CRIME, DEMOGRAPHY AND TIME IN FIVE AMERICAN CITIES*

Franklin E. Zimring
University of Chicago
Law School

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Crime is both a complicated and volitile set of phenomena. Projecting crime rates into any future time is thus a hazardous occupation in the best circumstances; given present and historical data on crime rates and criminal justice dispositions, the enterprise is even more chancy. Much of value to determining the feasibility of future projections can be learned by attempting to use historical data from American cities to see whether, and to what extent, variations in crime rates are susceptible to projection or, for that matter, historical understanding. This note attempts to trace crime rates and demographic changes for four offenses in five American cities from 1960 to 1970, comparing census data with the information reported by police on persons arrested for homicide, robbery, burglary and auto theft. The analytic methods used are, in my judgment, acceptable, but the results are no more reliable than the weakest link in the data chain employed--police reported data on arrests. Some of my findings, thus qualified, are as follows:

* Using crime rates and arrest statistics as a basis of analysis, the offense rates for males of both races and all important age groups increased in each city by a considerable margin.

* A small proportion of the increase in crime could have been predicted by assuming that age- and race-specific crime rates would continue at 1960 levels but the age and race structure of the cities would have changed in the pattern that has been experienced. I call this method "prospective demography" even though accurate use of the method in 1960 would have required foreknowledge of the characteristics of 1970 urban populations.

* Population changes become more important because rates of crime have increased. Using what is termed "retrospective demography," that is assuming the rates of crime would change for each age and racial group as they did, the difference in population composition explains a much larger share of the noted increase in crime rates; it cannot be projected to future time periods without assuming age, race and sex-specific crime rates.

* Variance between cities was substantial, so much so that generalization from aggregate national data seems less justified as a result of this exercise.

* The "raw data" on age-specific arrests from urban police was, in at least one case, sufficiently incredible to remove a city from one element of the analysis. What this episode suggests about the monitoring and auditing of police data casts a pall on all the age-specific data analysis.

* There is some evidence that robbery is more concentrated among young offenders (15-19) in 1970 than in 1960 and strong evidence that auto theft is less concentrated among the young in the later year. There is no clear pattern over time for burglary and homicide in our five cities.

* There is some evidence that robbery is more concentrated among Black offenders in 1970 than in 1960. This is probably related to the relatively high concentration of young men in the Black male population. The racial concentration of homicide is stable in three of the five cities and increases in the other two.

I

Data and Methods

This exercise was an attempt to blend two data sets--arrests and census counts--into a unified population-based estimate of specific crime rates. Census data provided and profile for each city of the estimated number of persons by age, sex, and race. While the census is acknowledged to undercount young Black males, and thus overestimate the crime rate attributable to that group in any given year, there is no serious view that undercounting increased between 1960 and 1970. For urban residents of Hispanic descent, it is likely that a smaller proportion were counted in the 1970 census than in the 1960 census. Cities with relatively large Hispanic surname populations were, therefore, avoided in the following analysis, and no attempt was made to project Hispanic surname rates of crime.

The arrest statistics used in this exercise exhibited three major flaws. First, they were nonspecific. While data on the age, sex and race of persons arrested were reported for each city in each year, there was no counting of age-specific arrest rates within each racial or sex grouping. Efforts to overcome this difficulty--only partially successful--are reported later. It is a formidable problem. Second, arrest rates are a far from perfect predictor of crimes rates, particularly among the young, who may get arrested more frequently per 100 crimes than older offenders and who more often commit

crimes in groups. A higher proportion of group criminality produces a ratio of arrests to crimes which is higher than that of adults. Very careful studies at the individual level can correct for this phenomenon, but historical examination of city arrest statistics cannot. If youth crime has become more group related, this will distort the crime rate estimates over time derived from the present data.

Population estimates were derived for Blacks and Whites in each city for males ages 0-14, 15-19, 20-29, 30-39, and 40 and above. These population figures can be translated into age-specific or race-specific arrest rates without making any assumptions other than that the two data sets are accurate. Any further uses of the data require further assumptions:

1. Estimating Crime Rates. Arrests for major crimes are a changing proportion of total crimes. As crime rates have increased, the ratio of $\frac{\text{arrests}}{\text{crimes}}$ has decreased. In order to estimate crime rates over time for a particular age or racial groups, the arrest rate for that group is multiplied by the ratio $\frac{\text{crimes}}{\text{arrests}}$ noted for a particular crime. Thus, the burglary arrest rate for White males in Cleveland is multiplied by the ratio of crimes over arrests in the general statistics for 1960 to produce an estimated offense rate for this group. This assumes that the crime to arrest ratio does not vary by race. Similar procedures are used for translating age-specific arrest rates into estimated crimes rates, thus assuming that age is not a significant determinant of the role

of arrests per 100 crimes committed. To the extent that age or race is rated to arrest risk, the estimates obtained by this method are biased.

2. Determining the "Youth Proneness" of Particular Offenses. With the exception of homicide, serious crime is concentrated among adolecents and young adults. To measure the variation in youth proneness for different cities and different time periods, an index of "youth proneness" is used in this report. This index number is the ratio of the arrest rate per 100,000 15-19 year-olds to the rate of arrest in the same city for 20-29 year-olds. If the homicide arrest rate per 100,000 for the younger group is 10 as compared to five for the 20-29 year-olds, the index is 10/5 or 2.0. As the number increases, the concentration of crime relative to population among the young is increasing. If younger offenders committing crimes are more apt to be arrested, the index will overestimate the concentration of crime among the young. But unless arrest proness by age changes dramatically by crime or between time periods, the index should perform as a good indicator of trends in youth proneness.

3. Estimating Racial Differentials in Crime Rates. Racial groups do not have crime rates any more than age groups, cities, or the nation as a whole. Individuals have crime rates--most committing no serious offenses and some committing one or more. But different classes and ages contain different proportions of crime prone individuals, even though no race, class, or age

grouping contains more than a minority of offenders. Predicting the offense rate of a particular population is more accurately done with specific data on crime rates and demography. Rates of violent offense among Blacks are much higher than those of Whites (as are rates of victimization). Arrest rates for nonviolent felonies are also higher than White rates, though the difference is much smaller than in violent crime. In this report, racial data on arrests per 100,000 is corrected for the differences in age structure between the races that could contribute to differences in the arrest rate for particular offenses. For each offense in each city in each year, the general relationship between age and arrest rate was computed for each crime. The age structure of a given city's Black and White population was then weighted to account for differences in age structure. A simplified example is presented in Table I.

Table I

Hypothetical Distribution of Population and Crime

	Whites			Blacks		
	(A) % of Population	(B) Arrest Rate (0-14)	A x B	(A) % of Population	(B) Arrest Rate (0-14)	A x B
0-14	30	0	0	30	0	0
15-19	8	100	800	16	100	1600
20-29	16	50	800	24	50	1200
30-39	16	20	320	16	20	326
40 and over	30	10	300	30	10	300
			2220			3420

Under these circumstances, the correction factor for age differences would be $\frac{3420}{2220}$, or 1.54. If the Balck rate of arrest was 154% of the White rate, the races would really be at arrest parity given demographic differences. In fact, usually the demographic correction factor is less dramatic--varying (Black/White) from .75 to 1.55, because the younger Black age structure contributed large numbers of noncrime prone youth (0-14) to compensate for a higher proportion of young persons in the high crime ranges. It should be noted however that the data on crime proneness by age is the same in column "B" in Table I for each racial group. This is not because crime trends by age are the same; it results from the fact that age-specific arrest rates are not reported separately. The operation assumes no differences by race in age propensity, even though we have evidence that offenses by Blacks are more concentrated among very young offenders than among Whites (see #5 below).

4. Estimating Race and Age-Specific Crime Rates. The arrest rate for each race was distributed in the age pattern of all arrests to estimate the race- and age specific rates. This method is a poor substitute for data that employ cross tabulated arrest information, as we shall see. But it is the only method that can be used on the historically collected city arrest statistics.

5. Testing the Validity of Homogeneous Age Distributions Among Blacks and Whites. The F.B.I. reporting does contain one cross tabulation of arrests by age and race for each index

offense--with arrests of those under 18, and 18 and over being the age categories that include specific racial data. We compared these figures for each city for each crime and found deviations between our estimates and those data.

Table II reports the mean deviation noted in the comparison between the actual pattern of arrests reported to the F.B.I. and our age-specific estimated crime rates. The deviation is reported by using our estimated rates as a base line and indicating the difference obtained using the F.B.I. figures as a deviation from that base line projection.

Table II

Mean Deviation of Police Reported Arrests from Age-Specific Estimates Used in This Report, Five Cities

	White, 18 and Over %	Black, 18 and Over %
Homicide	2.9	-1.3
Robbery	12.3	-3.5
Burglary	9.1	-3.2
Auto Theft	1.9	.8

	White, Under 18 %	Black, Under 18 %
Homicide	-22.7	15.4
Robbery	-22.1	6.8
Burglary	-11.7	4.3
Auto Theft	- 9.7	.7

There are two important conclusions to be drawn from the comparison of Table II. First, assuming the same distribution of arrests by age for both races significantly overestimates the offense rates of Whites under 18 while underestimating to a lesser degree the arrest rate of Blacks under 18 for robbery and homicide. A necessary by-product of this is that older Black arrest rates are overestimated and older White arrest rates are underestimated by the method we have selected. The comparison shows a greater concentration of arrests among very young age groups in the distribution of arrests of Blacks than in the distribution of the arrest for Whites. It also suggests that the margin of error produced by estimation technique may be within acceptable limits for Whites over 18 and both segments of the dichotomized Black population. For White males under the age of 18, the average deviation is much more substantial and the method we have used will overestimate arrest proneness, particularly for offenses of violence, to a more problematic degree. (Offense- and city-specific values can be found in Appendix C.)

Since our more detailed age data cannot be connected to the F.B.I. arrest data without making further assumptions about the break in over 18 arrests, we present this comparison as an indication of margin of error rather than a further correction factor that can be plugged into the data.

6. Deleting St. Louis. In the course of this analysis, using abstracted measures such as "youth proneness," some highly suspicious values appeared in the analysis of St. Louis

age-specific arrest rates for 1960. For reasons known only to the St. Louis police, the arrest rates for robbery and burglary experienced by males aged 20-24 were an order of magnitude lower than in that other sample city as seen in Table III.

Table III.

Arrests Rates per 100,000 for Males Ages 20-29, Robbery and Burglary, Six Cities, 1960

Robbery

	Population 20-29	# Arrests	Rate per 100,000
St. Louis	44,117	14	32
Cleveland	55,762	328	588
Boston	51,116	151	295
Dallas	42,108	93	221
Chicago	215,782	907	420
Washington	56,835	383	674

Burglary

	Population 20-29	# Arrests	Rate per 100,000
St. Louis	44,117	23	52
Cleveland	55,762	306	549
Boston	51,116	209	409
Dallas	42,108	216	513
Chicago	215,782	951	441
Washington	56,835	637	1121

In this one age group, St. Louis arrests average less than one-tenth the rate experienced by other cities for both crimes, yet the crime rate and the arrest rate for youths showed no such variation. Moreover, what was special about St. Louis disappeared in the 1970 reports. The discrepancy was not due to a visible typographical error: the rate difference appeared in two separate crime categories and the parallel data on arrest rates under 18 vs. over 18 showed much the same picture. Of course, the pattern reported could have been a faithful rendering of reality. This could be checked by inspecting prison admission records in Missouri for 1960 and 1961. If it is true, criminological scholars should rush to the record books to explain such an impressive gap between cities. As a cautionary maneuver, however, I have elected to exclude the data from St. Louis. The residual worry is that other city data might also be inaccurate. If differences as large as those noted in St. Louis pass into the records (and aggregate national totals) without question, the reporting system apparently does not contain the kind of auditing mechanism that would inspire confidence in the final result.

II

Results

The sample of cities reported is biased because it avoids areas of heavy Hispanic surname population. In other respects, it is fairly representative. With that in mind, it is appropriate to search the present data set for trends in: 1) age- and race-specific crime rates, 2) the relationship between demographic changes and shifts in crime, 3) the compound impact of changes in crime rates and in demography in explaining the growth of crime, 4) trends in the concentration of criminal acts among the very young and 5) trends, at the community level, in crime rate differences (as measured by arrest) between the races.

1. Estimated Offense Rates. Using the age-specific crime rate estimates described in I above, Table IV sets out shifts in estimated crime rates for different ages among White and Black males for 1960 and 1970.

Table IV

Estimated Offense Rates by Age and Race
for Males (Unweighted Mean, Five Cities)
(Rate per 100,000)

Age	Offense	White			Black		
		Rate 1960	Rate 1970	Increase %	Rate 1960	Rate 1970	Increase %
15-19	Homicide	13.8	32.6	136	114.2	235	106
	Robbery	613.8	1,722	180	5,239	14,736	181
	Burglary	3,712	7,397	99	14,348	28,877	101
	Auto Theft	6,295	12,187	94	13,503	36,571	171
20-29	Homicide	16	35	119	117	321	173
	Robbery	313	682	117	2,583	8,727	226
	Burglary	1,326	2,607	97	5,251	12,992	146
	Auto Theft	878	2,566	192	1,630	13,177	708
30-39	Homicide	12.2	26.2	115	84.4	169	100
	Robbery	128	236	84	932	2,223	139
	Burglary	692	1,196	73	2,247	4,675	108
	Auto Theft	293	777	166	506	3,044	502
40 +	Homicide	4.2	7.2	71	44	74	69
	Robbery	14.4	24.2	68	174	372	114
	Burglary	101	168	66	535	1,105	106
	Auto Theft	31	99	224	89	630	611

Increases in age-specific estimated offense rates occur across the board. The steepest and broadest increases for this period are homicide and auto theft. These figures should be qualified by the fact that rates of offenses for the youngest White males are overestimated (see I-5, supra) although not to a degree that would explain their 1960-1970 trend. The increase in offenses has been an episode with broad participation among age and ethnic groups. Inter-city differences in rate change are detailed in Appendix A; they are too great to be safely attributed to chance. Yet it is a safe generalization, given the error margin of the estimates and the inter-city differences, that when controlled for demographic changes, all the sample cities were headed substantially in the same direction over this period, but at different rates of increase.

What moral this carries for the future, with all cities starting from higher bases, is anyone's guess. Yet the sheer volume of 1970 estimated criminality might suggest a lower upper-limit on the growth of criminality than would otherwise be the case.

2. Population Shifts as a Partial Explanation--"Prospective Demography". Increases in age- and race-specific crime rates are a major contributor to the shift in crime rates in the city, but not a total explanation. This section presents data on what

would have happened to crime in our sample cities if crime rates for each of our sub-populations had remained at 1960 levels while the composition of the population shifted. Population shifts are isolated in this manner, because noninfant population is easier to predict over ten and fifteen year periods than fluctuations in propensity to commit offenses. Table VI reports the number of offenses projected by this method and compares this offense rate with the 1960 rate and the change in offense rates actually experienced between 1960 and 1970 for robbery, burglary, and auto theft. Homicide was deleted from this analysis because our projections were done for males only and female participation in homicide is significant.

Table VI

Projected Crime Rates and Estimated Actual Crimes Rates for Males, Five Cities

	1970 Projected Crimes	% Increase 1960 to Projected Rate	% Increase Actual No. Offenses 1960-1970
Robbery			
Cleveland	1,431	13	320
Boston	605	28	433
Dallas	920	80	434
Chicago	15,776	25	74
Washington	1,473	46	1,002
Burglary			
Cleveland	3,184	5	248
Boston	3,644	13	202
Dallas	7,603	58	291
Chicago	36,874	26	15
Washington	6,067	35	387
Auto Theft			
Cleveland	3,611	30	592
Boston	4,094	9	293
Dallas	3,140	54	261
Chciago	28,449	28	69
Washington	2,724	38	455

The middle column of Table VI shows that substantial increases in offenses could be predicted in all cities except Cleveland solely because of demographic change. A comparison of the middle column in the table with the right hand column shows how the projected increases compare with the experienced increases. The actual increase in offense volume is vastly greater than the predicted increase in 12 or our 15 observations, for every crime in every city except Chicago. It is worth noting that Chicago, with the highest base-rate of offenses has the lowest relative increase.

The "prospective" demographic estimates are probably on the low side of reality, because our underestimate of young Black male crimes (see I-5, above) reduces the projected crime rate for this high growth group in 1970. The margin of error produced by our estimating techniques and the high degree of inter-city variance make it difficult to extrapolate from these data to any national pattern. But it is clear that age-, race- and sex-specific population estimates are a necessary if not sufficient condition for projecting future crime rate.

3. <u>The Interaction of Population and Rate Changes--Adventures in "Retrospective" Demography</u>. Many critics of the theory that demographic change is a powerful explanation of variations in crime rates point out that demographic shifts alone do not account for the major changes in levels of offenses. Their method is generally that of Table VI, assuming that crime rates stay constant.

But offense rates have increased. And since the impact of population changes on crime rates will be affected by rate changes, it is logical to inquire what difference population changes have made in levels of crime, given that rate changes have occurred. An illustration of this method is provided in Table VII for robbery in Chicago and Washington, cities where the "prospective" predictions of 1970 crime show population shifts responsible for one-third (Chicago) and one-twentieth (Washington) of the increase in robberies.

Table VII

Estimated Offenses Attributable to Changes in Population of Young Black Males, Robbery Chicago and Washington, 1960-1970

	Population Increase 1960-1970	1970 Estimated Offense Rates	Number of Crimes		% of Total 1960-1970 Increase in Robbery
Chicago					
15-19	27,754	15,369	4,266		
20-29	18,995	9,092	1,727		
			5,993	=	72%
					(5,993/8,288)
Washington					
15-19	11,851	21,799	2,583		
20-29	14,833	8,031	1,191		
			3,774	=	38%
					(3,774/10,2681)

Table VII is an historical estimate of the role of population shifts in the sense that it estimates the extent to which changes in composition of the population have produced variations in crime levels that would not have occurred unless population increases in high risk sub-groups had compounded shifts in rate. Using this method, the population shift accounts for over half of all the increase in Washington robbery and 42 percent of the Chicago increase. It is at least as valid an estimate of demographic impact for historical purposes as the approach followed in Table VI, yet leads to starkly different conclusions for some crimes in some cities.

Like all the other analyses reported in this section, this exercise depends on the reliability of the data used to create the estimates. Still, in the context of planning for future projections, the contrast between the predictable (Table VI) and the unpredictable (Table VII) impact of population shifts on crime is worth making.

4. Trends in the Relative Criminal Participation of the Young. It has long been known that a disproportionate number of serious criminal offenses are committed by adolescents. Section I described the shorthand measure of "youth proneness" employed in the present study--a number representing for each crime in each city the arrest rate of 15 and 19 year-olds as a proportion of the arrest rate of 20-29 year-olds.

Table VIII

Youth Proneness to Arrest
In Five Cities
$(\frac{\text{15-19 rate}}{\text{20-29 rate}})$

	1960	1970	% Change
Homicide			
Cleveland	.48	.60	+25
Boston	1.36	.53	-60
Dallas	.51	.73	+43
Chicago	1.47	1.97	+39
Washington	1.63	1.15	-29
Robbery			
Cleveland	1.25	1.79	+43
Boston	1.70	2.18	+28
Dallas	3.28	1.38	-57
Chicago	1.80	2.19	+22
Washington	3.18	3.33	+ 5
Burglary			
Cleveland	1.87	2.33	+25
Boston	2.78	2.47	-11
Dallas	4.24	3.00	-29
Chicago	1.84	2.85	+55
Washington	2.72	3.06	+13
Auto Theft			
Cleveland	8.13	2.98	-63
Boston	5.24	4.75	- 9
Dallas	15.69	5.37	-66
Chicago	7.46	1.89	-80
Washington	5.61	4.83	-14

For offenses other than homicide, arrest rates of the young are higher in both years than for the 20-29 year-old age group that was used as a base rate. In 1960, the arrest rates for homicide among 15-19 year-olds was approximately half as large as the older age group in Cleveland and Dallas; the other three cities showed a youth arrest rate ranging between 36 and 47 percent higher than the next oldest cohort. The young were more arrest prone for robbery in all cities in both years, although the extent of youth proneness varies substantially in both years. In three of the four crimes the concentration of arrests among the young increases during the period 1960-1970. For homicide, this pattern applies to all cities except Boston; for robbery all cities except Dallas; for burglary, increases are noted in Cleveland, Chicago, and Washington, while Boston and Dallas show a decreasing concentration of crime among the young.

Auto theft, traditionally the most youth prone offense of the seven F.B.I. index crimes, shows a persistent and frequently substantial decrease in the concentration of arrests among the young. The extent to which this decrease is attributable to changes in police practice is not known. Federal anti-theft standards, and other devices designed to differentially deter "amature" offenders may have also played a role in this pattern. But one thing that this data unambiguously demonstrates is the hazard of aggregating arrests for all index crimes into single index category.

5. Trends in the Racial Concentration of Crime.

We attempted to measure the difference in crime rates between the races by deriving estimated offense rates based on arrest statistics, correcting these estimates for the different age structures of the two populations, and expressing the residual as an index of racial concentration. The resultant values, in each case on age corrected ratio of Black arrests to White arrests per 100,000 population. These figures probably overstate racial differences for three reasons: 1) the census, used as a population estimate undercounts high-risk Black males by as much as 30%; 2) Black arrests occur more frequently in younger age groups than White arrests so that our age correction proportions do not completely control for the interaction between age and race in the cities; 3) younger Black offenders are more apt to be arrested in groups, thus inflating any estimate of crime rates based on gross arrest rates. With these manifold and important limits, the data in Table IX are still of interest.

Table IX

Racial Differences in Arrest Rate (Black/White), Four Crimes in Five American Cities, 1960 and 1970

	1960	1970
Homicide		
Cleveland	8.7	8.0
Boston	14.5	15.6
Dallas	7.8	8.4
Chicago	6.5	18.6
Washington	3.8	6.4
Robbery		
Cleveland	7.7	7.3
Boston	6.4	9.0
Dallas	5.3	7.2
Chicago	10.0	15.7
Washington	6.2	11.5
Burglary		
Cleveland	4.1	2.8
Boston	2.9	3.7
Dallas	3.3	2.9
Chicago	2.4	4.1
Washington	3.3	4.0
Auto Theft		
Cleveland	2.6	4.2
Boston	1.7	2.7
Dallas	1.3	1.1
Chicago	2.4	6.0
Washington	2.0	5.0

In both years the racial differential for homicide and robbery--the two violent offenses--was far more substantial than for the two nonviolent offenses we surveyed; only one of the twenty observations of city-level homicide and robbery arrests show a Black/White arrest propensity of less than five, while only one of the twenty observations of burglary and auto theft exceeded five. Among the cities, in each year and for each offense, racial differences, as measured, varied widely. The extent to which this is a reflection of compound measurement error or differences in police policy is not known. It is a natural constraint, however, on the utility of this kind of data in making future projections based on historically observed values or trends.

The trend in relative racial concentration of crime, to the extent that it is observed, is also difficult to discern. With respect to homicide, the racial differences observed in 1960 remain relatively stable in three of the five cities when controlled for changing numbers in the population, change in general offense propensities, and the age structure of a population. In Washington the offense propensity of Black offenders is half again as large in 1970 as 1960. In Chicago, under the near unique 1970 circumstance of a larger number of homicide arrests than homicide offenses, the index number triples. We have studied the Chicago situation in detail and must conclude that a substantial amount of that change is due to the huge growth in arrests of Blacks under 21 in groups for single-homicide episodes.

For robbery, two of the five cities studied show relative stability in racial differences in arrest rates. The remaining three cities show a tendency for the racial concentration to increase. The pattern observed for burglaries is less clear: two cities show a decrease in the racial concentration of arrests and three cities show increases, all of modest proportions. The pattern for auto theft is chaotic; Dallas begins with virtually no difference between Black and White arrest rates and by 1960 the small gap between Black and White arrest rates had been reduced to the point of closure. During the same time period Cleveland and Boston show increases in the racial concentration of arrests but the 1970 difference is not great. Chicago and Washington, on the other hand, show an increase in the racial concentration of arrests that more than doubles between the two census years.

Concluding Reflections

If one were to expand the sample of cities and years covered in this paper, some of our techniques of analysis could be used to correlate population shifts with relative increases in crime and to determine whether increasing the sample of cities generates more consistent patterns. As an alternative, aggregate national totals could be used both to explain historical patterns and to project future rates.

An aggregate national approach seems foolhardy. The poor quality of the data and the dubious nature of the assumptions one would have to make interact to expand greatly the margin of error from such an exercise.

Expanding the sample of cities might prove worthwhile if performed cautiously. But the severe limits of our historical data will remain, and expanding the sample size will not ameliorate the dangers produced by (1) unaudited data, (2) arrest data that is not cross-tabulated by age and race, (3) variations in police reporting of crimes and arrests, and (4) probable variation in the ratio of crimes to arrests for different age groups.

It is an understatement to say that these data should be interpreted with caution. What, then, is the value of such an exercise? Some of our findings, such as the consistent decrease in the concentration of auto-theft among the young, seem robust enough to survive the assumptions in method that produced them. And one implication of the data on youth-proneness is that analysis of trends in offenses must be crime-specific rather than aggregated into categories such as "index crime."

More important, I hope the present exercise demonstrates the degree to which good history and good projections depend on reliable data. Not the least of our needs in dealing with criminal justice "futures" is reform of the information systems necessary for decent policy analysis.

APPENDICES

APPENDIX A

Estimated Offense Rates by Race and Age
Males 15-19
Five Cities

	White		Black	
	Rate 1960	Rate 1970	Rate 1960	Rate 1970
Homicide				
Cleveland	3.06	30.2	39.0	182.8
Boston	5.69	26.8	113.8	158.9
Dallas	15.75	37.8	133.9	211.6
Chicago	20.64	34.4	204.2	456.4
Washington	23.00	34.0	79.7	166.6
Mean	13.8	32.6	114.2	235.2
Robbery				
Cleveland	369.6	2,194.3	3,173.1	12,883.7
Boston	510.6	1,952.0	4,073.5	17,432.9
Dallas	686.7	911.6	3,757.8	6,330.4
Chicago	1,082.8	1,163.6	12,417.1	15,369.2
Washington	418.9	2,388.5	2,776.5	21,799.2
Mean	613.8	1,722.0	5,239.6	14,763.0
Burglary				
Cleveland	1,651.7	8,452.9	7,538.4	19,757.2
Boston	3,576.0	4,326.9	14,086.3	35,020.5
Dallas	6,294.4	10,624.0	21,927.6	42,399.6
Chicago	4,911.1	4,237.2	18,940.9	16,657.6
Washington	2,131.4	9,344.0	9,245.5	30,549.5
Mean	3,712.6	7,397.0	14,347.8	28,876.8
Auto Theft				
Cleveland	4,748.3	16,813.9	13,227.8	52,668.3
Boston	8,143.0	25,239.9	16,130.6	52,704.0
Dallas	5,807.4	8,562.0	7,609.6	24,333.4
Chicago	9,728.2	4,864.7	24,187.3	21,827.4
Washington	3,050.8	5,455.2	6,357.2	21,323.1
Mean	6,295.4	12,187.2	13,502.6	36,571.2

Estimated Offense Rates by Race and Age
Males 20-29
Five Cities

	White		Black	
	Rate 1960	Rate 1970	Rate 1960	Rate 1970
Homicide				
Cleveland	10	45	86	423
Boston	5	45	64	368
Dallas	29	48	256	337
Chicago	21	15	128	302
Washington	15	22	53	175
Mean	16.0	35.0	117.4	321.0
Robbery				
Cleveland	304	1,010	2,509	9,929
Boston	307	868	2,013	9,608
Dallas	214	632	1,064	5,475
Chicago	621	471	6,373	9,092
Washington	121	427	958	8,031
Mean	313.4	681.6	2,583.4	8,427.0
Burglary				
Cleveland	333	2,993	3,966	11,685
Boston	1,318	3,513	4,270	17,028
Dallas	1,513	3,396	4,816	16,088
Chicago	2,745	1,321	9,481	7,572
Washington	720	1,813	3,723	12,238
Mean	1,325.8	2,607.2	5,251.2	12,922.2
Auto Theft				
Cleveland	588	4,191	1,621	24,377
Boston	1,584	4,614	2,587	15,938
Dallas	377	1,369	457	5,158
Chicago	1,343	2,050	2,241	14,986
Washington	499	606	1,244	5,424
Mean	878.2	2,566.0	1,630.0	13,176.6

Estimated Offense Rates by Race and Age
Males 30-39
Five Cities

	White		Black	
	Rate 1960	Rate 1970	Rate 1960	Rate 1970
Homicide				
Cleveland	12	36	74	232
Boston	6	31	87	174
Dallas	15	39	151	248
Chicago	12	7	67	110
Washington	16	18	43	82
Mean	12.2	26.2	84.4	169.2
Robbery				
Cleveland	165	276	1,058	2,080
Boston	129	409	622	3,112
Dallas	40	210	239	1,820
Chicago	238	134	2,375	2,001
Washington	70	151	365	2,103
Mean	128.4	236.0	931.8	2,223.2
Burglary				
Cleveland	509	1,075	1,755	3,022
Boston	684	2,014	1,622	6,761
Dallas	507	1,253	1,923	5,919
Chicago	1,095	643	3,678	2,881
Washington	667	993	2,259	4,791
Mean	692.4	1,195.6	2,247.4	4,674.8
Auto Theft				
Cleveland	208	845	430	3,691
Boston	456	1,615	530	3,806
Dallas	178	342	255	1,284
Chicago	369	770	905	4,386
Washington	252	314	409	2,055
Mean	292.6	777.2	505.8	3,044.4

Estimated Offense Rates by Race and Age
Males 40 and Above
Five Cities

	White		Black	
	Rate 1960	Rate 1970	Rate 1960	Rate 1970
Homicide				
Cleveland	5	12	59	107
Boston	2	7	37	78
Dallas	5	10	58	90
Chicago	4	2	40	51
Washington	5	5	25	44
Mean	4.2	7.2	43.8	74.0
Robbery				
Cleveland	22	30	242	285
Boston	14	48	125	705
Dallas	7	13	49	172
Chicago	22	13	388	357
Washington	7	17	66	340
Mean	14.4	24.2	174.0	371.8
Burglary				
Cleveland	66	139	395	542
Boston	157	227	722	1,464
Dallas	75	172	333	1,195
Chicago	148	84	846	674
Washington	60	220	381	1,651
	101.2	168.4	535.4	1,105.2
Auto Theft				
Cleveland	17	134	70	754
Boston	42	170	92	714
Dallas	35	61	57	337
Chciago	42	106	171	1,084
Washington	17	25	53	260
Mean	30.6	99.2	88.6	629.8

APPENDIX B

Arrest Rates by Race, Offense and City,
Adjusted for Age Structure in City Population and Age-Specific Propensity to Arrest

Homicide

City	1960 Black/White Arrest Rates	1960 Age Propensity Score (Black/White)	1960 Corrected Ratio	1970 Black/White Arrest Rates	1970 Age Propensity Score (Black/White)	1970 Corrected Ratio
Cleveland	8.000	.920	8.7	7.192	.897	8.0
Boston	14.250	.985	14.5	10.25	.799	15.6
Dallas	7.6	.970	7.8	6.304	.752	8.4
Chicago	6.57	1.000	6.6	17.273	.929	18.6
Washington	3.3	.871	3.8	5.333	.832	6.4

Robbery

City	1960 Black/White Arrest Rates	1960 Age Propensity Score (Black/White)	1960 Corrected Ratio	1970 Black/White Arrest Rates	1970 Age Propensity Score (Black/White)	1970 Corrected Ratio
Cleveland	7.713	.997	7.7	7.629	1.041	7.3
Boston	6.348	.997	6.4	8.809	.973	9.0
Dallas	5.460	1.033	5.3	7.226	1.061	7.2
Chicago	11.032	1.097	10.0	16.695	1.066	15.7
Washington	6.184	.994	6.2	13.147	1.140	11.5

Appendix B (Cont'd)

Arrest Rates by Race, Offense and City,
Adjusted for Age Structure in City Population and Age-Specific Propensity to Arrest

Burglary

City	1960 Black/White Arrest Rates	1960 Age Propensity Score (Black/White)	1960 Corrected Ratio	1970 Black/White Arrest Rates	1970 Age Propensity Score (Black/White)	1970 Corrected Ratio
Cleveland	4.184	1.027	4.1	3.017	1.090	2.8
Boston	3.148	1.098	2.9	3.858	1.030	3.7
Dallas	3.480	1.072	3.3	4.502	1.548	2.9
Chicago	3.696	1.099	2.4	4.969	1.199	4.1
Washington	4.031	1.209	3.3	4.702	1.179	4.0

Auto Theft

City	1960 Black/White Arrest Rates	1960 Age Propensity Score (Black/White)	1960 Corrected Ratio	1970 Black/White Arrest Rates	1970 Age Propensity Score (Black/White)	1970 Corrected Ratio
Cleveland	2.549	.968	2.6	4.523	1.066	4.2
Boston	1.577	.931	1.7	2.737	1.030	2.7
Dallas	1.308	1.047	1.3	1.196	1.118	1.1
Chicago	2.534	1.040	2.4	6.331	1.053	6.0
Washington	1.939	.959	2.0	6.280	1.258	5.0

APPENDIX C

Percentage Deviation of F.B.I. Arrest Rates from Estimated Age-Specific Arrest Rates Males, by Crime, City, Age and Race

White, Under 18

City	Offense: Homicide	Robbery	Burglary	Auto Theft
Chicago	-29.5	-10.9	-13.9	3.9
Boston	-50.0	-38.6	-11.7	0.9
Washington	-	-50.0	-43.8	-22.2
Cleveland	50.0	12.1	10.9	-43.0
Dallas	-71.4	-23.3	-	11.7

Black, Under 18

City	Offense: Homicide	Robbery	Burglary	Auto Theft
Chicago	6.1	2.1	7.5	- 1.6
Boston	50.0	24.8	16.5	- 1.7
Washington	-	1.4	3.5	1.3
Cleveland	-12.5	- 2.6	- 5.9	15.5
Dallas	33.3	8.4	-	- 9.9

Percentage Deviation of F.B.I. Arrest Rates from Estimated Age-Specific Arrest Rates Males, by Crime, City, Age and Race

White, 18 and Over

City	Offense			
	Homicide	Robbery	Burglary	Auto Theft
Chicago	8.3	7.2	14.5	- 1.2
Boston	2.4	19.5	8.5	- 1.1
Washington	-	31.0	34.5	25.0
Cleveland	- 3.4	- 6.7	-11.7	3.7
Dallas	7.4	10.6	-	-16.8

Black, 18 and Over

City	Offense			
	Homicide	Robbery	Burglary	Auto Theft
Chicago	- 1.8	- 1.4	- 7.8	0.5
Boston	- 2.0	-12.5	-12.0	2.2
Washington	-	- 0.9	- 2.7	- 1.5
Cleveland	0.8	1.4	6.3	-15.7
Dallas	- 3.4	- 3.9	-	14.1