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## A Comparison of the Vocational Interests and Aptitudes of Delinquent and Nondelinquent Adolescent Girls

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A COMPARISON OF THE VOCATIONAL INTERESTS AND  
APTITUDES OF DELINQUENT AND NONDELINQUENT  
ADOLESCENT GIRLS

By

DANIEL FRANCIS NOVAK

A DISSERTATION SUBMITTED TO THE FACULTY OF THE GRADUATE  
SCHOOL OF LOYOLA UNIVERSITY IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE DEGREE OF  
DOCTOR OF PHILOSOPHY

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## LIFE

Daniel Francis Novak was born in Minneapolis, Minnesota, September 5, 1923.

He was graduated from the College of St. Thomas, St. Paul, Minnesota, in 1950, with a Bachelor of Arts degree in Psychology. He recieved a Master of Arts degree in Psychology from Loyola University, in February, 1953.

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## TABLE OF CONTENTS

Chapter	Page
<p>I. STATEMENT OF THE PROBLEM.....</p> <p style="padding-left: 40px;">Psychological and sociological aspects of  problem--Reintegration of delinquent--  Importance of vocational guidance--  Purpose of study--Hypotheses to be  evaluated.</p>	<p>1</p>
<p>II. REVIEW OF LITERATURE.....</p> <p style="padding-left: 40px;">Theory of vocational development--  Structural aspects--Contentual and  psychological factors--Determinants  of vocational interests and aptitudes--  External factors--Innate factors--  Comparison of vocational determinants  in delinquents and nondelinquents--  Comparison of determinants of aptitudes  in delinquents and nondelinquents--  Summary of literature review.</p>	<p>9</p>
<p>III. A. DESIGN OF THE RESEARCH.....</p> <p style="padding-left: 40px;">Definition of delinquent and nondelinquent--  Criteria for selection of subjects--  Selection of delinquents--Testing procedure--  Selection of nondelinquent group--  Comparison of variables in selected groups.</p> <p style="padding-left: 40px;">B. THE INSTRUMENTS.....</p> <p style="padding-left: 80px;">KPR--Rationale underlying development--  Historical evolution of Kuder--Validity  of the instrument--Reliability of the  Preference Record--DAT--Purpose of con-  struction--Meaning of aptitude--De-  scription of tests in battery--Reliability  of test--Validity of DAT--Evolution of DAT.</p>	<p>70</p> <p>89</p>

Chapter		Page
IV.	ANALYSIS OF DATA AND RESULTS.....	122
	Statistical rationale--Assumption of null hypothesis--Critical ratio comparison of groups on KPR--Chi square comparison of combined interest areas--Comparison of aptitudes.	
V.	SUMMARY AND CONCLUSIONS.....	147
	BIBLIOGRAPHY.....	159
	APPENDIX.....	175

# LIST OF TABLES

Table		Page
I.	Comparative Rankings of Occupational Interests of 538 Interned Delinquents Used in Corsini's Study and the Vocational Preferences and Actual Occupations of 5,143 Free Youths Studied by Bell.....	57
II.	Percentage Comparison of Occupations Reflected in the Vocational Interests of Corsini's 538 Delinquents and the Actual Occupations of Bell's 5,143 Free Youth.....	58
III.	The Number and Types of Offenses of Delinquent Girls in the Sample Leading to Internment at the Illinois State Training School for Girls.....	77
IV.	High Schools from which Nondelinquent Subjects Were Obtained, the Number of Subjects Available and the Number Finally Selected....	80
V.	Pairing of Qualitative Intellectual Measures with IQ Scores for One Hundred Delinquent and Nondelinquent Girls.....	83
VI.	Distribution of Father's Occupation for One Hundred Delinquent and Nondelinquent Subjects.....	86
VII.	The Reliability Coefficients of the Separate Scales of the Kuder Preference Record for Various Educational and Economic Groups.....	98
VIII.	The Mean Reliability Coefficient Mean Scores and Standard Deviations of Form A, Differential Aptitude Tests, Given by Sex, for 960 Boys and 1064 Girls in Grades Eight to Twelve.....	114

Table	Page
IX. The Reliability Coefficients, Mean and Standard Deviations of the DAT, Form A, for 186 Tenth Grade Boys and 215 Tenth Grade Girls.....	115
X. Correlations between Ninth Grade Scores and Twelfth Grade Scores on the DAT, Form A, for 71 Boys and 90 Girls of Two Mount Vernon High Schools, Class of 1950.....	117
XI. The Mean Intercorrelation Coefficients of the DAT Based on Records of 960 Boys and 1064 Girls Representing Grades Eight to Twelve...	119
XII. The Means, SD, Differences Between Means, Standard Error of the Difference Between Means and Critical Ratios for Fifty Delinquent and Fifty Nondelinquent Boys on the KPR.....	125
XIII. The Means, SD, Differences Between Means, Standard Error of the Difference Between Means, and Critical Ratios for Fifty Delinquent and Fifty Nondelinquent Girls.....	131
XIV. Name of Scale, Chi square and Probability in the Comparison of the Number of Significantly High Scores (75 centile or above) on the Individual Scales of the KPR for the Fifty Delinquent and Fifty Nondelinquent Girls.....	133
XV.. Name of Scale, Chi square and Probability in the Comparison of the Number of Significantly Low Scores (25 centile or below) on the Individual Scales of the KPR for Fifty Delinquent and Fifty Nondelinquent Girls....	135
XVI. The Means, Standard Deviations, Differences Between Means, Standard Error of the Difference Between Means and Critical Ratios for Fifty Delinquent and Fifty Nondelinquent Adolescent Girls on the DAT.....	145



## CHAPTER I

### STATEMENT OF THE PROBLEM

Juvenile delinquency has become a matter of increasingly serious concern to society during the past few generations. Many investigators have concerned themselves with the various psychological and social aspects of delinquency, but the solution to the problem has not been found.

The question, therefore, can be legitimately asked: Why?

A possible answer, perhaps, is contained in the failure to understand the juvenile delinquent as an individual. As an individual, he is a unit that does not fit properly into that complex abstraction, called society. As an individual, he stands alone, isolated from the social communion of his neighbors. If this is the delinquent's character, and if this is his present lot, then it is here where intense concentrations of effort must be focused. The more facts that can be collected about the delinquent as an individual, the greater will be the probability that his social status can be amended.

In allocating priority to the psychology of the juvenile delinquent over the sociology of the community, care must be exercised, lest a distorted perspective result. In the total configuration of juvenile delinquency, sociological features cannot be ignored. It is to the community that the delinquent must be returned, not in a delinquent role, but in the status of a socialized individual. In his new role, the delinquent must assume the same degree and quality of responsibility accepted by the other members of his society.

Since that is the ultimate goal of his reintegration, a greater understanding of him must be acquired. In making his readjustment, he must be able to contribute in a positive manner to the development and welfare of his newly adopted group. He must reorientate his talents and skills to the commonweal. The questions immediately arise: What are his talents? What are his skills? How can they be utilized not only for his own benefit, but for the welfare of the community to which he returns? The answers to such inquiries can be made available through counseling and vocational guidance.

Such a program does not reflect wishful thinking. Personnel employed in institutions for juvenile delinquents recognize the importance and value of a sound vocational program. Despert, for example, at the New York Training School for Girls, reports that "the main approach to the problem of juvenile

delinquency at this institution is through an educational or vocational training program outlined for each girl shortly after admission" (39, p. 378). Administrative personnel at the Illinois State Training School for Girls, have been taking steps to introduce a similar program in their institution, so that a more successful adjustment can be insured for the wards after their return to the community.

Counselors of delinquent girls and probation and parole officers who endeavor to aid the youthful offenders in their social readjustment through employment also appreciate the significance of proper vocational guidance and training programs. All professional personnel involved, however, despair at the dearth of knowledge concerning the vocational interests and aptitudes of this group. Even though valiant effort is being made to disperse the ignorance surrounding this area, the information available is scant and far from conclusive. Theoretical interpretations of dynamics underlying such deviant behavior flourish, where concrete, factual data should abound. The questions asked in this area are many but the answers are few. The primary objective of this project, therefore, will be to attempt to provide additional data having a bearing upon these questions.

Novak, in an earlier study, reports some significant differences in the vocational interests of delinquent and

nondelinquent males (119, p. 48). But how do delinquent females differ in their interests from their nondelinquent peers? At least in part, this research has been designed to answer that question. Many believe that the female delinquent's successful rehabilitation is of greater importance than that of the male, since there is a strong probability that she will bear children and have an important influence upon their socialization. Her techniques in adjustment may vary radically from those of the male; but the basic problems in effecting a satisfying personal relationship with her community, and its reciprocal acceptance of her as a useful promotor of society's welfare, are the same. She is not spared the competitiveness of the open labor market (104, p. 38). Unless she can receive such guidance and counseling through which her interests and abilities can be expertly evaluated, she can easily fall victim to exploitation, which adds to personal frustration and social maladjustment. Unless she can be adequately prepared for an occupation consistent with her natural dispositions during a period in which a re-integration of the self is being effected, she leaves the institution unprepared and unqualified to merit the gratifications of permanent employment (160). The stigmata of unsuitability and instability are more deeply impressed upon her, and her undesirable behavior patterns are reinforced (148).

The delinquent owes a debt to society. Society usually

demands that it be paid, in spite of the verbalized rationalization about "treatment" rather than "punishment". Society, however, also owes a debt to the delinquent. How this responsibility may be mutually discharged, then, can only be discovered through well planned and painstaking research. The intent of this study is to explore possible limitations which interfere with the delinquent's meeting of these responsibilities.

More specifically, this research is proposed to supplement the limited knowledge regarding the vocational interests and aptitudes of delinquent girls.

The instruments to be used are the Kuder Preference Record and the complete battery of the Differential Aptitude Test. The former is a standard technique for the appraisal of vocational preferences. The latter measures the basic skills necessary for vocational success, which in a final analysis, is a major factor in social adjustment.

The emphasis, then, is on the individual. His relationship to the community, however, is not neglected. An integration of the psychology of juvenile delinquency with the sociology of his community is effected.

The first three hypotheses of this project were suggested by the findings of a previous study by the author, in which preferences of a group of delinquent and a group of non-delinquent boys were compared. In that research, the means

computed for the Scientific, Mechanical, and Outdoor Scales of the KPR significantly distinguished the nondelinquent from the delinquent group. The interests of the nondelinquents were more intense. The delinquent boys secured higher mean scores in the Artistic, Literary, and Musical areas. This was said to be an indication of maladjustment. Though these differences were not significant, a definite trend was indicated.

The profiles of the delinquent group were generally depressed. This difference was significant at the .05 level of confidence. Also, when the two significantly high scores on the KPR were combined, the nondelinquents were more likely to obtain Mechanical-Scientific, Mechanical-Computational, and Scientific-Computational interest patterns, than were the delinquents. These differences were significant at the 0.1 level of confidence.

The fourth hypothesis proposed in this study is the result of speculation and research findings of Feinberg (152, p.211), Diller (40, p. 181), Small (141, p. 8), and Wechsler (164, p. 155) who contend that delinquents reflect poor abstractive ability, poor motivation, short attention span, low frustration tolerance, poor work habits, and an inability to pursue to completion such problems as are found in the reasoning tests of the DAT.

In the present research, attempt will be made to

evaluate the following hypotheses:

1. Nondelinquent girls possess significantly higher mean scores in the Outdoor, Scientific, and Mechanical areas of the KPR.
2. Delinquent girls secure higher mean scores on the Artistic, Musical, and Literary Interest Scales of the KPR.
3. The interest profiles for the delinquent group are generally depressed or weaker in intensity, that is, the delinquents have fewer individual records reflecting two or more significantly high scores than have the nondelinquent group; and in the combination of significantly high scales (centile of 75 or above) the two groups reflect significant differences. The two groups also differ significantly in the combination of low scales (centile of 25 or below).
4. The mean of the aptitude tests measuring different reasoning abilities is significantly lower in the delinquent group.

There are additional reasons for proposing this research. It is accepted that interests are mainsprings of the individual's behavior and reactions to his environmental needs. The levels of aspiration, motivation, and personality are all related to interests, and systematic research may evoke a clearer understanding of these factors. This study may contribute further to a better understanding of the delinquent since Strong

(144, p. 515) concludes that measures of an individual's interests may easily prove the best approach to an understanding of him.

In addition, after extensive research in the area of vocational interests, Darley (37, p. 72) suggests that other investigators seek out various groups and conduct further vocational interest research projects. He states that more specific information about the characteristic vocational pattern of individuals or groups is needed. It is believed that the female delinquents used in this study would compose such a group.



## CHAPTER II

### REVIEW OF THE LITERATURE

A review of the literature relevant to this study suggests the conclusion that the female population of our penal institutions has been rather seriously neglected by those interested in research. This is not too surprising when it is estimated that male offenders outnumber female violators in ratios existing from four to twenty to one (38, 48). The literature is filled with speculation regarding the varied aspects of sociopathic activity, but the areas of vocational interest and aptitude are rarely mentioned specifically. Although a limited number of allusions to similarities and differences in vocational interests and aptitudes of nondelinquent and delinquent girls were found, markedly contrasting viewpoints were reflected. When experimental evidence is lacking, however, it is inevitable that different hypotheses are introduced in an attempt to explain observed phenomena. Few completed studies are available which attempt to verify these hypothetical statements.

In the vocational and aptitude studies that have been

conducted comparing different maladjusted groups with "normal" ones, male subjects are almost exclusively used. The majority of the available studies on aptitudes of delinquents, were found to be most limited in scope. For example, they compared tapping speed, observed athletic prowess, and creative ability in the classroom. They were most inconclusive in their results. Frequently, data yielded by delinquent records were compared with norms not applicable to the group evaluated. Many times, too, no comparable nondelinquent group was involved. Where one was employed, usually no effort was made to control the most important variables, and the delinquent group was merely compared with an incidental sample. It is realized, however, that the matching of groups is most difficult to accomplish because of the numerous barriers encountered in attempting to secure adequately matched groups. This is especially true when groups of acceptable size, which yield more conclusive results, are desired.

Regarding the development of vocational interests, marked variations are noted in the theories that have been proposed. This lack of agreement is most obvious in the comparison of the speculations representative of the psychoanalysts with that group who emphasize contemporary environmental conditions. On the one hand, the analysts stress determinism, holding that vocational interests and the selection of an occupation are merely a reflection and result of early

unconscious needs. On the other hand, the latter group places primary emphasis on the individual's locale and the jobs available in the area. Regardless of identification with a particular school or philosophy, it is interesting to note the factors considered important in vocational selection by the various disciplines. The sociologist usually emphasizes the role of socio-economic pressures; the psychologist posits the dynamic aspects, with stress on the psychological characteristics of the subject and the role played by relatives and friends; the guidance counselor stresses the individual's lack of information and insight in the development of his vocational interests and his ultimate vocational choice (148). Logically, all personal and environmental factors should be considered, since objectively it is usually recognized that they are all important.

A specific theory regarding the structural development of vocational interests and vocational choice is presented by Ginzberg (65). Ginzberg maintains that the individual reaches his ultimate decision, not at any single moment in time, but as a result of a series of decisions over a period of years. He considers occupational choice a process which is largely irreversible. Thompson (155) supports this point of view by stating that vocational choice is a long term process and not a concrete, specific event occurring at a specific time. Except in very rare instances, an individual does not decide at a

certain age to select one position. Whenever this does occur, it is usually in regard to a choice of one of the professions, such as law or medicine. Generally, however, the individual "gravitates toward" rather than specifically chooses the occupation in which he ultimately finds himself. Garrison dissents, and holds that pupils frequently make vocational decisions on the basis of one single momentary experience, such as, an enthusiastic lecture, social approval, or a recent contact with an animating personality. He adds, however, that decisions made in this manner are somewhat in harmony with earlier "life bents" (63, p. 314). Generally, it is held that vocational choice consists of a series of decisions made in the light of a more distant goal, toward which the individual strives with various strengths of motivation at different times in his chronological development. Ginzberg (65, p. 491) further comments that vocational choice can begin at birth and, under certain circumstances, could possibly still be an open issue at the time of the individual's demise. This process, including the numerous decisions, is analyzed into three periods: (a) the period of fantasy choice (b) the period of tentative choice and (c) the realistic choice period. The fantasy choices are made before 11 years of age. This is a period when the child is most fickle and capricious. He believes himself capable of assuming the duties and responsibilities demanded by any vocation he desires.

Usually, however, he has little knowledge of the vocation he is considering. His impulses and needs are translated into his occupational choice. Perhaps one day he desires to be an engineer; on successive days a streetcar conductor or medical doctor seems more appealing.

The second period, that of tentative choice, lasts from approximately 11 to 17 years of age. During this time subjective factors, namely, interests, capacities and values, operate almost exclusively. In sequence, the interest phase occurs first during adolescence because choices during this period are primarily based on individual interest. Later, the adolescent takes into consideration his capacities to a greater degree and becomes somewhat more realistic. Finally, in the third stage of the tentative period, the subject's values are also brought into consideration. Of course, these factors--interests, capacities and values--never function exclusively, but usually evolve in the order given above. At approximately 17 years of age, the subject finds himself in a state of transition. He is either directed toward some type of immediate employment, or gives consideration to more formal education. Berdie (12), too, holds that vocational choice tends to become more realistic as the actual occupational decision is approached and the student starts thinking more critically about training requirements and personal limitations. Thus, vocational choice continues to shift from the glamorous to

the more realistic and practical. Ginzberg (65, p. 493) considers these factors in his third or final period, that of realistic choice. It consists of three phases, namely, exploration stage, crystalization stage, and specification stage. In the exploration phase, the individual for the last time attempts to further acquaint himself with his alternatives. This is followed by the crystalization phase of the realistic period, wherein he determines his vocational area. The specification phase of the realistic period follows, and the individual delimits his area of occupation and selects a more specific position. Ginzberg theorizes that this usually occurs between 17 years of age and early adulthood. His hypothesis was given some verification in an experimental study by Kaplan (90), where 282 former students of Idaho University were used as subjects. The data collected revealed that most of these persons, at the age of 17 or 18, decided upon a more specific occupational pursuit, and resolved vocational choice problems.

The vocational theory presented above stressed the developmental or structural periods of vocational interest and choice. Regarding the contentual or psychological factors which determine to a great extent the time of occurrence of the three periods discussed above, Carter's (26) hypotheses seem to be in agreement with most authors.

Home environment, personalities of close friends,

companions and parents, plus the cultural resources available to the individual, are all mentioned as important external factors in determining a person's vocational preference. The individual receives great satisfaction from the identification with some person or group of individuals whom he respects. In this way he obtains status. Through this identification his interests, hobbies, recreational activities and other life experiences become restricted. To the extent that this is true, the person's interests grow and he learns about the vocation and the vocational groups. Other influences, somewhat beyond the individual's control, are his personal needs, physical traits, mental ability and other native endowments.

Here, too, the close interaction between growth processes is involved. Some of these processes are biologically controlled. The effects of glands regulating size and other physical properties that can effect vocational choice are obvious. Limens in all sensory areas, ranging from deficiency to marked acuity, are products of organic interaction, heredity and training, and they place certain limitations upon the development of aptitudes and the ultimate selection of an occupation. Educational development and academic experience are also important in the development of desirable vocational interests, and eventual vocational adjustment demands the assimilation of realistic value systems found in his culture. Here, selfconcept, motivation,

and academic relationships are involved. This assimilation, Carter states, "implies learning, maturation, development of character and personality. All these factors relevant to learning, maturation, and development in general have a bearing upon the development of vocational attitudes" (26, p. 187).

Many of the factors mentioned above are also involved in the determination of aptitudes. The two most extreme schools of thought in regard to aptitudes are (a) those who vigorously defend biological determinism and (b) those who just as strongly adhere to the theory of environmental experience and training opportunities. It is concluded, however, that the middle of the road group, those who do not identify strongly with either of the above, claim an overwhelming majority of disciples. They maintain that abilities are not solely determined by innate capacity; neither are they completely independent of original endowment and based exclusively on learning and environmental contacts. Perhaps, Bingham best represents the moderate group regarding the evolution of aptitudes. Most important, he insists on factual data regarding the person's aptitudes as they are presently reflected. They represent possessed characteristics indicative of future success or failure in some occupational pursuit. Whether the individual was born that way, or whether he acquired certain enduring dispositions in his early infancy, or whether he matured physically and psychologically under



circumstances which resulted in radical alteration of his originally endowed capacities, is a question of speculative and theoretical interest. It is of more concern to our whole social structure, however, because according to Bingham, this information has a bearing on public policy in regard to universal education, the potential contributions of the schools and even upon our eugenic legislation. It is of little practical moment to the counselor when the subject has reached the stage of educational and occupational planning. At that time, the development of aptitudes has most certainly been the product of interaction between circumstances and contributing factors, both innate and environmental. The individual's capacity for gaining manual skills, his intellectual component, emotional make-up, moral character--in fact, all aspects of his total personality--are subjugated in varying degrees to limitations, circumscribed by opportunities for growth and exercise, as well as by his original, determined nature. Regardless of what the constitution originally was, it has been modified by numerous factors. This occurs under the impact of both favorable and unfavorable internal stimulation and from sources extraneous to the person. During this entire period, naturally, the constitutional factors responsible for potential aptitudes and various abilities have unfolded and taken shape (17).

It must also be emphasized that in the evolution and

eventual manifestation of aptitudes, aptitudes and present ability are not identical. One may possess the aptitude to become an excellent mechanic, which in turn means that under proper conditions and training the chances for success are good. Consequently, displays of aptitudes in standardized settings afford an opportunity to select candidates who possess certain skills and who will most likely acquire proficiency with further training. To this extent, success at a specific occupation is probably assured.

Thus, we see that many of the factors responsible for the gradual development of vocational interests are also, in varying degrees, responsible for the development of aptitudes. In the last analysis, personal characteristics, exceptional talents, environmental associations and guidance are responsible for the development of vocational preferences and aptitudes, and the determination of them. A closer examination and appraisal of the various elements that are active determinants in the evolution of vocational interests and abilities may reveal whether or not some basis exists for possible variation in delinquent and nondelinquent groups.

First, the various external factors of both groups will be examined, namely, home environment, relationships afforded, and participation in educational and recreational activities. Secondly, the more internal aspects, such as intelligence,

physical status, abilities, level of aspiration, motivation, selfconcept and personal adjustment will be discussed.

Many hold that the most important etiological factor in delinquency is the home (163, 70, 168, 19). Darley (37, p. 8) contends that students coming from homes where family maladjustments exist reflect occupational interest scores that are depressed and unpatterned. Broken homes, parental neglect and lack of proper discipline, all of which contribute to vocational patterns, are found to exist more frequently in the history of the delinquent. In an attempt to determine the needs of American young people, 13,000 Maryland youths between the ages of 16 and 24 were studied by Bell (9). It was found that 70 per cent of the white families classified came from "normal" homes and approximately 32 per cent of both white and negro families were subjected to broken home living as a result of death, divorce, separation or desertion. Shideler (136, p. 715), however, found that 40 to 70 per cent of the various groups of delinquents studied came from broken homes; whereas, only 25 per cent of all children came from similar environments.

One hundred ninety-one normal adolescent boys and girls and 138 delinquents of both sexes were included in an extensive study by Wittman. It was found that the girls in the control group had both parents in 87 per cent of the cases as opposed to approximately 20 per cent of the female delinquents at the Illinois

State Training School for Girls (168, p. 181). The delinquent group to be used in this study will be selected from that institution. Again, the conclusions of research conducted by the San Francisco Department of Public Health are pertinent, since it was found that the broken home was one of the primary contributing factors to the delinquent behavior of 365 sexually promiscuous girls interviewed extensively (100, p. 68). In a study of four groups from correctional institutions in New York, Slawson (140) found that 45 per cent of the delinquents came from broken homes whereas only 19 per cent of the pupils from three public schools in the area came from similar environments. Merrill (109, p. 120) found that 50 per cent of 300 California delinquents studied came from broken homes, as contrasted to 25 per cent of a similar control group that were products of that type of home. Healy and Bronner (80, p. 49), the Gluecks (67), and Despert (39) report similar findings.

Home discipline, also an element of home environment which affects vocational interest, is much poorer in delinquent groups. Sadler (132, p. 131) insists that young people are profoundly influenced by the attitudes and actions of older persons and look to them for instruction and example. He adds that the delinquent is frequently in contact with parents who lack the necessary knowledge, understanding and practical experience to assist him properly. Seventy per cent of the 500

delinquents studied by the Gluecks (66, p. 119) came from homes where excessive amounts or total lack of disciplinary enforcement were found. Burt (23, p. 37) reports similar findings. Seventy-nine per cent of the English homes which fostered delinquent children displayed defective family disciplinary patterns. This was seven times more frequent than that which was found in a similar number of nondelinquent family groups. More than three-fourths of the delinquents investigated by Merrill (109, p. 122) came from homes where the discipline was in some way extremely erratic, that is, either very lax or extremely rigid. Half of the 300 youngsters resided in homes where both parents were either indifferent or actually hostile towards the child. Wittman (168, p. 179) concludes, after a very extensive study of 329 normal and delinquent adolescents, that parental relationships definitely distinguish the two groups. On a rating scale, the delinquent girls reflected negative emotions toward the father and only low average attitudes toward the mother. The parents were characterized as "rejecting" or "indifferent". This was in contrast to the normal or average relationships with parents experienced by the control group of adolescent high school girls. The importance of these influences is emphasized when the results of Norton and Kuhlen (118) are considered. They found, after interviewing 193 teachers and factory employees, that the family was ranked as being the primary determinant of vocational choice. Peters (121), too, states that the family is the greatest single

agency in determining vocational selection.

It has also been proved that friends, of the family have some effect upon the selection of a youth's vocational preferences (27). The family friends and acquaintances supply the offspring with information and attitudes regarding occupations, as well as influencing other aspects of their social life. Acquaintances who serve as models for an individual may especially influence vocational choice. (12, 95). Crouch (35) found that problem adolescents of both sexes were influenced by family and friends in the choice of a vocation, but unfavorable emotional influences and the natural stress of the adolescent period were even more important. It is generally accepted that undesirable family acquaintances are found more frequently in the environment of the delinquent; but Friend and Haggard (59, p. 16), after emphasizing the importance of peer and associate identification, point out that little actual scientific research has been conducted to verify or, determine the degree of its importance.

It may be concluded that marked differences exist between the home environments of the nondelinquent and delinquent. It is recognized, however, that to evaluate many of the above statements, it would be necessary to discover whether defective family relationships were not equally prevalent in the backgrounds of children considered nondelinquent.

who came from the same areas, when other variables were rigidly controlled.

According to many authors, economic level and social status are directly related to the occupation of the parents and are very influential in regard to vocational selection of the children. Bell (9, p. 47) comments that under the surface of our social milieu there operates a striking concurrence of social and economic forces that tend to freeze social levels and groups into a perennial status quo. He makes the inference, after studying 13,000 subjects, that low grade attainment of the offspring and eventually low level occupations are associated with low income occupations of the parents. Olshansky (120), too, attempts to prove this point and holds that just as an individual's constitution is chosen for him by his parents, so too, is his job level almost similarly predetermined by the social status of the parental figures. Further importance is given to social position by Super (148, p. 122), since he holds that children from lower income groups secure less education than do children from families more financially secure. This, in time, results in entering lower level occupations with no better opportunities afforded to offspring than the parents themselves experienced. Of added significance is the fact that insufficient family income is frequently reflected in personal insufficiency; and economic crisis in the family frequently contributes to delinquent and asocial acting out by offspring (131).

In a more scientific approach based on research, involving Midwestern adolescents, Hollingshead (84) found that there was little indecision among adolescents of the upper class social groups. These students knew what their parents expected and recognized that they could look forward to economic and social assistance from them when attempting to secure their vocational objectives. The choice of a vocation was similar to the job patterns associated with the social class of their adult world. It was concluded that the selection of a vocation by these adolescents was a reflection of their experience in their social class and family circle. The high labor turnover in lower class cultural groups was a reflection of lower social class mobility and amorphous vocational interests. Also, Havighurst's (79) study of 13 year old students in a Midwestern community of 6,000 revealed that sons and daughters of families with higher social status tended to do better in areas measured by the Chicago Tests of Primary Mental Abilities. The students coming from homes of lower social position as classified by Werner's scale of social classes, performed less adequately. Havighurst and Janke (87) obtained similar results again in a study of 120, 16 year old adolescents in a typical Midwest community. The girls from families possessing better social standing significantly surpassed the lower level social groups on the Minnesota Mechanical Assembly Test. Significant findings favoring the higher social groups were



also reflected on the Wechsler-Bellevue Intelligence Scale, the Iowa Silent Reading and the Paper Form Board tests.

In another study attempting to determine to what extent social-class culture influences vocational choice, Galler (61) secured essays from 492 children. The subjects were divided into two groups, namely, upper lower class and upper middle class status. The essays were specifically intended to bring out vocational interests and the reasons for their selections. When chi square was employed, although the subjects did not tend to follow the parents' specific occupation, the upper class boys had a more intense desire for a specific occupation than did the lower class boys. The girls could not be differentiated on this basis. Both sexes in the upper class group selected positions identified with higher social status. However, the female choices were not consistent, and it was concluded that women's occupations are not structured in a social status hierarchy to the extent that male occupations are. Of much importance to the present study, however, was the finding that lower class girls were more immature in the selection of their occupations, and that parental influences actually had marked effects upon the choice of the subjects.

Form and Miller (54), in a study of 276 work histories in Ohio, concluded that there is a strong tendency for the offspring of white collar or professional workers to either inherit

the father's occupation or surpass it in occupational ratings, whereas, children from homes of manual laborers usually inherit their father's occupation or fall below it. They found a positive relationship between the educational and the occupational level of the father, and the vocational aspiration level of the children. Moore (111, p. 51), however, after investigating 95 senior high school students, found that the students, favored with better economic or social status, did not surpass lower social level students in regard to the realism of desires and ultimate vocational goals. He concluded that they needed just as much personal guidance as the lower income groups. The level of occupation engaged in by the parents did have more influence upon the offspring, however, than did the specific occupation pursued by the parental figure. Moore (11, p. 38) adds that only 6 of the 95 high school students thought that the occupation or desire of the parent had a strong influence upon their vocational choice. Greater variability is noted in the work of Sears (134) where from seven to 23 per cent of over 1,000 seventh and eighth grade students desired to enter the exact vocational pursuit of the father. Somewhat similar results are given by Proctor (126) and Andrews (4). Proctor, in a follow-up of 945 high school graduates out of 1,514 students employed in an original study, found that 13 per cent actually engaged in the exact occupation of the father while 51 per cent were working

at the same occupational level. Seventy-five per cent of the sons of fathers engaged in professional work desired a professional position. None of the remaining 25 per cent selected occupations below the skilled trades level, again alluding to the important influence of social background.

Six hundred seventy-three college men involved in Anderson's (3) research revealed that 40 per cent of their fathers and 37 per cent of their mothers made vocational suggestions to them. Twenty-seven per cent of the students were ultimately employed in areas reflecting the paternal desire, though only one out of ten really believed they were actually influenced by parental suggestion. Sheldon (135) dissents, and concludes, after a study of 550 girls and boys, that the occupation of the father had little effect upon the child's selection. However, it should be pointed out that elementary school children were involved. Possibly, parental wishes and/or parental identification were not yet as influential as might be expected in the cases of senior high school and college students.

Perhaps, the finding most pertinent to this study is presented by Wittman. She concluded that the mothers of delinquent girls were "below average" regarding ambition for their children. The father of a delinquent girl characteristically had, "no ambitions for his child's future" (168, p. 174).

In the studies concerning socio-economic level and parental occupations, elementary, high school and college

students were employed as subjects. The methods and procedures of research, varied greatly. Marked agreement, however, is reflected in the findings based on both objective measures and/or extensive observations by the investigators.

In the realm of educational factors, an intense dislike for formal educational activities and a negative attitude toward school and teachers are displayed by delinquent youth to a much greater degree than by nondelinquent students. On hundred ninety-three adult subjects employed by Norton (118, p. 296) ranked the school as the second most important factor shaping the development of their vocational interests. Super (149, p. 15) makes the point that high school adolescents of both sexes find much in their satisfying academic experiences and contacts to encourage them toward higher level occupations. Bell (9, p. 97) showed that the amount of formal schooling determines to a marked degree the kind of occupation a person will get. Davis, (38) too, emphasizes that the individual's school experiences play a dominant role in determining the type and range of his interests. Heck (81) comments that delinquent activity frequently originates in school settings because of dislike for academic work and inability to adjust to school personnel. The delinquent would seem severely penalized, since Feinberg (52) holds that marked retardation in the scholastic area and lack of the most rudimentary educational knowledge are a result

of school difficulties that commence in the very early grades. Armstrong (5), goes back farther historically and states that delinquents are already primed for failure when they are first enrolled, primarily because of early psychological traumas and personal instability!

Data from research studies of scholastic retardation and dislike of school among delinquents are presented by the Gluecks (69), Eckenrode (47), and Novak (119). The Gluecks found that open conflict with the school and society occurred in 77 per cent of 439 former inmates before they had reached 17 years of age. Eckenrode's study of 345 delinquents, committed to the National Training School for Boys in Washington, D.C., indicated that 90 per cent of them expressed definite dislike for school and its personnel. In comparison, Monash reports that of 374 students of both sexes in public schools, 68 per cent of the seventh and eighth grade girls liked school and found it highly satisfying (110, p. 70). In a study of 100 delinquent and nondelinquent adolescent boys where intelligence, chronological age, religion, economic status and residential area were controlled Novak found the mean placement for delinquent boys to be 1.5 grades below that of nondelinquents. The delinquents protested attending school. These findings are more important when it is considered that a relationship can be demonstrated between measured and expressed vocational interests and liking for teachers and

academic personnel. These contacts influence vocational aspirations because of the acceptance, encouragement, support and identification afforded the student. This is borne out in Berdie's (12) study of 42 students with measured interests in engineering, which gives an indication of the importance of instructor influence. Berdie found that 29 per cent of the engineer candidates reported that their favorite teacher taught mathematics. The author further comments that pleasant or unpleasant relationships serve to reinforce a preference or a dislike for a certain occupation (13). Similar results are reported by Peters (121), Pinney (123), and Livesay (102). The latter concluded, after studying 2,199 high school seniors, that a decided tendency existed to choose vocations in some way related to the type of high school subject which the pupil found most to his liking. Obviously, the teacher relationship was of importance, in varying degrees, regarding this determination. In Peters' study to determine the factors which contributed to vocational choice, 10 per cent of the students stated that vocational interests and selection were directly influenced by teachers. Pinney, investigating school influences on vocational choice, relates that 128 students employed in his study claimed that school relationships influenced vocational selection. Three hundred fifteen students stated they were not influenced; but the important influence of school personnel is

still demonstrated. Kaplan (90) further supports the importance of academic contacts. In his study, approximately 25 per cent of 282 subjects, contacted after college graduation, stated that school courses and teachers were primary causal factors for their vocational interests and present employment.

The finding of Brooks is most impressive. He states, "Eight girls said they expected to teach physical education. Knowing that their instructor in physical education was an excellent teacher, very popular, attractive and of a pleasing personality, the writer sought to find out when these eight girls had decided to become teachers of physical education. Six of them had made a decision as a result of being in the physical education class" (22, p. 300).

Many who have studied attitudes toward school recognize the students responses are sometimes based on feelings of the moment. Nevertheless, it can be assumed that both delinquent and nondelinquent students would be affected in a similar manner, and the differences seem to be quite marked. In fact, Sivori (138), after commenting extensively on the difficulties encountered in normal academic settings by delinquents, proposes general changes in the school atmosphere, and even suggests modification of school attendance laws in an attempt to aid juvenile delinquents in their adjustment.

Franklin (57), Brooks (22), and Berdie (13) further

emphasize that participation in properly conducted school programs, recreational activities and hobbies is conducive to the initiation of vocational interests and sometimes bears a close relationship to them. In fact, many counselors depend on hobbies and activities of the student as a means of identifying and analyzing both vocational interests and aptitudes. Fowler (56) agrees that a definite relationship exists between vocational interests and leisure time activities; Super (148) observed that people who have vocations that are outlets for their major interests were likely to have had hobbies which resembled these vocations. "A study of the interest patterns of adolescent and adult amateur photographers," he concluded, "revealed that they resemble both those of professional scientists and professional artists. Those of adolescent, amateur model engineers tended to resemble those of professional engineers and other scientists. Those of amateur musicians were like those of professional musicians" (147, p.139). Dyer (46), after studying the relationship between vocational interests of college men and their later occupations, agrees with Super, and comments that hobbies and boyhood occupations are most important in regard to later vocational selection. This was also indicated in Peters' (121) research involving 380 high school seniors, wherein 40 per cent reported that their vocational aspirations were influenced by previous hobbies. Greig (74)



reports that 40 per cent of 117 technical school students, too, reflected similarity between hobbies and job preferences.

In 1944, a study of 400 boys by the Big Brother movement in New York revealed that vocational objectives, or a lack of them, were most significantly reflected in a boy's behavior. One of the primary objectives of a Big Brother in dealing with delinquents or pre-delinquents is to give the boy firsthand information about the occupation he pursues. Industrial field trips are arranged to develop vocational interests which have not been developed because of a lack of wholesome pursuits and contacts (55).

Dooley (43) states that participation in accepted school and club activities where vocations can be stimulated, is woefully lacking in delinquent groups. Reinhardt and Harper (127) actually compared the club activities of 40 delinquent and 40 nondelinquent boys of equal age. It was found that 35 of the nondelinquents participated in all types of constructive clubs and organizations. Only 15 of the 40 delinquents enjoyed similar pursuits and the other 25 were unsupervised and were involved in unwholesome gang activities. Like findings are reported by both the Chicago Recreation Commission (171) and the Baltimore Criminal Justice Division, as reported by Bell (9). The former group, after investigating the recreational activities of 23,000 adolescents, 10 to 17 years of age, concluded that more super-

vised recreation was afforded boys than girls in the Chicago area; but marked differences existed in the amount of wholesomely supervised activities participated in by delinquents and nondelinquents of both sexes. The Baltimore group reported that only 5 per cent of 592 boys arrested had any supervised play, while 82 per cent expended their youthful energies in street play and corner gangs where unwholesome enterprises are frequently encountered. Murray (115) also concluded after a comparative study of delinquent and nondelinquent athletic participation, that an inability to cooperate in team activities, because of low frustration tolerance, and a fear of losing were found much more frequently in delinquents, and prevented them from partaking in group functions. Solomon (142) further emphasized the fact that delinquent boys and girls will not partake of organized recreation programs because they must be considerate of one another in a group, cooperate willingly, and exhibit sportsmanship. This is something delinquents will not give or do. They will not accept the supervision or instruction affiliated with any type of wholesome recreation or hobby where vocational interests could be initiated or abilities improved, because they usually fear teachers or leaders who know what the delinquent is thinking, planning or doing. Actually, directors of such agencies do not want this type of youngster in their programs because of the unwholesome influence he might have upon others

and the disciplinary problems he creates.

Similar findings were presented by Kindred (92) in his study conducted at the Colorado Industrial School for Boys. Only 26 out of 121 delinquents investigated had cultivated special hobbies or abilities, such as dramatics, music, art or cooking. Eighty-nine of the 121 boys did not belong to any type of club or organization. Kindred concludes that the number of delinquent boys participating in this type of activity is significantly smaller than that of average nondelinquents. He explains that maladjustment at home and at school, adoption of undesirable habits and bad companions deter delinquent boys from participating in purposeful organizations and constructive activities that could produce interest in some vocation that they eventually would aspire to pursue.

The Gluecks' findings are also most impressive. Ninety-three per cent of 976 cases investigated by the Gluecks' (68) in their classical work with 1,000 juvenile delinquents showed that they indulged in harmful work or undesirable recreational activities. "The counterpoise of legitimate and healthful recreational outlets was too often missing; for most of these boys were never absorbed into organizational programs for the use of leisure." Seventy-five per cent of them had never belonged to any organization or club such as the Boy Scouts, YMCA or settlement house groups where wholesome avocational interests are usually

cultivated. Only 3 per cent of these delinquent youths participated in constructive expenditure of their energies such as the development of personal talents or by attendance at various extra school or night classes. In comparison, Berdie discovered that 55 per cent of his students reflecting engineering interests on the Strong Interest Blank had related hobbies and actively pursued them. Forty-six per cent of 71 students interested in skilled trades had related hobbies and, of 90 students that recorded business interests, 32 per cent were interested in similar leisure time activities. He summarizes aptly that "These results suggest a substantial relationship between both expressed and measured vocational interests and the activities and hobbies of a student. Whether the interest and activities codetermine each other or whether they are paralleled expressions of a unified personality exposed to a given set of conditions is unknown" (12, p. 269).

On the basis of the above findings, one could conclude that several of the studies seem to verify the hypothesis that a positive correlation does exist between hobbies, recreational activities and vocational interests, and the discovery of aptitudes and ultimate occupations. No study could be found to contradict this premise. They also indicated that delinquents do not participate in these types of activities as much as nondelinquents do. It must be remembered, however, that adolescence is a period of exploration, and consequently

participation in some recreative activity could be most transitory in nature and would not necessarily imply deep seated vocational interests. Having become engrossed in an activity, however, the subject should discover whether or not he possesses the aptitude to achieve a feeling of personal satisfaction. Thus, success would seem to encourage further participation, the intensity of a vocational interest and development of possessed aptitudes; whereas failure would seemingly result in cessation of the expenditure of energy and further search for more adequate outlets.

Regarding the more innate and personal characteristics of both groups, intelligence is said to influence vocational selection and aptitudes. Most early studies stressed the significance of mental deficiency in the delinquent group. This is especially important because it is generally held that the mentally slow are retarded and less precocious in the development of vocational interests and in their ability to perform tasks reflecting varied aptitudes. It is also reported that the more intelligent young people tend to base their vocational choice on more realistic foundations, and are motivated by more socially desirable considerations than are their less able peers (148).

The practical implications of Moser's (113) study relative to the relationship of vocational interests and intelligence are pertinent. He studied 550 high school students

and discovered on the basis of Henmon-Nelson IQ's that occupations and vocations demanding professional training are usually selected by those individuals who possess high mental ability. The lower level students tended to select less skilled occupations demanding lesser abilities and training.

Resnick (128) insists that intelligence is also an aid in determining aptitude, although a high IQ does not unequivocally guarantee success in a particular type of work. It does, however, give indication of the possible level of performance. Standards are frequently set up at minimum and maximum intelligence levels for employing persons at certain types of positions in industry. The reasons are obvious. Bingham (17, p. 144) adds that aptitudes are also partially a matter of intelligence.

Pintner lists 41 individual investigations and those studies list feeble-mindedness as being present in 7 per cent to 93 per cent of the delinquents considered. Pintner sums up by saying that "the distribution of delinquents is heavily weighted at the lower end...there seems to be general agreement as to the fact that the average delinquent is mentally below the average nondelinquent on the usual abstract intelligence test" (124, p. 186). More recently, Gates (64) holds that the typical delinquent has an IQ of between 80 and 90 and is retarded in school. In the comparison of 1,000 delinquents referred to a clinic for assistance with 3,638 school children, the Gluecks (67, p. 102) found that

41.6 per cent of the delinquent group possessed or surpassed an average intellectual classification, as against 79 per cent of the school group. The results of studies by Kvaraceus (98) and Williams (166), in part, support the Gluecks' finding. The former reported intellectual findings of a large group of Passaic, New Jersey school children and 761 problem children referred by the schools for assistance and guidance. A mean IQ, "within the average range", was recorded for the normal group, as compared to a mean of 89 for the maladjusted youngsters. Williams presents information on 470 delinquents in California institutions and found the median IQ ranged from 69 to 82. Zeleny (170, p. 578), after analyzing many other studies and compiling their findings, reports that feeble-mindedness and mental deficiency classifications were applicable to delinquents two-tenths more times than to individuals considered normal. Goddard, in his classic book on feeble-mindedness, published in 1904, represents the thinking of that time. He concluded, "it is no longer to be denied that the greatest single cause of delinquency and crime is low grade mentality, much of it within the limits of feeble-mindedness" (7, p. 89).

Other authors, however, present markedly different viewpoints. Merrill (109, p. 170), after studying two groups, one of 300 delinquents and the other of 300 nondelinquents, records IQ's of 86.7 and 89.3 for the delinquent and nondelinquent

groups respectively. This difference, however, could be attributed to chance factors and was not significant. A most desirable aspect of this study involved the control of two important variables, school and economic backgrounds.

More pertinent to the proposed research, Jastak and Gilliland (88) concluded after administering Wechsler-Bellevue Intelligence Tests to delinquent girls, that the average delinquent possessed average intelligence.

Richmond (129, p. 120) informs us that when the delinquent is considered individually, it is necessary to revise the commonly asserted belief that delinquents are people of low mentality who possess abnormalities that make it impossible for them to conform to social standards. She concludes that the majority of delinquents are as normal as the average individual. This too, is the finding of Gurvitz (77). He emphasizes that in the past, prisoners of all types reflected large percentages of feeble-mindedness. It is now recognized that this was generally attributed to the test as well as to the population tested. More recent studies tend to prove that prisoners are equal in intelligence to the general population. In repudiating earlier findings, Gurvitz concludes that in his experience the percentage of mentally deficient inmates closely resembles that of similar cultural groups in the outside population. Both approximately are 3 per cent. Tulchin (158), whose results are in contrast



with those of earlier investigators, proclaims that if any difference does exist between the criminal population and a representative general one in regard to intelligence, it would favor the criminal group, although he concedes that the difference would not be significant! Murchison (114) did find after a study of three prisons that a total of 2 per cent of the inmates were college trained, a rate higher than that of the general population for that period. Bronner, further cautions us that it is well to remember one cannot compare a nondelinquent group with a group of delinquents who are clever enough to commit delinquent offenses without being detected (21, p. 2). In all of the studies of delinquent and nondelinquent groups it is only the apprehended ward that is discussed. It is the less intelligent

individual who is so much more readily, and so detected and brought into court. These are the delinquents who predominate in institutions where the investigations are conducted. Legal authorities also prefer to place the brighter or more intelligent delinquents on parole rather than intern them for a first offense. Further, the general attitude of the delinquent--the hostility, aggressivity, distrust and rejection of authority--frequently invalidates the results. These factors usually are not taken into account.

However, the most impressive conclusions are reported by Strong after surveying a number of studies that compared

the results of intelligence tests with measures of vocational interest. The correlations for each occupational key of the Strong Vocational Interest Blank with IQ ranged from a  $-.36$  to  $.38$ . "Occupational interest scores," he states, "correlate in the neighborhood of 0 with intelligence" (145, p. 332). Fryer (60) merely states that the relationship between inventoried interests and intelligence is negligible, and Darley (36) reports correlation ratios from  $.04$  to  $.31$  between six representative keys of the Strong Interest Blank and seven areas of the Primary Mental Abilities Test. Further findings of Andrews (4), Byrns (24), Lorge and Blau (103) show that the correlation between intelligence and vocational choice, as based on studies with lower level youngsters, hovered around the  $.05$  level.

In summarizing the research in regard to delinquency and intelligence, it must be pointed out that in much of the research, especially the earlier studies, conclusions were drawn on the basis of fallacious data. The attitude of inmates has already been mentioned; the fact that emotional incapacitation, especially immediately after internment when testing is usually done, is not taken into account; the delinquents are not typical since they are institutionalized, and the brighter ones, not apprehended, are not included in these research studies; the competence of the tester and the instrument employed are frequently mentioned as being suspect; finally, in most of the

early studies which pointed up a causal mental deficiency-delinquency relationship, the 16 year old mental age was taken as representative of the average adult population. Since that time, this has been rectified. The lack of validity of World War I psychological testing had been recognized, but the results of many of the early studies on delinquents and criminals are still accepted as proof of mental deficiency in those groups.

Regarding physical characteristics said to affect vocational selection and aptitudes, several writers have stressed the malnutrition and physical underdevelopment of delinquents and criminals. Burt (23, p. 138) noted a great prevalence of sickness and debility among juvenile delinquents in London. Physical defects seem to be more common among delinquents than among nondelinquents on account of ignorance, lack of proper care and training, and other unfavorable conditions which supposedly characterize the homes from which they come. Berro (16) merely holds that constitutional factors can be determinants of delinquency. Sadler (132, p. 141) states that some eugenicists maintain that crime is attributed largely to defective germ plasm, while the physiologist suspects endocrine gland dysfunctions. Slavson (139, p. 417) comments that some delinquent behavior is a result of constitutional and organic defects and other pathological conditions. However, many times our institutions harbor these individuals and categorize them as

delinquents when that classification is a result of a secondary symptom of a more primary physical or mental disorder.

In a study comparing 177 young women between the ages of 16 and 21 undergoing training at the Borstal Institution in Britain, with 123 young Oxford women 18 to 21 years of age, however, Epps and Parnell (48) found that, in the measures of physique, including height, weight, bi-iliac, chest width, chest depth, sitting height, chest and hip circumference, the delinquent group was shorter in height, had shorter trunks, shorter limbs, and were more stocky and tubby in build. They tended to Sheldon's somatonia classification. The authors conclude that organic constitution cannot explain why, among individuals of a given physique, only a portion become delinquent; but the existence of a short constitutional factor is confirmed and provides, for the authors, one answer to the question of why some individuals are susceptible to adverse environmental influences and become delinquent. It must be pointed out that there seems to be a lack of complete scientific basis for the conclusions drawn by the authors. Even though these results would not be carried beyond the limits of that particular study, they are misleading. Persons employed in delinquent institutions for girls soon recognize that frequently the length of stay in the institution is readily reflected in weight and physical proportions because of high caloric diets served in most penal

institutions, and secondly because of excessive regimentation and lack of normal pursuits which could contribute to better physical condition. Some of the findings of this study, however, would be expected when a delinquent group was compared with a most atypical control group, since it would hardly be expected that the women attending a distinguished English college would provide a comparable sample when intellectual and gross cultural and, even age factors were so loosely controlled. The findings of this particular piece of research did not seem commensurate with the amount of energy expended by the authors, if a major purpose was to prove that differences existed between the two groups employed.

Hooten (86) reports findings that were rejected by many of his colleagues when he reported on the American criminal and stated that, as a group, they represented an aggregate of sociologically and biologically inferior individuals with marked deficiency in gross bodily dimensions and poor physical development. He concludes that crime can only be eliminated by the extirpation of the physically, morally, and mentally unfit or by the complete segregation in a socially aseptic environment. In a critical reply to Hooten, Wallenstein and Wyle (161, p. 472) explain away many of his findings and refer to them as ridiculous and not based on fact. They concluded, "Professor Hooten professed to believe in biological inferiority when he began his study. He continued to believe in biological inferiority when

he was finished. For the learned anthropologist having once adopted a theory was apparently unwilling to be dissuaded by mere facts, even though the facts were a product of his own efforts". Further repudiation comes from Merrill (109, p. 7) who thinks that Hooten might convince some that the slight physical deviations from the average constitute an adequate demonstration that the criminal population is biologically inferior; but, when he claims its origin is hereditary in nature, the assumption is unwarranted and unproved in the data Hooten presented.

Faber and Ritter (50) discovered that delinquents and nondelinquents of the the same socio-economic status differ very little in the prevalence of physical ailments and defects. Masters succinctly states that "heredity factors per se do not have any high coincidence with delinquency" (107, p. 388). Anthropometric measurements of juvenile delinquents by Mathews (108), McCord (105), Healy and Bronner (80), and similar statistical research on criminals by Goring (72), do not provide any basis for the application of the theory of underdevelopment, malnutrition, and organic deficiency to delinquents. Brooks (22) concludes that delinquents and nondelinquents cannot adequately be differentiated by intellectual or physical characteristics; whereas Berdie (13, p. 140) summarizes that so far as physiological differences are concerned, scientists do not know

to what extent they do determine vocational interests. It is not known with certainty, either, how physical structure or physiological variability is related to vocational interests. This, too, can be applied to aptitude. Neither do we know if the different somatotypes or endocrinological functions are really characteristic of people having different vocational interests or abilities.

Although too little is definitely known about the amount and distribution of aptitudes to permit a final comparison of delinquent and nondelinquent youth, several studies, some of them comparative ones, have been conducted. The findings, however, are most inconclusive. Dougherty (44) administered several tests to 222 boys and girls who appeared in the Los Angeles Juvenile Court and were legally judged delinquents. The results of this group on the Stenquist Mechanical Aptitude Test revealed that the delinquents of both sexes earned slightly better scores than the New York public school boys who were tested by Stenquist. Shulman (137) also found, in a comparison of 22 delinquents and their nondelinquent brothers, that the delinquent group was superior to their brothers as well as to a group of school children on the Mechanical Assembly Form of the Stenquist Mechanical Test. It must be added, however, that the lack of control of important variables leaves much to be desired so far as full acceptance of the results are concerned. Similar findings are reported by

Armstrong and Heisler (6). One hundred fifty-two, or 76 per cent of the 14 and 15 year old white delinquent boys of 200 tested on the Stenquist Test of mechanical ability rated average or above the normal population. They concluded that the delinquent boys, as a group, were better than the average population in regard to mechanical ability. The delinquent boy was also found by Slawson (140) to approximate the mechanical intelligence and ability of children whose social reactions were considered perfectly normal. Similar findings are reported by Holmes (85), who attempted to answer the question whether or not the abilities of delinquents were high enough to enable them to compete favorably with nondelinquents in various industrial operations. He employed 60 youths who had come under the jurisdiction of the California Youth Authority for various misdemeanors. They ranged in age from 16 to 21, with an average age of 18. The General Mechanical Aptitude Test, C.M. -142a, 1945, issued by the Adjutant General's Office, War Department, was used. The data collected from the delinquent group were compared with the general norms for 676 employees of the Benicia Arsenal in California. These employees were doing mechanical and technical work. The results of this comparison revealed that the aptitude of delinquents in mechanical and technically related fields closely approximated the general norms. The boys seemed to be on a par with those engaged in skilled and semi-skilled trades.



They were found to rank above the common laborers in general mechanical aptitude and to compare well with norms established at Army installations throughout the country. Murray (115) in a comparative study, found the delinquents of both sexes to be practically equal to the nondelinquents in tests of athletic performance.

Green and Davis (73, p. 310), however, merely state that delinquents tend to lack occupational skill, and much contradictory evidence is reflected in other studies. Jastak and Gilliland (88, p. 228) found that performance of girls, on the Wechsler-Bellevue Intelligence Scale and the Wide Range School Achievement Tests, indicate that they were markedly deficient in the use of language, poor in perseverance, goal striving, dependability of action and constancy. It was also concluded on the basis of all accumulated data that delinquent girls were somewhat subnormal in the use of their limbs. Diller (40), by means of several studies of scatter, including all of the subtests of the Wechsler-Bellevue Intelligence Scale and the Wide Range Achievement Tests, distinguished delinquent from nondelinquent girls to a significant degree. The subjects consisted of 80 white nursing applicants and 80 female delinquents. The age range of the delinquents was 14-17 inclusive and the average of the nurse applicants approximated 17. After intensive analysis of the data, Diller found that the delinquents ranked

higher in the picture arrangement and object assembly subtests. When all the factors were considered, however, the nondelinquent group scored higher in all major areas, especially where reading and general information were demanded. A discrepancy of 23 points was noted in IQ favoring the nondelinquent group. Some of the delinquent girls did possess good motor control, but the typical female of that group appeared to be clumsy and unskilled in her somatic adjustments, and psychomotor efficiency seemed generally poor. Diller, however, concluded that school retardation and lack of achievement are embedded in general linguistic retardation, but were independent of native capacity. Although some of Diller's results seem quite impressive, failure to control age and other educational and cultural factors seem to weaken the findings.

In 1922, Porteus (125) noted that delinquent responses to his Porteus Maze Test reflected qualitative differences from those of normals of equal test age. Twenty years later, he completed a comparative analysis of the performance of delinquents and noted that the tendency to make qualitative errors was twice as marked in delinquent as in normal records. Eighty per cent of the delinquents and only 25 per cent of the normal group of high school students made qualitative errors above a critical point established by the author. He found that the typical responses of the delinquent were marked by carelessness,

disregard for instructions, haphazard work, and satisfaction with an inferior qualitative grade. Expectation of poor workmanship in a task was also reflected. The delinquent might secure a good quantitative score, but the qualitative aspects differed markedly because of these above-mentioned factors. It should be added that the same low qualitative scores were also registered by others having unfavorable personality tendencies. Children noted by teachers as being not dependable and, more important, workers in semiskilled occupations, who were reported by their foreman to be doing unsatisfactory work, were also found to secure low qualitative scores. These scores, however, were not as low as the ones secured by the delinquent groups. Doctor and Winder (42), who conducted a similar study some nine years later, again distinguished delinquents and nondelinquents on the basis of Porteus Maze Performance. Their major conclusion, a tentative one, implied that personality variables, primarily impulsivity and difficulty in ego control in the delinquent group were responsible for the manner in which the two groups were effectively distinguished. Feinberg (52), too, after examining 872 delinquents at Boy's Republic, a school for maladjusted boys in Michigan, concluded, on the basis of achievement tests, that they were retarded in several areas. The majority of the subjects reflected an inability to organize themselves for careful, exact or disciplined thinking.

In a comparison of 25 sixth grade girls, who were failing the sixth grade and who showed delinquent characteristics, with a group of 25 students of approximately equal intelligence who were successful in the scholastic area, Wolf (169) found that the Detroit Mechanical Aptitude examination for girls differentiated the two groups with "complete reliability". On the Minnesota Paper Form Board "a tendency of true difference" was again reflected, in both instances favoring the success group of girls.

Brooks (22, p. 406) concludes that delinquent and non-delinquent individuals are equal in tapping speed, and that, in motor abilities, both groups are about the same. On some performance tests delinquents do average slightly less than the general population for some ages, but so much overlapping exists that differences in abilities do not differentiate the two groups.

The level of aspiration, motivation and self-concept of the delinquent and nondelinquent groups may also be a differentiating factor. Symonds (152) asserts that the level of aspiration refers to what one would like to do or be, called an ideal goal, or that goal which the subject intends to reach, referred to as an action goal. The level of aspiration represents the degree to which the person's total background has prepared him to seek prestige and to discharge his social responsibilities. High income, status of those about us, and recognition of

leadership in the community are all important factors in determining levels of aspiration. Most significant is Darley's (37, p. 60) contention that the occupational level desired grows out of the level of aspiration of the individual. In the well adjusted individual, it is not customary to set the level of aspiration far below a point which can be accomplished nor at a point which greatly surpasses our capabilities.

Stubbins, in his intensive study of 219 veterans seeking vocational counseling, discovered that intelligence and six of the scales on the KPR gave a multiple correlation of .51 with the determined vocational aspiration level of the subject. Education, tendency toward social participation, father's education, and stability of home environment were all significantly related to the level of aspiration. In spite of generally lower levels of aspiration in the vocational areas held by children coming from lower socio-economic settings, it was found that they sometimes develop compensatory attitudes about their status which may be evidenced in a desire for high occupational ambitions. Stubbins concludes that the holding of lower aspiration levels tended to indicate the least adequate subjects, as judged by personal adjustment and the type of problem brought to the counseling setting. (146). Escalona (49) too, found a relationship between the emotional adjustment and the level of aspiration. In a later study of adolescents, Gruen (75) verified her findings and

stressed the relationship of maladjustment and the level of aspiration. He found students who rated themselves as emotionally unstable on the Rogers Test were inclined to possess either extremely high aspiration estimates or to fall at the other end of the continuum below their actual performance ability. Sears (133) and Himmelweit (83) present similar findings. The latter found that maladjusted women showed a greater tendency than normal ones to overestimate future performance.

In another study comparing 25 delinquent and 25 nondelinquent high school students, Birkness and Johnson (18) found that only 20 per cent of the delinquent group, but 60 per cent of the normal control group, had definite goals for the future. The nondelinquents had also made plans whereby they might secure their objectives. Only 8 per cent of the nondelinquent group, compared to 40 per cent of the delinquent group, were rated as really "vague" in regard to future goals. The delinquents, in the study, reflected a definite tendency to drift without persistence and decisiveness. In comparison, Merrill (109, p. 103) concluded in her study that the aspiration level of nondelinquents was considerably higher than the aspiration level of the delinquents. The delinquents who stayed in school longer had higher vocational aspirations, but in both the professional and unskilled areas, the nondelinquent group reflected higher vocational expectations than the delinquents.

It would seem, then, that well-adjusted persons tend quite constantly to aspire for levels slightly above average, and that the maladjusted possess either fear of failure or exaggerated desires for status and recognition. The more stable persons keep a healthy balance between hope and reality. Corsini (29) offered further verification in his comparative study of delinquent and nondelinquent vocational interests. He collected information from 239 inmates of the Elmira Reception Center, New York. His subjects, 16 to 21 years of age, submitted written statements giving their prime vocational interest. Two hundred ninety-nine other wards gave oral statements regarding their vocational preference to vocational supervisors at the institution. Corsini selected as a comparative sample the occupational choices of 5,143 youths in the State of Maryland (9). The age range for the Maryland group was 16 to 24. Corsini ranked the occupational choices of the inmates with those of the free youth and with a list of actual occupations of the latter group. He found the expressed interests of the free youth highest in terms of desired occupational level. Out of the ten occupational areas selected, three are in the professional category, (physician, lawyer, teacher) and two are found in the technical--highly skilled level of aspiration group (musician, engineer). Those interned at Elmira are next in terms of levels of occupation desired, while what the free youth were actually doing was lowest. A conclusion

drawn by Bingham (17) is corroborated by Corsini's findings, namely; it is generally true that youth aims slightly higher than what it will actually achieve. In Table I, is a tabular representation of Corsini's findings.

Examination of Table II, reflects a major discrepancy in the skilled work category. Sixty-six per cent of the delinquent group aspired to this level, yet only 4.3 per cent of the Maryland group were actually employed in these occupations. Also, 40 per cent of the free youth were actually performing in the domestic, personnel and office-sales occupations, while a total absence of desire to be employed in these areas was lacking in the delinquent group.

From Corsini's study we can draw the following conclusions: (1) the interests of the reformatory inmates are definitely circumscribed, the occupational aspirations of 50 per cent of the 538 inmates being relegated to five trade preferences and 93 per cent of the stated interests being encompassed by 27 trades or occupations, (2) a comparison of the vocational interests of the free youth and delinquent youth indicates the former group to have aspirations for higher level occupations. None of the ten main choices of the delinquent group are found in the highly technical professional areas, while five of the ten first choices of the free youth are located there, (3) the inmates possess levels of aspiration much higher than they will or can



Table I

Comparative Rankings of Occupation Interests of 538  
 Interned Delinquents used in Corsini's Study and  
 The Vocational Preferences and Actual Occu-  
 pations of 5,143 Free Youths Studied  
 by Bell

Vocational Int. of Corsini's Delinquents	Vocational Int. of Bell's Free Youth	Actual Occupations of Bell's Free Youth
1 Auto Mechanic	Engineer	Farm Laborer
2 Carpenter	Mechanic	Industrial Laborer
3 Electrician	Farmer	Inside Sales
4 Machinist	Aviator	Unpaid Family Wkr.
5 Farmer	Physician	Textile Wkr.
6 Tailor	Lawyer	Clerk
7 Baker	Electrician	Truck Driver
8 Painter	Teacher	W.P.A.
9 Plumber	Machinist	C.C.C.
10 Printer	Musician	Helper

Table II

Percentage Comparison of Occupations Reflected  
 in the Vocational Interests of Corsini's  
 538 Delinquents and the Actual Occu-  
 pations of Bell's 5,143 Free Youths

Occupations	Per Cent of	Per Cent of
	Delinquent Voc. Interests	Free Youth Occupations
1 Professional-Technical	4.9	7.5
2 Managerial	.1	4.1
3 Office Sales	0.0	27.1
4 Skilled	66.0	4.3
5 Semi-skilled	22.0	24.9
6 Unskilled	7.0	14.6
7 Domestic-Personal	0.0	11.4
8 Relief	0.0	5.9
9 Others	.25	.2

achieve in terms of occupational level, (4) More than ten times as many of the inmates wish to become skilled tradesmen as will actually achieve these goals.

Myers (117), and especially Carter (27), caution, however, that regardless of where these studies are conducted, a disproportionately large percentage of high school or college students reflect interest in, and train for professional or managerial occupations, even though the opportunities for such employment do not exist.

Motivation and self-esteem, related to level of vocational choice and possessed aptitudes, are said to be lower in maladjusted individuals and delinquents. Sadler (132, p.133), comments that delinquents are frequently convinced that they are "no good". They feel they are destined to failure and whatever they do with themselves is of little concern. Because of repeated early frustrations and failures, which further add to a feeling of inferiority in the delinquent, the self concept becomes poorer, and feelings of unworthiness and personal disgust continue to mount (5).

In an actual study, Diller (40) found his 80 non-delinquent female subjects to be motivated "fairly well," and one-third were found to be motivated exceptionally well. In the delinquent group, "poor motivation" was observed. Conative activities were weak, concentration poor, attention span short,

frustration tolerance low, work habits poor, and general aimlessness common; whereas, of the 547 delinquents and nondelinquents studied by Merrill (109, p. 132), stronger motivation and a much better self concept were reflected by the nondelinquent members. A desire for personal achievement and greater concern with remote goals were noted in the nondelinquent group. These goals are secured after wholesome competition with peers. The findings above would seem to corroborate, in part, Herr's comment that "delinquency patterns indicate failure to esteem the self as a responsible participator in group life" (82, p. 209).

It would appear, then, that a lower aspiration level, although important, merely points to a deeper cause--perhaps a fear of failure and a hurried withdrawal from situations in which the delinquent thinks success or achievement is impossible. Poor self concept, limited wholesome motivation, and the rejection of realistic goals are concomitant. The desire for a position can still remain, on occasion, but usually the manifestation of aptitudes or ability to function is disturbed. If one continues to encounter failure, it would seem probable that severe discrepancies appear in the evolution of one's goals, immediate and remote, and unusually low or excessively high occupational levels are fantasied.

Durea (45), Symonds (151), Tappan (153), Kelly (91), Weeks (165), Jenkins and Glickman (89)--all present information

attempting to prove that personality maladjustments occur much more frequently in delinquent than in nondelinquent personalities. Capwell (25), Wittman (168) and Despert (39) are among those who especially emphasize the occurrence of these disturbances in delinquent girls. If the conclusions from the preceeding studies are accepted, the existing differences in personality are all important. DiMichael states: "Undoubtedly, the interpretation of interest scores in the counseling interview must be considered in terms of the idea that interests are intimately bound up with all the layers and the phases of both the personal and social personality characteristics" (41, p. 93). Darley (37), too, after a study of 80 maladjusted adult cases, maintains that interests are outgrowths of personality, and that it is very possible that personality maladjustments are reflected in the intensity and patterning of vocational interests. Ford (53) and Williamson (167) also state that even mild abnormal personality traits and personal maladjustments are important determinants in the choosing of a general life's work or the pursuit of a more specific occupation. Strong (145) and Carter (27) reflect similar views. The former feels that there is a relationship between vocational interests and the attitudes and personality factors of the individual. The latter contends that "vocational interests are a manifestation of deeply ingrained traits of personality." (27, p. 52). Other investigators, however, reflect a different

point of view. Tyler (159), after surveying the results of various personality and attitude scales, found no relationship between neurotic indicators and interest scores on the Strong Vocational Interest Blank. Fowler (56) concludes that there seems to be general agreement that interest test scores are not a dependable basis for conclusions regarding the attitudes or adjustment of the student. Klugman (93) actually attempted to determine whether a relationship existed between general adjustment status, as measured by the Bell Adjustment Inventory, and the spread of vocational interests on the KPR profile scores. He employed 108 World War II veterans who had completed the eighth grade. They had been sent to the Veteran's Administration, University of Pennsylvania Guidance Center for advisement. The findings indicated that reliably better adjustment scores were obtained by those with stronger Scientific interest scores (above 50 per cent on the Kuder). Those with weak Artistic scores (below 50 per cent) indicated fair certainty of difference in their favor regarding adjustment. Had the Social Service score on the Kuder yielded a C.R. of 1.98, instead of 1.92, it would have been significant at the 0.5 level of confidence. General adjustment status for those with stronger Scientific interests was significantly better than those with stronger Artistic interests, Social Service interests, Mechanical and Musical interests. To a lesser extent, the better adjusted individuals also had stronger Computational interests. The

## SUMMARY OF THE LITERATURE

In summary, it must be concluded that many of the most important factors responsible for the possession and development of aptitudes and vocational interests are also expounded by authorities as being primary causes of delinquency. The sociologist stresses the broken home and lack of wholesome environmental contacts. The physiologist emphasizes the dysfunction of endocrine glands and the eugenicist poor germ plasm. Academic personnel frequently maintain that inadequate school facilities and limited personnel, which result in poor education and improper supervision, are responsible. The psychologist and psychiatrist stress dynamics and blame emotional difficulties and mental conflict, while some physicians and anthropologists mention physical defects and organic inferiority. The religious emphasize lack of moral training and lackadaisical attitudes in regard to participation in varied religious and social functions. Parents and family blame society, and the community, along with legal authorities, in turn rationalize away their obligations and castigate parents for not assuming the responsibilities concomitant with their role. The overwhelming complexity of the human personality makes specific and conclusive evidence regarding causality most difficult; but perhaps a just conclusion is that delinquency results not from any one factor exclusively

but from a constellation of several factors. Even the term delinquency, an abstraction to begin with, has become so abstruse, vague, and inclusive as to cover a myriad of misdemeanors. The task of distinguishing delinquents from nondelinquents is gradually becoming more difficult because of differences in environment, mores, and even legal criterion. Much overlap and little definite delineation exists in regard to the classification of delinquent and nondelinquent acts.

More specifically, in regard to a synthesis of the literature on aptitudes and the development of vocational interests and a comparison of them in the delinquents and non-delinquents, much disagreement is reflected amongst educational, sociological and psychological investigators. Many adhere in various degrees to the theory that vocational interests and aptitudes reflect the sum total of deeply ingrained personality factors and personal experiences. Others maintain that they are specialized and do not pervade all phases of the individual's life, and are determined by more contemporary needs and presses.

Recent authors do not accept the older theories of delinquency. They also refuse to accept those theories regarding the development of vocational interests and aptitudes adhered to in the past. Clinicians are gradually becoming aware of the increasing importance of both aptitudes and vocational interests and are slowly coming to realize the far reaching implications



of both factors. It is now generally accepted that neither the development of interests nor the manifestation of delinquent behavior is an abrupt transformation, but a gradual evolution affected by many of our environmental forces. The mere possession of native abilities does not insure adequate functioning on a related assigned task, since proper development of these aptitudes are dependent, too, directly upon personality factors and indirectly upon many environmental influences.

It is also evident that innumerable hypotheses have been proposed regarding the existence of similarities and differences in the vocational interests and aptitudes of those displaying delinquent and nondelinquent behavior patterns. A few "definite" conclusions are recorded, if not by presentation of actual results, then by highly speculative and sometimes most tentative hypotheses whose purpose, hopefully, is to stimulate further research.

The findings of many of these studies presented in the review of literature, seem weakened because they lack clear definition, employ faulty experimental design, and more generally, because they use poor criteria for the selection of subjects. Perhaps the most undesirable but most frequently occurring characteristic noted was the improper comparison of a delinquent group with a most atypical one. Conclusions are presented when the most important variables, for example, age, education and intelligence were poorly controlled, or not

controlled at all.

It is also concluded that both delinquents and non-delinquents may possess unpatterned, depressed or clearly delineated areas of vocational-interest. They may fluctuate or remain permanent in their vocational selections. Similarly, no conclusive evidence can be presented from the available studies and the speculations of numerous investigators in regard to the superiority or inferiority of aptitudes in the two groups.

In a final analysis of the literature, it was found that those most important innate and external factors could provide a basis for differentiating the vocational interests and aptitudes of the two groups: physical traits; mental endowment; native and acquired abilities; level of aspiration; socio-economic status; personality factors of self, parents and associates; family, school and social adjustment; occupations of parents and friends with whom one associates; and contacts with activities in which interests can be developed and aptitudes more efficiently employed.

## CHAPTER III

### A. DESIGN OF THE RESEARCH

The proposed study deals with a comparison of vocational preferences and aptitudes of delinquent and non-delinquent girls. Previous studies demonstrated that certain variables must be controlled if valid results are to be obtained. Age, grade placement, intelligence, residential area, economic status, and father's occupation are among the most important of these variables. Subjects with known physical defect which could possibly influence findings should not be included in the matched groups.

As a basis for the selection of the particular delinquent group used in this study, it was decided that the term delinquent should be confined to those individuals who were officially identified as delinquent as a result of contact with the court. The definition of the delinquent, therefore, is a girl who has been judged so by the authorized courts of Illinois and who was interned at the Illinois State Training School for Girls.

The group designated as nondelinquent was considered such on the basis of the following inquiry made of school

officials possessing information about these subjects: "To your knowledge, are any of the individuals selected, guilty of incorrigibility, truancy, sex crimes, auto theft, burglary or any other misdemeanor or infraction that, if brought to the attention of civil authorities, would provide a basis for classifying the student as delinquent?" A positive reply eliminated a subject from further consideration.

It was decided that all girls selected for the study would be Chicago residents and sophomores in Chicago high schools. Other requirements for selection were that the girls be white, between the ages of 14 and 16 inclusive, and that they possess at least average intelligence. A grade placement reading comprehension score on the Stanford Achievement Test or on the Gray Oral Reading Test of at least 8.2 was deemed necessary for understanding the items of the KPR. Any girl possessing a physical deformity which could possibly influence her vocational selection or the development of her abilities was excluded. This was based on the physician's report at the Training School, on medical information, school records, and inquiries made of the adjustment teachers or of the students themselves. Subjects with visual impairments not corrected, which could affect results on the aptitude tests involving visual tasks, were not selected. An attempt was made to secure girls from the same residential areas and from the same high

school whenever possible. No subject was selected if her family was receiving assistance from any governmental or social agency because of financial need. Only the delinquents whose family income, according to the social service report, did not surpass 6,000 dollars a year were used in the study. Beyond that level, matching would have been difficult. Those individuals were financially atypical and beyond the economic status of the delinquent population.

The delinquent subjects were obtained from the Illinois State Training School for Girls at Geneva, Illinois. All information was obtained from confidential files, social case histories, the subject herself, and from responses to inquiries made of the principal, social workers and vocational placement counselor at the institution. This was possible because the investigator was employed at the Training School and received excellent cooperation from all staff personnel involved.

Initial diagnostic staff meetings are conducted at the Training School shortly after the arrival of new inmates. From February to August 1954, the author took staff notes on all girls who could serve as subjects for the present research. After a check of school records, it was estimated that, including all new commitments and community replacements, about 600 female delinquents were available for the study. Out of approximately 349 potential white subjects, however, only 56

met the criteria adopted and were available at time of testing.

A schedule for the administration of tests to the delinquent girls was arranged during the first two weeks in August 1954. The schedule was adhered to rigidly. This was possible through the cooperation of the staff and other appointments were rescheduled. The testing was done in a large, naturally lighted classroom, set aside for the administration of a battery of group tests given to all new arrivals at the institution. One complete school day and the following morning school session were allowed for testing. Twelve girls were originally scheduled at the first two series of administrations and 13 at the last two. The following schedule was used. First, there was a general orientation period. The nature of the tests to be administered and the meaning of vocational interests and aptitudes were all explained. Then, the Verbal Reasoning and Space Relations portions of the Differential Aptitude Test Battery were administered. Approximately 15 minutes were allowed between tests to prevent fatigue. This recess was given prior to the administration of each new test during the series. In the afternoon, the Language Usage, Abstract Reasoning and Numerical Ability Tests were completed. The following morning, the Speed and Accuracy and Mechanical Reasoning Tests were administered. This was the sequence recommended in the DAT Manual, and the directions for administration as presented

in that Manual were followed. Because of the nature of the project and because of the full explanation given to their inquiries, the ward's cooperation was considered most adequate.

On the second morning, upon the completion of the final DAT, the KPR was given.

The KPR Booklet and Filler, Form CH, were placed on each desk that was to be occupied. The method for administration presented in the KPR booklet was followed. The directions were read by the examiner, and the blackboard was employed to further clarify the instructions. The subjects were permitted to ask any questions regarding the KPR or the testing situation. This was done to handle any apprehension, and to assure full cooperation. After the girls began, the investigator checked the first few recorded responses and again asked each ward individually if she understood what was to be done. Upon completion of the KPR, the record was checked individually to see if all sections had been properly completed. A few omissions were noted, and were corrected by the subjects. Only four records yielded validity scores which were not acceptable. The girls were retested at the next scheduled session, and the V scores secured from the KPR's were found satisfactory on all but one record. It was accepted, but the record was not employed in the study, and another girl meeting all the requirements was added to the next series of tests administered.

After all testing was completed, the girls were given a blank piece of paper with an assigned number in the upper left hand corner. They were told that the data secured were to be used by the examiner and that the answers to the five questions to be asked them would be most helpful. Names were to be omitted from the papers, and the questions would be answered on a voluntary basis. They were told, further, that in spite of its innocuous nature, the information secured would be held strictly confidential, would be listed by number rather than by name, and would be used only in regard to the research. It was emphasized that correct information was desired, otherwise the findings would be of limited value. All subjects in both groups submitted answers to the inquiries, but a few in each group hesitated until they observed their neighbor complying with the examiner's request.

The questions were: (1) Do you like or dislike school? (2) Do you intend to graduate from high school? (3) Is mother, step-mother or foster mother working, or has she been employed during the past two years? (4) List father's, step-father's, or foster father's occupation, and describe it as clearly as you can. (5) For the purpose of this study only, a family whose income is between 2,400 to 6,000 dollars a year would be called financially adequate; an income of below 2,400 dollars a year would be called marginal. Please state whether the family from



which you come would be considered financially adequate, that is, has an income of between 2,400 to 6,000 dollars a year, or marginal, that is, below 2,400 dollars a year. In regard to the fourth inquiry above, it should be pointed out that the information regarding father's occupation was secured from the records at the Training School and from the cumulative folders of the control group. In the case of the nondelinquents, however, frequently only the vocational area rather than a specific occupation was listed, for example, saleswork or tradesman, without further clarification.

At the conclusion of the final testing session, the girls were sent back to school or to the various details assigned them.

The delinquent group finally accepted consisted of 50 white, adolescent, former Chicago residents, who met the previously adopted criteria. One of the 27 available subjects in the 14 year old age group was selected. Thirty-eight of the 198-15 year old subjects, and 11 of the 124 sixteen year old delinquent girls originally screened were finally used in this research.

The girls selected had been interned at the institution for the offenses listed in Table III.

Where two offenses were involved, the committing charge is presented first. In some instances, where the subject

Table III

The Number and Types of Offenses of Delinquent  
Girls in the Sample Leading to Internment at  
The Illinois State Training School for Girls

Offense	Number Interned
Burglary-Sex.....	2
Forgery.....	1
Homosexual.....	1
Incest.....	3
Incorrigibility.....	4
Prostitution.....	1
Sex-Incorrigible.....	5
Sex-Runaway.....	12
Sex-Theft.....	5
Theft-Miscellaneous.....	9
Truancy/Chronic Runaways.....	7
All offenses	50

was not prosecuted on a sexual charge, it was frequently a contributing factor to the activity for which the girl was incarcerated, but was not listed as such on her commitment paper.

On the basis of the information secured from the delinquent group, a control group of Chicago high school students was obtained. The investigator was given permission by the Chicago Board of Education to choose the Chicago Secondary Schools which represented the districts from which the best control group could be selected. Wells, Kelly, Austin and Senn, large Chicago High Schools in different sectors of the city, were chosen. Students from other districts are allowed by permit to attend a school out of the district in which they reside and, in a few instances, it was possible to match residential areas even more accurately.

After receiving permission to examine cumulative folders in the schools, the investigator collected data on potential subjects. Other information was supplied by the principal or adjustment teachers at the school. Age, school grade, intelligence and residential area were of primary importance, with economic status and father's occupation being given priority in that order. In several instances, the girls paired came from the same square block. In 19 cases, the students came from within approximately a one mile radius of the home of the institutionalized ward. The distance was slightly greater in the remaining

instances, but radical neighborhood changes were avoided. In one case, the parents of the delinquent had moved to a Chicago suburb after her internment, but the girl had not yet resided in that home and the nondelinquent subject was selected in the original community.

The number of sophomores available for the study as presented in Table IV is only an approximation, since the transiency rate in most large Chicago high schools can result in moderate changes in estimate. These estimates were reported to the author by the adjustment teacher and/or the clerk at the school.

The testing of the control group was conducted during two periods: the last two weeks of September, and the last week in November and the first week in December of 1954. The beginning of the semester and the midsemester period were selected to secure a more adequate sampling, since the delinquent girls had been removed or excluded from formal school attendance and committed to the institution at varying times during the school year. During the first period, the testing program was completed at Austin and Senn High Schools. During the latter, the subjects at Wells and Kelly High Schools. were tested. The tests were administered in rooms used for regular school activities. The same schedule which was followed at the Training School was employed, with one complete day and the following half day devoted to orientation and testing. As before, all subjects

Table IV

High Schools from which Nondelinquent  
Subjects Were Obtained, the Number  
of Subjects Available and the  
Number Finally Selected

High School	Number of Subjects Available	Number Selected
Austin	612	14
Kelly	406	12
Senn	521	10
Wells	438	14
	—	—
Total	1977	50

participated of their own volition. Within a month after the initial contact, the examiner had returned to the schools with individually prepared profiles of interests and aptitudes. Group and individual interpretations were given to the subjects.

Finally, each group consisted of 11 girls 16 years of age, 38 girls 15 years of age, and one girl 14 years of age. The mean C.A. for the delinquent group was 15.9,  $\pm SE_M$  .09 with a SD of .63. A mean C.A. of 15.7,  $\pm SE_M$  .073 and a SD of .51 were recorded for the nondelinquents. The obtained C.R. of .79 between these means was not significant.

In spite of the fact that the results of some studies indicated that the correlation between intelligence and vocational interests was negligible, the more positive relationship to aptitudes indicated that intelligence should be controlled. All girls at the Training School are given a Wechsler-Bellevue Intelligence Examination, usually within two months after arrival. The score for each ward was secured from the personal psychological file. In many instances a Kuhlman-Anderson score was also available since it is given routinely in the Chicago Public Schools. This score was used in 39 cases.

For the nondelinquent group, revised Stanford-Binet quotients were available for 3 subjects, and Kuhlman-Anderson scores were available for the remaining 47 students. These ratings were secured from the personal cumulative record card

or cardex found in the cumulative folder. Because of the instruments involved, familiar qualitative terms were paired with IQ ratings falling within certain limits. This method is based on a procedure introduced by Wechsler (164, p. 37), and is presented in Table V. The intellectual range for the nondelinquent group varied from 94 to 118 inclusive on the Kuhlman-Anderson and from 97 to 117 on the Stanford-Binet. The quotients for the delinquents ranged from 95 to 122 on the Kuhlman-Anderson and from 94 to 116 on the Wechsler. A spread of not more than six points was the rule in matching the individuals. The mean IQ for the delinquent group was 100.5,  $\pm SE_M$  1.37 with a SD of 9.62. For the nondelinquents, 99.8,  $\pm SE_M$  1.27 was recorded as the mean intellectual quotient and the SD was found to be 8.92. The difference between the means of the two groups was not significant.

In regard to economic status, the records had been checked at the Training School, prior to selection, to eliminate any offspring of a family receiving governmental or agency funds such as Aid to Dependent Children, Federal or County Relief, and Catholic Charity Assistance. In the control group, this information was secured from the school records listing father's occupation, from the adjustment teacher, or from the students themselves. In the selection of potential candidates at the Training School, no subject was chosen whose father, step-father, or foster father was a professional man whose income would place

Table V

Pairing of Qualitative Intellectual  
Measures with IQ Scores for One  
Hundred Delinquent and Non-  
Delinquent Girls

	Revised		
	Wechsler- Bellevue	Stanford-Binet Form L	Kuhlman- Anderson
Average	90-110	90-110	95-104
Superior	111-119	111-119	105-114
Very Superior	120-127	120-133	115-124



them in a higher salaried category.

Based on the adequate and marginal classifications, it was concluded that 41 of the delinquents came from homes classified as adequate and nine from homes considered marginal. Of the nondelinquent group only three subjects were classified as coming from the marginal category.

Since it was found that the occupation of the fathers influenced the vocational selection of their sons, attempt was made to control this variable. This was done even though it was impossible to determine the degree of importance that the paternal occupation played in the vocational selection of female offspring. As best possible, a delinquent subject was matched with a nondelinquent one where the fathers were employed in similar vocational areas. The matched subjects were accepted if the discrepancy between the fathers' occupational area was not too great. The job classifications or grouping norms presented in the Kuder Examiner's Manual (96), based on the United States Census Bureau Reports, were used. Many fathers in the two groups had closely related occupations. This was especially true for craftsmen and allied workers, for example, (mechanics, machinists, and metal workers) and for the operatives and kindred workers for example, (truck and cab drivers and factory employees). The occupational information secured from high school subjects and verified by school personnel or school records, and the

occupational information of the delinquent fathers secured in actual parental interviews conducted by social workers or given by the delinquents is presented in Table VI. An elementary school teacher was listed in the nondelinquent professional group. A musician, the father of a delinquent ward, was also found in that category. It was possible to match the broad occupational area in 23 cases. In instances where the information was not available, it was attributed to the father's being deceased; to divorce, separation, or desertion; or to the subjects not knowing father's occupation or whereabouts. In the latter instance, the mother sometimes still received support from father and/or the maternal figure or other offspring contributed to the family support.

The last two variables, namely, economic status and father's occupation, are not as closely matched as would be desired. However, these two variables were thought to be of lesser importance than the others, and more rigid control was not possible because priority was given to age, grade placement, IQ, and residential area. It was also discovered, on the basis of the information supplied by the girls in both groups, that 52 per cent of the delinquent mothers were employed or had been employed within the last two years as compared to 60 per cent of the mothers of the nondelinquent group. This is a greater percentage of employed females than is given in the Women's

Table VI

Distribution of Father's Occupation for the  
One Hundred Delinquent and Non-  
Delinquent Subjects

Classification	Delinquent Fathers	Per Cent	Nonde- linquent Fathers	Per Cent
Clerical-Kindred Wkrs.	4	8	3	6
Craftsmen-Kindred Wkrs.	6	12	10	20
Operative-Kindred Wkrs.	10	20	11	22
Professional	1	2	1	2
Proprietor Sm. Business	4	8	7	14
Service Workers	16	32	12	24
Information not avail.	9	18	6	12
	—	—	—	—
Total	50	100	50	100

Bureau of the U.S. Department of Labor Report, 1954. According to that agency, 33 per cent of all women of working age are employed. It must be remembered, however, that a two year span is covered in this study and families of higher income categories are not included. It seems logical that mothers of marginal or adequate financial status would be more frequently employed than would mothers from the higher income brackets. Also, mothers of adolescents frequently have no small offspring to supervise and are, therefore, probably more frequently employed than mothers of preadolescent children.

After all completed tests were assembled, the KPR's were originally hand scored by the author. They were later checked by one other person.

The Differential Aptitude Records were scored by IBM machine. A skilled operator supervised the scoring of tests and was assisted by the author.

In the comparison of test data, statistical analysis employing the group method is useful in scientific study. It is most economical in ascertaining the general characteristics of delinquent or maladjusted groups (20).

Quantitative statistical analysis will be employed since the primary objective of the study is to determine whether significant variations in vocational preferences and aptitudes exist between a delinquent and nondelinquent group of adolescent girls. In attempting to determine whether either

group possesses significantly higher mean scores in the aptitude or interest areas, the means, standard deviations, difference between means, standard error of the difference between means and the critical ratios will be computed. In comparing the intensity of the vocational interests of the two groups, the number of records in each group reflecting two or more significantly high scores (75th centile or above) will be compared. The total number of significantly high scores for each group will also be compared. The same procedure will be followed for the significantly low scores (25th centile or below). The null hypothesis will be assumed and chi square employed. In comparing the combinations of any two significantly high scores on the KPR, or in comparing the combination of any two significantly low scores of the two groups that could possibly distinguish them, the same statistical measure will be used.

The statistical treatment of the scores, the results and analysis of the data will be treated in the following chapter.

## B. THE INSTRUMENTS

The first instrument employed in this study, the Kuder Preference Record, attempts to employ a systematic approach to the selection of an occupation. It is designed to measure preferences for broad fields of interests and is intended for use in the vocational and educational guidance of adolescents and adults of both sexes. The employment of that instrument with those in pubescence has also proved profitable. By means of the scores obtained, the subject's attention may be directed to vocations with which they may not be familiar but which involve activities of the type for which they express preferences. It is also possible to check whether a person's choice of an occupation is consistent with the type of thing he ordinarily prefers to do. The KPR is also valuable in employee counseling with emphasis on occupational placement. Providing an individual possesses the ability, his efficiency and personal satisfaction can often be markedly improved by placement in an occupation for which he has indicated preference. The KPR presupposes that people do their best and enjoy themselves when they are interested in what they are doing. The test is one of preferences and not one of abilities. It was constructed on a rational basis, has 168 items, each composed of three subitems, and employs a forced

choice technique, whereby the subject selects the most liked and least liked activities listed.

Some investigators say that selection of one item out of three does not warrant their stating that the individual is interested in the task chosen. He merely prefers it where he is forced to make a choice. They maintain further that there is a difference between vocational interests and mere preferences. However, it seems reasonable to suggest that on the KPR, when all of these individual items are totalled, the scores obtained for the various vocational areas reflect an interest or a disinterest in certain occupational fields, whether the individual is aware of it or not. Carter (26) indicates that a vocational interest is the sum total of all personality characteristics which are significant for vocational satisfaction. The individual's liking or preferring a certain activity is also a vocational interest if the task or duty constitutes an occupation or an essential part of some occupation. Fowler admits that "single expressions of liking may have limited value in counseling. But a systematically obtained pattern or aggregate of such single expressions can make it possible to say that 'a man has mechanical or scientific interests' (such an expression as is afforded for the KPR); or that he has 'interests of an engineer or a lawyer' (56, p. 25). Bingham (17, p. 61), too, reflects the attitude

that we prefer what we would like to do, and we like to do things in which we have an interest. Strong eliminates completely the suggestion that interests and preferences, as reflected by various vocational measures, differ. An interest is a response of liking and must be dealt with in a quantitative objective way (145, p. 6). Three modes of doing this are "(a) a single expression as 'I like arithmetic'; (b) a general tendency toward a constellation of items, as when we state that a man has mechanical or scientific interests; and (c) as a total score on an interest inventory, as a lawyer, or a high masculinity-femininity score" (145, p. 19).

Because numerous other authorities (93, 25, 31, 51) employed the KPR in various research studies and speak of the total preference profile as reflecting vocational interests, it can be argued, therefore, that vocational interest and vocational preference tests basically measure the same thing.

In the administration of the KPR, the subjects are usually given the KPR Booklet and an inserted filler upon which the individual records his selections. They are told to read the instructions and begin. The reading aloud of the instructions by the examiner is often desirable, depending upon the individual or upon the group being tested. Proctoring is advised. There is no time limit for administration but most college students and adults complete the record in about 40 minutes. On



occasion, adults and high school students demand additional time for completion. The scores representing the ten areas of preference are easily obtained by counting the pin holes appearing on the various sections of the four page filler which was inserted into the booklet. IBM method scoring can also be employed. The conversion of raw scores into percentile rank is done by merely recording the raw scores on the KPR profile sheet. The preference profile is then complete. Significantly high percentiles of 75 or above and low percentiles of 25 or below are of prime importance in interpretation. Low scores indicate categories or areas of lesser attraction for the subject.

Kuder first published Form A of the KPR in 1939, after he had conducted research with his instrument for six years. The paired item technique was used and seven interest areas were represented.

Unlike the Strong Blank, which was developed on various occupational groups and resulted in interest norms for each group, Kuder's tool was first developed at Ohio State University with the aid of student groups. The individual keys were constructed on the basis of internal consistency and mutual independence. Individual items of the records were examined for statistical agreement with other items which seemed to be of the same type, and these items were grouped and constituted a single scale. Further inspection of the items seemed a

sufficient basis for naming the scale, just as the inspection of the items of a mathematics test allows one to feel safe in calling it a mathematics test and not one of history or Latin. For example, the Literary scale was so named because the items constituting it were inspected and judged to be literary in nature. As the other scales were constructed, each item was checked as to its independence of other existing scales. Independence of each scale was therefore assured. This resulted in a relatively low intercorrelation, ranging from  $-.43$  for the Mechanical-Literary scales to  $.50$  for the Computational-Clerical scales, where the highest relationship is expected. These correlations were obtained from the records of 2,500 adult males. Numerous other scales were also developed but dropped because they lacked independence or internal consistency. The scales finally accepted were the Computational, Scientific, Persuasive, Artistic, Literary, Musical and Social Science.

Kuder (97) presented Form B, the first revision, in 1942. This modification and addition to the original edition were prompted by suggestions received from testers after extensive experience with the KPR. This resulted in the addition of Mechanical and Clerical measures. The new scales were developed with emphasis on internal consistency, without regard to correlation with other scales. This experimental form was given to college students who had previously filled out the

original records. More items were now included in the test, but an increase in the time required to complete the form was not desired. The triad form item was then decided upon, where the subject was requested to select the activity most liked and the one least liked. No loss of reliability resulted in the change from the doublet to the triad form.

In 1944, an expressed need for a measure related to agricultural, naturalistic and outdoor activities was recognized. A large number of items designed to measure preferences in that area were tried out on groups of students and adults. The best items were then selected and retained. These items composed the Outdoor Scale. It was recognized that a method identifying those who answered carelessly or without understanding of the items would be invaluable. A scale was devised composed of items which almost everyone selected. Those answering honestly and sincerely received scores from 38 to 44 inclusive. Carelessly answered recorded yielded much lower scores. The score recorded by chance alone was 25. Thus, the Validity Scale came into being. A glossary, describing or defining individual words or occupations perhaps not fully understood by the subject, is also found in the Test Booklet.

At first, the small number of occupational norms and validation data resulted in reluctant use of the KPR. In the past 18 years, however, numerous research projects have

produced favorable findings which have resulted in general acceptance of this easily administered and economical instrument. The first external evidence of the tool's validity was its ability to differentiate students majoring in various professional fields at the college level. This was based on records of small groups ranging in size from ten to 100. In the 1946 revision, however, norms for 2,667 adult men were classified according to 44 occupational groups. Occupational listings were given and based on the records of 1,429 females. The number of records employed in the formulation of each occupation norm ranged from 16 to 165.

Norms based on the records of 3,418 boys and 4,466 girls were published in the January 1950 revision of Form C.

The latest Manual, fifth edition 1953, lists 144 job profiles for men and 68 for women. These occupational profiles were based on more than 15,000 records. As few as 20 records are used as a basis for occupational profiles in a few instances, and over 1,000 were employed in constructing nurses' profiles. As desired, chemists are found unusually high on the Scientific Scale, writers high on the Literary Scale, musicians exceptional on the Musical Scale, and clerks superior on the Clerical Scale. As of June, 1955, Kuder Preference Records have been validated with more than 17,000 individuals.

Regarding validity, Cronbach (33, p. 346) states the

logical validity of the Kuder is high since a mechanical or other interest score indicates self-reported liking for the activity involved in that area. Many favorable empirical validity findings are also presented by Lehman (99), and she concludes that the scales validity is quite satisfactory from actual occupational selection and successes.

Barry (7) found that girls preparing for occupations as physicians, nurses, dental technicians, and pharmacists, were all high on the Scientific Scale. Those desiring nursery school occupations, school teaching, social work, theology or missionary careers, consistently score significantly high on the Social Service Scale.

Kopp and Tussing (94) found a correlation of .59 between Kuder rankings and the personal occupational preference of graduate high school boys who were seeking occupations in the areas they listed. In a similar study, Crosby and Winsor (34) used descriptions of the nine Kuder categories in an effort to determine the validity of a group of college students' estimates of their own interests. A correlation of .54 between percentile scores on these categories and the students' own estimates of their percentile ranking was obtained.

Phillips and Osbourne (122) discovered that four hundred college students majoring in business administration scored significantly higher than nonbusiness students on

### Clerical, Persuasive and Computational Scales.

In an extensive study by Triggs (157), 826 graduate nurses were employed, and it was discovered that they scored much higher on the Scientific and Social Service Scales than the general female population.

Sixty mature service veterans, ranging in age from 19 to 40 were studied by Rose (130). Correlations of between -0.5 and 0.99 were registered between interest in a particular occupational area and Kuder percentile rankings. The median correlation was 0.64.

Although some correlations presented above do not seem to be unusually high, we must remember that the revealing of new occupational areas is also one of the prime objectives of the Kuder Preference Record.

Super (149, p. 193) concludes that the extensive research findings now available justify the conclusion that the KPR has been sufficiently well standardized and validated for use in vocational guidance and counseling. Some of the original norms were based on small groups. However, when norms were obtained from much larger populations, the addition of these records resulted in insignificant profile changes.

Kuder's (97) summary of the reliability findings for various groups by several authors is presented in Table VII. It will be noted that the reliability formula developed by Kuder

Table VII

The Reliability Coefficients of the Separate Scales of  
The Kuder Preference Record for Various Educational  
and Economic Groups

Group	No. of		1	2	3	4	5	6	7	8	9
	Cases	Sex	Meo	Com	Sci	Per	Art	Lit	Mus	Soc	Cle
Graduate Students	41	M&F	.97	.98	.95	.97	.96	.95	.95	.93	.98
College Students Kuder-Richardson	166	M	.94	.90	.93	.93	.91	.90	.90	.91	.89
College Students Kuder-Richardson	101	F	.91	.88	.88	.94	.90	.92	.85	.90	.86
College Students	50	F	.85	.87	.91	.81	.95	.84	.96	.92	.95
High School Seniors Kuder-Richardson	125	M	.93	.90	.90	.82	.91	.91	.90	.87	.87
High School Seniors Kuder-Richardson	125	F	.89	.83	.89	.80	.92	.91	.91	.93	.90
Eighth Grade Students Kuder-Richardson	100	M&F	.96	.86	.92	.84	.92	.86	.93	.91	.89
Men in Occupations Kuder-Richardson	300	M	.95	.91	.89	.89	.90	.93	.94	.93	.88

and Richardson appears six times in the table. Generally, it obtains figures which slightly underestimate the true reliabilities. In spite of this, the average reliabilities for the different scales are all close to .90. The median for the entire table is .91.

From the numerous investigations that have been conducted with the KPR since its inception some twenty years ago, it can be concluded that its reliability and validity have been adequately established. Numerous investigators state that the favorable research findings guarantee its validity. The tool is used extensively by personnel in the fields of counseling and guidance. It is employed with adult and adolescent clientele, and Rose (130, p. 306) holds that the KPR is reasonably reliable for age groups as low as the eighth grade. After a study of test preferences in Guidance Centers in 1948, it was concluded that the KPR was employed in those installations more frequently than any other vocational instrument (15). During 1953-1954, 8,500 schools administered Kuder inventories to over 1,500,000 students. This gives some indication of its general acceptance.

The second instrument employed in this study, the Differential Aptitude Test, was selected because it not only yields a profile for counseling, but because it can be used in comparing or making decisions about individuals or groups. Academic personnel realize that the tests provide a more



satisfactory frame of reference for curricular planning when the students' profiles as a group are considered. They indicate what courses should be offered, and also the subjects who should take these courses (11).

The purposes in constructing the DAT, were to provide an integrated, scientific, and adequately standardized instrument for measuring the abilities of subjects of both sexes, in grades 8 to 12, and to secure information for educational and vocational guidance. The battery is now also employed in the selection of applicants for varied occupations and for the vocational counseling of young adults out of high school. The test, however, was intended primarily for junior and senior high school guidance. Information regarding the needs of the vocational counselor and psychologist were secured prior to the construction of the battery. Rigorous scientific standards were desired. Still, an instrument was anticipated that would be most practical for everyday use in the country's schools, social, and business agencies.

Before discussing the DAT itself, a few comments about aptitudes and aptitude tests in general seem warranted. The word aptitude has been and is being loosely used. As a result, it has come to have two different meanings in psychological literature. For example, when one speaks of tests that measure aptitude for teaching, it denotes the possession of desirable

characteristics which usually lead to success in that particular occupational pursuit. However, tests are also available which measure not aptitudes for a certain occupation but rather a single, more specific aptitude, as verbal reasoning, which can contribute to a constellation of factors demanded for success in any one of a number of occupations. Super (148, p. 67) thinks the former definition is misleading and it is less accurate, psychologically, than the latter. Actually, aptitude for teaching, as employed above, is not a unitary trait or aptitude, but any one of several varied combinations of a number of individual aptitudes or traits. Regarding the evolution of the two major concepts of aptitude, they are perhaps the results of theories propounded by Spearman (143) and Thurstone (156). Actually, the differences are not so radical as one would at first surmise. Spearman expounded the belief, based on the statistical analysis of the relationships between a large and varied number of tasks, that one general aptitude or ability underlies all the rest. This general factor he referred to as the "g" factor or central intellectual factor. It is thought of as an overall or general abstractive type of intelligence that permeates all man's operations. Other lesser or subordinate factors, which are called "s" or specific factors, are special abilities. These "s" factors are all different and were thought of by Spearman as being responsible for the subject's ability

to perform any given operation of a more limited and specific nature. If an operation is very simple, only one "s" factor is perhaps implied; if complex and complicated, a cluster of "s" factors or aptitudes might be involved.

Thurstone, after much research, instead of discovering one general mental ability or aptitude comparable to Spearman's "g" factor which enters into every operation of man in varying degrees, isolated a number of group factors which constitute, "general intelligence". Thurstone emphasized that mental abilities are so diversified that men of equal endowment usually differ radically in what they can accomplish. For him, the groupings of numerical ability, art talent, or mechanical skill were only roughly descriptive, and when subjected to experimental investigation would be found to be very complex in nature and not unitary. Consequently, from the psychological standpoint, it is important to ascertain how many abilities of a more fundamental nature are implied in each of the more broad group factors. For years, Thurstone attempted to isolate these human abilities and to find pure factors which either individually or in combination with other talents, would allow us to inventory all our abilities and aptitudes. The British School, as represented by Burt, Thomson and Vernon, usually stop after identifying three or four group factors plus "g", but the American school has produced 14 or 15 separate factors

(154, p. 225). Thus, we see that Spearman stresses both "g" and "s" factors, whereas Thurstone and his followers emphasize only group factors that account for our abilities to perform all human tasks. It is obvious, then, that Thurstone propounds a multi-factor theory in which no common or "g" factor is accepted.

In the development of aptitude tests, Binet recognized that mental ability was complex and variegated, and his practice was to sample a wide variety of mental abilities and then combine the various scores and present a composite score or intelligence quotient. Later, the Army Alpha and the series of Otis tests, too, sampled various mental abilities and presented the usual composite score. In the 1920's, with the more rapid expansion of psychological testing, the IQ test and the single score became practically the sole basis for all educational and vocational advisement. Beginning in the 1920's, in addition to the theories of Spearman and Thurstone already mentioned, experimental studies and theoretical speculation in psychology resulted in Thorndike's three kinds of mental abilities-- abstract, mechanical and social. Kelly, Hull, Bingham and others also contributed to the belief that it would no longer suffice to give a single score for all educational and vocational purposes. The need for measurement of special abilities was more fully recognized. During the late 1930's, the research studies

involving differential abilities resulted in the grouping of certain mental tests into two or more subscores. In 1937, the General Clerical Test was devised by the Psychological Corporation and it yielded three scores: Speed and Accuracy, Verbal Ability, and Numerical Ability. In 1938, the multiple-score yielding instruments were further represented by the American Council on Education Examinations, which yielded "linguistic" and "quantitative" scores. In 1941, the Modified Alpha Examination was constructed so as to produce separate verbal and numerical scores. As the introduction of these new instruments continued, personnel in the areas of vocational and educational counseling became more cognizant of the value of integrated test batteries. They came to realize more and more the need for scientifically constructed measures. During World War II, the military, business, and industry, because of their need for the proper selection and placement of the available, limited personnel, were forced to assume the initiative in aptitude testing. School counselors and social agencies added further impetus to the move for well integrated aptitude batteries by noting the shortcomings of the available measures and voicing their disapproval (11). Later, in 1946, Garrett (62), in presenting the presidential address before the APA, discussed certain studies pertaining to intelligence and ability testing. He emphasized that as one grows older,

intelligence seems to become more loosely organized. In childhood, the intelligence tests, loaded with verbal items and yielding a single score, seem acceptable for academic purposes. When the upper high school grades are reached, however, measures are needed which will contribute more information about the specific kinds of abilities. Most logically, a test which contains items that measure several aptitudes and yet yields only a single score obscures more than it reveals about the true potential of the subject. A test of a single aptitude is not enough in a guidance setting, since good counseling should uncover as many promising abilities as possible.

The trend toward the measurement of multiple abilities was well under way when, in 1947, Bennett, Seashore and Wesman, constructed the DAT battery, for purposes of educational and vocational guidance and of employee selection. They benefited greatly from the contributions of their predecessors. On the basis of available literature reviews, the test battery seems to be well accepted.

Prior to the construction of this new aptitude battery, consideration had to be given to the meaning of the word aptitude and an appropriate definition had to be selected. Many authors use talent or ability synonymously with the word aptitude; others go to great lengths in attempts to distinguish them. Mursell (116) holds that aptitude, talent, and ability are constantly used in

overlapping senses and the differences are most vague. He maintains that attempts at clarity in this instance do little good and may easily do harm, but he does not fully explain why. Generally, in the definition of aptitude the same essentials are included, as "an aptitude is the ability or collection of abilities required to perform a specified practical activity" (58, p. 182), or "the potential ability or overall suitableness of an individual to succeed at a particular line of work" (128, p. 606). Morgan defines aptitude in his definition of aptitude tests as "the fitness of a subject for undertaking a specific kind of activity, for example, mechanics, music, language study, etc.." (112, p. 573) Bingham holds that aptitudes indicate potentialities. Aptitude tests measure abilities and interests. They ascertain what an individual actually does in certain standard situations, and "from these measurements the estimate of capacity for future accomplishment is an inference....." (17, p. 11).

The definition of aptitude finally decided upon by the authors of the DAT is a condition or set of characteristics regarded as symptomatic of an individual's ability to acquire with training, (usually specified) knowledge, skill, or set of responses, such as the ability to speak a language, to produce music....(162, p. 18), or, "those qualities measured by a successful aptitude test, that is, the qualities essential in

successful future performance, or the previously acquired skills associated with or antecedent to, those qualities..."(32, p. 13). The authors concluded that these definitions were broad enough to include any factors related to aptitudes or any causes responsible for their presence (11, p. 2). Aptitude is not meant to be an "all or none" characteristic, something which is either present to perfection or completely lacking. It is a factor or ability, or a combination of factors or abilities which individuals possess to different degrees. Some possess aptitudes for numerous activities, while other individuals reflect limited potential for only a few occupational pursuits.

After the selection of the definition of aptitude, attention was directed to just what aptitudes were to be included in the battery. Existing tests and test items were surveyed. The experimental items selected for the newly constructed tests were then tried out. On the basis of these experimental studies, eight tests, published in seven test booklets with separate answer sheets which could be scored manually or by IEM, were finally selected. They gave promise of providing adequate reliability and sufficiently low inter-correlations, which indicated they were measuring different aptitudes. They also gave good indication of test validity. The tests finally selected were Verbal Reasoning, Numerical Ability, Abstract Reasoning, Space Relations, and Mechanical



Reasoning. Clerical Speed and Accuracy and Language Usage, composed of two parts, Spelling and Sentences," completed the battery. The tests avoided as much as possible dependence on particular school subjects, and although the language and numerical ability tests are inherently dependent on school training, materials are used that are common in the elementary schools.

The Verbal Reasoning Test is intended to measure the ability to understand concepts formed in words. The abilities to abstract, to generalize, and to think constructively are all measured. More than verbal fluency or mere vocabulary recognition is demanded. The items are versatile in that any field of study can be used. Words from history, geography, literature and kindred subjects are employed. Thirty minutes are allowed for completion of this test.

The test of Numerical Ability is designed to test the understanding of numerical relationships and the facility one possesses in handling numerical concepts. Arithmetic computation, rather than arithmetic reasoning, is demanded. Consequently, reading ability plays no significant role, as it does in problems of arithmetic reasoning. It has been demonstrated by experiments in the schools that the problems were complex enough to challenge students in all high school grades. Since the test was devised to require intelligent

handling of numerical concepts, this is reflected in the scoring. The maximum time allowed for completion is 30 minutes.

The Abstract Reasoning Test is a non-verbal measure and stresses reasoning ability. Each problem presents a series of changing diagrams and requires the perception of an operating principle that follows through from the first design to the final "answer" or correct one. The student must discover the changing principle or principles and select the final diagram which should logically follow the preceding ones in the series. No premium is put on vision, and considerable caution was employed in selecting items so as to eliminate ambiguity. However, complexity is obtained by increasing conceptual difficulties. Twenty-five minutes are allowed for administration.

The Test of Space Relations demands the ability to visualize a constructed object from a picture of a pattern and the ability to imagine how an object would appear if rotated in various ways. Both these factors were desired because they are important in any useful definition of ability to think in spatial terms. The ability to manipulate objects in three dimensional space is demanded. Again, visual discrimination is not emphasized and minute differences in size do not determine the answer. Thirty minutes are allowed for completion.

The Mechanical Reasoning Test is essentially a new form of the older Mechanical Comprehension Test introduced by Bennett.

Because of the research conducted with that instrument over many years, it was believed to be most reliable. The items consist of pictorially presented mechanical situations together with a simply worded question. A specific type of mechanical knowledge is not required. Administration time is one-half hour.

The speed of response in a simple perceptual task is measured by the Clerical Speed and Accuracy Test. Combinations of letters and numbers are involved in the items and the subject is required to glance alternately from one page to another. Immediate attention is also demanded. A combination of letters or numbers is selected from the test booklet, then located on the answer sheet, and marked accordingly. Little or no intellectual difficulty is encountered. This type of task is involved in many types of clerical jobs, and the speed of perception, momentary retention, and speed of response are all measured in this six minute test.

The words of the Spelling portion of the Language Test were selected with unusual care. They were chosen from Gates' Spelling Difficulties in 3,876 words, and were then further selected editorially for their prominence in everyday vocabulary. Each word found in the test was selected after research which emphasized that each would contribute its appropriate share to measurement, thus enhancing the reliability of the test. Ten minutes are allowed for the judgment of right and wrong spelling.

The second portion of the Language Test, Sentences, measures the student's ability to punctuate, use proper words, and distinguish between good and bad grammar. Each sentence is composed of five sections which can be scored. This results in 250 possible item responses. Each part of the sentence must be inspected and then judged accordingly, since a sentence may be correct or have one, two, three, four or five errors. The Language Usage Tests resemble achievement tests more than any of the other measures in the DAT battery; but they are included because they represent basic skills demanded in so many vocational pursuits. Twenty-five minutes are allowed for test administration.

In the past, it was desired that aptitude tests reflect the "speed" of the person rather than the "power". In recent years, however, the trend has been to reduce speed, except when speed is the factor desired to be appraised, and to emphasize power tests which measure the ability of the subject when not handicapped by the time factor. This is most logical since one of the primary reasons for measuring a person's ability is to discover the levels at which he can perform adequately. Only the Clerical Speed and Accuracy Test, as seen above, which allows six minutes for completion, involves a large element of speed. All the tests are essentially power tests with the items graded in order of difficulty. The time limits were established so that most subjects are able to attempt all items. These eight tests

cover the major measurement requirements in a guidance program.

The individual tests, in both Form A and Form B, are equivalent in content and significance. The individual tests of either battery can be administered alone, but the whole battery, which yields a total profile, is recommended. The raw scores on each test are converted into percentiles and are plotted on a profile sheet to facilitate interpretation. Plotted scores may be interpreted in terms of standard scores which appear on the profile chart. National norms are provided for both sexes of the eighth, ninth, tenth, eleventh and twelfth grades. Some standardization on college groups has also been completed (11).

Information about the reliability and validity of the DAT is presented in the Manual. In 1947, shortly after the publication of the DAT, the test was criticized because of the limited number of students used in preparing the norms, and counselors were cautioned regarding the acceptance of some comments made by the authors (30). This criticism was healthy for the test, and seemed justified. The authors of the DAT, even prior to that time, were petitioning research, and they are still seeking to encourage further study. In the last seven years, many of the criticisms leveled against the tests have been eliminated. The authors now state that the DAT's "are unusually reliable" (11, p. 19). Cronbach (33, p. 233) comments that the

DAT norms are based on large numbers of representative students. Norms published in the 1952 Manual are based on material secured from 47,000 students representing over 100 school systems from all major geographic areas in the United States, plus data from other individual research studies. In some cities of the 26 states sampled by the authors, the populations of grades 8-12 were evaluated. In other cities, classes in representative schools were selected. The reliability coefficients given were computed for each test separately, and for both sexes in each grade in three Eastern and Midwestern cities. The reliability coefficients for the tests were obtained by the "split-half" method, corrected by the Spearman-Brown formula. This method was appropriate because in all but the Clerical Speed and Accuracy Test, speed is of little importance. For the Clerical Test, students were given both Form A and Form B during the same class period, and the coefficients were computed from testing with alternate forms. The reliability coefficients of Form A, DAT, as computed on the basis of 960 males and 1064 female profiles, are presented in Table VIII.

More specifically, in this study tenth grade girls will be employed. Table IX presents the reliability coefficients, the means, and standard deviations of the Differential Aptitude Tests, Form A, for 186 boys and 215 girls in the tenth grade.

Further, regarding long term consistency of measurement,

Table VIII

The Mean Reliability Coefficient, Mean Scores and Standard Deviations of Form A, Differential Aptitude Tests, Given by Sex, for 960 Boys and 1064 Girls in Grades Eight to Twelve

Test	Boys (N=960)			Girls (N=1064)		
	Aver. r	Aver. Mean	Aver. SD	Aver. r	Aver. Mean	Aver. SD
Verbal Reasoning.....	.90	23.0	9.0	.90	22.8	8.8
Numerical Ability.....	.90	17.6	8.7	.86	16.1	8.2
Abstract Reasoning....	.90	28.7	10.5	.89	27.1	11.0
Space Relations.....	.93	45.2	24.9	.90	38.7	21.2
Mechanical Reasoning..	.85	38.0	12.4	.71	23.5	10.1
Clerical S and A.....	.87	51.9	10.6	.87	60.3	11.0
LU-1: Spelling.....	.92	39.5	24.0	.92	54.8	22.6
LU-11: Sentences.....	.88	30.5	14.7	.87	40.0	14.5

Table IX

The Reliability Coefficients, Mean  
and SD of the DAT, Form A, for  
186 Tenth Grade Boys and 215  
Tenth Grade Girls

Test	Boys			Girls		
	r	Mean	SD	r	Mean	SD
VR	.90	23.1	9.5	.90	23.9	9.1
NA	.89	17.5	8.6	.87	16.2	8.6
AR	.90	29.5	10.9	.91	28.0	11.8
SR	.94	46.9	26.6	.89	40.1	21.3
MR	.86	39.2	13.0	.70	24.3	10.0
CSA	.93	51.0	11.8	.91	58.8	12.3
Spell.	.92	37.6	25.2	.92	56.8	23.0
Sent.	.88	28.7	14.7	.86	39.9	14.5
N		186			215	



a study done by Doppelt and Bennett on the students comprising the 1950 Class of two Mount Vernon, New York high schools consisted of giving the DAT battery in the ninth grade and again in the twelfth grade. It yielded the results represented in Table X.

The validity of the DAT is based on studies involving the prediction of course grades, the prediction of achievement test results, and most importantly, the prediction of vocational and educational success. In several studies conducted in these three areas, it has been found that grades in the typical English course can be reasonably well predicted by the Sentence, Spelling, Verbal Reasoning and Numerical Tests. The Numerical Ability Test clearly shows the greatest predictive power for mathematics grades. The Mechanical Reasoning Test has predicted well in some shop courses and less adequately in others (2, p. 375). This can also be said about other tests in the battery. However, the failure to predict all grades more accurately is not necessarily a shortcoming of the instrument. Much depends upon the skills or aptitudes which the course requires, in spite of the name given to the course. It is also recognized that school marks are partially subjective in nature. The test reflects validities, rather than one validity, and this varies with course material, sex of the students, and school grade. Evidence is strong that the DAT's are useful as predictors of school marks

Table X  
Correlations Between Ninth Grade Scores  
and Twelfth Grade Scores on the DAT,  
Form A, for 71 Boys and 90 Girls  
of Two Mount Vernon High Schools,  
Class of 1950

Test	Boys	Girls
	r	r
Verbal Reasoning.....	.87	.82
Numerical Ability.....	.75	.74
Abstract Reasoning.....	.62	.64
Space Relations.....	.59	.70
Mechanical Reasoning.....	.73	.63
Clerical S and A.....	.68	.58
LU - 1: Spelling.....	.77	.77
LU - 11: Sentences.....	.75	.80
N	71	90

in courses taken a considerable time after the administration of the test.

In the Spring of 1947, the DAT battery was administered to a large number of junior and senior high school students. The school systems of Mount Vernon, New York, Hamilton, Ohio, Dover, New Jersey, Jackson and Ann Arbor, Michigan, and St. Paul, Minnesota cooperated in the research. In 1950 and 1951 questionnaires were sent to 2,900 former students who had taken the test previously in 1947. The students gave information relative to what they had done educationally and vocationally since graduation. Approximately 1,700 students replied. The data obtained in this follow-up study are reported as "most acceptable". The authors realize that it would have been desirable to base the criteria of success on intervals of longer duration, and it would have been preferable to secure data from much larger groups representing the various occupational pursuits.

It is also essential to have marked independence of tests used in an aptitude battery. If two tests correlate highly, one is redundant and unnecessary. The likelihood of discovering differences and abilities is greatly diminished by tests reflecting high correlations. The mean intercorrelation coefficient of the DAT, Form A, for 960 boys and 1,064 girls representing grades eight through twelve is presented in Table XI.

It will be noted that the coefficients ranged from .06

Table XI

The Mean Intercorrelation Coefficients of  
The DAT Based on Records of 960 Boys &  
1064 Girls Representing Grades 8-12

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Boys (N=960)	VR	NA	AR	SR	MR	CSA	Spell.
Numerical Ability.....	.58						
Abstract Reasoning.....	.56	.54					
Space Relations.....	.52	.47	.56				
Mechanical Reasoning.....	.53	.39	.51	.59			
Clerical S and A.....	.12	.20	.16	.13	.06		
LU - 1: Spelling.....	.51	.41	.28	.19	.17	.13	
LU - 11: Sentences.....	.62	.50	.44	.36	.36	.14	.62

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Girls (N=1064)	VR	NA	AR	SR	MR	CSA	Spell.
Numerical Ability.....	.58						
Abstract Reasoning.....	.61	.52					
Space Relations.....	.49	.37	.57				
Mechanical Reasoning.....	.54	.41	.53	.54			
Clerical S and A.....	.16	.22	.18	.12	.13		
LU - 1: Spelling.....	.52	.43	.33	.21	.25	.15	
LU - 11: Sentences.....	.67	.55	.46	.34	.37	.16	.64

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to .67. High correlations exist between aptitudes which are considered normally related. However, the coefficients demonstrate that the abilities measured by the separate tests are sufficiently different to warrant inclusion of all tests in the series. These correlations are especially surprising, since each test was originally constructed to be meaningful on its own account.

The DAT is well accepted in recent literature reviews. Praise is given the authors for the construction and development of the test. Bechtoldt (8) concludes his critique by recommending the use of the instrument. Berdie (14), too, recommends the battery. After analyzing the individual tests, he points out that it has validities rather than one validity, and states that the battery has been carefully standardized by competent authors. Berdie acknowledges the recognition which the authors received from the Council of Guidance and Personnel Associations in 1951.

In conclusion, in his work on Aptitude and Aptitude Testing, Bingham relates that the purposes of an aptitude test are to aid in the evaluation of a person's decision to pursue some vocation successfully, to uncover hidden talents, to suggest alternative positions or vocational areas, and to focus the individuals attention on endowments that could be utilized. A good aptitude test also points out disabilities (17, p. 14). It is believed that the instrument, employed in the proposed

study, most adequately meets the desired characteristics of an aptitude battery.

## CHAPTER IV

### ANALYSIS OF THE DATA AND THE RESULTS

In order to determine the reliability of the results and to provide for an accurate interpretation of the data, the performance was evaluated against the null hypothesis, that is, no real difference will exist between the two groups other than would be expected through the operation of chance factors. The formula presented by McNemar for the standard error of the difference between means ( $\sigma M_D$ ) was employed to ascertain whether the differences between the two groups of paired subjects were significant. A correlation existed between the delinquent and nondelinquent groups since qualitative variables were used to match the subjects. This correlation factor had to be considered in comparing the matched samples. The formula presented by McNemar took into account the variance associated with each distribution. It also took into consideration how each variance was modified by the correlation. The problem studied in this research was subsumed under case g of pairing possibilities for related measures described by McNemar (106, p. 74). Guilford states that this direct method "is very strongly recommended whenever it can be conveniently applied" (76, p. 221). The means, SD, difference between means, and

standard error of the difference between means were found in this manner. The significance of the differences was expressed in terms of the critical ratio (76, p. 604). To be significant at the .05 level of confidence, a C.R. of 1.96 was required. To be very significant, at the .01 level of confidence, a C.R. of 2.58 was demanded. Differences yielding a critical ratio smaller than 1.96 were not regarded as significant in this study but indicated a trend.

According to the first hypothesis, the means in the Outdoor, Scientific, and Mechanical areas are significantly higher for the nondelinquent group. This statistic for the nondelinquent group on the Outdoor Scale was 31.98. The SD was 11.80. This was compared with the mean score of 33.32 for the delinquent group. The SD was 15.23. A mean difference of 1.34 yielded a critical ratio of 0.48. On the Scientific Scale, the mean of the delinquent group was 28.00 and the SD was 11.88. The mean and SD for the nondelinquent group were 29.30 and 10.52 respectively. The mean difference was 1.30. The C.R. was 0.53. A Mechanical interest mean of 23.02 with a SD of 4.72 for the delinquent students was compared to a mean of 20.34 and a SD of 7.38 for the nondelinquents. The mean difference was 2.68. A C.R. of 1.58 was computed. Although this is the second largest critical ratio obtained in the comparison of the two groups on all vocational interest scales, it falls short of the



C.R. of 1.96. Rather than distinguishing the two groups, these findings seem to indicate marked similarity in these specific vocational areas as reflected on the KPR.

In previous research completed by the writer (119), where groups of nondelinquent and delinquent boys were compared, the Outdoor, Scientific, and Mechanical areas of the KPR were found to differentiate the two groups significantly. The control and experimental groups in that study were somewhat similar to the delinquents and nondelinquents recruited for the present research. It was on the basis of the previous findings that the first hypothesis in the present study was tested.

The means, SD, differences between means, standard error of the difference between means, and the critical ratios for the 50 delinquent and 50 nondelinquent adolescent boys on the KPR are presented in Table XII.

The question naturally arises as to why similar significant differences were not found when delinquent and non-delinquent girls were compared on the same scales. Perhaps, the Outdoor, Mechanical, and Scientific interests, as reproduced on the self-interpreting profile sheets of the KPR are more closely related to male pursuits (for example, automobile repairman, watchmaker, drill press operator and engineer on the Mechanical Scale; doctors, chemists, nurses, engineers, radio repairmen, aviator and dietician in the Scientific area; and

Table XII

The Means, SD, Differences Between Means, Standard Error  
of the Difference Between Means and Critical  
Ratios for Fifty Delinquent and Fifty Non-  
delinquent Boys on the Kuder  
Preference Record

Scale	Non-Delinquent		Delinquent				
	$M_1$	SD	$M_2$	SD	$M_1 - M_2$	$M_D$	C.R.
Outdoor.....	48.48	13.56	42.30	14.72	6.18	2.83	2.18**
Mechanical.....	47.02	10.95	41.30	10.58	5.72	2.05	2.79*
Computational.....	25.22	7.18	22.64	6.19	2.58	1.16	1.36
Scientific.....	40.86	11.54	33.98	9.31	6.88	2.12	3.25*
Persuasive.....	38.08	11.60	41.64	16.04	-3.56	2.22	-1.60
Artistic.....	27.22	9.58	29.18	8.77	-1.96	2.06	-.90
Literary.....	17.44	7.07	18.58	7.49	-1.14	1.55	-.74
Musical.....	12.44	7.66	14.68	6.13	-2.24	1.29	-1.74
Social Service.....	35.58	9.91	37.66	9.23	-2.08	1.93	-1.08
Clerical.....	47.80	12.32	47.84	11.61	-.04	2.16	-.02

\* Significant at the .01 level of confidence

\*\* Significant at the .05 level of confidence

forest ranger, naturalist, and farmer on the Outdoor Scale). Differences, then, perhaps would be more pronounced in the comparison of male subjects than they would be in the comparison of female groups. This would support the comment of Norton (118, p. 296), made after analyzing the vocational preferences of adult subjects. In that study, it was postulated that the vocational interests of females as reflected during adolescence are more homogeneous and less variable than are those of men. Consequently, the disparity noted in the comparison of delinquent and nondelinquent boys is not obtained in this study involving female subjects. In addition, the groups employed in this research were more closely matched in regard to several important variables than in any of the previously completed male studies that yielded significant differences (119, 93, 51).

Also, the hierarchal position of occupations might have some effect upon the results. Some positions afford prestige, status and security, and are related to the vocational aspiration level of the subject. It is generally held that not as much importance is given to careers by females as by males. The males most likely will be responsible for the support of a family. In our social structure women usually secure social position and prestige through the occupational pursuits and success of their mates. It could be possible, then, that the differences in male groups might be more significant than they

would be in female ones, primarily because the occupational area is more meaningful, and the selection of an occupation a more serious decision.

More specifically, in regard to the Mechanical area, Triggs (157, p. 296) found that women securing higher femininity scores were more apt to reflect lower mechanical interest. Many clinicians maintain that because of the offenses committed, and because of the observed personality characteristics and the general conduct of delinquent girls as a group, they are not as characteristically feminine as nondelinquent female adolescents. Although the delinquent group does secure a higher mean score, this speculation could not be verified on the basis of the results obtained on the KPR. This instrument is not intended to measure the degree of femininity of the subject. It is interesting to note that the mean percentile rank on the Mechanical Scale for the delinquent girls in the present study was 55, as contrasted with the mean percentile rank of 36 for the delinquent boys employed in the author's previous research (119, p. 58). It must be emphasized, however, that in the interpretation of these scores, separate norms are employed. In addition, the delinquent males in the previous study had a mean grade placement of 9.7. All subjects in the present research had attained sophomore classification. The boys, however, exceeded the mean chronological age of the female group

by 0.7 years.

Because of insufficient evidence, the first hypothesis is regarded as being untenable within the framework of the present study. The one significant finding, however, in the comparison of the vocational interests of the delinquent and nondelinquent girls, was noted in the Persuasive area. The mean for the nondelinquent group was 39.74. The SD was 9.61. This was compared to a mean of 35.58 and a SD of 9.04 for the delinquents. The mean score difference was 4.16. The C.R. was 2.05. This was significant beyond the .05 level of confidence.

According to Kuder, a Persuasive preference indicates that the subject likes to meet and deal with people and likes to promote projects or things to sell. This vocational interest is especially related to lawyers, ministers, politicians and successful sales people. It is desirable that they possess self-control and that they be emotionally mature. This would be noted in the ability to postpone personal satisfaction and immediate goals for more ultimate and subtle ones. Rational or rhetorical persuasion would seemingly be characteristic of these individuals. These characteristics, then, could be reflected in a high persuasive interest. On the other hand, research findings indicate (141, 40, 109, 168, 88) that the need for immediate pleasure in delinquents is quite marked.

They are usually unable to postpone personal satisfaction. Delinquents are more inclined to act out their frustrations. As a group they are less capable of exercising intellectual control than a group of nondelinquents. The delinquents, moreover, tend to be argumentative and labile. Delinquents are usually not inclined to resort to logical persuasion. They try to avoid reality by not coming to grips with actual life problems. It is believed that the nondelinquents, as a group, would tend to respond in a more cautious and reasonable manner to external reality. This, then, could partially explain the significant difference found between the two groups on the Persuasive Scale.

The second hypothesis, namely, delinquent girls secure higher mean scores on the Artistic, Musical and Literary interest areas, was not substantiated. On the basis of the results of all male studies by Klugman (93), Feather (51), and Novak (119), it had been theorized that high scores on this "cultural triad" were more characteristic of maladjusted than of well-adjusted subjects. On the basis of the present results, this hypothesis could not be defended, when applied to the female delinquents. Novak had speculated, in a previous study of delinquent boys, that Artistic, Musical and Literary interests could be reflected more strongly by individuals possessing somewhat stronger feminine interests. Lack of masculine identification and/or

inability to accept the responsibilities and functions concomitant with assuming the male role, as demanded by our generally accepted social mores, were frequently discovered as being a basic or contributing factor to the male delinquents' sociopathic activities and ultimate confinement. Actually, however, if these vocational areas are considered to be more feminine, one might probably expect the control group to secure higher mean scores than would a group of incarcerated delinquent girls who are believed to be less feminine in their pursuits. Kuder states that hairdressers, dress designers, interior decorators, drama critics, and book reviewers would score high in these areas. Attending music concerts and reading about music and musicians contribute prominently to the Musical interest area. The nondelinquents did receive a higher mean score on the Artistic Scale, but it was not significant. The C.R. was 1.28. On the Musical Scale, the mean raw score for the delinquents differed from that of the nondelinquents by 0.04. The C.R. was 0.03. A mean difference of 0.50 was noted between the two groups in the Literary area. The C.R. was 0.36. Again, the overlap of the two groups and the degree of homogeneity reflected are impressive. On the basis of these findings the second hypothesis is also rejected. The means, SD, difference between means, standard error of the difference between means, and critical ratios for the 50 delinquent and 50 nondelinquent adolescent girls on the KPR are presented in Table XIII.

Table XIII

The Means, SD, Differences Between Means, Standard Error  
of the Difference Between Means, and Critical  
Ratios for Fifty Delinquent and Fifty Non-  
delinquent Girls on the Kuder Preference  
Record

Scale	Delinquent		Non- Delinquent		$M_2 - M_1$	$M_D$	C.R.
	$M_1$	SD	$M_2$	SD			
Outdoor.....	33.32	15.23	31.98	11.80	-1.34	2.80	-.48
Mechanical.....	23.02	4.72	20.34	7.38	-2.68	1.70	-1.58
Computational.....	23.46	6.71	22.44	10.23	-1.02	1.29	-.79
Scientific.....	28.00	11.88	29.30	10.52	1.30	2.46	.53
Persuasive.....	35.58	9.04	39.74	9.61	4.16	2.03	2.05*
Artistic.....	27.86	9.14	30.52	7.38	2.66	2.08	1.28
Literary.....	19.48	6.56	19.98	7.77	.50	1.38	.36
Musical.....	15.74	5.33	15.70	6.74	-.04	1.28	-.03
Social Service.....	49.96	11.71	51.12	10.81	1.16	2.46	.47
Clerical.....	61.90	15.08	59.28	13.97	-2.62	2.99	-.88

\* Significant at the .05 level of confidence



In testing the next hypothesis, namely, that the interest profiles for the delinquent group are generally depressed or weaker in intensity, the total number of significantly high scores (centile of 75 or above) appearing on each record was checked. The nondelinquent group had a total of 118 significantly high scores on all scales. This resulted in a mean of 2.36 significant scores per record. The SD was 1.31. This was compared to 113 significantly high scores for the delinquent group. The mean for this group was 2.26 significant scores for each record, and the SD was 1.11. A nonsignificant C.R. of 0.40 was obtained. In the nondelinquent group, 38 individuals, or 76 per cent, had two or more significantly high scores on the KPR, as contrasted with 37 or 74 per cent of the delinquents.

When the number of significantly high scores (75th centile or above) on the individual scales of the KPR were compared, it was found that only the difference in number of delinquents and nondelinquents scoring that high on the Artistic Scale approached significance. The  $X^2$  of 3.33 was significant between the 0.10 and the 0.05 level of confidence.

Table XIV shows that all other chi squares are not significant at the level of confidence stipulated for this study. In the table will be found the name of the scale, chi square, and its probability level, when the number of significantly high

Table XIV

Name of Scale, Chi square and Probability in the Comparison of the Number of Significantly High Scores (75 centile of above) on the Individual Scales of the KPR for the Fifty Delinquent and Fifty Nondelinquent Girls

Scale	$\chi^2$	P	Scale	$\chi^2$	P
Outdoor.....	.76	.50	Artistic.....	3.33	.10
Mechanical.....	.08	.80	Literary.....	1.41	.30
Computational.	1.61	.30	Musical.....	1.52	.30
Scientific.....	0		Soc. Service	.05	.90
Persuasive.....	2.25	.20	Clerical	.21	.70

scores on the individual scales of the KPR for the two groups were compared.

The significantly low scores (25th centile or below) are also important in the interpretation of the KPR, and the total number of significantly low scores on each record was computed. A total of 116 was secured by the delinquent group for a mean of 2.32 significantly low scores per record and a SD of 0.93. This was compared to a total of 123 significantly low scores obtained by the nondelinquent group with a mean of 2.46 per record and a SD of 0.80. The obtained C.R. of .82 was not significant.

In the comparison of the number of low scores on each individual scale considered significant in the interpretation of the KPR (25th centile or below), the highest chi squares obtained were 1.97 and 1.87, on the Persuasive and Literary Scales, respectively. Their probabilities do not exceed the 0.10 level of confidence. The chi squares and their probabilities for all of the scales of the KPR are presented in Table XV.

In a further attempt to discover significant differences, any two high scores appearing on the individual records (75th centile and above) were combined and the totals for each group then compared. Chi square was employed. Where necessary, Yates correction for continuity was used. The Persuasive-Literary combination resulted in a  $\chi^2$  of 2.46, the largest computed. This

Table XV

Name of Scale, Chi square and Probability in the Comparison of the Number of Significantly Low Scores (25 centile or below) on the Individual Scales of the KPR for Fifty Delinquent & Fifty Nondelinquent Girls

Scale	$\chi^2$	P	Scale	$\chi^2$	P
Outdoor.....	.02	.90	Artistic....	.88	.30
Mechanical....	.80	.30	Literary....	1.87	.10
Computational.	1.78	.20	Musical.....	.04	.90
Scientific....	.23	.50	Soc. Service	.06	.80
Persuasive....	1.97	.10	Clerical....	.27	.50

was significant at approximately the 0.10 level of confidence. The procedure was repeated for the combination of significantly low scales (25th centile or below). A  $X^2$  of 2.33, was the largest obtained. It approximated significance at the 0.10 level of confidence. This resulted from the comparison of the total number of Mechanical-Musical combinations. These results were not significant.

The fourth hypothesis, that is, the delinquent group obtains significantly lower mean scores in some of the aptitude areas is only partially substantiated. It is not supported to the extent that would be anticipated, on the basis of many of the findings presented in the literature review. The differences between the groups were somewhat more marked than in the comparison of vocational interests, but only one aptitude area, that of Abstract Reasoning, was found to be statistically significant. The mean score for the nondelinquent group was 27.64 and the SD was 10.02. This was compared with a mean score of 21.52 for the delinquent students and a SD of 11.38. The mean difference was 6.12. The C.R. was 2.65. This was significant beyond the 0.01 level of confidence.

In attempting to discover the schema involved in solving the problems of the Abstract Reasoning test, the subject must discover the principle or principles governing the change in the figures presented, and give evidence of understanding

the problem by designating the diagram which follows logically in sequence. He must then generalize the changes noted into operating principles, and must employ abstract symbols.

Reasoning with words is not involved. If any difference between the two groups would be anticipated in the aptitude areas, perhaps the prediction of the one noted, namely Abstract Reasoning would seem most logical. It was stated by Wechsler, that "psychopaths" were generally below average in abstract thinking. Some clinicians would undoubtedly assign the term, "psychopath", to many of the delinquent girls in this research.

Over a period of time, the present author has administered individual and group tests routinely to delinquents of both sexes. It has been observed that delinquents encounter difficulty in attending consciously for any length of time to assigned tasks which demand persistent, concentrated, and continuous mental effort. The abilities to prepare and to organize the self for concerted thinking, to control impulses, and to persevere are not generally evidenced in delinquent subjects. This would seem to corroborate Adelson's (1, p. 623) more inclusive comment that delinquents are unable to sustain effort in terms of both vocational and educational achievements.

Although no significant differences are reflected in other aptitude areas, there is a definite trend on the part of the nondelinquent group to secure higher mean scores in two

other areas, namely, the Verbal Reasoning and the Mechanical Reasoning Tests. Both demand reasoning ability and perseverance. These are personality characteristics which would usually be attributed to more stable persons.

In the Verbal Reasoning Test, a C.R. of 1.80 was computed, approximating the 0.08 per cent level of confidence. The mental functions involved in this test, as represented by the DAT, demand the ability to understand concepts framed in words, but are aimed at the evaluation of the student's ability to abstract, generalize and think constructively, rather than at simple fluency or vocabulary recognition. Reasoning ability is especially emphasized in the items composing the test. The aspiration level of the two groups might also be inferred, since the authors of the DAT state that "vocationally, the test also indicates something of the occupational level to which the student may appropriately aspire, since there is a positive relationship in many occupations between the level of responsibility of a job and the complexity of verbally phrased ideas to be comprehended" (11, p. 6). The Verbal Reasoning Test also deserves considerable weight in determining whether the subject should be considered of college caliber (11, p. 7). On the questionnaire employed in this study, only 15 out of 50, or 30 per cent of the delinquents, stated that they wanted to finish high school, as opposed to 42, or 84 per cent of the nonde-

linquent group. A chi square of 29.74 was obtained. The difference was significant beyond the .001 level of confidence. Many of the nondelinquents stated during interviews that they aspired to college careers, even though matriculation at college was only tentative. They realized its value. Thus, again perhaps, a higher aspiration level and more ultimate life goals could be attributed to the nondelinquent group.

On the Mechanical Reasoning Test, the delinquent group had a mean of 18.98 and a SD of 12.37. This was compared to the nondelinquent group mean of 22.36 and SD of 8.34. A C.R. of 1.67 was significant at approximately the 0.10 level of confidence. In the Mechanical Reasoning area, the abilities to concentrate, to persevere and, to a degree, to manipulate abstract concepts are again relevant to the solution of the problems presented. It might first be theorized that because of the positive relationship between intelligence and aptitude, the delinquents are not as intelligent as the nondelinquents. The significant differences, and those differences tending toward significance in the aptitude area between the two groups, then would be a reflection of this discrepancy. The intellectual variable, however, was adequately controlled. It could be maintained that the differences are not attributed to innate intelligence. Perhaps, the delinquents did not apply effectively the intelligence which they possessed. This was supported in later interviews with



the examiner, where several members of both groups complained verbally about the difficulty of the Mechanical Reasoning test, an area not generally of interest to females. The delinquent group, however, tended to avoid the tasks, as noted by observations made during group testing and by inspection of the answer sheets. The delinquents completed fewer items successfully than did the nondelinquent group, which, in spite of a dislike for the test, attacked and attempted to solve the problems more realistically. The delinquent group, as a whole, seemed to avoid tasks they interpreted as being beyond their ability. They made numerous responses to test items at random. After completion of the test and during the presentation of the results, the delinquents readily verbalized the feeling that they had not done well. They stated that they had attempted to escape from the discomfort created by the test situation.

The delinquents, then, earned a lower mechanical ability score than did the nondelinquents in spite of the fact that, as a group, they tended to reflect a stronger mechanical interest, as indicated by the mean score on the KPR. When forced to display abilities on a standardized test, in a structured situation, they did not perform as well as the nondelinquent group whose interest was not as intense. Lippman's contention was consistent with this finding. He states that delinquents have, as their goal, the securing of more comfortable or

pleasurable circumstances with the expenditure of minimum effort and without delay (101, p. 164). This, too, could be partially responsible for the significant difference between the two groups on the Persuasive Scale of the KPR. Small succinctly summarizes that egocentric and asocial impulses, along with limited ego control, prevent delinquent or maladjusted subjects from the proper exercise of talents and skills (161, p. 8)..

On the basis of the differences reflected in the aptitude areas demanding abstraction, the similarity of the performances of the two groups on the Spatial Relations Test seems somewhat incongruous. The authors of the DAT, however, state: "the Space Relations Test is a measure of ability to deal with concrete materials," and the "ability to manipulate things materially" (11, p. 7), rather than abstract ideas. Actually, the mean score of the nondelinquents was 34.18, with a SD of 19.60. This was compared to a delinquent group mean of 29.02 and a SD of 17.75. Although a mean difference of 5.16 favored the nondelinquent group, the standard error of the difference between means was quite large, yielding a C.R. of 1.24.

When the differences above are considered, the motivation of the less able group toward testing should be investigated. In the present research, however, the delinquents reflected their attitude by numerous and repeated requests for the presentation of test results. Prior to the administration

of tests, the discussion of the reasons for testing and of the possible implications of the test information," both in the institution setting and in regard to more ultimate vocational goals, provided motivation of both an intrinsic and extrinsic nature. All subjects participated on a voluntary basis. In addition to these factors, the frequently expressed desire of adolescents to know more about themselves should be added. Motivation is so intangible a variable, however, that conclusive information in regard to the two groups could not be given.

On the questionnaire, 17 of the delinquents, or 34 per cent, stated that they liked attending school, as opposed to 26, or 52 per cent, of the nondelinquent group. A chi square of 3.30 was obtained, significant beyond the 0.10 level of confidence. During interviews, many of the nondelinquents added that, although they had answered the question negatively in regard to school attendance, they would, nevertheless, continue until they received their diplomas. They realized graduation from high school would be of value, no matter what future life goals might be. When the delinquents' dislike for academic subjects and their desire not to attend school are considered, the equality of the two groups on the Spelling and Sentence Tests might not at first be expected, since these areas are closely related to formal learning and academic settings. The mean scores for the delinquent group on the Spelling and Sentence

areas differed from those of the nondelinquent group by only 0.14 and 0.28, respectively. The critical ratios were 0.03 and 0.10 respectively. It must be remembered, too, that even though delinquents are usually retarded in grade placement when compared to nondelinquents, intellectual ability in this instance was controlled. Both groups had achieved the same grade placement. Frequently, too, certain reading and spelling scores are demanded of the students prior to graduation from Chicago Elementary Schools.

In regard to all the comparisons above, it might be added that after a longitudinal study of the DAT, the authors concluded it was possible that a great deal of exposure to verbal, numerical, and language concepts occurs in the formal classroom situation in a context which is relatively uniform for all students. The areas of abstract reasoning, space relationship, mechanical reasoning, and clerical ability are not so directly related to uniform or common portions of the school curriculum. These were the areas in which the differences between the two groups in this study were significant or approached significance. The exposure to the type of material presented in these latter areas is more likely to be a function of differential academic experience, gained in specialized courses and in a variety of extra curricular activities (10).

The means, SD, difference between means, standard error of the difference between means and C.R. for the fifty delinquent and fifty nondelinquent girls on the DAT are presented in Table XVI.

The findings on the DAT seem in general to emphasize similarity rather than marked differences between the two groups. Moreover, much overlapping is shown. Thus, it was felt that the comparison of group profiles, to a few profiles characteristic of specific occupations presented in the DAT Manual, would not contribute further to the present study. It could be concluded, however, that both groups employed in the present research vary somewhat, though not markedly, from the norms presented for tenth grade girls in the test manual. This merely emphasized the author's suggestion that to insure greater validity, test norms should be established for populations in more specific geographical locations.

It will be noted that all three of the tests reflecting significant differences or most nearly approaching significance in the aptitude areas, and the scale yielding the one significant difference on the vocational interest test probably demand characteristics that are not usually attributed to delinquents. This is based on actual research findings, on observation, or on speculation in numerous research studies, by Doctor (42), Jastak (88), Birkness (18), Diller (40), Wittman (168), Hathaway (78),

Table XVI

The Means, Standard Deviations, Differences Between Means,  
Standard Error of the Difference Between Means and  
Critical Ratios for Fifty Delinquent and Fifty  
Nondelinquent Adolescent Girls on The  
DAT

Aptitude	Delinquent		Non-Delinquent		$M_2 - M_1$	$M_D$	C.R.
	$M_1$	SD	$M_2$	SD			
Verbal Reasoning.....	16.50	6.62	18.88	6.32	2.38	1.32	1.80
Numerical Ability....	9.80	6.18	11.30	5.48	1.50	1.32	1.14
Abstract Reasoning...	21.52	11.38	27.64	10.02	6.12	2.31	2.65*
Space Relations.....	29.02	17.75	34.18	19.60	5.16	4.16	1.24
Mechanical Reasoning.	18.98	12.37	22.36	8.34	3.38	2.02	1.67
Clerical-Sp & Accu....	55.66	9.13	58.84	11.97	3.18	2.00	1.59
Spelling.....	45.24	30.30	45.38	22.33	.14	4.92	.03
Sentences.....	25.30	14.47	25.02	11.02	-.28	2.80	-.10

\* Significant at .01 level of confidence

and Small (141).

## CHAPTER V

### SUMMARY AND CONCLUSIONS

The purposes of this investigation were to compare the vocational interests and aptitudes of a group of delinquent and a group of nondelinquent adolescent girls and to determine whether any significant differences existed. The task of distinguishing delinquents from nondelinquents is gradually becoming more difficult. Persons having extensive contact with members of both groups are especially aware of this fact. The difficulty is primarily attributed to variations of environment, differences in cultural codes, and social mores. Legal criteria, too, are found to differ markedly. Judges and law officers frequently use their own judgement as to the degree of mischievousness or delinquency involved in specific cases. Attenuating circumstances are often considered. Much overlap exists between delinquent and nondelinquent groups, and often no clear delineation is made in regard to the classification of delinquent or felonious acts.

A synthesis of the literature in regard to a theory of vocational interests or aptitudes indicates that psychologists, sociologists, physiologists, psychiatrists, and academic personnel



still frequently emphasize factors closely related to the viewpoints of their specific disciplines as being responsible for the development and/or manifestation of both vocational interests and aptitudes.

Although it is generally accepted that conclusive evidence supporting any one specific theory is not available, many present day clinicians are becoming aware of the increasing importance of aptitudes and vocational interests, and are coming to realize the far reaching implications of both areas. It is now generally accepted that neither the development of interests nor the manifestation of aptitudes is an abrupt occurrence, but both are gradual transformations affected by native capacities and many environmental forces. It is also generally accepted that the mere possession of innate abilities does not insure adequate functioning on a related assigned task, since proper development of these aptitudes is dependent directly upon personality factors, and indirectly, upon environmental influences.

It is evident, also, that innumerable hypotheses have been made regarding the existence of similarities and differences in the vocational interests and aptitudes of those displaying delinquent and nondelinquent behavior patterns. A few "definite" conclusions are presented, some of which are buttressed by highly speculative hypotheses, if not supported by clear-cut evidence, with the hopeful intent of stimulating further research.

The findings of many of the studies presented in the review of the literature are vitiated because of poor criteria in the selection of subjects. The most undesirable, but most frequently occurring weakness in studies comparing delinquent and nondelinquent groups, however, was the poor control or lack of control of important variables such as, age, education, intelligence and socio-economic status.

Previous studies brought out that both delinquents and nondelinquents may possess unpatterned, depressed or clearly delineated areas of vocational interest. These students may fluctuate or remain consistent in their vocational selections. Similarly, in regard to aptitudes, no conclusive evidence can be presented from the available studies and the speculations of numerous investigators with respect to the superiority or inferiority of the groups.

In a final analysis of the literature, it was found that the following most important innate and external factors could provide a basis for differentiating the vocational interests and aptitudes of the groups employed: physical traits; mental endowment; native and acquired abilities; level of aspiration; socio-economic status; personality factors of self, parents and associates; family, school and social adjustment; occupations of parents and of friends with whom one associates; and contacts with activities in which interests can be developed

and aptitudes discovered or more efficiently employed.

The subjects in the present research were two groups composed of 50 delinquent and 50 nondelinquent, white adolescent girls, all residents of Chicago, from 14 through 16 years of age. Reading ability, IQ, school grade, residential area, father's occupation and socio-economic status were the other variables controlled. The delinquent subjects selected were obtained from the Illinois State Training School for Girls at Geneva, Illinois. These subjects were paired with nondelinquents secured from four large Chicago high schools, located in different sections of the city. All subjects were tenth grade students and scored, at least, at the 8.2 grade level on a standardized reading examination. No visual or physical impairments, which could have influenced the selection of an occupation or which could have interfered with the proper display of aptitudes, were present. The writer administered the Kuder Preference Record and the complete battery of Differential Aptitude Tests to both groups according to the instructions given in the manuals for the respective tests. Testing conditions for both groups were very similar, and generally ideal.

On the basis of the numerous investigations which have been conducted with the Kuder Preference Record since its initiation approximately 20 years ago, it can be concluded that its reliability and validity have been adequately established.

Numerous investigators state that very favorable research findings assure its validity. A reliability coefficient of .91 is claimed for the KPR. The instrument was found to be employed more than any other type of vocational interest test in installations affording counseling and guidance to adolescents and adults of both sexes. It has been found reasonably reliable for age groups as low as the eighth grade.

The DAT, a more recent addition to the clinician's armamentarium, was introduced in 1947. It can be employed with adolescents and adults of both sexes, and is used in educational and vocational guidance, and in the selection of employees for more specific occupations. It not only gives a profile for individual counseling, but affords a means of comparing groups. The soundness of the assumptions and the thoroughness of the procedures involved in the construction of the DAT have received enthusiastic approval. The eight tests comprising the battery are said to possess validities rather than one validity. Reliability coefficients are available for each school grade, from the eighth through the twelfth, for both sexes. DAT norms are based on more than 50,000 individual profiles from adolescents and adults in different areas of the country. The instrument has been warmly received by most of the experts in the vocational counseling and guidance fields. Its rapid growth and extensive use give indication of its general acceptance.

The hypotheses tested and the results obtained from these samples warrant the following conclusions:

1. Nondelinquent girls do not possess significantly higher mean scores in the Outdoor, Scientific, and Mechanical areas of the KPR. All but two of the occupations listed under these vocational interest areas by Kuder are predominantly masculine in nature and could be responsible for the greater difference found to exist between delinquent and nondelinquent male groups. Another reason for the similarity of the two groups on these scales may be that, generally, not so much importance is given to careers by females as is given by males. Vocational interests of female adolescents are probably less variable and more homogeneous than those of male subjects, as was pointed out in previous studies. Finally, the control of several important variables was more rigid in the present research thus, further decreasing the possibility of significant differences.

2. Delinquent girls do not secure significantly higher mean scores in the Artistic, Musical and Literary areas of the KPR. Instead, a marked similarity on these interest areas was actually revealed.

3. Nondelinquent girls reflect a more intense interest in the Persuasive area of the KPR. The difference was significant at the 0.05 level of confidence. This indicates

that the nondelinquents, as a group, would be more interested in meeting with and dealing with people than would the delinquents. They would like to promote projects or sell things more than would the group of delinquent subjects. It is believed that the delinquents, as a group, less frequently resort to logical persuasion. They are more concerned with the securing of immediate satisfaction and less able to postpone immediate goals for more ultimate ones.

4. The interest profiles of the delinquent group are not generally depressed or weaker in intensity. When all significantly high scores (75th centile or above), and when all the significantly low scores (25th centile or below) for the two groups were compared, the homogeneity seemed impressive. The speculation in the literature that the personal problems of delinquents interfere with the intensity of vocational interests could not be substantiated, at least with these groups of subjects, when several important variables were rigidly controlled.

5. In the comparison of the number of records having two or more significantly high scores (75th centile or above), said to reflect the range and intensity of vocational preferences, again, the similarity between the two groups was marked. No significant differences were observed.

6. In the comparison of the significantly high scores (75th centile or above) obtained by each group on the individual

scales of the KPR, in no instance did chi square reach the 0.05 level of confidence, stipulated as significant in this study.

7. When the significantly low scores (25th centile or below) obtained by each group on the individual scales of the KPR were compared, again the likeness and overlap of the two groups was noted.

8. The two groups differed significantly in regard to the area of Abstract Reasoning, the only aptitude test so distinguishing them. This difference was significant at the 0.01 level of confidence. The nondelinquent group performed more adequately where perseverance, logical analysis, reasoning ability, and abstraction were involved.

9. In two other aptitude areas, those of Verbal and Mechanical Reasoning, the critical ratios approximated the 0.08 and 0.10 levels of confidence, respectively. Though not significant within the framework of the present study, the differences favored the nondelinquent group, which showed a trend to function in a more desirable manner in the reasoning areas. The abilities to persevere, to concentrate and to function on an abstract level are demanded by these reasoning tests. Skill in understanding concepts framed in words, in generalizing and in thinking constructively, are especially involved in the Verbal Reasoning Area. The delinquent group seemed to become frustrated more easily in the performance of

these reasoning tests, seemed to lack confidence insofar as successful completion of the tasks was concerned, and avoided coming to grips with reality. On the KPR the delinquent group obtained a slightly higher mean score in the Mechanical area; but when forced to display their skills on a standardized test, in a structured situation, they did not perform as well as the nondelinquent group whose interest was not as strong.

10. The two groups were distinguished at the 0.10 level of confidence in regard to a liking for school attendance. The nondelinquent group reflected more positive feelings in regard to both school personnel and academic material.

11. The two groups differed most significantly in regard to the desire to complete their formal high school education. This difference was significant beyond the 0.001 level of confidence. More nondelinquents stated they desired to finish high school and to earn high school diplomas. The nondelinquents were able to recognize the value of such training and aspired to a higher academic level. They were concerned in a more mature manner with ultimate life goals.

Since the intellectual factor was adequately controlled the differences between the two groups were not attributed to that variable. As was noted in several other studies, however, the delinquents did not effectively apply the intelligence which they possessed. Personality characteristics, then, as



had been pointed out by many authors who have investigated aptitudes and interests, were shown to be of primary importance. The present findings indicate that the delinquents as a group are more labile, resort less to reason, lack self-confidence, and reflect low frustration tolerance. They are more impulsive and do not possess desired ego control. They seem to reflect an inability to organize themselves for disciplined and exact reasoning. They do not persevere as well as the nondelinquent group, and tend to escape or avoid reality situations which might cause them personal discomfort. These characteristics would especially interfere with adequate performance on the interest and aptitude areas in which significant differences or trends toward significance were found between the groups in the present study.

It is recognized that the KPR is designed to measure preferences for broad areas of interest. These vocational areas are too inclusive to differentiate specific occupational pursuits. The possibility exists that wider variations may be present between the two groups, but because of the extensive areas covered, more specific occupational differences were not revealed. It is also suggested that to insure greater validity, DAT norms should be established for populations in more specific geographic locations.

The major findings of this study indicate greater similarities between delinquent and nondelinquent girls than might be anticipated on the basis of some findings reported in the review of the literature. Many of the very pessimistic comments pertaining to the delinquent's future in the vocational field, primarily because of his lack of vocational interest or aptitudes, are not warranted on the basis of the present findings. The strong feelings of inadequacy which many inmates verbalize in regard to their abilities or aptitudes would not seem to be completely realistic. It is true, however, that the possession of ability and interest does not insure adequate functioning on related vocational tasks, since the proper development and utilization of these interests and aptitudes depend upon personality factors and environmental influences. The delinquent girls were unable to adjust in their communities and that is indicative of some personal maladjustment on their parts. Thus, it would be difficult to emphasize too strongly the importance of personal counseling and of sound vocational guidance and training programs in reformatory institutions. It has been pointed out that a realistic appraisal of one's potentialities and limitations is considered a primary prerequisite in successful vocational counseling. Individual or group guidance and the opportunities for the delinquent to

make first preliminary, and later more intensive explorations of the vocational field, should help him to make more realistic and more logical vocational decisions. The effect of these measures upon the delinquent's personal adjustment and social efficiency, upon his self-confidence, and sense of achievement and recognition, would be worth-while questions for further investigations. The effect of these measures upon the delinquent's chances for readjustment in the community, after release, should also be subjected to experimental investigation.

In dealing with any student, his freedom to choose any vocation should be respected. However, in reformatory settings, especially, affording the delinquent the facilities which will better prepare him to make more realistic and logical vocational choices is also an obligation which society must assume.

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V	0			1			2			3			4			5			6			7			8			9		
	RS	%		RS	%		RS	%		RS	%		RS	%		RS	%		RS	%		RS	%		RS	%		RS	%	
1.	42	49	88	19	35	17	28	26	42	27	11	34	72	22	63	13	23	64	90	50	29									
2.	40	31	52	30	81	16	24	27	48	41	57	28	49	19	50	22	68	35	13	50	29									
3.	38	26	35	23	55	20	42	28	50	33	27	24	33	26	79	18	49	50	56	43	17									
4.	42	55	94	26	66	17	28	31	59	20	3	46	95	16	33	11	15	53	66	53	76									
5.	39	26	35	24	59	35	95	29	53	41	57	34	72	18	44	18	49	50	56	61	57									
6.	41	52	91	35	90	18	32	57	97	33	27	15	8	21	58	4	1	67	93	42	16									
7.	38	59	96	13	11	7	1	46	88	36	37	39	84	13	19	18	49	66	92	36	9									
8.	42	31	52	11	6	19	37	25	41	31	20	48	97	25	76	15	32	52	64	62	60									
9.	42	54	93	22	50	10	4	21	26	29	15	47	96	21	58	21	65	51	60	45	20									
10.	38	23	25	19	35	29	84	11	2	44	68	31	63	24	72	28	94	32	8	65	67									
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12.	39	27	39	31	83	28	80	26	43	34	30	28	49	13	19	18	49	41	26	68	74									
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49.	41	27	39	32	85	20	42	29	54	43	65	30	58	21	58	9	9	56	73	65	67									
50.	39	35	64	24	58	29	84	21	26	40	53	26	40	18	44	11	16	44	37	77	89									

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	RS	%		RS	%		RS	%		RS	%		RS	%		RS	%		RS	%		RS	%		RS	%		RS	%	
1.	40	45	84	16	20	11	6	16	11	37	41	48	97	19	50	15	33	37	17	55	41									
2.	41	32	55	20	40	9	3	35	71	37	41	10	3	35	97	27	90	51	60	58	50									
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5.	40	19	14	23	55	20	42	23	33	26	9	19	17	23	68	13	23	58	78	62	60									
6.	42	27	39	6	0	24	64	34	68	47	78	16	10	36	98	9	9	46	44	65	67									
7.	44	37	69	34	89	17	28	25	41	36	38	26	41	10	9	12	19	70	96	64	65									
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9.	42	30	49	12	8	26	73	35	71	48	80	15	8	34	96	30	99	31	7	78	90									
10.	42	57	95	28	74	15	19	39	78	31	20	35	74	11	12	17	43	62	86	39	12									
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50.	42	46	85	12	8	20	42	34	68	41	57	39	84	11	12	25	82	54	66	45	20									

	VR	NA	AR	SR	MR	CSA	Spell.	Sent.
1.	17	7	0	12	11	57	34	18
2.	22	2	38	68	48	60	36	14
3.	12	7	10	4	25	46	32	4
4.	19	20	35	58	36	80	50	22
5.	10	6	31	23	25	65	5	20
6.	18	8	16	50	29	51	23	23
7.	23	12	20	31	17	55	54	45
8.	8	6	24	44	26	62	60	38
9.	10	2	11	15	16	38	20	17
10.	18	8	19	20	19	58	21	9
11.	9	11	0	10	11	40	16	0
12.	17	9	22	11	18	34	33	28
13.	19	14	25	30	18	51	51	41
14.	24	20	43	34	37	57	57	22
15.	11	3	32	50	22	64	60	26
16.	19	2	22	12	17	57	31	37
17.	9	6	16	26	14	48	14	16
18.	4	2	5	24	22	60	6	12
19.	9	1	19	26	17	76	44	13
20.	26	20	34	31	11	54	72	42
21.	19	20	0	18	35	55	38	29
22.	19	16	13	23	13	48	78	22
23.	14	13	40	78	32	62	51	55
24.	22	17	28	37	20	57	12	26
25.	15	14	24	36	19	46	50	30
26.	24	10	15	49	14	59	80	30
27.	9	8	9	12	21	44	65	31
28.	4	2	15	19	1	47	0	0
29.	20	14	39	51	38	65	36	35
30.	33	15	39	53	32	61	83	50
31.	12	7	29	16	13	59	73	24
32.	18	7	19	44	22	64	82	32
33.	14	0	17	12	9	64	1	8
34.	9	13	21	21	19	55	47	12
35.	12	16	32	16	1	64	70	34
36.	18	13	16	41	20	53	26	39
37.	21	16	29	22	15	53	62	29
38.	12	3	33	20	14	47	66	18
39.	20	13	22	56	40	53	72	17
40.	27	17	29	49	38	52	30	50
41.	24	3	30	52	19	61	46	29
42.	9	14	7	22	11	51	3	4
43.	21	11	23	24	17	41	61	32
44.	31	19	31	14	31	59	80	50
45.	24	16	27	20	20	63	70	48
46.	19	0	6	26	14	49	78	24
47.	16	10	22	39	20	73	59	36
48.	15	7	31	5	14	60	72	18
49.	4	6	4	7	2	50	0	0
50.	15	11	9	3	10	54	45	20

	VR	NA	AR	BR	MR	CSA	Spell.	Sent.
1.	24	7	27	63	26	62	37	13
2.	25	5	37	18	18	68	39	46
3.	19	15	38	18	36	56	5	23
4.	25	2	23	43	22	48	5	31
5.	9	13	15	18	22	61	48	13
6.	23	20	29	22	16	67	81	37
7.	27	14	35	46	34	56	49	28
8.	22	11	33	18	17	71	60	16
9.	15	11	31	39	24	67	25	27
10.	20	11	21	9	18	62	36	6
11.	22	17	32	32	15	77	72	33
12.	22	17	39	50	28	72	53	20
13.	16	8	28	15	20	65	57	16
14.	17	10	32	44	9	71	54	30
15.	15	17	1	6	33	44	19	24
16.	28	7	24	29	33	56	34	37
17.	22	17	33	52	14	65	76	29
18.	13	5	36	50	26	37	14	29
19.	23	5	17	13	22	57	36	31
20.	15	3	23	13	16	53	51	19
21.	17	18	39	36	30	56	29	30
22.	10	2	1	5	9	55	73	6
23.	14	10	7	9	23	56	14	16
24.	20	23	37	52	37	58	50	33
25.	15	17	29	47	14	72	31	0
26.	20	1	21	17	6	58	50	14
27.	7	7	31	10	6	49	74	26
28.	24	12	19	22	22	65	75	40
29.	20	15	35	62	4	78	56	44
30.	15	14	34	57	26	51	20	29
31.	16	17	39	57	31	52	32	17
32.	21	12	33	33	29	79	6	22
33.	7	9	9	26	17	47	30	9
34.	11	12	36	76	20	53	46	19
35.	14	8	26	37	23	66	24	31
36.	26	14	36	35	28	54	72	50
37.	21	15	24	15	17	50	48	17
38.	23	9	37	29	20	50	47	24
39.	14	7	9	21	17	65	66	30
40.	6	7	27	32	20	56	62	14
41.	16	8	29	28	27	56	54	22
42.	17	5	23	16	23	63	49	28
43.	7	7	12	10	11	42	0	6
44.	22	7	23	32	23	58	80	32
45.	22	9	33	43	34	59	42	23
46.	19	15	33	32	20	54	58	30
47.	34	9	33	62	35	60	66	31
48.	24	17	33	52	34	63	44	40
49.	29	19	39	78	31	42	69	38
50.	31	25	41	79	32	67	71	35

APPROVAL SHEET

The dissertation submitted by Daniel Francis Novak has been read and approved by four members of the Department of Psychology.

The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the dissertation is now given final approval with reference to content, form, and mechanical accuracy.

The dissertation is therefore accepted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy.

October 8, 1952  
Date

Frank J. Kober  
Signature of Advisor