WHAT DETERMINES RATES OF HOMICIDE OVER TIME AND PLACE: CAN WE FIND OUT?

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INTRODUCTION

Frank Zimring and Gordon Hawkins in *Crime Is Not the Problem: Lethal Violence in America* note that most of the research in criminology has focused on who will commit crimes, not on what the overall rate of crime will be.[1] They would like to know why there are large differences in homicide rates by era and country.[2] However, they are pessimistic about the possibility of predicting such differences because they believe that rates are determined by events that we cannot predict.[3] My goal in this article is to discuss why predicting historical changes in crime rates is so difficult and to ask whether there are nevertheless strategies that might enable some prediction of homicide rates.

I. PREDICTING INDIVIDUAL SUSCEPTIBILITY TO OFFENDING

As Zimring and Hawkins recognize, we do reasonably well at predicting *who* is at the highest risk of having an extensive criminal record.[4] However, they do not believe that predictors of crime are much use in predicting violence, which they argue is what we should be interested in, because it is violence, not crime in general, that distinguishes the United States from other countries.[5] Why do they believe crime and violence are not closely connected? First, they note that "crime . . . is a complex amalgam" of many types of behavior, while violent acts have "more common elements."[6] Second, levels of crime are "not efficient

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1. FRANKLIN E. ZIMRING & GORDON HAWKINS, CRIME IS NOT THE PROBLEM: LETHAL VIOLENCE IN AMERICA 217-18 (1997).
2. *See id.*
3. *See id.*
4. *See id.* at 98.
5. *See id.* at 1-20.
6. *Id.* at 98.

predictors of levels of violence cross-nationally."[7] Both of those statements are true, but not necessarily relevant to the question of whether predictors of who will exhibit criminal behavior also predict who will be violent. With respect to their first argument, while there are indeed all sorts of crimes, the great majority of prosecuted crimes are property crimes.[8] So, predictors of the common property crimes such as theft and burglary do a good job of predicting who will belong to the universe of those arrested or convicted. With respect to the second statement, the fact that the prevalence of crime is not highly correlated with the prevalence of violence cross-nationally does not necessarily mean that they have different predictors. A good analogy is the striking difference between black and white arrest probabilities. My studies have found that despite this difference in prevalence of arrests, the same family structures and the same childhood behaviors were equally powerful predictors of arrest for the two ethnic groups.[9] The same can be said for predictors of arrest for males and females: male rates are much higher, but the same kinds of families and behaviors predict with the same power for the two sexes.[10] Prediction then is possible in two ways: First, in the total population, demographic characteristics such as ethnicity and gender can serve as predictors for crime and violence. Second, within a specified ethnic group or gender, family type and behavior do reasonably well at predicting which members are most likely to engage in criminal acts.

Zimring and Hawkins doubt that factors present long before the time of criminal acts would be helpful in prediction.[11] Yet there is ample evidence that prediction can succeed even if made very early in life.[12] Indeed, predictors can date from before birth,

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7. *Id.* ("The reader will recall that levels of crime are not efficient predictors of levels of violence cross-nationally. Under these circumstances, it is ludicrous to suppose that causal explanations could work interchangeably for crime and violence.").

8. *See* FEDERAL BUREAU OF INVESTIGATION, U.S. DEP'T OF JUSTICE, UNIFORM CRIME REPORTS FOR THE UNITED STATES 1995, at 8 (1995).

9. *See* Lee N. Robins, *Sturdy Childhood Predictors of Adult Outcomes: Replications from Longitudinal Studies*, *in* STRESS AND MENTAL DISORDER 219-35 (James E. Barrett et al. eds., 1979) [hereinafter *Sturdy Childhood Predictors*].

10. *Cf.* Bill Henry et al., *Early Family Predictors of Child and Adolescent Antisocial Behavior: Who Are the Mothers of Delinquents?*, 3 CRIM. BEHAV. & MENTAL HEALTH 97, 106-08 (1993).

11. *See* ZIMRING & HAWKINS, *supra* note 1, at 98.

12. *See* Henry, *supra* note 10, at 106-13.

for we note that mothers with a history of juvenile delinquency before the birth of their children are almost certain to produce at least one delinquent among their offspring.[13] Serious offending can be better predicted than can prediction of delinquency in general because a very large proportion of adolescents will do something for which they are or could be arrested.[14] The prototypic portrait of the serious offender-to-be is a boy whose conduct problems began by age eight to ten, consisting of truancy, fighting, stealing, lying, and substance abuse. He has parents who deserted or neglected him, disciplined him erratically and violently, drank excessively, were frequently unemployed, and argued or fought with each other. He will have had an unusually early first contact with the justice system, and will have spent time in a juvenile correctional institution. Children with all of these traits have at least ten times the risk of becoming serious offenders as children with none of them.[15] That is not to say that any of these traits are either necessary or sufficient.[16] It is rare indeed in social research to identify a causal variable that is either. But this pattern of behaviors and family history is a powerful predictor of future criminality. It applies equally well to blacks and whites, males and females. And it predicts violence as well as crime. Why? Because violence occurs mainly among those with other criminal behaviors (at least if one drops spanking one's children from the definition of violence. Spanking was not only permitted in the past; it was considered necessary and virtuous on the part of the parent.) Violence is rare as compared with property crime and is most often found among persons with multiple prior property offenses.[17] Thus, one can consider violence as an indicator of a relatively severe criminal career. It is not surprising, then, that it can be predicted handily by histories that predict severe criminal careers.

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13. *See* Lee N. Robins et al., *Arrests and Delinquency in Two Generations: A Study of Black Urban Families and Their Children*, J. OF CHILD PSYCHOL. & PSYCHIATRY 125, 130-33 (1975).

14. *See generally Sturdy Childhood Predictors*, *supra* note 9.

15. *See generally id.*

16. *See* ZIMRING & HAWKINS, *supra* note 1, at 101. Zimring and Hawkins appear to think that a cause must be either necessary or sufficient. *See id.* By causal, I mean only that, holding other factors constant, a characteristic increases the risk that crime will occur.

17. *Cf. id.* at 23.

These conclusions about common predictors for crime in general and violence in particular are supported by data from many large studies that obtained interviews or criminal records of identifiable individuals or both, and linked their childhood portraits to later outcomes either by follow-up studies in which the same persons were repeatedly investigated at various ages or by single retrospective interviews with adults that asked about both recent criminal history and childhood history.[18] Because Zimring and Hawkins have relied on published crime rates by year and country,[19] records that do not track individuals across time or offense, they do not know how many homicide perpetrators have prior crimes, of what types, and at what ages. They conclude that differently shaped curves over time imply different causes.[20] Certainly there has to be some explanation for the different shapes, but one cannot therefore assume that all the causes are different. And indeed, there is considerable evidence that predictors of individual criminal behavior are remarkably stable across time and place.[21]

How can this stability at the individual level be reconciled with the marked differences Zimring and Hawkins have shown between countries and over time?[22] How can the same predictors operate cross-culturally and historically, when prevalence rates vary by time and place? Clearly, being able to predict which members of a population have an elevated risk of arrest and an elevated risk for violent crimes in particular does not mean that one can also predict that a given era will have a high or low rate of homicides. When prevalences differ profoundly, the *presence* of these variables in members of a high prevalence population predicts with considerable certainty that they *will* be charged with a crime, while their absence predicts only a lower rate of criminality. In members of a low prevalence population, their *absence* predicts with equal certainty that those members will be arrest-free, but only some of those in whom they are *present* will be known as criminals.

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18. *See, e.g., Sturdy Childhood Predictors*, *supra* note 9.
19. *See* ZIMRING & HAWKINS, *supra* note 1, at 254-59.
20. *See id.* at 22-27.
21. *Cf.* Rolf Loeber, *The Stability of Antisocial and Delinquent Child Behavior*, 53 CHILD DEV. 1431, 1441-42 (1982).
22. *See* ZIMRING & HAWKINS, *supra* note 1, at 22-50.

While it is easy to provide a prototypic picture of the future violent offender, there is no agreed on prototypic portrait of an era in which crime rates or homicide rates will be high. Why do we know so much less about predictors of eras in which crime rates will be high than about who will be responsible for whatever crimes will be committed in the future?

II. PROBLEMS WITH PREDICTING PREVALENCE OF CRIME

Poor ability to predict prevalence rates for crime in a particular period is an instance of a very general problem with predicting historical change. The ability to do so is so poor that one wonders whether history currently qualifies as a social science and indeed whether it can ever qualify. A science identifies rules that can be generalized beyond a particular sample assessed at a particular time. Are there characteristics of eras of high crime rates that could be used to predict criminal rates at a specified future time? It is possible, of course, simply to extrapolate from recent trends, invoking the principle that small changes are more probable than large changes over short time intervals. But that is not a satisfactory scientific principle because it posits no change in the speed at which current trends will transform rates nor can it predict a change in the direction of a trend. Achieving a scientific approach to history requires developing rules that allow predicting the speed of transitions and switches in the direction of trends.

The reason it is much easier to predict which persons will be perpetrators than to predict which eras will have high crime rates is that a population consists of millions of people. Generalizations about their behavior can be made by studying a carefully selected sample of that population. Studying people allows describing the histories that led to their current behavior. Regularities in these histories can then be used to forecast future behavior for people who are not yet in the age range for criminal activity. Such predictions succeed because people are biologically nearly identical from one generation to the next and one country to the next. The success of this approach is indicated by the fact that the predictors of serious offending summarized above were identified early in this century and have been rediscovered and reconfirmed in dozens of longitudinal and retrospective studies in

many countries since then.[23] But when it comes to predicting changes in the *prevalence* of crime, we lack both the effectively infinite population from which to sample and the assurance of stability over time.

Our units in studying historical change are eras, not people. Studying eras, as compared with studying people, presents what seems like insuperable difficulties. As noted below, these problems are small numbers, lack of agreed on criteria for defining an era, lack of predictable developmental patterns within an era, and rapid changes in factors that can profoundly affect the likelihood of criminal behavior. All of these difficulties make prediction of the crime level in a future era extremely tenuous.

(1) Small numbers. The set of eras from which to sample is small. Reasonably stable record keeping has been practiced only for some fifty years in industrialized countries, and is still not practiced in much of the rest of the world. Research modeled after successful prediction of individuals' behavior would involve sampling from a population of eras, determining the precursors for eras with high rates of criminality, and predicting that eras in the same or other countries with those precursors will have high rates of criminality. The first step would be to divide the period in which records are available into high and low prevalence eras, with each era encompassing a number of years. Given the short period for which comparable records are available, the upper limit of currently identifiable eras for which historical data exist is about ten; a much too small population of eras on which to base reliable predictions.

(2) Criteria for defining an era. Nor are there clear rules for deciding when an era begins or ends. Because it is easy to distinguish one person from another, the size of a population of human beings can be readily ascertained. But it is not easy to decide on the number of eras that existed in the period for which records are available because eras have no clear-cut boundaries. Zimring and Hawkins divide the last thirty years into eras by plotting crime rates year-by-year, and noting periods of several years in which rates rose, declined, or were stable.[24] Unfortunately, shifts in crime rates are of no use in defining the bound-

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23. *See, e.g.*, Rolf Loeber et al., *Multiple Gating: A Multistage Assessment Procedure for Identifying Youths at Risk for Delinquency*, 21 J. RES. CRIME & DELINQ. 7, 7-32 (1984).

24. *See* ZIMRING & HAWKINS, *supra* note 1, at 22-29, 58.

aries of eras in the future, because their crime rates are what we are trying to predict.

(3) Lack of developmental patterns. One aid in predicting human beings' propensities toward crime is that each child is born with a clean slate and must traverse many of the same developmental pathways that every other child traverses. An era, in contrast, does not start de novo, but emerges from the history of the preceding era. Therefore, we cannot suppose that two eras with similar crime or homicide levels share common histories. Instead, the crime rate of one may be an instance of continuity with the prior era explained by inertia—a lack of force for change—while the other era's rate may represent a distinct break with the preceding era, indicating that there must have been some major precipitating events. Because eras lack the well-delineated developmental patterns that human beings have, it also is not possible to say how the early years of an era will compare with its later years.

(4) Rapid changes. Evolution, which blessedly for the pursuit of social science is so slow for the human species as to be imperceptible from one generation to the next, has not been slow for many of the factors that are suspected to predict crime level, such as the availability of weapons, rapid increase in communications through the media and person-to-person, computerization of record keeping, and new laws.[25] So how can one predict the future from studying a sample of past eras when the future differs so profoundly from the past?

These difficulties are only worsened when the topic of interest is not crime in general but aggravated assault and homicide, the particular crimes of interest to Zimring and Hawkins.[26] Not only are there few eras for which data exist for building predictive models, but the dependent variable, homicides, is relatively scarce, compared with crime in general. Even in studies seeking predictors for individual human beings rather than eras, it is difficult to predict events as rare as violent crime. Although persons who have a history of property crimes are at higher risk of an arrest for violence than are members of the unarrested population, characteristics of property offenders that predict an offence for violence remain largely unidentified.

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25. *See id.* at 106-37, 237-47.
26. *See id.* at 1-20.

III. POSSIBLE SOLUTIONS TO FORECASTING PREVALENCE

Despite the drawbacks enumerated, there are some strategies that may improve our ability to forecast levels of violence.

(1) Changes in levels of precursors of homicides. First, predictors of individual criminality can be applied to forecasting the future. Extrapolations from studies describing those who commit homicides allow predicting that if the culture remains the same, a growth in the number of adolescent and young adult males in the population would make it likely that the number of crimes of many kinds would increase, including homicide.[27] However, the crime *rate* will increase when the number of adolescent and young adult males increases only if the number of females plus the number of males in other age groups increases more slowly than the number of young males.

Parallel predictions are possible if any of the other predictors of individual liability to commit homicide are predicted to increase. The possible causal factors noted by Zimring and Hawkins as associated with homicide are being male,[28] African American,[29] living in impoverished inner-city areas,[30] coming from the South,[31] youth,[32] frequency of illicit drug use,[33] and availability of guns.[34] The level of violence in the media can be omitted because Zimring and Hawkins are skeptical about its impact.[35] Increases in these correlates of crime *during* the era to which we are attempting to predict are not useful to long-term prediction. This is the point that Zimring and Hawkins make with respect to guns as a cause of homicide: "[C]hanges in gun use may signal changed intentions by attackers as well as increas[e] the chances that an attack will result in death because the gun is a more lethal instrument."[36] The ambiguity results because gun-related attacks occur at the same time as homicides.

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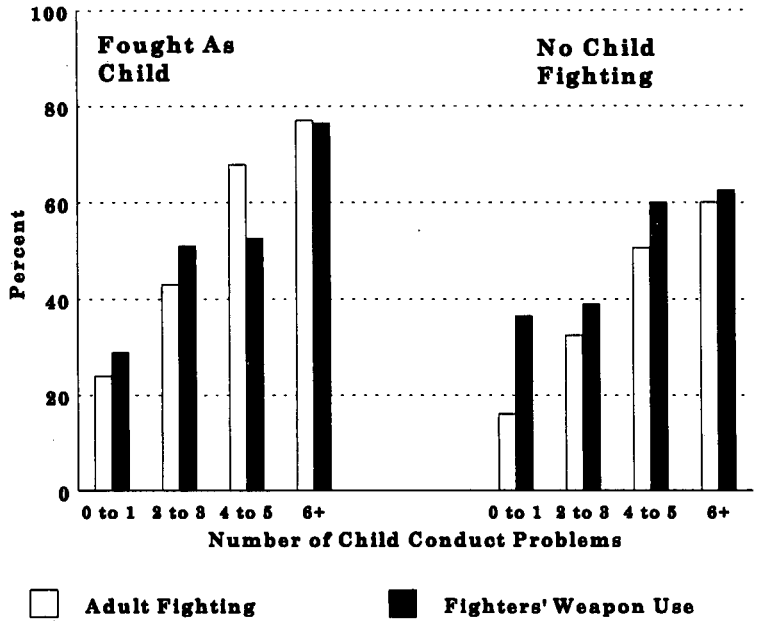
27. *See, e.g.*, ZIMRING & HAWKINS, *supra* note 1, at 64-65 (listing being male as a descriptor of those who commit homicides).
28. *See id.*
29. *See id.* at 73-90.
30. *See id.* at 66.
31. *See id.*
32. *See id.* at 65.
33. *See id.* at 138-55.
34. *See id.* at 106-23.
35. *See id.* at 124-37.
36. *Id.* at 112.

Figure 1: Child Behavior Problems and Early Fighting Forecast Adult Fighting and Weapon Use[37]



However, most predictors can be assessed at least several years ahead of the era in which the homicides will occur. Take childhood conduct problems as an example. If conduct problems increase, more youngsters will grow up to fight, use weapons (Figure 1), and beat their spouses (Figure 2). These increases will occur whether or not the conduct problems in childhood included physical aggression. If adolescent drug use increases, more youngsters with other conduct problems will use drugs, and it has been shown that the use of illicit drugs increases the likelihood that conduct problems will continue into adulthood.[38] An increase in illicit drug use thus predicts that the subsequent generation of young adults will be more criminal and more physically aggressive.[39] Similarly, if the age of beginning alcohol use and illicit

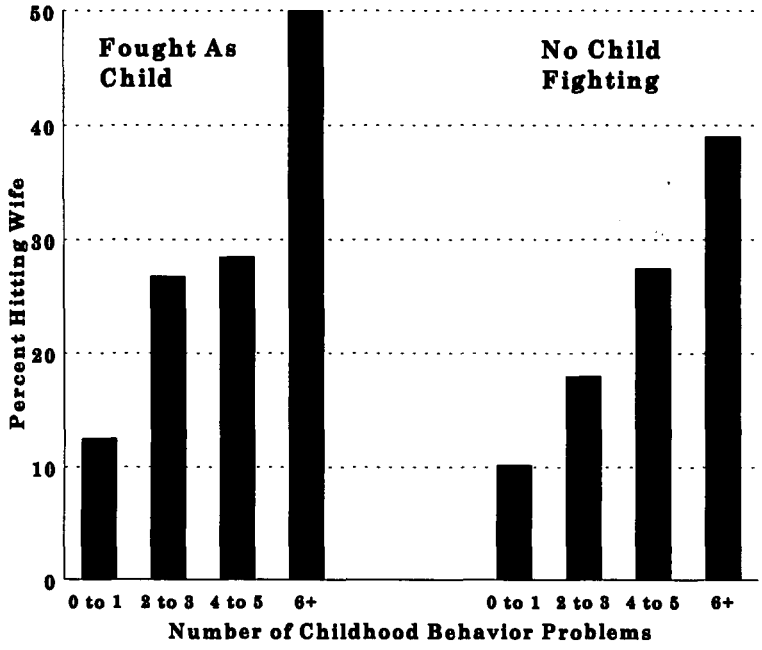
37. Men Under 50, 3 Sites, N = 3051 (unpublished research on file with author).

38. *See* Lee N. Robins et al., *Substance Abuse in the General Population, in* MENTAL DISORDERS IN THE COMMUNITY: FINDINGS FROM PSYCHIATRIC EPIDEMIOLOGY 9, 9-29 (James E. Barrett & Robert M. Rose eds., 1986).

39. *See* Lee N. Robins & Lawrence McEvoy, *Conduct Problems as Predictors of Substance Abuse, in* STRAIGHT AND DEVIOUS PATHWAYS FROM CHILDHOOD TO ADULTHOOD 182, 182-204 (Lee N. Robins & Michael Rutter eds., 1990).

drug use continues to drop, the chances will increase that substance use will become heavy and that there will be associated violence (Figure 3). The reason that early drug use is much more pernicious than later use is not well understood, but the data are substantial.

Figure 2: Early Behavior Problems and Fighting Forecast Hitting Wife[40]

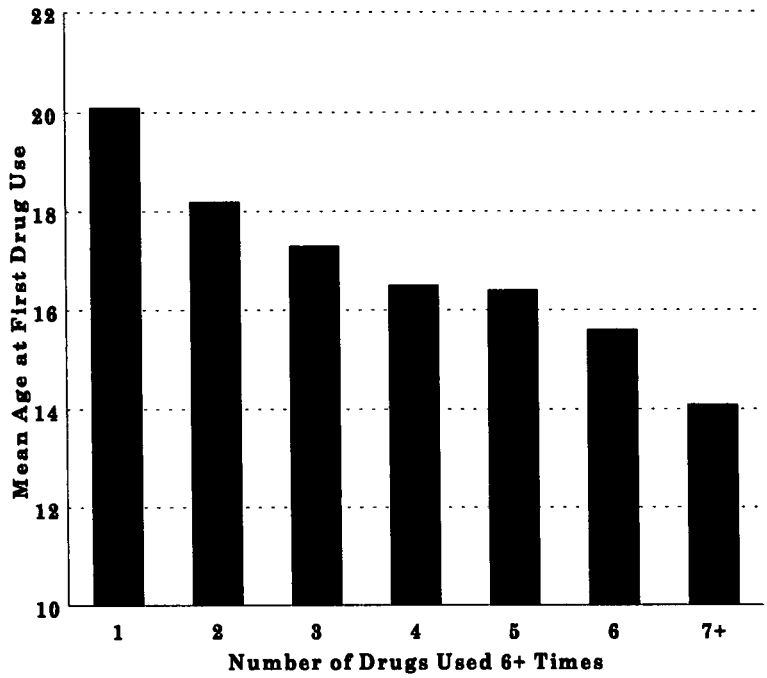


If the trend toward an increasingly "get tough" policy with juvenile offenders continues, so that a greater proportion of police contacts result in juvenile court appearances and a larger proportion of court appearances result in temporary or long-term detention, we can predict that more juvenile delinquents will continue their offending into adulthood, up to ten years later. Higher fertility rates in an ethnic group with a high crime rate allows predicting increased crime rates as far as eighteen to twenty-one years ahead. Continued shrinking of the farm economy, with resulting movement of young families to cities,

40. Men Under 50, 3 Sites, N = 3031 (unpublished research on file with author).

predicts an increase in crime a whole generation later. Crime should also increase if the number of children reared in the kinds of families that produce criminals increases. Homes broken because of a rise in out-of-wedlock pregnancies and divorce are likely to result in more crime and more violent crime ten to eighteen years later.

Figure 3: Age at First Drug Use by Final Level of Polydrug Use[41]



(2) Echoes. In a book in preparation, Zimring has challenged the idea that crime will increase because of an echo of the baby boom following World War II.[42] He has argued that there are too many other causes of crime to take seriously an effect set into motion by an increase in the birth rate many years ahead of the time when the crimes will be committed.[43] He has also challenged

41. Drug Users, Weighted (unpublished research on file with author).
42. *See* FRANKLIN E. ZIMRING, AMERICAN USE OF VIOLENCE (forthcoming 1998).
43. *See id.*

the idea that the echo would be of substantial size because the baby-boom generation has delayed childbirth and therefore has fewer children than expected.[44]

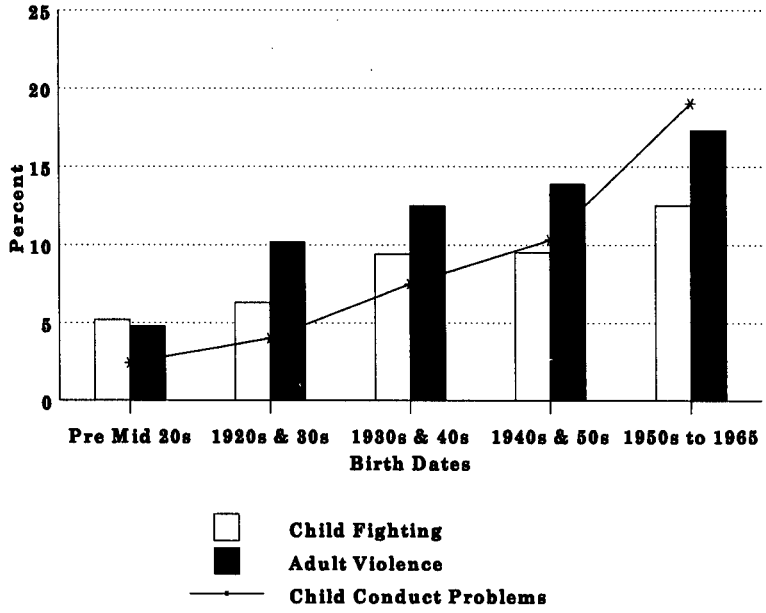
Whether or not the echo of the baby boom is large enough to have a noticeable effect on crime rates, the echo principle should apply to the generation born during any period in which there was a sudden upsurge of the number of crimes or homicides. The baby-boom echo theory states that there will come a time when the number of persons in high-risk ages will increase because the large number of baby boomers procreate at about the same time.[45] Like the expected increase in youngsters in the high-risk ages when the baby boomers became parents, each high-crime era can be expected to have an echo in the next generation, because an increase in crime rates implies an increase in the number of criminal parents at ages when their lifestyle has a significant impact on their children's lives. As crime rates increase, more children will be born into the kinds of households that foster criminality: parents with histories of arrest, alcoholism, and substance abuse; deserting fathers; harsh and inconsistent discipline; lack of supervision; fragile marriages and multiple liaisons for the parents; large sibships in overcrowded living quarters; and poverty. Because criminals are especially likely to create such families, one might expect a basic cycling pattern of high rates of criminality every eighteen to twenty years, when the offspring of these families both become criminal and become dysfunctional parents of the next generation.

Even if this cycling principle is correct, its effects on homicide rates might not be easily observable because homicide is so rare compared with crime in general. However, the problem of the rare event is somewhat compensated for in homicides by the fact that these cyclical increases in numbers and rates would apply to both perpetrators and victims. A disproportionate impact on crimes of violence, as compared to property crimes, can be expected because there are similarities between perpetrators and victims of aggravated assault and homicide that we do not find between thieves and the owners of the goods they steal. An increase in crime in the parental generation and its accompanying family disruption predicts not only an echo increase in

44. *See id.*
45. *See id.*

offspring easily provoked into violent acts but also an echo increase in offspring likely to provoke others to violence, for example, an increase in potential victims. This double liability probably does not fully make up for the problem of the rare event, which tends to make predictions statistically insignificant and useless for designing practical interventions. It would be interesting, nonetheless, to test the logic of an echo effect of parenting disruption in empirical data.

Figure 4: Time Trends in Child and Adult Fighting Follow Trends in Child Behavior Problems[46]



(3) The special role of conduct problems. Zimring and Hawkins may be too pessimistic about the possibility of using changes in family and behavioral histories to prognosticate violence. Data from the Epidemiological Catchment Area show that there has been a steady increase in rates of conduct disorder in the United States over the last sixty or seventy years and a parallel increase in self-reported adult violence, including fighting, weapon use, spouse-beating, and child abuse (Figure 4).

46. 3 Sites, N = 11,000 (unpublished research on file with author).

The telling result is that if one holds conduct disorder constant, the rate of self-reported violence has not changed (Figure 5). The total increase in adult violence seems to be explained by the increase in conduct disorder. In this study, as in other studies, prediction from conduct disorder to adult violence is equally accurate across race and ethnic groups. I will be interested to know whether Zimring and Hawkins could accept this evidence as justifying what they call a "claim to predominance."[47]

(4) Decomposition into stages. There is another strategy that reduces the rare event problem. The general principle is to conceive of the event of interest as an endpoint in a continuum of behaviors that must each occur before the event of interest can occur. For example, among the veterans who returned from Vietnam in September 1971, the only ones who were at risk of using heroin within the first year after their return were those who had used heroin in Vietnam.[48] Heroin was so much more readily available and so much cheaper in Vietnam than in the United States that the potential United States market for its use had been exhausted. As a result, if we looked at factors predicting use after Vietnam in the total sample of returning veterans, we would be confounding factors leading to use in Vietnam with factors leading to use after Vietnam. The solution was to restrict the sample to veterans who had used heroin in Vietnam. Then we were able to detect factors quite different from those predicting use in Vietnam. We refer to this strategy as decomposition into stages.[49]

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47. ZIMRING & HAWKINS, *supra* note 1, at 103. Zimring and Hawkins state:

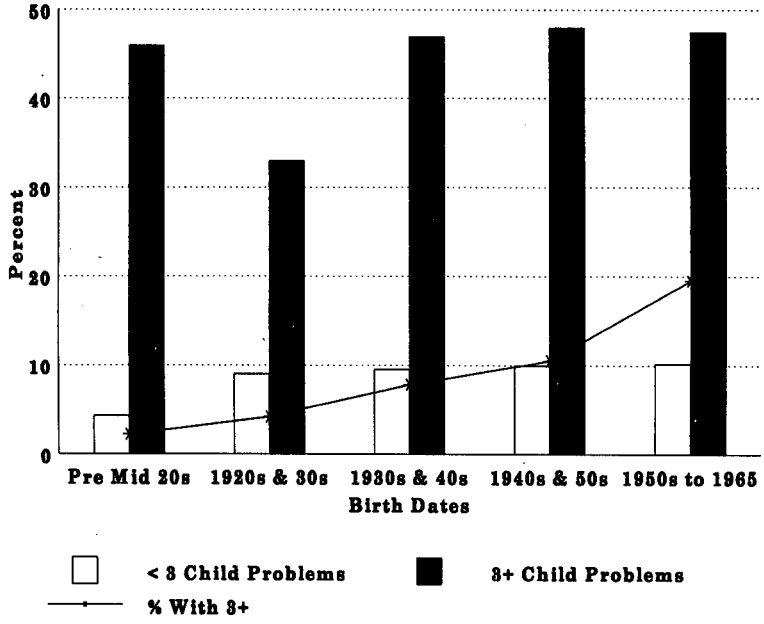
> There is in contemporary discussion of the subject a competition between theories of violence that emphasize social, individual, and public health approaches to the explanation and prevention of violent acts. We would like to call these *claims to predominance* in that the proponents of each approach are arguing that their particular perspective should receive more attention and resources than other ways of viewing violence. But these are not competing schools of violence causation in any real sense.

Id.

48. *See* Lee N. Robins et al., *Detecting Predictors of Rare Events: Demographic, Family, and Personal Deviance as Predictors of Stages in the Progression Toward Narcotic Addiction, in* ORIGINS AND COURSE OF PSYCHOPATHOLOGY: METHODS OF LONGITUDINAL RESEARCH 379, 383 (John S. Strauss et al. eds., 1977).

49. *See id.* at 380.

Figure 5: Had Child Behavior Problems Remained Stable, Violence Would Have Increased Very Little[50]



This strategy has one important drawback: the sample can become so small and so homogeneous that there is nothing left to predict. This was our experience when we went from predicting use of heroin after Vietnam to predicting the method of administration. To learn whether the method would be injection rather than smoking or snorting the drug, we limited the sample to veterans who used heroin after returning in order to avoid confounding the decision to use with the decision to inject.[51] Because eighty percent of all veterans who returned to heroin use in the United States did inject, the only predictor we found was residence on the East or West Coast.[52] There was insufficient variation in the reduced sample to get more detailed explanations for the injection decision. In larger samples, the successive restriction of the sample to those at risk of taking the next step

50. 3 Sites, N = 11,000 (unpublished research on file with author).

51. *See* Lee N. Robins & S. Slobodyan, *Correlates and Predictors of Heroin Injection*, *in* DRUG TRANSITIONS (Michael Gossop & John Strang eds., forthcoming 1998) (manuscript on file with author).

52. *See id.*

is a valuable method for seeking explanations specific to the question of interest. For the study of homicides, one might want to limit the sample to persons who already have had two or more adult arrests, because homicides are probably nearly vanishingly rare in persons with little or no arrest history, or perhaps to persons who have already had an assault arrest.

The strategies I have suggested require having longitudinal data either from records or interviews—or best of all, both—for the study subjects. These strategies cannot be implemented by reference only to published data, but they could be carried out if one had access to databases that link individuals across arrests. To take the next step, Zimring and Hawkins might seek publicly accessible databases which provide identifiers for linking individuals across data sets or forge collaborations with those who control such databases.

(5) Selecting strategic samples. Are there other strategies that could be used to predict increases in violence even when we cannot use data obtained in earlier eras to predict later eras and do not have access to complete criminal histories? Zimring and Hawkins consider the possibility that gun laws reducing access to revolvers might be effective, though they cite alternative predictions.[53] I wonder whether we might get closer to a resolution of these alternative views by comparing the frequency of violent offenses committed by persons known to have ready access to guns—policemen, soldiers, and hunters—with the frequency of such offenses in matched control groups.

The work of Zimring and Hawkins is mostly ecological—that is, it relates changes in the prevalence of homicide to what is known about historical changes in the same eras. It shares with other ecological studies the lack of a convincing method for proving a connection between those historical changes and variation in homicide rates. As an illustration, consider how much weaker the evidence for the effect of smoking on lung cancer would be if we knew only that lung cancer rates rose parallel to a rise in cigarette sales, but did not have smoking histories of persons with lung cancer to compare with a control group's history. The consequences of a lack of individual histories are underscored when there are historical changes that may be countervalent—some reducing the risk of homicide at the same time that other changes

53. *See* ZIMRING & HAWKINS, *supra* note 1, at 199-201.

occur that are thought to explain its increase. An example is improvement in methods for emergency treatment of gunshot wounds at the same time that the supply of guns is increasing.

Yet ecological studies are important first steps in laying out a research agenda. As another fertile ecological study related to homicide, we have work by Dugan et al.[54] and Rosenfeld[55] which suggests five historical events that may explain an observed twenty-year decline in intimate partner homicides in which the perpetrator is the woman, and the victim is her sexual partner or husband. This particular category of homicides has experienced a remarkably steady decline, while adolescent homicides have escalated.[56] The five factors are: a decline in the frequency of marriage, the initiation of no-fault divorce, better job opportunities and higher pay for women, the increased availability of no-cost or low-cost legal aid, and the opening of shelters for abused women.[57] The decline in marriage and initiation of no-fault divorce should reduce the number of households in which sexual partners cohabit, reducing the opportunity for conflict and abuse. The ability to support herself and her children, easy divorce, legal help, and shelters should provide an abused woman with the opportunity to separate from her partner without resorting to homicide when the relationship becomes intolerable.

IV. FUTURE DIRECTIONS

Although ecological arguments for both the rise and decline of homicide have plausibility, they would be much more persuasive if they were substantiated by follow-up studies and experiments that directly test the effect of these proposed causal factors. Both follow-ups and experiments may be feasible to test some of the hypotheses suggested by Zimring and Hawkins. The hypothesis that gun availability explains the high homicide rate could be tested. There have been repeated studies of high school

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54. *See generally* L. Dugan et al., *Explaining the Decline in Intimate Partner Homicide: The Effects of Changing Domesticity, Women's Status, and Domestic Violence Resources*, HOMICIDE STUD., May 1997.

55. *See* Richard Rosenfeld, *Changing Relationships Between Men and Women: A Note on the Decline in Intimate Partner Homicide*, HOMICIDE STUD., Feb. 1997, at 72-83.

56. *See* Dugan et al., *supra* note 54.

57. *See id.*; *see also* Rosenfeld, *supra* note 55, 73-75 (citing declining marriage rates as a factor in the decrease in intimate partner homicides).

students' access to firearms. These could be extended into follow-up studies to link changes in access in guns to frequency of involvement in shootings as either the victim or the perpetrator. To overcome the rare event problem, the samples might be limited to students in schools where gun access is initially close to fifty percent. The same hypothesis could be tested by selecting a random sample of parents of children with access to guns and persuading them to remove guns from the home or to lock them up. Then subsequent rates of gun-related violence in these households would be compared with those involving youngsters with gun access at home who were not part of the experimental group.

To test the ameliorating effect of legal services and shelters on the risk of murdering a male spouse or sexual partner, an at-risk-of-homicide sample might be defined as women who have sought police intervention in domestic violence. A follow-up study would investigate the frequency of domestic violence in the ten to fifteen years after the initial police contact in those who did and did not receive legal assistance, get a divorce, or move to a shelter during the year after the initial contact. An experimental design would offer legal aid and shelter to a random sample of these women and compare later episodes of violence with that of a matched control group from the same population. We note that we speak here of domestic violence, not female-perpetrated homicide. As usual, we have the problem of the rare event, and would probably have to settle for events associated with homicide such as aggravated assault, as well as actual homicides.

These few suggestions are just illustrative. They could doubtless be improved, and should be expanded to test more of the hypotheses proposed. Those of us meeting in celebration of *Crime Is Not the Problem*,[58] a book that stimulates and challenges us all to make the history of fluctuations in homicide rates a science, should take this opportunity to come up with other ideas that might help us to better understand the causes of dramatic changes in homicide rates over time and the differences across countries that Doctors Zimring and Hawkins have shown us. Establishing causal explanations for these variations in rates is no easy task, and answers will not be quickly or inexpensively achieved. But attaining partial explanations may be neither impossible nor useless. Surely Zimring and Hawkins have

58. ZIMRING & HAWKINS, *supra* note 1.

persuaded us that homicide rates are horrendous in the United States and worth our best efforts at finding explanations that might lead to successful interventions. Although Zimring and Hawkins are correct in their warning that understanding some of the causes of the high United States rate may not point the way to reducing it,[59] the possibility that these efforts might uncover a modifiable cause is sufficient to justify a very considerable investment.

59. *See id.* at 100-01. "[T]he assumption that the prevention of violence should be confined to the removal of factors that are properly classified as causes, . . . is both popular and nonsensical." *Id.* at 100.