L	5.42	0.57	.64
M	3.78	0.39	.76
N	5.10	0.71	.55
O	5.57	0.49	.69
Q1	13.53	1.90	.13
Q2	71.97	2.29	.08
Q3	67.64	7.19	.0002
Q4	36.19	1.77	.15

Note: Degrees of freedom for univariate F-statistic: Between schools 3; error 324.

[a]These may not be true levels of significance.

MANOVA a multivariate F-statistic of 1.60 was obtained for the effects of the independent variable school. This was significant at the .007 level of confidence. It must be concluded that there were school differences significantly effecting the 16 PF scores of females in this study who had been classified into three behavior groups by their driver education instructors.

The univariate F-statistic probability levels for each dependent variable presented in Table 4.8 may not be true levels of significance since the sixteen variables were not independent of each other.

Table 4.9 presents the correlation coefficients among factors on the 16 PF Questionnaire for 336 females, classified into three behavioral groups by their driver education instructors.

A correlation coefficient of plus or minus .25 was significant at the .01 confidence level for over 100 degrees of freedom.

Twenty-one inter-correlations of a possible 120 were either directly or inversely correlated at the .01 or better significance level. The sixteen dependent variables were in fact not independent of each other indicating that each factor along with one or more factors in combinations reflected the differences of all scores on all factors among the three instructor rated behavior classifications for females.

TABLE 4.9.--Sample Correlation Matrix for Factors of 16 PF Questionnaire for Behavior Classifications of Average, Over-Controlled and Under-Controlled by Driver Instructor Ratings (Females N=336).

Factor	A	B	C	E	F	G	H	I	L	M	N	O	Q1	Q2	Q3	Q4
A																
B	-01															
C	05	02														
E	13	03	-06													
F	30*	14	04	29*												
G	18	-01	22	-19	-06											
H	25*	07	32*	35*	44*	15										
I	21	07	01	09	09	-03	05									
L	-03	01	-45*	24	16	16	-03	-01								
M	-05	09	18	15	-03	-16	07	09	-08							
N	08	-12	-01	-29*	-14	17	-12	-11	-11	-14						
O	05	04	-06	02	-13	-28*	13	31*	-09	01						
Q1	-05	-09	-04	17	09	-15	02	-07	25*	15	-08	-03				
Q2	-24	01	-07	-03	-11	-09	-13	14	09	10	16	02	08			
Q3	08	-06	35*	-25*	-10	44*	14	-05	-35*	-05	19	-27*	-11	-10		
Q4	06	09	-56*	24	09	-20	-23	12	45*	-06	-08	50*	01	05	-42*	

Note: For clarity the decimal point before each number has been omitted.

*Correlation coefficient of .25 P < .01 with over 100 degrees of freedom.

Table 4.8 data show that factors Q3 and I were strong contributors to school PF score differences. Factors C, G, and Q2 discriminated between schools at a lower level.

The remaining eleven dependent variables accounted for very little of the between school 16 PF score differences.

Table 4.10 displays the 16 PF score means of each factor in the 16 PF Questionnaire for the females (N=336) in each of the schools who were categorized as displaying average, over-controlled or under-controlled behavior by their driver education instructors.

Females in School III obtained a mean score of 12.54 on factor I which indicated they were more tough-minded than subjects in other schools. The factor Q3 mean score of 10.81 for School I subjects characterized them as having more undisciplined self-conflict than those in the other schools. Female subjects in School IV with a mean of 12.84 on factor Q3 placed them on the high end of this factor, they saw themselves as having more controlled behavior.

School I females with a mean score of 13.49 on factor G were more affected by feelings and less emotionally stable than those in other schools.

TABLE 4.10. Factor Descriptions and Mean Scores on 16 PF Factors From Four Schools for Females (N=336) Classified as Average, Over-Controlled, or Under-Controlled by Instructor Ratings.

Factor	Factor Description		School			
	Low Scores	High Scores	I	II	III	IV
A	Reserved	Outgoing	11.01	10.48	10.96	11.26
B	Less intelligent	More intelligent	7.61	7.28	6.97	7.68
C	Affected by feelings	Emotionally stable	13.49	14.76	15.17	15.07
E	Humble	Assertive	11.73	11.45	11.57	11.85
F	Sober	Happy-go-lucky	15.11	16.62	6.55	16.19
G	Expedient	Conscientious	11.37	10.29	11.92	11.84
H	Shy	Venturesome	11.64	13.20	13.79	14.44
I	Touch-minded	Tender-minded	13.08	13.76	12.54	13.99
L	Trusting	Suspicious	9.58	8.84	8.46	8.72
M	Practical	Imaginative	9.85	10.63	9.87	9.98
N	Forthright	Shrewd	9.64	9.71	10.23	9.81
O	Self-assured	Apprehensive	12.82	12.15	12.25	11.98
Q1	Conservative	Experimenting	9.10	8.70	8.71	8.48
Q2	Group dependent	Self-sufficient	10.76	10.00	9.61	8.76
Q3	Undisciplined self-conflict	Conrolled	10.81	10.90	11.92	12.84
Q4	Relaxed	Tense	15.48	14.32	13.33	14.05

Female subjects in School II with a mean of 10.29 on factor G revealed that they were more expedient and less conscientious than those in the other schools in the study.

Females were more group dependent in School IV with a mean score of 8.96 on factor Q2 compared to those in the other schools who indicated they were more self-sufficient.

Table 4.10 displays factor descriptions denoting directions for the trait described.

The two-way MANOVA for the independent variable between group main effects on the 16 PF Questionnaire factor scores or on the dependent variables is presented in Table 4.11. The multivariate F-statistic obtained was 1.37. The confidence level associated with this F-ratio was .09 which fell short of the .05 level of confidence chosen to reject the null hypothesis.

On the basis of data presented in Table 4.11, the null hypothesis (H_o1) for females of no significant differences on the dependent variables, 16 PF scores, among the three behavior ratings, average, over-controlled and under-controlled as rated by driver education instructors was sustained.

Factor descriptions with the means of the 16 PF scores for female subjects who were classified as exhibiting average, over-controlled or under-controlled behavior by their driver education instructors are presented in Table 4.12.

TABLE 4.11.--Two-way MANOVA of the 16 PF Scores and the Categories of Average, Over-Controlled and Under-Controlled Behavior of Females as Classified by Instructors.

Multivariate Test of Equality of Mean Vectors
Multivariate F-Statistic 1.37

With 32 and 618 Degrees of Freedom

Level of Significance P < .09

Factor	Between MS	Univariate F-Statistic	P Less Than[a]
A	7.98	0.97	.38
B	4.75	1.18	.31
C	1.63	0.11	.89
E	20.86	1.72	.18
F	12.76	0.82	.44
G	52.57	5.12	.007
H	47.12	1.97	.14
I	24.43	3.55	.03
L	19.46	2.04	.13
M	0.69	0.07	.93
N	6.68	0.93	.40
O	10.80	0.95	.39
Q1	8.47	1.19	.31
Q2	2.65	0.08	.92
Q3	17.89	1.90	.15
Q4	25.55	1.25	.29

Note: Degrees of freedom for univariate F-statistic: Between categories 2; error 324.

[a]These may not be true levels of significance.

TABLE 4.12.--Means for 16 PF Scores of Females (N=336) in Four Schools Classified as Average, Over-Controlled or Under-Controlled by the Instructor Rating and Polarized Factor Descriptions.

Factor	Low Score Description	High Score Description	A[a]	O[b]	U[c]
A	Reserved	Outgoing	11.09	10.54	10.95
B	Less intelligent	More intelligent	7.25	7.64	7.16
C	Affected by feelings	Emotionally stable	14.55	14.38	14.70
E	Humble	Assertive	11.34	11.28	12.27
F	Sober	Happy-go-lucky	16.17	15.62	16.50
G	Expedient	Conscientious	12.13	11.20	10.77
H	Shy	Venturesome	13.35	12.65	14.39
I	Tough-minded	Tender-minded	13.70	13.64	12.66
L	Trusting	Suspicious	8.95	8.45	9.57
M	Practical	Imaginative	10.15	10.16	9.98
N	Forthright	Shrewd	10.12	9.78	9.64
O	Self-assured	Apprehensive	12.62	12.00	12.29
Q1	Conservative	Experimenting	8.49	8.11	9.07
Q2	Group dependent	Self-sufficient	9.47	9.88	10.20
Q3	Undisciplined self-conflict	Controlled	12.02	11.33	11.36
Q4	Relaxed	Tense	13.77	14.26	14.80

[a]Average behavior.

[b]Over-Controlled behavior.

[c]Under-controlled behavior.

An examination of the means associated with the three behavior categories for each factor indicated that these means do not vary substantially. This agrees with not rejecting the null hypothesis of no between group statistically significant differences on the dependent variables, the 16 PF scores.

Distribution of Sample by MI Sub-Scores

Table 4.13 presents the number and percentage distribution of the study sample of males (N=332) and females (N=336) in schools and within schools into average, over-controlled and under-controlled classifications by MI sub-scores.

Males were categorized as average in 56 per cent of the cases, while 64 per cent of the females were considered possessing average behavior as revealed by MI scores.

In all schools 21 per cent of the females were classified by the MI as over-controlled as compared to 16 per cent of the males in that category. In the category of under-controlled behavior, 28 per cent of the males and 15 per cent of the females placed themselves in that classification by their scores on the MI.

School III had the lowest percentage (56) of females in the average group. School III, also, had the lowest percentage (53) of average males.

TABLE 4.13.--Number and Percentage Distribution of Males (N=332) and Females (N=336) into Average, Over-Controlled and Under-Controlled Classifications and Schools by MI Sub-Scores.

School		Average			Over-Controlled			Under-Controlled			Total	
		Male	Female		Male	Female		Male	Female		Male	Female
I	N	59	74	N	15	24	N	31	13	N	105	111
	P	56	67	P	14	22	P	30	11			
II	N	49	57	N	15	14	N	22	11	N	86	82
	P	57	70	P	17	17	P	26	13			
III	N	36	37	N	14	15	N	18	15	N	68	67
	P	53	56	P	21	22	P	26	22			
IV	N	41	46	N	10	16	N	22	14	N	73	76
	P	56	67	P	14	21	P	30	18			
Total	N	184	214	N	54	69	N	94	53	N	332	336
	CA	56	64	CA	16	21	CA	28	15			

Note: N = number
P = per cent
CA = combined average percentage

Difference Among MI Sub-Score Categories for Males

The following is the null hypothesis which was tested for each of the categories of behavior for males:

H_o2: There are no significant differences among groups classified average behavior, over-controlled behavior or under-controlled behavior by the MI sub-scores on dimensions of self-concept as measured by the 16 PF Questionnaire.

Table 4.14 presents results of the two-way MANOVA of scores on the 16 PF Questionnaire, the dependent variables for males (N=332), and interaction between the independent variables MI sub-score behavior classifications and the other independent variable, the four schools from which the subjects were selected.

A multivariate F-statistic of 1.13 was obtained. This represents a level of confidence of .20.

On the basis of data displayed in Table 4.14, it was concluded that interaction between the two independent variables did not significantly reflect differences on dependent variable scores among the three behavior classifications.

It was then permissible to further investigate and statistically interpret differences on dependent variable scores which were reflected due to the effects of each of the independent variables, MI sub-score classifications and schools.

TABLE 4.14.--Two-way MANOVA of the 16 PF Scores and Interaction Between Schools and MI Ratings for Males (N=332) Classified as Average, Over-Controlled or Under-Controlled by MI Sub-Scores.

Multivariate Test of Equality of Mean Vectors
Multivariate F-Statistic 1.13

With 96 and 1734.8 Degrees of Freedom

Level of Significance P < .20

Factor	Between MS	Univariate F-Statistic	P Less Than[a]
A	5.04	0.70	.65
B	4.34	0.99	.43
C	7.09	0.53	.78
E	14.27	1.36	.23
F	5.79	0.31	.91
G	20.05	2.17	.05
H	38.47	1.71	.12
I	23.34	2.33	.03
M	1.54	0.17	.99
N	10.31	1.46	.19
O	7.19	0.63	.71
Q1	6.06	0.75	.61
Q2	21.18	2.01	.06
Q3	19.51	2.57	.02
Q4	26.45	1.59	.15

Note: Degrees of freedom for F-statistic: Interaction 6; error 320.

[a]These may not be true levels of significance.

The differences on dependent variables, i.e., 16 PF scores, which were attributable to the dependent variable school main effects are presented in Table 4.15. A multivariate F-statistic of 0.99 was obtained by a two-way MANOVA. This represented a .49 level of significance.

The effect of the independent variable school did not significantly reflect differences on the 16 PF Questionnaire scores, the dependent variables.

Using a two-way MANOVA on the scores of all factors on the 16 PF Questionnaire for all males (N=332) classified as indicating average, over-controlled or under-controlled behavior by the MI sub-scores, a value of 2.06 was obtained for the multivariate F-statistic. This F-ratio was associated with a .0007 level of confidence.

The .05 confidence level was chosen for rejecting the null hypothesis. Table 4.16 presents the data obtained from the two-way MANOVA for the effects of the independent variable MI sub-score behavior classifications. On the basis of this data the null hypothesis (H_o2) of no significant differences among groups of males classified average behavior, over-controlled behavior or under-controlled behavior by the MI sub-scores on dimensions of self-concept as measured by the 16 PF Questionnaire, must be rejected.

The univariate F-statistic and the associated probability levels for each dependent variable presented

TABLE 4.15.--Two-way MANOVA of the 16 PF Scores and the Schools for Males Classified as Average, Over-Controlled or Under-Controlled by MI Sub-Scores.

Multivariate Test of Equality of Mean Vectors
Multivariate F-Statistic 0.99

With 48 and 907.9 Degrees of Freedom

Level of Significance P < .49

Factor	Between MS	Univariate F-Statistic	P Less Than[a]
A	9.79	1.35	.26
B	2.92	0.67	.57
C	45.68	3.43	.02
E	5.72	0.55	.65
F	6.58	0.39	.76
G	12.73	1.38	.25
H	18.17	0.81	.49
I	23.91	2.39	.07
L	22.79	2.48	.06
M	3.80	0.42	.74
N	3.71	0.52	.67
O	17.91	1.57	.20
Q1	0.70	0.09	.97
Q2	13.92	1.32	.27
Q3	4.73	0.62	.60
Q4	46.81	2.81	.04

Note: Degrees of freedom for univariate F-statistic: Between schools 3; error 320.

[a]These may not be true levels of significance.

TABLE 4.16.--Two-way MANOVA of the 16 PF Scores and the Categories of Average, Over-Controlled and Under-Controlled Behavior of Males as Classified by the MI Sub-Scores.

Multivariate Test of Equality of Mean Vectors
Multivariate F-Statistic 2.06

With 32 and 610 Degrees of Freedom

Level of Significance P < .0007

Factor	Between MS	Univariate F-Statistic	P Less Than[a]
A	16.05	2.21	.11
B	7.34	1.68	.19
C	32.58	2.45	.09
E	19.67	1.88	.15
F	161.17	9.53	.0001
G	101.63	11.00	.0001
H	113.41	5.04	.007
I	11.67	1.17	.31
L	7.79	0.85	.43
M	17.42	1.93	.15
N	18.56	2.62	.07
O	17.05	1.50	.23
Q1	12.02	1.48	.23
Q2	32.25	4.11	.02
Q3	34.63	4.56	.01
Q4	12.85	0.77	.46

Note: Degrees of freedom for univariate F-statistic between categories 2; error 320.

[a]These may not be true levels of significance.

in Table 4.16 may not be true levels of significance since the sixteen dependent variables are not independent. Each factor may combine with one or more other factors to reflect the collective differences which have been shown to discriminate among the independent variables of behavior categories.

Table 4.17 presents the statistical significant correlation coefficients among the factors of the 16 PF Questionnaire for the males (N=332) grouped into behavioral categories by the MI sub-scores.

A statistical correlation coefficient of plus or minus .25 is significant at the .01 level of confidence with more than 100 degrees of freedom.

A number of the dependent variables correlate significantly inversely and directly. The data indicated that twenty inter-correlations are significant at the .01 level of confidence of 120 possible correlations. It can be concluded that the sixteen dependent variables of the 16 PF Questionnaire are in fact not independent.

Factors with .10 or less univariate probability levels in Table 4.16 can be selected as variables which individually account for the largest proportion of the total dependent variables score differences among the three MI sub-score behavior classifications.

Factors F and G reflect to the greatest extent, differences among MI classified behavior categories for

TABLE 4.17.--Sample Correlation Matrix for Factors f 16 PF Questionnaire for Behavior Classifications of Average, Over-Controlled and Under-Controlled by MI Sub-Scores (Males N=332).

Factor	A	B	C	E	F	G	H	I	L	M	N	O	Q1	Q2	Q3	Q4
A																
B	-03															
C	08	06														
E	07	26*	-06													
F	25*	07	14	29*												
G	12	08	21	-13	05											
H	29*	-02	23	33*	51*	14										
I	22	-01	-05	06	-03	04	11									
L	-01	05	-29*	37*	20	-15	-02	-01								
M	-02	18	12	11	-01	-05	04	13	-09							
N	-04	-18	02	-23	-18	09	-06	01	-12	-08						
O	-02	-12	-35*	-06	-11	-09	-16	-01	22	-11	13					
Q1	-01	07	-04	35*	05	-23	03	01	24	08	-18	-09				
Q2	-38*	13	-11	10	-28*	-10	-31*	-03	08	07	-02	-01	16			
Q3	12	01	25*	-14	-03	36*	17	03	-25*	12	-12	-15	-13	-02		
Q4	-08	-09	-51*	18	02	-20	-19	01	39*	-16	-03	32*	03	08	-29*	

Note: For clarity the decimal point before each number has been omitted.

*Correlation coefficient of .25 P < .01 with over 100 degrees of freedom.

males. Dependent variables H, Q2, and Q3 individually differentiate among the three groups at an intermediate level. Factors C and N represent a less powerful discriminatory value among the classifications of behavior. The remaining dependent variables reflect very minimal differences in the 16 PF scores among the behavioral ratings.

Table 4.18 presents directional descriptions of the 16 PF factors and mean scores for each dependent variable in each of the classifications of MI behavioral group. Males in the average behavior group with a mean of 15.42 on factor F indicated they were more sober than happy-go-lucky. Those classified as under-controlled indicated that they possessed more of the expedient trait with a mean of 10.17 on factor G. Students in the over-controlled group saw themselves as the most conscientious with a mean of 12.61 on factor G.

On factor H males in the average behavior group saw themselves as more venturesome (mean 13.56) than male subjects in the under-controlled group who indicated that they were more shy with a mean of 12.05 on this variable.

Males in the over-controlled classification saw themselves as higher on the trait self-sufficiency (Q2) with a mean of 11.76, with subjects in the other categories.

TABLE 4.18.--Means for 16 PF Scores of Males (N=332) Classified as Average, Over-Controlled or Under-Controlled by the MI Sub-Scores and Polarized Factor Descriptions.

Factor	Low Score Description	High Score Description	A[a]	O[b]	U[c]
A	Reserved	Outgoing	8.92	8.33	8.28
B	Less intelligent	More intelligent	7.42	7.22	6.94
C	Affected by feelings	Emotionally stable	14.79	14.83	13.82
E	Humble	Assertive	13.30	12.56	13.62
F	Sober	Happy-go-lucky	15.42	12.80	14.10
G	Expedient	Conscientious	11.09	12.61	10.17
H	Shy	Venturesome	13.56	11.67	12.05
I	Tough-minded	Tender-minded	9.31	8.98	8.71
L	Trusting	Suspicious	9.38	9.24	9.82
M	Practical	Imaginative	10.84	9.94	10.78
N	Forthright	Shrewd	9.44	10.07	9.03
O	Self-assured	Apprehensive	11.55	11.13	12.10
Q1	Conservative	Experimenting	9.86	9.33	10.17
Q2	Group dependent	Self-sufficient	10.34	11.76	10.82
Q3	Undisciplined self-conflict	Controlled	11.67	12.31	10.94
Q4	Relaxed	Tense	12.85	12.59	13.38

[a]Average behavior.

[b]Over-controlled behavior.

[c]Under-controlled behavior.

Male subjects in the under-controlled behavioral category indicated a degree of undisciplined self-conflict with a mean of 10.94 on factor Q3, while males in the over-controlled behavior group revealed they were much more controlled with a mean of 12.31 on this same variable.

Subjects in classification under-controlled could be characterized as more affected by feelings with a mean of 13.82 on factor C, while those categorized as over-controlled indicated they were more emotionally stable with a mean of 14.83 on the same factor.

Males classified as under-controlled by the MI saw themselves as more forthright than those in other behavior groups with a mean of 9.03 on factor N.

Difference Among MI Sub-Score Categories for Females

The following is the null hypothesis which was tested for each of the categories of behavior for females:

H_o2: There are no significant differences among groups classified average behavior, over-controlled behavior or under-controlled behavior by the MI sub-scores on dimensions of self-concept as measured by the 16 PF Questionnaire.

Table 4.19 presents the two-way MANOVA of scores on the 16 PF Questionnaire for females and interaction between the independent variables, MI categories and

TABLE 4.19.--Two-way MANOVA of the 16 PF Scores and Interaction Between Schools and MI Ratings for Females (N=336) Classified as Average, Over-Controlled or Under-Controlled by MI Sub-Scores.

Multivariate Test of Equality of Mean Vectors
Multivariate F-Statistic 1.00

With 96 and 1757.5 Degrees of Freedom

Level of Significance P < .49

Factor	Between MS	Univariate F-Statistic	P Less Than[a]
A	4.51	0.55	.77
B	8.03	2.02	.06
C	13.41	0.95	.46
E	30.36	2.54	.02
F	17.50	1.16	.33
G	13.42	1.36	.23
H	57.08	2.51	.02
I	2.23	0.33	.92
L	6.74	0.72	.64
M	7.99	0.83	.55
N	8.89	1.24	.28
O	6.70	0.62	.71
Q1	3.49	0.49	.82
Q2	13.39	1.36	.23
Q3	5.94	0.66	.68
Q4	30.32	1.51	.17

Note: Degrees of freedom of univariate F-statistic: Interaction 6; error 324.

[a]These may not be true levels of significance.

independent variables, the four schools which the sample subjects attended.

A multivariate F-statistic of 1.00 was obtained. This indicated a confidence level of .97 for the interactive effects of the two independent variables. The data substantiated a conclusion of no significant interaction between MI classifications and schools. The interactive effect did not reflect possible differences among MI behavioral categories on the dependent variables, the 16 PF Questionnaire results.

It was statistically permissible for further investigation and statistical interpretation of dependent variable differences which may be reflected by the effects of each of the independent variables, MI grouping and schools.

Differences on results of the 16 PF Questionnaire for females (N=336) assigned to behavioral classifications by the MI sub-scores which were attributable to the school main effects are presented in Table 4.20. A multivariate F-ratio of 1.55 with an associated probability level of .01 was obtained. From the data displayed, it was concluded that the .05 significance region has been surpassed and that dependent variable scores for females are significantly different in the sample due to the school in which they were enrolled.

TABLE 4.20.--Two-way MANOVA of the 16 PF Scores and the Schools for Females (N=336) Classified as Average, Over-Controlled or Under-Controlled by MI Sub-Scores.

Multivariate Test of Equality of Mean Vectors
Multivariate F-Statistic 1.55

With 48 and 919.8 Degrees of Freedom

Level of Significance P < .01

Factor	Between MS	Univariate F-Statistic	P Less Than[a]
A	7.47	0.92	.43
B	5.59	1.41	.24
C	50.34	3.56	.01
E	1.39	0.12	.95
F	24.82	1.64	.18
G	29.18	2.97	.03
H	46.99	2.04	.11
I	33.01	4.81	.003
L	6.95	0.74	.53
M	3.31	0.34	.79
N	3.81	0.53	.66
O	7.74	0.69	.56
Q1	12.09	1.68	.17
Q2	31.54	3.20	.02
Q3	66.28	7.33	.0001
Q4	33.28	1.66	.18

Note: Degrees of freedom for univariate F-statistic: Between schools 3; error 324.

[a]These may not be true levels of significance.

The univariate F-ratios and associated confidence levels may not be true significant levels as the sixteen dependent variables were not independent in their effect on the differences among behavior groups. These inter-correlations are presented in Table 4.21. There are twenty-five statistically significant coefficient correlations among the 120 possible inter-correlations. A correlation coefficient of plus or minus .25 was significant at the .01 confidence level. On the basis of data displayed in Table 4.21 it can be concluded the sixteen dependent variables do not independently reflect differences among female MI classified behavioral groups but act in connection with one or more other of the 16 PF factors.

Table 4.20 revealed that five of the dependent variables may be the most discriminatory of the sixteen factors among females from the four schools. Factor Q3 reflected the strongest difference, and factor I discriminated at the next highest level. Factors C, Q2, and G were strong contributors to the between school differences with each of the variables at approximately the same level of discrimination.

The school means and a directional description is shown for each of the sixteen variables on the 16 PF Questionnaire in Table 4.22.

The data revealed that female subjects who were placed into behavioral groups by the MI sub-scores may

TABLE 4.21.--Sample Correlation Matrix for Factors of 16 PF Questionnaire for Behavior Classifications of Average, Over-Controlled and Under-Controlled by MI Sub-Scores (Females N=336).

Factor	A	B	C	E	F	G	H	I	L	M	N	O	Q1	Q2	Q3	Q4
A																
B	-01															
C	04	02														
E	15	02	-07													
F	30*	15	06	27*												
G	18	01	19	-13	-03											
H	26*	06	33*	32*	44*	16										
I	20	07	-01	10	08	-01	06									
L	01	01	-44*	24	15	-15	-04	01								
M	-06	09	17	15	-03	-17	06	08	-07							
N	07	-13	-04	-27*	-12	18	-09	-11	-09	-15						
O	07	03	-45*	-07	02	-09	-28*	14	31*	-08	04					
Q1	-05	-09	-05	18	07	-13	02	-08	26*	14	-06	-04				
Q2	-34*	03	-11	-08	-30*	-11	-30*	-11	11	10	01	06	-16			
Q3	07	-07	34*	-25*	-06	42*	17	-05	-33*	-05	18	-25*	10	-14		
Q4	09	10	-55*	23	07	-19	-24	12	45*	-05	-08	48*	01	02	-41*	

Note: For clarity the decimal point before each number has been omitted.

*Correlation coefficient of .25 P < .01 with over 100 degrees of freedom.

TABLE 4.22.--Factor Descriptions and Mean Scores on 16 PF Factors From Four Schools for Females (N=336) Classified as Average, Over-Controlled or Under-Controlled by MI Sub-Scores.

Factor	Factor Description		School			
	Low Scores	High Scores	I	II	III	IV
A	Reserved	Outgoing	11.00	10.29	10.96	11.09
B	Less intelligent	More intelligent	7.37	7.62	6.90	7.61
C	Affected by feelings	Emotionally stable	13.50	14.54	15.09	15.11
E	Humble	Assertive	11.57	11.76	11.49	11.14
F	Sober	Happy-go-lucky	15.46	16.28	16.14	16.71
G	Expedient	Conscientious	12.11	10.49	12.25	12.27
H	Shy	Venturesome	12.80	13.71	13.59	13.56
I	Tough-minded	Tender-minded	12.85	13.96	12.48	13.85
L	Trusting	Suspicious	9.34	9.23	9.04	8.75
M	Practical	Imaginative	9.97	10.43	9.96	9.88
N	Forthright	Shrewd	9.52	9.88	10.36	10.19
O	Self-assured	Apprehensive	12.86	12.71	12.34	12.22
Q1	Conservative	Experimenting	8.82	8.64	8.48	8.07
Q2	Group dependent	Self-sufficient	9.86	10.66	9.44	8.92
Q3	Undisciplined self-conflict	Controlled	11.64	10.76	12.11	13.19
Q4	Relaxed	Tense	14.24	14.85	13.48	13.57

vary in score means for factors Q3, I, C, Q2, and G due to the independent variable school.

Subjects in School IV with a mean of 13.19 on factor Q3 were more controlled. A mean on factor I of 12.48 indicated that the females in School III were more tough-minded than those in the three other sample schools. Subjects in School I were the least emotionally stable with a mean of 13.50 on factor C. School IV females with a mean of 8.92 on factor Q2 were the most group dependent among the four schools.

A mean of 10.49 on factor G for School II females characterized them as the most expedient and least conscientious of all school sample populations.

It was concluded that the independent variable schools did effect differences on some identifiable dependent variables.

The factors which discriminated among female behavior groups are presented in Table 4.23. This was obtained using a two-way MANOVA of the 16 PF Questionnaire scores and the categories of average, over-controlled and under-controlled behavior as classified by MI sub-scores. This analysis for the behavioral group dependent variables revealed a multivariate F-ratio of 2.44. This indicated significance at the .0001 level of confidence.

The .05 level of confidence was chosen for rejecting the null hypothesis.

TABLE 4.23.--Two-way MANOVA of the 16 PF Scores and the Categories of Average, Over-Controlled and Under-Controlled Behavior of Females as Classified by the MI Sub-Scores.

Multivariate Test of Equality of Mean Vectors
Multivariate F-Statistic 2.44

With 32 and 618 Degrees of Freedom

Level of Significance P < .0001

Factor	Between MS	Univariate F-Statistic	P Less Than[a]
A	15.87	1.95	.14
B	1.25	0.32	.73
C	46.28	3.28	.04
E	52.85	4.43	.01
F	51.78	3.42	.03
G	95.89	9.75	.0001
H	66.52	2.88	.06
I	30.20	4.40	.01
L	57.37	6.11	.003
M	3.94	0.41	.66
N	12.26	1.71	.18
O	12.87	1.15	.32
Q1	15.06	2.10	.12
Q2	10.52	1.07	.35
Q3	99.36	10.99	.0001
Q4	78.22	3.91	.02

Note: Degrees of freedom for univariate: Between categories 2; error 324.

[a]These may not be true levels of significance.

The data obtained using the two-way MANOVA for the effects of the independent variable, MI behavioral classifications, was conclusive evidence that the null hypothesis (H_o2) of no significant differences among groups of females classified average behavior, over-controlled behavior or under-controlled behavior by the MI sub-scores on dimensions of self-concept as measured by the 16 PF Questionnaire must be rejected.

The univariate F-ratios and associated probability levels obtained and presented in Table 4.23 for each factor may not be true levels of significance. The sixteen dependent variables are not independent. Each dependent variable may combine with others to effect the collective differences which discriminated among the behavioral categories or independent variable.

The inter-correlations among the dependent variables derived from the 16 PF scores of females (N=336) were presented in Table 4.21. There were twenty-one statistically significant coefficient correlations among the sixteen dependent variables. Some were direct and others were inverse correlations. This number of correlations at the .01 level of confidence substantiated non-independence of the dependent variables.

Factors with .10 or better univariate probability levels could be identified as those which contributed the major 16 PF score differences among the MI sub-score

behavioral classifications for female subjects in the samples from the four schools.

Table 4.23 revealed that nine of sixteen dependent variables may contribute significantly to the 16 PF score variance among the three MI behavioral classifications.

It was asserted that the remaining seven factors did not discriminate among the three behavioral groups.

Factors G, L, and Q3 substantially contributed to between group score differentials.

Factors E, I, and Q4 individually accounted for between group score variance at an intermediate level.

At a less powerful discriminatory level, factors C, F, and H accounted for how subjects saw themselves differently in the three behavior groups.

Group means of the 16 PF scores and directional factor descriptions are presented in Table 4.24.

Factor G was a strong discriminating variable and indicated females in the under-controlled category with a mean of 10.94 are less conscientious than subjects in other behavior groups.

A mean of 10.25 on factor L showed that those in the under-controlled group saw themselves as more suspicious than subjects in other groups.

A mean of 11.02 on factor Q3 for the under-controlled classification would indicate that they possessed undisciplined self-conflict with those in the

TABLE 4.24.--Means for 16 PF Scores of Females (N=336) Classified as Average, Over-Controlled or Under-Controlled by the MI Sub-Scores and Polarized Factor Descriptions.

Factor	Low Score Description	High Score Description	A[a]	O[b]	U[c]
A	Reserved	Outgoing	11.10	11.03	10.25
B	Less intelligent	More intelligent	7.28	7.48	7.23
C	Affected by feelings	Emotionally stable	14.54	15.30	13.55
E	Humble	Assertive	11.46	10.71	12.58
F	Sober	Happy-go-lucky	16.35	15.03	16.57
G	Expedient	Conscientious	11.44	13.16	10.94
H	Shy	Venturesome	13.53	12.25	14.25
I	Tough-minded	Tender-minded	13.78	13.38	12.60
L	Trusting	Suspicious	8.81	8.39	10.25
M	Practical	Imaginative	10.22	10.09	9.79
N	Forthright	Shrewd	9.94	10.42	9.53
O	Self-assured	Apprehensive	12.36	12.19	13.06
Q1	Conservative	Experimenting	8.85	8.09	8.62
Q2	Group dependent	Self-sufficient	9.67	9.33	10.17
Q3	Undisciplined self-conflict	Controlled	11.48	13.25	11.02
Q4	Relaxed	Tense	14.09	12.97	15.24

[a]Average behavior.

[b]Over-Controlled behavior.

[c]Under-controlled behavior.

over-controlled behavior group indicating the most self-control with a mean of 13.25 on factor Q3.

Those females found to be most assertive were found in the under-controlled group with a mean of 12.58 while those who were more humble were in the over-controlled classification with a mean of 10.71 on factor E.

The most tough-minded subjects were in the under-controlled group with a mean of 12.60 on factor I.

Those who saw themselves as most tense were females in the under-controlled group with a factor Q4 mean of 15.24.

The females who could be characterized as most affected by feelings had a mean of 13.55 and were in the under-controlled classification, while those who felt they were most emotionally stable were in the over-controlled classification with a mean of 15.30 on factor C.

The most sober (factor F) subjects were in the over-controlled category with a group mean of 15.03.

A factor H mean of 12.25 indicated that females in the over-controlled MI classification were the most shy while those in the under-controlled group with a group mean of 14.25 were the most venturesome.

Distribution of Sample by MI Total-Scores

Table 4.25 presents the number and percentage distributions of males (N=332) and females (N=336) in

TABLE 4.25.--Number and Percentage Distribution of Males (N=332) and Females (N=336) From Four School Samples into Disturbed and Non-Distrubed Classifications by MI Total Scores.

School		Non-Disturbed			Disturbed			Total	
		Male	Female		Male	Female		Male	Female
I	N	64	91	N	41	20	N	105	111
	P	61	82	P	39	18			
II	N	71	71	N	15	11	N	86	82
	P	83	87	P	17	13			
III	N	51	51	N	17	16	N	68	67
	P	75	76	P	25	24			
IV	N	52	65	N	21	11	N	73	76
	P	71	86	P	29	14			
Total	N	238	278	N	94	58	N	332	336
	AP	72	83	AP	28	17			

Note: N = number
P = per cent
AP = average percentage

schools and within schools into non-disturbed and disturbed behavior classifications by MI total scores.

Data revealed that 72 per cent of the male subjects were classified as non-disturbed or reasonably well-adjusted while 28 per cent indicated disturbed behavior or problems of adjustment. Subjects in the non-disturbed classification made up 83 per cent of the female sample from the four schools.

The percentage obtained for the number of females classified as possessing disturbed behavior patterns was 17 per cent.

It could be stated that many more males than females across the four schools indicated disturbed behavior.

The highest percentage (39 per cent) of disturbed males as indicated by total score results on the MI were found in School I. The highest percentage (20 per cent) of female subjects were also found in School I.

Differences Between Non-Disturbed and Disturbed MI Classifications for Males

The following null hypothesis was tested for each of the behavior groups of males:

H_o3: There are no significant differences between groups classified as non-disturbed and disturbed by the MI total scores on self-concept dimensions as measured by the 16 PF Questionnaire.

Interaction between the independent variables group classifications and the independent variable schools is presented in Table 4.26. A two-way MANOVA of scores on the 16 PF Questionnaire, the dependent variables for males (N=332) and interaction between the independent variables indicated a multivariate F-ratio of 0.95. This represented a confidence level of .57.

On the basis of data obtained it was concluded that interaction between behavior classifications and the four schools did not significantly reflect differences on 16 PF scores for males in the disturbed and non-disturbed groups.

It was then permissible to continue an investigation and statistical interpretation of differences on dependent variable scores which may have occurred from the effects of each of the independent variables, MI total score behavior classifications and the schools from which the male subjects were chosen.

The differences on 16 PF Questionnaire scores which could be attributed to the school main effects are presented in Table 4.27. A multivariate F-statistic of 1.06 was obtained by a two-way MANOVA. This represents a .36 level of significance.

The effect of the independent variable, schools, did not significantly reflect differences on the dependent variables, 16 PF Questionnaire scores.

TABLE 4.26.--Two-way MANOVA of the 16 PF Scores and Interaction Between Schools and Ratings for Males (N=332) Classified as Non-Disturbed or Disturbed by the MI Total Scores.

Multivariate Test of Equality of Mean Vectors
Multivariate F-Statistic 0.95

With 48 and 919.8 Degrees of Freedom

Level of Significance P < .57

Factor	Between MS	Univariate F-Statistic	P Less Than[a]
A	23.78	3.34	.02
B	7.39	1.73	.16
C	8.80	0.68	.57
E	18.84	1.84	.14
F	8.41	0.48	.70
G	1.19	0.13	.94
H	12.58	0.54	.66
I	0.74	0.07	.98
L	4.04	0.47	.71
M	14.14	1.59	.19
N	18.03	2.55	.06
O	11.55	1.04	.37
Q1	5.87	0.74	.53
Q2	17.88	1.65	.18
Q3	0.41	0.05	.98
Q4	4.76	0.28	.84

Note: Degrees of freedom for univariate F-statistic: Interaction 3; error 324.

[a]These may not be true levels of significance.

TABLE 4.27.--Two-way MANOVA of the 16 PF Scores and the Schools for Males Classified as Non-Disturbed or Disturbed by the MI Total Scores.

Multivariate Test of Equality of Mean Vectors
Multivariate F-Statistic 1.06

With 48 and 919.8 Degrees of Freedom

Level of Significance P < .36

Factor	Between MS	Univariate F-Statistic	P Less Than[a]
A	9.41	1.32	.27
B	4.70	1.10	.35
C	44.32	3.42	.02
E	7.76	0.76	.52
F	4.04	0.24	.87
G	13.68	1.45	.23
H	20.62	0.88	.45
I	23.67	2.28	.08
L	29.18	3.36	.02
M	4.08	0.46	.71
N	2.93	0.41	.74
O	14.51	1.31	.27
Q1	1.32	0.17	.92
Q2	16.65	1.54	.20
Q3	6.76	0.88	.45
Q4	48.74	2.89	.04

Note: Degrees of freedom for univariate F-statistic: Between schools 3; error 324.

[a]These may not be true levels of significance.

Using a two-way MANOVA on the 16 PF scores for all males (N=332) from the four schools classified as disturbed or non-disturbed by the MI total scores, a value of 4.01 was obtained for the multivariate F-ratio. This F-ratio was associated with the .0001 confidence level.

The .05 probability level was chosen for rejecting the null hypothesis (H_o3). Table 4.28 presented the data obtained for the effects of the independent variable, behavior classifications, on the dependent variable scores.

On the basis of this data, the null hypothesis (H_o3) of no significant differences between groups of males classified as disturbed or non-disturbed by the MI total scores on dimensions of self-concept as measured by the 16 PF Questionnaire must be rejected.

The univariate F-ratio and the associated confidence levels are presented in Table 4.28. These probability levels may not be true since some factors were not independent. Each factor may combine with one or more other factors to collectively indicate a multivariate significant score discrimination between the behavioral classifications.

The inter-correlations of the 16 PF factors are shown in Table 4.29. The factors correlated directly and inversely. There were eighteen related factor combinations of the possible 120 correlations obtained from the results of 16 PF scores of all male subjects (N=332) in the MI total score categories of disturbed or non-disturbed.

TABLE 4.28.--Two-way MANOVA of the 16 PF Scores and the Categories of Non-Disturbed and Disturbed for Males as Classified by MI Total Scores.

Multivariate Test of Equality of Mean Vectors
Multivariate F-Statistic 4.01

With 16 and 309 Degrees of Freedom

Level of Significance P < .0001

Factor	Between MS	Univariate F-Statistic	P Less Than[a]
A	2.56	0.36	.55
B	31.11	7.30	.007
C	150.03	11.58	.0008
E	83.03	8.08	.005
F	27.86	1.58	.21
G	211.43	22.37	.0001
H	20.16	0.86	.35
I	0.03	0.003	.95
L	128.30	14.79	.0002
M	1.02	0.11	.74
N	18.39	2.60	.11
O	97.99	8.83	.003
Q1	51.70	6.48	.01
Q2	10.06	0.93	.34
Q3	111.07	14.40	.002
Q4	26.49	1.57	.21

Note: Degrees of freedom for univariate F-statistic: Between categories 1; error 324.

[a]These may not be true levels of significance.

TABLE 4.29.--Sample Correlation Matrix for Factors of 16 PF Questionnaire for Behavior Classifications of Disturbed and Non-Disturbed by MI Total Scores (Males N=332).

Factor	A	B	C	E	F	G	H	I	L	M	N	O	Q1	Q2	Q3	Q4
A																
B	-02															
C	10	04														
E	08	28*	-05													
F	26*	08	14	32*												
G	12	03	19	-13	-01											
H	30*	-01	23	36*	53*	10										
I	22	-01	-05	05	-03	05	09									
L	01	09	-27*	35*	22	-11	-01	01								
M	-01	17	11	11	02	-07	05	12	-09							
N	-06	-19	02	-23	-21	11	-09	03	-10	07						
O	-03	-11	-35*	-09	-10	-08	-17	-01	20	-11	14					
Q1	02	09	-03	34*	08	-22	05	-02	21	08	-19	-12				
Q2	-37*	11	-12	06	-30*	-05	-34*	-02	06	04	03	-01	12			
Q3	13	-03	23	-15	-05	37*	15	04	-22	-13	14	-14	-12	-01		
Q4	-08	10	-50*	19	03	-20	-17	01	39*	16	-04	-04	03	08	-29*	

Note: For clarity the decimal point before each number has been omitted.

*Correlation coefficient of .25 $P < .01$ with over 100 degrees of freedom.

The eighteen correlations had a correlation coefficient of plus or minus .25 or more which was a confidence level of .01 with over 100 degrees of freedom.

It was concluded that the dependent variables were not independent.

The univariate F-ratios and possible probability levels obtained for the dependent variables are presented in Table 4.28. There were seven of sixteen factors which were analyzed with a possible alpha level of .10 or better.

The highest rank factors reflecting differences on the 16 PF scores between the disturbed and non-disturbed were factors, C, G, and L.

Factors B, E, and O reflected differences on 16 PF scores between male behavior categories at an intermediate level.

Factor Q2 accounted to a lesser degree for differences between the disturbed and non-disturbed classifications on the dependent variables, 16 PF Questionnaire scores.

Table 4.30 presents the means for males (N=332) in the disturbed and non-disturbed MI total score categories for all factors of the 16 PF Questionnaire. The factor descriptions for both high and low 16 PF scores are presented.

It was concluded that males in the non-disturbed category were less affected by feelings and more emotionally stable with a mean of 14.95 on factor C.

TABLE 4.30.--Means for 16 PF Scores of Males Classified as Non-Disturbed or Disturbed by MI Total Scores and Polarized Factor Descriptions.

Factor	Low Score Description	High Score Description	N[a]	D[b]
A	Reserved	Outgoing	8.59	8.79
B	Less intelligent	More intelligent	7.45	6.77
C	Affected by feelings	Emotionally stable	14.95	13.47
E	Humble	Assertive	12.95	14.06
F	Sober	Happy-go-lucky	14.80	14.16
G	Expedient	Conscientious	11.58	9.81
H	Shy	Venturesome	12.98	12.44
I	Tough-minded	Tender-minded	9.08	9.11
L	Trusting	Suspicious	9.09	10.47
M	Practical	Imaginative	10.64	10.77
N	Forthright	Shrewd	9.56	9.05
O	Self-assured	Apprehensive	11.29	12.50
Q1	Conservative	Experimenting	9.61	10.49
Q2	Group dependent	Self-sufficient	10.59	10.98
Q3	Undisciplined self-conflict	Controlled	11.93	10.65
Q4	Relaxed	Tense	12.78	13.40

[a]Non-disturbed.

[b]Disturbed.

Those males with a mean of 11.58 on factor G were substantially more conscientious and saw themselves as less expedient than the disturbed groups.

A mean of 10.47 indicated that males in the disturbed classification considered themselves much more suspicious (factor L) and less trusting than those in the non-disturbed category.

Males in the non-disturbed behavior group revealed that they were more intelligent with a mean of 7.45 on factor B than disturbed subjects in the sample.

Assertiveness (factor E) was a trait possessed by males in the disturbed group with a mean of 14.06.

Males in the disturbed group saw themselves as much more apprehensive (factor O) and less self-assured with a mean of 12.50.

Those subjects in the disturbed classification indicated they were more self-sufficient than the non-disturbed males with a mean of 10.98 on factor Q2.

Differences Between Non-Disturbed and Disturbed MI Classifications for Females

The following is the null hypothesis which was tested for each of the classifications of behavior for females:

H_o3: There are no significant differences between groups classified as non-disturbed and disturbed by the MI total scores on self-concept dimensions as measured by the 16 PF Questionnaire.

Interaction between the independent variables, behavior classifications and the independent variables, schools, is presented in Table 4.31. A two-way MANOVA of scores on the 16 PF Questionnaire, the dependent variables for females (N=336) and interaction between the independent variables indicated a multivariate F-ratio of 1.45. This represented a confidence level of .03. On the basis of data obtained, it was concluded that interaction between schools and behavior classifications did significantly reflect differences on the dependent variables, 16 PF scores.

The interactive effects of the independent variables precluded a continuation of the investigation and statistical interpretation of possible differences on the dependent variables which could be attributed to either of the main effects of behavior classifications or the schools' main effects.

The behavior classification main effects are not independent of the school, they are significantly interrelated.

The null hypothesis (H_o3) of no significant differences between groups classified as disturbed and non-disturbed by the MI total scores on self-concept

TABLE 4.31.--Two-way MANOVA of the 16 PF Scores and Interaction Between Schools and Ratings for Females Classified as Non-Disturbed or Disturbed by the MI Total Score.

Multivariate Test of Equality of Means Vectors
Multivariate F-Statistic 1.45

With 48 and 931.7 Degrees of Freedom

Level of Significance P < .03

Factor	Between MS	Univariate F-Statistic	P Less Than[a]
A	13.37	1.65	.18
B	7.37	1.86	.14
C	15.34	1.07	.36
E	7.79	0.64	.59
F	11.14	0.72	.54
G	2.13	0.21	.89
H	79.21	3.39	.02
I	13.63	1.99	.11
L	6.11	0.68	.57
M	9.68	1.01	.39
N	7.28	1.01	.39
O	0.54	0.05	.99
Q1	9.11	1.30	.27
Q2	28.64	2.92	.03
Q3	4.94	0.53	.66
Q4	25.49	1.29	.28

Note: Degrees of freedom for univariate F-statistic: Interaction 3; error 328.

[a]These may not be true levels of significance.

dimensions as measured by the 16 PF Questionnaire could not be rejected or sustained when significant interaction between independent main effects were present.

Since a two-way MANOVA could not be performed to test for behavior classification main effects nor for the school main effects, they were examined by presenting each of the sixteen dependent variables graphically. The means of each factor for school effects and behavior category effects or interaction are presented in graph form in Figures 4.1 through 4.16. The differences presented are not significant at any chosen alpha level, but discussed only in a subjective manner showing interactive effects where it occurs and other relationships where they are evident.

Graphical Presentation of Differences on Dependent Variables Effected by Schools and Behavior Classifications for Females

Figure 4.1 graphically portrays the interactive effects between the independent variables, schools and behavior classifications in School I and IV on the dependent variable A.

In Schools II and III there were some differences on the dependent variable between classifications.

Between school differences of the mean did not appear to be as much in the non-disturbed category as there appeared to have been in the disturbed classifications.

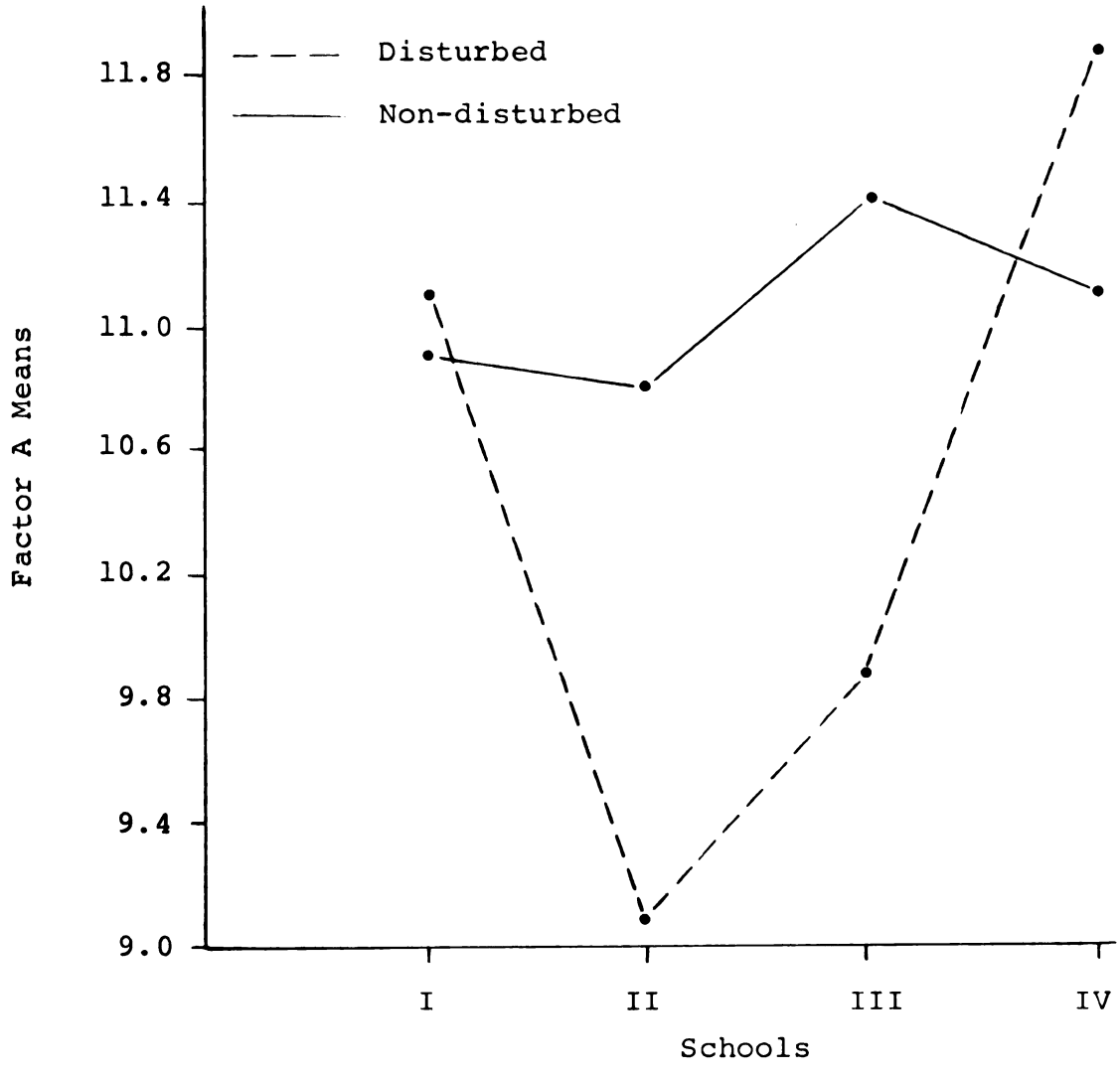

Figure 4.1. Means for Factor A (reserved, outgoing) for disturbed and non-disturbed classifications of females (n = 336) in four schools. Low score description listed first.

Females in non-disturbed classifications indicated they saw themselves as more outgoing in schools IV and III.

The graph in Figure 4.2 indicated the independent variables, school and MI behavior classifications were interacting which precluded any meaningful interpretation of the means for the dependent variable in School II.

Females in School I appeared to be more intelligent in the non-disturbed category than those who indicated they were disturbed.

The means for the disturbed vary rather sharply between all schools.

There was more homogenity on factor B across the schools in the non-disturbed classification.

Figure 4.3 shows that interaction did occur between the independent variables in School II thus diminishing the possible interpretation of the dependent variable means for each behavior category.

There was considerable variance of the factor means between classifications in School I and IV with very little mean difference in School III.

In Schools I, III, and IV the females in the non-disturbed classification saw themselves as more emotionally stable than subjects in the disturbed group.

There were considerable between school differences in both behavior categories.

It was concluded from the graphed data in Figure 4.4 that there was no interaction between the

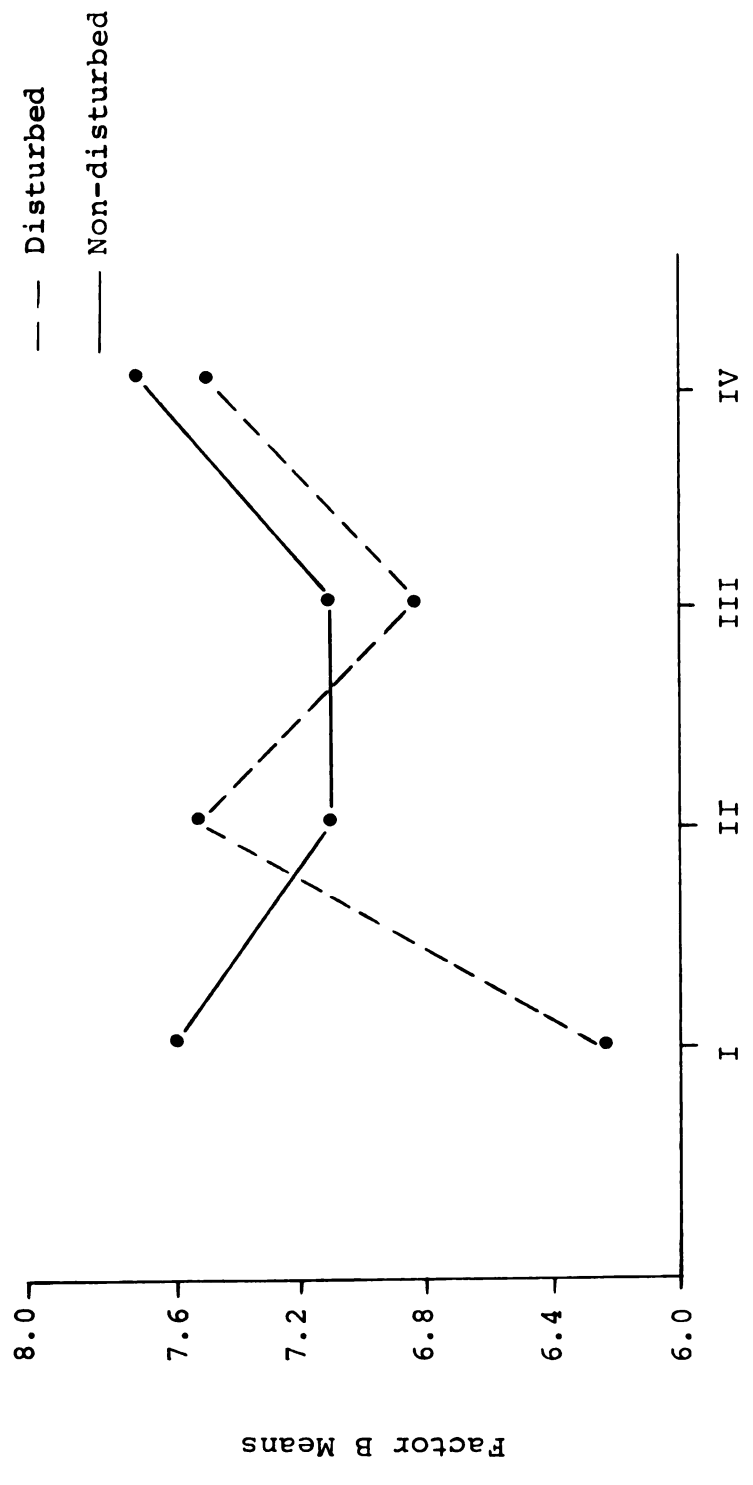

Figure 4.2. Means for Factor B (less intelligent, more intelligent) for disturbed and non-disturbed classifications of females (n = 336) in four schools. Low score description listed first.

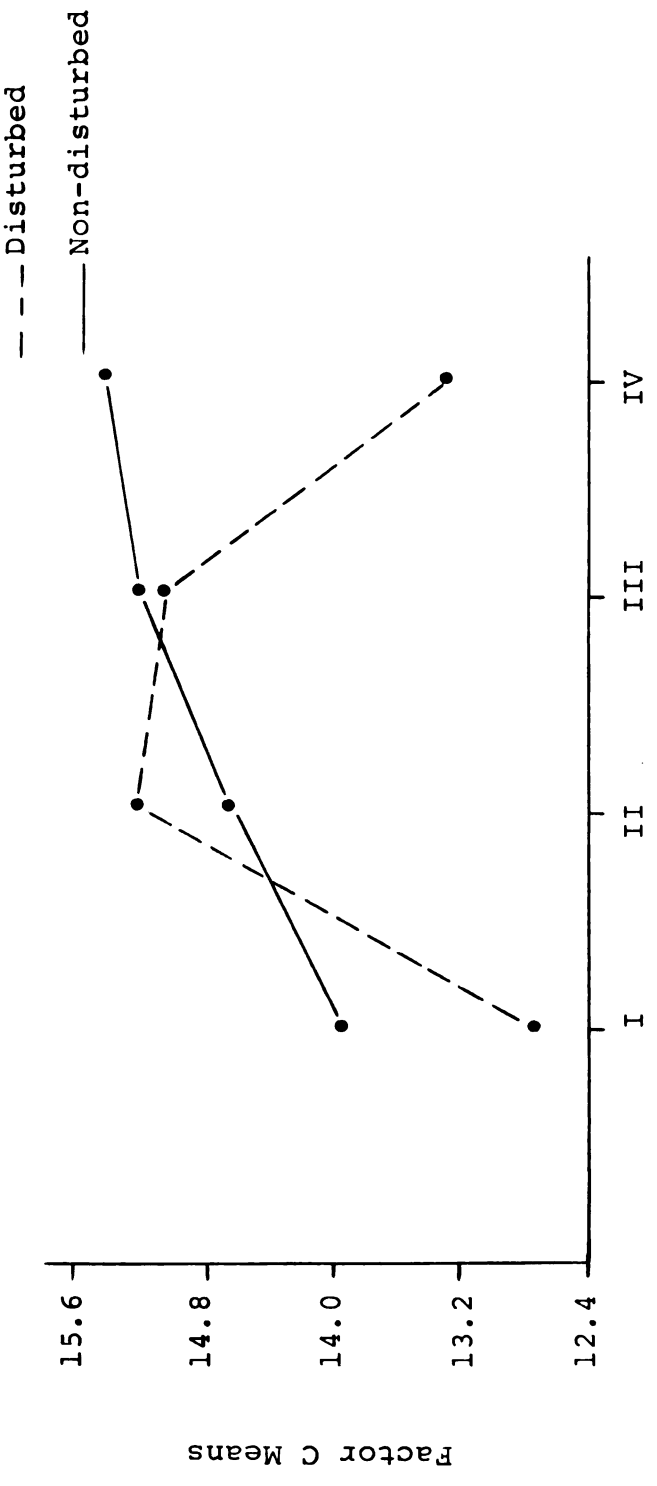

Figure 4.3. Means on Factor C (affected by feelings, emotionally stable) for disturbed and non-disturbed classifications of females (n = 336) in four schools. Low score description listed first.

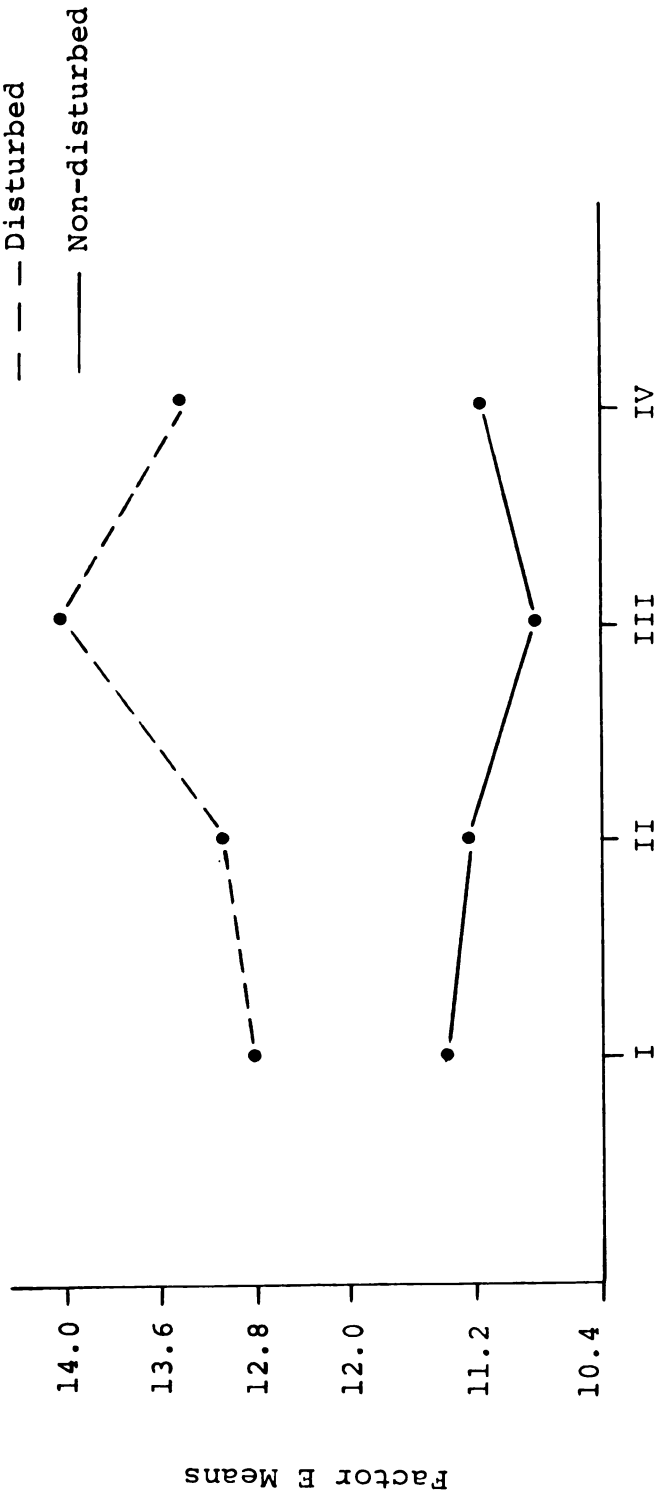

Figure 4.4. Means on Factor E (humble, assertive) for disturbed and non-disturbed classifications of females (n = 336) in four schools. Low score description listed first.

independent variables since the effect of behavior classifications and the dependent variables (16 PF scores) varied in the same direction for each level of the other independent variable, schools.

The between categories differences in School III was much greater than those in the other schools.

The factor means for the disturbed classification between schools varied quite markedly.

From the data graphed in Figure 4.5 it was concluded that there was interaction between the independent variables since the effect of behavior ratings on the 16 PF scores did not vary in the same direction for all levels of the independent school variable, the inverse variance occurring in School III.

Females in School II classified as disturbed saw themselves as more happy-go-lucky than those in any other school in either category. There was greater magnitude in mean scores between schools for those in the disturbed classification.

Figure 4.6 presented a rather classic graph of dependent variable mean differences reflected by the effects of two independent variables. There was no interactive effects and means varied uniformly between behavioral categories.

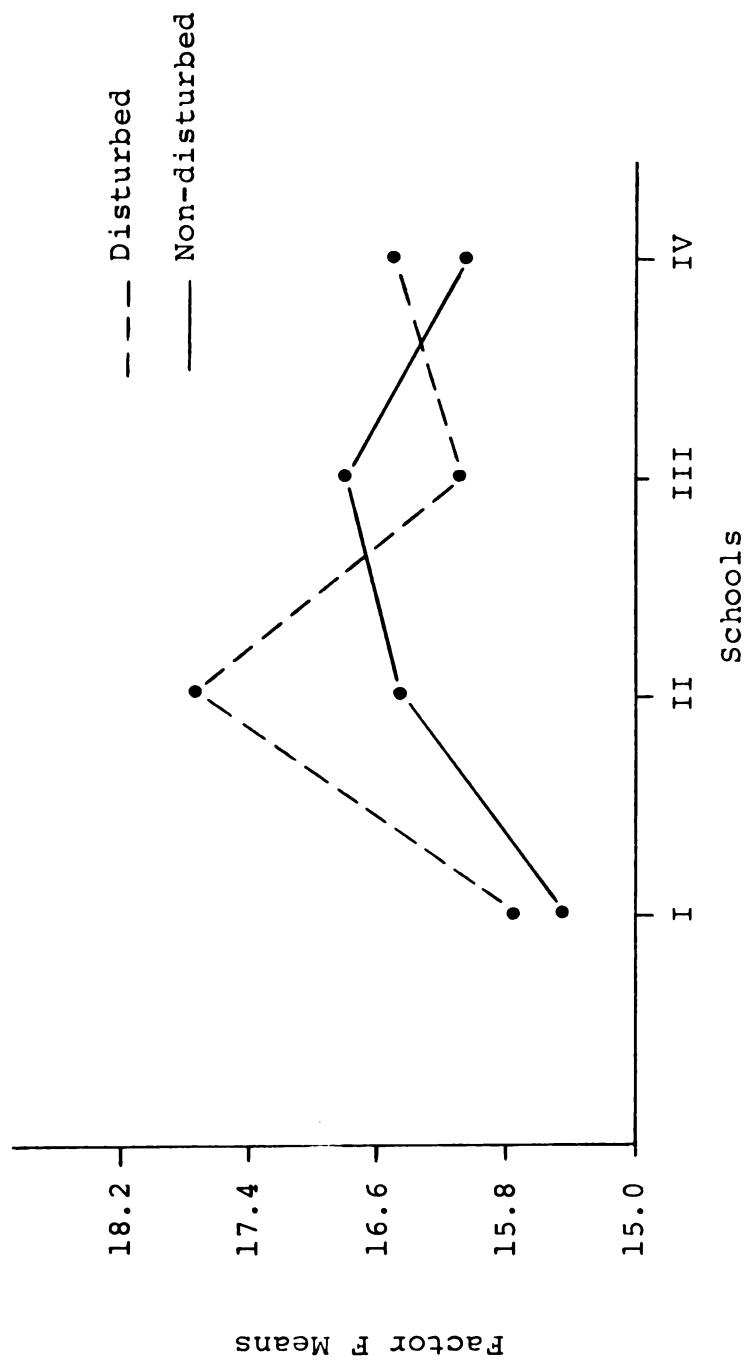

Figure 4.5. Means on Factor F (sober, happy-go-lucky) for disturbed and non-disturbed classifications of females (n = 336). Low score description listed first.

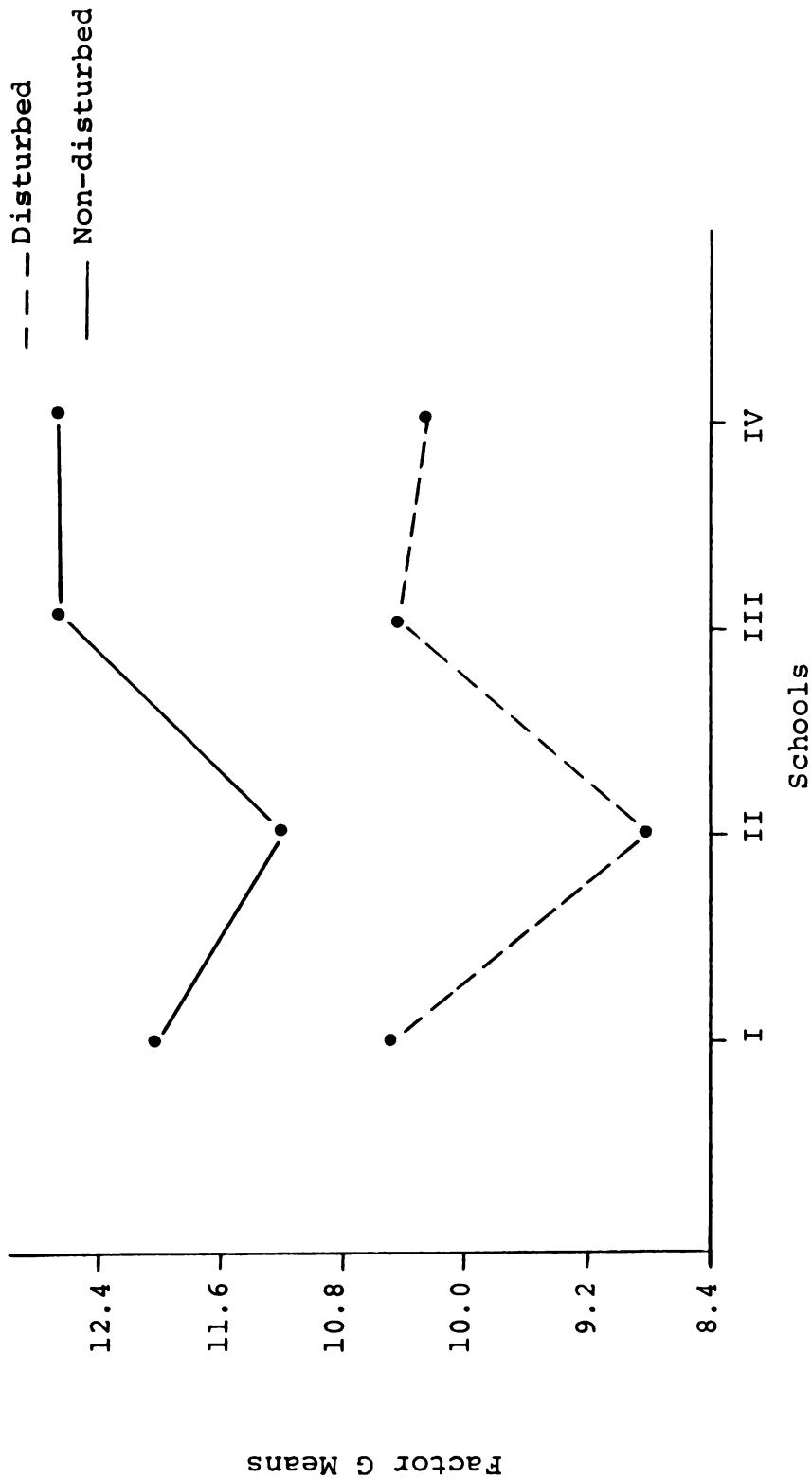

Figure 4.6. Means on Factor G (expedient, conscientious) for disturbed and non-disturbed classifications of females (n = 336). Low score description listed first.

Schools I, III, and IV reflected a very small difference on means for each level of the independent variable, categories.

Those females in the non-disturbed classification saw themselves as more conscientious across all schools.

Subjects in School II indicated they were more expedient in each category.

Interaction between independent variables was presented by Figure 4.7 in Schools I and IV.

There was a considerable magnitude of variance of factor means between behavior classifications in School II. Between school mean differences of the dependent variable in the disturbed category was very large. Females in this classification saw themselves as quite venturesome. Subjects in School III compared closely on this dependent variable.

Figure 4.8 indicated that interaction between schools and behavior categories did occur in School III precluding any meaningful discussion of possible differences in the factor means. Factor I discriminated minimally between independent variable effects.

It was noted that there were more differences of means among schools than between classifications. It cannot be asserted that female subjects in the various schools or in the two behavior groups saw themselves as tough-minded or tender-minded.

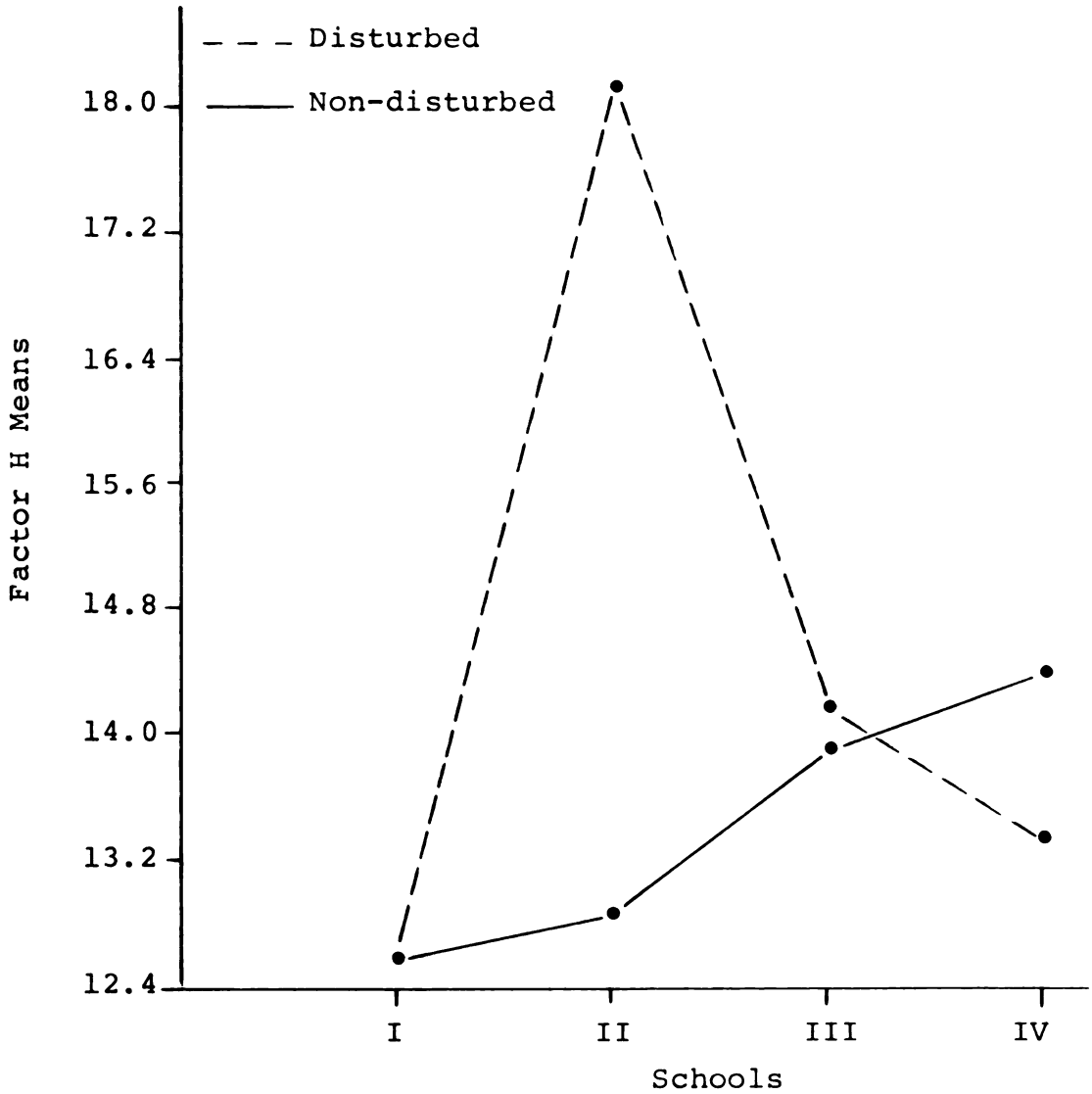

Figure 4.7. Means on Factor H (shy, venturesome) for disturbed and non-disturbed classifications of females (n = 336). Low score description listed first.

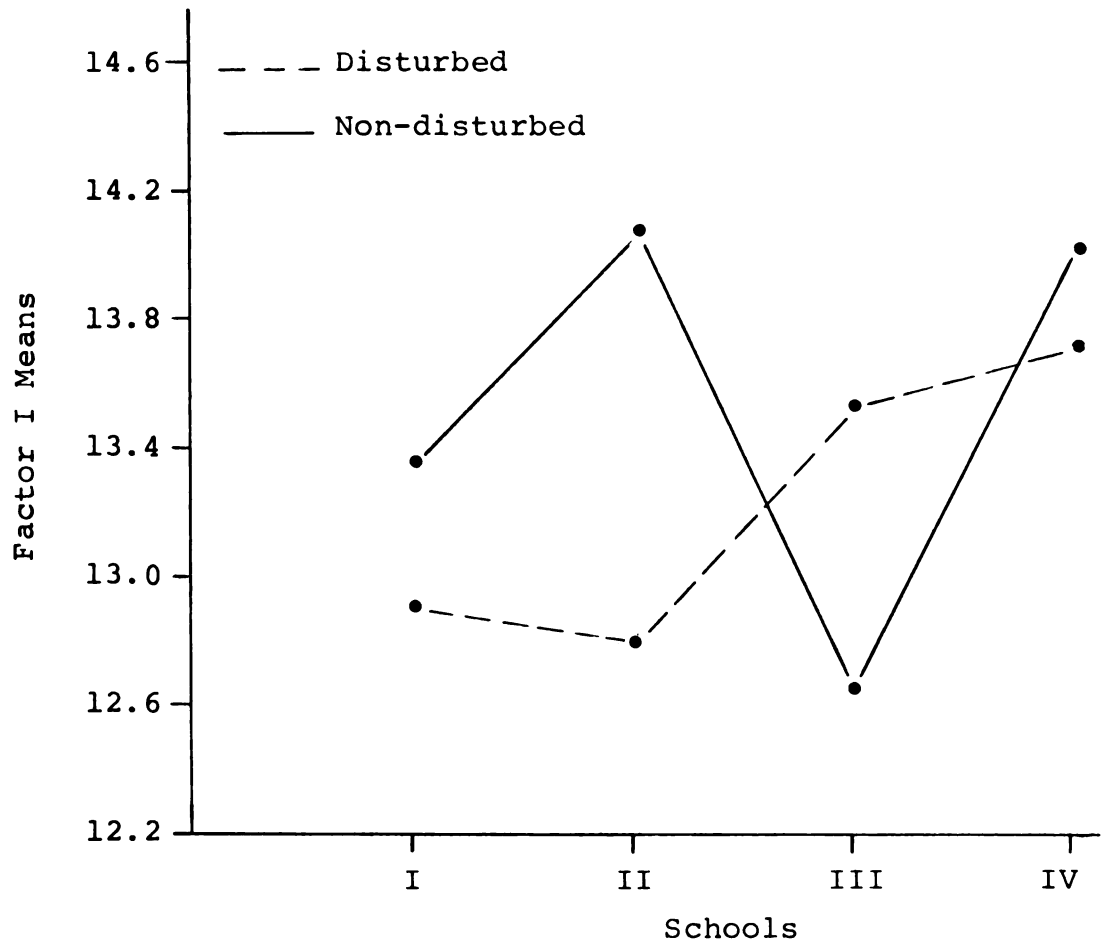

Figure 4.8. Means of Factor I (tough-minded, tender-minded) for disturbed and non-disturbed classifications of females (n = 336) in four schools. Low score description listed first.

It is clearly indicated by the graph in Figure 4.9 that no interaction between schools and behavior classifications occurred.

The means on the dependent variable varied quite markedly between the two levels of the independent variable behavior category. The differences between means among the schools in each classification did not vary appreciably.

There is a clear indication that female subjects in the disturbed category across all schools saw themselves as more suspicious than subjects placed into the non-disturbed group.

The graph in Figure 4.10 indicates the independent variable school had interacted with the independent variable behavior classification in Schools III and IV precluding any interpretation of possible dependent variable differences.

Between school differences did occur among females in the disturbed category. Generally, there was minimal discrimination on the practical to imaginative continuum by the school from which subjects were selected or from the behavior classification into which they were placed.

Figure 4.11 shows that significant interaction had taken place between the two independent variables in the study thus rendering accurate interpretation of possible mean differences of the dependent variable impossible. Interactive effects were present in School III.

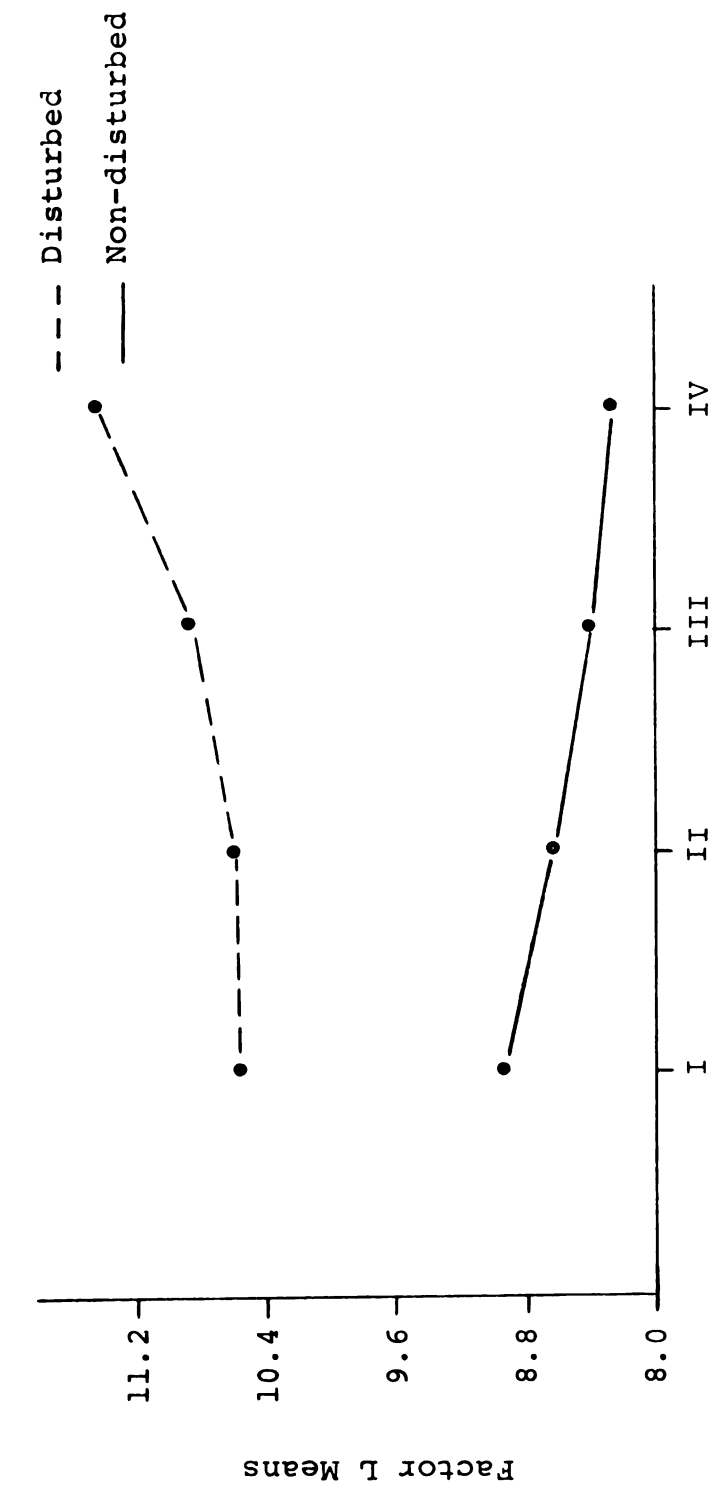

Figure 4.9. Means of Factor L (trusting, suspicious) for disturbed and non-disturbed classifications of females (n = 336). Low score description listed first.

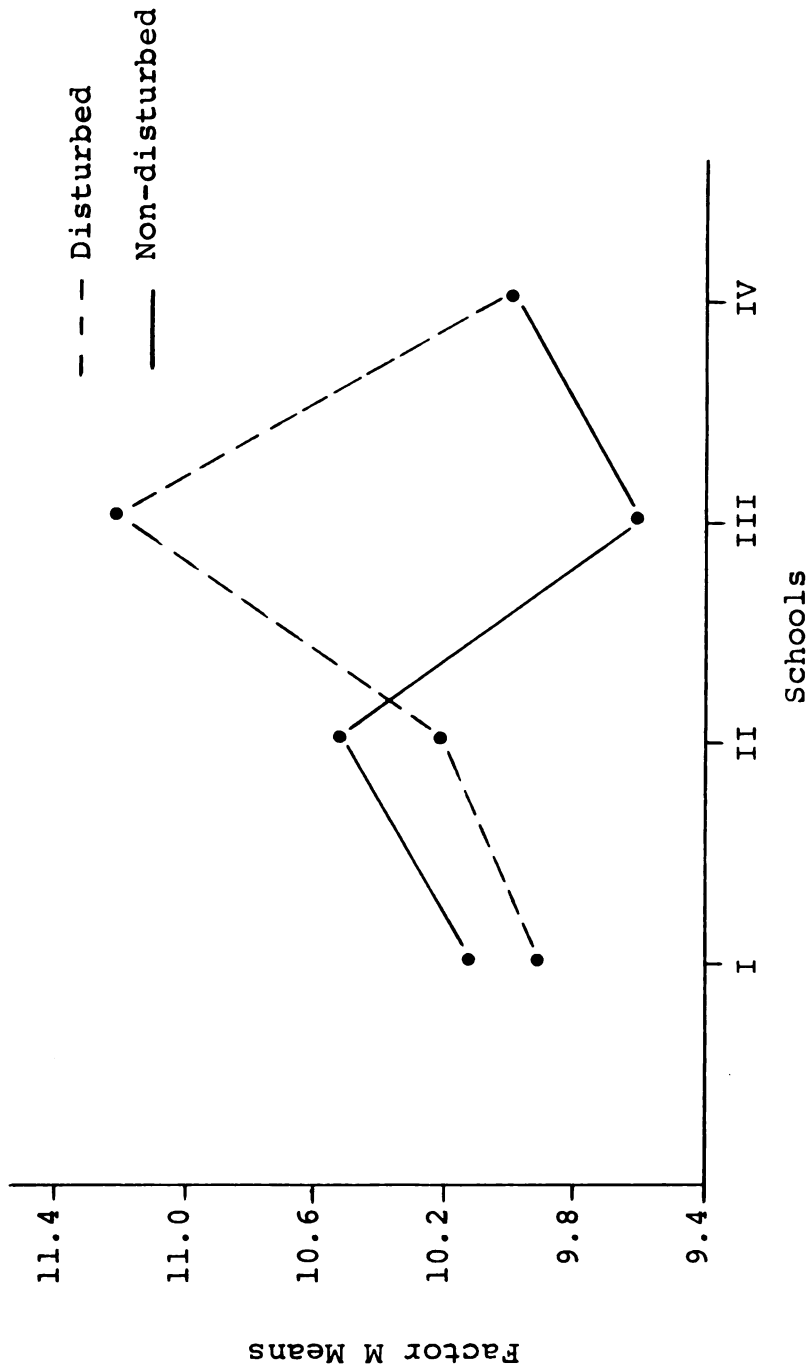

Figure 4.10. Means of Factor M (practical, imaginative) for disturbed and non-disturbed classifications of females (n = 336). Low score description listed first.

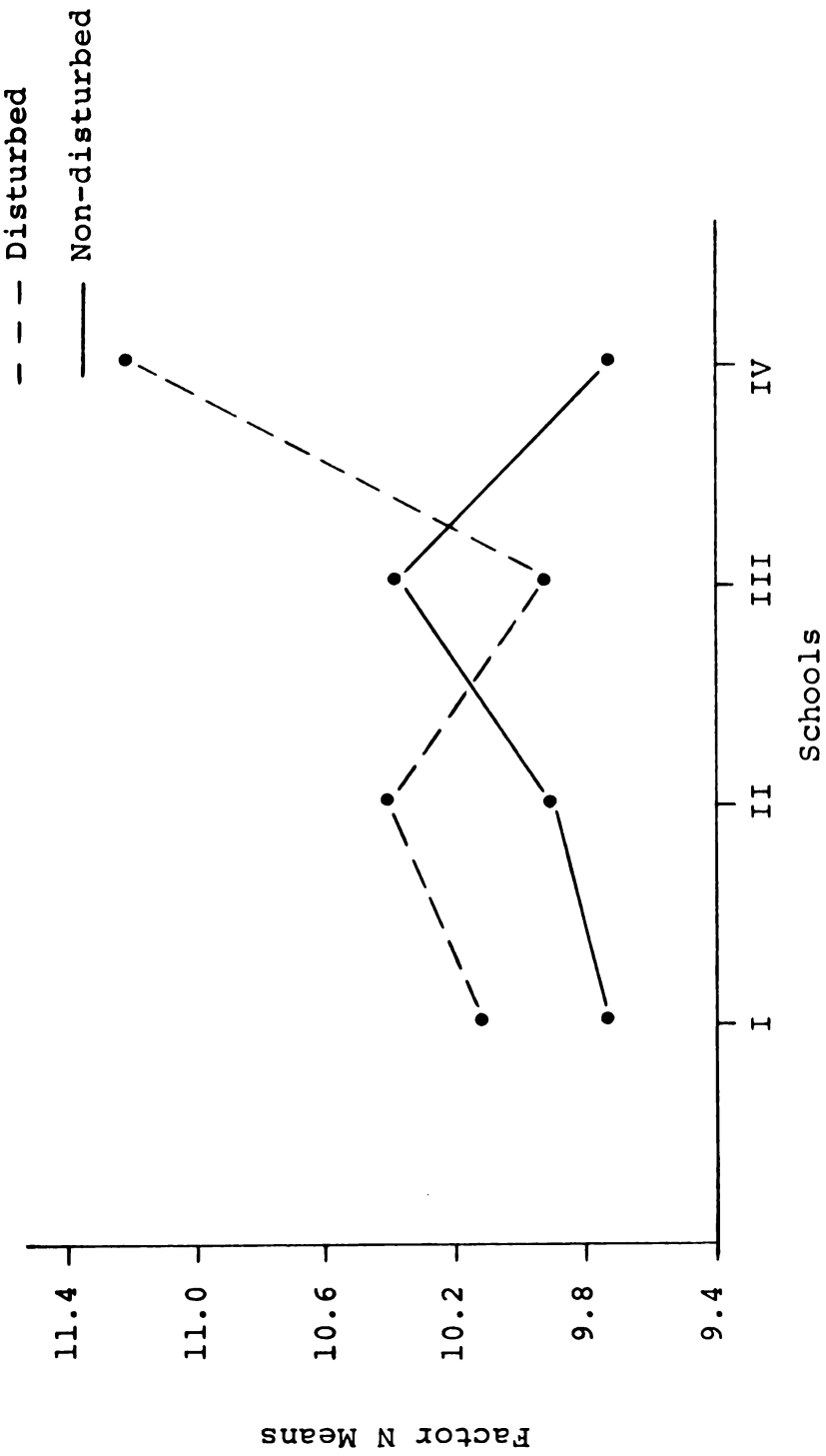

Figure 4.11. Means of Factor N (forthright, shrewd) for disturbed and non-disturbed classifications of females (n = 336). Low score description listed first.

Female subjects in the disturbed group indicated they were more shrewd than those in the non-disturbed group in Schools I, II, and IV. The most marked difference was in School IV.

Factor N scores discriminated very minimally between either of the independent variables.

An analysis of Figure 4.12 revealed that some interaction had occurred among the independent variables in School I. There was minimum variance on factor O means across all schools in each behavior category.

Females in the non-disturbed classification saw themselves as more self-assured, as indicated by slightly lower scores on this dependent variable.

The graph in Figure 4.13 portrays that interaction had occurred since the effects of behavior classifications on the dependent variable (factor Q1) did not vary in the same direction for each of the four levels of the independent variable, school. No interpretation of between category differences could be made for School II.

There was moderate between category variance of the dependent variables in Schools I, III, and IV. The between school differences in the disturbed group were relatively strong.

Generally, females in the disturbed category indicated they were not too conservative but, most likely, experimenting.

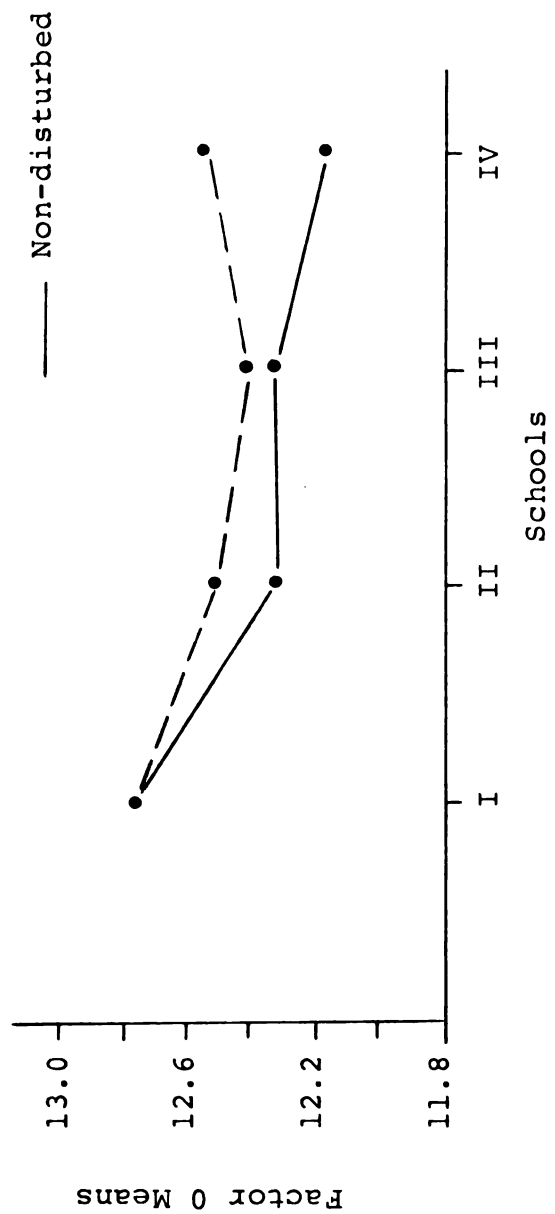

Figure 4.12. Means of Factor 0 (self-assured, apprehensive) for disturbed and non-disturbed classifications of females (n = 336). Low score description listed first.

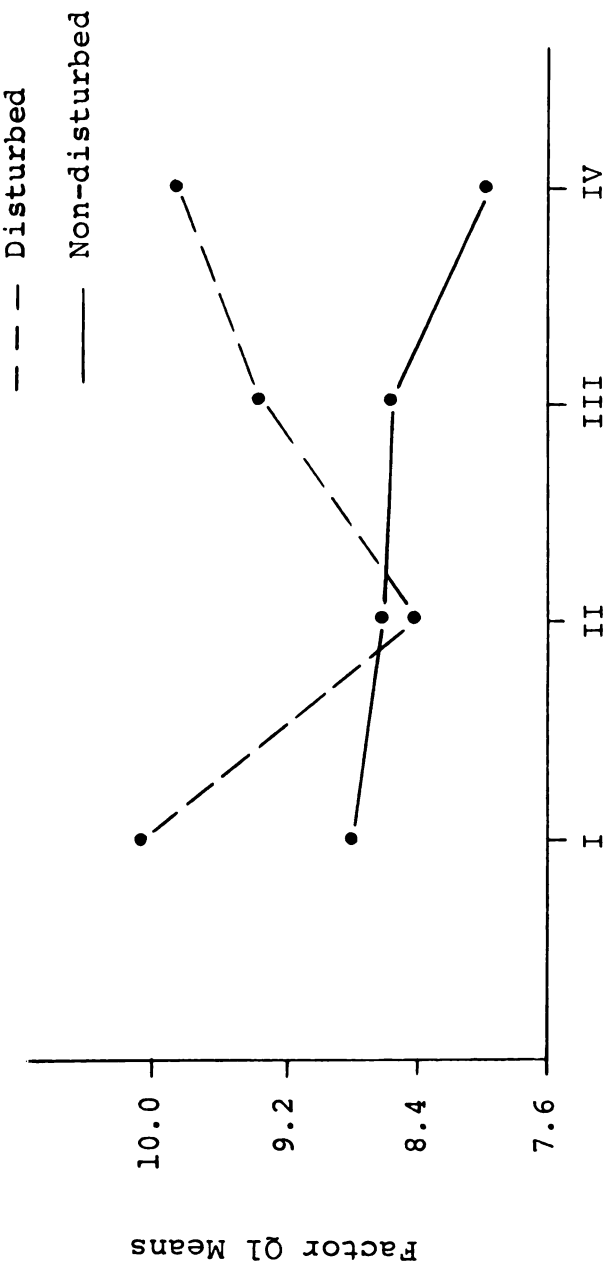

Figure 4.13. Means of Factor Q1 (conservative, experimenting) for disturbed and non-disturbed classifications of females (n = 336). Low score description listed first.

Figure 4.14 displays the interactive effects of the independent variables on the dependent mean scores. Interaction had occurred so significantly that it precluded clearly discerning which behavior classification of female subjects indicated they were more self-sufficient.

Those in School II saw themselves as much more self-sufficient in the disturbed classification.

There was considerable between school variance on the dependent variable among the subjects in the disturbed classification.

The data graphed in Figure 4.15 substantiated a conclusion of no interaction between independent variables since the effects of behavior categories on the dependent variable, factor Q3 means, varied in the same direction and approximately the same magnitude for each level of the independent variable schools.

There were considerable between school differences on the dependent variables in each behavior classification.

Subjects in the disturbed category possessed more undisciplined self-conflict with subjects in School II seeing themselves as less controlled in each classification.

No interactive effects on the means for factor Q4 by the independent variables were apparent (Figure 4.16).

The between school dependent variable score variance of females in the disturbed category was substantial.

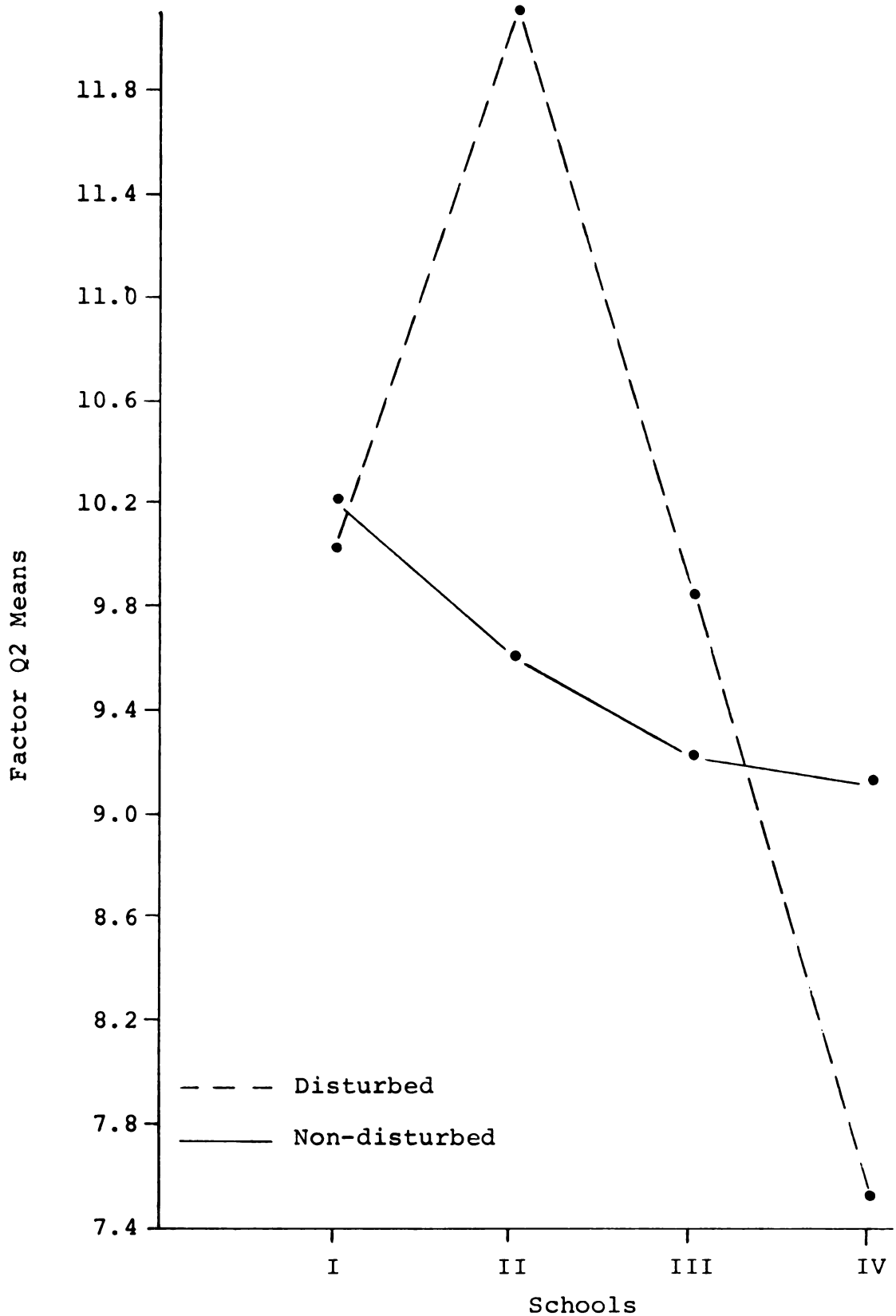

Figure 4.14. Means of Factor Q2 (group dependent, self-sufficient) for disturbed and non-disturbed classifications of females (n = 336). Low score description listed first.

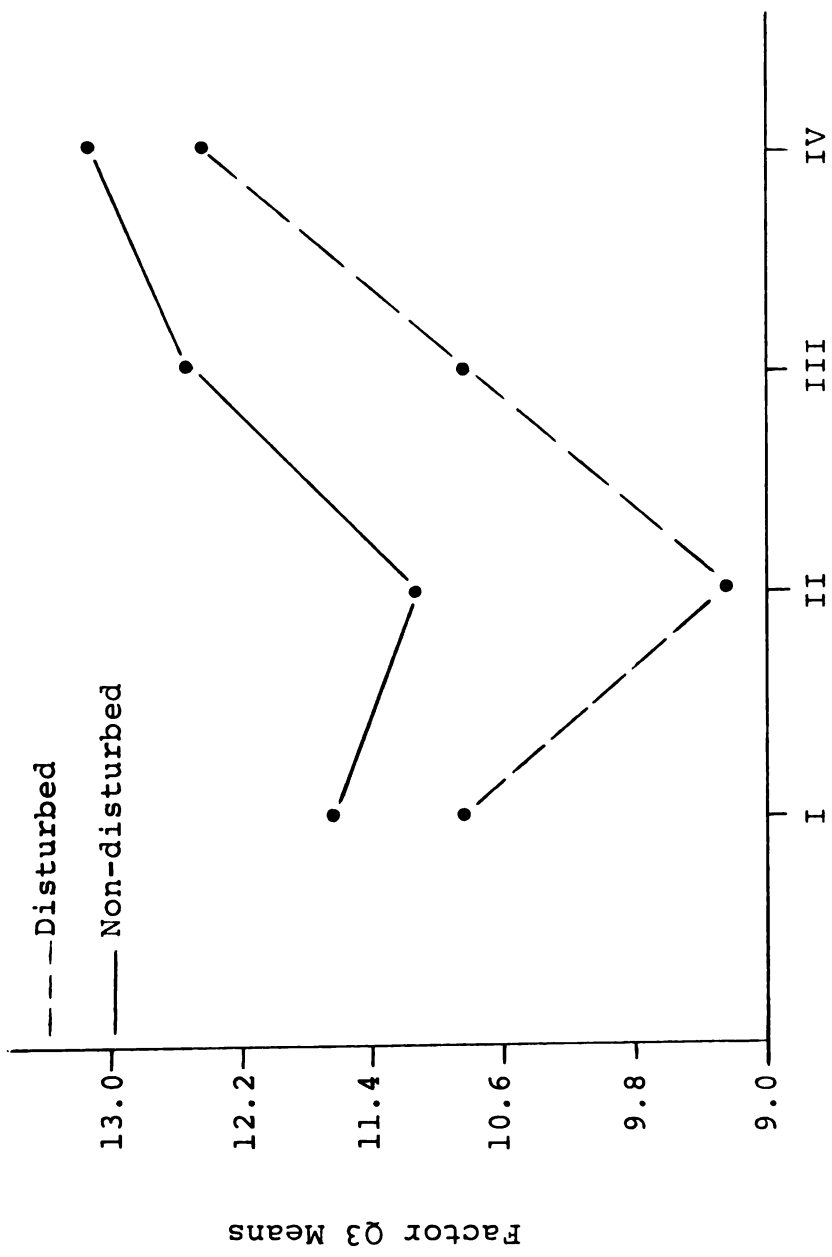

Figure 4.15. Means of Factor Q3 (undisciplined self-conflict, self-controlled) for disturbed and non-disturbed classifications of females (n = 336). Low score description listed first.

The between school dependent variable differences of subjects in the non-disturbed group were not extreme. The sharpest differences on factor means occurred between categories in School IV.

With constant substantial factor mean differences between behavior classifications across the four schools, it was reasonably concluded that females in the disturbed classification saw themselves as much more tense.

A summary of the graphical representations (Figures 4.1-4.16) indicated that it was not possible to identify the main effects of the independent variables on the 16 PF scores due to interaction of schools and behavior classifications on eleven of the sixteen dependent variables.

Interaction occurred in two schools on factors A, H, M, and Q2 and in one school on factors B, C, F, I, N, O, and Q1. The remaining dependent variables E, G, L, Q3, and Q4 were not effected by interaction.

The interaction between independent variables appeared across the schools with a minimum of three occurrences in each school.

There was evidence that females in the disturbed category were much more assertive (factor E) and especially so in School II.

There was an evident discrimination between behavior groups on factor G. Those subjects in the

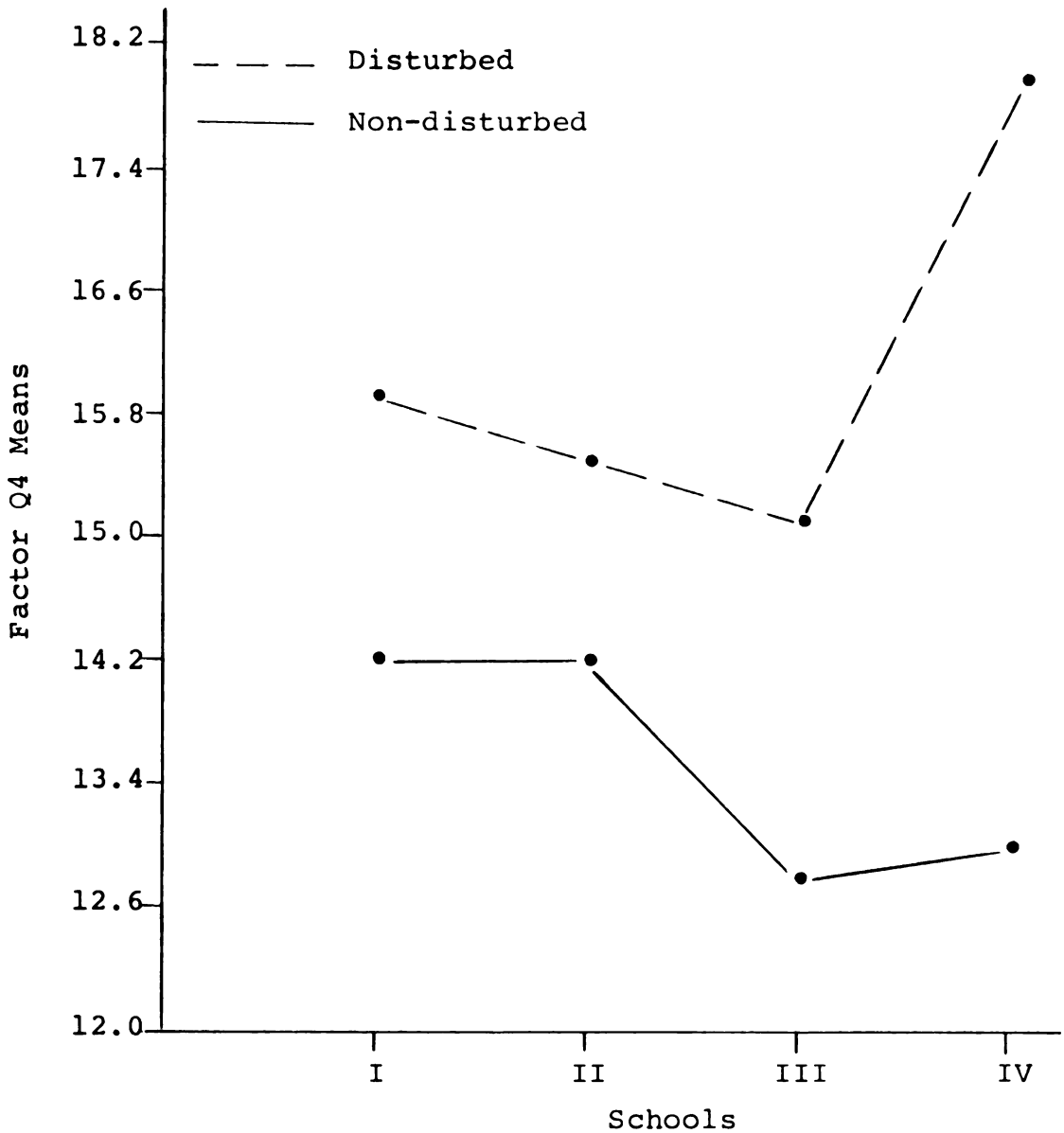

Figure 4.16. Means of Factor Q4 (relaxed, tense) for disturbed and non-disturbed classifications of females (n = 336). Low score description listed first.

disturbed group indicated more expediency in their behavior. Females in School II in each classification saw themselves as more expedient and less conscientious than other schools.

A rather sharp difference in the dependent variable (factor L) means substantiated that those females in the disturbed rating across the four schools were more suspicious and less trusting.

A moderate difference between the means of factor Q3 indicated that females in the disturbed classification saw themselves as having undisciplined self-conflicts.

Subjects in School II in both categories could be characterized as possessing undisciplined self-conflict.

From the graphic expression of mean differences on factor Q4 for between behavioral groups it could be reasonably concluded that females in the disturbed category indicated they saw themselves as more tense. Those subjects in School IV were much more tense than those in the other schools in the disturbed classification.

Thus, it was indicated that the main effects of the independent variables schools and behavior classifications were present. The dependent variables, 16 PF scores, did vary, but it was not possible to state any statistically significant differences as these were inconclusive due to the interaction of the independent variables.

Summary of Findings

The summary will present a concise review of the statistical and graphic analyses. The analysis of data associated with males will be summarized separately from data pertaining to the females.

The percentage of subjects placed into the various behavioral classifications by the three methods will be presented in table form.

A table displaying significant and non-significant effects of interaction and independent variables on the 16 PF scores (dependent variables) for the various classifications association with each method of grouping will be presented.

The dependent variables which reflect the major differences among classifications associated with the various grouping methods will b e presented in table form displaying personality dimensions related to behavior groups in the study.

Findings for Males

The percentage of males placed into behavioral categories average, over-controlled and under-controlled by instructor raters and by MI sub-scores are presented in Table 4.32. This table also displays the distribution percentage of males identified as disturbed (students with personality adjustment problems) or non-disturbed (well-adjusted personalities) by MI total scores.

TABLE 4.32.--A Summary of the Percentage of Males Placed Into Behavioral Classifications by Instructor Raters and the Mann Inventory.

Instructor Rater		MI Sub-Scores		MI Total Scores	
Rating	Per cent	Rating	Per cent	Rating	Per cent
A	41	A	56	N	72
O	21	O	16	D	28
U	31	U	28		

Instructors rated less males (48 per cent) average than did the Mann Inventory which identified 56 per cent as average.

The symbols A, O, U, N, and D will denote average, over-controlled, undercontrolled, non-disturbed, and disturbed behavior groups, respectively, in all tables found in the summary.

Table 4.33 presents a summary of the effects of the independent variable, schools, and the independent variable, groups, and interaction between them on the dependent variables, 16 PF scores for males. Significant levels for rejection of interaction and independent variable effects were chosen at the .05 level of confidence.

The data in Table 4.33 indicates that there was no significant effect on the 16 PF scores by the interaction of schools and groups nor by the schools in which the

TABLE 4.33.--Summary of the Effects of Interaction or Independent Variables on the 16 PF Scores for Males.

Effects	Instructor Rated Groups (A, O, U)	MI Sub-Score Groups (A, O, U)	MI Total Score Groups (N, D)
Interaction	NS	NS	NS
School	NS	NS	NS
Groups	S ($P < .004$)	S ($P < .0007$)	N ($P < .0001$)
(Hypotheses)	(H_o1 rejected)	(H_o2 rejected)	(H_o3 rejected)

Note: NS = not significant
S = significant

students were found, among groups classified by either instructor ratings, MI sub-scores or MI total scores.

The dependent variables, 16 PF scores, did vary significantly for groups classified by any of the three categorization methods.

The hypothesis (H_o1) of no significant differences among average, over-controlled or under-controlled behavior groups on the 16 PF scores where classified by their driver education instructor was rejected ($P < .004$).

The hypothesis (H_o2) of no significant differences among groups categorized as average, over-controlled or under-controlled behavior by the MI sub-scores and scores on the 16 PF Questionnaire must be rejected with a .0007 level of confidence.

Hypothesis three (H_o3) was rejected as there was a difference at the .0001 confidence level between those males identified by MI total scores as having non-disturbed or disturbed behavior on the dependent variable scores, 16 PF results.

Table 4.34 presents a summary of the personality dimensions which were most effective in discriminating between behavior groups.

The average category in both the instructor rated and MI sub-score groups had no personality dimensions in common. Students who were rated average by driver education instructors indicated they were humble, conservative,

TABLE 4.34.--16 PF Questionnaire Personality Dimensions Reflecting a Major Portion of the Differences Among Male Behavior Groups Identified by Instructor Raters, MI Sub-Scores and MI Total Scores.

Discriminating Dimensions		Discriminating Dimensions
A Humble	Sober	N Emotionally stable
Conservative	Adventuresome	Conscientious
Relaxed		More intelligent
O Conscientious	Conscientious	D Suspicious
Emotionally stable	Emotionally stable	Assertive
Shrewd	Controlled	Apprehensive
	Self-sufficient	Self-sufficient
U Expedient	Expedient	
Forthright	Forthright	
Affected by feelings	Affected by feelings	
Experimenting	Undisciplined self-conflict	
Tense	Shy	
Assertive		

relaxed and trusting as a result of their dependent variable score results.

Students classified as over-controlled by either instructor raters or MI sub-scores indicated they were conscientious and emotionally stable.

The MI sub-score over-controlled group were more controlled and self-sufficient, while the instructor rated over-controlled students indicated by their 16 PF scores that they were more shrewd.

The under-controlled students whether classified by instructor or their MI sub-scores indicated they were expedient, forthright and affected by feelings.

The instructor rated under-controlled students were more experimenting, tense and assertive, while those identified as under-controlled by the MI sub-scores saw themselves as more shy and with undisciplined self-conflicts.

Students classified as non-disturbed by the MI total scores indicated by their 16 PF scores that they were emotionally stable, conscientious and more intelligent than those in the disturbed classification. Those in the disturbed category were suspicious, assertive, apprehensive and self-sufficient.

Among the males in the various behavior classifications categorized by instructor rater, MI sub-scores or MI total scores, thirteen of the sixteen factors on the

16 PF Questionnaire were found to discriminate at the probable univariate .10 level of confidence.

Findings for Females

Data in Table 4.35 shows that the percentage of females placed into the behavior category of average by instructor raters or by the MI sub-scores is 63 per cent and 64 per cent, respectively, or approximately equal.

TABLE 4.35.--A Summary of the Percentage of Females Placed Into Behavioral Classifications by Instructor Raters and the Mann Inventory.

Instructor Raters		MI Sub-Scores		MI Total Scores	
Rating	Per cent	Rating	Per cent	Rating	Per cent
A	63	A	64	N	83
O	20	O	21	D	17
U	17	U	15		

Table 4.36 presents a summary of the effects of interactions between school and behavior group independent variables, or either independent variable on dependent variable scores, i.e., the 16 PF results. The .05 confidence level was chosen for rejection of independent variable interaction and the effects of either independent variable, schools, or behavior groups on the 16 PF scores.

Data in Table 4.36 reveals that the interactive effects of the independent variables did not significantly

TABLE 4.36.--Summary of the Effects of Interaction or Independent Variables on the 16 PF Scores for Females.

Effects	Instructor Rated Groups (A, O, U)	MI Sub-Score Groups (A, O, U)	MI Total Score Groups (N, D)
Interaction	NS	NS	S
School	S	S	*Not determined
Groups	NS (P < .09)	S (P < .0001)	**H_o3
(Hypotheses)	H_o1 sustained	H_o2 rejected	

Note: NS = not significant
S = significant

**Hypothesis three could not be rejected or sustained due to interaction between the independent variables.

*Independent variable school effect cannot be statistically determined because independent variables interacted significantly.

effect 16 PF scores of female groups rated average, over-controlled or under-controlled behavior by driver education instructors.

In the instructor rated behavior groups the independent variable, schools, did significantly effect differences on the 16 PF factors.

There were no significant differences on 16 PF scores between behavior groups categorized by instructor raters; hypothesis one (H_o1) for females was sustained since only the .09 confidence level was reached.

Data revealed that MI sub-score behavior group scores on 16 PF were not significantly affected by independent variable interaction.

Both of the independent variables, schools and behavior groups, significantly effected differences on the results obtained from the 16 PF scores. Hypothesis two (H_o2) of no significant differences among groups classified by MI sub-scores on the dependent variables was rejected at the .0001 level of confidence.

The 16 PF scores for females in both the instructor rated and MI sub-score behavior classifications were significantly effected by the schools in which the subjects were found. Table 4.37 presents those personality dimensions which reflected the most discrimination between schools.

TABLE 4.37.--Between School Discriminator Variables for Instructor and MI Sub-Score Classified Behavior Groups of Females.

Schools			
I	II	III	IV
Personality Dimensions			
Affected by feelings	Expedient	Tough-minded	Controlled
Undisciplined self-conflict*		Group dependent	

*This was the only personality dimension reflected by school differences not associated with both instructor rated and MI sub-score behavior classifications.

Data revealed that students in School I saw themselves as affected by feelings more than subjects in other schools.

Only subjects classified by instructor raters in School I indicated by their 16 PF scores that they have low self-control or undisciplined self-conflict.

Females in School II saw themselves as more expedient than those in other schools.

School III females indicated they were both tough-minded and group dependent.

The 16 PF results for females in School IV revealed that they saw themselves as more controlled.

There were significant differences on 16 PF scores between groups of females classified into average, over-controlled and under-controlled behavior by MI sub-scores.

Those personality factors reflecting the most differences between groups are presented in Table 4.38.

TABLE 4.38.--Between MI Sub-Score Behavior Group Discriminator Variables for Females.

A	O	U
*	Self-control Emotionally stable Sober Shy	Expedient Suspicious Undisciplined self-conflict (no self control) Assertive Tense Venturesome Affected feelings

*It is concluded by inspecting group means that those in the average (A) category fall in between on each of these dependent variables.

Hypothesis three (H_o3) could not be rejected or sustained due to significant interactions of the independent variables, schools and behavior groups.

An observation of the graphed results of mean scores of 16 PF dimensions where no interaction occurred indicates that females who were classified as disturbed by the Mann Inventory total scores saw themselves as: assertive, expedient, suspicious, possessed of undisciplined self-conflict, and tense. Subjects in the non-disturbed group scored at the opposite poles of these personality dimensions.

A visual inspection of those same graphed means for those in the disturbed and non-disturbed classifications indicates that females in School II saw themselves as expedient; those in School IV indicated more self-control. Both of these dimensions were found in the same schools when students were grouped by instructors or by MI sub-scores.

Female subjects in School II also indicated undisciplined self-conflict or a low level of self-control.

Summaries of statistical and graphical information in this chapter will be further discussed in Chapter V along with conclusions, recommendations for possible applications of findings and suggestions for further research.

CHAPTER V

SUMMARY, CONCLUSIONS, DISCUSSIONS, IMPLICATIONS, AND RECOMMENDATIONS

The concluding chapter of this investigation will consider: (1) summations of the relationships researched in the study, including both methods and findings; (2) conclusions which appear warranted in view of the methods employed and the statistical data resulting; (3) discussion of factors which may have contributed to the findings obtained in the study; (4) implications for traffic safety education; and (5) recommendations related to the further expansion of research in areas closely related to the findings of this study.

Summary

Purpose, Population, Methodology

The purpose of this study was to investigate the relationship of students in high school driver education programs who were grouped into behavioral classifications of average, over-controlled and under-controlled by either

the driver education instructors or by the Mann Inventory and their self-concepts of certain personality characteristics they possess as measured by the 16 PF Questionnaire.

Another purpose was to investigate the relationships of self-concept as measured by the 16 PF Questionnaire of students who were characterized as having either disturbed or non-disturbed personality adjustment problems.

The problem was investigated by classifying the behavior of 668 students, 332 males, and 336 females from four public high schools, into average, over-controlled and under-controlled categories. The sample population was, also, placed into disturbed and non-disturbed personality adjustment categories. They were classified by the results of the Mann Inventory and by observations of driver education instructors during driver education programs.

The 16 PF Questionnaire was administered to all subjects in the various behavioral groups to discern their concept of self on sixteen dimensions of personality.

A two-way multivariate analysis of variance was employed to ascertain the effects of the independent variables, behavior grouping and schools on the dependent variables, the 16 PF scores.

Findings for Males

Significant differences among male groups classified as average, over-controlled and under-controlled behavior by driver education instructors were found at the .004 confidence level on the 16 PF scores. Those males who were classified into the same groups by MI sub-scores scored differently on the 16 PF at the .0007 significance level.

When male subjects were classified into disturbed and non-disturbed by the MI total scores a significant difference at the .0001 level was found on the 16 PF results.

Hypothesis one, two, and three were rejected for males since the .05 level chosen for rejection was surpassed in each case.

The independent variable schools did not significantly effect differences of the results for males on the 16 PF Questionnaire.

Findings for Females

When females were placed into the behavior categories of average, over-controlled and under-controlled by driver instructor raters, hypothesis one of no significant differences between groups on the 16 PF scores was sustained since .09 level of confidence was reached which fell short of the .05 level chosen for rejection.

There was a significant difference on 16 PF results between the females and different schools at the .007 level of significance.

Females, when placed into the same behavior groups by MI sub-scores, did score differently at the .0001 level of confidence on the 16 PF.

The 16 PF Questionnaire results of females who were classified into behavioral groups by MI sub-scores were significantly different possibly due to the school effects.

No determination of possible significant differences on the 16 PF score for females classified as disturbed or non-disturbed by MI total scores could be made due to significant interaction between the independent variables, behavior groups and schools.

For females, hypothesis one of no instructor rated group difference on 16 PF results had to be sustained as the chosen .05 confidence level was not reached.

Hypothesis two of no significant difference on 16 PF results for females classified into behavior groups by MI sub-scores was rejected since the chosen .05 level of confidence was surpassed.

Hypothesis three of no significant differences between females classified as disturbed or non-disturbed by the MI total scores of 16 PF scores could not be

rejected or sustained due to interaction of independent variables.

Conclusions

The following are the conclusions that the findings support in this investigation:

1. When male students are categorized into behavioral groups by either their instructors or the Mann Inventory, they do score significantly different on the 16 PF Questionnaire.

2. Female students have significantly different 16 PF scores when they are classified into behavioral groups by the Mann Inventory and do not score significantly different on the 16 PF when categorized by their driver education instructors.

3. When males in the sample were identified as having average behavior by their driver education instructors, the results of the 16 PF indicated they saw themselves as humble, conservative and relaxed.

4. Those males rated over-controlled by their instructors reflected that they were more conscientious, emotionally stable and shrewd according to their 16 PF scores.

5. When instructors placed males into the under-controlled categories, their 16 PF results

indicated they were strong on the following personality dimensions: expedient, forthright, affected by feelings, experimenting, tense, and assertive.

6. Differences on 16 PF dimensions found for males classified as average by MI sub-scores indicated they were sober and adventuresome.

7. Those males categorized as over-controlled by MI sub-scores had 16 PF results which reflected that they were conscientious, emotionally stable, controlled and self-sufficient.

8. The under-controlled male groups as classified by MI sub-scores indicated by 16 PF scores that they saw themselves as expedient, forthright, affected by feelings, undisciplined self-conflict, and shy.

9. Groups of males classified as possessing disturbed behavior by MI total scores indicated by 16 PF score results that they are suspicious, assertive, self-sufficient, and apprehensive.

10. Whether the males were identified as under-controlled by their driver education instructors or by the MI, 16 PF results show that they see themselves as expedient, forthright, and affected by feelings.

11. Females classified by the MI sub-scores as under-controlled indicated by their 16 PF score results that they possess the following personality dimensions: expedient, suspicious, undisciplined self-conflict, assertive, venturesome, and affected by feelings.

12. Females in the over-controlled category, who were classified by MI sub-scores, indicated by their 16 PF scores that they saw themselves as having self-control, as being emotionally stable, sober, and shy.

13. Scores on the 16 PF indicated that females from different schools possessed different personality characteristics.

14. Females in School I were more affected by feelings and had undisciplined self-conflicts.

15. School II females appeared to be much more expedient than those in other schools.

16. Females in School IV saw themselves as following their self-image or being very controlled.

Discussion

On the basis of the findings it appears that adolescent males will express their view of certain personality characteristics they possess when given a

paper-pencil test and that these personality characteristics are different for students in the various behavior classifications.

A complication arises in the determination of statistical significance for the hypothesis in that females vary on personality characteristics in each of the different schools as well as differences when places into average, over-controlled and under-controlled behavior categories.

The rationale for females in School II indicating that they were far more expedient than those in other schools in the sample cannot be clearly defined. Neither can a valid reason be found for females in School IV showing they were more controlled or socially precise than those in other schools in the study.

All schools had nearly the same percentage of minority students and same socio-economic conditions.

It is possible that the personality of the driver education instructors, the behavioral expectations of the administration and the total climate of the schools may have effected differences in female self-images.

There were no significant differences between instructor rated female groups on personality dimensions which may bespeak the need for a female instructor to be used as a rater. There may be a bias which male raters may manifest when they observe, especially, over-controlled

behavior as it may truly be the average behavior of many females in the presence of male authority figures.

It appears reasonable to conclude that male students in driver education classes can be placed into behavioral classifications by either observations of competent instructors or an objective test. It seems clear that female students in driver education classes can be classified into behavioral groups by objective tests, but not by male instructor raters. Results of this investigation would indicate that certain self-concepts of personality characteristics will be associated with each of these behavior classifications.

It seems feasible that these concepts of self will influence future driving behavior, and they must be seriously considered when dealing with students in all their experiences, not just in driver education.

A measure of progress in the affective learning domain in traffic safety education may be encouraged if increased attention is given to appropriate educational experiences that undergirds the premise that future driving behavior will be affected by the sum total of an individual's knowledge, skill, and concept of self.

Implications for Traffic Safety Education

1. Schools involved with traffic safety education must take cognizance of the self-image of the individual.

2. Programming in traffic safety education must include materials and activities aimed at assisting youth, who have poor self-images, grow in self-acceptance and recognition of a more positive self.

3. A most promising approach would seem to be a concerted instructor effort in the formation of warm personal relationships with youngsters, not only in driver education laboratory activities, but, in the total planned experiences.

4. Special assistance by either the school counselors or qualified driver education instructors should be provided through small group experiences designed to argument the development of more satisfying self-concepts.

5. Methodologies in the classroom should be complemented with greater involvement of the individual student in "real world" surveys of accident problem areas, observations of high violation localities, development of spot maps and projects on display case materials with the opportunity to make independent reports or feed back to his peers.

6. Special personal driving problems should be discussed in small peer groups within the class and summaries of individual contributions reported back to the class as a whole.

7. Talented traffic workers who have the ability to project the meaningful, personal interest of traffic safety officialdom in youth should be utilized as a part of traffic safety education program experiences.

8. Substantial and diverse efforts should be instituted at the elementary and junior high school levels to provide experience keyed to traffic safety concepts with the hope that positive reinforcement would occur over a longer period of time.

Recommendations

As a result of the findings of this study it seems appropriate that further educational experimentation in traffic safety education is needed to determine how these individuals and student groups may best be helped in their development of a positive self-concept. If educators, in general, are to develop programs on a more realistic basis and not on suppositions, then there must be continuous research at the highest levels to identify appropriate

teaching techniques that provide every opportunity to develop the most favorable self-concept.

The notion of a positive self-concept and its critical relationship to the affective learning domain may well be the important focus currently needed in the traffic safety education effort, possibly a focus for all disciplines.

On the basis of the findings of this study and relevant literature, it is recommended that:

1. A research project should be set up using small group technique suggested by Mann[1] aimed at improving self-image of individuals motivating them toward better driving.

2. A study should be instituted to determine if there has been a significant change in self-image resulting from a program setting where instructors develop a more personal relationship with students and another where the instructor uses a more authoritian approach. This follows a conclusion by Sheehe[2] that the truly competent driver educator must be much more than just a skills coach.

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[1]W. A. Mann, "Let's Talk It Over," Analogy (Charter Issue Allstate Insurance Company, 1966), pp. 4-9.

[2]G. H. Sheehe, "How Can We Improve Driver Education?" Traffic Safety, LXX, 2 (February, 1970), 34.

3. It might be more advantageous to replicate this study in schools with less enrollment since there may be more interpersonal relationships between students and instructors.

4. Educators should set up investigation procedures to evaluate a two-part program suggested by Silvernale and Whale[3] for traffic safety education which would extend over a considerable period of time which would maintain interpersonal activities where the possibility of sustaining a positive self-concept may exist.

5. Both Pelz[4] and Hamachek[5] present a variety of concepts, methods and learning strategies to enhance the development of a more positive view of self. Driver educators should develop a framework for application of these self-concept oriented procedures at much lower school grade levels as well as in current traffic safety educational experiences.

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[3]L. R. Silvernale and M. D. Whale, "Does Driver Education Go Far Enough?" Traffic Safety, LXIX, 9 (September, 1969), 10-12.

[4]D. C. Pelz, "Who Are the Dangerous Drivers?" Analogy (Allstate Insurance Company, Spring, 1968), pp. 13-15.

[5]D. E. Hamachek, Encounter With the Self (New York: Holt, Rinehart and Winston, Inc., 1971), pp. 225-45.

6. There should be a comparison and classification of current classroom and laboratory procedures according to their effectiveness in the objective learning domain.

7. Studies should be set up to evaluate the competency of current driver education instructors to recognize the symptoms of emotional problems, unstable types of personality and drives of students.

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APPENDICES

APPENDIX A

YOUTHFUL DRIVER SELF-CONCEPT STUDY BEHAVIOR DESCRIPTIONS AND RATER INSTRUCTIONS

APPENDIX A

YOUTHFUL DRIVER SELF-CONCEPT STUDY BEHAVIOR

DESCRIPTIONS AND RATER INSTRUCTIONS

Under-Controlled

General: Behavior characterized by forceful, outgoing action or vigorous efforts to assert oneself over others, with little consideration of the results.

Specific in the driver education context:

1. Will try any skill with no fear of making a mistake or failure.

2. Will attempt to answer any question--hand always up in responding to an oral question.

3. Will attempt to argue and bargain to keep ahead.

4. Will do wrong or doubtful act, then may ask about doing it.

5. Will be trying to communicate much more than expected.

6. Will try many activities before told to do so, or before full instructions given.

7. Will insist or demand all that he or she feels is due--with no concern for the feelings of others involved.

8. Will seem to be cool and calm most of the time.

9. Will be impulsively lively, gay and enthusiastic on occasion.

10. Will wish to drive much more and try any new experience.

Over-Controlled

General: Behavior characterized by withdrawal from communication with other persons with efforts to have everything under control so that they cannot be criticized by others.

Specific in the driver education context:

1. Will try a skill after deliberation and full understanding--then only hesitatingly.

2. Will not attempt to answer question if not sure with fear of being wrong in peer group.

3. Will accept what is said by instructor or peer and will very rarely argue for a point.

4. Will ask about a task coming up, then when understood, will try it.

5. Will communicate when he feels it absolutely necessary.

6. Will not move into any activity until told or given permission to do so.

7. Will not demand or assert rights, but will accept what is offered.

8. Will be upset and exhibit anxiety rather often.

9. Will be sober, prudent and serious.

10. Will not readily volunteer for more driving or new experience without first considering them very carefully.

Average

General: Behavior characterized by well-adjusted interaction with persons and consistent with the mores of

the society in which the individual functions within the educational institution norms, with the absence of tendencies toward extremes in personality.

Instructions for Rating Student Behavior:

Please be mindful of descriptive items while interacting with each student in the driver education program whether in classroom or laboratory activities, in an informal or formal setting. Observation during any interpersonal relationships for the duration of this study with subjects involved is a goal, also.

During the final week of the total driver educational experience a rating of average, over-controlled or under-controlled will be given each student in your class.

All students who do not fall into either of the over-controlled or under-controlled behavioral categories should be classified as average.

APPENDIX B

YOUTHFUL DRIVER SELF-CONCEPT STUDY

MANN INVENTORY (MI)

APPENDIX B

YOUTHFUL DRIVER SELF-CONCEPT STUDY

MANN INVENTORY (MI)

The following statements reflect your attitude and feelings about yourself and your relations to others. There are no right or wrong answers. Fill in on the answer sheet the answer that reflects your feelings the best.

Do not mark on the test booklet. Place mark in parentheses ( ) on answer sheet:

(A)always (B)usually (C)sometimes (D)rarely (E)never

1. I like (liked) to take part in organized extra-curricular activities in school.

2. Young people are much better drivers than middle-aged people.

3. Policemen are sincere in enforcing the laws.

4. My parents are reasonable in their relations with me.

5. My community is a happy place to live.

6. I put off until tomorrow things I should do today.

7. I like to daydream while I am driving.

8. I feel full of pep when I get behind the wheel.

9. I live in a home that is happy.

10. If I see a police officer when I am driving, I am more careful.

(Please turn to next page, item 11 on response sheet)

11. Over-careful drivers cause more accidents than the so-called reckless ones.

12. I enjoy being out late at night and sleeping mornings.

13. I get a feeling of real power when driving a car.

14. All courses in school are set up to meet the needs and interest of the student.

15. I am concerned about the way my clothes look.

16. Slow drivers should be kept off the highways.

17. All young people should be required to take a course in driver education.

18. Unsafe drivers should be deprived of the right to drive.

19. Accidents don't just happen; they are caused.

20. I like to get everything out of a car that it has in it.

21. The chief work of most policemen should be traffic control.

22. My parents exert too much control over me.

23. The people in my community want the traffic laws enforced.

24. I have been tempted to cheat on a test at school.

25. I get impatient when driving in heavy traffic.

26. There are times when it seems like everyone is against me.

27. Old, defective cars should be kept off the road.

28. Drivers should be given more freedom in obeying traffic signs.

29. People should drive when they are angry.

(Please turn to next page, item 30 on response sheet)

30. Passing on hills and curves is exceedingly dangerous.

31. It is necessary to stop at "stop" signs if no other cars are in sight.

32. I like to put extras on my car to attract attention.

33. I am good at talking the police out of giving me a traffic ticket.

34. Strong discipline in practice makes a better team.

35. I am (was) popular with most of the kids in my class.

36. Cops are rougher on teenagers than on adults.

37. Teachers want to help students with their problems.

38. My father (or other adult family driver) gets traffic tickets for moving violations.

39. I have as good table manners at home as when I eat out.

40. I have been wrong in an argument but wouldn't admit it to my opponent.

41. The school should have the right to question the way I drive.

42. I like to razz the team when it is losing.

43. I am proud of my reputation in the community.

44. I am considered a friendly person.

45. I like most of my school work.

46. Our family spends a great deal of time together.

47. Attitudes toward driving are more important than ability to handle the car.

48. I like to take chances when I'm driving.

49. Traffic laws are set up to promote safety.

(Please turn to next page, item 50 on response sheet)

50. Courtesy toward other drivers is important.

51. I like a great deal of freedom.

52. I don't mind being told what to do.

53. My grades in school are (were) a good indication of my ability.

54. I sometimes become concerned about what other people think of me.

55. I find that older people tend to be too bossy.

56. I feel somewhat nervous when I drive a car.

57. I think courtesy towards others is a good reflection of a person's character.

58. I get more fun out of driving a car than in any other activity.

59. The police are only trying to do the job for which they were hired.

60. My folks insist that I spend most week-day evenings at home.

61. I am considered a reliable person.

62. I like to help a person who is in trouble.

63. I am more courteous than the average driver.

MI responses concluded

APPENDIX C

YOUTHFUL DRIVER SELF-CONCEPT STUDY

MANN INVENTORY (MI)

RESPONSE SHEET

APPENDIX C

YOUTHFUL DRIVER SELF-CONCEPT STUDY

MANN INVENTORY (MI)

RESPONSE SHEET

Student class number ____ Birthday_____ Sex _____
mo day yr M F

	A	B	C	D	E		A	B	C	D	E
1.	( )	( )	( )	( )	( )	15.	( )	( )	( )	( )	( )
2.	( )	( )	( )	( )	( )	16.	( )	( )	( )	( )	( )
3.	( )	( )	( )	( )	( )	17.	( )	( )	( )	( )	( )
4.	( )	( )	( )	( )	( )	18.	( )	( )	( )	( )	( )
5.	( )	( )	( )	( )	( )	19.	( )	( )	( )	( )	( )
6.	( )	( )	( )	( )	( )	20.	( )	( )	( )	( )	( )
7.	( )	( )	( )	( )	( )	21.	( )	( )	( )	( )	( )
8.	( )	( )	( )	( )	( )	22.	( )	( )	( )	( )	( )
9.	( )	( )	( )	( )	( )	23.	( )	( )	( )	( )	( )
10.	( )	( )	( )	( )	( )	24.	( )	( )	( )	( )	( )
11.	( )	( )	( )	( )	( )	25.	( )	( )	( )	( )	( )
12.	( )	( )	( )	( )	( )	26.	( )	( )	( )	( )	( )
13.	( )	( )	( )	( )	( )	27.	( )	( )	( )	( )	( )
14.	( )	( )	( )	( )	( )	28.	( )	( )	( )	( )	( )

(Please turn to next page, item 29 on response sheet)

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APPENDICES

APPENDIX A

YOUTHFUL DRIVER SELF-CONCEPT STUDY BEHAVIOR DESCRIPTIONS AND RATER INSTRUCTIONS

APPENDIX A

YOUTHFUL DRIVER SELF-CONCEPT STUDY BEHAVIOR

DESCRIPTIONS AND RATER INSTRUCTIONS

Under-Controlled

General: Behavior characterized by forceful, outgoing action or vigorous efforts to assert oneself over others, with little consideration of the results.

Specific in the driver education context:

1. Will try any skill with no fear of making a mistake or failure.

2. Will attempt to answer any question--hand always up in responding to an oral question.

3. Will attempt to argue and bargain to keep ahead.

4. Will do wrong or doubtful act, then may ask about doing it.

5. Will be trying to communicate much more than expected.

6. Will try many activities before told to do so, or before full instructions given.

7. Will insist or demand all that he or she feels is due--with no concern for the feelings of others involved.

8. Will seem to be cool and calm most of the time.

9. Will be impulsively lively, gay and enthusiastic on occasion.

10. Will wish to drive much more and try any new experience.

Over-Controlled

General: Behavior characterized by withdrawal from communication with other persons with efforts to have everything under control so that they cannot be criticized by others.

Specific in the driver education context:

1. Will try a skill after deliberation and full understanding--then only hesitatingly.

2. Will not attempt to answer question if not sure with fear of being wrong in peer group.

3. Will accept what is said by instructor or peer and will very rarely argue for a point.

4. Will ask about a task coming up, then when understood, will try it.

5. Will communicate when he feels it absolutely necessary.

6. Will not move into any activity until told or given permission to do so.

7. Will not demand or assert rights, but will accept what is offered.

8. Will be upset and exhibit anxiety rather often.

9. Will be sober, prudent and serious.

10. Will not readily volunteer for more driving or new experience without first considering them very carefully.

Average

General: Behavior characterized by well-adjusted interaction with persons and consistent with the mores of

the society in which the individual functions within the educational institution norms, with the absence of tendencies toward extremes in personality.

Instructions for Rating Student Behavior:

Please be mindful of descriptive items while interacting with each student in the driver education program whether in classroom or laboratory activities, in an informal or formal setting. Observation during any interpersonal relationships for the duration of this study with subjects involved is a goal, also.

During the final week of the total driver educational experience a rating of average, over-controlled or under-controlled will be given each student in your class.

All students who do not fall into either of the over-controlled or under-controlled behavioral categories should be classified as average.

APPENDIX B

YOUTHFUL DRIVER SELF-CONCEPT STUDY

MANN INVENTORY (MI)

APPENDIX B

YOUTHFUL DRIVER SELF-CONCEPT STUDY

MANN INVENTORY (MI)

The following statements reflect your attitude and feelings about yourself and your relations to others. There are no right or wrong answers. Fill in on the answer sheet the answer that reflects your feelings the best.

Do not mark on the test booklet. Place mark in parentheses ( ) on answer sheet:

(A)always (B)usually (C)sometimes (D)rarely (E)never

1. I like (liked) to take part in organized extra-curricular activities in school.

2. Young people are much better drivers than middle-aged people.

3. Policemen are sincere in enforcing the laws.

4. My parents are reasonable in their relations with me.

5. My community is a happy place to live.

6. I put off until tomorrow things I should do today.

7. I like to daydream while I am driving.

8. I feel full of pep when I get behind the wheel.

9. I live in a home that is happy.

10. If I see a police officer when I am driving, I am more careful.

(Please turn to next page, item 11 on response sheet)

11. Over-careful drivers cause more accidents than the so-called reckless ones.

12. I enjoy being out late at night and sleeping mornings.

13. I get a feeling of real power when driving a car.

14. All courses in school are set up to meet the needs and interest of the student.

15. I am concerned about the way my clothes look.

16. Slow drivers should be kept off the highways.

17. All young people should be required to take a course in driver education.

18. Unsafe drivers should be deprived of the right to drive.

19. Accidents don't just happen; they are caused.

20. I like to get everything out of a car that it has in it.

21. The chief work of most policemen should be traffic control.

22. My parents exert too much control over me.

23. The people in my community want the traffic laws enforced.

24. I have been <u>tempted</u> to cheat on a test at school.

25. I get impatient when driving in heavy traffic.

26. There are times when it seems like everyone is against me.

27. Old, defective cars should be kept off the road.

28. Drivers should be given more freedom in obeying traffic signs.

29. People should drive when they are angry.

(Please turn to next page, item 30 on response sheet)

30. Passing on hills and curves is exceedingly dangerous.

31. It is necessary to stop at "stop" signs if no other cars are in sight.

32. I like to put extras on my car to attract attention.

33. I am good at talking the police out of giving me a traffic ticket.

34. Strong discipline in practice makes a better team.

35. I am (was) popular with most of the kids in my class.

36. Cops are rougher on teenagers than on adults.

37. Teachers want to help students with their problems.

38. My father (or other adult family driver) gets traffic tickets for moving violations.

39. I have as good table manners at home as when I eat out.

40. I have been wrong in an argument but wouldn't admit it to my opponent.

41. The school should have the right to question the way I drive.

42. I like to razz the team when it is losing.

43. I am proud of my reputation in the community.

44. I am considered a friendly person.

45. I like most of my school work.

46. Our family spends a great deal of time together.

47. Attitudes toward driving are more important than ability to handle the car.

48. I like to take chances when I'm driving.

49. Traffic laws are set up to promote safety.

(Please turn to next page, item 50 on response sheet)

50. Courtesy toward other drivers is important.

51. I like a great deal of freedom.

52. I don't mind being told what to do.

53. My grades in school are (were) a good indication of my ability.

54. I sometimes become concerned about what other people think of me.

55. I find that older people tend to be too bossy.

56. I feel somewhat nervous when I drive a car.

57. I think courtesy towards others is a good reflection of a person's character.

58. I get more fun out of driving a car than in any other activity.

59. The police are only trying to do the job for which they were hired.

60. My folks insist that I spend most week-day evenings at home.

61. I am considered a reliable person.

62. I like to help a person who is in trouble.

63. I am more courteous than the average driver.

MI responses concluded

APPENDIX C

YOUTHFUL DRIVER SELF-CONCEPT STUDY

MANN INVENTORY (MI)

RESPONSE SHEET

APPENDIX C

YOUTHFUL DRIVER SELF-CONCEPT STUDY

MANN INVENTORY (MI)

RESPONSE SHEET

Student class number ____ Birthday_____ Sex _____
mo day yr M F

	A	B	C	D	E		A	B	C	D	E
1.	( )	( )	( )	( )	( )	15.	( )	( )	( )	( )	( )
2.	( )	( )	( )	( )	( )	16.	( )	( )	( )	( )	( )
3.	( )	( )	( )	( )	( )	17.	( )	( )	( )	( )	( )
4.	( )	( )	( )	( )	( )	18.	( )	( )	( )	( )	( )
5.	( )	( )	( )	( )	( )	19.	( )	( )	( )	( )	( )
6.	( )	( )	( )	( )	( )	20.	( )	( )	( )	( )	( )
7.	( )	( )	( )	( )	( )	21.	( )	( )	( )	( )	( )
8.	( )	( )	( )	( )	( )	22.	( )	( )	( )	( )	( )
9.	( )	( )	( )	( )	( )	23.	( )	( )	( )	( )	( )
10.	( )	( )	( )	( )	( )	24.	( )	( )	( )	( )	( )
11.	( )	( )	( )	( )	( )	25.	( )	( )	( )	( )	( )
12.	( )	( )	( )	( )	( )	26.	( )	( )	( )	( )	( )
13.	( )	( )	( )	( )	( )	27.	( )	( )	( )	( )	( )
14.	( )	( )	( )	( )	( )	28.	( )	( )	( )	( )	( )

(Please turn to next page, item 29 on response sheet)

	A	B	C	D	E
29.	( )	( )	( )	( )	( )
30.	( )	( )	( )	( )	( )
31.	( )	( )	( )	( )	( )
32.	( )	( )	( )	( )	( )
33.	( )	( )	( )	( )	( )
34.	( )	( )	( )	( )	( )
35.	( )	( )	( )	( )	( )
36.	( )	( )	( )	( )	( )
37.	( )	( )	( )	( )	( )
38.	( )	( )	( )	( )	( )
39.	( )	( )	( )	( )	( )
40.	( )	( )	( )	( )	( )
41.	( )	( )	( )	( )	( )
42.	( )	( )	( )	( )	( )
43.	( )	( )	( )	( )	( )
44.	( )	( )	( )	( )	( )
45.	( )	( )	( )	( )	( )

	A	B	C	D	E
46.	( )	( )	( )	( )	( )
47.	( )	( )	( )	( )	( )
48.	( )	( )	( )	( )	( )
49.	( )	( )	( )	( )	( )
50.	( )	( )	( )	( )	( )
51.	( )	( )	( )	( )	( )
52.	( )	( )	( )	( )	( )
53.	( )	( )	( )	( )	( )
54.	( )	( )	( )	( )	( )
55.	( )	( )	( )	( )	( )
56.	( )	( )	( )	( )	( )
57.	( )	( )	( )	( )	( )
58.	( )	( )	( )	( )	( )
59.	( )	( )	( )	( )	( )
60.	( )	( )	( )	( )	( )
61.	( )	( )	( )	( )	( )
61.	( )	( )	( )	( )	( )
62.	( )	( )	( )	( )	( )
63.	( )	( )	( )	( )	( )

End

APPENDIX D

WHAT THE 16 PF TEST MEASURES

APPENDIX D

WHAT THE 16 PF TEST MEASURES

The sixteen primary dimensions of the 16 PF are briefly indicated below.

Factor	A person with a low score is described as:
A	RESERVED, cool, detached, aloof
B	LESS INTELLIGENT, concrete-thinking
C	AFFECTED BY FEELINGS, emotionally less stable, easily upset
E	SUBMISSIVE, mild, accommodating
F	SOBER, prudent, serious, taciturn
G	EXPEDIENT, disregards rules, feels few obligations
H	SHY, restrained, timid, threat-sensitive
I	TOUGH-MINDED, self-reliant, realistic, no-nonsense
L	TRUSTING, adaptable, free of jealousy, easy to get along with
M	PRACTICAL, careful, conventional, regulated by external realities
N	FORTHRIGHT, natural, artless, unpretentious
O	SELF-ASSURED, confident, complacent
Q1	CONSERVATIVE, respecting established ideas, tolerant of traditional difficulties
Q2	GROUP-DEPENDENT, a "joiner" and good follower
Q3	UNDISCIPLINED SELF-CONFLICT, follows own urges, careless of social rules
Q4	RELAXED, tranquil, composed

Factor	A person with a high score is described as:
A	WARMHEARTED, easygoing, participating, outgoing
B	MORE INTELLIGENT, abstract-thinking, bright
C	EMOTIONALLY STABLE, faces reality, calm, mature
E	ASSERTIVE, dominant, aggressive, competitive
F	HAPPY-GO-LUCKY, impulsively lively, enthusiastic

Factor	
G	CONSCIENTIOUS, persevering, moralistic, straight-laced
H	VENTURESOME, socially bold, uninhibited, spontaneous
I	TENDER-MINDED, gentle, overprotected, sensitive
L	SUSPICIOUS, self-opinionated, hard to fool
M	IMAGINATIVE, wrapped up in inner urgencies, careless of practical matters, bohemian
N	SHREWD, calculating, worldly, penetrating
O	APPREHENSIVE, self-reproaching, worrying, troubled
Q1	EXPERIMENTING, liberal, analytical, free-thinking
Q2	SELF-SUFFICIENT, prefers own decisions, resourceful
Q3	CONTROLLED, socially precise, compulsive, following self-image
Q4	TENSE, frustrated, driven, overwrought