
CRIMINALITY IN SPACE AND TIME: LIFE COURSE ANALYSIS AND THE MICRO-ECOLOGY OF CRIME

by

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Abstract: *In studying the relationship between communities and crime, most researchers use either one of two methods: quantitative and cross-sectional, or qualitative and ethnographic. The former has the advantage of permitting the researcher to look for general relationships among a great number of community variables, but the nature of the interactions occurring within the communities cannot be discerned. The latter has the advantage of permitting the researcher to describe street-level interactions in a neighborhood and relate them to its characteristics, but by its nature an ethnography can only investigate such interactions in a limited interval of time and space. This chapter describes an exploration into another means of studying the relationship between communities and crime, one based on archival data in the many public agencies that work in neighborhoods. By integrating the data from these agencies, it attempts "tell a story" of the relationship between neighborhood characteristics and crime.*

INTRODUCTION

For the most part, studies of crime and criminality do not take full advantage of many potential sources of information that would be useful in inferring patterns of criminal behavior. These sources are not all readily available, and not all can be employed using standard statistical (or other social science) techniques. In this article I describe some of the ways that I have been combining these different types of data into a place-based analysis of crime and delinquency. It is an attempt to incorporate into a methodological whole what Sampson (1993) has called "dynamic contextualism" and "narrative positivism." The goal is to use graphical tech-

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niques to present different types of data in ways that permit researchers to infer patterns, in recognition of Wild's (1994:168) prediction that in the future, "the primary language for promoting the human understanding of data will be sophisticated computer graphics rather than mathematics."

Since the pioneering studies of Shaw and McKay (1942), studies of criminality have taken into account the social and community context, in which the neighborhood conditions are seen as having a major effect on crime and delinquency. The studies usually fit into one of two categories. The first category focuses primarily on quantitative analysis, and attempts to account for the relationship between individuals and their community by considering the "community variables" collected by the U.S. Census Bureau. (Actually, the Census Bureau does not collect community data *per se*, but rather collects data about individuals and households, and aggregates them by census tract.)¹ This permits researchers to get an impression of the characteristics of the census tract and those who live in it, using data such as: age distribution, racial distribution, median income, percent employed, percent renters, percent on welfare, percent of housing stock that is unoccupied, etc. These are often used as independent variables in regression analyses, in order to determine their influence on (or to "control for" their effect on) the outcome of interest. These analyses have been useful in showing which community variables are statistically related to outcomes. However, for the most part, they are not as useful in describing the nature of the relationships. That is, the fact that areas with the highest unemployment rates and welfare rates contain the most delinquents is well-known, but the analyses are unable to show us how delinquency is affected by these variables.²

In addition, there are statistical problems in using such methods (Lieberson, 1985; Maltz, 1994). For example, most methods are based on linear (or log-linear) regression, which implies that individuals with similar characteristics react similarly—and (log)linearly—to the same conditions, which is rarely the case. More recently, methods such as contextual analysis (Boyd and Iversen, 1979; Iversen, 1991) and hierarchical linear analysis (Bryk and Raudenbush, 1992; Day, 1992) have been used to analyze community-level and individual-level data, to account for the effect of each separately. These newer methods are subject to the same problems.

The second major category of research on crime and community is the ethnographic study of a community. Ethnographies such as *Street Corner Society* (Whyte, 1943), *Talley's Corner* (Liebow, 1967), and *Streetwise* (Anderson, 1990) investigate the micro-interactions in neighborhoods, detailing the texture of the residents' lives from their own standpoint. These studies are very intensive, but very limited in space, time and

subjects: they can rarely cover more territory than a single block and more people than those in a single social network, and they are useful in studying what is currently happening but not what occurred at earlier times.

In this article I would like to suggest a third approach, one that I am currently using to study the life courses of youths in a high-risk neighborhood of Chicago. It involves obtaining data from many public agencies and integrating the data in a way that "tells a story" of the neighborhood in question. Obviously, the story will not be as detailed as one arising from an ethnography, nor will it cover as much territory as a sample-based study, but it does have other advantages. Rather than starting out by describing these advantages, I think that it would be more useful to describe the thought processes that led to the choices made in this research. I then discuss the research strategy I am using, and describe some of the problems in obtaining useful data on both individuals and places.

RESEARCH GOAL

My initial intent was to study the effect of residential mobility on crime. Some years ago, when looking through juvenile "rap sheets," I was struck with the fact that on many of the youths' records there were almost as many new addresses as there were offenses. It brought out the stark reality facing many children of low-income families: that residential transiency is a fact of life in major cities. In some parts of Chicago, and in other cities as well, teachers find that only about a third to half of the students in their classes at the start of the school year are present at the end of the year (Lobosco, 1992).

Many have recognized the negative consequences of moving: Dunn (1988) noted the detrimental effects of moving on young children; Hardesty et al. (1993) determined that female prisoners who moved frequently had the lowest self-esteem. Wood et al. (1993) found that frequent moving was associated with educational and behavioral problems among youths. Sampson and Laub (1993:83) found that "residential mobility is significantly related to both self- and teacher-reported delinquency."

But moving may not be an altogether harmful factor. Farrington (1988) noted that youths who moved out of London exhibited decreased criminality. In Chicago, court cases have forced the Chicago Housing Authority to permit families to relocate in middle-class communities, i.e., to move out of high-risk areas.³ So the consequences of moving may not always be negative. But no one has actually examined the effect of the frequency of moves and the character of the place to which one moves on

delinquency, education, and other Outcomes. Based on this observation, moving itself may be a significant criminogenic factor, one worthy of studying.⁴

However, neither of the two research approaches described above, the extensive or intensive, would permit me to perform this study. The sample-based study provides a snapshot of many individuals, but their moves cannot be linked to events or people in their neighborhoods. The ethnographic study provides a picture of great depth, but of too few individuals to draw useful inferences. So I decided to use alternative methods, and began to consider the issues I needed to deal with.

Four data-related problems arose immediately. *First*, the moves recorded by the police are probably not the only moves experienced by these youths; how could data be obtained on any moves between arrests, moves that would not be recorded by the police? *Second*, what was the experience of other youths who live under similar circumstances as these youths? Frequent moving is a common occurrence among certain types of families (e.g., military families), and most of these youths do not become delinquent. But the nature of the moves of families living in poverty may be different. How could I get data on the moves experienced by all youths living under the same circumstances of poverty and/or in high-risk areas, not just the delinquent youths? *Third*, assuming I could get information about all moves experienced by all the youths, was there some way to distinguish between "upward" moves (i.e., out of high-risk neighborhoods) and "lateral" or "downward" moves? *Fourth*, supposing I could get the data, how should I choose my sample of youths to study? Should I choose a random sample and follow them through their lives? And how would I track them?

RESEARCH STRATEGY

In order to answer these questions, the research design needs to be described in some detail. In this section I explain why I study a single neighborhood and a population instead of a sample; why and how data from different agencies are integrated; and the reasoning that went into the choice of neighborhood and subjects.

Geography and Crime

Current research on the relationship between crime and geography has been developing along two distinct lines. The first focuses on crime opportunities. It was given its initial impetus in the environmental design work of Jeffery (1971), in the geographical approach taken by Harries (1974),

in the routine activity work of Cohen and Felson (1979), and in the environmental criminology work of Brantingham and Brantingham (1981). The theoretical underpinnings of this focus on crime opportunities are based on rational choice theory (Cornish and Clarke, 1986), and have been developed more recently by, among others, Block and Block (1993), Brantingham and Brantingham (1984), Cusson (1993), Felson (1986), LeBeau (1987), Maltz et al. (1990), Rengert and Wasilchick (1985), Roncek and Pravatiner (1989), and Sherman et al. (1989). (See also Zahm and Cromwell, 1993.) This approach focuses on the proximate causes of crime as seen through the eyes of a potential offender: What is available for me to target, and how easily can I get away with it? It looks at spatial and temporal patterns of crime to search for individual patterns of behavior, and for what might be useful as preventive measures.

The second approach relating geography and crime focuses on correlates of delinquency. It is based on the work of Shaw and McKay (1942), who proposed that delinquency develops in areas of high social disorganization, marked by high levels of poverty, residential mobility and population heterogeneity. As noted by, among others, Byrne and Sampson (1986), Bursik and Grasmick (1993), Reiss and Tonry (1986), and Skogan (1990), individual and community variables are studied to determine the relative extent to which they are associated with the development of delinquency. This approach uses cross-sectional data that allows for comparisons of neighborhood characteristics across cities.

The approach taken herein borrows from both of these schools. Like the crime opportunity approach, it relies on a map-based investigation rather than community variables to characterize an area. Nor does the approach compare effects across areas, but rather looks intensively at one area and its inhabitants. Like the correlates of delinquency approach, it focuses on why individuals become delinquent. However, the focus of the approach is not on the availability of targets within the area, but on how the *micro-ecological characteristics* of the life courses of individuals and the area in which they live affect whether they become delinquent. In other words, the micromethods of one type of geographic analysis are used to achieve the goals of the other type of geographic analysis at the microlevel, not at aggregate cross-sectional level.

I do not seek to confirm hypotheses so much as to generate hypotheses: how many youths on the block that had a drug house got involved in the drug trade, and how do they differ from those who didn't? How (or why) did the building deteriorate to the point that a drug market was able to develop there in the first place? This study, therefore, can be looked upon as an attempt to understand the dynamics of a single neighborhood. No claims are made as to the representativeness of this neighborhood;

however, until we study at least one neighborhood in depth, we have no point of departure to discuss the characteristics of any neighborhood.

A Population, Not a Sample

Social scientists know the value of using a sampling strategy based on randomization. It permits them to make inferences about the entire population by studying only a small number of the population though it does have some drawbacks. In the study of delinquency, random sampling prevents one from considering the effects of what Zimring (1981) has called a "well-known secret" (see also Reiss, 1982, and Reiss and Farrington, 1991)—that youths start out committing crime in groups, not individually. Random sampling precludes one from investigating how the offending careers of youths interact, since it is hardly possible that all youths in a network will be in a randomly selected sample.

In addition, sampling restricts full consideration of the characteristics of the youths' neighborhoods. When a population is sampled, its subjects are drawn from many neighborhoods. Since it is difficult to give a complete description of every one of these neighborhoods, it is usually necessary to characterize them using a handful of variables. Such studies attempt to incorporate "community effects" in their analyses by including the community-level variables described earlier (percent owner-occupied housing, median income percent on welfare, etc.).

But these cross-sectional studies overlook the fact that the social ecology of different communities, even those that appear to share the same characteristics, can be entirely different (Stark, 1987). For example, two public housing projects in Chicago that are notorious for their crime problems, Robert Taylor Homes and Cabrini-Green, have different "cultures" and characteristics—and even different buildings within them have different characteristics. Gang homicides in Latino communities have different patterns than gang homicides in black communities (Block, 1991). Although cross-sectional studies have certain advantages (and sampling plays an important part in them), their primary drawback in terms of the goal of this study is that they measure *variation* as distinct from *change* (Farrington, 1988:168).⁵ Since I want to determine the effect of moves on youths' subsequent careers, I focus on change. And to measure change, a longitudinal, not a cross-sectional, design must be used.

Therefore, I decided *not* to start with a random sample of delinquent youths and follow their moves, but to start with a single well-defined high-risk area and follow *all* of the youths living there. This strategy needs some elaboration and defending. Why only a single area? How could I

expect to obtain results from one area that could be generalizable to other areas? And how big an area should be chosen?

Integration of Data Sources

To answer these questions, additional aspects of this study need to be described. The goal is to use agency data, but not just from criminal justice agencies. Data from schools and juvenile justice agencies, from police and fire departments, from welfare and health agencies, from planning and housing, and social workers and building departments sit in their respective information systems or file cabinets, but no efforts are made to integrate them in any meaningful way. This study attempts to do so, on a pilot basis. Therefore, selecting a single area in which to accomplish this task makes sense: if it can be done in one area, and if the results are useful, then additional efforts can be justified later to integrate the information elsewhere.

Social scientists are often leery of using official data, and for good reason (Kitsuse and Cicourel, 1963). Studies abound of the way that crime statistics have been used in the past to mislead the public into believing that the police were more effective than they actually were in curtailing crime (e.g., Seidman and Couzens, 1974). Although this practice may still exist in some jurisdictions, it appears to be on the wane, as departments professionalize⁶ and as the public becomes more sophisticated about the limits of what the police can do to stop crime.

My own experience over the past few years has given me more confidence in the adequacy of data provided by the police, perhaps not in terms of the totality of crime in a jurisdiction (since citizens under report crimes of different types for different reasons) but in terms of the nature of the jurisdiction's crime problem—as well as other problems for which citizens are wont to "call the cops." (Of course, the data from other agencies may also have their own problems of which the researcher should be aware.)

While the use of agency data can never achieve the perceptiveness of a good ethnography, it does have the advantage of reaching back into the past and describing events as seen and recorded by probation officers, social workers, building inspectors at the time they happened. It permits one to understand, at a minimum, the interactions between an area's residents and the institutions that deal with them, and can provide a great

deal of food for thought. Consider, for example, how data from many agencies can be used to describe patterns of behavior.

A Hypothetical Example

Suppose, in our selected neighborhood, we collect data on three youths. The first set of data we get is from the police, as outlined below:

1. Mike, DOB 3/4/77, address as of last offense, 1234 Main Street:
 - 6/8/89 vandalism, station adjust
 - 7/2/91 possession of drugs, station adjust
 - 5/13/92 aggravated assault (gang-related), referred to court, dismissed
 - 1/20/93 theft, referred to court, dismissed
 - 4/12/93 armed robbery, detention, referred to court, probation
 - 8/12/93 disorderly conduct, referred to court, probation

2. John, DOB 9/16/78, address as of last offense, 1238 Main Street:
 - 5/13/92 aggravated assault (gang-related), referred to court, dismissed
 - 4/12/93 armed robbery, detention, referred to court, probation
 - 6/18/93 theft, referred to court, probation.

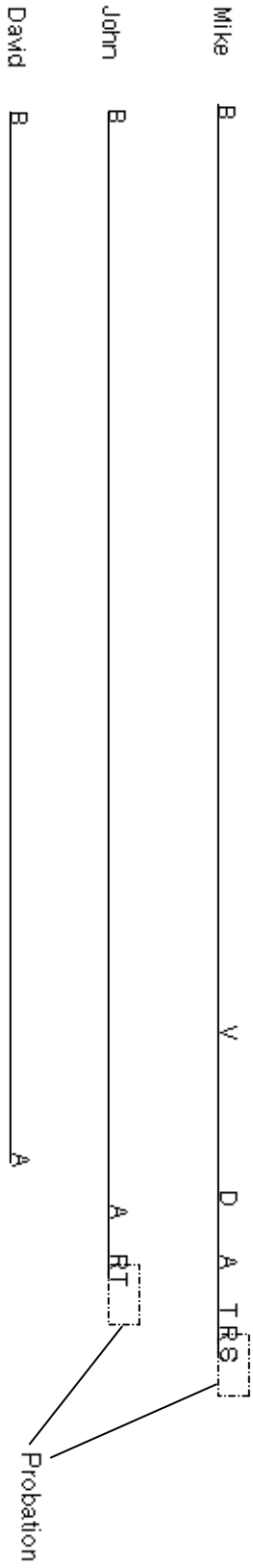
3. David, DOB 6/23/79, address as of last offense, 1240 Main Street:
 - 5/13/92 aggravated assault (gang-related), referred to court, dismissed

Analyses based on this type of data have been found to be useful in determining the criminal career patterns of offenders (Blumstein et al., 1986). One can construct offense trajectories for these offenders, and estimates can be made of their career parameters (date of onset, offense rate, and termination date).⁷ Figure 1 depicts the offense career trajectories of these three youths. But other agencies also collect data that would be useful in studying criminal careers.

Suppose that we also have additional information from a number of different state, county and municipal agencies to flesh out the lives of these youths. Based on their information we find the following:

Mike was first arrested for vandalism in 1989, at age 12, while living in another neighborhood (addresses obtained from *school data*) equally as high-risk as his current neighborhood (based on *census data* for the neighborhoods in question). His family moved in 1990 to his present

Figure 1: Arrest Career Patterns of Three Youths



LEGEND:

- A: Aggravated assault
- B: Birthdate
- D: Drug possession
- R: Armed robbery
- S: Disorderly conduct
- T: Theft
- V: Vandalism

address at 1234 Main Street, into a building owned by a land trust (*county assessor's records*) that had subdivided the large apartments into smaller ones (*zoning department records*). At that time the building was filled with families receiving Aid to Families With Dependent Children (*state welfare agency records*), including Mike's. Immediately after this period the number of building code violations increased substantially (*building department records*).

The building next door, at 1236 Main, was a two-flat that had been occupied by its owner until 1988 (*recorder of deed's records*), when a fire destroyed the rental apartment (*fire department and building department records*). Since the area was "red-lined" (*state insurance department records*), the owner had no insurance and, since he was living very close to the edge, was forced to abandon it in 1989 (*housing department and tax assessor's records*). [This may have been the reason that the land trust subdivided 1234 Main.] It was subsequently used by drug dealers for a number of years (*police narcotics division arrest records*). Mike was arrested at age 14 in connection with his acting as a lookout for drug dealers.

Mike was then arrested in 1992, at age 15, along with John (1238 Main) and David (1240 Main), who were aged 13 and 12, respectively, at the time (*police and juvenile court records*). They were arrested in connection with gang activity (*gang crimes unit records*). Mike's grades (*school records*) had been low for some time; those of John and David, which had been good until 1990, began to suffer greatly after that time.

In 1993, six months after the boys were arrested, David's family moved (*school records*) to a higher-income area (*census data*). His grades soon improved. John's family stayed in the same apartment, and John had subsequent arrests, along with Mike.

This hypothetical scenario paints a highly idealized picture of what can be gleaned from archival data. But it does serve to show how data about individual people, families, and buildings can make concrete some of the theories that we have about crime causation and attempt to infer from aggregate data. In particular, it can be used to show how crime may be affected by housing conditions, youth networks and moving.

Note also that this example includes the use of data from four levels of government: federal census data; state welfare (and possibly insurance) data, county court, property, and tax data; and municipal police, fire, school, housing, building, and zoning data. Now that so many agencies have computerized their data, studies of this type become feasible, even though experience with many of these agencies indicates that there are many

problems to be worked out in combining such data. Yet it does seem possible to dig down into agency archives and use their data to learn a great deal about the social structure of neighborhoods.

Displaying Life Course Data

In most studies, the presentation of data is usually in the form of statistics or tables. Even when the data are presented in graphs, they are aggregated in some form. But aggregation can be accomplished in different ways. In this particular case, since I am looking intensively at a single neighborhood and its youthful inhabitants but using data from many agencies, I want to "aggregate" the data in a different way. The goal is to be able to show how and when different events affected the individuals in question, and to portray them in a way that helps the reader to infer patterns.

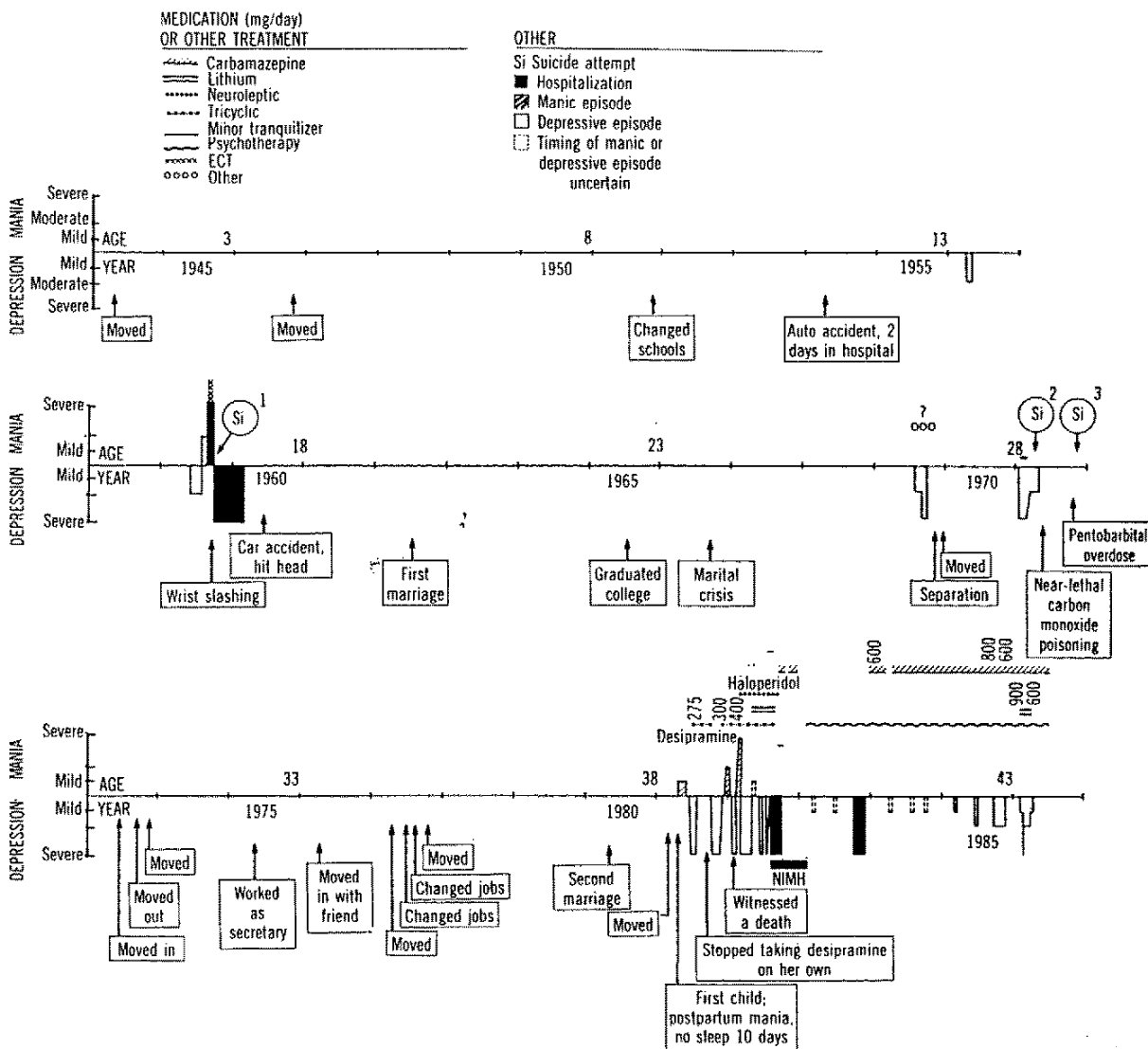
One way to do this is by using the graphical techniques developed for charting the life course of psychiatric patients (Post et al., 1988). Figure 2 illustrates the way the life course of a manic depressive is charted, showing the relative timing of the patient's episodes and the sequencing of the different medications prescribed. When such charts are studied in aggregate, one can determine the differential effect of various treatment modalities.

A first attempt to use life course charting in studying delinquency is shown in Figure 3. This figure shows: (1) the sequence of each individual's events; (2) the relationships between the youths, in terms of their joint offenses; and (3) the relationships between the youths' activities and their environment. While this figure is admittedly crude—it would benefit from better symbols and/or icons, color, and other graphical additions and techniques—it depicts patterns in a way that would not be possible with the methods and data that are normally used in studying delinquency. Note that the youths' life course trajectories are associated with the buildings in which they live(d), and the "life course" trajectories of the structures are also included, to permit one to infer relationships between the individual behaviors and structural characteristics of the neighborhood. Although the example does not provide "statistical significance," in looking at the life course trajectories of about 500 youths, I hope to be able to infer patterns of behavior among the youths in the study.

A great deal of detail is shown in Figure 3, but this is not necessarily bad. As Tufte (1990:37) says, "Simplicity of reading derives from the context of detailed and complex information, properly arranged. A most unconventional design strategy is revealed: *to clarify, add detail.*" Standard statistical analyses may hide too much; to quote Tufte again (1990:50), "Data-thin, forgetful displays move viewers toward ignorance and passivity,

Figure 2: Life Chart of the Course of Illness of a Manic-Depressive Woman

(Source: Post, 1988)



and at the same time diminish the credibility of the source. Thin data rightly prompts suspicions: "What are they leaving out? Is that really everything they know? What are they hiding? Is that all they did?" The problem is not so much in the amount of detail, but in its presentation. Using color, texture, and different icons and overlays would permit a great deal of information to be displayed. Advances in computer graphics and software will permit such graphical representations to become widespread. The specifics, however, need to be explored to determine how best to represent different types of data.

This approach itself is not so much new as it is a new means of doing old social science. In much the same way that crime mapping (e.g., Maltz et al., 1990) harks back to the Chicago School of Sociology and its emphasis on the geography of crime (e.g., Shaw and McKay, 1942), the "life course" approach harks back to the Chicago School's emphasis on the oral history of delinquents (Bennett, 1981). Using the approach I describe, however, the history is not based on interviews with the delinquents themselves but on the information present in agency files. If oral histories were available, I would use them as well—there is no reason why the same life course methodology cannot be used to include oral histories as another source of information.

Choice of Subjects

As I mentioned earlier, sampling prevents one from investigating the interactions among individuals in a community. But not all the interactions are peer-to-peer, within the same birth cohort. As Shaw and McKay (1942) noted, there is a great deal of intercohort transmission of social pathology, as older youths provide an avenue for their younger friends and siblings to engage in delinquent acts. For this reason, it would be preferable to include in the study all resident youths in the neighborhood. Yet there is a limit to how far back one can go and to how far back the records go, as will be detailed later.

The decision was made to draw the line at five years. That is, all youths in five consecutive birth cohorts would be included. This seems to be a reasonable interval: for example, it would not be expected that 15 year olds would commit (many) delinquent acts with 10 year olds, while they might do so with 12 and 13 year olds. In particular, the 1970-1974 birth cohorts were tentatively chosen, that is, everyone born between 1/1/70 and 12/31/74.⁸ Choosing an earlier cohort would not be possible, since the computerized data maintained by the Chicago Police Department Youth Division does not include youths born before 1969. Nor would it be useful

to choose much later cohorts, since the goal was to follow the youths' records through early adulthood.

Neighborhood Selection

Because it is the first attempt to combine such different sources of data, I decided to focus on a high-risk area, one characterized, as Wilson (1987) described

... by massive joblessness, flagrant and open lawlessness, and low achieving schools, and therefore to be avoided by outsiders. Consequently, the residents of these areas, whether women and children of welfare families or aggressive street criminals, have become increasingly socially isolated from mainstream patterns of behavior [p. 58].

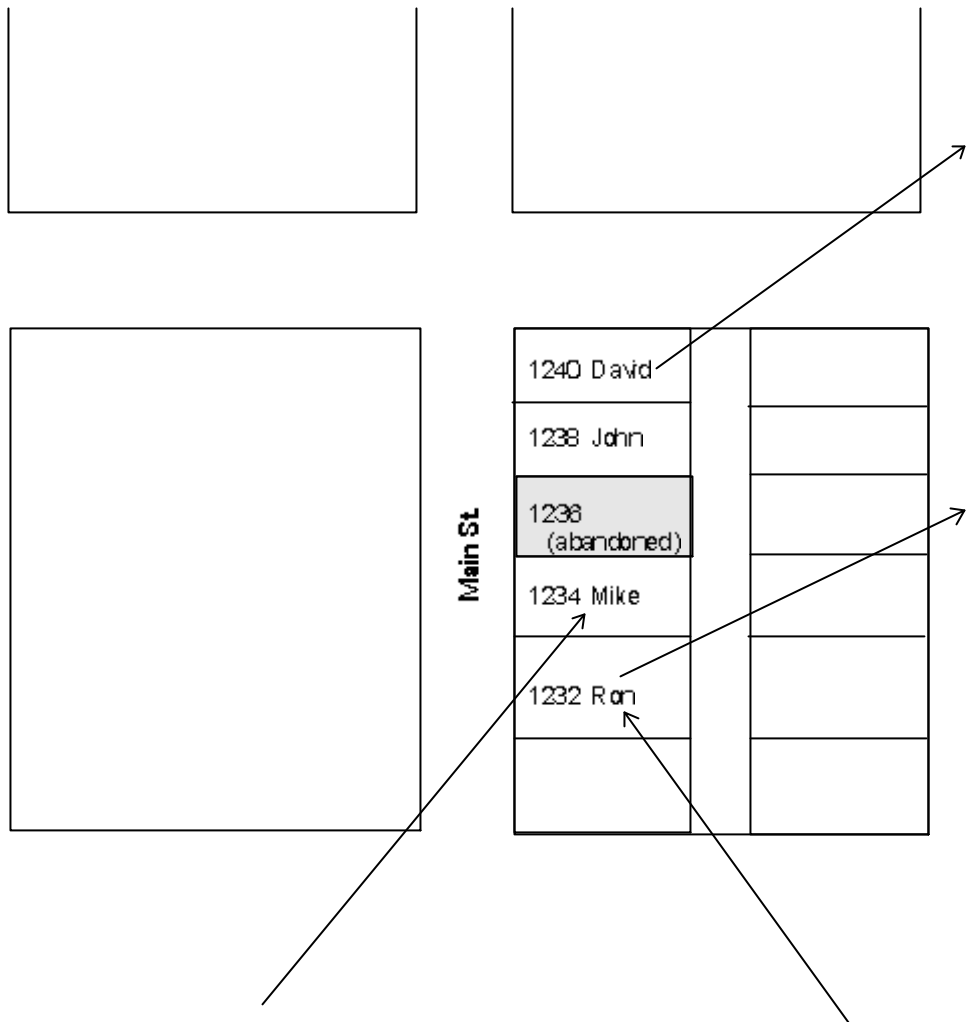
One of the more salient features of such an area would be a high delinquency rate, i.e., a large number of youths with juvenile records.

I chose an area that did not contain a low-income public housing project. I felt that inclusion of such a project would make it more difficult to interpret the results. Moreover, it would make it easier to identify the selected neighborhood, and I wanted to ensure the privacy and confidentiality of all individuals in the study. I spoke with a number of officials in the Chicago Police Department, and tentatively selected one of the areas they recommended. I based the neighborhood size on the number of individual youths I wanted to include, about 500 in five birth cohorts of about 100 each. If we assume a yield of about five live births per block per year, this would put the size of the neighborhood at about 20 blocks.

There are four principal geographical trajectories of youths who lived at one time or another in a neighborhood (Figure 4). First, they may have been born there and have lived there continuously up to the present (the case of John). Second, they may have been born there and subsequently moved (David). Third, they may have been born elsewhere and subsequently moved into the neighborhood, and are still living there (Mike). Fourth, they may have been born elsewhere and are currently living elsewhere, but at one time lived in the neighborhood (Ron). If we assume that about half of the youths in a cohort were born elsewhere, then the estimated neighborhood size is reduced to about 10 blocks.

I subsequently met with officials from the Department of Research and Evaluation of the Chicago School Board to investigate the possibility of obtaining school data. They were open to the possibility, but wanted to explore the special privacy and confidentiality guidelines under which they operate. While we were negotiating such issues, they looked at the area I had selected and suggested that since it was about the same size as a

Figure 4: Possible Geographic Trajectories of Neighborhood Residents



(primary) school attendance area, I consider using those borders instead of the arbitrary ones I had fashioned. This had two virtues: first, most of the youths would have gone to that school, so it might facilitate the acquisition of data; second, school attendance areas are fashioned using common-sense borders like heavily trafficked streets and thus represent a certain geographical compactness and contiguity that one would normally associate with the term "neighborhood." Since my first-cut neighborhood had a considerable overlap with one of their school attendance areas, we decided to settle on that area. They estimated the mobility rate in this school to be about 50%.

Obtaining Individuals' Addresses

Obtaining the names and addresses of all youths in an area is not a straightforward task. In fact, ensuring the privacy and confidentiality of such data has taken the better part of a year to arrange-and is based on less information than was desired.

Public School Data

Where can one obtain information on every youth living in an area? The obvious answer is the school system. Since virtually all young children do go to school, and most of them to public school, school records are created for them at initial registration. At this point it was necessary to make a few more compromises concerning the construction of the group under study. First, we cannot obtain address information at the time of birth, but we can obtain it at the time the youth is enrolled in public school.⁹ So for the most part, all address information will start at approximately age 5.

Second, some may never be enrolled in public school, so for them-unless they or their siblings appear in another agency's (computerized) records, such as that of the Chicago Police Department Youth Division-we will have no record at all of them. But this is fairly unlikely for the neighborhood selected, because of the high level of poverty. And even those parents who send their children to parochial school may not do so for the first few years of school, for a number of reasons: the public school is free and within walking distance of home; public schools often have inexpensive after-school programs; and the problems found in such schools rarely exist in the lower grades. It may also be that some youths transfer to schools outside of Chicago, or Illinois, or even the U.S.¹⁰

However, considering the income level of the area, this would probably be minimal.

Third, it is known that many students use false addresses so that they can enroll in schools considered "better" (safer or academically more rigorous). It is not known how this will affect the study results, although I expect it to have a minor effect. Moreover, this occurs for the most part when youths are of high-school age, so the first part of their school careers should contain valid addresses. In addition, for those older youths who have younger siblings, we may be able to determine the addresses of their siblings as a check on where the youths actually live.

Once the youths leave school, tracking them may become more problematic. At this point the focus will shift to the records of the Chicago Police Department and Cook County Juvenile Court, and possibly to the Illinois Department of Children and Family Services, to see the extent to which these individuals have police records, juvenile petitions (which will not all be for delinquent activity) and welfare-related problems. It is not expected that all of the tracked individuals will have additional records, even in a high-risk neighborhood; however, this is one of the matters that the research project can address.

Identification and address information is being provided by the Chicago School Board (CSB), but no achievement data will be provided along with it (see the section *Obtaining School Data*, below). Moreover, the CSB does not have computerized records that track students through their school careers. It creates an archive tape every year, containing the name and address of every student, along with scholastic achievement information. That is, Mike's 1983 school record is on the 1983 archive tape (with his earlier address), and his 1984 school record is on the 1984 archive tape (with his 1234 Main Street address); to have a complete record of Mike's addresses, the CSB needs to compile it from each of the dozen or so annual tapes on which he appears.

Voting Lists

To ensure that we have identified all the youths living in the area we intend to look at voting records as well, to identify the adult residents. Those who vote are probably more likely to be able to afford parochial

school, so this can be used as a check on the number of youths not identified by public school records.

Reverse Telephone Directories

Another source of information about residents in a community is the telephone book. We are investigating the possibility of gaining access to reverse telephone directories (those listed in order of address, not by name) for the past 20 years, to provide a further check on who lived in the neighborhood at different times.

Obtaining Data on Individuals

Access to information about individuals, much of which may be sensitive, is not (and should not be) given without some restrictions. Gaining access to agency records can be a complicated process, and lessons learned from one agency are not necessarily useful in dealing with another, since the requirements vary greatly from jurisdiction to jurisdiction and agency to agency. Obtaining such information requires patience, persistence and (in some cases) connections. My longevity at the University of Illinois at Chicago (UIC) definitely helped, since I have worked with agencies' sensitive data before and am a known quantity—and since former and current students are employed by some of the agencies. In some cases, however, there are legal restrictions. This is the case with school data.

Obtaining School Data

The primary means of identifying the resident youths in a neighborhood will be through the public school records. But there is a major obstacle to this—the Family Education Rights and Privacy Act (FERPA). This federal law was enacted to ensure that information from school records did not become readily accessible outside the schools, for example, to prospective employers. Researchers can use school data, but only as long as individuals cannot be identified. According to this act, no access can be given to school records that might conceivably be used to associate the individual students with their records.

Data problems related to confidentiality of records of research subjects abound in social research (Boruch and Cecil, 1983). In some instances, agencies require a pledge by the researcher and/or a description of the steps taken to ensure that no one's privacy or confidentiality will be breached. In cases where the link between record and identification is

proscribed, many different strategies have been used, but for the most part they involve averaging cases so that single individuals cannot be identified. Such a strategy would not work in this case, where there is a need to link individual records from many different agencies, because we need to have a means of identifying the individual whose records are to be linked.

I am working with the Chicago School Board to find a way to follow the spirit and the letter of the law, while still providing me with the information I need. Although the exact mechanism has not yet been set, the following are some possibilities.

First, it may be possible to use the same strategy that has been employed by the Census Bureau, to swear me (or another person) in as a temporary employee of the Chicago School Board. That person could take the data set that already includes the other (i.e., non-school) information and, after creating a new identifier for each person—and securing the key—append the school information to it. Another possibility along the same line is to provide the data set to a CSB employee, who then adds the school data to the data set and creates anonymous identifiers, again keeping the key. A third possibility is to ask a neutral third party to perform the record-linking and to keep the key.¹¹

My hope is that a fourth possibility will be accepted. Because of the way the student data are kept (at least, the computerized data), the CSB does not know how many students move, or how such moving affects their scholastic achievement. If they decide that such a study would be of value to them, it is entirely possible (and within the letter and spirit of FERPA) for them to commission someone to perform such a study. If this were the case, the achievement data could then be linked to the other records without some of the contortions outlined in the previous paragraph.¹²

Obtaining Criminal Justice Data

The Chicago Police Department's Youth Division maintains on-line the records of youths who have had police contacts, either because of delinquency or for other reasons (e.g., parental abuse and neglect, running away). These records are purged after the youth reaches age 25 if he or she has a Youth Division number (i.e., has committed a delinquent act that entailed a referral to court); if the youth is in the system for non-delinquency reasons, the records are purged after age 19. It was for this reason that the birth cohorts 1970-74 were selected (in 1993, when I started this project), since the Youth Division would still have records of

delinquents for at least another two years—until 1995—giving me some leeway in collecting data from this agency.

I could not gain access to the data, however, until I had received permission from the presiding judge of the Cook County Juvenile Court to review juveniles' records. This entailed providing her with a description of the project and of the procedures to be used to maintain the records' anonymity, privacy and confidentiality.

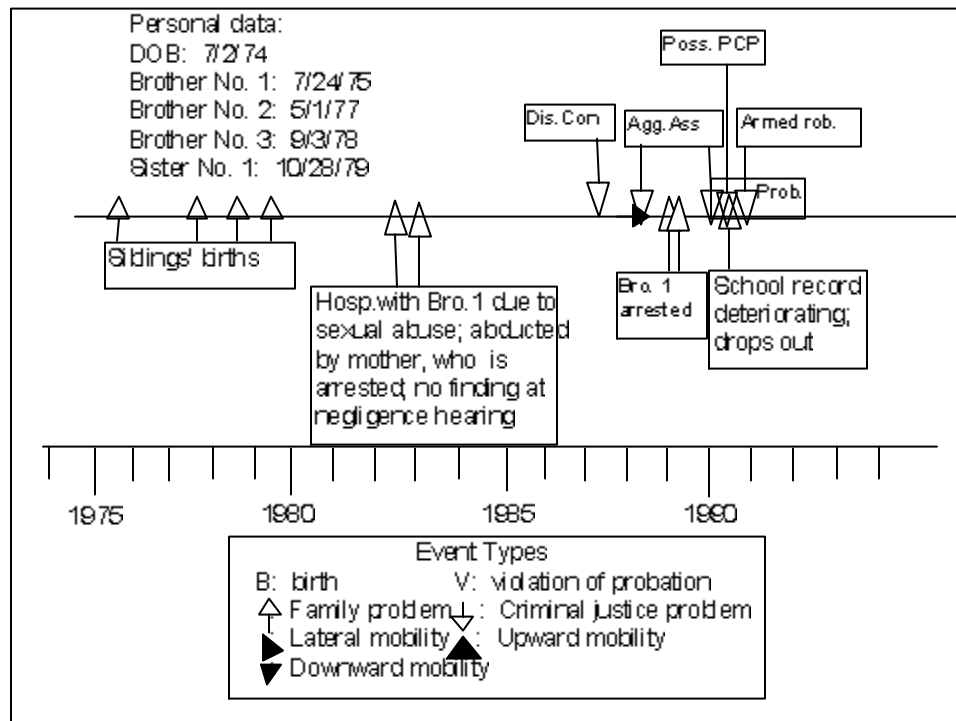
The computerized Youth Division data set contains only the latest recorded addresses of the youths on the system, so it would not be suitable for obtaining information related to moves. But while waiting for the address information from the Chicago School Board, on all youths living in the selected neighborhood, I decided to start by obtaining data on some of the youths in the Youth Division data set who met the criteria of age and address. The information on the computer system is very limited, but using it we were able to select individuals whose juvenile court records could then be accessed.

What we have found is that the paper records in the Cook County Juvenile Court are very rich in detail. Reading through them, which includes reports by social workers on family and medical problems, siblings' activities, and (in some cases) other agencies' involvement with the family, provides a great deal of useful information about the youths' life courses (Figures 5 and 6).

State Welfare Data

Not all youths in the neighborhood will have come to the attention of the juvenile court. To find out about these individuals I will use, among other sources, data from the state welfare agency, the Illinois Department of Children and Family Services (DCFS). DCFS maintains records on the families it serves on two computer systems, the Child Abuse and Neglect Tracking System and the Child and Youth Information System. The agency requested that formal application be made for access to their Research Committee, equivalent to obtaining approval from the university Human Subjects Review Committee. To gain access to their records I wrote them a letter, including a copy of my proposal and my Human Subjects Review Committee approval from UIC, and described the confidentiality procedures that I would use, the ones already approved by the Juvenile Court,

**Figure 5: A Single Youth's Record,
Based Only on Data from Juvenile Court**



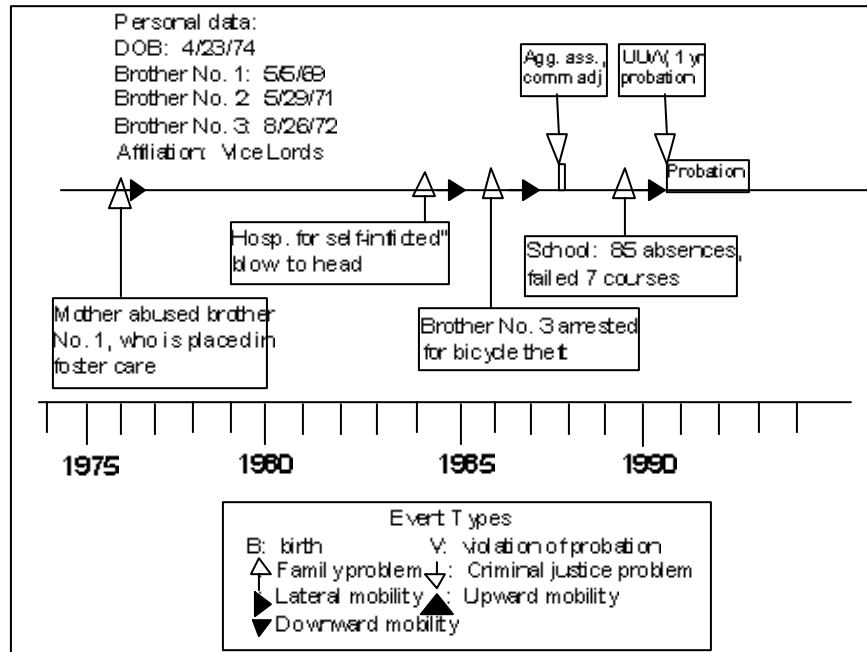
the Chicago School Board, and the CPD. Although I have received formal approval from them, I have not yet incorporated DCFS data in the study.

Incorporating And Integrating All Data Sources

My original intent for the pilot study was to do a complete analysis of five or six youths, by sending research assistants through every agency to collect data on each of them. Once I gained access to the Cook County Juvenile Court, however, I decided to keep the research assistants there. for a number of reasons:

- (1) The juvenile court information proved to be very rich in detail and texture, and we spent a great deal of time in developing procedures and standards for acquiring it.

**Figure 6: A Single Youth's Record,
Based Only on Data from Juvenile Court**



(2) Learning the court system (acronyms used, what the different documents mean and how they are used, where things are located, etc.) required a substantial time investment.

(3) Were I to request data from another agency that entailed a similar "learning curve," I would get little from either agency.

(4) It would be wasteful of the "social capital" I invested in gaining access to an agency were I to leave it after a few weeks' time with only a few cases.

(5) It might prove very difficult to return to the agency a second time, especially if they were set up at one time to receive research assistants and did not want to be bothered again.

Thus, although I have been given permission to gain access to data from a number of agencies, I have limited my requests for the time being, until I am assured of funding and sufficient research assistance, for the reasons given above. What has been most surprising is the extent to which

I have been given access. I can only assume that these agencies are also aware of the counterproductivity inherent in maintaining isolated information systems, and are interested in seeing the extent to which new insights and approaches might be forthcoming from joining forces.

Obtaining Information about the Physical Neighborhood

As Figure 3 shows, information about the built (or deteriorating) environment can be very useful in inferring causal links about criminality. Sources for this include the city housing, building, and fire departments, and the county assessor's office and recorder of deeds.

Obtaining Building Structural Data

In Chicago there are two different agencies that deal with the structural integrity of buildings, the Housing Department and the Building Department.¹³ From the Housing Department I obtained the addresses of all lots and buildings in the neighborhood and their overall condition—size of parcel, address range, land or building use, vacancy status, year of construction, and number of units (for buildings).

The Building Department has records relating to code violations that go back to the late 1960s. The more recent data concerning each building are on their computer system, but the earlier data can be read on microfiche. Although obtaining it can be tedious, the early information can be of considerable utility in attempting to trace the roots of a neighborhood's decline.

Fire Data

The Chicago Fire Department maintains records on structural fires. This can also be a useful source of information on building structural data, since in citing a building for code violations, the Building Department inspector may not include the cause of the damage in his or her report.

Building Ownership

The Cook County Recorder of Deeds maintains records on the ownership of all property and on any liens against the property. This source of information will be useful in making inferences about the causes of

decline, which may be related to changes in the percentage of owner-occupied houses in the neighborhood.

Tax Assessor Data

The Cook County Tax Assessor's Office has information on assessed value and property tax payment. Property tax assessment levels are supposed to follow market values, but there is often a long lag between changes in market values and changes in assessments.

Data Analysis

The purpose of analysis is to infer patterns of behavior from the data. Very often, social scientists use regression-based techniques to accomplish this. But most behavioral phenomena are non-linear, and most statistical models assume linearity (Liebersohn, 1985; Maltz, 1994). In particular, patterns that depend on land use and other geographical characteristics cannot ordinarily be modeled as linear. The eye, however, can integrate the spatial characteristics of a pattern in very non-linear ways. It is for this reason that I feel that the best way to analyze these very disparate types of information is to depict the life courses of the individuals and of the structures, and key the life courses to a map of the neighborhood.

Another reason for doing so is that, in my experience, a great deal of information can be lost when data are aggregated beyond the block level. For example, in driving through the neighborhood in question I was struck by the great degree of deterioration of the housing stock on all blockfaces; *except* those that sported "Neighborhood Watch" signs: these were relatively untouched by urban decay. To my mind, aggregating these blockfaces with the adjacent blockfaces in some ways devalues the efforts of these residents, by lumping them in statistically with their less diligent neighbors. Nor is it necessarily a wise statistical practice to ignore this variation.

The primary reason data are aggregated beyond the block level, perhaps, is that there is very little block-level information available from the census. But if distinct patterns emerge at the block level that are not apparent at higher levels of aggregation, it seems better to work at the smaller level of analysis (with the consequent increase in the number of units to be analyzed) than to mask potentially important patterns. Advantages to using smaller units of geographical analysis are found in

Block and Dabdoub (1994), Eck (1994), Maltz et al. (1990), and Weisburd and Green (1993).

Individuals' records also contain information that can be masked by ignoring the details of their lives. Juvenile court records are very rich in detail. They contain reports by juvenile probation officers, social workers, and others who describe the circumstances surrounding incidents and the conditions faced by the families. The great amount of detail has been problematic to some researchers, who find it difficult to categorize all of the events in the record. As Sampson and Laub (1993) and Farrington (1993) point out, the same type of event will be reacted to differently by different persons; for example, upon learning that they have become fathers, some youths may become more responsible, others less responsible.

This is not at all troublesome when life course analysis is used. The events are laid out on a time line, and patterns are inferred based on the totality of incidents and the individuals' reactions to them, not on the specific nature of the incidents. Some examples are given in Figures 5 and 6, based only on Juvenile Court data.

We have just begun (in early 1994) to analyze data from the Cook County Juvenile Court. Since their Master File Index consists of 3x5 inch index cards sorted alphabetically by last name, we could not use this system to find youths who fit our criteria of age and neighborhood. Instead, we used the Chicago Police Department Youth Division's computer system, since we could search on address and select those youths who were so identified based on whether they met the age criterion. After obtaining their names from the police records, we were able to find the master file for the youths, called the "family folder" because it contains information on the youths and their family (defined as other youths having the same mother) with some information about the mother and the father as well, if present.

Analysis of the property data will follow soon thereafter. Our intention is to tie the two together, relying heavily on graphical and mapping techniques to do so. Exactly how we will do this is still being developed, but the data presentation will probably be based loosely on that used by Post et al. (1988)—a time line containing significant events—using some of the principles espoused by Tufte (1983, 1990). As discussed earlier, we intend to use symbols, color, texture and overlays to facilitate grasping

the considerable amount of information that can be presented in such a figure.

CONCLUSION AND FUTURE PLANS

In this article I have described a research plan to investigate the relationships between and among individuals, events, and locations. While the data are not aggregated and summarized in tables, graphs or confidence levels, they may permit one to draw inferences about causation to a much greater degree than can studies using more quantitative methods. The life course figures themselves are somewhat cumbersome, which may restrict their usefulness in studying large groups of individuals. I feel, however, that by the proper choice of symbols—see, for example, Tufte (1983, 1990)—this method of presentation can be used to draw causal inferences using large groups. Graphical representation of data, which does not impose the straitjacket of a predetermined structure on the data, holds great promise: it lets the data speak for themselves, not mediated through a statistical model.

The plan also permits one to integrate many different kinds of data, from many different agencies at different levels of government, in ways that "tell a story" of events and circumstances that have affected the people and neighborhood under study. And the data are by and large accessible: what has stopped me from requesting access from additional agencies is the fear that they will welcome me and expect me to start working with them immediately, which is what happened with one agency. I was unable to do so due to resource limitations—the feasibility study included about 150 hours of research assistance—and was afraid that my inability to follow up in a timely fashion would be seen as lack of interest. Therefore, I have stopped contacting additional agencies until I can obtain sufficient funding to incorporate data from other agencies.

Among the agencies not mentioned in this article—but that would play an important part in a complete study of this nature—are those that deal with public health at all levels of government. While the criminal justice system is often the locus of troublesome outcomes for young males, the public health system is often the locus of troublesome outcomes for both young males and females. Since my experience has been primarily in dealing with criminal justice agencies, this is where I chose to start this investigation, but I intend to include public health agencies as well.

Integration of all these sources of information also has broader public policy ramifications. The issue of privacy is a thorny one. We now have a kind of benevolent anarchy in the data establishments of the various governmental agencies, since they are by and large incompatible. What

kinds of safeguards can be developed once they start communicating with each other? This issue is one that needs to be addressed beyond the boundaries of this particular neighborhood and study. As Reno (1993) has noted

Let us develop some comprehensive, humane, thoughtful rational policy with respect to confidentiality; because at every meeting I attend on juveniles, the confidentiality issue raises its head ... It's time we come all together as a collective partnership, state and federal, prosecutors and public defenders, social workers and counselors, correctional officials and police officers, to use the limited resources of America in the wisest way possible [p. 991.

This study, attempting to integrate data from different agencies to study high-risk neighborhoods, is a small step in this direction.

Acknowledgments: The author is indebted to Sophia Hall, Presiding Judge of the Cook County Juvenile Court, and Warren Watkins, Juvenile Court Administrator; to John Easton, William Rice and Bruce Marchiafava of the Chicago School Board; to Barbara MacDonald, Director of Research and Development, Chicago Police Department, (CPD) and to Officer Charles Bugajski of the CPD Youth Division; and to Ron Davidson and Sardari Bhasin of the Illinois Department of Children and Family Services for their assistance in gaining access to the data. Richard Barrett of the Sociology Department, University of Illinois at Chicago (UIC), discussed with me many of the concepts described herein. The support of the UIC Campus Research Board, which provided funding for the pilot study described in this chapter. is also gratefully acknowledged.

NOTES

1. Whether the census tract is the best unit of analysis to use in doing community-based research is open to debate. It has the merit of being a standard of a sort, but in terms of community characteristics, Census tracts often include highly disparate areas within them.
2. This is not to say that such data cannot be used innovatively to make inferences about causality. For example, Wilson (1987) combines streetlevel insights with Census and other data to draw inferences about the relationship between inner city problems and governmental policies.

3. Dorothy Gautreaux et al v CHA et al. 296 F. Supp. 907, 1969; Hill v Gautreaux et al, 425 US 284, 1976.

4. This, by the way, suggests a "criminology of place" (Sherman et al, 1989), too. but it is the generation of criminality due perhaps to the absence of a (secure) place (e.g., Bowlby, 1988) than due to the nature of the place itself.

5. To distinguish between these two concepts, change and variation, suppose that a study looks at the statistics of different neighborhoods, in particular at their crime rates and the prevalence of "broken homes" (i.e., single parenthood). An analysis might well show that as the percentage of households headed by single parents in a community increases, so does crime. This variation is often interpreted as meaning that single parenthood is a change agent that breeds crime. when the economics of single parenthood and the housing situation may be the causal factors: families led by single parents often have meager financial resources and have no choice but to move into the most crime-ridden communities.

6. For example, in response to a well-publicized problem with its crime reporting practices, in 1984 the Chicago Police Department conducted an intensive audit of its response to calls for service, one that led to substantial changes in its reporting practices (CPD, 1984).

7. For the hypothetical data I posit, termination dates cannot be estimated, since they may not have ended their offending careers as yet.

8. This was later changed to 1975-1979 because, after we started our study, the Records Division of the Cook County Juvenile Court began to clean house by shredding the files of youths born in 1970 and 1971, with plans to continue beyond 1971 in the near future.

9. No attempt has been made as yet to gain access to parochial school records.

10. Out-of-country. transfers would have to be taken into account if the neighborhood had a high percentage of residents of Mexican or Puerto Rican origin (Marcia Farr, personal communication), which this neighborhood does not. Such families often send their children "back home" if they feel that they are at risk in local schools. African-American parents also do this. sending their children to live with relatives in the South (James, 1993), but my impression is that this occurs much less frequently.

11. The key needs to be kept because some agencies may provide data after the school data have been added to the data set. In that case, the key

would have to be applied to the new data, which would then be linked to the overall data set.

12. I have since obtained permission from the Chicago School Board to obtain some of the data, with the prospect that additional data may be obtainable as well.

13. The Chicago Housing Authority is a separate entity; it manages the city's public housing projects

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