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Some dimensions of criminal behavior

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SOME DIMENSIONS OF CRIMINAL BEHAVIOR

BY

AUSTIN EARNEST GRIGG

A THESIS
SUBMITTED TO THE GRADUATE FACULTY
OF THE UNIVERSITY OF RICHMOND
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FOR THE DEGREE OF
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PREFACE

This thesis was done under the supervision of Dr. Merton E. Carver, chairman of the Department of Psychology, University of Richmond. It was his continued interest and encouragement which brought about the author's return to graduate studies following an absence of almost five years from matters academic. His role is gratefully acknowledged. The author wishes to acknowledge also the cooperation of Major Rice-M. Youell, Commissioner of Corrections, and Mr. W. Frank Smyth, Jr., Superintendent of the State Penitentiary, who granted time off from an over-crowded work schedule to allow time for class attendance and seminar discussions.

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INTRODUCTION

The purpose of the present study is to ascertain the relative roles of certain measureable factors in influencing or predisposing criminal behavior. The study also represents an initial attempt to conduct scientific research on the white male adult criminal confined in Virginia.

Among the variables studied are: certain factors related to the home and family, intelligence, educational achievement and adjustment, occupational skills, interests and adjustment, and certain measures of aspects of the personality. The desire has been not to prove any preconceived theory, but to study the roles of these several variables of human behavior and their possible relationship to criminal behavior.

The approach, therefore, is an operational one. The desire is to measure certain dimensions of social behavior as seen in the life history and clinical picture of the criminal. As Pratt explains, often the best approach is to

make careful study of certain variables and to ascertain their roles under changing conditions. Having systematically studied one set of variables, we may go to another set of variables, and in this manner gradually acquire a better understanding of the total phenomenon in question.⁻¹

This paper, then, is not an attempt to theorize, but to collect data and to draw conclusions from the data. If there is any bias, it is toward a multi-factor theory of criminal behavior which sees crime as the result of an interplay of many factors. The ultimate desire would be to discover the various factors and to study their inter-relationships and their relative weights.

Multi-dimensional causality does not necessarily imply pessimism for research such as that expressed by Reckless who is alarmed that no single all-inclusive cause has yet been found for crime. He writes, for example, "whether positive, verified knowledge about the etiology of crime is possible at all or is likely to appear in the near future may well raise questions of doubt."⁻² And he also writes that "criminology may have to abandon the search for causative factors as a rather hopeless task and content itself

1. Pratt, Carroll C. - Logic of Modern Psychology. Macmillan, 1939 185 pp
✓ 2. Reckless, Walter C. - Criminal Behavior McGraw Hill 1940 225 p

with the possibility of establishing the importance or unimportance of factors related in varying degrees to delinquency and criminal behavior."⁻¹ But there are many facts and laws in science which are multi-dimensional and yet not so clumsy that they cannot be applied. The elementary law of gravitation, for example, takes into account several variables.

In the present study the role of environment may appear neglected. This factor has been extensively treated by Shaw and his associates.⁻² There is the possibility that criminal behavior which they seek to relate to physical ecological factors are in actuality psychological reactions of various sorts and etiologies which occur in the ecological setting. Healy, for example, believes that emotional frustration is usually necessary before delinquent behavior will occur regardless of the environmental factors.⁻³

The obvious variables age and sex have been pretty well worked over in the literature and are not here studied.

It will be observed that the present study does not deal

1. Reckless, Walter C. - Criminal Behavior McGraw Hill 1940 p. 181
 2. Shaw, Clifford, et al - Juvenile Delinquency and Urban Areas Chicago 1942 451 pp
 3. Healy, William & Bronner, A. - New Light on Delinquency and Its Treatment Yale 1936 224 pp

with data from a psychoanalytical view of crime which is growing in popularity today. This is because such data apparently are difficult to collect objectively. The growing psychoanalytical view, perhaps best expressed by Abrahamsen, is that "antisocial behavior is a direct expression of an aggression or may be a direct or indirect manifestation of a distorted erotic drive."¹ We all have such drives and motives and crime is seen as a result of ingrained human tendencies. But some of us have more resistance to these tendencies than others. It should appear obvious that no operational measure of this resistance, or indeed, of these various tendencies is within the grasp of the present investigator.

Original data in the present investigation were collected at the Virginia State Penitentiary. Study was confined to white male adult prisoners. All social history data were collected from partially verified statements of inmates. This was accomplished by including in the present study only those cases which had been seen by the Department of Corrections Classification Committee, which committee has available field reports which verify or correct certain, but not all

1. Abrahamsen, David - Crime and the Human Mind Columbia
1944 p. 27

of the prisoners' statements concerning their social histories. Inmates when giving information about themselves are told that such data will be checked.

The principle method of treatment of the data has been to seek the normal expectancy of the variable by study of the general population and to compare this with the criminal data by means of chi square technique. This promising approach to criminology has not been used frequently in the past. It allows an objective quantitative measure of the degree of difference between the criminal and the general population.

I

FAMILY BACKGROUND

Undoubtedly, many of the most important factors which lead to criminal behavior and delinquency are to be found in the family and home backgrounds of the offenders. Clinical experience has amply demonstrated that early environmental influences are highly significant in shaping the course of an individual's adjustment pattern. This is particularly so if we regard environment as more than physical, more than socio-economic, but as also psychological. It is not a broken home, as such, which is directly responsible for a child's maladjustment, for example, but it is the psychological reaction of the child's parent or guardian to the broken home which appears particularly important. It is not poverty, as such, which makes for a child's feeling of insecurity or embitterment toward society, but the reaction of the family to the poverty which will prove important.

Healy places great stress upon the psychological aspects of the home scene. He sees emotional frustration within the family as a primary factor in predisposing an individual to criminal behavior. A child who feels that he is not gaining normal emotional responsiveness from parents and siblings will seek such emotional responses outside of the home. If outside influences are vicious, the child may well enter delinquency. Another child within the same home and same neighborhood who is receiving normal emotional satisfactions from the family group will not generally enter delinquency. "Indeed, a striking finding of our present study has been the immense amount of discoverable emotional discomfort that clearly has been a part of the origins of delinquency . . . very few indeed of the non-delinquents in the same families had in their emotional lives any such frustrations."¹

Lowrey cites the importance of the psychological atmosphere of the home in cases of delinquency when he writes: "Thus it can be shown in case after case that a psychologically broken home, with disharmony, quarreling, and the use of the child as a buffer between parents, is far more important in determining attitudes conducive to delinquency

1. Healy, William & Bronner, A. - New Light on Delinquency
Yale 1936 p. 7

than are actual, physical breakdowns in the makeup of the family."¹ Zucker found a lack of close emotional tie between the delinquent child and parents and believed this results in superficial assimilation of the moral values and ideals of the parents and adult society. He studied matched groups of 25 delinquent boys and 25 non-delinquent boys in story completion situations in which both a parent and a friend needed help. Delinquent boys chose assistance to the friend significantly more frequently. In a story situation where there was a chance to follow or reject the advice of a parent against stealing, the delinquent group significantly more often rejected the advice.⁻²

In an attempt to obtain a gross estimate of difficult family situations, study was made of the social histories of 421 white adult inmates received at the Virginia State Penitentiary. These social histories were partially verified by field reports. Complete verification is not possible because the thoroughness of field reports vary from locality to locality. In the study, it was found that 106 of the prisoners came from homes which had been broken by the death of one or both of the parents prior to the

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1. Lowrey, Lawson G. - "Delinquent and Criminal Personalities" Chapter 26 in Vol. II Personality and the Behavior Disorders 1944 p. 816
 2. Zucker, H. - "The emotional attachment of children to their parents as related to standards of behavior and delinquency" J. Psychol., 1943 15, p. 31-40

prisoner's eighteenth birthday and that 74 of the criminals came from homes broken by separation or divorce prior to their eighteenth birthday. This totals to 43 percent of the sample studied as coming from homes broken by death, divorce or separation prior to the prisoner's eighteenth birthday.

(SEE TABLE I)

It is not possible with the data at hand to ascertain the degree of emotional trauma and dissatisfaction which occurred in the families studied. Sixty-three percent of the homes broken by death of one or both of the parents occurred prior to the criminal's eleventh birthday. When we note the relatively low socio-economic status of the families (to be discussed later), we may assume that early death of either parent exerted considerable hardship and necessitated rather striking changes in the family routine. Interviews confirm this and also suggest that it was generally the inmate who bore the brunt of such changes -- forced to quit school in order to go to work, forced to live with a relative, began to see less and less of the surviving parent, etc.

The percentages found in the present study agree closely with that reported by Cantor from a study of 3,053 criminals by the Catholic Charities Probation Bureau of New York City. In this study 47 percent of the cases came from homes broken

TABLE I

SHOWING BROKEN HOME AT AGE OCCURRED FOR 421 WHITE ADULT CRIMINALS

Age of Criminal When Home Broken

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
DEATH																		
EITHER OR BOTH PARENTS	14	10	8	8	8	5	7	3	3	3	4	5	9	4	4	6	1	6
DIVORCE																		
OR SEPARATION	11	6	5	5	3	5	2	2	3	4	3	4	1	5	3	5	3	4

Death	106
Divorce, etc.	74
Family intact	241
Remarried:	
Widowed, widowered	39
Divorced	11

by the death of either or both parents or separation.⁻¹ Other studies reported by Cantor place the percentage of broken homes somewhat higher. A sample of 145 men from Elmira Reformatory and State Prison, for example, yielded 68 percent from broken homes, while a study of 11,176 cases to the Probation Departments of New York City Childrens Courts found 56 percent from broken homes.

As another measure which is believed to reflect poor adjustment to the family situation (among other factors), a study was made of the number of men who ran from home during childhood. The sample studied was the same as that studied for broken homes -- 421 male adult white convicts. It was found that 92 criminals (22%) gave histories of running from home during childhood or early adolescence. Of these 92 criminals, 56 stated that they ran from home because of dissatisfaction with one or both of the parents, usually over some disciplinary episode. Wanderlust appeared to be the primary cause in 31 of the cases -- "just wanted to see the world and have a little excitement," etc., and 5 of the criminals stated that they left home in order to go to work and live their own lives.

1. Cantor, Nathaniel - Crime. Criminals and Criminal Justice Holt N. Y. 1932 p. 80

Considerable attention has been focused on the relation of order of birth to behavior problems and crime. Levy in 1930 examined 576 problem cases from the Institute for Juvenile Research and compared them with a sample of 41,000 cases drawn from the general population of Chicago. He found that 37 per cent of the problem children were first born while 31 per cent of the general population were first born. He believed that family constellation exerted an influence on behavior problems.⁻¹ Miller reviewed studies on birth order and delinquency and concluded that first children are more prone to deviate from average than others in traits involved in aberrant behavior.⁻² Shield and Grigg studied the birth order of 300 admissions to the Virginia State Penitentiary and found that incidence of birth order varied in pattern for white and Negro but that in general extreme ordinal position (first born, last born or only born) occurred more frequently than in-between children.⁻³ Hart and Axelrad compared records of 37 only children with 133 child-

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1. Levy, John - "A Quantitative Study of Behavior Problems in Relation to Family Constellation" Amer. J. Psychiat. 1930-31, 10, 637-654
Same data
 2. Miller, E. - "The Problem of Birth Order and Delinquency" in Mental Abnormality and Crime, London 1944 pp. 227-239
 3. Shield, J. & Grigg, A. - "Extreme Ordinal Position and Criminal Behavior" J. Crim. Law Criminol. 1944, 35, 169-173

ren from families with siblings and concluded that only children showed significantly more aggressiveness, emotional instability, seclusiveness, lying and running away.⁻¹ Ward studied 100 only children referred to a guidance clinic and found that stealing, lying and running away occurred more often than among other children.⁻²

The statistical difficulties of evaluating the role of ordinal position of criminals and of delinquents have not been met adequately in the past. Even in those studies which have compared criminal groups with non-criminals, for example, there has been no adequate control for size of family. Thus, if the so-called normal sample contains families of different size from the criminal sample, then we may expect some discrepancy in the statistics, since obviously the probability that a given individual will be an oldest child, a youngest child, or in-between is a direct function of the number of children within the family. Thus, in a family of three children, the probability that a given individual will be from an extreme ordinal position will be

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1. Hart, H. & Axelrad, S. - "The Only Child Delinquent Contrasted with Delinquents in Large Families" J. Crim. Law Criminol, 1941 32, 165-170
 2. Ward, Anne - "The Only Child: A Study of 100 Only Children . . . Referred to a Child Guidance Clinic" Smith Coll. Stud. Social Work, 1930-31, 1, 41-65

2:1; from a family of six children, the probability will be 1:3, etc.

What is needed is a study which controls the size of family. This was done in an analysis of 421 convicted male White adult criminals confined in the Virginia State Penitentiary.

The method of the study was to record the prisoner's birth order and to record also the total number of children within his family. The probability of the inmate's birth order occurring in a specific situation was computed and this was regarded as the normal expectancy. Thus, in 36 cases of individuals from families of three children, 24 were expected to be from the extreme ordinal positions (youngest or oldest). This figure was obtained by noting that the expectancy of an extreme ordinal position in a family of three children is 2:1. By so controlling for the size of the family, it was possible to compare the obtained frequency of extreme ordinal position with that normally expected. Chi square was computed from the observed and expected frequencies and was found to be insignificant.

On the basis of this study of ordinal position of 421 male adult criminals, it appears that extreme ordinal position does not occur significantly more than would normally be expected for individuals from similar sized families.

This is shown in Table II.

(SEE TABLE II)

Studies among juvenile delinquents have indicated that oldest-born children develop more behavior problems and occur more often in delinquency than youngest-born children. Levy, in the previously cited study, believed that his data indicated that the oldest child is peculiarly predisposed to delinquency. Healy and Bronner found in their study of 105 delinquents who were compared with 105 controls that the oldest child occurred more often than the youngest child in delinquency.⁻¹ Data cited by Mowrer on 7,445 juvenile delinquents also suggests that oldest born children enter delinquency more often than youngest-born children.⁻²

For the purpose of the present paper, the data of Healy and Bronner were recomputed and treated by chi square technique. The results indicate that oldest-born children occur in their delinquency data significantly more often than do youngest-born children (chi square 6.68). A retreatment of Mowrer's data on oldest and youngest children also yielded a statistically significant chi square (60.72) which

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1. Healy, William & Bronner, A. - "New Light on Delinquency and Its Treatment Yale 1936 cf pp73-74
 2. Mowrer, Ernest - Disorganization Personal and Social Lip-pincott 1942 Table VII p.585

TABLE II , PART 1

ORDINAL POSITION 421 MALE ADULT CRIMINALS

# Children	N	Extreme		Other	
		E	O	E	O
2	18	18	18	0	0
3	36	24	30	12	6
4	64	32	35	32	29
5	51	20	18	31	33
6	52	17	19	35	33
7	47	13	12	34	35
8	42	11	13	31	29
9	31	7	11	24	20
10	16	3	4	13	12
11	19	3	2	16	17
12	6	1	1	5	5
13	3	0	0	3	3
14	1	0	0	1	1
Totals	386	149	163	237	223

Only child 35

TABLE II , PART 2

CHI SQUARE, EXTREME ORDINAL POSITION

	Extreme	Other	Total
Observed	163	223	386
Expected	149	237	386
O-E	14	-14	
(O-E) ²	196	196	
(O-E) ²	131.32	0.827	Chi Square 2.15

Note: Extreme is youngest or oldest child
 E is expected frequency
 O is observed frequency

indicates that in his large sample of juveniles, oldest born occurred significantly more often than younger born.

Table III shows data on oldest-youngest born from the sample of 421 male adult criminals studied at the Virginia State Penitentiary. It may be seen that the expected frequency of oldest vs youngest was computed on a chance basis—that is, it was assumed that there was an equal chance for an extreme ordinal position to represent either oldest or youngest position. This 50-50 expected distribution was then compared with the frequency of oldest and youngest actually observed.⁻¹ The chi square computed from the data on 421 adult cases proved to be statistically insignificant (0.74). Data from the Shield-Grigg study of 300 adult criminals was similarly treated and no significant differences between oldest and youngest born adult offenders occurred. None of the Shield-Grigg data recurs in the present sample of 421 cases.

(SEE TABLE III)

It would appear, therefore, that among male adult criminals the differences in frequency of oldest-born and

1. In similar manner, chi square was computed for the juvenile studies cited.

TABLE III, PART 1

CHI SQUARE FOR DATA ON OLDEST VS YOUNGEST CHILD

	Oldest	Youngest	Total
Observed	87	76	163
Expected	81.5	81.5	163
O-E	5.5	-5.5	
(O-E) ²	30.25	30.25	
(O-E) ²	0.37	0.37	Chi Square 0.74
E			

TABLE III, PART 2

CHI SQUARE DATA ON ORIGINAL SHIELD-GRIGG STUDY

	Oldest	Youngest	Total
Observed	16.0	9	25
Expected	12.5	12.5	25
O-E	3.0*	-3.0*	
(O-E) ²	9.0	9.0	
(O-E) ²	0.72	0.72	Chi Square 1.44

-1

*Note: Figure corrected for continuity because small N.

youngest-born are not significant and are not in keeping with finding among juveniles. Of course, certain obvious factors such as sibling rivalry do appear to lessen with maturity, especially if the individual moves from the original home scene. Also with adulthood there is the possibility that emotional frustration caused by parental treatment is relieved when the maturing individual is able to become more independent of the family scene and is able to gain more psychological satisfactions which are not dependent upon the reactions of parents or siblings.

Of the sample of 421 male adult criminals studied, 35, or 8 percent were only children. This compares favorably with Mowrer's finding that 8 percent of his 7,445 juvenile delinquents were only children. At the present time, there is no adequate data to allow estimate of exact frequency of only children in the general population.

One of the most striking findings in the study of 421 male adult criminals was the size of the families from which these men came. The mean number of children within the family was 5.79. This compares with estimates of from 2.4 to 1.4 children per family in the United States in 1940. The median size of family in the South Atlantic States, according to the U. S. Census data for 1940, is 3.41, which allows an estimate of 1.4 children per family. Unfortunately

the census data is not strictly accurate since the figures obtained in the Census report were computed by dividing the total population by the number of families. This is not strictly the average size of families because of those in quasi-households. But the trend from one census to another is practically the same as that for the average size of private families.⁻¹

It appears obvious, therefore, that the criminals of the sample studied came from disproportionately large families. This, of course, has certain sociological as well as economic implications, particularly when we note that the occupational level of the fathers of the families was, for the most part, that of a semi-skilled laborer or tradesman. There are also psychological factors which play their part in large family living. Hart and Axelrad, for example, have shown that children from large families show more revenge feelings, suspiciousness, temper outbursts, and association with undesirable companions than children from small families.⁻²⁻ Here again, however, we should remember that it is not the physical variable *pe se* which possibly exerts an

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1. Bureau of Census - Statistical Abstract of the United States 1946 Table 45 p. 48 , Table 51, p.52
 2. Hart, H. H. & Axelrad, S. - op cit.

influence on the personality, but it is the reaction of the parents and siblings to family size which is significant. If the father feels under great economic pressure and stress to provide for a large family and if the weight of household duties irritates the mother, or causes neglect on her part, then these psychological reactions to family size are of great significance to the personality development of the child. When we recall the relatively low socio-economic status of these families, the generally poor neighborhood situations with correlated land and room over-crowding, the inadequate recreational facilities, etc., then we begin to realize the true significance of large families among delinquents.⁻¹

(SEE TABLE IV)

Table IV shows that large numbers of children are characteristic of families which tend to produce criminal individuals. There is the possibility that the size of these families is fairly similar to that of the non-delinquent population from similar neighborhoods and socio-economic circumstances, although this cannot be demonstrated positively because of lack of normative data.

1. For excellent discussion of environmental factors, see Shaw, Clifford, McKay, H. et al - Juvenile Delinquency and Urban Areas Univ Chicago 1942

TABLE IV

SHOWING DISTRIBUTION OF NUMBER OF CHILDREN PER
FAMILY BACKGROUND OF 421 ADULT WHITE OFFENDERS

No. Children	Frequency	Nf
1	35	35
2	18	36
3	36	108
4	64	256
5	51	255
6	52	312
7	47	329
8	42	336
9	31	279
10	16	160
11	19	209
12	6	72
13	3	39
14	1	14

421

2440

Mean 5.79

The majority of the fathers of these large families were employed as craftsmen -- plumbers, carpenters, electricians, etc., while a large number were employed as unskilled laborers, or as farm laborers. Chi square was calculated by computing the expected number of cases in each occupational grouping from ratios occurring in the census data on white male adults.⁻¹ It may be seen in Table V that the fathers of the criminal group differed significantly from the general population in type of occupation followed in all but one category, that of operatives which includes apprentices to various trades, truck drivers, miners, and various factory laborers. The deviations are generally economically unfavorable to the fathers of the criminals -- that is, the tendency is rather definite for the fathers of the criminals to be semi-skilled and unskilled laborers of various sorts and descriptions, with one exception of high number of craftsmen.

(SEE TABLE V)

When It is recalled that 43 percent of these families were broken by loss of one or both parents before the criminal was 18 years old, the importance of size of family as

1. U. S. Census - Statistical Summary, 1946, Table 203, p. 188. Data used: White Males, South Atlantic States.

TABLE V

SHOWING DISCREPANCY BETWEEN OCCUPATIONAL GROUPING
OF FATHERS OF 421 WHITE MALE ADULT PRISONERS AND
THAT OBSERVED AMONG GENERAL MALE ADULT POPULATION

<u>Occupational Group</u>	<u>Crim. Fathers</u>	<u>Expected</u>	<u>Chi Square</u>
Professional	0	17	17.715
Farmers, Farm Mgrs.	38	71	18.449
Proprietors, Mgrs.	14	34	12.799
Clerical, Sales	19	42	13.991
Craftsmen, Foremen	115	51	91.384
Operatives, etc.	61	76	3.613
Service Workers	9	29	14.813
Farm Laborers	77	55	10.122
Laborers	88	46	43.052

NOTE: Expected number computed from Table Number 203,
Major Occupation Group of Employed Persons by Sex, By
States: 1940. U. S. Census, Statistical Summary, 1946,
p. 188. Data used: white males, South Atlantic States.

a factor in difficult social adjustment becomes even more obvious. Certainly it may be concluded that the families of the sample studied were not adequately equipped to smoothly provide for the needs of so many children.

But atypical family situations do not stop when the criminal leaves the childhood scene and seeks adult adjustment. He, in turn, appears to provide atypical family situations. The Gluecks found that 90 percent of a group of 510 criminals with average age of 25 years were single and that slightly over 2 percent were separated from their wives. When the group was studied 15 years later, 33 percent were single, 11 percent were separated and 7 percent divorced.⁻¹ The separation and divorce figures appear to be significantly high.

A study of 1244 white male adult prisoners in the Virginia State penal system reveals that a disproportionate number are single and that the rate of divorce and separation is abnormally high among the criminal group. The chi square table was computed by using ratios for single, married, divorced and widowed which were calculated from

¹ Glueck, Sheldon & Eleanor - Criminal Careers in Retrospect Commonwealth 1943 cf Appendix C, Table 10, p. 332

Census data on white males.⁻¹ Table VI shows significant values for chi square in all computed categories.

(SEE TABLE VI)

Certainly on the basis of the studies cited and those accomplished for this paper it is safe to conclude that the adult white male criminal is in general the product of atypical family situations. The family is generally broken by death or separation, the occupational status of the father is relatively poor and skewed away from white-collar vocations, the number of children for whom the family must provide is generally excessively high. Ordinal position does not appear to be as significant among the adult criminal as among juvenile offenders. The criminal tends to leave his childhood family scene and to himself display an atypical marital status.

1. Census Bureau - Statistical Abstract of the United States
1946 Table 43 p. 45 South Atlantic rates
used.

TABLE VI

SHOWING MARITAL STATUS OF 1244 WHITE MALE
ADULT PRISONERS AND EXPECTED CENSUS RATES *

<u>Marital Status</u>	<u>Observed</u>	<u>Expected</u>	<u>Chi Square</u>
Single	653	416	202.858
Married	397	769	471.288
Separated-Divorced	170	48	322.528
Widower	34	11	48.520

* NOTE: Prisoner figures adopted from Table I, "Statistical Data Pertaining to Felons Committed to the Penitentiary", Virginia State Board of Corrections, 1946. Of course, it is recognized that the criminal group herein reported is overloaded with young men and that chi square values are accordingly subject to age distortion.

II

INTELLIGENCE

Most authorities now agree that earlier estimates of criminal intelligence were too low. After reviewing the literature on criminal intelligence from 1930 to 1940, Metfessel and Lovell concluded that "the studies do, in the main, support placing the typical delinquent in the dull normal class."¹ Our present study of intelligence of 489 white adult male convicts agrees with the conclusion of Metfessel and Lovell.

Sutherland found considerable change in emphasis placed upon the role of feeble-mindedness and criminal behavior. He reviewed the literature and reported that for the period 1910-14, the median report on criminal intelligence placed 51 per cent of the delinquent group as feeble-minded. With

1. Metfessel, M. & Lovell, C. - "Recent Literature on Individual Correlates of Crime" Psychol. Bul. 1942, 39 p.148

the advent of Army draft testing during World War I, investigations began to show that the criminal, in general, did not deviate as widely from the norm in general mental capacity as had been expected. By 1925-28, Sutherland reports that the median report on criminal intelligence placed feeble-mindedness at 20 per cent of the cases studied.⁻¹ Murchison found that the criminal IQ, as measured by group tests of the Army Alpha type, varied considerably among various sorts of criminals, but that feeble-mindedness appeared no more marked among the extensive criminal groups studied by him than among non-criminal groups. He could find little reason to label the criminal group a mentally inferior group and, indeed, stated that "in terms of Alpha scores, the criminal group seems superior to the white draft group."⁻²

Tulchin made a study of 10,414 prisoners confined in Illinois penal and correctional institutions during the period 1920-27 in which he used the Army Alpha and Beta tests and also individual tests with the more retarded subjects. All diagnoses of feeble-mindedness were based on individual tests. He found that the percentage of inferior,

1. Sutherland, E. N. - Principles of Criminology Lippincott
1939

2. Murchison, Carl - Criminal Intelligence Clark 1926 p.57

average and superior prisoners was strikingly similar to averages obtained for the Illinois Army draft, World War I, with the Alpha and Beta tests.⁻¹ Brown and Hartman found also that their 13,454 adult male prisoners had approximately the same level of intelligence as the Army draft figures for World War I. They did note, however, that the distribution of the prisoner's mental levels was more heterogeneous and displayed a disproportionate number of mentally defective or retarded individuals.⁻² Glueck compared 1000 juvenile delinquents with 3638 school children in regard to intelligence and found that the delinquents tended to skew toward the lower IQ ranges -- 13.1 per cent of her delinquents had IQs below 70, while only 1.5% of the non-delinquents scored in this range.⁻³

When one remembers the socio-economic distribution of the criminal population, it appears to be wiser to compare criminal statistics with those of non-criminals of like socio-economic rank. When this is done, the skew of the distributions of criminal mental levels toward the lower

1. Tulchin, S. H. - Intelligence and Crime Chicago 1939
see pp. 11-14

2. Brown, A. & Hartman, A. - "A Survey of the Intelligence of Illinois Prisoners" J. Crim Law Criminol, 1938, 28, 707-719

3. Glueck, E. T. - "Mental Retardation and Juvenile Delinquency" Ment. Hyg., 1935, 19, 549-572

end does not appear so striking. Lichtenstein and Brown, for example, studied 658 grade school children from a high delinquency area. They found that the intelligence distribution was skewed with too many cases at the lower end and that 10 per cent of this non-delinquent sample displayed IQ's below 70.⁻¹ Indeed, the frequency of IQ's below 70 is strikingly similar in this study and the previously cited Brown and Hartman study of adult criminals -- 10.2 per cent of the adult criminals had IQ's below 70.

Table VII shows the distribution of mental ages of 489 white male adult prisoners consecutively admitted to the Virginia State Penitentiary who were given the Revised Beta Intelligence Test, a non-verbal revision of the old Army Beta. This test was selected because it holds educational differences of individuals tested at a minimum. The instructions are oral and before each subtest there is a practice period allowed in which the testee may be given individual assistance until the examiner feels that he understands the instructions. The test is administered to groups, and in this study, the groups were never larger than 15.

1. Lichtenstein, M. & Brown, A. - "Intelligence and Achievement of Children in a Delinquency Area." J. Juv. Res., 1938, 22, 1-25

(SEE TABLE VII)

Table VII shows that the mean for the distribution is at the dull normal level. There are, however, a disproportionate number of cases in the range Mental Age 8 years and below. This skew to the lower limits of the scale is in keeping with previously cited findings by Brown and Hartman and by Glueck. Certainly one cause for the skew is the fact that retarded subjects tend to score much lower on group tests than on individual tests. Clinical experience at the Virginia State Penitentiary, for example, has been that individual tests bring retarded subjects' mental levels up by as much as 9 to 24 months. This may be the cause of skews found in the reports in the literature, although we must remember that in some studies non-delinquents had been given the same tests and did not display this tendency to skew to the lower mental age levels.

Clinical psychologists have recently shown an interest in the constellation of scores from several tests on the same individual. Efforts have been made to differentiate various clinical groups on the basis of these psychometric patterns. In general, at the present, the results do not appear conclusive but are suggestive that batteries of tests can yield information concerning the total personality when study is made not only of the meaning of scores of the

TABLE VII

SHOWING DISTRIBUTION OF MENTAL AGES
BY MONTHS ON REVISED BETA, 489 WHITE
ADULT MALES, VIRGINIA PENITENTIARY

Mental Age	f	x'	fx'
210-215	1	11	11
204-209	3	10	30
198-203	21	9	189
192-197	14	8	112
186-191	16	7	112
180-185	17	6	102
174-179	31	5	155
168-173	32	4	128
162-167	37	3	111
156-161	45	2	90
150-155	30	1	30
144-149	39	0	0
138-143	32	-1	-32
132-137	29	-2	-58
126-131	17	-3	-51
120-125	23	-4	-92
114-119	18	-5	-90
108-113	14	-6	-84
102-107	9	-7	-63
96-101	17	-8	-136
90-95	10	-9	-90
84-89	8	-10	-80
78-83	6	-11	-66
72-77	20	-12	-240

489

-12

Mean 146.3 or 12-2
Median 12-7
Mode 13-0
Sigma 2-9

individual tests, but also the meaning of the relationship of the scores of the various tests. It is believed that the separate tests provide measures of how the total personality reacts to that specific test situation, and that a study of differential reactions to various tests reveal additional data on the total personality structure. Changes in pattern of results on the tests are supposed to reflect alterations of behavior structure.⁻¹

Wechsler in analysing the reactions of delinquents and behavior problem adolescents to the various subtests of the Wechsler-Bellevue Scale of Intelligence, concluded that "the most outstanding single feature of the adolescent psychopath's test performance is his systematic high performance score as compared with his verbal test score."⁻² He found that on the Wechsler-Bellevue Scale, adolescent psychopaths consistently did better on non-verbal items than on verbal subtests. Glanville studied 30 adolescent boys committed to a reform school and used the Terman

1. For excellent discussion of psychometric patterns, see Bijou, S. W. "The Psychometric Pattern Approach . . . A Review" Amer. J. Ment. Defic., 1942, 46, 354-362., also pp. 972-989 in Hunt, J. M. Personality and the Behavior Disorders Ronald 1944
2. Wechsler, David - The Measurement of Adult Intelligence. Williams & Wilkins 1944 p.155

Vocabulary Test, the Stanford-Binet and a Performance Scale, usually the Grace Arthur Scale. He found that his group of delinquents scored highest on the performance scale with a mean of 97 for the performance scale and 80 for vocabulary and also the Binet.⁻¹ Bijou, working with 56 habitual criminals of mean age 33.8 years, obtained different results and found that his group scored highest on vocabulary and poorest on performance. He used the Terman Vocabulary, Stanford Binet and Army Performance Scale.⁻² He concluded that his criminal group had a psychometric pattern similar in many cases to adult psychotics.

So far as the literature is concerned, possible psychometric patterns of group test results have been neglected (although various factor analysis studies of group batteries have extracted interesting relationships). A study was made of 268 consecutive admissions of white adult male criminals to the Virginia State Penitentiary who had formal educational backgrounds of fourth grade or higher. All illiterates were, accordingly, eliminated and also those who barely satisfied the literacy standards. A study was made of the relationship of scores made by these literate

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1. Glanville, A. D. - "Psychometric Patterns of Industrial School Boys" Del. State Med. J., 1937, 9, 91-94
 2. Bijou, S. W. - op cit p. 357

criminals on the Revised Beta, a non-verbal intelligence examination, and the Otis Quick-Scoring Mental Examination, Beta B, a verbal intelligence examination designed for those with educational backgrounds from grade 4 to grade 9 or above. It was decided to use only mental age scores, since there is a difference in the method of computing the IQ in the manuals of the two tests. Both tests were standardized on large samples of grade school subjects for mental age norms. The mental age norms appear free from bias or sampling errors.

The results of the study are indicated below:

Revised Beta(non-verbal)	Mean 156.407 Months	
		sigma 24.336 months
Otis Quick-Scoring(verbal)	Mean 147.299 Months	
		sigma 32.756 months
Difference between the means	9.108	
Sigma of the difference	2.492	
Critical ratio	3.655	

There is a significant difference between the mental age scores made by the criminal group on the non-verbal and the verbal intelligence test. This difference is in favor of the non-verbal test and would indicate that the psychometric pattern of these two group tests given to a criminal group is similar to that reported by Wechsler and by Granville for delinquent and psychopathic groups. Certainly this approach to patterning of group test results offers fruitful fields for research. The present study

Suffers from lack of a normal control sample (we do not know the pattern which a non-delinquent group would display on these same two tests) but the findings are quite suggestive.

The present studies support the conclusion that the mean intelligence of white adult male criminals is at the dull normal level. There does not appear to be evidence to support the contention that intelligence, as measured by psychological tests, is a major dimension of criminal behavior. There is a tendency for the IQ's of the sample studied to skew in such a manner that a disproportionate number of cases occur at the lower mental levels. A psychometric pattern on a non-verbal group test of intelligence and a verbal group test of intelligence appears statistically significant and indicates that the group does better on the non-verbal group test.

III EDUCATIONAL ACHIEVEMENT AND ADJUSTMENT

As a group, delinquents and criminals give records of poorer school adjustment and achievement than is found in the general population. Truancy has been found to be of particular significance in the educational records of anti-social groups. Johnson, for example, found that 61 per cent of first offenders and 78 per cent of recidivists in his sample had records of repeated truancy from school.⁻¹ Cantor reviewed a New York State Crime Commission study and found that "Among the cases studied, chronic truancy was, in a disquieting number of cases, the first step in a criminal career."⁻² Healy and Bronner in their comparison of 105 delinquents with 105 controls, found that 60 delinquents had records of repeated, often excessive, truancy, whereas

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1. Johnson, A. C. - "Our Schools Make Criminals" J Grim Law Criminol, 1942, 33, 310-315
 2. Cantor, N. F. - Crime. Criminals and Criminal Justice Holt 1932 p.88

none of the controls displayed such repeated truancy.⁻¹ In data on 1,000 cases of juvenile delinquents studied by Healy in Chicago, 1915-17, 43 per cent of the boys had records of repeated truancy. A study of 1,000 cases in Boston, 1919-21, by Healy found 41 per cent of the boys with records of repeated truancy.⁻²

A study was made of the school adjustment histories of 421 white male prisoners at the Virginia State Penitentiary and 154 of the prisoners, 63 per cent, admitted frequent truancy. Suspension from school occurred in 30 cases. Whether or not this truancy is a reflection of a basic inability to adjust to the school situation, or is a reflection of some personality component such as wanderlust, the findings do not allow us to decide. It appears obvious, however, that in this group situation the future criminal begins to display his deviation from the group norm, whatever the cause of that deviation may be.

The criminal group appears to be lower in educational achievement than the non-criminal group. Murchison after conducting his extensive studies and comparisons of criminal groups with World War I Army draft, concluded that:

"The criminal is much less literate than was the American

1. Healy, W. & Bronner, A. - New Light on Delinquency and Its Treatment Yale 1936 p. 76
2. quoted by Cantor, N. F. op cit p.88

Army."⁻¹ He cited data based on over 3,000 criminals which demonstrated the educational inferiority of the criminal group.⁻²

Healy and Bronner found that 34 of 105 delinquents had definitely poor scholastic records compared to 18 controls with poor records. They also reported that 20 delinquents scored markedly below their grade levels on achievement tests, whereas only 5 controls scored so poorly.⁻³

Chart A shows the results obtained on the Modern School Achievement Test which was administered to 227 consecutive admissions of literate white male criminals to the Virginia State Penitentiary. This test, which is quite comprehensive and samples information on a wide variety of school subjects in addition to providing measures of reading rate, comprehension, arithmetical skill, etc., provides norms for all grammar school grades. By interpolations made from the curve of scoring points, it is possible to provide rough approximations for 9th, 10th, 11th, and 12th grades. Such interpolations were rarely necessary in the present sample studied, however.

Chart A shows correlation between the Achievement Test and scores made by the inmates on the Revised Beta, a

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1. Murchison, Carl - Criminal Intelligence Clark 1926 p.111
 2. Murchison, Carl - *ibid* p. 98
 3. Healy, W. & Bronner, A. - *op cit* p.75

non-verbal intelligence test. The Revised Beta correlated .799 with the Achievement Test scores. This indicates a good degree of relationship between non-verbal aspects of intelligence and educational achievement.

Of greater interest to us, however, is the finding that the mean grade level achieved by the criminals on the educational test was 4.5. This shows the criminal sample to be strikingly deficient in their formal educational achievement. When one considers the many possible implications of such severe educational retardation, such a finding is of the utmost significance. (It should be recalled that only literates were tested and that thus the actual level of the criminal is even lower since illiterates would have depressed the mean). Educationally, the criminal is severely handicapped. In competitive society there are times when such a handicap may bring about defeat of attempts for adequate adjustment.

(SEE CHART A)

Criminals, as a group, deviate significantly from the general population in school enrollment, according to a study made of 421 white male adult criminals admitted consecutively to the Virginia State Penitentiary. Record was made of the age the prisoners stated that they began school and the age when school was discontinued. This record was verified partially by field reports. Since the verified

REVISED BETA MENTAL AGE

	6-0	6-6	7-0	7-6	8-0	8-6	9-0	9-6	10-0	10-6	11-0	11-6	12-0	12-6	13-0	13-6	14-0	14-6	15-0	15-6	16-0	16-6	17-0	Y
10																1								1
9																	4		2	4	2	5		1
8									1						2		1		3		1	3		3
7										2					1	1	4	3				4		4
6								2		1	2	2	2	9	5	3	4	3						1
5										7	5	2	3	2	3	2	2							1
4										4	3	5	5	5	1									1
3	1		1							4	2			1										1
2	1		1	1	1				1	1	1													1
1																								1
0	15	2	2	3	5	1	2	2	2	1	3	1												1

CHART A

Sum y	1019	Sum x	2588
Sum y ²	6307	Sum x ²	37412
	Sum xy	14570	
		227	
r	.799	Mean x (to raw M.A. units)	11.11
		sigma x (to raw M.A. units)	2.11
		Mean y (grade units)	4.5
		sigma y (grade units)	2.8

CHART SHOWING CORRELATION BETWEEN MODERN SCHOOL ACHIEVEMENT TEST AND REVISED BETA NON-VERBAL INTELLIGENCE TEST

records agreed so well with the inmates' statements, it was decided to use also those records which had not been reported from the field. A search was then made for a normal sample to use for comparison. Unfortunately, the Census data could not be adopted as reported in the 1946 abstract or earlier forms. It was finally decided to utilize ~~some~~ as a normal control a study of 63,194 children, white and negro, both sexes, born in Virginia in 1925 whose school progress had been followed by the research staff of the State Department of Education.⁻¹ The ratio of the total sample of 63,194 which attended school at each age level was then computed. This ratio was then applied to the total criminal sample and was designated the number of criminals expected to be in school at that particular age level. The method amounts essentially to comparing a theoretical frequency which is based on a control population to the frequency actually observed in the criminal sample. Chi square was then computed for each age level.

The results of the comparison of normal expectancy and actually observed frequency of enrollment among the criminals are shown in Table VIII. It will be seen that criminals do not differ significantly from the normal expectancy for ages

1- Data supplied by C. E. Myers, Supervisor of Research, State Board of Education, Richmond, Va., by personal communication to author.

8, 9, 10 and 11.

(SEE TABLE VIII)

It may be seen from Table VIII that the criminal group begins school late -- the chi square for age 7 is statistically significant at the 1% level of confidence. By age 8, however, the criminal group appear to be enrolling in sufficient numbers in school and do not deviate from normal expectancy until age 12 when apparently a disproportionate number begin to drop out of school. From that age upward, an increasingly disproportionate number of the criminal group appear to drop out of school with the exception of a small group who remain in school through age 18.

Unfortunately, the normal sample contains both White and Negro cases and also both sexes. Annual report statistics published by the Department of Education will verify, however, that Negroes in Virginia tend to drop out of school at earlier ages than white children and at a much higher rate. It is believed, therefore, that the relatively high rate of dropping out of school of the Negro will counteract the tendency for the white girls in the normal sample to remain in school. At any rate, chi square figures are of such magnitude that there can be little doubt that criminals deviate significantly from the general population in regard to school enrollment and begin school at later ages and discontinue school at earlier ages.

TABLE VIII

SHOWING DISCREPANCY BETWEEN CRIMINAL SCHOOL ENROLLMENT
AND THAT EXPECTED FROM STATISTICS ON NORMAL POPULATION

Age	# In School	# Expected	Chi Square
7	342	366	12.104
8	370	383	4.882
9	377	379	0.105
10	374	383	2.344
11	372	375	0.220
12	350	370	8.924
13	314	358	36.138
14	239	337	142.832
15	149	286	204.656
16	67	210	194.291
17	29	63	21.578
18	17	25	2.722
Over 18	17	8	10.321

From the data presented on school adjustment and achievement, it appears obvious that dimensions of criminal behavior are to be found in the educational backgrounds of criminals. The criminal group studied displayed a record of excessive truancy, of very poor educational achievement as measured by a psychological test, and of late school enrollment followed by early cessation of formal schooling.

IV

VOCATIONAL ACHIEVEMENT AND ADJUSTMENT

Perhaps no other single phase of everyday life is more intimately related to an individual's capacities and ability to adjust than is his occupational status. Here will be reflected the individual's abilities, his capacity to adjust to outside circumstances as well as to other people, and here will be determined in large measure the socio-economic circumstances in which he may live. As a group, criminals appear to be inadequate in the vocational area.

The Gluecks found that only 5 per cent of their 510 criminals were skilled workers when they entered crime and the last follow-up study conducted on this same sample 15 years later showed only 9.7 as skilled, while 45 per cent were regarded as semi-skilled and 45.3 per cent were listed as unskilled.⁻¹

1. Glueck, Sheldon & Eleanor - Criminal Careers in Retrospect, Commonwealth 1943 p.338

A study was made of the distribution of occupations of 1215 male adult criminals who had been admitted to the Virginia State penal system. This distribution of occupations was compared with theoretical expectancies which were computed from occupational data on white male adults from the latest report of the Bureau of Census. The criminal data was classified according to the same job categories employed by the Census report. The expected percentage of total cases for each job category was then computed from the Census data and this percentage was applied to the criminal data to obtain expected frequency. The theoretical expected frequency was then compared with the number of criminal cases actually observed in that job category. Results are shown in Table IX.

(SEE TABLE IX)

It may be seen from Table IX that the greatest discrepancy between the criminal sample and that normally expected is in the classification of laborers, where a disproportionate number of criminals occur. Craftsmen, such as plumbers, carpenters, painters, etc., also occur considerably more often in the criminal group. Operatives, which include miners, certain factory machine operators, truck drivers, and also various trade apprentices, appear to occur in expected frequency, as also do service workers and farm laborers.

TABLE IX

SHOWING DISCREPANCY BETWEEN OCCUPATIONAL GROUPING
OF 1215 WHITE MALE ADULT CRIMINALS AND NORMAL MALES

<u>Occupational Group</u>	<u>Criminal N</u>	<u>Expected</u>	<u>Chi Square</u>
Professional	6	49	38.400
Farmers, Farm Mrgs.	63	207	120.745
Proprietors, Mrgs.	11	97	82.862
Clerical, Sales	46	121	51.630
Craftsmen, Foremen	274	146	127.545
Operatives, etc.	216	218	0.022
Service Workers	72	85	2.138
Farm Laborers	150	158	0.466
Laborers	377	134	495.288

NOTE: Criminal statistics adopted from TABLE VI: Analysis of Prisoners Confined in the Major Penal System at June 30, 1946, from Virginia State Board of Corrections publication entitled "Statistical Data Pertaining to Felons Committed to the Penitentiary." Expected number computed from Table Number 203, p.188, U. S. Census Statistical Summary, 1946.

Farmers and farm managers, as distinguished from farm laborer, occur very infrequently among the criminal group and all white collar positions such as clerk, salesman, proprietor or professional workers occur much less often among criminals than would be expected from ratios based on the general population. The criminal group studied, then represents a group which is significantly divergent from white collar skills and is skewed in such a manner that a disproportionate number of semi-skilled to unskilled laborers occur. Craftsmen apparently represent the only skilled vocational category where the criminal group occurs in significant numbers.

Since the criminal appears to specialize in non-white collar work, a study was made of the scores of a sample of 100 literate criminals on two mechanical aptitude tests. The men tested were literate white males. The results are not favorable to the criminal group -- on the Revised Minnesota Paper Form Board the mean raw score converted to a percentile rank of 25 and on the Stenquist Mechanical Aptitude Test, Part I, the mean raw score converted to a percentile rank of 33. As measured by these two tests and as compared with norms for the tests on occupational groups in the mechanical trades, the criminal group appears inadequate. The Minnesota test correlates .70 with intelligence as measured by the Revised Beta; Stenquist correlated .591.

(SEE TABLE X)

(SEE CHARTS B & C)

The study of the distribution of occupations of criminals and the results obtained on the two vocational aptitude tests which purport to measure mechanical aptitude are in agreement in placing the criminal in a relatively poorly skilled vocational grouping. The relatively low correlation between the two tests -- .482 -- suggests that the tests are not measuring identical factors of mechanical skill. The scores of the criminal group were compared with those of the occupational norms provided with the tests -- these occupational groups constitute larger and more adequate samples than could be obtained locally among non-criminals and are regarded as valid normative groups.

Biserial correlations were computed to ascertain the validities of the two tests in discriminating those criminals who had histories of considerable experience in mechanical occupations from those whose work was of a non-mechanical or unskilled nature. Nineteen of the group studied had histories of employment in mechanical occupations at the skilled level. Biserial correlation computed for the Stenquist Test was .326. For the Revised Minnesota Paper Form Board, biserial correlation was .243.⁻¹ These correlations

1. The sampling is admittedly small for biserial technique.

TABLE X

SHOWING MEAN, SIGMA, CORRELATION
OF MINNESOTA REVISED PAPER FORM BOARD
AND STENQUIST MECHANICAL APTITUDE TEST, I

	Minnesota	Stenquist
ΣX	2,891	5,558
ΣX^2	100,577	329,432
N	100	100
Mean	28.91	55.58
Sigma	13.037	14.324
XY	169,687	

Correlation: Minnesota-Stenquist .482

CHART B

REVISED BETA (MONTHS)

	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200
85																		
80				1							1				1			1
75							1									1		2
70	1					1	1		1				1			1		1
65	1						3	1		1			4		1			
60							1	1	2	1		1	1			1		1
55	1		1	1	1	2	1		2	1	4	1				2		1
50					1	4	1	1	1	1	1		1		1			1
45	1	1		3			1	2	2		1	1	1					1
40	2		1			4	3		1	2								
35				1		1												
30						1												
25																		
20					1													
15																		
10																		
5																		
0																		1

Sum X	811	Mean X(M.A. units)	13.2
Sum X ²	8847	sigma x(M.A. units)	1-10
Sum Y	1070	Mean y(score units)	55.0
Sum Y ²	12276	sigma y(score units)	14.4
Sum XY	9429		
N	100		

r=.591

CHART SHOWING CORRELATIONS BETWEEN STENQUIST MECHANICAL APTITUDE TEST AND REVISED BETA NON-VERBAL INTELLIGENCE EXAMINATION

CHART C

REVISED BETA (MONTHS)

52	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200
48									1	1		1					1	2
44									1	1		2				1	1	2
40					1			1	1	1		2		2				1
36						1		3	2	4		1		1	2			
32					1	2		1		2	1			1				1
28	1		1	1	1	1	1					1						1
24						1		3		3		1						
20	1	2			2	3	3	1	1									
16	3		1		3	1	1	1						1	1			
12	1			2	1	2		1	1									
8	1																	
4	1					2				1								
0							1											

Sum x	811	Sum y	681	Mean x (raw M.A. Units)	13.2
Sum x ²	8847	Sum y ²	5645	sigma x (raw M.A. Units)	1.10
	Sum xy	N	1000	Mean y (raw score units)	28.7
r	.700			sigma y (raw score units)	12.7

CHART SHOWING CORRELATION BETWEEN REVISED MINNESOTA PAPER FORM BOARD
AND REVISED BETA NON-VERBAL INTELLIGENCE TEST

indicate that among the criminal group studied, the two tests were not able to adequately discriminate those who had skilled mechanical experience from those who had no record of skilled mechanical experience. Among the criminal sample, the low validity may be attributed in large measure to the inability of the so-called skilled mechanical worker to gain high or superior scores. On the Stenquist, for example, the mechanically experienced group obtained a raw score mean which converted to a percentile rank of 47 on the occupational norms published for the test. On the Revised Minnesota, the mechanically experienced group obtained a raw score mean which converted to a percentile rank of only 30 on the published occupational norms. (Incidentally, these findings lend support to the belief that the Stenquist score reflects experience more than does the Revised Minnesota).

A study of the vocational interests of a sample of 187 white male adult prisoners at the Virginia State Penitentiary further shows the criminal's trend away from white collar employment. In this study an interest scale was used which requires the individual to select one of several alternate types of work until he has made 37 decisions as to choice of occupation. The alternatives are counterbalanced so that clerical work, for example, occurs successively in alternate situations with mechanical work, factory work, outdoor labor, and sales.

Table IX shows that the criminal group studied tended to prefer craftsman and laboring types of work and to avoid white collar work.

(SEE TABLE XI)

The Gluecks found that 78.4 per cent of their sample of 510 criminals had histories of irregular employment prior to confinement in corrective institutions. By the third follow-up period, made 15 years later, 46.1 per cent of the group displayed irregular employment.⁻¹

A study of the employment histories of the sample of 421 white adult criminals at the Virginia State Penitentiary revealed that 12 of the criminals had never held full time jobs, and that 218, or 53.3 per cent of those who had been employed, changed jobs frequently. The lower incidence of employment instability in the present sample as compared with that of the Gluecks may be explained by the fact that their study was conducted in a more industrialized environment where job shifts normally occur more frequently. Also, the criterion used for employment instability obviously is not constant. This criterion must take into account the individual's age, his reasons for job changes, the economic conditions which prevailed at the time, etc. Certainly both studies support the conclusion that the criminal group is

1. Glueck, Sheldon and Eleanor - op. cit. Table 30, p.339

characterized by occupational instability.

A study was also made of the age at which the 421 criminals began full time employment (as distinguished from after-school or vacation employment). The results, which are to be expected when we recall the early age at which the criminal group dropped out of school, are reported in Table XII. It appears evident from the data collected that the criminal group began to leave the normal family routine and enter into employment during the impressionable period of adolescence (Mean age 16.3).

(SEE TABLE XII)

When we consider the poor educational achievement of the criminal group, and the early age at which many of the group enter the everyday working world, we begin to realize the potentially inadequate status which faces the criminal. Educationally ill-equipped, with little prestige value because of his tender age, it would not be difficult in such a situation to develop the concept of the world as a hostile place.

From these various studies, it appears that the criminal is poorly equipped for the vocational battles of everyday life. He seeks work of a craftsman where his skills appear to be poor, or laboring type and tends to avoid the white collar jobs. He enters full time employment early and is handicapped by lack of formal schooling and apparently has

TABLE XI

SHOWING FREQUENCY OF THOSE CRIMINALS
SELECTING HIGHEST INTERESTS IN 6 JOB AREAS

<u>Highest Interest</u>	<u>N</u>	<u>Per cent</u>
Factory	47	25.1
Outdoor	47	25.1
Mechanical	43	22.9
Persuasive	26	13.9
Clerical	20	10.7
Computational	4	2.1

TABLE XII

AGE AT WHICH 421 WHITE MALE
CRIMINALS BEGAN FULL TIME EMPLOYMENT

<u>Age</u>	<u>Number</u>
8	3
9	1
10	2
11	5
12	10
13	12
14	40
15	52
16	105
17	59
18	51
19	23
20, over	46
Never worked	12

Mean Age 16.5

difficulty competing with more mature and better trained workers. He consistently displays occupational instability and shifts jobs often.

V

CERTAIN PERSONALITY FACTORS

Inasmuch as criminal behavior deviates from the socially acceptable norm, it is by definition abnormal behavior in a strict and specific sense. But there are reasons to feel that often the criminal's reactions to his life situation are not abnormal reactions but are manifestations of normal psychological mechanisms. It is possible that it is the life situation of the criminal which is abnormal and not the mechanisms of behavior which he displays as a reaction to that environment.⁻¹ Most studies on the personality characteristics of criminals have had as a common thread, according to Lowrey who reviewed the literature, an "obvious attempt to prove the criminal to be a variant from the normal, a person set apart, different from the rest of the population

1. See for example the view of the criminal's behavior as normal and meaningful to him in *New Light on Delinquency and Its Treatment* by Healy and Bronner.

. . . it was evidently hoped that the criminal personality might be recognized before it swung into action."⁻¹

Metfessel and Lovell reviewed the literature on personality studies of delinquents ~~and criminals~~ which were published between 1930 and 1940 and concluded that "test results show offenders to be inferior in many aspects of personality, as illustrated by their emphasis on worry, their high scores on tests of neurotic tendency, and their retardation on tests of social maturity."⁻² But it appears highly probable that many reports of discrepancy between delinquent and non-delinquent groups on neurotic inventories and similar tests were magnified because of the tendency of many criminals to develop certain psychoneurotic symptoms as a result of an reaction to confinement. Indeed, differences have been found in personality test scores for men who were confined for varying lengths of time. ^{these} There is, therefore, a definite need for temporal location of the neurotic or atypical trend. Even when inmates are examined within a few days after they are brought to prison, it is

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1. Lowrey, L. G. - Delinquent and Criminal Personalities p. 797 in Personality and the Behavior Disorders, ed. J. M. Hunt 1944
 2. Metfessel, M. & Lovell, C. - "Individual Correlates of Crime" Psychol Bul, 1942, 39, p.160
 3. See for example studies cited by Metfessel and Lovell, op cit

difficult to assess the role of anxieties of the trial, jail confinement or of the outlook of temporary thwarting of all individual social freedom.

Studies with the Thurstone Personality Schedule and the Thurstone Neurotic Inventory have suggested that the criminal scores more unstable than a non-delinquent group. Simpson, for example, studied 252 male prisoners with the two tests and found a mean score difference of 8.6 when compared with college freshmen. A low correlation (.34) was found between scores on the tests and number of sentences.⁻¹ Using the same two tests with women prisoners, Garrison found that the criminal group showed more desire to be alone, to run from home, to be subject to temper outbursts, than did an unselected sample of girls.⁻²

Durea used the Pressey Interest Attitude Tests and by item analysis keyed the test to discriminate between a non-delinquent sample and a delinquent sample. He then applied the key to a new sample of offenders and found a reliable difference between the means of 34 - 13 year old delinquents and 61 controls of the same age. A second study found

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1. Simpson, R. M. - "A Psychoneurotic Inventory of Penitentiary Inmates" J. Soc. Psychol., 1935, 6, 437-457.
 2. Garrison, K. C. - "A Study of the Emotional Characteristics of Women Prisoners" J. Soc. Psychol., 1932, 3, 472-477.

significant differences between 115 delinquents and 374 controls. ✓ The author concluded that the delinquents' scores indicated more emotional retardation, less concern over things traditionally regarded as wrong, overstress of certain items of worry which reflected guilt reactions, and a selection of persons admired which indicated egocentricity on the part of the delinquents. -1

Wittman and Huffman used the Bell Adjustment Inventory, the Guilford Personality Inventory and the Elgin Developmental History in a study of 191 normal high school subjects, 138 reformatory inmates and 223 patients at a State Hospital. Both sexes were included in the study. Item analysis indicated that delinquents, psychotics and normals could be differentiated in respect to sociological data, self-ratings of parental relationships, particularly mother relationships, and ratings of early home and school life. -2

Date ✓ Corsini gave the Bernreuter to 50 mentally superior prison inmates and found that the only scale which consis-

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1. Durea, M. A. - "Personality Characteristics of Juvenile Delinquents" quoted by Metfessel and Lovell, op cit, p.153-155
 2. Wittman, M. P. & Huffman, A. V. - "A Comparative Study of Developmental, Adjustment and Personality Characteristics of Psychotic, Psychoneurotic, Delinquent and Normally Adjusted Youth" J. Genet. Psychol. 1945 66; 167-182

tently differentiated the criminals from normals was the self-confidence scale. The criminals displayed a significant lack of self confidence, even those whose crimes had involved acts of aggression in face to face situations.⁻¹

A study was made of the reactions of 32 white adult prisoners in the Receiving Cell of the Virginia State Penitentiary to the Bernreuter Personality Inventory. The men were selected on the basis of intelligence and no man was tested whose IQ on the Otis Quick-Scoring Beta B was below normal. This was done to insure adequate comprehension of the verbal items. The results are reported in Table XIII which shows the distribution of decile ranks obtained by converting the raw scores to Bernreuter norms. (No attempt is made here to deal with deciles statistically. The Table is utilized merely to allow description of the scoring tendencies of the prisoners).

(SEE TABLE XIII)

The sample utilized in the present study is small and in view of the spread of the raw scores, it is not safe to draw definite conclusions. There is a fairly strong tendency, however, for the criminal sample studied to appear gregarious. Emotional stability is indicated in the majority

1. Corsini, R. - "Bernreuter Patterns of a Group of Prison Inmates." J. Clin. Psychol., 1946, 2; 283-285.

TABLE XIII

SHOWING DECILE RANKS OBTAINED WHEN SCORES
OF 50 ADULT CRIMINALS WERE CONVERTED TO
NORMS OF THE BERNREUTER PERSONALITY TEST

SCALE:	B1-N	B2-S	B3-I	B4-D	F1-C	F2-S
<u>Deciles</u>						
10	3	1	5	2	5	1
9	3	1	2	5	3	2
8	1	3	0	3	3	2
7	2	2	2	8	5	1
6	4	3	4	2	1	4
5	1	5	6	3	2	1
4	3	6	1	2	4	6
3	6	6	5	1	4	4
2	3	3	2	5	2	6
1	6	2	5	1	3	5

High deciles on B1-N reflect instability
 " " B2-S " self-sufficiency
 " " B3-I " introversion
 " " B4-D " dominance tendencies
 " " F1-C " inferiority feelings
 " " F2-S " non-sociable, solitary traits

of cases. More score extraverted than introverted.

Much more striking results were obtained with Lentz's C-R Questionnaire, a measure of conservative-radical opinions on a series of statements, in a study of 50 white male adult criminals of normal intelligence who were newly received at the Virginia State Penitentiary. The median age of the group tested was 25.3 years. The mean score for the group was 38.74, sigma 6.43. This mean score converted to a percentile rank computed from the normative group which indicates a rather high degree of conservatism. The age range of the group does not appear to influence the results, since we would normally expect a relatively young group to display more radical views. Whether or not confinement and reactions to feelings of guilt bring about more conservative scores on a test of this sort, or whether the men reacted according to what they believed would be favorable to them should the results become known to authorities cannot be decided. The men tested had not been in the prison longer than thirty days. The orientation to the testing stressed the research nature and assured the men of anonymity of results. The findings are significant, however, and in the group studied the men are generally conservative in their opinions on social issues. On a priori assumptions, it would have appeared more logical that these criminals, rebellious to the customs and laws of society, would

have scored radical and out of sympathy with conservative socially traditional and accepted opinions. One possible explanation of the conservatism obtained may be the influence of deficient formal schooling, since it has now been established that radical social views are fairly highly correlated with level of education. These men were of normal intelligence, but the educational studies reported earlier in this paper indicate the deficiency of the educational background. There is grounds here for fruitful additional research.

As another approach to the area of interest and attitudes, the Allport-Vernon Survey of Values was administered to the same group of 50 criminals. The test represents an attempt to measure the dominant interests of the personality. Scores are converted into standard scores on scales which reflect theoretical interest, economic, aesthetic, social, political and religious interests.

The distributions and means of the scales are shown in Table XIV. Comparison with 1163 non-delinquent males is shown in Table XIV, Part 2. Critical ratios are not computed because no sigmas for the normal sample were listed in the test manual.

(SEE TABLE XIV)

Of interest in the present study is the value given greatest stress by the criminals. Table XV shows the highest scores made by scale and also the lowest scores. The

TABLE XIV, PART 1

SHOWING DISTRIBUTION OF STANDARD SCORES
ON THE SURVEY OF VALUES OF 50 ADULT CRIMINALS

Score	Theoretical	Economic	Aesthetic	Social	Political	Religious
48-50	1	0	0	0	0	0
45-47	1	0	0	1	1	1
42-44	1	2	1	0	4	3
39-41	1	3	0	2	3	13
36-38	5	5	1	4	14	8
33-35	11	9	2	6	9	6
30-32	10	10	2	15	10	9
27-29	9	11	1	9	3	6
24-26	6	6	8	6	4	3
21-23	2	2	7	4	1	0
18-20	1	0	10	2	1	0
15-17	2	2	9	1	0	1
12-14	0	0	4	0	0	0
9-11	0	0	5	0	0	0
Mean	30.88	30.82	20.56	29.74	33.94	34.66
Sigma	6.48	5.85	7.17	5.73	5.64	5.94

TABLE XIV, PART 2

COMPARISON OF MEAN SCORES MADE BY CRIMINALS
AND THOSE MADE BY 1163 MALES IN STANDARDIZATION

	Theo- retical	Eco- nomic	Aes- thetic	Social	Polit- ical	Reli- gious
Criminal Mean	30.88	30.82	20.56	29.74	33.94	34.66
Normal Mean	30.83	32.02	27.04	29.74	32.08	27.96

TABLE XV

HIGHEST AND LOWEST INTEREST SCORES
BY 50 ADULT CRIMINALS, SURVEY OF VALUES

Value	Frequency Highest score	Frequency Lowest score
Theoretical	6	6
Economic	6	4
Aesthetic	1	37 *
Social	2	2
Political	15	1
Religious	20	0

*NOTE: Aesthetic value normally rated low by males

two values most frequently selected as most dominant were the religious and the political. The selection of the religious value appears somewhat startling on a priori assumptions, but discussion of the results with the Prison Chaplain and also comparison with clinical experience shows the high frequency of selection of religion as characteristic of many men who have just entered prison. (The men had been confined for less than 30 days). The reaction is a reflection of what prison officials call "jail-house religion" and psychologically viewed may be considered a reaction to feelings of guilt and depression and of an escape from the present intolerable situation. In such a frame of mind, and with the usual tendency on a paper and pencil attitude test to record what is thought to be correct rather than what is actually followed in overt behavior, we find the criminal group appearing as a religious-minded group. Confinement, then, influences such test scores.

The other value most frequently selected as highest was the political value. According to the test authors, those who place this value as highest are most interested in power, in personal influence and renown. On a priori assumptions, stress of the political scale appears logical for a criminal group.

The lack of stress of economic values would allow the

assumption that the criminal is no more strongly motivated by materialistic and economic drives than is the non-delinquent, but that if such drives appear they are more the result of objective economic need and pressure than the expression of some subjective personality trait.

Conflicting results with various personality scales, and inconclusive vague results of other studies, lead to the conclusion that personality traits, as measured by these scales, are not determining factors in criminal behavior. The truth is, there are perhaps all the various personality traits to be found among criminals. But the results obtained in the present study with the attitude-interest scales suggest that it may be possible in the future to devise a measure of attitudes and interests which will efficiently discriminate the criminal from the non-criminal. This would suggest that those aspects of the personality which are reflected in beliefs, opinions, attitudes, likes and dislikes are more closely related to criminal behavior than are such personality factors as emotional stability, introversion-extraversion, etc.

A study of the clinical impression gained after a psychological workup and a neuropsychiatric interview with criminals should prove of particular value since the results would yield some measure of the total personality Gestalt as judged by a psychiatrically trained observer. A study

was made, therefore, of the psychiatric diagnoses of 310 white male adult prisoners at the Virginia State Penitentiary. All diagnoses were made after review of a psychological report and after interview with the inmate and study of his social history. Results are shown in Table XVI.

(SEE TABLE XVI)

The most frequent psychiatric diagnosis was that of psychopathic personality and of constitutional defective personality. The diagnoses were made by three psychiatrists who did not examine identical cases. The high incidence of psychopathic personality among the criminal group included in this study is in accordance with other studies in the literature. Lowrey, after reviewing the literature on the subject, concluded that "experience in correctional institutions indicates some 20% to 25% of psychopathic personality among the inmates."¹ In the present study, when those labeled "psychopathic personality with mental deficiency" are combined with those diagnosed simply as psychopathic personality, the percentage is 22.9. As used at the Virginia State Penitentiary, the term psychopath refers to individuals who have displayed adjustment difficulties over prolonged periods of time, who have not profited by

1. Lowrey, Lawson - op cit. p. 812

TABLE XVI

NEUROPSYCHIATRIC CLASSIFICATION
OF 310 WHITE ADULT CRIMINALS

Diagnosis	N
Psychopathic	72
Psychopathic, mentally deficient	9
Constitutional Defective	72
Essentially negative	59
Unclassified Psychopathology	31
Psychoneurotic	18
Psychoneurotic, ment. Deficient	7
Chronic alcoholism	10
Simple feeble-mindedness	8
Adolescent maladjustment	7
Hysterical reaction	6
Traumatic encephalopathy	5
Pre-psychotic	4
Epilepsy, idiopathic	2
	<hr/>
	310

experience, whose work adjustment has been unstable and whose social history is generally characterized by instability and Wanderlust and by evidence of disturbances of temperament and/or emotional instability. That the term psychopath is widely misused in the literature and appears to be a catch-all is recognized, but in the present study there appears to be a definite frame of reference when the diagnosis is given.

The concept of constitutional defectiveness is a little more difficult to objectively define, but as used at the Virginia Penitentiary refers to individuals with defective physical constitutions as reflected by evidence of tainted heredity, psychologically unstable forebears, and by a clinical picture of general personality inadequacy.

It is significant that only 59 of the 310 cases were regarded as essentially negative after psychological and psychiatric study. Of course, this may be partly the resultant of a bias on the part of the psychiatrists who may have been predisposed to seek abnormal traits in criminal subjects. A hint at this possible bias is seen in the 31 cases which were diagnosed as unclassified psychopathology. Here, however, were generally included such cases as those who had certain vague symptomologies such as restlessness, temper outbursts, egotism, lowered inhibitions, etc., which did not occur in adequate combinations with other factors to allow definite clinical diagnosis but which did occur to

a degree which suggested that the personality picture was not wholly normal.

The incidence of psychoneurosis is somewhat high, but is in keeping with the present psychoanalytical trend which sees crime as an expression of an unconscious need to be punished, or as a result of misplaced aggression or a compulsion based on various unconscious needs.⁻¹ Those diagnosed in the present study as psychoneurotic generally were of the anxiety type and displayed feelings of tension, insecurity, etc., and there were, of course, some who had been prone to psychoneurotic complaints for a number of years. The diagnosing psychiatrists in the present study were not framing their decisions in terms of psychoanalytic views of crime. When those diagnosed as psychoneurotic are combined with those judged to be mentally defective with a psychoneurosis, (retarded IQ plus neurosis), the percentage of psychoneurotics is 8.0, which is fairly similar to the incidence of 6.9 per cent reported by Bromberg and Thompson.⁻²

The present study of the psychiatric diagnoses of 310 criminals should demonstrate that no one personality type, as clinically defined, may be cited to account for

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1. See Abrahamsen, David - Crime and the Human Mind Columbia, 1944, for excellent treatment of psychoanalytic view.
 2. Reported by Lowrey, L. - op cit. p.809

criminal behavior, but that criminal behavior may occur in various clinical personality settings. Two major clinical types do occur here more often than other clinical groups: the psychopath and the constitutional defective. But the very definitions of the terms may account for the high incidence, since the frame of reference used for these two groups implies general social inadequacy.

From the data cited in this section, it is evident that the trend is to regard the criminal as a clinically abnormal, atypical personality type. Studies with various personality tests tend to favor this belief, but these studies, if viewed critically, are found to be inadequate often because of failure to control the effect of confinement upon the criminal group. Also, the results are often conflicting. In the present study, results obtained with the Bernreuter differed from that reported in the literature and found no sharp scoring tendency on the test for criminals with the possible exception that the group scored gregarious, extraverted and at the same time tended to indicate by their scores that they sought advice and encouragement. On a conservative-radical scale, the findings were significant and the group scored conservative. Reactions to imprisonment and feelings of guilt and depression possibly account for the emphasis placed by a large portion of the group on religious values on the Allport-Vernon test.

Of particular interest was the finding with this test that economic interests and motivations are not high among the criminal sample, but that desire for prestige and power is high.

VI

CONCLUSIONS

The present paper has been an examination of certain dimensions of criminal behavior. Pertinent studies from the literature have been cited and original studies and data presented. The following conclusions appear evident from the present study:

(1) The criminal, more often than those of the general population, begins to assume a handicapped status during childhood because of the higher frequency of broken homes among criminal-producing families and the disproportionately large number of children forced to adjust within the home on a relatively low income of a semi-skilled to unskilled father.

(2) Birth order, while appearing significant among juvenile cases, loses its significance among adult criminals. The reason is probably removal from dependence upon the family for emotional responsiveness which occurs with maturity.

(3) The criminal, more often than those of the general population, is handicapped by lack of adequate educational equipment and this lack is not primarily the result of low IQ but appears to be more closely related to beginning school late and dropping out early, to a psychometric pattern which suggests that criminalistic individuals are peculiarly handicapped in situations which place a premium upon verbal ability as does the school, and to demonstrable behavior problems during school as evidenced by excessive truancy.

(4) The criminal, more often than those of the general population, seeks socio-economic adjustment by means of economically unfavorable work assignments -- semi-skilled and unskilled labor.

(5) There is a lack of high skill in the only job classification where the criminal, more often than the general population, seeks work adjustment at the skilled level -- the various trades and crafts.

(6) Intelligence, per se, is not an important factor in criminal behavior, although certain manifestations of test results such as a skew to the lower levels and possible psychometric patterns appear to have significance.

(7) The attempts to delimit definite personality traits as specifically peculiar to criminals have not succeeded.

✓(8) Tests of the attitude-interest type appear to be

more promising than other types of personality measures for discrimination between criminals and non-criminals. On one such test, a sample of adult criminals scored significantly conservative in opinions on various social issues.

(9) Personality and attitude tests on imprisoned criminals may produce results which are more typical of reactions to confinement than of the criminals' normal pattern of reaction, and a high religious score made by a prisoner group is so interpreted.

(10) A measure of dominant interest or motivation suggests that the criminal, contrary to popular lay belief, is not strongly materialistic or economically minded (although necessity may force him to appear to be), but tends much more often to be motivated by desire for personal prestige and power.

(11) Clinical Gestalten obtained from individual study of the criminal shows a tendency for the criminal to be diagnosed in one or another of various clinical categories but not in any one specific diagnostic group often enough to permit generalization that a majority of criminals are of that specific clinical group.

(12) The findings favor a multi-factor theory of criminal behavior in which many dimensions are taken into account, the chief of which appear to be: the family

situation, educational history and achievement, vocational level and adjustment, and those personality factors which are most closely related to motivations, interests and attitudes.

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APPENDIX A

CENSUS DATA, WHITE ADULT MALES, SOUTH ATLANTIC STATES,
USED AS CONTROL IN STUDYING OCCUPATIONS OF FATHERS OF
PRISONERS AND OF OCCUPATIONS OF WHITE ADULT CRIMINALS

Professions	198,489	4%
Farmers, Farm Mgrs.	797,230	17%
Proprietors, Mgrs.	358,174	8%
Clerical, Sales	462,264	10%
Craftsmen	545,528	12%
Operatives, etc.	805,771	18%
Service workers	313,794	7%
Farm Laborers	572,930	13%
Laborers	493,167	11%

Adopted from Table Number 203 - Major Occupations of
Employed Persons, By Sex, By States: 1940 - p.188
Statistical Summary United States 1946, Census Bureau.
South Atlantic States are: Delaware, Maryland, Virginia,
West Virginia, North Carolina, South Carolina, Georgia,
Florida and District of Columbia.

APPENDIX B

PROGRESS THROUGH SCHOOL OF 63,194 CHILDREN
BORN IN VIRGINIA IN 1925, BOTH SEXES & RACE

Year	Age	Total	% Born 1925 enrolled
1932-33	7	54,960	87
1933-34	8	57,366	91
1934-35	9	56,685	90
1935-36	10	57,723	91
1936-37	11	55,960	89
1937-38	12	55,570	88
1938-39	13	53,809	85
1939-40	14	50,733	80
1940-41	15	42,675	68
1941-42	16	31,862	50
1942-43	17	15,956	25
1943-44	18	4,059	6
1944-45	19	1,047	2
1945-46	20	525	1

Data supplied by C. E. Myers, Supervisor of Research, Virginia State Board of Education, personal letter to author, March 31, 1947. Above figures adopted from statistical data supplied. Figures refer only to public school and not to colleges or universities.

APPENDIX C

SHOWING CALCULATION OF BISERIAL CORRELATION
FOR TWO MECHANICAL APTITUDE TESTS, CRIMINAL SAMPLE

Revised Minnesota Paper Form Board

Mean M	32.947	Sum M	626
Mean F	27.963	Sum M ²	22616
	<u>4.984</u>	N	19
pa/z	.635	Sum F	2265
		Sum F ²	77961
		N	61
Sigma T	1005.77	Sum T	2891
	835.79	Sum T ²	100577
	<u>169.98</u>	N	100
Sq. root	13.03		
Biserial r	$\frac{(4.984)(.635)}{13.03}$	or	.243

Stenquist Mechanical Aptitude, I

Mean M	61.526	Sum M	1169
Mean F	54.185	Sum M ²	75583
	<u>7.341</u>	N	19
pa/z	.635	Sum F	4389
		Sum F ²	253849
		N	61
Sigma T	3294.320	Sum T	5558
	3089.136	Sum T ²	329432
	<u>205.194</u>	N	100
Sq. root	14.32		
Biserial r	$\frac{(7.341)(.635)}{14.32}$	or	.326

Where M is for mechanics' scores
 F is for non-mechanics' scores
 p is for proportion of total N who are mechanics
 q is for proportion total N who are non-mechanics
 z is for ordinate of normal distribution curve

APPENDIX D

SHOWING DISTRIBUTION OF SCORES MADE
ON LENTZ G-R QUESTIONNAIRE BY CRIMINALS

<u>Score</u>	<u>Frequency</u>
50-51	1
48-49	0
46-47	6
44-45	8
42-43	3
40-41	4
38-39	8
36-37	8
34-35	3
32-33	3
30-31	1
28-29	1
26-27	0
24-25	0
22-23	2
20-21	0
18-19	1

Raw Score Data:

Sum X 1,937
Sum X² 77,105
N 50

Mean 38.740
Sigma 6.43