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CRIME AND COMMUNITY -
CRIME PREVENTION POLICIES

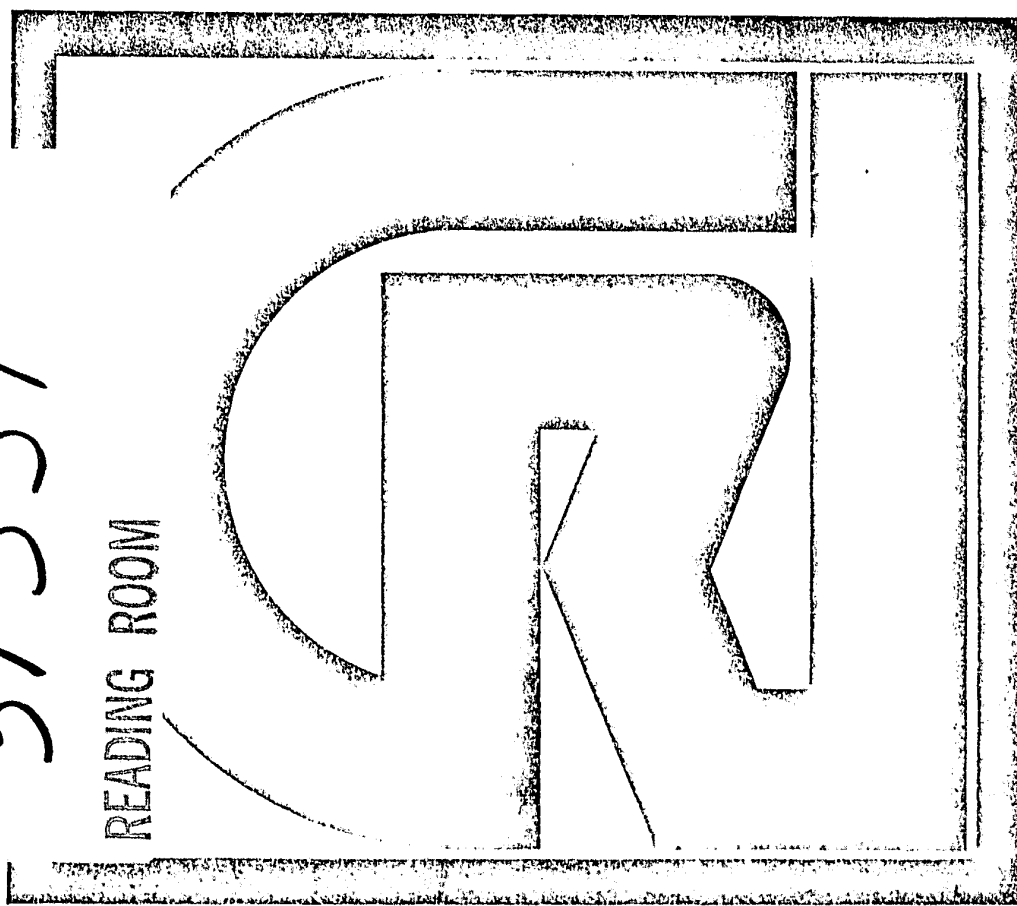
DAYTON/MONTGOMERY
COUNTY PILOT
CITIES PROGRAM

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Background

Crime reduction programs throughout the United States are generally categorized into two areas: prevention and control. Crime control programs are usually launched by increasing the allocation of human and/or capital resources within the Criminal Justice law enforcement agencies. Crime prevention programs are usually directed towards rehabilitating apprehended offenders (i.e., preventing recidivism), or towards changing the psychological and environmental conditions causing criminal behavior.

The effects on crime reduction using crime control programs are mixed. Centralization of public expenditures within law enforcement agencies reduces the problem of who should receive the funds. On the other hand, the allocation of public funds towards crime prevention programs is not as straightforward. Many prevention programs are proposed by private and public institutions outside the criminal justice system. Thus, many different agencies and programs must be considered.

Criminal justice decision makers, faced with limited resources, must choose which public or private institution should receive funding. Generally, knowledge of the expected reduction in the number of crimes and/or program cost would provide decision makers useful information when considering types of programs that should be funded. The purpose of this Pilot Cities research report is to provide information on the reduction in the number of selected Part I crimes expected from the adoption of community based crime prevention programs. Cost of implementing programs and determining the expected reduction of crime numbers resulting from prevention and control programs adopted within the criminal justice system are currently under study. The specific objectives of this study are:

1. Estimate the reduction of five (5) Part I crimes by changing selected community characteristics.
2. Identify crime prevention programs that would be expected to bring about the desired reduction in crime.
3. Determine the cost of the prevention programs.

Conclusions and Recommendations

Based upon the analysis of crime and community factors the following conclusions and program areas have been identified. The conclusions and program areas are divided into two parts. The first set of conclusions and program areas are called "highly significant". These program areas were selected because each community characteristic, which this program manipulates, was statistically significant at the .01 or .05 level. Put in less statistical language, the programs called highly significant are the ones believed to have the best chance of accomplishing the stated results.

The second set of conclusions and program areas is called "significant". These program areas are based upon findings that each community characteristic, which this program changes, was approaching statistical significance at the .05 level and was significant at the .2 level. Said in another way, the second set of programs are less likely to accomplish the stated results.

The conclusions and program areas recommended to reduce five selected Part I crimes are shown in Chart 1. All numerical coefficients represent expected average values. The one community characteristic that tends to be highly associated in each of the five crime types was "number of rental dwellings". Apartments and other rental dwellings, although they provide an inexpensive way to house the population, appear to make a real contribution to the number of crimes committed and reported to police

The second program which would influence the number of crimes is increasing incomes. A considerable amount of public attention and resources has been directed towards the increasing of general income levels. This study provides additional evidence that if incomes were raised one of the social ills of most cities, crime, would be reduced.

The relationship between numbers of Blacks and numbers of crimes was also significant. Further study is being undertaken to determine why numbers of Blacks are highly related to number of crimes. The conclusions drawn from this study are that more crimes occur in Black than in white communities even when demographic characteristics are the same. A study under current investigation relates crime with other social and cultural characteristics closely associated with the Black community. From this study more specific program areas are expected.

A final conclusion based upon this study is that a number of programs originating from several federal agencies may be required to reduce the nation's crime problem. For example, if programs designed to raise incomes are used to reduce the number of crimes, then both departments of Labor and Health, Education and Welfare would be involved in training and education. If home ownership becomes a national policy directed toward reducing crime, then the Department of Housing and Urban Development would be required to provide resources towards the solution. Although no health or family variables were tested in this model, it is hypothesized that these variables would influence the number of crimes, thus lengthening the list of public agencies which can have some effect on reducing the number of crimes.

Estimating the Reduction in Crime

Based upon research results of an earlier Pilot Cities study, (Crime and Community: A Preliminary Glance, 1972) the number of crimes committed within an area (census tract) was hypothesized to depend upon the number of Blacks, number of males between 10 and 24, number of families headed by females, number of persons per house,

CHART 1. Summary of Program Areas

Crime	Program Area	Policy variable	Expected result
Assault	<u>Highly Significant</u>		
	Home ownership	Reduce the number of rental dwellings by 10	Reduce number of assaults by 0.6
	Income maintenance	Decrease the number of persons living below poverty level by 10	Reduce number of assaults by 0.6
	Education	Increase median education level of adults by one year	Reduce number of assaults by 6.0
Robbery	<u>Highly Significant</u>		
	Home ownership	Reduce the number of rental dwellings by 10	Reduce number of robberies by 0.4
	<u>Significant</u>		
	Income	Increase income by \$100 per family	Reduce number of robberies by 0.1
Burglary	<u>Highly Significant</u>		
	Home ownership	Reduce the number of rental dwellings by 10	Reduce the number of burglaries by 0.55
	<u>Significant</u>		
	Income	Increase income by 100 per family	Reduce the number of burglaries by 0.2
	Housing Condition	Reduce overcrowded housing by 1 person	Reduce the number of burglaries by 3.25
Larceny	<u>Highly Significant</u>		
	Home ownership	Reduce the number of rental dwellings by 10	Reduce the number of larcenies by 1.38
	Income maintenance	Decrease the number of persons living below the poverty level by 10	Reduce the number of larcenies by 1.89
	Income	Raise the average income \$100 per family	Reduce the number of larcenies by 1.8
Auto Theft	<u>Highly Significant</u>		
	Home ownership	Reduce the number of rental dwellings by 10	Reduce the number of auto thefts by 0.18
	Income	Raise the average income \$100 per family	Reduce the number of auto thefts by 0.3
	<u>Significant</u>		
	Income maintenance	Reduce the number of persons living below the poverty level by 10	Reduce the number of auto thefts by 0.23

mean income, number of persons below poverty level (as defined in the 1970 census), number of rented dwellings, number of unemployed males between 16 and 21 years of age and median school years completed by persons 25 years old or older. Put in a shorthand notation:

$$(1) Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9)$$

Where:

- Y = number of crimes
- X₁ = number of Blacks
- X₂ = number of males between 10 and 24 years of age
- X₃ = number of families headed by females
- X₄ = number of persons per home
- X₅ = mean income
- X₆ = number of persons below poverty level
- X₇ = number of rental dwellings
- X₈ = number of unemployed males between 16 and 21 years of age
- X₉ = median school years completed by persons 25 years old or older.

This set of independent variables was chosen because 1) they have been shown to be likely causes of differences in crime numbers from community to community, 2) they represent recent data collected by the Census Bureau and are tabulated by census tract and thus are available and relatively up-to-date, and 3) they represent the kinds of variables toward which crime prevention programs could be directed. The data used to approximate the community factors were obtained from the 1970 Census of Population and Housing by Census Tract for Dayton, Ohio.¹ A total of 68 census tracts were used in the analysis.

The number of reported crimes in each census tract was used as the dependent variable. Types of crimes were separated into assault, robbery, burglary, larceny and auto theft. The number of each reported crime varied considerably among census tracts. A discussion of the

¹ Census tract data may not be the appropriate unit of observation. Criminals living in one census tract are likely to commit crimes in other census tracts within the city. The city may be a more appropriate observational unit. Thus, crime statistics and community characteristics of many large cities are currently being analyzed to test hypotheses at a more aggregated level.

diversity of number of crimes can be found in an earlier Pilot Cities research report. The number of crimes reported to police by census tract was obtained from the Dayton Police Department.

Multiple regression techniques were used to determine the effects of each of the independent variables upon the number of crimes. Each of the five crime types were regressed upon the community factors. A linear statistical model was chosen. The usual assumptions regarding the regression model were made. The linear additive model can be represented in the following equation:

$$(2) \quad Y_{ij} = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 \\ + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + e_{ij}$$

Where: Y_{ij} = the i^{th} type of crime (assault, robbery, burglary, larceny, auto theft) in the j^{th} census tract

$X_1 \dots X_9$ = the independent variables defined in equation 1

$b_0 \dots b_9$ = regression coefficients relating the expected change in Y as a result of a change in X .

e_{ij} = the error term associated with the i^{th} crime in the j^{th} census tract

Although no single theory exists to explain criminal activity, the following explicit hypotheses were made with respect to the independent variables based upon finding of other studies. They were:

1. As the number of Blacks increase the number of crimes increase.

Many sociological studies have related the number of crimes to the number of Blacks living within the area. Also the number of Blacks have been associated with conditions of ghetto life. Conditions within the ghetto such as inadequate housing, low levels of educational achievement, higher unreported as well as reported unemployment rates, etc., tend to influence the number of reported crimes. Also, this combination of environmental conditions leads some citizens to search for escape through the drug culture. If income from legitimate earnings are not sufficient, then individuals may turn to illegal activities to support the drug habit.

The literature is not conclusive with respect to relating number of Blacks to number of crimes. Some studies have shown that if economic factors such as income and employment are made equal, there is little correlation between number of crimes and race. Thus, the variable number of Blacks living within a census tract is an approximation of a more complex variable. If the number of Blacks is a statistically significant variable, then further study into the conditions within predominately Black communities would be required to isolate public programs expected to reduce the number of crimes.

2. As the number of males between 10 and 24 increases the number of crimes increases.

This age group commits the highest proportion of all crimes, thus, the larger the number of males within this age group the larger the number of expected crimes.

3. As the number of families headed by females increases the number of crimes increases.

Much of the crime and delinquency literature stresses the importance of family. The parent-son relationship is one factor often cited. Also the parental control factor seems to be related to number of juvenile crimes. This finding has led to many research reports testing the relationship between delinquency and single-parent home situations. The variable, number of families headed by females, is an approximation for the above phenomenon.

A more appropriate variable may have been to lag the number of families headed by females by 5 or 10 years. The lag would be required because inadequate home life of an adult criminal would have been influenced by the home situation of 5 or 10 years earlier. Data on the number of families headed by females dating back to 1965 did not exist. Also, the mobility of the population made it difficult to justify using 1960 data.

4. As the persons-per-house increases the number of crimes increases.

This variable attempts to approximate overcrowding conditions. Overcrowding was expected to influence the manner in which persons relate to others. The larger the number of persons per house the greater the noise and tension factors and the greater the expected number of crimes. Also the overcrowding conditions may have an influence on the resident's sense of identity or lack of identity.

5. As the mean family income increases the number of crimes decreases.

Economists have argued that the decision to enter into many criminal or illegal activities is based upon the available legal job alternatives. If income potential is low then the loss of permanent lifetime earnings is small and thus one is expected to choose crime because there is little

to lose. Sociologists label this as the stake that an individual has within the community. Also low income families may tend toward illegal activities to increase or supplement their low incomes.

6. As the numbers of persons below the poverty level increase the numbers of crimes increase.

Poverty conditions have been cited in most sociological literature as a major cause of crime. The reasons often cited are:

- A. A perceived low stake in society,
- B. Conditions in the community are hopeless, and performing criminal acts is a way of relieving frustration,
- C. Necessity of survival forces persons to commit property crimes.

Many of these reasons are similar to those used to relate income and number of crimes. Both variables were included in the model; however, similar results may be obtained by including only the poverty variable.

7. As the number of rental dwellings increases the number of crimes increases.

Much has been said in the literature concerning the number of home owners versus number of renters and this relationship to number of crimes. Apartments, which are usually rentals, promote or permit more mobility than does home ownership. Community identity is lost and persons fail to know their neighbors, thus making it easier for criminals to enter these areas, remove property, and leave without being identified.

Also, areas in which there are a high proportion of renters may be associated with landlords who have insufficient security measures for dwellings, or who do not keep the dwellings in an attractive appearance. A reciprocating attitude of the renter follows and thus both landlord and renter become apathetic about the community. A loss of community spirit or pride results, and basic values, particularly about property rights, decline or remain at a low level.

Thus the variable, "number of rental dwellings," is a likely approximation for a large number of social and perhaps economic conditions that would lead to crime.

8. As the number of unemployed males between 16 and 21 increases the number of crimes increases.

This variable was to approximate the effect of young persons' idle time on the number of crimes committed. If young persons, particularly males, do not have a job or some recognized means of earning income or satisfying their needs, then they are likely to commit crimes to satisfy some goal achievement.

9. As the median educational level of persons 25 years old and older increases the number of crimes decreases.

Some research findings show that lack of parental education and lack of various kinds of educational materials available for their children have been associated with juvenile delinquency.

Results: Assault

The results of regressing the number of assaults on the selected independent variables is shown in Regression A, Table 1. The following independent variables do not seem to have any effect on the number of crimes: number of males between 10 and 24 years of age (X_2), persons per house (X_4), and mean income (X_5). The conclusion from the analysis would be: programs directed towards changing one of these three community factors would have no effect on reducing the number of assaults committed and reported to the police.

The number of families headed by females (X_3) and the number of unemployed males 16 to 21 years of age (X_8) are approaching statistical significance at the .05 level and are significant at the 0.1 level. The coefficients of these two variables have the wrong sign (.15 for number of families headed by female and .069 for unemployed males between 16 and 21 years of age) with respect to the proposed hypothesis. If the coefficients are a rough approximation of what would happen as one changed the number of families headed by females and unemployment among males 16 and 21, then as one reduced the number of families headed by females by 10 and unemployment by 10 an increase in the number of assault crimes of 1.5 and 69 would occur. This evidence does not support the frequently stated hypothesis concerning female headed families and unemployment.

The unexpected results may also reflect the selection of an inappropriate unit of observation, the census tract. The probability of persons committing crimes only within the census tract in which they reside is low. Thus the results could be reflecting the mobility of criminals to commit crimes throughout the city. Areas of low unemployment and low numbers of families headed by females may attract more criminal activity, e.g., a larger quantity and value of items to be stolen may occur in these areas. In the case of assaults, a larger number of private business, such as bars, restaurants, skating rinks, theaters, etc., and/or public institutions, like schools, may occur in census tracts having low unemployment or low numbers of families headed by females. Areas where a larger number of persons congregate very likely increase the probability of the number of assaults.

If the city were the unit of observation then the effect of mobility on numbers of crimes would be reduced. The effect of unemployment and numbers of families headed by females could be tested without the strong influence of criminal mobility (note: the results of all tested hypothesis may be influenced by criminal mobility when using census tracts as the unit of observation). Current Pilot Cities' research is using the city as the unit of observation for testing hypotheses concerning the effects of community and police, on numbers of crimes. This will reduce the criminal mobility bias that is introduced when using census tract data.

Four independent variables: number of Blacks (X_1), number of persons below the poverty level (X_6), number of rental dwellings (X_7) and median years of education of persons 25 years and older (X_9) are statistically significant at the .05 or .01 level and have the expected sign. These four variables would be the most appropriate community characteristics to change if the number of assaults are to decline.

For example if the median educational level could be increased by one year the number of assaults are expected to decline by 6.69 crimes on the average. In addition if the number of rental dwellings could be reduced by 10 the number of assaults would be expected to decline by .26. Also, as the number of persons below the poverty level declines by 10 the number of assaults is expected to decline by .6. Finally, reducing the number of Blacks within an area by 10 would be expected to reduce the number of assaults by .08.

The model predicts, on the average, what is expected to occur as one changes one of the independent variables. In addition, the model also predicts expected change of more than one variable. For example, changing education and number below poverty would have an added effect. In reality an interaction between education and number of persons below poverty may exist. Increasing educational levels and reducing poverty may lead to a greater total reduction in the number of assaults than predicted.

Results: Robbery

Regressing number of robberies on the selected community characteristics reveals fewer community characteristics as statistically significant at the .05 or .01 level (Regression B, Table 1). For example, number of males between 10 and 24 years of age (X_2), number of persons per house (X_4), and number of unemployed males between 16 and 21 years of age (X_8), and the median years of education of persons 25 years and older (X_9) are not statistically significant at the .1 level.

Again the number of families headed by females (X_3) appears to influence the number of robberies in a manner unexpected from the current literature. It is approaching the statistically significant at the .05 level. Again, the criminal mobility factor may have biased the data and no firm conclusions are warranted on this variable from this study.

Two other community characteristics, the mean income (X_5) and number of persons below the poverty level (X_6), agree with the findings of other studies; however, they are only approaching the .1 statistically significant level. Further research would be suggested to determine if the effects of income and persons below poverty really have an influence on the number of robberies. Note, a policy directed towards reducing the number of assaults by raising income levels above the poverty level may have no influence on reducing the number of robberies.

The two community characteristics that are statistically significant (.01 level) were the number of Blacks and the number of rental dwellings. Both effects agree with the stated hypothesis. The policy of reducing the number of rental dwellings may have an influence on reducing both the number of assaults and the number of robberies. Thus, it is possible that one policy may have an effect on several types of crime.

Results: Burglary

A similar pattern of policy implications is suggested from regressing the number of burglaries upon the community characteristics (Regression C, Table 1). Having no apparent influence on the number of burglaries committed were the number of males between 10 and 24 years of age (X_2), families headed by females (X_3), families living below the poverty level (X_6) and median education of persons 25 years old and older (X_9).

The number of persons per house appears to affect the number of robberies in a positive way, i.e., an increase of 3.25 burglaries are expected as the persons per house increase by one. This appears to be the only crime where the crowding conditions of the household is significant.

As in the case of robbery, number of Blacks and number of rental dwellings appear to explain the variation in number of burglaries among census tracts. In the case of burglaries the size of the coefficients are much larger than in the case of assaults or robberies. This implies that reducing the number of Blacks within a census tract and/or the number of rental dwellings within a census tract would affect the reduction in number of burglaries much more than the number of assaults or robberies.

Results: Larceny

The regression results from larceny are the most difficult to explain (Regression D, Table 1). Two variables, the number of families headed by females (X_3) and median education of persons 25 years old and older (X_9) are statistically significant (.05); however, they do not have the expected sign. The expected reduction in number of larcenies would be accomplished by increasing the number of families headed by females and lowering the median educational levels. Both actions seem contrary to other published studies.

A possible explanation to this seeming paradox is that the criminal commits larceny acts in areas where a larger amount of property goods exist. These areas are where the education levels are higher and the number of families headed by females are less. However, he may live in census tracts having on the average lower

educational levels and higher numbers of families headed by females. The criminal mobility factor appears to be raising its ugly head again, providing additional support that city data rather than census tract data should be used.

Mean income (X_5), number of persons living below the poverty level (X_6), and the number of rental dwellings (X_7), would appear to influence the number of larcenies in the expected way. While the number of Blacks (X_1), number of males between 10 and 24 (X_2), persons per house (X_4) and number of unemployed males between 16 and 21 (X_8) do not appear to influence the number of larcenies.

Results: Auto Theft

The two variables that appear to influence the number of auto thefts among census tracts were mean income and number of rental dwellings (Regression E, Table 1). Increasing income levels tends to reduce auto thefts. Reducing the number of rental dwellings also reduces the number of auto thefts. Fewer cars may be stolen in areas of higher income levels because: a) larger number of new cars, having more safety features, are more prevalent and b) greater amounts of security, i.e., family garages, are available for housing the automobiles. Areas having large numbers of rental dwellings may have fewer new cars and fewer garages.

Conclusions from All Results

The variable that continues to show statistical and logical significance in all 5 crime types is the number of rental dwellings. The reason why number of rental dwellings seems to influence the number of crimes may be more difficult to establish. Certainly factors like community pride, community cohesion, and community awareness come to mind. These factors have been cited by sociologists as causes of crime. Thus, the number of rental dwellings may be an approximation for these sociological variables.

If the results are correct, then crimes can be reduced by encouraging home ownership. A program designed toward that goal is appropriate. Many of the federally funded housing programs could be used. Costs of these programs are readily available and could be used to determine the cost effectiveness in reducing crime.

Another variable that appears statistically and logically significant, particularly with respect to property crimes, was mean income. Economists have argued that entering crime is a rational choice based upon one's alternative occupations, thus in areas where income or the means of obtaining legitimate income are low, persons will choose crime as a way of life. A variety of programs to change income levels currently exist. Usually these programs involve retraining and education. More recently, guaranteed minimum incomes for all citizens have been considered.

TABLE 1. Regressions of 5 crime types on selected independent variables, 1970

Regression ^a	Coefficients of independent variables ^b									R ²
	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	
A	.008 (3.5)	.034 (1.1)	.151 (-1.8)	.006 (.004)	-.001 (-.7)	.06 (3.4)	.026 (2.6)	-.069 (-1.05)	-6.69 (-2.35)	.73
B	.009 (4.3)	-.01 (-.4)	-.118 (-1.62)	.161 (.127)	-.001 (-1.29)	.018 (1.17)	.041 (4.59)	-.033 (-.9129)	.479 (.19)	.56
C	.032 (10.5)	.034 (.88)	-.012 (-.113)	3.25 (1.76)	-.002 (1.5)	.019 (.828)	.055 (4.18)	-.078 (-1.46)	2.68 (.738)	.87
D	.015 (1.39)	.103 (.78)	-.84 (-2.32)	-1.73 (-.28)	-.018 (-3.24)	.189 (2.40)	.138 (3.09)	-.218 (-1.21)	28.5 (2.3)	.48
E	.003 (1.51)	-.004 (-.17)	.022 (.32)	.709 (.58)	-.003 (-2.41)	.023 (1.54)	.018 (2.07)	.006 (.17)	1.24 (.52)	.62

a
The five dependent variables were: A=number of assaults, B=number of robberies, C= number of burglaries, D=number of larcenies, and E=number of auto thefts.

b
The nine independent variables were: X₁=number of Blacks, X₂=number of males between 10 and 24, X₃=number of families headed by females, X₄=persons per house, X₅=mean income, X₆=number of persons below the poverty level, X₇=number of rental dwellings, X₈=number of unemployed males between 16 and 21 years of age, X₉=median years of education of persons 25 years and older. Coefficients significant at the .05 level must have a computed t value (number in parentheses) of 2.01 or larger. Coefficients significant at the .01 level must have a value of 2.67 or larger.

Guaranteed income programs have been established in various geographic areas of the United States. Generally a direct income payment has been given to selected families or persons. The basic behavioral question under investigation was: will persons continue to remain in the labor force if income is guaranteed at a given level. The experiments have not been concluded and the results of preliminary analysis are not conclusive. The experiments were not designed to determine the effect of income changes on criminal behavior, and it is doubtful that information on changes in criminal behavior would have been collected.

The number of Blacks appears to influence the number of crimes. Again, sociologists and psychologists have explained this phenomenon in terms of social oppression, discrimination, segregation, inadequate housing, etc. These social pressures lead to escapes often found in the drug culture. Unlike whites, the Blacks often do not have sufficient income to purchase drugs, thus turn to illegal activities. Therefore, it is possible that the correlation of crime with number of Blacks is actually the influence of drugs on number of crimes.

A search into number of Blacks arrested and on drugs would be necessary to establish the above hypothesis. If that search proved the hypothesis to be correct then drug programs would probably reduce the number of crimes.

A fourth variable that was statistically and logically significant in three out of five crime types was the number of persons living below the poverty level. The programs directed towards increasing incomes could be used to raise persons above the poverty level. The guaranteed income program would be the most direct. However, some retraining or educational program would have to be required if increases in income levels are expected to occur.

Thus, based upon the results of this study, four (4) program areas are most likely to reduce number of crimes. They include increasing the number of home owners, increasing the income levels, increasing the number or effectiveness of drug programs and reducing the number of persons living below the poverty level.

Future Research

Conclusions reached in this study will direct future research into the following areas:

1. Develop a model relating characteristics of both law enforcement agencies and the community to number of reported crimes, using cities or standard metropolitan statistical area (SMSA) as the unit of observation.
2. Estimate cost of programs directed towards reducing crime.

3. Calculate expected benefits from crime reduction programs.
4. Rank crime reduction programs on the basis of costs and benefits.

Model

The geographic unit of observation to be included in the next study will be the city or the SMSA. These areas are considered large enough so that criminal activity within these units will be caused by the characteristics of these areas. That is, criminals living within these areas are likely to commit crimes within these areas. The criminal mobility is less likely to bias the data.

Many economists (Becker, 1968; Stone, 1973) have assumed that a person commits a criminal offense if the expected utility to him exceeds the utility he could get by using his time and other resources at other activities. Therefore, persons become criminals not because their basic motivation differs from that of other persons, but because their benefits and costs differ. In short, criminal behavior is a rational choice based upon ones expected benefits less the costs. Casting criminal behavior in a benefit-cost model focuses research on factors likely to influence the expected benefits and costs.

The costs of committing criminal acts involves the probability of being apprehended and convicted and the opportunity cost of foregoing legitimate earnings while being incarcerated. Other costs (family psychic cost, directly related to the criminal behavior, could be approximated in terms of divorce cost, medical cost, etc.) could be added to the cost of foregone earnings.

The probability of being apprehended depends upon the quantity and quality of police personnel, their capital equipment and the information provided or cooperation given by the community. Stated in mathematical shorthand:

$$(1) P_A = f(T, L, C, A)$$

Where: P_A = probability of being apprehended

T = training and education of the police agencies

L = number of police personnel

C = capital equipment used by police personnel

A = community information leading to the arrest of suspected persons

The information and cooperation that a community provides its police agencies is assumed to depend upon: a) the general interaction between police and community, i.e., how the community perceives the treatment that the police department provides; b) the measure of each person's stake in the community; and c) the amount of community

information known by its citizens. The President's Commission on Law Enforcement and Administration of Justice (1967) has documented the fact that a lack of trust and high level of hostility exist between many Black communities and the police. This mistrust and hostility has resulted in many Black citizen-police officer confrontations. Thus, the community having a larger number of Blacks may have lower community cooperation with the police than other communities. If community cooperation with the police is low then the probability of not being apprehended increases. Thus, crime would be expected to increase in those communities. The above rationale may provide part of the answer to why so many more crimes occur in Black communities than elsewhere. Thus, when the variable number of Blacks living within a community is added to the explanation model, it is perhaps measuring the community-police relationship.²

The second factor that may influence the cooperation between citizens and police is the citizen's stake in the community. Wealth or home-ownership are two possible approximations of one's stake in the community. The greater the wealth, the greater the expected loss of property, thus the greater is the expected communication and cooperation between citizens and police.

The third consideration influencing the cooperation between citizens and police is the knowledge that the individuals may have with respect to other members of the community. Communities in which a large number of renters reside may not have knowledge of other residents because renting promotes and permits greater mobility. If community identity is lost, this would make it easier for criminals to enter these areas, remove property and leave without being identified.

In sum the probability of being apprehended is likely to be influenced by a) the number of police personnel, b) their education and training, c) the capital equipment available to them, d) the number of Blacks living within the community, and e) the number of renters or homeowners.

Given that a person is apprehended, then the expected incarceration period would be the probability of being convicted times the average sentence length of this particular offense. The probability of conviction depends upon the evidence that the police provide to the prosecutor, the ability of the defense attorney, the income of the offender, etc. The punishment meted out for each crime depends upon a host of different factors, including number of previous crimes committed, probability of being rehabilitated by probation, the philosophy of the presiding judge, plea bargaining, etc. Finally, the opportunity cost of foregone future legitimate earnings would be determined by calculating

2. Research by the Dayton/Montgomery County Pilot Cities Team will attempt to establish if clearance rates within Dayton are significantly different among communities and if the number of Blacks tends to influence the clearance rates.

the expected years incarcerated times the expected future annual income. However, a recent study (Stone, 1973) concludes that this variable is not significant in explaining the differences in number of crimes. Thus, this variable will probably not be included in this model.

Turning to the benefit side, the criminal would evaluate the return from time spent in illegal activities versus using the same resources in legal activities. Thus, an estimate of the value of using resources legitimately is required. The expected value of resources applied to legitimate activities (most likely the labor market) depends upon one's current employment status (employed, unemployed, underemployed or welfare) and upon one's expected future employment status.

The hourly wage would represent the value lost if illegal activity were chosen rather than labor market employment. The lower the hourly wage the less income lost as a result of participating in illegal activities and the greater would be the expected number of crimes. If one were unemployed the opportunity cost for entering illegal activity would be zero. Again, the larger the number of unemployed persons the larger the expected number of crimes.

The future employment status may be a function of education, training, discrimination, business cycles, etc. If discrimination, particularly against Blacks, occurs, the future as well as the present employment picture may offer very little in the way of lifetime earnings. Thus, the number of Blacks suggested earlier as a community police relationship variable, may also be an approximation for the degree of discrimination occurring within the labor market. Indeed, if future income earnings seem to be low, then the opportunity cost of entering into criminal activity is low and the benefits from crime may be the "best" use of one's resources.

Also, persons who have a) failed to obtain a high school degree; b) have little or no formal training; or c) have training skills no longer needed by the current labor market may find that their future earnings are low. Thus, the number of high school drop-outs or the number of non-skilled workers may provide an approximation for low expected future income. The larger the number of high school drop-outs or number of non-skilled workers the larger the expected number of crimes committed within those areas.

The returns or benefits derived from criminal offenses involve the psychic value of committing the crime, the purchase value of the stolen property if the criminal keeps the item for his own use or the fence value of the stolen property if resold. The psychic value associated with committing crimes has never been calculated. Likewise, the market prices of stolen merchandise are not reported by published sources. However, one would expect the prices of stolen merchandise to remain approximately equal from city to city. Otherwise, merchandise would be stolen in one area and shipped to the higher priced area until the market price declined enough to cover only costs of transportation and some degree of risk. Therefore, no attempt will be made in this study to use market prices of stolen goods but will assume market prices to be similar among cities.

However, one of the major reasons (stated by criminal justice experts) for committing crimes is to support a drug habit. The number of drug addicts may provide an approximation for crimes committed for this reason. The larger the drug addict population then the larger the expected number of crimes.

One variable economists generally take as given is the person's taste or preferences. Other disciplines have found that the family and/or the home situation is related to the number of crimes. The values that persons have originate within the family. Many sociological and psychological studies have related parent-son relationship, parental control, single-parent families as highly associated with juvenile crimes. Thus, to approximate the taste or preference for crime that has been developed from the family situation, the number of families headed by a female will be used. The larger the number of families headed by a female the larger the number of crimes.

The theoretical model described above can be formulated in a mathematical statement as:

$$(2) \quad Y_{1j} = f(X_{1j}, X_{2j}, X_{3j}, X_{4j}, X_{5j}, X_{6j}, X_{7j}, X_{8j}, X_{9j}, X_{10j})$$

Where: Y_{1j} = the number of the 1th crime committed in the jth city

X_{1j} = the population of the jth city

X_{2j} = the number of police officers in the jth city

X_{3j} = the dollar expenditure on operating equipment in the jth city

X_{4j} = the number of Blacks in the jth city

X_{5j} = the number of renters in the jth city

X_{6j} = the unskilled wage rate in the jth city

X_{7j} = the number of unemployed persons in the jth city

X_{8j} = the number of high school drop-outs in the jth city

X_{9j} = the number of drug addicts in the jth city

X_{10j} = the number of families headed by a female in the jth city

Possible model changes would be to divide the appropriate variables by the population and use various rates. Also the SMSA could be used as the unit of observation.

The sources of data would come from the U. S. Census of Population for the designated city and the police information would come from the Municipal Year Book, 1970 and UCR Reports. If police data on number of drug arrests can be obtained from one central location, like the FBI, then the data collection time would be reduced.

Program Costs

Based upon findings of the current and proposed study, plus findings from recent research from other sources, specific programs directed towards the reduction of specific crimes will be determined. If reducing unemployment is a major way of reducing the number of crimes, then several alternative ways of reducing unemployment would be considered. The cost of each program would be summarized into general accounting areas such as personnel, raw materials, equipment, overhead, etc. and presented with its expected results.

Program Benefits

The benefits to be derived from each program will include the expected reduction in crime, the reduction in resources required by the criminal justice system, and the external effects on members of the community. The benefits will likely be measured in dollar terms. Summary and comparisons will be listed by program area.

Program Effectiveness

The program effectiveness of each specific program will be determined by calculating benefit-cost ratios or comparing the benefits to be gained with a given dollar expenditure.

The conclusions and program recommendations based upon the results of this study will have national implications. Although, the research results can be applied nationally, the primary purpose of the findings are to aid local Dayton/Montgomery County Criminal Justice planners. In addition, Pilot Cities staff will provide expertise in the various aspects of development and evaluation of these recommended programs.

Research Time Table

Gathering data and testing hypotheses stated in the model will be accomplished first. If the data to be used is obtained from readily available published sources, the primary task will be to gather the data and place it in the computer. Regression analysis and interpretation of results would follow. The entire time period for collecting the data and publishing results would be about two (2) man months.

The calculation of cost will require the gathering of data that is not readily available. Thus, program specification and cost determination will probably require four (4) man months.

Calculating benefits from the programs may require the collection of primary data and thus the entire benefit and effectiveness measures may require another two (2) man months. Thus, this research project is expected to require approximately eight (8) man months.

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