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Relationship Between Crime Rates and Certain Population Characteristics in Minnesota Counties

Van B. Shaw

RELATIONSHIP BETWEEN CRIME RATES AND CERTAIN POPULATION CHARACTERISTICS IN MINNESOTA COUNTIES

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Purpose and Methods of Study

The purpose of this study was to discover what, if any, characteristics of the populations of all eighty-seven Minnesota counties were co-existent with high or low crime rates in those same counties.

The primary method employed was the correlation of each of two crime rates calculated from different statistical sources with population characteristics obtained from 1940 census returns. In addition, multiple and partial correlations were prepared in order to check clusters of associations among factors shown to have significant coefficients of correlation with one of the crime rates.

Materials Involved

Crime Rates. Each of the two crime rates was prepared from statistical reports in the files of the *Minnesota Bureau of Criminal Apprehension,* 488 North Wabasha Street, St. Paul 2, Minnesota.

The first crime rate, hereafter referred to as the *judicial crime rate,* was based upon convictions in district courts of each of the counties of Minnesota. Calculation of judicial convictions per thousand population put all counties on a comparable basis. Since in most situations only more serious cases are bound over for district court judgments, this would seem to indicate a rate based on more or less major crimes. To avoid excessive bias represented by police "raids" in a single year, a five-year average (1936-1940) was used rather than the single 1940 figure.

The second crime rate was calculated in the same manner, but was based on *offenses known to police* in seven major criminal categories (felonious homicide, rape, robbery, aggrevated assault, burglary, larceny, and auto theft). Since a comparison of figures revealed that a single year was as representative as a five-year average, figures for the single year, 1940, were employed in these calculations.

Population Characteristics: The population characteristics
with which these crime rates were correlated were chosen from
the 1940 census returns for Minnesota counties as procured by
the United States Bureau of the Census. Characteristics to be
used were selected on two bases: (1) availability and usability
of recorded data, and (2) frequent assumption of their associa-
tion with criminality.

Two measures of urbanization or population density were cor-
related with each of the crime rates. These were (1) total popu-
lation of each county, and (2) percentage of population urban
(using the Bureau of Census figure of 2500 population as the
dividing line between urban and rural) in each county. In the
area of education, the median school grade attained by (1) males
and (2) females, 25 years of age and over of the population, was
correlated with each of the crime rates. Since Indians are the
only non-white racial group that exist in any considerable num-
bers in Minnesota, the percentage of the population Indian in
each county was correlated with each crime rate. Since foreign
birth is often thought to be associated with criminality, the per-
centage of the population foreign-born was correlated with each
crime rate. Finally, two indications of economic instability in
each county were correlated with the crime rates. These were
(1) the percentage of the population over 14 seeking work and
(2) this same group plus the percentage in each county on
"relief" work.

Results and Interpretations

Table I, below, shows the results of the correlation procedure
applied to the judicial crime rate and each population character-
istic under consideration. The coefficient of correlation of each
of the population characteristics in the left hand column with the
judicial crime rate (as described above) is shown by the corre-
sponding figure in the right hand column. Thus in Table I, the

Table I

COEFFICIENTS OF CORRELATION OF THE JUDICAL CRIME RATE WITH
CERTAIN POPULATION CHARACTERISTICS IN MINNESOTA COUNTIES,
1940.

Population Characteristic	Coefficient of Correlation with the Judicial Crime Rate
Total County Population	.036
Per Cent of Population Urban	.071
Median School Grade Attained by Males, 25 and Over	—.096
Median School Grade Attained by Females, 25 and Over	.033
Per Cent of Population Indian	.462
Per Cent of Population Foreign Born	.105
Per Cent of Population 14 and Over Seeking Work	.360
Per Cent of Population 14 and Over Seeking Work Plus "Relief" Cases	.336

first line might be read—The coefficient of correlation between the Total County Population and the Judicial Crime Rate is .036 (remembering that the nearer this figure approaches 1.00 the greater is the relationship between the two factors and conversely, the nearer it approaches 0.00 the smaller is the relationship).

The coefficients of correlation between the judicial crime rate and the various population characteristics as shown by Table I, above, indicate no results having statistical significance. The correlation was highest for the per cent of the population Indian. However an examination of the statistics underlying this correlation reveals that many counties had no Indian population whatsoever. Therefore the results of an over-all study of the eighty-seven counties resulting in a correlation no greater than that shown here is quite invalid.

Beyond this item, none of the coefficients of correlation can be said to be sufficient to warrant any judgments concerning a relationship. Although the range of the judicial crime rate for the various counties was very small, the characteristics of the county populations varied greatly. These facts would seem to justify the judgment that, regardless of its characteristics, a fairly regular per cent of the population finds its way into the district courts.[1]

Table II shows the coefficients of correlation for the crime rate based on offenses known to police and each population characteristic under consideration. Thus line one of Table II may be read—The coefficient of correlation between the Total County

Table II

COEFFICIENTS OF CORRELATION OF THE CRIME RATE BASED ON OFFENSES KNOWN TO POLICE AND CERTAIN POPULATION CHARACTERISTICS OF MINNESOTA COUNTIES, 1940.

Population Characteristic	Coefficients of Correlation with Crime Rate Based on Offenses Known to Police
Total County Population...................................	.645
Per Cent of Population Urban..............................	.717
Median School Grade Attained by Males, 25 and Over..........	.510
Median School Grade Attained by Females, 25 and Over........	.554
Per Cent of Population Indian...............................	.047
Per Cent of Population Foreign Born........................	.271
Per Cent of Population 14 and Over Seeking Work............	.454
Per Cent of Population 14 and Over Seeking Work Plus "Relief" Cases	.213

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[1] Cf. Ronald H. Beattie, *Judicial Criminal Statistics, Ohio, Minnesota, and the District of Columbia, 1938* (U. S. Bureau of the Census, Government Printing Office (1939) pp. 17-24 for a similar conclusion.

Population and the Crime Rate Based on Offenses Known to Police is .645. (Again, the closer this figure approaches 1.00 the greater is the relationship.)

A strikingly different picture is shown by the coefficients of correlation when the crime rate is based upon offenses known to police (Table II). 'In these cases at least three characteristics are seen to be of significance. They are (1) urbanization, (2) educational attainment, and (3) economic instability.

Urbanization: Since the coefficients for offenses known to police and total population of the county (.645) and per cent of population urban (.717) are both quite great it is clearly evident that urbanization and offenses co-exist to a great degree in Minnesota counties. This conforms to the results of a majority of studies concerning the relative frequency of crime in rural and urban areas.[2] The relationship is greater here than with any other characteristic within the present study.

Education: Of second importance is the educational attainment of the population. It matters little whether this be of males (.510) or females (.554) since the correlation is nearly the same in either case. The indication would be that the highly educated and the criminals live in the same areas. Since both characteristics are common to city life, we need not conclude that the well educated are also the criminal. We might well observe, however, that education has not been of such calibre or quality that it enables the educated to arrange society in such a fashion as to eliminate criminal behavior.[3]

Economic Instability: To a lesser degree than either urbanization or educational attainment, but sufficiently to be statistically significant, economic instability would seem characteristic of populations having high crime rates.[4] Since the rate is higher

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[2] For summaries of such studies, see Pitirim A. Sorokin; Carle C. Zimmerman; and Charles J. Galpin, *A Systematic Sourcebook of Rural Sociology.* (The University of Minnesota Press, 1931) II, 266-342; Pitirim A. Sorokin and Carle C. Zimmerman, *Principles of Rural-Urban Sociology* (Henry Holt and Company, 1929) pp. 370-402; and Walter C. Reckless, *Criminal Behavior,* (McGraw Hill Book Company, New York, 1940) pp. 82, 83, and 87.

[3] For other studies of the relationship 'of educational attainment to criminality, see *Population, Special Report on Institutional Population,* (Bureau of the Census, Government Printing Office, 1943) p. 6; *The Prisoner's Antecedents,* (Bureau of the Census, Government Printing Office, 1929) p. 19; Mabel A. Elliott and Francis E. Merrill, *Social Disorganization,* (Harper and Brothers, New York, 1933) p. 108; Arthur F. Raper, *The Tragedy of Lynching* (University of North Carolina Press, Chapel Hill, 1933) p. 6.

[4] For summaries of studies of the relationship between economic status and criminality see: William A. Bonger, *Criminality and Economic Conditions* (Little, Brown and Company, Boston, 1916) and Thorsten Sellin, *Research Memorandum on Crime in the Depression,* (Social Science Research Council Bulletin 27, 1937.) For a study employing essentially the same procedure as the present study but based on a comparison of a number of cities instead of counties, see William F. Ogburn, "Factors in Variation of Crime Among Cities", *Journal of the American Statistical Association,* Vol. 30, March 1935, pp. 12-24.

for those unemployed and seeking work (.454) than for that same group combined with "reliefers" (.213) it would be possible to speculate whether (1) relief tends to reduce the crime rate, or (2) relief is more likely to be given to those who have fewer tendencies toward crime. However, the difference is hardly sufficient to make this field of investigation profitable.

At any rate, the study has indicated that counties whose populations have a higher rate of offenses known to police are also (1) more urban in nature, (2) populated with better educated people, and (3) more likely to contain numerous individuals whose economy is unstable and insecure than are counties with lower crime rates.

Since greater educational attainment and economic instability as reflected in relief and unemployment are characteristic of city populations, it was deemed necessary to calculate multiple and partial correlations to judge the combined co-existence of these characteristics, and to judge the importance of each with the other factors held constant. The results are tabulated in Tables III and IV below. Thus line one in Table III may be read—The coefficient of correlation (R) between the Crime Rate Based on Offenses Known to Police (c) with the combined factors of urbanization (u), educational attainment (e), and per cent of population seeking work (w) is .763. (Again, the closer this figure approaches 1.00 the greater is the relationship.)

Table III

MULTIPLE CORRELATION COEFFICIENTS

Rc.uew	.763	R—Coefficient of Multiple Correlation
Rc.cw	.658	c—crime rate based on offenses known to police
Rc.uw	.694	u—per cent of population urban
Rc.ue	.731	e—median educational grade, males 25 and over
		w—per cent of population 14 and over seeking work

Examination of this table shows that the correlation based on a combination of all three independent variables with the dependent variable results in a higher correlation coefficient than when only two of the independent variables in combination are used. The multiple correlation is also higher than that resulting from any one of the single correlations formerly computed. Thus, although urbanization may be the most significant characteristic of populations of counties with high offense rates, the greater the educational attainment and the more unemployed those city populations are, the more likely their crime rates are to be even higher. Line one of Table IV may be read—The coefficient of partial correlation (r) of the Crimes Known to Police (c) with urbanization (u) when educational attainment (e) and per cent

seeking work (w) are held constant is .513. (Again, the.nearer this figure approaches 1.00 the greater is the relationship.)

Table IV

COEFFICIENTS OF PARTIAL CORRELATION

$r$cu.ew	.513	r—coefficient of partial correlation
$r$ce.uw	.442	Other symbols as in Table III above.
$r$cw.ue	.317	

Table IV reveals that the above assumption concerning urbanization as the most significant single correlate is a correct one. A partial correlation with educational attainment and unemployment held constant is considerably higher than a correlation with either of these factors when urbanization is held constant. In each case, however, the factors show correlations of significant statistical proportion.

One other relationship examined by the study seems significant. If the crime rate based on convictions in district courts and the crime rate based upon offenses known to police were equally valid measures of total criminality of the population, the correlation of each with a given population characteristic should be nearly the same and their correlation with each other should be nearly perfect. Actually no such relationships exist. A comparison of Tables I and II shows that there is no agreement in their correlation with any single item in the population characteristics. The coefficient of correlation between the two crime rates is only .205. Most authorities (Vold, Sellin, Reckless, Sutherland, and others) agree that offenses known to police constitute our most satisfactory measure of criminality. If this is true, the present study would indicate that studies based on judicial trials and convictions, institutional populations, and other statistics further removed from the crime are completely inadequate indications of the total criminality of a community. It would also indicate that studies of the "causes" of crime as revealed by interviews and case histories of convicted criminals are more than likely to be heavily weighted in a given direction and not truly representative of crime and criminals in general. Acceptance of this observation would throw grave doubt upon the validity of many of our more prominent studies in the field of criminology.

Summary and Conclusions

It would seem from the preceding evidence that the following conclusions concerning crime in Minnesota counties are warranted:

1. That the judicial crime rate bears no association with any of the factors under study; indeed, that a certain regular percentage of the population is convicted in the district courts regardless of the character of that population and regardless of the number of offenses known by police to have occurred in that population.

2. That urbanization, educational attainment, and unemployment are significant characteristics of populations with high crime rates as based on offenses known to police.

3. That each of these factors is significant in its own right since the coefficient of multiple correlation is higher than the coefficient for any single one or for any two combined.

4. That the significance of these factors can be placed in the following order: (1) urbanization, (2) educational attainment, and (3) unemployment.

5. That acceptance of offenses known to police as the best measure of criminality of a population must necessarily be accompanied by denial of the validity of convictions and institutional population statistics as indications of the same criminality.

Offenses known to police in Minnesota counties are not entirely separated from and independent of the society in which they occur, but rather, they fluctuate in accord with some elements of the social pattern. Three such elements were isolated by the study. Further research on a state-wide, county-by-county basis might make it possible to ascertain the total or near total of characteristics of populations likely to have a high rate of offenses known to police. In addition, refinement of the data to take into account age variations and other factors not included in the present study might result in significant changes in the conclusions cited above.