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SOCIAL STRUCTURE AND HOMICIDE

IN POST-SOVIET RUSSIA

by

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A Dissertation

Submitted to the University at Albany, State University of New York

in Partial Fulfillment of

the Requirements for the Degree of

Doctor of Philosophy

Rockefeller College of Public Affairs and Policy

School of Criminal Justice

2002

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Abstract

This study examines social structure and homicide in Russia. The dissolution of the Soviet Union and the shift toward rule of law and a free market economy in Russia have increased the availability and validity of demographic, economic, mortality, and crime data. In this study, these newly available data are employed in order to describe the temporal, demographic, and spatial variation of homicide rates among the 89 Russian regions. Further, structural models developed to fit patterns of homicide in the United States are estimated with these data in order to evaluate the cross-sectional effects of social structural characteristics on the variation of homicide rates within Russia and to discover if these results are similar to those found in comparable studies conducted in the United States.

The results of the descriptive analyses display a steep decline in the homicide victimization rate in Russia in the mid-1980s, followed by a period during the late 1980s and early 1990s when the rate more than tripled. These analyses further reveal that both homicide victims and offenders in Russia tend to be much older than their American counterparts. Multivariate analyses show that (1) poverty and other elements of social disorganization, such as ethnic heterogeneity and single-parent households, are positively and significantly associated with the variation of homicide victimization rates, (2) levels of alcohol consumption are also positively related to homicide rates, and (3) the lower than average homicide rates in the Northern Caucasus regions and the higher than average rates in the regions east of the Ural mountains do not appear to be explained solely by their structural features. Finally, in spite of widely different cultures, histories, and contemporary experiences, a comparison of the Russian results with those from comparable studies in the United States yields similar patterns in the relationships between structural characteristics and homicide rates. This appears to indicate that social structure plays an important role in the variation of homicide rates within nations, despite any cultural and historical differences that might exist among them.

This dissertation is dedicated to the memory of my grandfather, Alex Perry, a carpenter who taught me that everything in life must be built on a solid foundation, and to my grandmother, Nellie Perry, who illustrated to me that even with a dependable foundation one must still exercise a healthy amount of stubbornness in order to get the job done. I am forever grateful for the example you set.

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Preface

Aside from the scientific reasons for the selection of Russia as my topic of study that are discussed in the Introduction, a brief personal note is also in order. I have had an intense interest in the history and culture of Russia for many years. The remarkable events of the last decade provide scholars with opportunities to do research that was impossible only a few years ago. These events have provided me the opportunity to wed my personal interests in Russia with my professional interests in the study of social structure and violence. The increased permeability of once-closed borders has permitted me to spend a year teaching sociology and criminology at the University of the Ukrainian Ministry of the Interior and Kharkov State University (both in Kharkov, Ukraine), to study the Russian language while living in St. Petersburg, Russia, to travel extensively in the region, and to work with fellow researchers in Moscow. These experiences provide me with first-hand knowledge of the culture and have left me with valuable resources within the region. This, together with the living laboratory of social change created by the transition and the relative absence of criminological study in the area, helps to answer the question "Why Russia?"

Of course, a project of this magnitude would be impossible without the assistance of many talented people. I owe a debt of gratitude to the following: Evgenii Andreev at the Russian State Statistical Committee (Goskomstat); Arleen deGonzague and Deborah Coppola of the Hindelang Criminal Justice Research Center; Timothy Heleniak at the World Bank; Vitaly I. Kvashis of the Research Institute of the Russian Ministry of the Interior; Aleksandr Nemtsov at the Moscow Research Institute of Psychiatry; Vladimir

Shkolnikov of the Max Planck Institute, Rostock, Germany; and, especially, the members of my dissertation committee: David Bayley, David McDowall, Graeme Newman, and Terence Thornberry. Finally, a very special thank you to the hardest-working and nicest man in criminology, my dissertation chair Colin Loftin, who continuously and generously gave sage advice and countless hours of his time to this project, to my graduate education, and to preparing me for a professional career. Огромное спасибо!

The research conducted here was supported by the National Institute of Justice, grant number 1999-IJ-CX-0009. My thanks to my grant monitor Richard Titus and to NIJ. Given the time and monetary costs imposed by the international nature of this research, this project would have been impossible without their generous assistance.

Finally, for their endless support in so many ways throughout my graduate school career, I would also like to thank my best friend, Roddrick Aaron Colvin, my mother and her husband, Patricia and Mike Kern, and my grandparents, Alex and Nellie Perry, to whom this dissertation is dedicated.

I am sincerely appreciative of the support of all of these people and many more, and my thanks goes out to you all. Of course, the countless mistakes, missteps, and misinterpretations throughout this document are my own, the result of my own foibles in the face of the sound advice provided by all those mentioned here.

This book examines patterns of homicide in Russia. The dissolution of the Soviet Union and the democratization of Russia have made available criminal statistics and socioeconomic and mortality data that were before inaccessible. I take advantage of these

newly available data here in order to describe the variation of homicide rates over time and among the more than 80 regions in Russia.[1] Demographic patterns of homicide offending and victimization are also presented in terms of age and sex, often using the United States as a point of comparison. Further, a preliminary analysis of the relationship between rates of alcohol consumption–a long-standing social problem in Russia–and rates of violence is presented. Finally, basic structural models developed to fit patterns of homicide in the United States are evaluated employing these data in order to examine how well they operate in the Russian context.

ENUMERATE OTHER TOPICS ADDRESSED, BY CHAPTER.

[1]Russia is a federated nation and the term "region" is used here to denote political entities that are analogous to American states. These are variously called *oblast*, *krai*, and *okrug*. The Russian Federation currently contains 89 regions.

Chapter 1:

Introduction

FINAL REPORT Approved By: _____

Date: 1/18/02

This study examines social structure and homicide in post-Soviet Russia. The dissolution of the Soviet Union and the democratization of Russia make available criminal statistics and socioeconomic and mortality data that were before inaccessible. In this study, these newly available data are used to describe the variation of homicide rates over time, among demographic groups, and among regions in Russia.[1] Structural models developed to fit patterns of homicide in the United States are also evaluated employing these data in order to examine how well they operate in the Russian context, and these results are compared to those from similar models tested in the United States.

The ongoing structural changes in Russia have resulted in social, economic, and demographic shocks that are unrivaled in the history of the United States. At the same time, the homicide rate rose 300% in Russia from 1988 to 1994. In 1998, the last year for which data are available, the homicide rate in Russia was nearly four times that in the United States, at 24.2 and 6.4 victimizations per 100,000 population, respectively (raw data from Martin, Smith, Mathews, and Ventura (1999), and from Ministry of Health of the Russian Federation, (1999)). The expanded socioeconomic variation accompanying these changes provides valuable insight into the study of violence, and the increasing availability and validity of data related to these phenomena make a study such as one feasible for the first time.

This introductory chapter begins with an argument for the importance of employing a comparative and cross-national approach when investigating the etiology of

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crime. The next section provides the reasons for the selection of Russia, as well as a discussion of recent changes in the country that make a study such as this possible. The chapter ends with a statement of the central questions to be answered by this research.

Why the comparative approach?

> One cannot explain a social fact of any complexity except by following the complete development through all social species. Comparative sociology is not a particular branch of sociology, it is sociology itself, insofar as it ceases to be purely descriptive and aspires for facts.

This statement by Durkheim (1938, p. 139) in *The Rules of Sociological Method* contains both the elements of the comparative approach employed in this study. The first is that of comparing across nations with different organizational structures (or, as Durkheim put it, "social species"). Comparative research examines the similarities of and differences between societies and cultures and the institutions they create (Terrill, 1997). Clinard and Abbott (1973) state that the goal of comparative criminology is to distinguish "between universals applicable to all societies and unique characteristics representative of one or a small set of societies" (p. 2). As C. Wright Mills suggests in *The Sociological Imagination* (1959), "if we limit ourselves to one national unit of one contemporary (usually Western) society, we cannot possibly hope to catch many really fundamental differences among human types and social institutions" (as quoted in Newman and Ferracuti, 1980, p. 11). This element of the comparative method provides both provincial and universal benefits to our understanding of crime and criminal justice institutions (Reichel, 1994) and keeps us from falling into the trap–recognized by Clinard (1960) four

decades ago–of making decisive conclusions about the nature of crime based upon the study of an unrepresentative sample:

> [I]f the sociological study of crime is to be scientific... hypotheses and findings should not be derived from only one particular series of historical events taking place in one society, which is often the case, especially in American criminology (p. 253).

The other element mentioned in Durkheim's selection above is the move away from pure description of phenomena and toward systematic analyses of them. This element of the comparative approach consists chiefly of (1) comparing the attributes of the cases under study and (2) evaluating theoretical models that posit an explanation for the variation in these attributes among the cases. Due to data limitations, previous studies of crime in Russia were largely descriptive in nature. This research, however, employs the second element of Durkheim's comparative approach in order to examine if and how social structural characteristics of Russian regions influence the variation of homicide rates among them.

We make two similar but distinct mistakes when we fail to recognize the importance of the comparative approach. The first ignores the new knowledge gained by examining similar phenomena from alternative perspectives. The second fails to recognize the suggestive power of our paradigm to shape–even radically alter–what we see. Both represent powerful attacks upon the validity of our theories of crime causation. These dangers result from empirical research on crime in one or a few nations–which exhibit limited variation on the concepts under examination–and from an insulated perspective. As Geis (1987) suggests, we must continually ask "whether this or that

theoretical statement or generalization in criminology is culture-bound or whether in fact it has universal applicability" (pp. 7-8). This study does just that by borrowing from models developed to explain the variation of homicide rates in the United States in order to evaluate their explanatory success in the Russian context, which is distinctly non-Western both historically and culturally.

Scholars raised, trained, and practicing under the umbrella of one paradigm are unlikely to recognize their own preconceptions (Kuhn, 1970). Without a comparative frame of reference, we are likely to make faulty generalizations concerning crime and violence based on research in only a few Western industrialized nations at similar stages of development (Archer and Gartner, 1984; Neapolitan, 1997). Cultural differences are strong, and the effects of the same structural element may interact with local culture in a way not in accordance with our accepted models. Archer and Gartner (1984) claim that Western theorists' tendency to make broad generalizations while failing to take into account the experiences of other countries has stunted scientific progress toward a more comprehensive understanding of the nature of crime. It also establishes a false sense of comfort in our level of knowledge about the correlates of violent behavior. There is wide variation in the level and intensity of violence across nations. Comparative evaluation is a powerful aid in our understanding of this variation and it provides a stringent diagnostic for empirical validation of models developed to fit the experiences of Western countries.

Shifting from abstract to more concrete arguments, there are theoretical and empirical advantages to engaging in comparative work, and for choosing a country such as Russia in which to carry it out. First, a true test of any theory is its ability to generalize

to a broad population. If the hypothesized relationships of a theory hold up under many and diverse environments, then we gain confidence its ability to explain the concepts under study. Although we should expect some systematic differences across cultures, a strong theory should not only be able to explain the spatial variation of homicide rates in a politically stable nation exhibiting relative homogeneity on socioeconomic indicators (such as the United States), but also in a less economically-developed, politically unstable nation with heterogeneous values on those same indicators (such as the Russian Federation).

Second, variation among and independence of cases provide a more exacting test of any theory. In the United States, a common history, cultural diffusion, and various social welfare policies have decreased the independence of cases and the range of variation among areas on socioeconomic indicators such as unemployment, age structure, poverty level, and ethnic distribution. Such a narrow range of variation does not allow researchers to draw strong conclusions about their models. If the tenets of a model hold in a nation where regions are more independent of one another and exhibit a wide range of values on crime rates and on socioeconomic and demographic indicators, the researcher is able to draw broader conclusions. Russian regions–despite a relatively common recent history and the enforced political homogeneity of Sovietism–exhibit a wide range of variation on the indicators employed in this study (a brief explanation of this greater range in variation is presented in the "Why Russia?" section below).

Many comparative researchers have used crime statistics aggregated to the nation-state level in order to derive and empirically test meta-narratives of crime such as

"modernization" (see Bennett, 1991; LaFree and Kick, 1986; Neuman and Berger, 1988; Shelley, 1981, 1986; and Unnithan and Whitt, 1992), "civilization" (see Braithwaite, 1993; Chesnais, 1992; Elias, 1982; Gurr, 1981; Heiland and Shelley, 1992; and van Dijk, 1989), and "dependency" (see Chambliss, 1974; Lopez-Ray, 1970; Quinney, 1977; Sumner, 1982; and Zvekic, 1990). These grand theories–with their foundations in the process of development within countries–have been roundly criticized on several accounts, mostly because of their neglect of country-specific cultural and historical contexts (see Groves and Newman, 1989; Newman and Ferracuti, 1980; Shelley, 1986; Sumner, 1982; and Zvekic, 1990), and this has led many comparativists to call for case-specific research using disaggregated data in order to build a more solid foundation for comparisons (Archer and Gartner, 1984; Arthur and Marenin, 1995; LaFree and Kick, 1986; Lynch, 1995; Neapolitan, 1997). The present study attempts to overcome some of the difficulties of the former and heed the suggestions of the latter since (1) it is a case study of the variation within Russia, thus providing an examination of specific social structural contexts within that nation and (2) it tests structural models developed to explain crime in the United States, thus a comparative aspect.

Why Russia?

The use of Russia as a country in which to evaluate Western theories of criminal violence is important for several reasons. First, as mentioned above, one of the strongest assets of a scientific theory is its ability to generalize to widely disparate settings. As an urban and industrial nation, Russia shares similarities with developed Western nations. However, Russian historical and cultural experiences are distinctly non-Western,

presenting a rigid test of models developed to explain violence in Western cultures. Further, three recent major changes provide unique opportunities for the study of violent crime in Russia: massive structural change, expanded socioeconomic variation, and newly available data.

Massive structural change. The shifting political and economic landscape in Russia has resulted in massive structural change within the country. A totalitarian government is being replaced by a representative democracy based upon the rule of law, and free-market reforms are slowly being substituted for the centrally planned "command" economy of the past. The moorings of the Soviet way of life have been uprooted. The move toward a less intrusive government, protected personal freedoms, and a market economy now seems inevitable. Unfortunately, these positive advances have not been without painful costs to a new Russia and her people. Among others, these costs include an alarming increase in homicide rates.

The economic crisis in Russia following the breakup of the Soviet Union is well-documented. Before the disintegration of the USSR, however, the economy was already in a "freefall" (Panel, 1992: 356). Gorbachev's perestroika was designed to reorient the economy in order to more efficiently take advantage of scientific and technological gains and to raise the flagging living standards of Soviet citizens. These limited changes, however, could not salvage an economy that was on the verge of implosion after 70 years of poorly planned production and distribution. The dismantling of the command economy and the transition toward a market-oriented one began in Russia in 1992. Since

that time production has plummeted, inflation skyrocketed, unemployment has doubled, and poverty and inequality have become widespread.

The shifting political and economic fortunes in Russia produced traumas unlike anything experienced in the United States, including the Great Depression (Heleniak, 1995a). The effects, however, were not caused directly by the transition itself, but by the forced and unresponsive command economy of the previous Soviet regime. Central planning left local economies poorly integrated. Soviet industrial infrastructure was dated and parts needed for repair were non-existent or long in arriving. Shortages of materials were common due to hoarding and transportation problems. The lack of hard currency at the beginning of the transition prevented the importation of the technology needed to modernize Russia (Panel, 1992). Although corporate giants such as Coca-Cola, Exxon, General Motors, and IBM are now active in Russia, many other companies are awaiting political and economic stabilization in the country before risking capital. Thus the level of investment does not yet match the industrial and natural potential of the country (Russian Embassy, 1998).

According to official Russian data, unemployment was 11.2% in 1997 (Goskomstat, 1998). Even this high level may not present a true picture of the problem, since hidden unemployment is growing (Starikov, 1994) and many workers who retain their jobs are likely to go unpaid for months.[2] Women, who head 90% of single-parent households, are over-represented among the unemployed, largely because their traditional

[2]By the third quarter of 1997, wage arrears had reached 54.4 trillion rubles–approximately $10 billion (Labour Market, 1997).

clerical and peripheral positions were the first to be cut in a tightening economic environment (Klugman, 1995). As the well-educated became a larger proportion of the unemployed, and as long-term unemployment increased and wage-arrears grew, labor strikes–especially in the education sector–increased in frequency and militancy beginning in 1995 (Connor, 1997). This situation is not likely to decrease any time soon since the Soviet attempt to provide employment for everyone is being replaced by the demand for a leaner and more efficient labor force.

Declining production and increasing unemployment, along with the Russian government's dramatically reduced spending on social needs, has led to widespread poverty across the country. In June of 1991, before the dissolution of the Soviet Union, 11.7% of Russians had per capita incomes below the subsistence minimum. By June of 1993, the number had risen to 36% (Urinson, 1993), and World Bank data set this figure at 31% for 1998. One-half of the poor live in families where at least the head of the household is employed (Klugman, 1995). One-quarter of the families in Russia have incomes that are less than half the average per capita income, one-third own no property (a piece of land, an apartment, a house), and only 26% own a car (Khakhulina and Tuček, 1997). Again, Russian women, who are 53% of the population and represent 69% of the unemployed, are especially hard hit since the education and health care sectors–traditional employers of large numbers of women–are still largely government-funded and thus receive inadequate wages (World Bank, 1997). Women are increasingly threatened by these trends since household burdens limit their opportunities to earn money outside the home and to receive the retraining necessary in a shifting economy

(Korel, 1995). Even under Communist rule, Russian citizens had a lower standard of living than their counterparts in several other Soviet republics. Today, the level of poverty among the Russian population is stalling the transition to a healthy market economy and threatening the stability of the young democracy.

The troubles of inequality, unemployment, and poverty are now exacerbated by the move to increase the responsibilities of local governments, which lack basic resources and are ill-trained to deal with these problems. Local authorities are increasingly responsible for housing, health care services, education, and social assistance programs (Klugman, 1995; Panel, 1992). Regions where jobless rates are high have less payroll taxes to collect leading to fewer services offered to their citizens. These economic woes have had a tremendous effect on Russians. A large percentage of the population have become politically alienated and lost confidence in their leaders (Rukavishnikov, 1996), and critics suggest that Westernization is eroding national culture, that natural and industrial potentials are being squandered, and that a market-oriented economy has resulted in corruption and monopolism rather than democracy and healthy competition (Sukhotin, 1996).

The effects of the transition on the Russian people have been tremendous. Life expectancy has dropped sharply in Russia since the breakup up the Soviet Union, especially among males, whose life expectancy at birth in 1995 was less than 57 years (Kingkade, 1997). The largest increases in mortality are occurring among middle-aged men, who are increasingly falling victim to stress-related heart attacks and strokes, as well as to generally poor health, alcohol abuse, and homicide and suicide. Maternal and

infant mortality rates in Russia have risen to several times those in developed countries and the suicide rate in Russia, at about 41 per 100,000 in 1995 (Ministry of Public Health, 1998), is three times greater than in the United States. Such drastic changes are rarely experienced in a population, even during times of war; the effects of the former Soviet political-economy and the current transition on demographic trends in Russia are astounding and these negative trends may lead to social problems in many spheres, including violence and homicide.

Indicators of social disorganization, which have often been found to be correlated with increased rates of violence in the United States, are also on the rise in Russia. The number of births out of wedlock is increasing and this rate is now comparable to the United States (Kingkade, 1997). The health of the family has also declined over the last decade. Marriage rates, for example, have decreased 25% during this time and divorce rates rose nearly 20% during the first three years of the 1990s (Heleniak, 1995b; Korel', 1997). Heleniak (1995c) reports that with the relative stabilization of the economy and the political structure these negative demographic trends are slowly improving. The shock to the Russian people has already occurred, however, and it will take many years for the population to recover. As the structural forces of the transition act to break down families and the social ties of communities, it is no surprise that crime rates are increasing.

Along with these fundamental structural shifts has come an increase in levels of crime, especially violence. Both crime (Ministry of the Interior) and mortality data (Ministry of Health) show that homicide rates more than doubled in Russia in the early

1990s. Figure 1.1 below employs Ministry of Health (MZ) and Ministry of the Interior (MVD) data to track the changes in homicide rates during the period 1985-1998. Not only have these rates risen dramatically, but the Ministry of Health-reported annual rate of 24.2 homicides per 100,000 population for 1998 is nearly four times greater than the homicide rate in the United States (6.4 per 100,000), long thought to be one of the most violent industrialized nations in the world.

Expanded socioeconomic variation. These massive structural changes have increased socioeconomic and demographic variation across Russia. These differences are interesting to researchers because such wide variation is rarely experienced in Western societies. Although socioeconomic variation certainly existed in the former Soviet Union at a level not in accordance with official ideology, it was not as extreme as today.

World Bank (1999) calculations showed a per capita GNP of $2,300 in 1998, but this average is not likely indicative of the true situation, as variation has increased across regions[3] and among business sectors. This regional stratification is heavily affected by the age structure and, especially, the type of industry in a region. Sixty percent of all joint ventures in the country are located in Moscow or St. Petersburg (Russian Embassy, 1998), leaving vast tracts of rural areas and regions with declining industry to create a rust belt (consisting chiefly of former military-related factories) and concentrated zones of poverty throughout the country.

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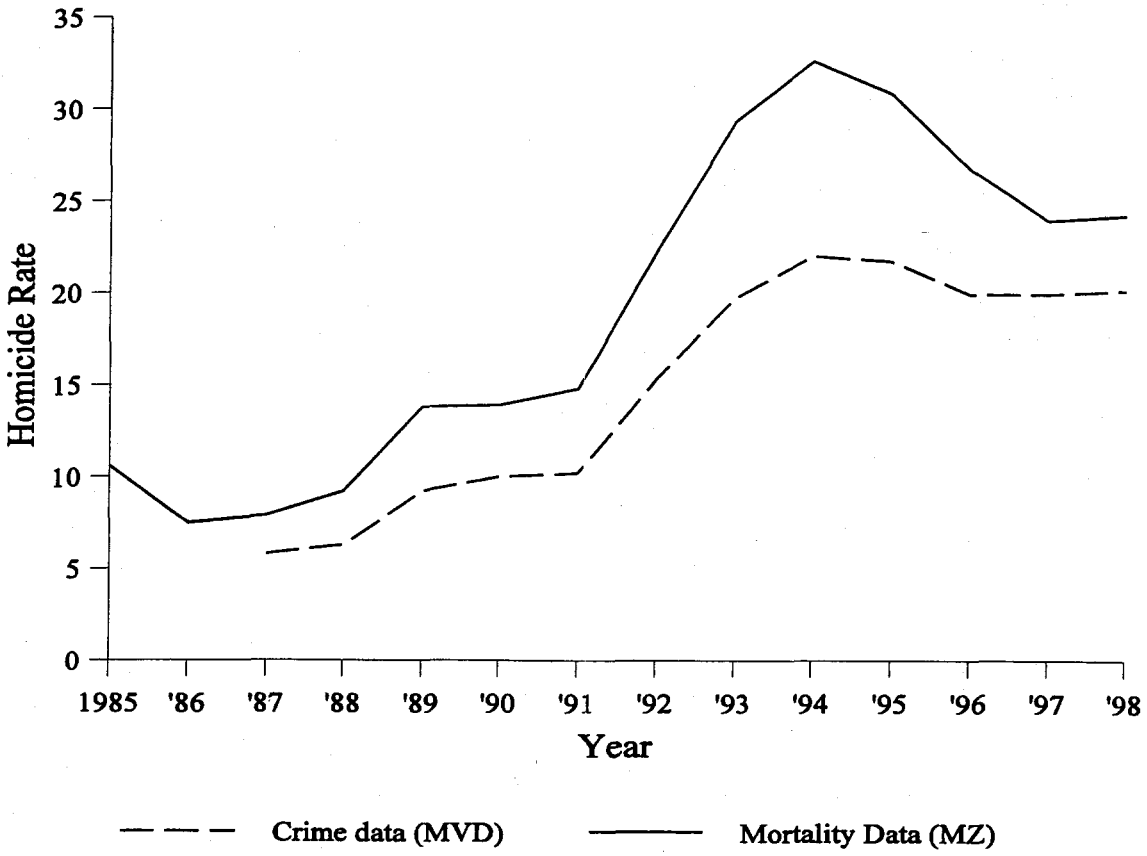
[3]For administrative purposes, the Russian Federation is split into 12 economic regions. See Figure 1.2 below for a map of these economic regions and Appendix A for a list of the administrative units (oblasts, krais, okrugs) within each regions.

Similarly, social stratification is increasing among the population due to variation in wages among different business sectors (not to mention the unemployment and wage

Figure 1.1. Homicides rates in Russia, 1985-1998[4]



arrears problems discussed earlier). For example, in some regions workers in the gas industry make nearly twice as much as those in the coal industry and more than twenty-five times those laboring in the glass industry (Shaw, 1993). Data from Russia's

[4]A more detailed discussion of the case definitions for these different homicide rates is contained in the "Data" section in Chapter 3.

Committee for State Statistics (Goskomstat) shows that in 1997, the top 20% of Russian wage earners received 46.7% of all the annual income distributed in Russia and the bottom 20% received only 6.2% (Goskomstat, 1998).

Most research on violence to date has examined the variation in concepts such as poverty, inequality, social disorganization, and subcultures among U.S. cities. Given the similar histories of cities in the United States and cultural diffusion within the country over time, especially with the advent of mass media, the range of variation on these concepts is limited among American cities. In Russia, however, a truly vast area, poor communications, dozens of relatively large ethnic and religious groups, the disparate histories of many regions, the changes created by the transition, and the widely varying pace of change across the country have resulted in a much broader range of variation on the factors under examination. This study allows us to extend our knowledge beyond what has been possible in the past by discovering if and how this wide variation influences homicide rates across Russian regions (see Figure 1.3 on the following page for a map of Russian administrative regions).

Newly available data and research. One of the results of Russia's changing political orientation is the increasing availability of data relating to Russian society, economics, the health of citizens, and crime, as well as the opportunity to work together with Russian experts. The change from a totalitarian regime–under which access to these data was strictly controlled and much of the information classified as state secret–to a more transparent government based upon rule of law has meant the increasing availability and validity of data sources (Heleniak, 1996). Statistical systems must adjust to new

political and economic systems, and governmental data collection agencies in Russia have made appreciable gains in data compilation and presentation (World Bank, 1996). Russia's Committee for State Statistics (Goskomstat) collects and disseminates information from several different sources and provides much of the data employed in this project. Likewise, Russia's Ministry of the Interior now makes public crime-related data, which is used for descriptive purposes in this study.

New research is beginning to appear concerning crime in the former Soviet Union and Russia using these newly available data (see Butler, 1992; Dashkov, 1992; Nalla and Newman, 1994; Shelley, 1987; and Williams and Serrins, 1995), but results thus far are unclear and the problem of violence deserves greater attention. Further, I am aware of no study of Russia that systematically examines the variation of homicide rates and their structural covariates. The willingness of the Russian government to share data, the increasing validity of the data distributed, and the number of sociologists and criminologists realizing the importance of studying the region allows for more refined and scientific analyses. Solid answers, however, begin with the formation of sound questions.

Research questions

In order to focus this research project on the essential issues before moving on to more in-depth inquiries in the future, I have formulated three fundamental objectives. These objectives are delineated in the following research questions:

1. *How do Russian homicide rates vary in terms of demographic groups, time, and space?*

2. *Which structural factors partially explain the spatial variation of homicide rates among Russian regions?*

3. *How do the findings from Russia compare to those from similar models estimated with data from the United States?*

The analyses undertaken to answer these questions will result in valuable benefits to our understanding of the structural correlates of violence, not only in Russia but in the United States and elsewhere.

Summary and conclusions

During a session on theoretical integration at the 1997 meetings of the American Society of Criminology, D. Wayne Osgood called upon criminologists to question "the body of assumptions, concepts, and established facts" that we bring to our work.[5] Osgood hopes that his challenge will direct criminologists to assimilate the knowledge of *other disciplines* into our criminological repertoire, but it works just as well as a challenge to add the findings obtained from *other countries and cultures* to our understanding of crime. This study of homicide in Russia answers Osgood's challenge by (1) determining whether or not Western models of crime are generalizeable to a distinctly non-Western culture and nation, (2) collecting new data that might not otherwise be collected, and (3) generating new knowledge about social structure and violence to add to what we already know about this topic in the West.

In sum, this study examines the variation of homicide rates among Russian regions. The study takes advantage of newly available data to describe the demographic, temporal, and spatial patterns and the structural context of homicide rates in Russia (see Fox and Zawitz (1999), and the National Institute of Justice (1997), for similar

[5]See also the reprint of the Osgood's presentation in *The Criminologist* (1998).

exploratory analyses of homicide in the United States). Structural equation models similar to those employed to explain homicide in the United States are constructed and tested using social, demographic, economic, and health data from Russia. The results of these models are then compared to the results of similar models employing data from the United States.

This introductory chapter outlines the project, discusses the importance of a comparative approach to the understanding of crime, presents the reasons for the selection of Russia as the target of study, and poses the major research questions to be answered. The next chapter describes each of the major structural and cultural theories of violence and homicide causation and reviews the results of the empirical research undertaken to test the adequacy of these explanatory models.

Chapter 2:

Review of the theoretical and empirical literature

The scientific study of the relationship between social structure and crime has a long history, dating at least to Guerry's *Essay on moral statistics in France* and to Quetelet's "social mechanics" (Beirne, 1993). Focusing on criminal violence, researchers during the middle decades of this century produced work that suggested structural conditions have an impact on the spatial variation of homicide rates (Schmid, 1960; Schuessler, 1962) and that both homicide victims and offenders often share characteristics indicative of low social status (Brearley, 1932; MacDonald, 1961; Wolfgang, 1958). Today, *individual-level* studies of offending generally take one of three explanatory approaches: social learning, strain, or social control. The major contemporary theories relating *social structure* to violence fall into three analogous categories: culture, strain (usually represented by economic deprivation), and social disorganization, respectively.[1] In general, this literature attempts to explain the variation in rates of criminal violence across geographic units such as cities, states, and nations by examining the demographic, economic, and social characteristics of these units as they covary with violence rates.

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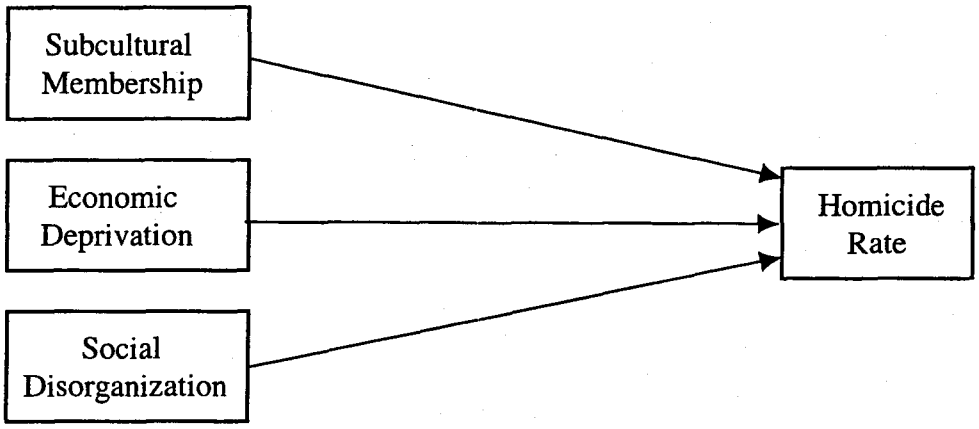
[1]Although theoretical quibbling has often led researchers to divide *structural* and *cultural* theories into two separate streams, it seems likely that the two are closely intertwined. Consequently, it is often the case that social scientific measures of one of these concepts also capture features of the others. It could thus be argued that this imperfect process of operationalization is not simply an empirical question (i.e., separating out the effects of structure from those of culture) but represents a theoretical problem as well (i.e., Are culture and structure truly two separate and distinct features of a community or society?). For this reason, the empirical findings reported here will be discussed in terms of support for each specific theory–not in terms of refuting the other hypotheses–because support for one explanation does not necessarily invalidate others.

Although the work of Wolfgang (1958) and Wolfgang and Ferracuti (1967) did not directly test models explaining the spatial variation of homicide rates, these two studies provide theoretical arguments and empirically-founded conclusions that helped to bring the study of the structural and cultural antecedents of homicide to the forefront of criminological research. Following this, Hackney (1969) and Gastil (1971) published findings that appeared to indicate that the long tradition of high rates of homicide in the South were due to a *subculture* of violence in the region. Others, such as Curtis (1975), employed subcultural theory in the attempt to explain the elevated levels of homicide among blacks.

Loftin and Hill (1974) responded to the southern culture of violence thesis by arguing that the empirical evidence supporting this hypothesis disappeared when *structural* variables such as *poverty* were controlled. Less than a decade later, Blau and Blau (1982) and Messner (1982) posited that the frustration resulting from the unequal distribution of resources (i.e., *relative deprivation*), not the absolute deprivation of poverty, was the cause of higher rates of homicide. Finally, the 1980s saw the revival of *social disorganization*–via such paths as family disruption (see Sampson, 1986), high mobility (see Crutchfield, Geerken, and Gove, 1982), and ethnic heterogeneity (see Hansmann and Quigley, 1982)–as an explanation for the spatial variation in homicide rates. Figure 2.1 provides a general theoretical model of the spatial variation of homicide rates.

Figure 2.1. Basic model for the relationship between social structure and the variation of homicide rates.



The following review consists of three sections, one each for subcultures of violence, economic deprivation, and social disorganization. Each section contains two parts, a discussion of the theoretical assumptions, elements, and propositions, and a review of the empirical literature testing these propositions. The sources cited and reviewed here come from the sociological, criminological, and public health literature. They were selected via two main methods: gathering the literature cited in other studies of social structure and homicide, and keyword searches of the electronic databases Sociological Abstracts, Social Science Abstracts, Criminal Justice Abstracts, and MedLine. Further, the review of empirical results focuses almost exclusively on studies appearing since 1969 that have employed multivariate analysis to explore the relationship between structural-cultural concepts and homicide rates.

Box 2.1. Tabular summary of findings of prior research on the structural covariates of homicide.

A summary of the findings of prior research on the structural covariates of homicide is presented in tabular form in Appendix B. Although I do not claim this to be an exhaustive list, the 48 studies itemized in the table represent greater coverage than is contained in any other published literature review or meta-analysis conducted on this topic to date and summarizes the main issues usually covered in the literature on the structural causes of homicide. As mentioned in the text, these studies were drawn from keyword searches of electronic abstract databases and from the reference lists of other similar studies.

Each of the 48 studies is labeled with the names of the authors and the year it was published. For each study, the table contains the level of analysis and the findings (significantly positive, null, significantly negative, or not tested) relating the commonly tested covariates to homicide rates. Appendix C presents a complete list of variables included in each model presented in Appendix B, as well as any notes required to clarify each of the studies.

Culture[2]

Theory

Cultural explanations of violence date back at least to the first half of the 19th century. At that time Guerry suggested that the high rates of violence in southern France were the remnants of past migration and settlement patterns that had left various regions of the country populated by different cultures (Corzine, Huff-Corzine, and Whitt, 1999). Later, the Neapolitans, Calabrians, and Sicilians of southern Italy were singled out as possessing cultural traits that were responsible for the high levels of crime and violence in the areas they inhabited. In the late 1800s, work by Redfield (1880) in the United States also revealed elevated homicide rates in the American South.

[2]Since the present study does not directly test cultural components, only a brief discussion of these theories and the empirical findings is provided here.

Since rates of interpersonal violence vary widely across social groups, many theorists attempt to explain this variation in terms of cultural or subcultural norms that may promote violence, or at least condone it in specific interpersonal situations. That is, the values and beliefs of social groups that exhibit high rates of violence should be distinguishable from groups with lower rates. These cultural explanations have their foundations in social learning theories. They have a long history and, at the structural level, have been used most often to explain high rates of violence in the South and among African-Americans. Most theorists believe that the development of a violent subculture may originate in structural conditions (making it clear that both cultural and structural models are important when attempting to explain varying crime rates), but argue that subcultural norms and values are the most proximate causes of violent events. Finally, since these ideas can be transmitted across geographic space and across generations as a coherent set of values, it is possible for the subculture to be maintained after the original negative conditions that set it in motion have improved or disappeared.

Setting the stage for contemporary cultural theories, Wolfgang (1958; Wolfgang and Ferracuti, 1967) argued that a subculture of violence may explain the high levels of violence among minorities and the poor. Wolfgang and Ferracuti (1967) state that they understand violence "as a reflection of basic values that stand apart from the dominant...culture" (p. 158), and that the "expression of violence (of which homicide is only the most extreme) is part of a subcultural normative system... [that] is reflected in the psychological traits of the subculture participants" (p. 158). In other words, members of the subculture share values that are supportive of violence. Since Southerners or

young black men are not believed to be born violent, they must learn subcultural traits from those around them.[3] Thus these cultural theories may be viewed as building upon Sutherland's (1947) ideas of differential association, with violence-condoning norms transmitted from member to member and across generations through a process of social learning.

Empirical findings

The results of empirical studies relating subcultures of violence to high levels of homicide show little support for the hypothesis and have been plagued by the inability of most researchers to operationalize "culture" in a way that is empirically valid. In the United States, most subcultural work has focused on higher homicide rates in the South, with a few macro-level studies completed that attempt to explain the persistence of high homicide rates among blacks in terms of a black subculture of violence. Research attempting to evaluate this hypothesis has encountered difficulty operationalizing the theoretical concept of a southern subculture of violence, usually simply denoting it as group membership via a South/non-South dichotomous variable. The result of this approach is to restate the question, not to answer it. Additionally, the majority of studies that have included structural factors such as poverty and urbanity in the model along with

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[3]Exceptions to this are theories based upon biological notions of crime causation. Rushton (1990, 1995), for example, argues that constitutional differences between races provide the answers to why countries composed mostly of blacks have higher rates of violence than those composed mostly of whites or Asians. Criticisms of this work are numerous. The most damaging reveal Rushton's failure to (1) account for the considerable differences both within races from country to country and within the same country over time and (2) employ commonly accepted correlates of violence as controls (Neapolitan, 1998).

region (see the table in Appendix B) have resulted in null effects for the regional variable. Further, studies that have operationalized culture in terms other than regional location (see Baron and Straus, 1988; Dixon and Lizotte, 1987; Erlanger, 1976) have found no significant differences between the South and non-South in cultural attitudes or values condoning violence. Of the 76 estimates generated by the studies in the table in Appendix B relating southern subculture to homicide rates, 31 show significantly positive effects and 45 show null effects.

The lack of empirical evidence for a southern subculture of violence, however, should not be taken as an indictment of the hypothesis that culture influences offending. Almost without exception, the authors of the studies reviewed here that examine structural factors also maintain that culture is likely to have an impact on violent crime rates and that both culture and structure should be considered, not one at the expense of the other. Thus the scientific charge is to discover an empirically valid method of operationalizing culture so that its impact on violence, as well as its interactive relationship with social structure, may be discerned.

Social structure and homicide

Unlike cultural theorists, structural theorists argue that regardless of personal characteristics or cultural values, rates of criminal violence will vary spatially in relation to the social structure of the units under analysis. These types of theories generally fall into two broad categories, strain and control. The first contends that positive forces, such as the social and psychological strain of economic deprivation or social inequities, push people to commit crime. Areas in which the overall population contains a higher

proportion of people experiencing these types of strain are expected to have higher rates of violence. Control theories, on the other hand, maintain that areas that are not socially integrated or that lack viable control mechanisms will have higher rates of violence. Since residents in these areas are not as strongly bonded to their community, and since their community is unable to maintain adequate social control mechanisms, individuals are free to commit crime. In structural models of homicide, these two types of theories are usually represented by economic deprivation and social disorganization, respectively. A discussion of the theoretical propositions and empirical findings of two general types of economic strain is provided here, followed by a presentation of social disorganization.

Theories of strain/economic deprivation

At the structural level, strain is usually operationalized as either absolute or relative deprivation. Although highly correlated empirically, theorists explain the relationship of each to homicide in a divergent manner.[4] Some argue that the social and/or psychological strain induced by absolute deprivation leads to higher rates of crime. On the other hand, some theorists maintain that anger develops when people realize others are better off than them, especially if these inequities are perceived to be the result

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[4]Poverty and inequality are actually two functions of the same economic distribution and research reveals them to be so closely related that efforts to include both in the same model are likely to result in inconsistent findings because of the high degree of multicollinearity. Thus some scholars suggest either (1) including only one or the other in an explanatory model at the same time or (2) including them together in a sort of "resource deprivation/affluence" component (see Land, McCall, and Cohen, 1990) when trying to ascertain the effects of economic distress on levels of homicide. Whether these two concepts have separate effects (or are both representative of an underlying latent trait) is an empirical matter; the processes through which these factors are suggested to have an impact on levels of homicide, however, differ in their theoretical explanations and thus each is discussed here.

of racial discrimination. This inequality is suspected of creating hostility and aggression that can lead to violence.

Absolute deprivation. Several research traditions have posited a theoretical link between absolute deprivation and homicide rates. Though the processes through which higher levels of poverty serve to increase rates of violent behavior differ from conflict theories (Taylor, Walton, and Young 1973), to subcultural theories (Bernard, 1990; Wolfgang and Ferracuti, 1967), to social disorganization (Sampson, Raudenbush, and Earls, 1997; Shaw and McKay, 1942), to criminal opportunity theories (Cantor and Land, 1985; Cohen, Felson, and Land, 1980), to strain theories (Merton, 1938; Messner and Rosenfeld, 1994), they all posit that the level of poverty in an area is positively correlated with its rate of violence.

Relative deprivation. In opposition to the absolute deprivation argument, many have suggested that another source, relative deprivation, is the important economic mechanism leading to strain and higher homicide rates. The main assumption here is not that an absolute lack of resources leads one to commit crime due to necessity or the strain brought about by poverty, but that the individual's perception that others are better off than he or she leads to frustration over this inequitable distribution of resources. This perceived inequity creates frustration and hostility within the individual that may be expressed through aggression and violence (Fowles and Merva, 1996). As Schur (1969) suggests, the poor in a rich society are more likely to resent their deprivation relative to others than in a society where the deprived are surrounded by like others (see also Toby,

1967). Thus the foundation of this argument is that members of the community recognize socioeconomic inequities, gauge them as unfair, and react to them in a violent manner.

From Merton's (1938) anomie theory, to Blau's (1977) macro-structural theory, to Messner and Rosenfeld's (1994) institutional anomie theory, economic inequality is often employed in an attempt to explain higher crime rates.[5] What these researchers usually have in common is their suggestion that someone is poor not simply when they lack the basic resources needed for a healthy existence, but when they are incapable of attaining a standard of living that is acceptable within their own culture (Messner, 1982; Townsend, 1974). For example, Miller and Roby (1970) argue that the determination of what exactly are "basic needs" in a society is relative to the times and thus changes from one era to the next. During any one period there will be a portion of the population living at a level that provides them with what is currently determined to be the basic needs. However, these basic needs may still be well below what should be deemed acceptable within that society given its level of affluence. Thus, the Social Science Council (1968) stated that "people are 'poor' because they are deprived of opportunities, comforts, and self-respect regarded as normal in the community to which they belong" (p. 227-228). Messner and Tardiff (1986) posit that this perceived inequality produces resentment and hostility in the have-

[5]As presented later in this chapter, many "types" of inequality have also been tested. These types depend upon the referent group involved and include overall inequality within the unit of analysis, racial (or *inter*-ethnic) inequality, and inequality within ethnic groups (*intra*-ethnic inequality).

nots that is expressed through violence.[6] The implication is that it is more appropriate to associate with inequality those social problems, including criminal violence, that are usually attributed to poverty.

In sum, strain is usually defined in terms of absolute and/or relative economic deprivation in structural-level models of homicide. The social and psychological strain of deprivation is suspected of increasing rates of criminal violence. In theoretical terms, poverty is an absolute condition based upon a standard level of survival. It is an important element of several, sometimes conflicting, theories of crime. Inequality, on the other hand, is theoretically defined in relative terms. That is, one may have an absolute standard of living that is above what is needed for survival, but relative to others this may still be well below what is acceptable within his or her society. Thus the inequities revealed when one compares him- or herself with others is thought to create hostility and aggression that, in turn, lead to higher rates of violence and homicide.

Empirical findings of strain/economic deprivation

Absolute deprivation

As suggested in the previous section, the exact process through which levels of poverty lead to higher crime rates is the topic of much debate. However, whether legitimacy and order are undermined or social bonds weakened or subcultures develop,

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[6]As Danziger and Wheeler (1975) and others have noted, the *intra*-class and *intra*-racial nature of violent crime does not necessarily undermine this theory, which is based upon *inter*-class antagonisms. The suggestion is simply that aggression is acted out against proximate targets, not those with whom comparisons are made.

most theorists agree that economic distress heightens the probability of increased rates of violence. Though the results are not unequivocal, the positive relationship between levels of poverty and the variation in homicide rates is the most consistent finding in the literature on the structural covariates of homicide.

The contemporary literature relating these two phenomena can be traced to an article by Loftin and Hill (1974) that criticizes earlier studies by Hackney (1969) and Gastil (1971) and that suggests that structural characteristics may better account for the variation in homicide rates. Work by Blau and Blau (1982) and Messner (1982), however, failed to corroborate the poverty-homicide relationship found by Loftin and Hill and others (see Parker and Smith, 1979; Smith and Parker, 1980). Blau and Blau argued that the poverty-homicide relationship was spurious and that this finding could be better explained by racial inequities. When the authors controlled for racial inequality (see the Inequality section below for a full discussion of this study) they found it to be significant and that the relationship between poverty and homicide disappeared. Similarly, Messner (1982) asserts that overall inequality (not poverty) accounts for higher homicide rates and he also holds that the SMSA (not the state) is the more appropriate level of analysis and that the percentage of residents living under the poverty line (not an Index such as that created by Loftin and Hill) is a more valid measure of poverty. After making these changes, Messner failed to find support for his inequality thesis but he did find a significant *inverse* relationship between poverty and homicide. Thus Blau and Blau conclude that racial inequity is the reason for higher homicide rates and Messner concludes that, given his results that suggest that homicide rates *decrease* as poverty

increases, the relationship between poverty and homicide is more tenuous than earlier studies suggest.

Bailey (1984) and Williams (1984) respond to Messner and Blau and Blau with work that calls into question the results of these studies. First, both Williams and Bailey cite the theoretical and empirical tradition–at both the individual and structural levels–relating poverty and homicide. Bailey also questions Messner's statement about the strong theoretical link between inequality and homicide, suggesting that orthodox and neo-Marxist theories, as well as Mertonian strain theories, are mostly concerned with economic, not violent, crime. Given the high level of intra-unit variation across SMSAs, Bailey also contests that the city is the more appropriate level of analysis because of its increased homogeneity on the concepts under study. Using official crime rates from the UCR and social measures from the 1950, 1960, and 1970 censuses, he finds the expected positive relationship between poverty and homicide but null effects of inequality on homicide. Williams, pursuing an alternative course, suggests that the contradictory findings of the Blau and Blau and Messner studies are likely due to specification error. Specifically, he believes the relationship between poverty and homicide to be nonlinear. Williams replicates both studies and, after re-estimating the model to reflect this new specification, finds significantly positive findings for the poverty variable, but only chance findings for Messner's inequality and Blau and Blau's racial inequality measures. Williams and Bailey conclude that the findings of Blau and Blau and Messner are the result either of misspecification or incorrect level of analysis and thus do not present

serious challenges to the traditional theoretical and empirical link between poverty and homicide.

Loftin and Parker (1985) reveal that measurement error may also be problematic in studies that find negligible effects of poverty on homicide. The authors posit that a common measure of poverty (i.e., the percentage of families below the poverty line) contains errors that are confounded with the disturbance term and that this is likely to produce biased parameter estimates. To correct for this problem, Loftin and Parker employ an instrumental variable–infant mortality–which they argue has strong theoretical and empirical links to poverty (for reviews of this literature see Loftin and Parker, 1985; McDowall, 1986). When the authors estimate original OLS regression equations (without infant mortality) they find no relationship between poverty and homicide. However, when the instrumental variable is introduced into the equation, the effects of poverty on homicide become significant. Loftin and Parker conclude that these findings demonstrate the sensitivity of structural models of homicide to measurement error in the poverty variable and that this may be one reason for the inconsistent findings across studies.

A 1984 article by Centerwall, along with a similar follow-up study by the same author in 1992, clearly displays the effects of socioeconomic status on homicide, as well as vividly demonstrating the relationship between race and economic status. The author studies intra-racial homicide in Atlanta (1984) and New Orleans (1992) and finds that in both cities the risk of homicide commission among blacks during the periods under study was six times higher than that of whites. Centerwall then operationalizes socioeconomic

status as household crowding and separates city census tracts into seven different strata based upon the percentage of crowded households in each tract. The author finds that when this measure of socioeconomic status is controlled, "blacks were no more likely to commit... homicide than were whites in comparable socioeconomic circumstances" (Centerwall, 1992, p. 1755). In other words, socioeconomic status accounted for the entire difference in homicide rates between blacks and whites.

Just as important in both articles is the dispersion of blacks and whites among census tracts. In the Atlanta study (see Table 2.1a below), there were no blacks in the census tract with the lowest percentage (0-2%) of crowded households and either no or very few whites in the strata with the highest percentages of crowded households (21-25%, 26-30%, 31-40%); in the New Orleans study (see Table 2.1b below), there were again no blacks in the stratum with the lowest percentage of crowded households, and this time no whites lived in a stratum in which more than 6% of the households were crowded. This resulted in only three strata in Atlanta and one stratum in New Orleans for which there were comparable data for blacks and whites. This is a perfect example of the multicollinearity issue that researchers face when studying the structural covariates of homicide. Without a substantial number of cases and valid measures, highly correlated independent variables are likely to make structural models sensitive to slight changes in model specification (Blalock, 1979).

Table 2.1a. Number and rate of domestic homicides, by race of victim and by rates of crowding in the victim's census tract of residence, Atlanta, 1971-1972.

	Race of victim						
	White			Black			Black:White
% crowded households*	Domestic homicides	Population (≥ age 16)	Homicide rate**	Domestic homicides	Population (≥ age 16)	Homicide rate**	Relative risk (95% C.I.)
0-2	6	70,135	0.4	--	--	--	--
3-10	17	94,842	0.9	7	19,803	1.8	2.0 (0.8-4.7)
11-15	3	7,255	2.1	22	31,174	3.5	1.7 (0.5-5.6)
16-20	10	8,217	6.1	34	39,968	4.3	0.7 (0.3-1.4)
21-25	0	1,086	--	65	45,719	7.1	--
26-30	--	--	--	31	14,848	10.4	--
31-40	--	--	--	27	9,596	14.1	--
TOTAL	36	181,535	1.0	186	161,108	5.8	5.8 (4.3-8.0)

Source. Centerwall, 1984, p. 814.

Note. Centerwall defines "domestic homicide" as intra-racial homicide committed by a relative or acquaintance of the victim.

*>1.0 resident per room.

**Rate per 10,000 person-years.

Table 2.1b. Number and rate of domestic homicides by race of victim and by rates of crowding in the victim's census tract of residence: New Orleans, La., 1979, 1982, 1985, and 1986.

	Race of victim						
	White			Black			
% crowded households*	Domestic homicides	Population (≥ age 15)	Homicide rate†	Domestic homicides	Population (≥ age 15)	Homicide rate†	Black:White Relative risk (95% C.I.)
0-1	9	55,043	0.4	...‡	...	...	...
2-6	20	63,728	0.8	7	19,088	0.9	1.2 (0.4-2.9)
7-10	...	...	...	27	22,991	2.9	...
11-15	...	...	...	126	97,056	3.2	...
16-20	...	...	...	97	51,579	4.7	...
21-30	...	...	...	40	12,252	8.2	...
31-43	...	...	...	23	6,725	8.6	...
TOTAL	29	118,771	0.6	186	209,691	3.8	6.3 (4.3-9.5)

Source. Centerwall, 1995, p. 1757.

*More than 1 resident per room.

[†]Average annual number of homicide victims per 10,000 race-specific population.

[‡]Ellipses indicate insufficient population to permit calculation of a homicide rate.

Yet another reason for inconsistent results, claims Kposowa, Breault, and Harrison (1995) is the dependence upon small samples of urbanized areas (cities or SMSAs). The authors contend that the reliance upon urban samples has limited the level of variation from unit to unit on variables such as percent black and poverty (which as the Centerwall studies show, are likely to be highly correlated). Using the county as the unit of aggregation negates this problem, argue Kposowa et al., and by including nearly all U.S. counties in their sample they hope to defend against the complications associated with multicollinearity. Theoretically, the authors contend that a focus on urban areas has led to perpetuating the idea of the city as pathological,[7] thus diverting theoretical interest away from the true causes of homicide. Employing official data from 1980 for over 98% of all counties in the United States, the authors fail to find support for the effects of subculture and inequality on homicide, but do find poverty to be positively related to the variation in homicide rates among counties. In fact, the authors estimate several models–testing for relationships on various samples disaggregated by county size (greater than 100,000 residents or fewer than 25,000 residents), location (only those in the South), and relative size of the black population (greater than 25% of the overall population)–and find their measure of poverty to be significantly related to the variation of homicide rates in every model.

[7]Parker (1989) and Kovandzic, Vieraitis, and Yeisley (1998), for example, argue that homicide is, by and large, a center city phenomenon.

"Types" of homicide. In the last decade and a half, several authors have argued for disaggregating data on the basis of race (separate models for blacks and whites)[8] and/or type of homicide (family, acquaintance, and stranger) when examining the effects of structural factors on criminal violence. Parker and Smith (1979) contend that, just as all types of crime may not be similarly motivated and thus cannot be grouped together in a single category, the designation of "homicide" is not unidimensional. The authors note that earlier theorists such as Wolfgang (1958) and Curtis (1975) suggest that a typology of homicide can be created based upon the relationship between the victim and the offender.

Specifically, Parker and Smith advocate the division of homicide into two general types–primary and non-primary–and argue that the etiology of each is different. Primary homicides are defined as those in which the victim and the offender are either family or acquaintances, and the authors contend that these types of homicides are likely to be unpremeditated acts of passion. Non-primary homicides, on the other hand, are thought to be mostly calculated, instrumental acts of criminal violence that involve victims and offenders who do not know each other. The authors employ Uniform Crime Reports and Census data for 1970 to test their hypothesis of differing etiological models at the state level. Using Loftin and Hill's (1974) "structural poverty index" as their measure of poverty, they find this measure to be related to overall and primary homicide rates, but not non-primary. Parker and Smith conclude that the disaggregated effect is different

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[8]The theoretical justification for this is that failure to disaggregate on the basis of race masks the differential effects on homicide rates of the structural covariates for blacks and whites (see Ousey, 1999).

from the overall. They state that "it is clear that partitioning homicide by type yields divergent results" (p. 622), and thus suggest that it is important to study how and why non-primary rates have different causal mechanisms.

Later studies by Smith and Parker (1980), Loftin and Parker (1985), and Williams and Flewelling (1988) also argue that homicide may not be a homogeneous phenomenon and that this may be a reason for inconsistent findings when testing for relationships between structural covariates and crime. Using Census Data for 1970 and FBI data on homicides for 1973, Smith and Parker find that the structural poverty index is significantly and positively related to the variation among states' total and primary homicide rates, but has null effects on non-primary homicides. Loftin and Parker employ data for the 49 largest cities in the United States in 1970, use the percentage of families below the poverty line (as well as an instrumental variable, infant mortality) as a measure of poverty, and further refine the classification of homicide into four types: family, other primary, robbery, other felony. Their results indicate that poverty is significantly and positively related to all types of homicide (including overall rates) except for "other primary." Finally, Williams and Flewelling classify homicide into three categories–family, acquaintance, and stranger–and further dichotomize each of these into "conflict" and "other" types of homicide. Much like the Loftin and Parker results, the authors find that their measure of poverty is positive and significant across all types of homicide. Whether or not a classification of homicide (and thus differing etiological models) is necessary, the results of these studies find poverty to be a consistent explanation of the spatial variation in homicide rates.

Time-series analysis. In order to study the relationship between the change in economic distress over time on the change in levels of homicide, further research has been completed that employs time-series analysis. McDowall (1986), for example, argues that cross-sectional studies may not be appropriate because the impact of poverty on homicide may not be instantaneous. Instead, he argues that the initial force of economic distress may be blunted by the resources the individual or family has built up over time. Extended periods of poverty, however, exhaust these resources and raise the risk of violence. McDowall tests this hypothesis by studying homicide rates in Detroit from 1926 to 1978. Using infant mortality as a proxy for poverty,[9] he finds evidence of both short-term and long-term effects of poverty on homicide rates. The findings suggest that a 1% increase in the infant mortality variable eventually leads to a long-term increase of more than 1% in the homicide rate. McDowall concludes that any null findings of poverty on homicide in cross-sectional research are likely due to method, not theory, and that his time-series analysis "strongly support[s] the idea that poverty is related to homicide" (p. 29).

Fowles and Merva (1996) conduct a time-series analysis of homicide rates among 28 SMSAs in the United States for the years 1975 to 1990. They argue that SMSAs present a more appropriate unit of analysis because smaller units, such as cities and neighborhoods, do not provide an adequate level of variability in the data. Although their study focuses on the relationship between wage inequality and criminal activity, they also

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[9]More precisely, the measure is actually a ratio of the number of infant deaths in Detroit to the number of infant deaths in the United States. This is done in order to control for advances in medical technology over time (McDowall, 1986).

test for a poverty-homicide relationship during the period under study. The authors' results show a positive impact of poverty on homicide and Fowles and Merva conclude that changes in the level of absolute deprivation is an important factor in the generation of higher homicide rates over time.

Consistency in findings. Finally, two articles appeared earlier this decade that attempted to summarize the findings relating social structure and homicide. Land, McCall, and Cohen (1990) suggest that any discrepancies in the literature have probably been due to inconsistencies in methodology such as the variance in levels of aggregation, samples, time periods studied, and model specifications. In an attempt to correct for this, the authors first construct a general model consisting of 11 covariates and test this model on cities, SMSAs, and states for the years 1960, 1970, and 1980. They find this baseline model to be unstable (i.e., the results are context-specific, depending upon the level of analysis and the year tested) and argue that this instability is due to the intercorrelation of several independent variables. By employing principal components analysis, however, Land et al. discover two underlying factors that they call "population structure" and "resource deprivation/affluence." This reduces the problem of multicollinearity in their revised model which, when re-estimated, shows a much higher level of stability across levels of aggregation and time periods. In fact, the resource deprivation/affluence measure[10] is found to be significantly and positively related to the variation in homicide

[10]This component consists of median family income, the percentage of families living below the poverty line, the Gini index of income inequality, the percentage of the population that is black, and the percentage of children under 18 not living with both parents.

rates in cities, SMSAs, and states in each of the time periods (1960, 1970, and 1980) examined.

In light of the contradictory nature of the literature relating poverty, inequality (see next section) and homicide, Hsiegh and Pugh (1993) completed a meta-analysis of 34 macro-level studies relating poverty to violent crime. Since many analyses over the last two decades have employed similar measures of poverty and homicide, the authors argue that they are able to employ meta-analytic procedures to test for consistent findings across studies. Hseigh and Pugh compute a total of 76 bivariate correlation coefficients for measures of violent crime and either poverty or inequality and find that all but two are positive and that approximately 80% are of at least moderate (i.e., $r > .25$) strength. The authors conclude that their results are "clearly consistent with the assumptions that resource deprivation is an underlying cause of violent crime and...is especially associated with... homicide" (p. 182).

Overall, the findings that suggest that the variation of homicide rates is due in part to levels of poverty are consistent across (1) time periods (1970, 1980, 1990), (2) levels of analysis (e.g., neighborhood, city, SMSA, county, state, nation), (3) various measures of poverty (e.g., the percentage of families below the poverty line, a "structural poverty index," a "resource deprivation/affluence" factor created via principle components analysis, and infant mortality–both as a proxy for poverty and as an instrumental variable), (4) different types of analysis (cross-sectional and longitudinal), and (5) both model specification (what other variables are included) and specification of the

relationship (linear and non-linear).[11] Thus, regardless of the underlying mechanisms, these consistent results lead Sampson and Lauritsen (1990) to conclude that "almost without exception, studies of violence find a positive and usually large correlation between some measure of area poverty and violence–especially homicide" (p.63).

Relative deprivation

Two studies appeared in 1982 that turned attention away from poverty and toward inequality in the attempt to explain variation in homicide rates. Messner (1982) argued that relative deprivation is more important than poverty as an explanation of high homicide rates. Since inequality is supposedly based upon comparisons to those with whom one comes in daily contact, Messner suggests that earlier studies are flawed because they employ an improper unit of analysis (such as the state). It is more appropriate to aggregate to the SMSA level, claims Messner, since this more closely resembles a community–and thus is home to those with whom one will compare him- or herself–than does an entire state. Based upon 1970 census data and official homicide

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[11]Given the variation in models presented here (samples, time periods, specification of models, measurement of variables) it is unsafe to rely simply on enumerating the number of coefficients for and against. For illustrative purposes, however, it is noted that of the 93 coefficients estimated from the studies in the table in Appendix B, 58 show a positive and significant effect of poverty on homicide, 30 show null effects, and 5 show negative effects. Further, more than half (17) of the models reporting null effects, and three of the five models reporting negative effects, included both poverty and inequality, which is likely to make the model unstable due to the effects of multicollinearity. Also, some studies that report null effects operationalize poverty in questionable manner. Hackney (1969) and Hansmann and Quigley (1982), for example, use measures of central tendency (median income and Gross National Product, respectively) that are unlikely to capture the true extent of poverty in each unit. As both McDowall (1996) and LaFree, Drass, and O'Day (1992) note, the overall well-being of a population says little about the size of the poverty population, and both can increase at the same time.

rates, Messner employs the Gini coefficient as a measure of inequality in a sample of 204 SMSAs and controls for several other structural elements thought to influence homicide rates. The author is unable to find support for the inequality hypothesis, but this study, along with a second published that same year, inspired a flurry of research on inequality and homicide.

Building on Peter Blau's (1977) macrostructural theory, Blau and Blau published an article in 1982 that is perhaps the most-cited piece to date on inequality and crime. The Blaus' thesis is that it is not inequality *per se* that leads to higher crime rates, but inequality that is based upon an ascribed status such as race or ethnicity. In other words, in a democratic society such as the United States, socioeconomic inequality based upon the ascribed characteristics of race and ethnicity is a clear manifestation of discrimination and will "consolidat[e] and reinforc[e] ethnic and class differences [and] engender pervasive conflict" (Blau and Blau, 1982, p. 119). Ascriptive inequality in a democratic society is expected to lead to resentment and hostility that result in higher rates of homicide. Using 1970 census data and official crime rates for 125 SMSAs, the authors control for population size, income inequality, percent divorced and percent black. They find that their measure of racial inequality (operationalized as the difference in average socioeconomic status between nonwhites and whites) is positively and significantly related to the variation in homicide rates among the SMSAs in their sample and conclude that inequality based upon race and ethnicity is a stronger explanation of homicide rates than either overall inequality or poverty. A high rate of criminal violence, the authors conclude, is the price a society pays for high levels of racial inequality.

It is worth noting that the findings of both the Blau and Blau (1982) and Messner (1982) studies have been questioned on several accounts. First, Blau and Golden's (1986) replication of the original study fails to show support for a relationship between racial inequality and homicide in the overall model. Second, work by Golden and Messner (1987) reveals that tests for a relationship between racial inequality and homicide are sensitive to how the former is operationalized. Their research indicates that the outcome will likely be different depending upon whether the researcher chooses *income* inequality or *socioeconomic* inequality as a measure of the racial inequality concept. The authors conclude that this sensitivity is the major reason for the inconclusive findings relating racial inequality to homicide rates in the research inspired by the Blaus' work. Finally, the ecological fallacy (Robinson, 1950) made by Blau and Blau is apparent. From a macro-level framework that examines the variation in crime *rates* among SMSAs due to the income disparity between racial *groups*, the authors draw strong conclusions about the micro-level processes through which *individuals* translate perceptions of inequity into feelings of hostility and, finally, individual acts of violence.

As for Messner's (1982) study, although he found no effect of inequality on homicide, his work did generate criticism on both theoretical and empirical grounds, and his strong conclusions concerning his findings on the relationship between poverty and homicide (he found it to be significantly negative) also received an unfavorable assessment. Bailey (1984), for example, raises several points of contention. First, he disagrees with Messner's statement that there is a strong theoretical linkage between relative deprivation and homicide, citing that most theorists in this tradition relate

inequality with property crimes, but have little to say about violence. Empirically, Bailey raises questions about Messner's choice of the SMSA as the correct level of aggregation. In response to earlier studies that had aggregated to the state level, Messner suggests that the SMSA is the more appropriate unit of analysis since it more closely resembles a community. Bailey, on the other hand, argues that high levels of variation in homicide rates and other theoretically important structural characteristics within an SMSA make this an inappropriate frame of reference and that the city itself is the correct level of aggregation since it is more homogeneous.[12] Finally, citing (1) the theoretical tradition linking poverty and violence, (2) a long list of empirical studies that support this hypothesis, and (3) Messner's own results that show null effects of inequality on homicide, Bailey rejects Messner's conclusion that his findings "call for serious reconsideration of the linkages between poverty, inequality, and the homicide rate" (Messner, 1982, p. 112).

Despite these criticisms and the sometimes unclear theory linking inequality and homicide, the Blau and Blau (1982) and Messner (1982) articles have generated a large number of studies that examine this relationship, and it is now commonplace for studies focusing on other structural covariates of homicide to control for inequality. The results have been equivocal. With units of analysis varying from neighborhood to city to SMSA

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[12]This argument is certainly valid, but he does not heed his own advice when he later states that he "avoids" aggregation problems by using cities as units of analysis. It is true that cities are more homogeneous than SMSAs, but they are not without variation on the concepts of interest. Others suggest that the most appropriate unit of analysis is the community, neighborhood, or census tract (see, for example, Crutchfield, 1989; Messner and Tardiff, 1986; Sampson, Raudenbush, and Earls, 1997).

to state to nation, the majority of studies (see the table in Appendix B) have found null effects of inequality on homicide rates, but a few (see Kposowa et al., 1995; Messner, 1983a) have presented models showing a significantly negative relationship, and several have found the hypothesized positive impact of inequality on homicide.

These inconsistent findings have only increased interest in the topic.[13] For example, Messner and Tardiff (1986) employ neighborhoods as their unit of analysis, arguing that this is the most appropriate level of aggregation because "neighborhoods are more likely to constitute more meaningful frames of reference for social comparisons" (p. 297).[14] Using 1980 Census data, the Gini coefficient as their measure of inequality, and

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[13]One of the results has been theoretical argument over what constitutes the appropriate reference group. For example, some argue that "overall" inequality within a society will lead to negative feelings by the lower classes toward those who are better off. On the other hand, citing reference group theory, others suggest that "inter-ethnic" or "intra-ethnic" inequality may be a more appropriate frame of reference. The former is based upon Blau's (1977) macrostructural theory and the Blau and Blau (1982) study discussed above. The latter suggests instead that individuals are more likely to compare themselves to others *within* their own racial or ethnic group when measuring personal standards of living (see Harer and Steffensmeier, 1992). Therefore within-group inequality is hypothesized to be the more likely source of violence. Again, since the present study directly tests neither of these hypotheses in the context of Russian regions, only overall (not inter- or intra-ethnic) inequality is discussed in this review. However, a tabular summation of these findings is presented in Appendix B.

[14]This argument is a valid one. However, the authors also attempt to support their choice by arguing that cities and SMSAs, which they term *political* and *statistical* units, are less "natural groupings of urban populations" (p. 301) than neighborhoods. Whether or not neighborhood structure is any less political than city or SMSA structure is debatable. Also, since official data are not available for neighborhoods, the authors must aggregate census tract data and "fit" the census tracts to their neighborhoods (and thus they employ data from the "statistical" unit of census tracts). My argument is that this choice of the unit of analysis should be defended in terms of theory (e.g., neighborhoods are more appropriate levels of aggregation since they are the unit within which social comparisons occur) instead of attaching negative labels–such as "mere statistical aggregates"–to others' choices of units of analysis.

controlling for several other concepts thought to influence rates of criminal violence, Messner and Tardiff find null effects of income inequality on homicide rates in their sample of 26 Manhattan neighborhoods. Crutchfield (1989) uses census tracts as the unit of analysis in his study of the dual labor market theory and its effect upon crime rates in Seattle. Though concentrating upon the structure of labor (i.e., unemployment and unstable employment) within census tracts, Crutchfield discovers a significantly positive impact of within-tract income inequality on homicide rates. Also finding positive support for his hypothesis that labor instability increases crime rates, the author suggests that the failure of past studies of inequality and crime to control for the structure of employment has led to misspecified models and thus contradictory findings.

Shifting the unit of analysis back to SMSAs, Fowles and Merva (1996) employ time-series methodology to examine the relationship between wage inequality and homicide rates in 28 SMSAs from 1975 to 1990. The authors employ SMSAs because of their higher unit-to-unit variability in income inequality, arguing that one reason for Messner and Tardiff's (1986) failure to find positive effects of inequality on homicide might have been the low range of variation on the income inequality variable in their sample of neighborhoods. The OLS regression results indicate that inequality has a strong positive impact on homicide rates over time and the authors estimate that the increase in wage inequality from 1980 to 1990 in their sample accounted for an increase in homicides of between 0.68% and 6.15% during the same period. The authors are careful not to make broad claims about the causal mechanisms producing this

relationship, but conclude that the effects of wage inequality on homicide are consistent across a number of model specifications.

Finally, Kovandzic, Vieraitis, and Yeisley (1998) employ data from the 1990 Census for the largest 190 cities in the United States. One of their aims is to address the inconsistent findings relating inequality and homicide. In an attempt to do so, they use three different measures of inequality: the Gini coefficient, an inequality ratio (operationalized as the ratio of the percentage of total U.S. income received by the top 20% of families to the percentage received by the lowest 20% of families), and the share of income received by the top 20% of families. Arguing that states and SMSAs are inappropriate levels of aggregation due to the intra-unit variation on the phenomena under study and due to the differing types of ecological areas contained within them, the authors use cities as their level of analysis.[15] Controlling for a host of other factors suspected of influencing homicide rates, the authors find all three of their inequality measures to be significantly and positively related to the variation of homicide rates among the cities in their sample. Their findings hold when they disaggregate upon the dependent variable (type of homicide), and they conclude that inequality is a strong predictor of homicide rates.

In sum, the findings relating inequality to the spatial variation of homicide rates have been neither as strong nor as consistent as the poverty findings discussed above. In

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[15]Drawing on Parker (1989), they also argue that homicide is primarily a "central city phenomenon," since 62% of all homicides in the United States in 1990 occurred within the boundaries of the 190 cities in their sample.

the 71 models in the table in Appendix B in which a coefficient for some type of inequality was estimated, 29 show a significantly positive relationship, five show a significantly negative relationship, and 37 report null findings. Popular reasons cited for the inconsistent findings include disparate samples, multicollinearity, improper measures of inequality, incorrect levels of analyses, incorrect specification of the relationship between inequality and homicide rates, and the failure to disaggregate based upon region, race, or type of homicide. For example, Golden and Messner (1987) caution that their results indicate that how inequality is operationalized (i.e., in terms of socioeconomic status versus income) has a significant impact on the outcome. They conclude that their results "call for a skeptical assessment of previous evidence indicating a positive relationship between racial inequality and rates of violent crime" (p. 525).

The outcome of these inconclusive findings has been an effort to find positive results via (1) aggregating to several different levels of analysis (community, city, SMSA, and county levels), (2) testing for several different types of inequality (overall inequality, between-race inequality, within-race inequality, inequality based upon income, and inequality based upon socioeconomic status), and (3) disaggregating data in order to determine if the effects of inequality are contingent upon geographic location and ethnic status, or if inequality of some sort may lead to certain types of homicide but not others.

At best, the empirical results are inconclusive; at worst, the work sometimes seems to be led by an empirical search for significant results rather than sound theory.[16]

Social disorganization theory

Theories of social disorganization argue that a breakdown in social bonds decreases a community's ability to control its members, thereby freeing them to commit crime. Social disorganization is thus a macro-level analog of individual control theory (Hirschi, 1969). Structural impediments are viewed as disrupting the social ties and group solidarity that would normally aid the community in regulating itself. As the community or society loses its ability to produce conformity via formal and informal social control, its members become detached from their social bonds and are free to engage in criminal behavior (Bursik, 1988). After gaining popularity throughout the 1950s and 1960s, social disorganization as an explanation of the variation in crime rates

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[16]Although rarely mentioned by those who study the effects of relative deprivation on criminal violence, the main reason for their difficulty in specifying a relationship between *relative* deprivation and homicide that is separate from the relationship between *absolute* deprivation and homicide might be inattention to the nature of these concepts. Whether or not separate effects are operating is certainly an empirical matter. However, the structural concepts of poverty and inequality are in actuality two functions of the same economic distribution and are thus inherently related. Ignoring this fact will lead to difficulty in operationalizing inequality in a way that is (1) truly separate from poverty (Land et al., 1990) and (2) faithful to the concept being measured (Balkwell, 1990). Kposowa et al. (1995) claim that it is unlikely that researchers are able to separate the effects of relative and absolute deprivation and Kovandzic et al. (1998) state that "research that has modeled both inequality and poverty simultaneously...has consistently failed to find significant effects for both" (pp. 574-575). This issue is loosely analogous to the problem of separating the effects of structure and culture, which was briefly discussed earlier. Finally, these difficulties are likely exacerbated by the fact that theorists seem to be trying to test a micro-level theory (i.e., an individual compares his economic standing to others, becomes frustrated at the inequities he discovers, then eventually manifests his anger via an act of violence) with macro-level data (i.e., variation in crime rates among ecological areas).

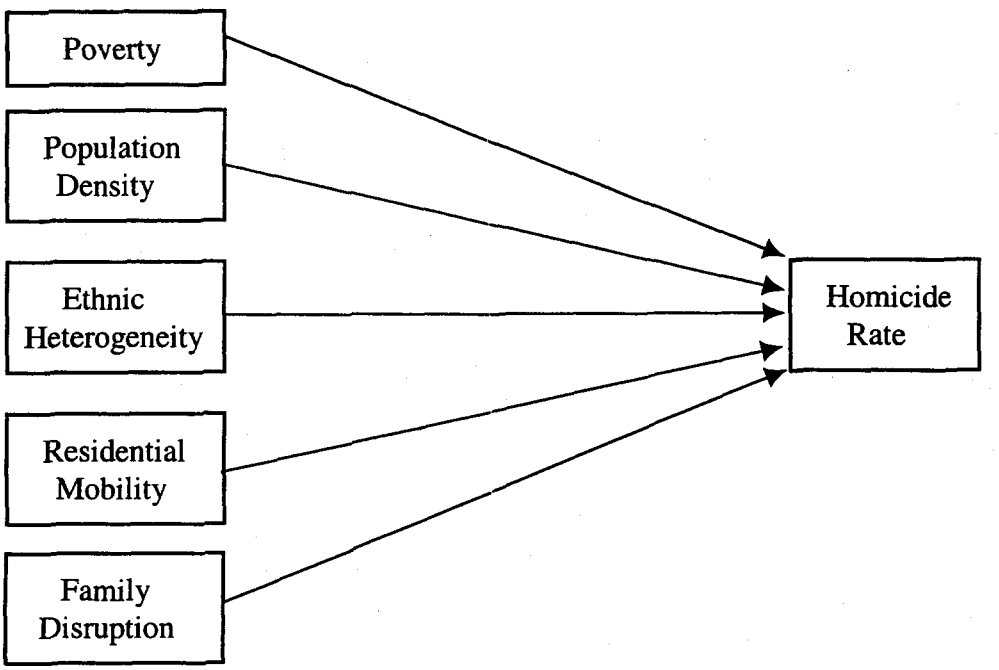
fell into disfavor until the mid-1980s. In the last decade and a half, however, there has been a resurgence of interest in this model.

Contemporary social disorganization theory has its roots in Durkheim (1933), who argued that the processes of modernization and urbanization create communities that lack social integration. The work of Wirth (1938) was also a precursor to social disorganization. He stated that as a community's size, density, and heterogeneity increased, the interpersonal relationships of its members become transitory and superficial, thereby reducing any shared understanding the community may possess. Sellin (1938) focused more closely on cultural differences, arguing that ethnic groups often possess distinct cultural values that dictate the forms of their societal institutions, roles, and interpersonal interaction. When these diverse groups share the same geographic space, their differences make it difficult to build a common understanding. Shaw and McKay (1942) pull all this together, stating that the disorganization created by these factors, along with the economic deprivation and transient nature characteristic of these types of communities, disrupt social integration and weaken social control.

The community or neighborhood has long been regarded as the most appropriate unit of analysis for testing models of social disorganization. However, since structural mechanisms external to the community, such as political-economic forces that direct the distribution of jobs, services, and even people (Bursik, 1988), are recognized as contributing to social disorganization, theoretical models that incorporate these factors and examine broader aggregations are widespread. The commonly accepted elements of these macro-level models of social disorganization are poverty, population density, ethnic

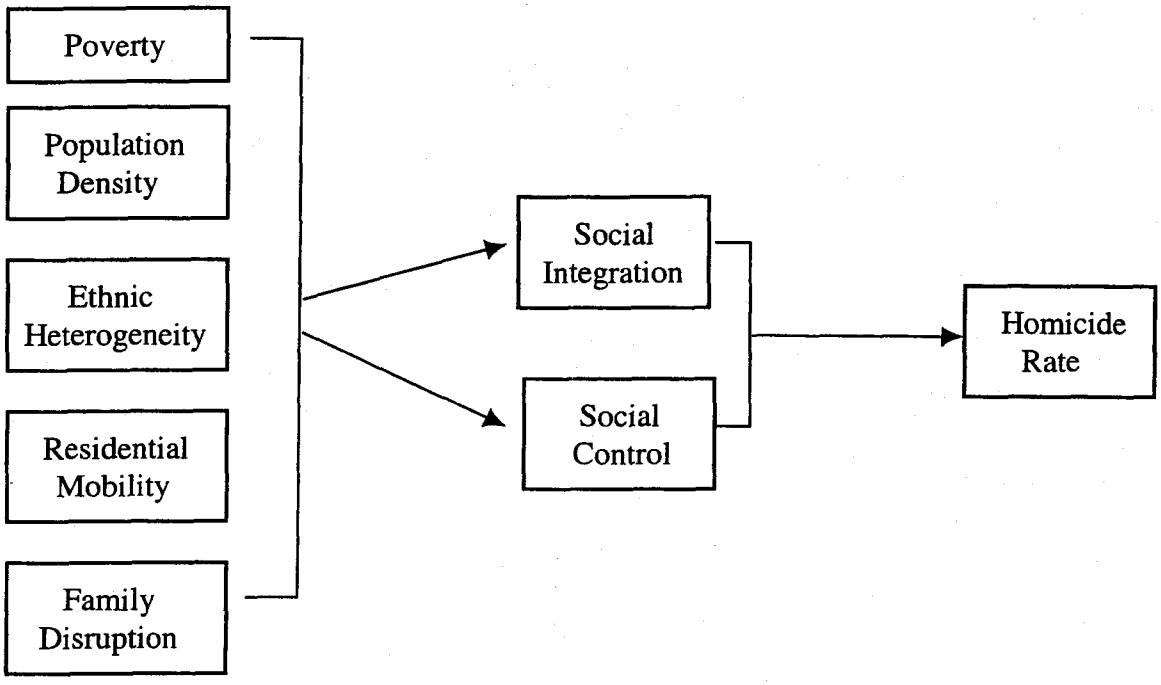
heterogeneity, residential mobility, and family disruption. Each is suspected of disrupting community organization and integration, thereby weakening social control and allowing crime and violence to increase. Figures 2.2a and 2.2b show the macro-level and community-level models of social disorganization, respectively.

Figure 2.2a. Macro-level theoretical model of the relationship between social disorganization and homicide rates.



For example, Wilson (1987, 1996) argues that nation- and worldwide economic patterns dictate the availability and distribution of jobs. One of the many negative results of this is the creation of pockets of concentrated poverty. Poor communities have neither the internal resources to bring to bear on their many social problems nor the political clout to attract external resources. For example, a low tax base means that schools are ill-equipped to prepare the community's children for well-paying jobs and are unable to

Figure 2.2b. Community-level model of the relationship between social disorganization and homicide rates.



socialize many children into pro-social values. Thus economic deprivation within the community translates to an inability to demand a strong educational system–an institution that is vital to social integration and control–from the state.

The size and density of the population is also suspected of playing a role in the social disorganization of the community. First, Mayhew and Levinger (1976) argue that the larger the number of residents in an area, the lower the proportion of the population a person recognizes. This increased anonymity not only makes people in heavily populated areas more vulnerable to victimization (friends or neighbors, for example, are unlikely to intervene in a dangerous situation if they barely know the victim), but also makes it more difficult for residents to recognize those who live in or frequent the neighborhood from

those who do not. Second, the physical space of these communities can serve to exacerbate organizational problems. For example, the multiple-dwelling housing units built to accommodate the high number of residents may actually increase opportunities for crime commission. Newman (1972) and Roncek (1981), for example, suggest that certain neighborhoods may be more at risk because they contain large apartment complexes or similar structures with abandoned rooms, dark stairwells, and dimly-lit streets and courtyards that attract opportunistic offenders and make it hard to defend against victimization. Thus high rates of crime are expected in these communities with less "defensible space"areas because population density serves to both decrease integration and hamper surveillance mechanisms.

Ethnic heterogeneity is also viewed as a negative factor influencing social organization. As mentioned earlier, different ethnic groups often maintain distinct cultural understandings. Since most people are more likely to build close friendships with like others (Angell, 1974), the proximity of unique cultural groups not only makes it difficult to create a shared consensus, but also makes a problem more difficult to resolve once it has arisen. Thus heterogeneity is viewed by some as an impediment to local integration and the realization of commonly agreed upon goals.

Shaw and McKay (1942) suggest that another obstruction to integration into local social networks is high residential mobility. Crutchfield, Geerken, and Gove (1982) contend that the construction of social relationships and networks is a lengthy process and is less likely to occur in areas with greater mobility. Thus rapid population turnover disrupts social integration by (1) creating anonymity, (2) producing unstable and

impermanent social relationships that would otherwise bind people to neighbors and to their community, and (3) undermining institutional development (Patterson, 1991; Sampson, 1985; Stark, 1987).

Finally, family disruption is also a suspected cause of social disorganization. According to Hirschi (1969) and Kornhauser (1978), areas with higher levels of family instability are less capable of implementing a network of informal controls. For example, Kornhauser argues that these areas are less able to supervise children and to deter or detect delinquency and deviance. Similarly, the members of a community that has a high level of family disruption are less likely to be involved in social networks and community affairs. Again, these conditions create less integration and fewer community controls, resulting in higher crime rates in disorganized areas.

In sum, social disorganization today is defined similarly to the concept of social control in Park and Burgess' (1924) discussion of human ecology. That is, social disorganization is understood as the inability of a community to regulate the behavior of its members according to its common values (Bursik, 1988; Sampson, Raudenbush, and Earls, 1997). This may be influenced by forces outside the community that have a negative impact on community structure. The commonly accepted elements of disorganization are economic deprivation, population density, ethnic heterogeneity, residential mobility, and family disruption. These structural forces are suspected of decreasing social integration, thereby interfering with community mechanisms of social

control. Freed from social bonds, and in the absence of controls, residents are free to become involved in crime and violence.

Empirical findings of social disorganization

After gaining popularity throughout the 1950s and 1960s, the number of empirical studies focusing on social disorganization and variation in crime rates dropped markedly until the mid-1980s. In the last decade and a half, however, there has been a resurgence of interest in social disorganization theory and research. Even though there have been a limited number of studies focusing directly upon the effects of social disorganization on the spatial variation in homicide rates, nearly every study controls for what are commonly accepted as the structural analogs of social disorganization variables.

Hansmann and Quigley (1982) use a sample of 58 nations to test the cultural-integration hypothesis, arguing that ethnic, linguistic, religious, and economic heterogeneity within a nation are likely to produce higher levels of conflict that will lead to higher rates of homicide. They find, however, that these categories of heterogeneity beget differential outcomes, with income and ethnic heterogeneity producing positive effects and religious and linguistic heterogeneity negative effects on the variation of homicide rates. Hansmann and Quigley suggest that *religious* and *linguistic* heterogeneity are likely to lead to less interaction between groups because of marked differences, but that higher levels of daily interaction are found between groups with *income* and *ethnic* differences. They conclude that less interaction means less conflict, but that increased interaction between diverse ethnic and income groups likely leads to higher rates of conflict and homicide for these categories of heterogeneity.

Crutchfield, Geerken, and Gove (1982) examine another potential barrier to community integration, high residential mobility. They argue that the construction of social relationships and networks is a lengthy process and is less likely to occur in areas with greater mobility, since rapid turnover leads to unstable relationships and feelings of impermanence. This lack of integration is expected to reduce the efficiency of local informal control mechanisms, thereby producing higher rates of criminal violence. The authors employ 1970 data from 65 SMSAs to test for the effects of mobility on crime rates. They define total mobility as the sum of the movement within an SMSA and the movement into an SMSA (both are measured during the time period 1965-1970), and find this measure to be positively and significantly related to the spatial variation in homicide rates. Crutchfield et al. argue that this mobility represents low levels of local integration that are conducive to, though not necessarily a direct cause of, higher homicide rates and conclude that integration is more important than economic variables in predicting local crime rates.

Another contributing factor to low levels of integration is the size of the local population. This is a concept that social disorganization shares with opportunity theories: large cities or neighborhoods serve to increase criminal opportunities by decreasing integration and hampering both formal and informal surveillance mechanisms. As Mayhew and Levinger (1976) suggest, the larger the number of residents in an area, the lower the proportion of the population that a person recognizes. This increased anonymity and decreased cohesion makes people in heavily populated areas more vulnerable to victimization. Employing 1970 data for all United States cities with a

population greater than 25,000, Jackson (1984) tests the hypothesis that the increased time spent in activities outside the household will have a greater impact on victimization in larger cities because they possess lower levels of cohesion and higher levels of anonymity than smaller cities. Jackson's measure of household activity is significant in larger cities (those greater than 50,000) but not in smaller cities (less than 50,000), lending support to her argument. She also presents supportive results for the effects of the social disorganization concepts of population size and percent poor on homicide rates. Jackson concludes that these ecological characteristics are indicative of criminogenic conditions in larger cities that lead to higher rates of violence.

In a series of studies, Sampson and his colleagues have attempted to both clarify social disorganization theory and to rigorously test its hypotheses. Sampson (1986) uses arrest data to estimate race-specific offending rates for 171 cities in 1980 and employs measures such as the percentage of two-parent households, divorce rates, poverty, and population size to indicate social disorganization. Although he finds differential effects for blacks and whites, Sampson concludes that family disruption is a key determinant of homicide rates and that cities with a high level of poverty and generally low occupational level are likely to experience increased homicide rates. In another study, Sampson (1987) discovers that family disruption (which he operationalizes here as the percentage of female-headed households) is not only a strong determinant of homicides for both blacks and whites, but that it also mediates the effects of economic deprivation on rates of violence. He concludes that the degree of integration within a community can moderate the negative influences of structural factors.

In an effort to more clearly delineate the processes through which social disorganization leads to higher crime rates, Sampson and Groves (1989) argue that the theory discusses not only a community's ability to regulate itself via informal social control mechanisms (victimization rates) but also socialization processes that may help to create lawbreakers (offending rates). Using the 1982 British Crime Survey of England and Wales, the authors test the hypothesis that the effect of community-structural factors–measured as economic status, ethnic heterogeneity, residential stability, family disruption, and urbanization–upon both victimization and crime rates are not simply direct but are mediated by social relationships and the organizational characteristics of community residents–measured as density of local friendship networks, the ability to control local teenage peer groups, and organizational participation.[17]

An analysis of the relationship between the structural indicators and social disorganization reveals that (1) urbanization negatively affects and residential stability positively affects the density of local friendship networks, (2) each of the community-structural measures except residential stability are significantly related to the supervision of teenage peer groups, and (3) economic status has a positive impact on organizational participation. A further analysis of both structural factors and social disorganization measures on crime and victimization rates indicates that, with the exception of ethnic heterogeneity's positive impact on muggings/street robberies and family disruption's

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[17]These three mediating variables are more truly indicative of the theoretical concepts of social disorganization and the processes through which they operate. Usually, however, data sets are unable to provide such information and so the community-structural variables discussed thus far are employed as proxies of social disorganization.

positive impact on stranger violence and total victimization, the direct effects of the structural factors on crime and victimization are nil. However, measures of social disorganization exhibit significant effects on both measures of violence (muggings/street robberies and stranger violence) and on total victimization rates. From this, Sampson and Groves conclude that the effects on crime and victimization rates of a community's structural characteristics are largely mediated by its level of organization and the intensity of its social networks. In other words, regardless of the potentially negative influences of external structural factors such as high residential mobility and low economic status, a community that is internally organized to achieve its goals will have lower crime rates.

As one product of the complex and multi-faceted "Project on Human Development in Chicago Neighborhoods" (PHDCN), Sampson, Raudenbush, and Earls (1997) present a rigorous test of the evolving social disorganization model. The authors created 343 neighborhood clusters from Chicago census tracts, each containing about 8,000 residents. Aside from the socio-demographic data collected on the neighborhoods, each cluster was sampled and a household survey administered to the sample. Once again, the hypothesis is that the structural characteristics of the community indirectly influence crime rates through what the authors term "collective efficacy," which is generally defined as the sum of the social cohesion among neighbors and their willingness to intervene on behalf of the common good.

The neighborhood-level independent variables are defined as concentrated disadvantage, immigrant concentration, and residential stability. Social cohesion is measured based upon responses to questions on the household survey related to items

such as the trustworthiness of neighbors and the shared values of the community. Similarly, informal social control is based upon Likert-scale responses to questions asking how likely it is that neighbors will respond to various threats to social order. First, the authors find that neighborhood disadvantage and immigrant concentration are significantly and negatively correlated with collective efficacy and that residential stability is positively and significantly associated with collective efficacy. Second, holding social composition (i.e., individual-level characteristics) constant, each of the neighborhood-level characteristics is significantly related to violent victimization, and both concentrated disadvantage and residential stability significantly predict homicide events. Finally, when collective efficacy is added to the model it is found (1) to be significantly and negatively related to violent victimization and homicide, (2) to mediate the effects of all the neighborhood characteristics on violent victimization, and (3) to mediate the effects of concentrated disadvantage on homicide.

Sampson et al. conclude first that their collective efficacy construct can be reliably measured at the neighborhood level and second that informal social control and social cohesion (i.e., collective efficacy) are important factors in rates of violent offending and victimization and that they mediate the effects of a neighborhood's structural characteristics on rates of violence. Finally, they suggest that even though collective efficacy seems to be a vital element in explaining criminal violence, it would be a mistake to ignore the effects of structural factors since levels of collective efficacy are often conditioned by political decisions and economic trends that are external to the neighborhood.

Although not focusing directly on social disorganization, several recent studies have assessed the effects of the structural components of the theory on homicide rates. For example, Kposowa et al. (1995) argue that the focus of structural-level research on cities has resulted in (1) a view of the city as pathological and (2) a failure to completely understand how structural factors can influence rates of violence across geographical areas. The authors use 1980 data and a sample of 98% of all United States counties. For large counties (greater than 100,000 residents), social disorganization variables such as divorce rates, population change, and density are associated with homicide rates; for small counties (fewer than 25,000 residents), poverty, divorce rates, the percentage of the population that are migrants, and population change prove significant; in Southern counties, poverty, divorce, and density are all significantly correlated with homicide rates (and population change and percent urban approach significant levels); and, in the entire sample, poverty, divorce rates, population change, percent urban, and population density all prove to have an impact. It is clear that these structural characteristics are consistently related to criminal violence across a number of samples differing by the size and regional location of the county, and Kposowa et al. conclude that social disorganization plays a strong role in the spatial variation of homicide rates.

In another study, Land et al. (1990) include social disorganization concepts in their attempt to find consistent results of the structural covariates of homicide across time and levels of aggregation. Through the use of principle components analysis, the authors identify two factors that are largely composed of what may be considered concepts of

social disorganization. First, they find that population size and population density consistently cluster together and name this component "population structure." The same is true for the variables median family income, the percentage of families living below the poverty line, the Gini Index of income inequality, the percentage of children younger than 18 not living with both parents, and the percent black, and they name this cluster "resource deprivation/affluence." The authors then re-estimate the original model (which had included each of these concepts separately and was unstable due to the presence of multicollinearity) and find that each of these two components, as well as divorce rates, are positively and significantly related to homicide rates over time (1960, 1970, and 1980) and among units of analysis (city, SMSA, and state) and that the effects of each are largely independent of the others. Land et al.'s results indicate that the structural components of social disorganization are significantly related to the spatial variation of homicide rates.

Overall, the structural measures of social disorganization theory are shown to be relatively consistent in their relationship with levels of violence over time and across levels of aggregation. Following poverty (which is actually one component of the theory), elements of this model have proven to be more consistently associated with the spatial variation of homicide rates than relative deprivation and subcultural explanations. First, although population density overwhelmingly shows null effects, absolute population size regularly results in positive and significant associations with homicide

rates.[18] Second, about three-quarters of the estimates generated to test the effects of family disruption on the spatial variation of homicide rates resulted in significantly positive findings. Third, the few studies completed that examine the effects of mobility on criminal violence show support for the theory. Finally, theoretical clarification of the processes of social disorganization (see Bursik, 1988; Sampson et al., 1997), along with the increasing availability of data to test these more exacting specifications (Sampson and Groves, 1989; Sampson et al., 1997), have resulted in more rigorous tests of the model. The results of these studies–which show that local informal social control mechanisms and neighborhood social cohesion can mediate the potentially damaging structural effects of economic disadvantage, heterogeneity, and residential mobility on a community's rates of criminal violence–present promising new directions in the understanding of how multiple levels (social structural, neighborhood, and individual) interact to influence the spatial variation of victimization and offending rates.

Summary and conclusions

The scientific study of the relationship between social structure and crime has a long history. In general, this literature attempts to explain the variation in rates of criminal violence across geographic units such as cities, states, and nations by examining the demographic, economic, and social characteristics of these units as they covary with

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[18]Fifty-three of the 81 coefficients denoting this relationship in the table in Appendix B show significantly positive effects of population size on the spatial variation in homicide rates. Moreover, about 40% of the estimates resulting in null effects modeled both population size and density together. Given the usually high relationship between these two measures, including them in the same model is likely to create instability due to the presence of multicollinearity.

violence rates. Although there is no basic model that is agreed upon by all researchers, the theoretical and empirical discussion during the last 30 years has resulted in three general theories that attempt to explain the spatial variation of homicide rates: violent subcultures, absolute and relative deprivation, and social disorganization. Some theorists have argued that these theories should be divided into two separate streams, *structure* and *culture*, and that one or the other provides a better explanation of homicide rates. It is more likely, however, that *both* structure and culture provide independent as well as interactive effects and that a model that includes both is necessary.

This review of the empirical literature covers research completed during the last three decades and focuses almost exclusively on those studies that have employed multivariate analysis to explore the relationship between structural-cultural concepts (not individual characteristics or interactional processes) and homicide rates. Appendix B summarizes these studies in tabular form.

In the United States, subcultural theories have concentrated upon high rates of violence in the South and among blacks, arguing that members of these demographic groups maintain subcultural values that either promote violence or condone its use in specific interpersonal situations. Empirical studies of subculture and homicide have had difficulty operationalizing subculture in terms of values and have instead often relied on regional location or group membership as a proxy for subculture. The inconsistent findings relating subculture and homicide rates do not mean that culture has no effect on violent crime, but instead challenges researchers to discover and agree upon an

empirically valid method of measuring culture so that its impact on homicide rates can be discerned.

At the structural level, strain theories are usually represented by models based upon absolute or relative economic deprivation. In the case of the former, the social and psychological strains of poverty are expected to result in violence. In the latter, the inequitable distribution of resources is suspected of creating hostility among the have-nots, who are expected to respond with aggression. These theorists believe that areas containing large amounts of strain-inducing characteristics will have higher homicide rates.

The positive relationship between poverty and homicide rate is the most consistent finding in the literature. Moreover, these positive findings are consistent across time periods, levels of analysis, various measures of poverty, cross-sectional and longitudinal analyses, and model and relationship specifications. So, no matter what the exact processes may be, it is easy to understand why Sampson and Lauritsen (1990) state that "almost without exception, studies of violence find a positive and usually large correlation between some measure of area poverty and violence–especially homicide" (p. 60).

Compared to poverty, the theorized process through which relative deprivation has an impact upon violent crime rates is clearer. These theorists argue that economic distress is not the cause of increased violence, but instead that comparing one's economic status with others will lead to feelings of inequity for the have-nots that will likely increase frustration and raise levels of conflict and violence. Notwithstanding the attempt

to explain differential rates of homicide with an individual level process, empirical evidence for positive effects of inequality on homicide rates have been neither as strong nor as consistent as those of poverty. In fact, the negative reasons cited for this inconsistency are the same ones through which the poverty findings hold up: disparate samples, differing operationalizations, varying levels of analysis, incorrect specifications, and multicollinearity.

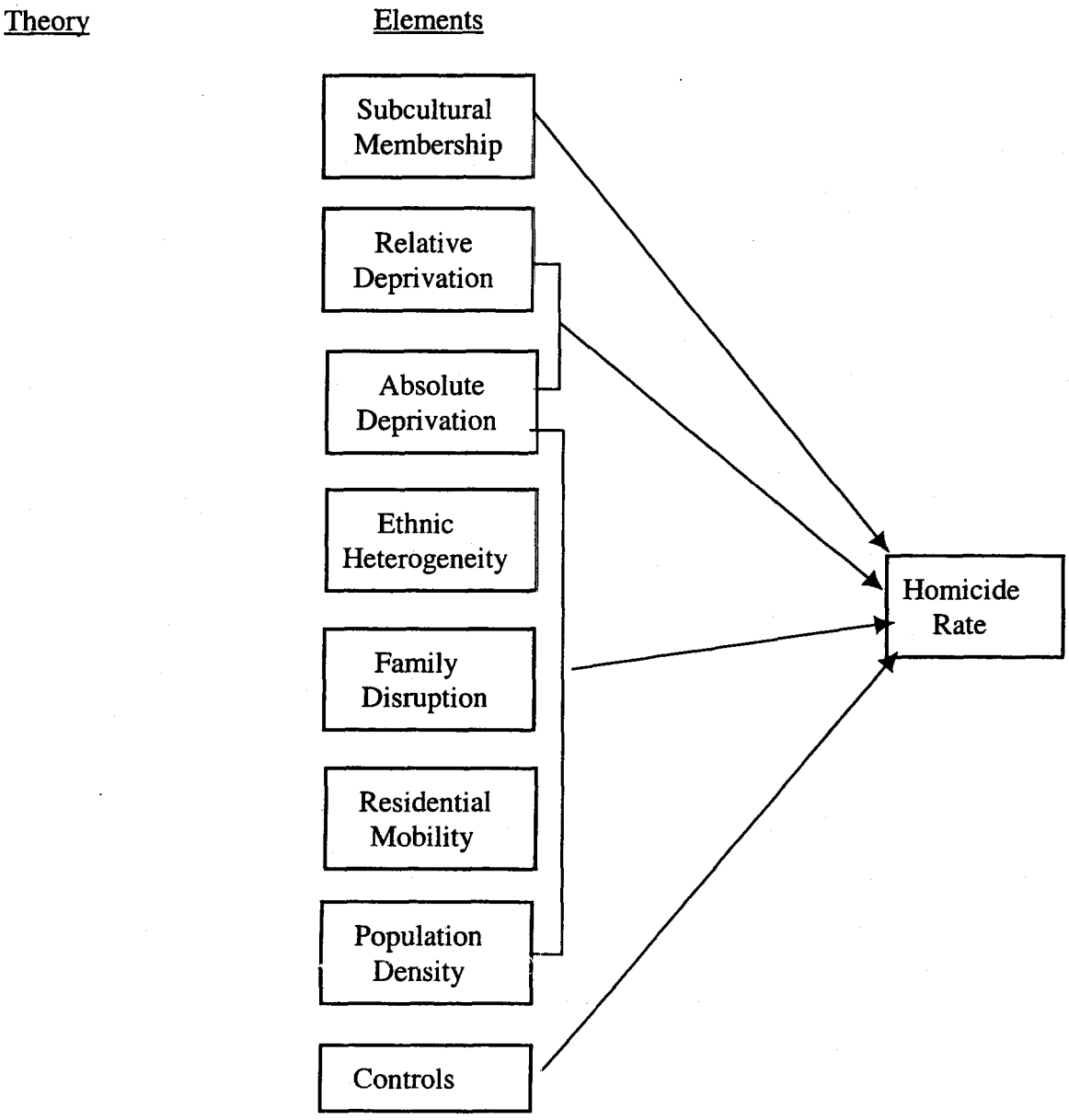
Finally, disorganization theorists argue that the absence of social integration, together with poor social control mechanisms, frees community members to commit acts of crime and violence. The last decade and a half has seen a renewal of interest in social disorganization theory and research. Although the theory dictates that community-level concepts serve to mediate the structural effects on crime, structural analogs of social disorganization variables are often shown to be associated with crime rates. Factors such as residential mobility, poverty, heterogeneity, population density, and family instability are expected to create impediments to local integration and to the realization of commonly agreed upon goals, such as community attachments and informal control, and rates of criminal violence are thus expected to increase with the levels of disorganization.

The social disorganization model has proven to be more consistent in explaining the spatial variation of homicide rates than subcultural and relative deprivation models. Absolute population size of a city, family disruption, and residential mobility all show relatively consistent effects on homicide (and other violent crime) rates. Furthermore, recent theoretical and empirical attempts to clarify the contextual effects of social disorganization reveal that local informal control mechanisms and social cohesion within

a community can mediate the potentially damaging effects of these structural variables on rates of violence.

Given the elements of these three general theories, Figure 2.3 below presents a specific theoretical model to be tested.

Figure 2.3. Proposed theoretical model for the relationship between social structure and homicide.



In sum, this chapter has discussed the three main structural-level explanations for the spatial variation of homicide rates in the United States. It also provides an extensive review of the empirical literature, assessing the strength of support for each of the theories and examining some of the difficulties involved in translating these theoretical models into measurable concepts and testable hypotheses. The next chapter discusses the data and methodology to be used for the current study of the variation of homicide rates in Russia. The definition of each covariate, along with explanations of the source of this information and the validity of the measure, is presented. The techniques employed to describe and statistically analyze these data are also outlined.

Chapter 3:

Data and methodology

This chapter describes the data and methodology employed to answer the research questions posed in Chapter 1. The data section explains the unit of analysis and the dependent, independent, and control variables. This includes a discussion of the definition of each theoretical element, how each is operationalized, the source of the data, and its measurement. In some cases, there is a brief examination of the literature related to the validity of the measure. This section concludes with an illustration of the measurement model to be evaluated. The methodology section describes the procedures followed in the next three chapters in order to answer the research questions and evaluate the model. This includes a discussion of the descriptive analysis in Chapter 4, the structural modeling in Chapter 5, and the comparison of findings from Russia and the United States in Chapter 6.

Data[1]

Unit of analysis

This is a cross-sectional study of Russian regions; the unit of analysis is the Russian region in 1995.[2] In 1995, the Russian Federation contained 89 administrative units, which are referred to in Russian as *regiony*, or regions. Among these 89 regions

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[1]Chapter 6 describes the comparison of the Russian findings with those from a comparable model estimated with United States data. Since the Russian data are new to most Western researchers and since they are often available only in Russian-language publications, they are described in detail here. The United States data, however, are commonly used and likely familiar to the researcher. For this reason, a description of these data are placed in Appendix E, in the text of this chapter.

[2]Unless otherwise noted, all data are for the year 1995.

are 50 oblasts, 21 republics, 11 autonomous okrugs, 5 krais, and two federal cities (Moscow and Saint Petersburg). Figure 1.3 in Chapter 1 shows the location of these regions, and Appendix A lists these administrative units and the 12 larger "economic regions" in which they are located (for a map of these economic regions, see Figure 1.2 in Chapter 1). In general, the republics often contain a large proportion of indigenous ethnic groups, while the autonomous okrugs are smaller regions located entirely within a larger administrative unit, such as an oblast or krai, and are also usually populated mostly by local ethnic groups. In nine regions, data from the small okrugs are embedded within the data of the larger administrative unit.[3] Further, until 1989, data for two of the current regions–the Ingush and Chechen Republics–were reported together. The Ingush Republic is small (fewer than 300,000 people) and data for most of the measures employed here are not available, thus this region is dropped from the analysis. Finally, the Chechen Republic was involved in a war of independence with Russia in 1995 and is therefore also dropped from the analysis. This leaves a total of 78 cases for study.

According to Goskomstat's (1997a) *Demograficheskii ezhegodnik*, these regions range in geographic size from the enormous Sakha Republic in Fareast Siberia (which has a population of only a little over a million people, but at 3,103,000 square kilometers is one-third the size of the entire United States) to the Adygei Republic in the Northern Caucasus, which is 7,600 square kilometers (about twice the size of Long Island).

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[3]These Autonomous Okrugs (and the larger regions in which they are included) are as follows: Nenets (Arkhangel Oblast), Komi-Permyak (Perm Oblast), Khanti-Mansiisk and Yamalo-Nenets (Tyumen Oblast), Taimir and Evenkii (Krasnoyar Krai), Ust-Orda Buryat (Irkutsk Oblast), Aga Buryat (Chita Oblast), and Koryak (Kamchatka).

Regional populations range from only 21,000 people in the Evenkii Autonomous Okrug, which is part of Krasnoyar Krai in Eastern Siberia, to Moscow's 8.7 million people.[4]

Dependent variable

The dependent variable in this study is the regional homicide rate in 1995. For this study, homicide is defined here as any purposeful killing of one person by another, whether or not the homicide is defined as criminal.

Information on homicide is available from both crime and mortality data in Russia. Crime data are collected for each city and town by regional offices of the Russian Ministry of Internal Affairs (MVD). This information is then aggregated to the regional level and forwarded to Ministry headquarters in Moscow, where it is reported annually in *Prestupnost' i pravonarusheniya* ("Crime and delinquency"). These data include the absolute number and rate of criminal homicides recorded by the police in each region.

For the statistical analyses planned here, however, I will be using mortality data. Death certificates contain information on the cause of death and these data are collected by a vital statistics registration system. The Soviet enumeration system is still employed in Russia, but the causes themselves correspond to the World Health Organization's *International Classification of Diseases* (Andreev, Scherbov, and Willekens, 1995; Kingkade and Arriaga, 1997).[5] When a person dies in Russia, a death certificate is issued

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[4]Moscow and the surrounding Moscow Oblast were home to more than 10% of the entire Russian population in 1995.

[5]ICD items E960-E978 contain deaths due to homicide and injury purposely inflicted by other persons, including legal interventions and executions (in 1995, there were 86 executions in the Russian Federation). The corresponding code in the Russian classification system is 184.

by a doctor or trained medical assistant ("*fel'dsher*") at the hospital where the death occurs or is reported. Along with personal data about the decedent such as age, ethnicity, and place of residence, the certificate contains information on the cause of death. A copy of this certificate is given to a relative or friend of the decedent, who must take the form to the local *Zapis' aktov grazhdanskogo sostoyaniya* (or "Registry of Acts of Civil Status," commonly referred to as ZAGS) in order to officially register the death (Andreev, Scherbov, and Willekens, 1995). These data are aggregated to the regional level, forwarded to Moscow, and published annually in the Ministry of Public Health's *Smertnost' naseleniya Rossiiskoi Federatsii* ("Population mortality of the Russian Federation").[6]

In the United States, mortality data are commonly considered to provide a better representation of the total number of homicides than crime data (Fox and Zawitz, 1999; LaFree, 1999; Rokaw, Mercy, and Smith, 1990), and this is true for Russia, as well. First, like many other European nations, official crime data in Russia includes both attempted and completed homicides in this category. Although attempts represent a relatively small percentage of the total number reported,[7] given the nature of the data published by the

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[6]This manner of data collection makes it difficult to obtain homicide and explanatory data in Russia at a level of aggregation lower than the administrative region. City-level information is available, but collecting it requires contact with each of the 89 regional offices of the respective Ministries.

[7]A colleague at the Research Institute of the Russian Ministry of the Interior who has access to unpublished data that provides this information estimates that attempts make up 5-10% of the total number of reported homicides annually (Personal communication, Vitaly Y. Kvashis, August, 1998). Similarly, the percentage of convictions for this category of crime that are for attempted homicide has fallen from about 9% at the beginning of the decade to 6.3% in 1995 (Ministry of the Interior, 1996).

MVD there is no way to extract these attempted homicides from the overall number. Second, even though crime data include attempts, they annually show a significantly lower number of homicides in Russia than mortality data. In 1995, for example, the MVD reported 31,703 homicides while the Ministry of Health reported 44,069. Figure 1.1 (in Chapter 1) presents the total number of homicides in Russia reported by both measures for the years 1985 to 1998. Table 3.1 below provides regional disparities between these two measures for both absolute numbers and rates of homicides in 1995. Given the idiosyncracies of each data collection agency and the specific categories of homicide (i.e., criminal homicide versus all purposely inflicted violent deaths) included in each measure, differences in the total number of homicides are to be expected. Such a large disparity, however, is difficult to explain[8] and deserves further research attention.

Data on cause of death were limited during the Soviet years, and between 1974 and 1986 the government did not make mortality data available to the public (Shkolnikov and Mesle, 1996). Further, from 1965 to 1989, deaths due to homicide (as well as deaths resulting from suicide, certain types of dangerous infectious diseases, and occupational injuries) were recorded on a special form (called "5B"). Although these deaths were tallied during this time, their number remained classified and in publicly available reports

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[8]This discrepancy is likely partially due to under-reporting by the police. Given the high levels of violence in the country, administrators are under pressure to deflate violent crime rates and, like their colleagues throughout the world, have found ingenious ways to do so. This pressure, together with the historical acceptance of falsifying official statistics during the Soviet era, provide an atmosphere conducive to under-reporting. It should be noted that measures of homicide collected from mortality data also contain errors and do not capture all homicides that occur. The main reasons for this are idiosyncratic reporting and the level of medical expertise of local doctors. The coverage of mortality data, however, is still more complete than crime data.

were placed in the "other and unknown causes" category (Andreev, Scherbov, and Willekens, 1995). This policy changed in 1989, however, and mortality data (including

Table 3.1. Regional disparities in homicide reporting between mortality and crime data in 1995.

Region	MVD # (Rate)	Mortality # (Rate)	Region	MVD # (Rate)	Mortality # (Rate)
Karelia	181 (22.9)	304 (38.5)	Adygei	74 (16.4)	95 (21.1)
Komi	386 (32.1)	515 (42.8)	Dagestan	256 (12.7)	183 (9.1)
Arkhangel	339 (22.8)	520 (35.0)	Ingushetia	59 (21.1)	39 (13.9)
Vologda	225 (16.6)	310 (22.8)	Chechnya	629 (64.6)	—
Murmansk	135 (12.6)	264 (24.6)	Kabardina	80 (10.2)	55 (7.0)
St. Petersburg	937 (19.4)	1203 (24.9)	Karachaevo	85 (19.5)	49 (11.3)
Leningrad O.	435 (26.0)	528 (31.6)	S. Osetia	129 (19.4)	67 (10.1)
Novgorod	164 (22.0)	238 (32.0)	Krasnodar	788 (15.7)	1261 (25.2)
Pskov	149 (17.8)	202 (24.2)	Stavropol	437 (16.5)	498 (18.8)
Bryansk	192 (13.0)	205 (13.9)	Rostov	577 (13.0)	637 (14.4)
Vladimir	272 (16.5)	378 (23.0)	Bashkortostan	569 (14.0)	832 (20.4)
Ivanov	231 (18.1)	358 (28.1)	Udmurtia	365 (22.2)	626 (38.2)
Kaluga	176 (16.1)	207 (19.0)	Kurgan	267 (23.9)	369 (33.1)
Kostroma	126 (15.6)	181 (22.4)	Orenburg	489 (22.0)	770 (34.7)
Moscow	1702 (19.5)	2278 (26.1)	Perm	853 (29.8)	1187 (41.4)
Moscow O.	1749 (26.5)	2390 (36.2)	Sverdlov	1061 (22.6)	2087 (44.4)
Orlov	166 (18.1)	158 (17.3)	Chelyabinsk	928 (25.1)	1493 (40.5)
Ryazan	304 (22.8)	376 (28.3)	Altai (Rep.)	71 (35.5)	120 (60.0)
Smolensk	231 (19.7)	246 (21.0)	Altai (Krai)	544 (20.2)	930 (34.5)
Tver	359 (21.8)	526 (31.9)	Kemerov	1268 (41.3)	2040 (66.4)
Tula	443 (24.3)	578 (31.7)	Novosibirsk	466 (17.0)	751 (27.4)
Yaroslavl	296 (20.3)	426 (29.3)	Omsk	425 (19.5)	671 (30.9)

Region	MVD # (Rate)	Mortality # (Rate)	Region	MVD # (Rate)	Mortality # (Rate)
Marii El	130 (16.9)	308 (40.2)	Tomsk	261 (24.4)	378 (35.3)
Mordovia	179 (18.7)	221 (23.0)	Tyumen	800 (59.2)	1134 (83.9)
Chuvashia	246 (18.1)	206 (15.1)	Buryatia	365 (34.7)	504 (47.9)
Kirov	317 (19.2)	416 (25.2)	Tyva	231 (75.0)	416 (135.1)
Nizhegorod	542 (14.5)	781 (20.9)	Khakasia	211 (36.2)	219 (37.6)
Belgorod	158 (10.9)	206 (14.1)	Krasnoyar	861 (28.2)	1296 (42.4)
Voronezh	256 (10.2)	140 (5.6)	Irkutsk	1081 (40.6)	1771 (66.6)
Kursk	187 (13.9)	223 (16.5)	Chitin	449 (36.8)	744 (61.1)
Lipetsk	164 (13.1)	206 (16.5)	Sakha	268 (25.9)	265 (25.6)
Tambov	178 (13.5)	325 (24.7)	Evrei Aut. O.	62 (28.7)	106 (49.1)
Kalmykia	78 (24.4)	95 (29.7)	Chukot	22 (21.8)	22 (21.8)
Tatarstan	651 (17.3)	1137 (30.3)	Primorskii	634 (27.8)	993 (43.6)
Astrakhan	131 (12.8)	142 (13.9)	Khabarov	540 (33.7)	836 (52.2)
Volgograd	407 (15.1)	604 (22.5)	Amur	203 (19.3)	376 (35.8)
Penzen	201 (12.9)	254 (16.3)	Kamchatka	81 (20.8)	131 (33.7)
Samara	693 (21.0)	685 (20.8)	Magadan	98 (34.8)	170 (60.3)
Saratov	502 (18.4)	775 (28.3)	Sakhalin	200 (29.4)	331 (48.6)
Ulyanov	290 (19.5)	325 (21.8)	Kaliningrad	124 (13.4)	177 (19.1)

Note. The Ministry of the Interior includes homicide data from Autonomous Okrugs in the larger administrative unit of which they are a part, and in this table I have done the same for mortality data. For this reason, data are included for only 80 regions in this table.

those that were classified in the past) are now publicly available from both the Ministry of Public Health and Goskomstat.

The reliability of Soviet and Russian mortality data, including that related to violent death (see Wasserman and Varnik, 1998; Shkolnikov and Mesle, 1996), has been

the subject of continued scrutiny. As Anderson and Silver (1997) report, the collection and evaluation of population statistics of any sort are likely to confront difficulties as Russia encounters repeated crises. These authors assess the validity of the reported mortality data through the construction of life tables and the examination of such issues as age heaping, age exaggeration, mortality crossover, and infant mortality; they check for internal consistency in the Russian data, as well as comparing these figures to mortality levels and patterns reported by other countries. Their research reveals that Russian mortality data are valid, and the authors employ them as a benchmark when analyzing the mortality data of other former Soviet Republics (for a detailed discussion of the methodology employed to evaluate the validity of these data, see Anderson, Katus, and Silver, 1994; Anderson and Silver, 1997). Further, a sizeable literature has examined Soviet and Russian mortality on several respects and the use of mortality data for research on a host of topics is abundant. A recent example is the Bobadillo, Costello, and Mitchell (1997) edited volume, *Premature death in the New Independent States*, that contains chapters on data availability and validity as well as topical essays (including those that address violence- and alcohol-related causes of death) covering mortality patterns and trends, both spatial and temporal.

So, since mortality data (1) represent only deaths and not attempts, (2) are not subject to police recording (or non-recording) practices, and (3) are commonly accepted as a better representation of the true number of violent deaths, I have chosen this as the

measure of homicide to be employed here.[9] According to Ministry of Health data, there were a total of 44,069 homicides in Russia in 1995. This ranged from a high of 2,278 in Moscow to a low of 22 in the Chukot Autonomous Okrug. The mean regional homicide rate in the Russian Federation in 1995 was 31.8 homicides per 100,000 population. According to mortality data, the highest rate was in the Republic of Tyva, where there were 135.1 homicides per 100,000 population, and the lowest rate was in Voronezh Oblast, in which there were 5.6 homicides per 100,000.[10]

Independent variables

Poverty. Poverty can be defined in many different ways, often depending upon the theoretical orientation of the researcher. Methods of defining poverty that are based upon wealth, income, or socio-economic status are the most common. In this study, poverty is defined in terms of the monetary income needed to purchase the basic requirements of a healthy existence. To this end, poverty is measured here as the percentage of the region's population living below the poverty line. This is called *prozhitochnii minimum* in Russian, meaning subsistence minimum, and is defined as the percentage of the population who report an income that is less than that needed to purchase the basic requirements (i.e., food, goods, and services) for survival (Goskomstat,

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[9]However, crime data from the Ministry of the Interior are used for descriptive purposes in some sections of chapter 4.

[10]Means and standard deviations rarely provide a clear summary of the distribution of the data and are included in the text for descriptive purposes only. Given the relatively low number of cases in this sample, a truer and more visual representation of the distribution can be provided by stem-and-leaf plots. The plots for all of the measures employed in this study are in Appendix D.

1998; Personal communication, Dmitri Tikhonov, Centre for Regional Analysis and Forecasting, April, 1999). The subsistence minimum varies by region, depending upon local prices. In non-census years, this information is collected by Goskomstat through the use of sampling techniques. The data are available from Goskomstat's *Rossisskoi Statisticheskii Ezhegodnik.* The average regional population living below the subsistence minimum is 30.9%, with a low of 11.5% in Tyumen and a high of 66.8% in Tyva.

Table 3.2 (below) lists all measures for the dependent and independent variables employed in the analysis, together with a brief definition and descriptive statistics for each.

Data on infant mortality are used here as an instrumental variable (the justification for this approach is discussed in the *Methodology* section below). The infant mortality rate is defined as the number of deaths of children less than one year old per 1,000 live births. This information is collected by the Ministry of Health–based upon data from the ZAGS, as discussed earlier–and is available in Goskomstat's (1997) *Demograficheskii ezhegodnik.*[11] The mean regional rate of infant mortality in Russia in 1995 was 18.6 per 1,000 live births. The region with the highest rate was the Chukot Autonomous Okrug

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[11]The evaluation of Soviet and Russian infant mortality data has been a popular subject of study. Problems with this measurement during the late Soviet era led to concerted efforts by the Ministry of Health and Goskomstat to improve registration of infant deaths (Anderson and Silver, 1997). The two largest problems were underreporting in some rural areas (especially the Asian Republics of the former Soviet Union, which are not a part of contemporary Russia) and a Soviet definition of a viable birth that was more restrictive than that of the World Health Organization (Anderson and Silver, 1986; Velkoff and Miller, 1995). The efforts to improve registration and a new definition (implemented in 1993) of a live birth that mirrors WHO's have likely increased the completeness and accuracy of this measure. Again, though not perfect, the measure is consistently employed in epidemiological and demographic research.

(located in Eastern Siberia) at 34.0 infant deaths per 1,000 live births, and the region with the lowest rate was the Yaroslavl Oblast, which had 12.0 infant deaths per 1,000 live births in 1995.

Table 3.2. Descriptive statistics for dependent and independent variables.

Variable Name	Description	Regional Mean	Standard Deviation
Homrate	Homicide victimization rate (1995)	31.77	19.00
Poverty	% of population below subsistence minimum (1995)	30.93	11.53
Infntmrt	Infant mortality rate (1995)	18.57	3.68
Unemploy	% of active labor force Unemployed (1995)	10.24	3.75
Gini	Gini index of income inequality (1994)	0.31	0.03
Mobility	Persons per 1,000 population moving into or within the region (1995)	29.94	11.22
Single	% of single-parent households (1994)	15.65	2.06
Diversity	Lieberson's measure of "population diversity" (1989)	0.30	0.20
Urban	% of the population living in cities > 100,000 (1995)	38.26	17.29
Livspace	Square meters of living space per person (1995)	17.98	1.72

Variable Name	Description	Regional Mean	Standard Deviation
Alcohol	Deaths per 100,000 population due to alcohol poisoning (1995)	31.69	19.15
Males25-54	% of the population male and between 25 and 54 (1995)	20.94	1.78

Unemployment. Unemployment is operationalized here as the proportion of a region's active labor force that is unemployed. The unemployment rate ranges from a low of 5.3% in Moscow to a high of 24.0% in both Kabardino-Balkaria and Severnaya Osetia, with a regional mean of 10.24%.

Inequality. Like poverty, inequality can be defined in a number of ways. The theoretical focus of relative deprivation is on the inequitable distribution of resources, again usually defined in terms of wealth, income, or status. Relative deprivation is defined here as the inequitable distribution of wage income among the working population.

The measure of income inequality used here is the Gini coefficient of income inequality. Also called the index of income concentration, the Gini coefficient ranges from zero (which represents perfect equality) to one (which would mean that one person in the population earned all the income, while everyone else earned none). Box 3.1 below provides an illustration and explanation of the derivation of the Gini coefficient, as well as an example of how it is calculated for this study. The average regional Gini

Box 3.1. The Gini Coefficient of Income Inequality.

The Gini coefficient is the most commonly employed measure of income inequality in criminological research. The coefficient is a function of the Lorenz curve. If income is distributed equally throughout the population, then each population decile would earn 10% of the income, yielding the 45° diagonal in the graph below (where the X-axis represents the cumulative percentage of households, ordered from lowest to highest income, and the Y-axis represents the cumulative proportion of income). Since income is not distributed equally, however, the Lorenz curve sags below the diagonal. In order to compute the Gini coefficient, simply measure the area *between* the Lorenz curve and the 45° diagonal and then divide this sum by the *total* area under the diagonal, which is always 0.5. The resulting ratio is the Gini coefficient of income inequality. The Lorenz curve is thus a visual representation of inequality, while the coefficient is a quantitative representation of the Lorenz curve. (Box is continued on next page.)

Box 3.1. The Gini Coefficient (continued).

The Gini index can be approximated by employing the proportion of income earned by each population decile. This is accomplished via the following formula:

$$\text{Gini} = 2 \sum (X_i - Y_i)\ \Delta X_i$$

Where X_i is the accumulated proportion of the population, Y_i is the accumulated proportion of the income, and $\Delta X_i = X_i - X_{(i-1)}$. For example, given the following actual income distribution for the Pskov Oblast in 1994:

Accumulated proportion of population	Accumulated proportion of income
.10	.03
.20	.08
.30	.14
.40	.21
.50	.29
.60	.39
.70	.50
.80	.63
.90	.79

the Gini coefficient is calculated as follows:

$$\text{Gini} = 2 \sum [(.1 - .03).1 + (.2 - .08).1 + (.3 - .14).1 + (.4 - .21).1 + (.5 - .29).1 + (.6 - .39).1 + (.7 - .50).1 + (.8 - .63).1 + (.9 - .79).1]$$
$$= 2\ (.155)$$
$$= .31$$

Again, the coefficient ranges from zero (representing perfect equality) to one (meaning that only one person in the sample received all of the income). This score of .31 for Pskov is also the mean coefficient for all the Russian regions. For comparative purposes, the Census Bureau reports a Gini of .46 for the United States in 1994.

coefficient is 0.31, ranging from 0.25 in Lipetsk and St. Petersburg to 0.41 in the Altai Republic.

Mobility. In social disorganization, the theoretical focus of mobility is on the disruption it creates in terms of neighborhood social cohesion. The rapid turnover of people moving into the community does not provide for the development of strong social bonds and also makes it difficult for members of the community to recognize outsiders. Thus mobility is defined and measured here as the movement within and into each region.

Data for this measure are obtained from Goskomstat's *Demograficheskii ezhegodnik* (1996) and *Regiony Rossii* (1997). Measures of migration in Russia are based upon registration records maintained by the militia (Andreev, Scherbov, and Willekens, 1995). When people change residences, they must first go to a neighborhood passport office, where they receive a "deregistration" ticket (*talon*) and a stamp in their passport (*vypiska*) from the local militia. Upon arrival at the new residence (in another city within the region, or in a completely different region), they must take their ticket and passport to the office in the new area, where they turn in the ticket (which is forwarded to the local militia), get another passport stamp (this time, *propiska*), and report their new address. Migration statistics are based upon these tickets, which contain information about the person (e.g., sex, birthplace, ethnicity, marital status, occupational position, and education) that is moving.

For this study, a measure of mobility is calculated by adding two figures: the number of persons moving into the region and the total movement of persons within the

borders of the region. This sum of inflow and within-region movement is then divided by the total population of the region and multiplied by 1,000 to create the total mobility rate. This measure varies widely throughout Russia, ranging from a low of 11.2 persons per 1,000 population in Moscow to a high of 98.8 per 1,000 in Tyumen Oblast, with a mean mobility rate for the Russian regions of 29.9 persons per 1,000 in 1995.

Family disruption. The attention given to family disruption by social disorganization theory is not simply on divorce, but on single-parent households. Single parents have a harder time supervising the actions of their children, and they are also less likely to be involved in community-oriented activity. This can result in a decrease in neighborhood ties and an increase in the number of unsupervised adolescents that the community is unable to control, both of which may lead to higher rates of violence. Thus the measure of family disruption employed in this study is the proportion of the regional population that live in households with a single adult and at least one child under the age of 18, which is a common measure in structural-level analyses of social disorganization and crime in the United States.

Information on divorces in Russia is maintained by the ZAGS registry system (Andreev, Scherbov, and Willekens, 1995). If no children are involved and there are no property disputes, the couple may go directly to the ZAGS office to fill out an application for divorce. After a wait of three months, the divorce is finalized. Most divorces are settled in court, however, since there are children involved. Even so, when the judicial decision is made, both parties must take the court papers to the ZAGS office to register the divorce. In any case, ZAGS collects information on each party, including the number

of common children involved, thus making it possible to get a count of the number of households in a region with a single adult and at least one child under the age of 18.

With 11.9% of single-parent households, the Dagestan Republic is the lowest in Russia, while the highest percentage is in Moscow, at 20.6%, and the mean among Russian regions is 15.7%. These data are for 1994 and are available from Goskomstat.

Heterogeneity. Heterogeneity is defined here in terms of ethnicity. Although more than 80% of Russian citizens are ethnic Russians, the country is home to dozens of different ethnic groups. Hypotheses generated from social disorganization theory suggest that such ethnic diversity may lead to higher rates of violence.

In studies of the United States, the percentage of the population that is non-white is usually employed as a measure of ethnic heterogeneity within an area. Given the distribution of the population across Russia, however, it makes little sense to employ a simple measure of the percentage of a region's population that is non-ethnic Russian. This is due to the fact that in some republics Russians may not make up a majority of the population. Further, there are often more than one or two minority groups within a region that have a sizeable population, meaning that a simple "percentage of the population that is not part of the majority" will not truly represent the ethnic diversity of the region, since it assumes homogeneity of the minority population. In other words, this measure only accounts for differences between two groups, when in fact there may be several large ethnically distinct groups.

A measure of heterogeneity that takes this into account, what Lieberson (1969; see also Greenberg, 1956) calls "population diversity," is employed in this study. Using this

approach, ethnic heterogeneity is defined here as the likelihood that any two randomly paired persons within a region are of different ethnic backgrounds (Greenberg, 1956; Lieberson, 1969). This measure ranges from zero, where every person would have the same ethnicity, to one, where each person would have a different ethnicity. This (and closely related) measures are popular among social scientists, who use them to determine economic, ethnic, religious, and linguistic diversity among populations, as well as to ascertain the level of residential isolation of certain demographic groups. The measure is calculated as follows:

$$A_w = 1 - \sum_{i=1}^{N} p_i^2$$

Where A_w = the within group population diversity (i.e., the probability that any two randomly paired persons will have a different ethnic status) and p = the proportion of the regional population that is in each ethnic group, i. So, in terms of this study, the higher the score on A_w, the higher the level of ethnic heterogeneity within a region.

Data on the ethnic composition of the regions comes from the 1989 Russian census. This measure ranges from a low of .05 in Lipetsk and Tambov Oblasts, which are located next to each other in the Central Chernozem region south of Moscow and which are both overwhelmingly populated by ethnic Russians, to a high of .85 in Dagestan, which is the southernmost Russian region in the Caucasus and is home to six different ethnic groups (Avarians, Darginians, Kumyks, Lezgins, Russians, and Laksians) that comprise at least 5% of the regional population. The mean regional score on this measure of ethnic diversity is .30.

Density. It makes little sense to speak of population density when aggregating to the regional level. As an element of social disorganization, however, the density element is theoretically concerned with the loss of social cohesion that occurs in densely populated urban areas. This element is thus measured here as the percentage of the region's population living in cities with a population of at least 100,000 people (although any figure–including 100,000–is necessarily arbitrary when deciding what is "large" and "urban," and many definitions are likely to focus on factors other than simple population size when making this determination). In order to create this measure, I used the Goskomstat (1998) publication *Rossiiskii statisticheskii ezhegodnik* to find all of the cities in each region with a population of at least 100,000 on January 1, 1995. The population of each of these cities are then simply added together and this sum is divided by the total population of the region.

An alternative theoretical argument is that cramped living quarters create less private space for individuals, leading to social and psychological stress that may result in frustration and aggressive behavior. In this case, density is presented in terms of strain theory rather than social disorganization. For this theoretical interpretation of strain, density is measured here as the average living space for each individual, or more specifically square meters of living space per person. These data are obtained from the Goskomstat publication *Regiony Rossii* (1997) and represent the space available for each person in apartments, houses, communal living quarters, and similar residences. The regional average is 18.0 square meters of living space per person in, ranging from 8.8

square meters per person in the Ingush Republic to 21.4 square meters in the Chukot Autonomous Okrug.

Control variables

Alcohol consumption. Due to both physiological and social reasons, there is reason to believe that alcohol consumption can lead to violence. Studies of both homicide victims (see Barnes, Ansari, and Kress, 1996) and offenders (see Fendrich, Mackesy-Amiti, and Goldstein, 1995; Spunt, Brownstein, and Crimmins, 1996; Spunt, Brownstein, and Goldstein, 1995) reveal that a high percentage of both groups are under the influence of alcohol at the time of the violent event. At the aggregate level, both longitudinal (Clayton and Webb, 1991; Parker, 1998; Parker and Rebhun, 1995) and cross-sectional research (Lester, 1995; Parker, 1995) present evidence of a correlation between alcohol and homicide. Further, this seems to be an especially salient issue in Russia given (1) its historically high rates of alcohol consumption (especially of vodka and *samogon*–homemade distilled alcohol–which result in faster intoxication), (2) a tendency toward binge-drinking (see Treml, 1997), and (3) the difficult conditions associated with the transition that are likely to be correlated with levels of alcohol consumption.

In the epidemiological literature, alcohol consumption is often measured using mortality data.[12] For example, the rate of deaths due to cirrhosis of the liver may be used

[12]It is also common to employ economic data, such as retail sales of and household expenditures on alcohol, to measure consumption. Such data are readily available for Russian regions, but cannot be considered reliable measures of true alcohol consumption for several reasons (Treml, 1997). First, it is commonly accepted that individuals under-report consumption levels and the amount of money spent on alcohol. Second, although

as a proxy to represent levels of alcohol consumption (for recent examples, see Lester, 1993; Nemtsov, 1998; Norstrom, 1998; Smart and Mann, 1998). Unfortunately, there are problems with employing this measure with Russian mortality data. First, there are two items for liver cirrhosis in the death classification system: "alcohol cirrhosis of the liver" and "other cirrhosis of the liver." Unofficially, it is common practice for many cases of alcoholic liver cirrhosis to be recorded in the "other" category, thereby underestimating alcohol consumption (Personal communication, Dr. Evgeny Andreev, Institute for Statistics, Goskomstat Rossii, April, 1999). Second, registration habits make it common to classify deaths in more proximate alcohol-related categories without reference to latent alcoholism (Shkolnikov and Mesle, 1996). As a result, most deaths due to alcoholism are recorded as "poisonings" (Shkolnikov, Mesle, and Vallin, 1996; Treml, 1997), and this category usually contains well over 80% of all alcohol-related deaths annually.[13]

Levels of alcohol consumption in this study are thus measured as the rate of deaths due to alcohol poisoning in each region in 1995. This cause of death is coded as number 165 in the Ministry of Public Health's death classification system, and these data are available from the Ministry publication *Smertnost' naseleniya Rossiiskoi Federatsii.*

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retail sales are normally considered a more reliable figure, several Russia-specific conditions again create a problem. Most notably (and for several historical reasons not germane to this discussion), the quantity of homemade *samogon* produced, sold, and consumed has reached considerable levels and varies from region to region. For these reasons, economic means of measuring consumption are not used here.

[13]Alcohol-related cause of death categories include alcohol psychosis, chronic alcoholism, alcoholic cirrhosis of the liver, and accidental alcohol poisoning (Treml, 1997).

This rate ranges widely, from 0.6 per 100,000 in Dagestan (which is largely Muslim) to 93.0 in the Altai Republic; the regional mean for Russia in 1995 was 31.69.

Males 25-54. In the United States, it is commonly accepted that young males compose a large percentage of both the victims and perpetrators of violent crimes. A demographic interpretation of this relationship suggests that the larger the proportion of the overall population that are young males, the higher the homicide rate. Although the findings relating this measure to rates of violence both in the United States (see Maxim, 1985; O'Brien, 1989; Smith, 1986) and cross-nationally (Gartner, 1990; Gartner and Parker, 1990; Pampel and Gartner, 1995) have been inconsistent, it is still often employed as a control variable.

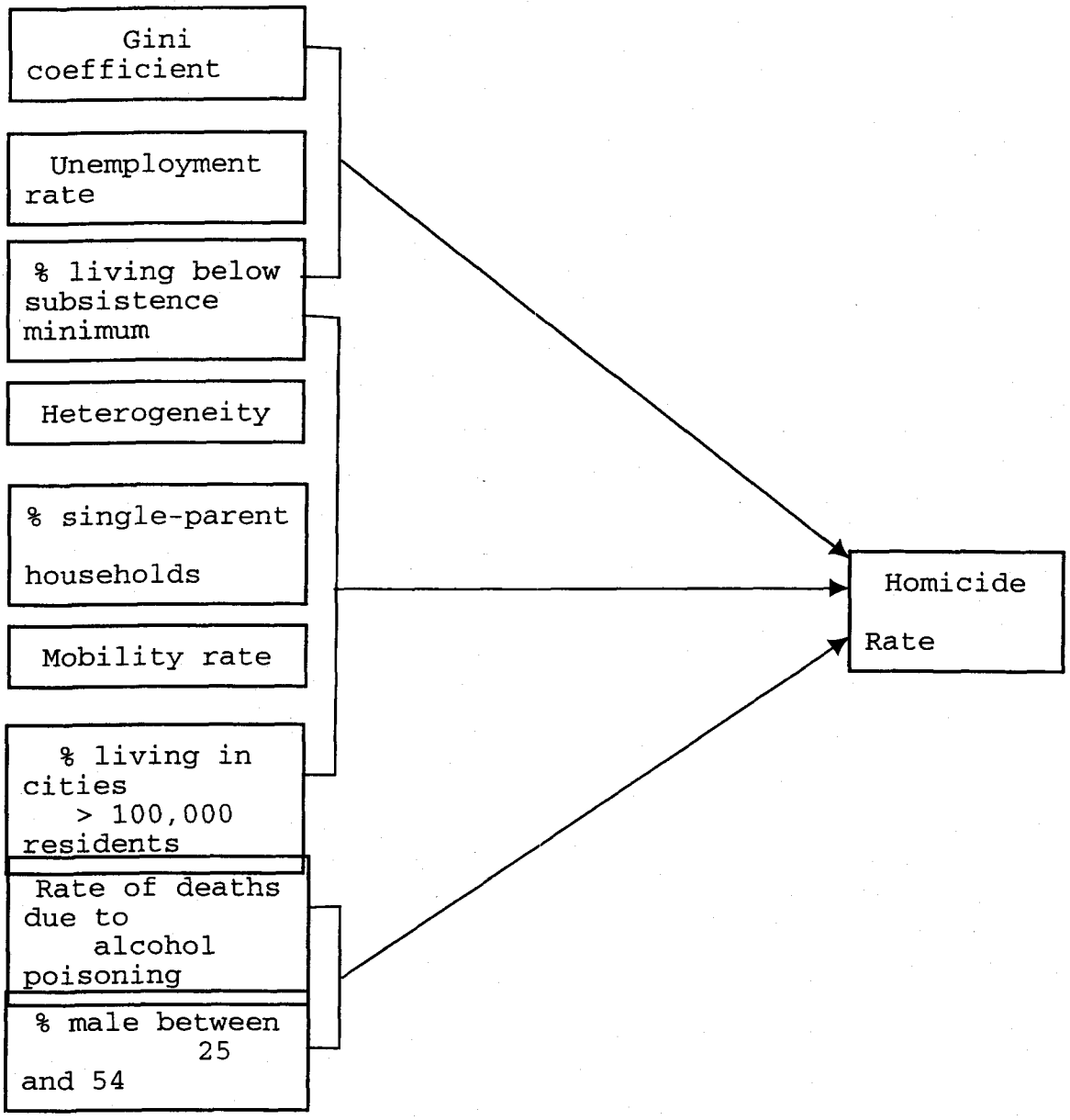
As the analysis in the following chapter shows, however, both homicide victims and offenders tend to be older in Russia than in the United States. In fact, homicide rates among males in the age categories 25-34, 35-44, and 45-54 are substantially higher than other age and sex categories. Therefore, in this study the proportion of a region's population that is male and between 25 and 54 is controlled. These data were obtained from *Chislennost' naseleniia Rossiiskoi Federatsii po polu i vozrasty na 1 yanvarya 1995 goda: Statisticheskii Byulleten* [Composition of the population of the Russian Federation by sex and age on 1 January 1995: Statistical bulletin] (Goskomstat, 1995). The regional average is 10.98%, with a low of 9.3% in Moscow and a high of 27.3% in the Tyumen Oblast.

Missing data

As discussed earlier, the data for nine of the Autonomous Okrugs are actually reported as part of the larger Oblast or Krai in which they are embedded, and two regions–the Ingush and Chechen Republics–are dropped from this study. This leaves 78 cases for analysis. Three of these regions–Dagestan, the Jewish Autonomous Oblast, and the Chukot Autonomous Okrug–have missing data on selected variables. Dagestan has missing data on the poverty and Gini variables; the Jewish Autonomous Oblast has missing values for the poverty, Gini, and mobility variables; the Chukot Autonomous Okrug has missing data on the poverty, Gini, and unemployment variables. In the case of poverty for Dagestan, I simply substituted the available 1994 value. Similar information is not available for the other missing data, however, and so in order to retain these cases for analysis these missing observations were replaced.

Replacing these values was accomplished by estimating their scores from the other variables in the model. The other independent variables can be used as instruments to predict these missing observations if we assume that they correlated with each of the variables that have missing values and that they are uncorrelated with the error term (Pindyck and Rubinfeld, 1998, p. 247). Case by case, the variable with the missing observation was regressed on all of the other independent variables for which data were available for that case. This produced a fitted value for that case on that variable, and I used this value to replace the missing observation.

Figure 3.1. Measurement model.



Note. All proposed relationships are positive, except that between living space per person and homicide rate, which is expected to be negative.

This data section has discussed how each theoretical element is operationalized, the source of these data and, where appropriate, issues concerning the validity of the measures. Chapter 2 ended with an illustration of the proposed theoretical model. Figure 3.1 on the previous page presents the measurement model to be evaluated.

Methodology

The data analysis in this study consists of three parts, description, theoretical evaluation, and comparison of findings between Russia and the United States. The first addresses research question number one in Chapter 1–*How do Russian homicide rates vary in terms of demographic groups, time, and space?*–by providing an overview of temporal, demographic, and spatial patterns of homicide victimization and offending in Russia (Chapter 4). The second (Chapter 5) addresses research question number two–*Which structural factors partially explain the spatial variation of homicide rates among Russian regions?*–by employing multivariate regression analysis in order to evaluate the theoretical model provided at the end of the previous chapter. The third (Chapter 6) answers the final question posed in Chapter 1–*How do the findings from Russia compare to those from similar models estimated with data from the United States?*–by comparing the results obtained from Chapter 5 with the findings from comparable models estimated in the United States. The rest of this chapter provides a discussion of the methodology to be employed in each of these endeavors.

Description of homicide patterns and trends

The descriptive analysis in Chapter 4 employs official homicide-related crime data from the Russian Ministry of the Interior and mortality data from the Russian Ministry of

Health in order to illustrate the demographic, temporal, and spatial variation of homicide rates in Russia. This discussion is categorized into three parts: demographic, temporal, and regional variation.

Demographic variation. Victimization and offending rates vary for different demographic groups, and within group changes over time are also apparent. Given the available data, this discussion focuses on the variation in victimization rates and arrest rates among different age groups and among males and females.

Temporal patterns. This section examines the changes in the overall homicide rate in the country from 1965 to 1998. A discussion of this temporal variation is provided, along with an overview of national-level events (such as Mikhail Gorbachev's anti-alcohol campaign in the mid-1980s and the transitional process of the 1990s) that coincided with these changes. Further, the patterns of the sex- and age-specific rates are also presented.

Regional variation. This final type of analysis examines the cross-sectional variation in homicide rates among Russian regions in 1995. Major differences between regions are highlighted. Regions with particularly high or low homicide rates are briefly highlighted. This presentation of regional variation provides a segue to the theoretical evaluation provided in Chapter 5, which attempts to provide a partial explanation of the spatial variation of homicide rates in Russia via the social structural characteristics of these regions.

Theoretical evaluation

One of the main questions posed by this research is whether models developed to explain the variation of homicide rates in the United States also explain the spatial variation of homicide rates in Russia. To this end, Chapter 2 provides a discussion of different structural-level theories of homicide rate variation and presented an overall theoretical model to be tested. Chapter 5 contains an evaluation of this model via the use of Ordinary Least Squares regression and the errors-in-variable model, both of which are discussed below. This section also describes how the sensitivity of these models is tested, and ends with a discussion of how the regression coefficients generated by model estimation are to be interpreted.

Ordinary Least Squares regression. The second research question posed in Chapter 1 asks which structural factors help to explain the variation of homicide rates among Russian regions. This question requires an examination of the relationship (if any) between several different structural factors and homicide rates, while at the same time accounting for the influence of the other theoretical elements hypothesized to partially explain the variation in these rates. To this end, the classical linear regression model is employed here, making the Ordinary Least Squares (OLS) estimator the optimal one (Pindyck and Rubinfeld, 1998). This classical linear regression model requires certain assumptions about the nature of the data employed. Closer examination of the data and the application of regression diagnostics (see the *Model sensitivity* section below) may reveal that one or more of these assumptions are violated and that another

estimator might be more appropriate.[14] At this stage, however, it is assumed that the data employed in this study meet these assumptions.

The errors-in-variable model. One potential problem that is anticipated is measurement error, especially in the production of the data representing poverty.[15] Measurement error in an independent variable violates the assumption of the classical linear regression model that demands that observations of the variable be independent of the error term in the equation. One approach employed to purge the independent variable of its relationship with the error term is the use of an instrumental variable.

The percentage of the population living below the subsistence minimum discussed above is based simply upon monetary income, creating two main possible sources of error in this variable. The first source is the inherent difficulty in measuring income. Aside from the traditional tendency of people to underreport their income, the severe depression and economic volatility in Russia have resulted in (1) problems for agencies responsible for measuring income that make it difficult for them to successfully perform their duties, (2) de facto borrowing by the state from its citizens via wage arrears (i.e., workers who

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[14]For example, given the wide variation in the size of the populations of the regions, one readily apparent problem is the violation of the assumption of constant error variance. That is, the errors involved in measurement may vary along with the dramatic differences in population size. In order to account for this, the weighted least squares approach is employed. This procedure involves simply weighting the data accordingly and then employing OLS techniques on the transformed model (see Pindyck and Rubinfeld, 1998).

[15]Of course, all of the independent variables are measured with at least some amount of error. It would be ideal to employ an instrumental variable for each independent variable in the model. Unfortunately, however, locating data from Russia for measures that meet the criteria for instrumental variable status is difficult. The link between infant mortality and poverty is well-established, however, and data on infant mortality for the Russian regions is readily available, so this situation is taken advantage of here.

labor for weeks or months without being paid), and (3) unreported income of citizens earning a living any way they can. These situations make a true measure of income extremely difficult to obtain. It is also likely that certain segments of the population–rural populations in the vast Russian countryside, certain ethnic groups, the poor–are underrepresented in the samples drawn to estimate this information. Since these groups likely vary in their income level from those that are sampled, this presents a further possibility of measurement error. The second general source of error derives from the income-based measure that does not include non-income forms of subsistence, such as subsidized housing and medical care or other forms of public assistance, that may aid a family in purchasing the necessities for a healthy existence (DeFronzo, 1983; Loftin and Parker, 1985). This is especially true for Russia, a formerly socialist nation where (1) a large part of the economy is still state-owned, (2) price controls and state subsidies remain common in Russia's regions, and (3) a thriving barter economy for basic goods and services still exists in many areas.

One of the fundamental assumptions of OLS regression is that the disturbance term is independent of the regressor, X. When an independent variable is measured with error, this error is confounded with the disturbance term, violating this assumption. The resulting specification error produces biased estimates of the regression parameters. One way to resolve this situation is to respecify the model with the use of an instrumental variable.

It is possible to obtain consistent estimates of the effects of X on Y if an instrumental variable, Z, can be identified that is correlated with the independent variable

but unrelated to the dependent variable (Pindyck and Rubinfeld, 1998). Though common with econometricians, this technique is rarely employed by criminologists. A study by Loftin and Parker (1985) is an exception. They employ this errors-in-variable model in their study of the effects of poverty on homicide rates, and their example is followed closely here.

Infant mortality is chosen as the instrumental variable for poverty in this study for several reasons. Loftin and Parker (1985) explain these in detail, so they are only briefly discussed here. First, the instrument must be shown to be correlated with X, and in this case the literature provides consistent support for a relationship between health and socioeconomic status in general, and infant mortality and poverty specifically[16] (for evidence of a relationship between poverty and infant mortality in Russia, see Komarov, Albitskii, Korotkova, and Rozenshtein, 1990; Tarasova, 1998; Vyazmin, 1996). Second, the instrument cannot be causally related to the dependent variable. This is unlikely here since (1) in 1995 there were only 126 homicide victims who were infants less than one-year old (these cases show up both in the infant mortality rate and in the homicide rate), (2) the type of medical services corresponding to each of these situations (infant mortality and emergency medical services) are very different, and (3) the death registration system

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[16]This is especially so in Russia. Government subsidies on food products were loosened or removed in many places in the early 1990s. This led to a rise in prices and a concomitant decrease in daily protein intake (Shkolnikov and Mesle, 1996). This increases the likelihood that the poorest segment of the population will suffer nutritional and vitamin deficiencies, which likely increases infant mortality due to the poorer health of pregnant and nursing women and newborn children. Similarly, the privatization of health care has produced increasing costs in this sector, thus restricting access to advanced medical care for much of the population, again including pregnant women and newborns.

in Russia is independent of the agencies responsible for collecting economic data, so there is no reason to believe that the errors in collecting one set of data might contaminate the other set in any way.

Model sensitivity. The use of least-squares estimation requires specific assumptions about the structure of the data employed. Social science data, such as the structural-level measures used here, often fail to meet these assumptions, creating potential problems with the regression estimates. These difficulties may include high multicollinearity among the regressors (which is common among highly aggregated structural measures such as those employed in this analysis), outliers that exhibit undue influence on the regression results (such as the extremely high homicide rate in Tyva, the unusually low unemployment rate in the Sakha Republic, or the elevated level of alcohol consumption in the Altai Republic), errors that are not normally distributed, heteroscedastic error variance (due perhaps to the tremendous variation in the size of the regions), and non-linear relationships between the independent and dependent variables (Berry, 1993; Pindyck and Rubinfeld, 1998).

The least-squares analysis in Chapter 5 considers these potential problems. A battery of regression diagnostics that are often capable of detecting these sources of trouble are examined (see Fox, 1991; Hartwig and Dearing, 1979). In some cases, these potential problems (if present) can be corrected; in others, their presence may create considerable difficulties in interpreting the regression coefficients. These issues are addressed where appropriate throughout Chapter 5 and remedial measures taken where necessary.

Interpreting the regression coefficients. This dissertation is entitled "Social structure and homicide in post-Soviet Russia," implying that some determination will be made concerning the effects of social structure on the spatial variation of homicide rates in the country. To this end, the main "structural" theories attempting to explain this relationship have been introduced, the hypotheses they generate discussed, and a measurement model operationalized. For several reasons, however, interpreting the coefficients obtained from testing this model via regression analysis is not so simple.

First, theoretical models are developed in an attempt to answer interesting questions, such as "Which individual traits heighten the risk of homicide victimization or offending?" or "Why do homicide rates vary from one region to the next, regardless of the characteristics of the individuals who live in these regions?" The first question is concerned with individual effects, the second with structural effects. For several reasons, however, individual models are often empirically tested at the aggregate level. Unfortunately, the empirical necessity of repeatedly testing individual theories at the aggregate level may lead researchers to blur the two, resulting in theoretical statements that are imprecise as to whether the expected effects are individual or structural. So, when we select a geographic area as the unit of analysis, it is often unclear what is actually being modeled, structural effects or aggregated individual effects. Theoretical imprecision early on leads to a lack of clarity when it is time to interpret the coefficients.

Second, theoretical models are formed in terms of causal structure. In other words, a change in X is expected to lead to–or *cause*–a change in Y, holding all other relevant factors constant. For example, social disorganization theory suggests that,

regardless of the characteristics of the individuals that live within a community, an increase in ethnic heterogeneity will cause higher crime rates due to the resulting lack of social cohesion. But while measures of heterogeneity are usually available, it is rare that measures of the individual characteristics of community members are available, making it impossible to control for these effects. Theoretical elements such as those in this study are thus often referred to in the literature as "correlates" or "covariates," suggesting a realization that the regression coefficients do not simply represent structural effects, but an inseparable mixture of individual and structural effects. At the same time, however, researchers continue to make statements about the causal effects of structural factors without assumptive statements concerning individual influences.

The first issue, then, deals with imprecise theory, but the second issue is empirical in nature and is referred to as aggregation bias. In this case, the problem arises from the decision to aggregate the data on the basis of geographic proximity. In doing so, the data are grouped on the basis of a variable (i.e., in this case, the Russian region) that is related both to the independent variable and, through the uncontrolled factors contained in the disturbance term, the dependent variable. In other words, the coefficients are biased because we have confounded the independent variable with the disturbance term. The result is that the regression coefficient does not truly represent a pure structural effect, but is instead a composite of individual effects, group effects, and this aggregation bias.

A fundamental question, then, is how to interpret the regression coefficients obtained when the models are estimated. In this study, this is accomplished in two ways. The first is descriptive, the second makes assumptions about the lower level effects.

First, it is an interesting endeavor in its own right to compare the results of estimating these models with Russian data with the results of research estimating the models in the United States. This is a simple descriptive process that does not demand an exact interpretation of the coefficients but simply compares their significance in one context to that in another. This is done in Chapter 6.

Such description is fine for comparative purposes, but it does not suffice if we wish to speak the language of causal structure that comes from the theoretical model. In the second case, an assumption is made that allows the coefficients to be interpreted as structural effects. That is, it is assumed here that the effects represented by the coefficients are predominantly structural in nature, and that individual-level effects and aggregation bias are relatively small. This assumption may not necessarily hold, of course, and further refinement may be needed, but it is a working hypothesis that provides for tentative causal inferences to be drawn based upon model estimation. This is done in Chapter 5.

To summarize, the slope coefficients in the following analyses are interpreted in two ways. The first is descriptive, thinking of the coefficients as "correlates" or "covariates" and simply comparing the results achieved from the Russian context with those found from research on social structure and homicide in the United States. The second way is to interpret the coefficients as structural effects, conditioned on the hypothesis that individual effects and aggregation bias may be present but are small relative to the structural component. This second interpretation allows cautious causal inferences to be made based upon the estimation of the models.

Comparison of findings between Russia and the United States

The final aspect of the analysis for this project is to compare the results of the model estimation with the Russian data in Chapter Five to the results of similar models from the United States. This is done in two basic ways, one specific and one more general, and Chapter Six describes this process.

First, comparable models are estimated in the United States using similar measures to those used in Russia. States are used as the level of analysis, since they are most analogous to Russian regions. The same model-building process is employed and the results obtained from this process are compared with those from the analysis of Russia in Chapter Five.

Second, I return to the review of the theoretical and empirical literature in Chapter Two and discuss the Russian results in these terms. I review the most common findings from the literature and describe both how the results from Russia are similar to and where they depart from the common findings from models estimating the effects of structural characteristics on homicide rates in the United States. Potential reasons for both the similarities and differences are also discussed.

Summary and conclusions

This chapter has described the data and methodology to be used to answer the research questions posed in Chapter 1 and to test the theoretical model presented at the end of Chapter 2. The data section defined the unit of analysis and the dependent, independent, and control variables, and included a discussion of how each theoretical element is measured and the source of the data obtained. Where appropriate, a brief

examination of the literature related to the validity of the measure was also provided. The data section concluded with an illustration of the measurement model to be evaluated. The methodology section described the procedures that are followed in the next two chapters in order to answer the research questions and evaluate the model. The next chapter provides a descriptive analysis of the demographic, temporal, and spatial variation of homicide rates in Russia.

Chapter 4:

Demographic, temporal, and spatial patterns of homicide rates in Russia

This chapter describes the demographic, temporal, and spatial patterns of homicide rates in Russia. The first section employs mortality and crime data to examine demographic variation of homicide rates in 1995 by sex and age. The pattern of victimization rates over the last three decades is presented in the next section, as are age and sex differences during this time. The final section describes the spatial variation of homicide rates in Russia, focusing on the patterning of rates in the economic regions of Russia and the distribution of homicide rates among the administrative regions.[1]

Demographic variation

This section presents homicide rates for different demographic groups in Russia in 1995. Both victimization and offending are employed to describe sex and age differences.

Sex

According to mortality data from the Ministry of Health, there were 44,069 homicide victims in Russia in 1995, a rate of 30.2 homicides per 100,000 persons. This is more than three times higher than the victimization rate of 9.4 in the United States in 1995.[2] Of these, 33,507 were males, representing 76% of all victims. This provides a male homicide victimization rate of 48.3 per 100,000 in Russia, which is more than 3 times the 1995 male rate of 14.7 in the United States, and nearly as high as the black male

[1]See Figure 1.2 on page 15 and Figure 1.3 and page 18 for maps of the Economic and Administrative Regions of Russia, respectively.

[2]All data related to homicide victimization in the United States in this chapter are drawn from the National Vital Statistics Report (see, Anderson, Kochanek, and Murphy, 1997), and as with the Russian victimization data represent ICD codes E960-978.

victimization rate in the U. S. that year. With 10,562 homicide victimizations, women represented 24% of all homicide victims, resulting in a female rate of 13.8 per 100,000, which is 3½ times the 1995 female rate of 4.0 in the United States.[3]

According to data from the Ministry of the Interior, there were 24,350 people *arrested* for committing or attempting homicide in Russia in 1995.[4] Males represented 86.7% of all those arrested for homicide in that year. There were 3,250 females arrested, representing 13.3% of all homicide arrests. In the United States, there were 16,701 arrests for homicide in 1995. Of these, 90.5% were males and 9.5% females. Thus, females appear to compose a slightly higher percentage of all homicide arrestees in Russia than in the United States.

Age

Table 4.1 below provides the total number of homicides, the age-specific homicide rate, and the proportion of all homicides for each of nine different age categories. These are data for 1995 from the Russian Ministry of Health.

Aside from the strikingly high age-specific victimization rates, the table reveals a distinctly different pattern in the age of homicide victims in Russia than in the United States. Figure 4.1 below employs the data from the third column in Table 4.1 to provide

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[3]Aside from the generally higher homicide rates, the elevated victimization rate among females in Russia may be due in part to the suspected high rates of female victimization by husbands and other partners (see Gondolf and Shestakov, 1997; Horne, 1999).

[4]As discussed in the previous chapter, crime data in Russia include attempted and completed homicides in the same category. Although the presentation of the data do not allow the disaggregation of this category, attempted homicides make up a small proportion (probably less than 10%) of the overall number (see footnote number 5 in Chapter 3). In any event, this category is not directly comparable with United States data, and comparisons here are for general and illustrative purposes only.

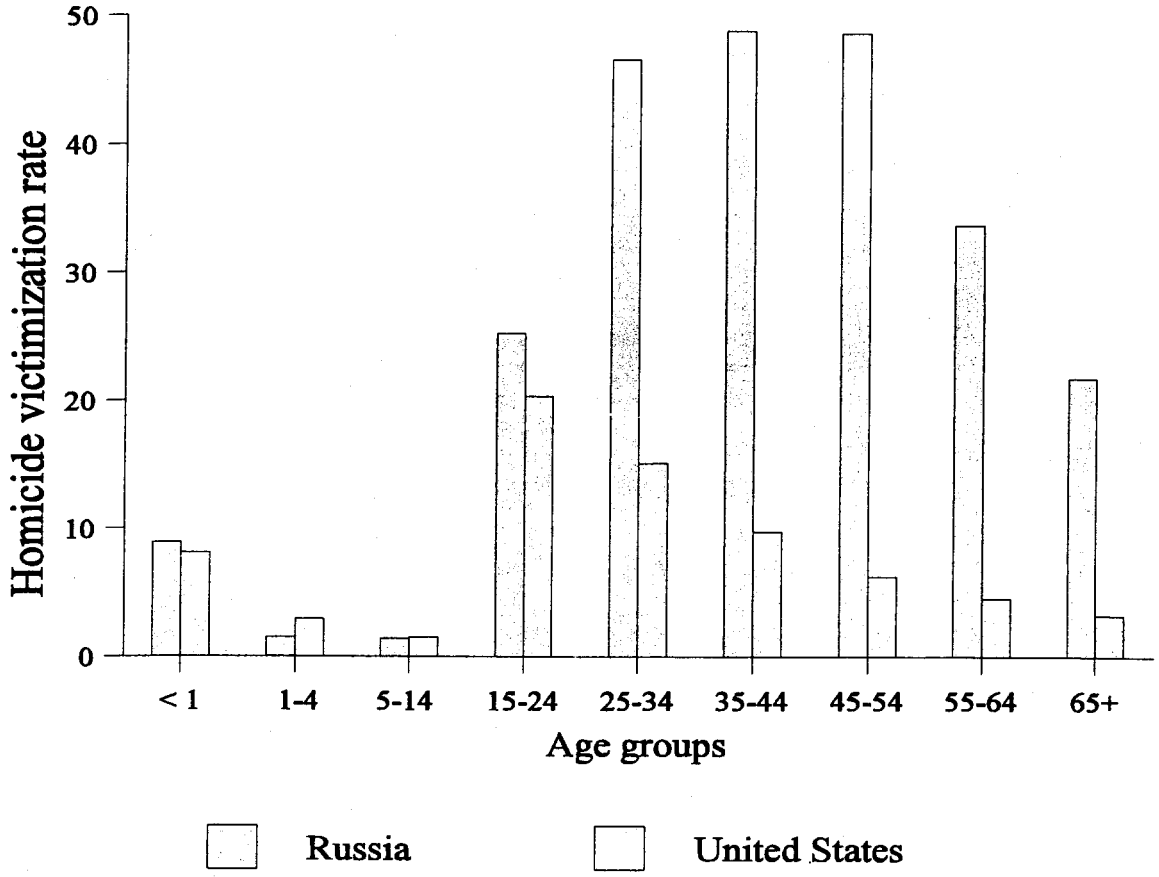
Table 4.1. Variation of homicide rates per 100,000 according to age, 1995.

Age Category	Total number of homicides	Age-specific victimization rate
Less than 1 year old	126	8.9
1 - 4 years old	98	1.5
5 - 14 years old	337	1.4
15 - 24 years old	5,377	25.2
25 - 34 years old	9,931	46.5
35 - 44 years old	12,132	48.7
45 - 54 years old	7,316	48.5
55- 64 years old	5,432	33.6
65+ years old	3,320	21.7

a comparison between Russia and the United States for homicide victimization rates by age.

This figure highlights the sharp differences between the two countries in terms of the relationship between homicide victimization and age. Again, setting aside the dramatically higher rates in Russia, we see two distinct age patterns. In the United States, the victimization rate is highest in the 15-24 year old age group and descends smoothly as age increases. In Russia, however, the victimization rate jumps sharply from the 15-24 to the 25-34 year old age group. It then rises slightly, but essentially plateaus at this level

Figure 4.1. Patterns of homicide victimization by age in Russia and the U.S., 1995.



for both the 35-44 and 45-54 age groups, before beginning to decrease. However, the homicide victimization rate is still higher among the 55-64 age group than the 15-24 year old category, and for those 65 and older the rate is nearly as high as for those 15 to 24 years old. Although older Russians have faired the worst in terms of overall mortality rates during the transition (see Shkolnikov and Mesle, 1996), the pattern of age-specific homicide rates over time displayed in the next section reveal that this distribution of homicide victimization by age is not an artefact of the transition, but has held in Russia for the last three decades. This pattern is considerably different than what we are

accustomed to in the United States, and the potential causes of this variation deserve further attention.

As for arrests, there were 24,350 arrests for completed and attempted homicide in Russia in 1995, according to the Russian Ministry of the Interior. Of those arrested, 6% were younger than 18-years old, 33% were between 18 and 29, and 61% were older than 30 years of age.[5] Data from the Federal Bureau of Investigation's Uniform Crime Reports (Federal Bureau of Investigations, 1996), reveal 16,701 arrests for homicide in the United States in 1995. Of those arrested, 2,560 (15%) were of persons younger than 18, another 9,249 (55%) of the arrestees were between 18 and 29, and 4,892 (29%) were over 30 years of age. Thus, 70% of those arrested for homicide in the United States are younger than 30-years old, while in Russia this total is less than 40%. Table 4.2 below illustrates this age difference among arrestees in Russia and the United States. Although these are arrest data and thus may not accurately reflect offending rates, when taken together with the homicide victimization rates from above, they suggest that both victims and offenders of homicide in Russia tend to be older than their counterparts in the United States.

Table 4.2. Age of homicide arrestees in Russia and the United States, 1995.

Age of arrestees	Russia	United States
< 18 years old	6%	15%
18 - 29 years old	33%	55%
30+ years old	61%	29%

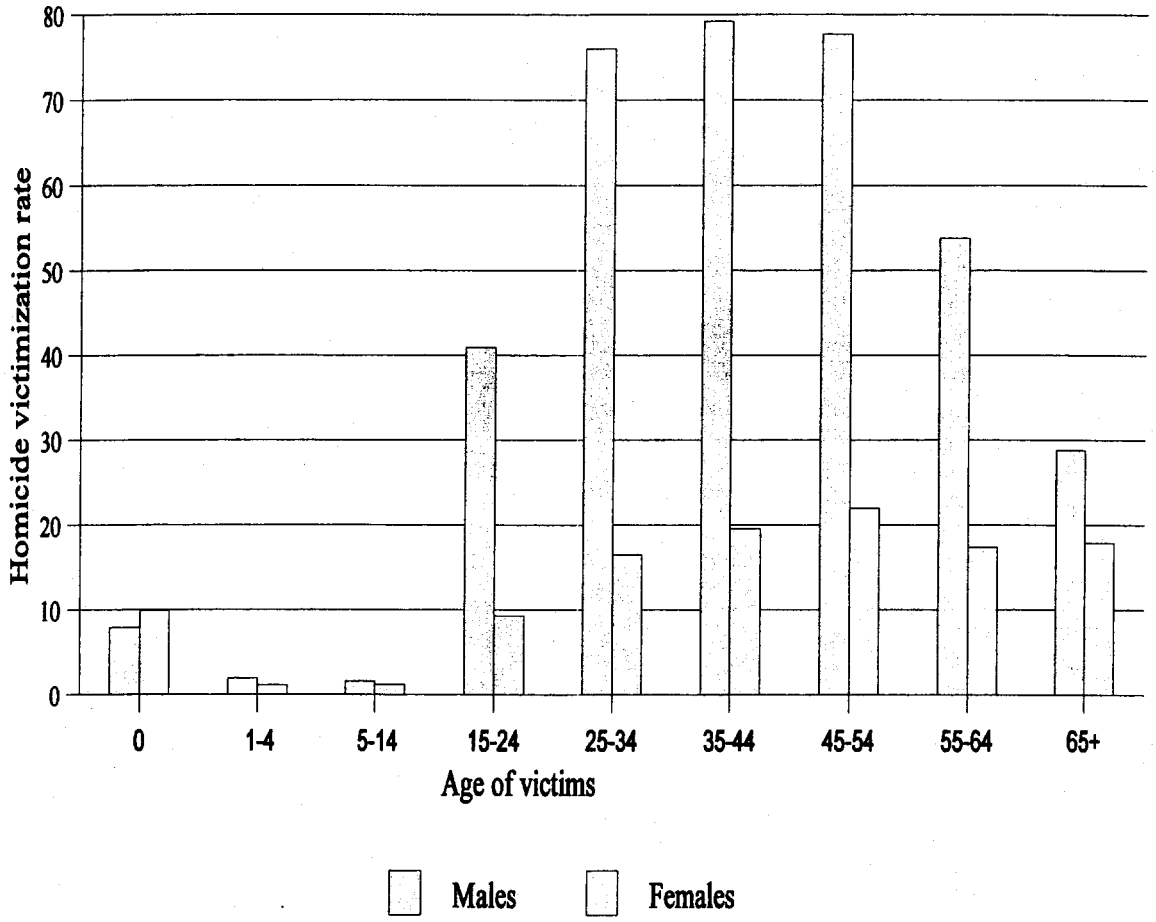
[5]Unfortunately, these are the only age categories for homicide arrests published by the Ministry of the Interior.

Age and sex

Figure 4.2 below presents the sex- and age-specific homicide victimization rates for Russia in 1995, highlighting the differences in the patterns of homicide victimization between men and women within the country. For males, rates are relatively low among the three lower age categories, then jump to over 40 per 100,000 for the 15-24 age group, and then nearly double again to almost 80 per 100,000 for males in the 25-34, 35-44, and 45-54 age groups. The rate does decrease for the 55-64 age group, but is still higher than the 15-24 category. For females, the pattern is similar but with a slight and interesting difference. The increase in rates that begins with the 15-24 age group continues all the way through to the 45-54 age group, which has the highest victimization rates among females. The rates decrease somewhat for the 55-64 and 65+ age categories, but are still higher than the 15-24 and 25-34 age groups.

Table 4.3 below compares the sex-specific rates among males and females in the United States and Russia. First, if compared with the age-specific homicide victimization rates of women in the United States, the rates for Russian women are much higher (see Table 4.3 below). Again, however, the pattern of the age distribution of female victims is just as interesting. In the United States, infant females less than one year old have the highest homicide victimization rate of any female age category. In general, however, female victims tend to be slightly older, on average, than male victims, thus their victimization rates peak not in the 15-24 age group, but instead in the 25-34 age group. After this, however, U.S. female victimization rates decrease consistently. As shown above, this is not the case with Russian women. Again, this pattern is radically

Figure 4.2. Variation of homicide rates by sex and age of victim in Russia, 1995.



different than what we are accustomed to in the United States, and the potential causes of this disparate distribution of female homicide victims by age demands further attention from researchers. One plausible hypothesis is that the higher rates among the older age groups are due to these women becoming victims of homicide at the hands of their husbands (Gondolf and Shestakov, 1997; Horne, 1999), who are themselves part of the hardest hit sex-age groups–in terms of employability, income, health, and alcohol consumption–during the transition (Shkolnikov and Mesle, 1996).

Table 4.3. Homicide rates per 100,000 persons by sex and age in Russia and the United States, 1995.

	Males		Females	
Age groups	Russia	United States	Russia	United States
< 1 year old	7.9	8.9	9.9	7.2
1 - 4 years old	1.9	3.1	1.1	2.6
5 - 14 years old	1.6	1.9	1.2	1.0
15 - 24 years old	40.9	33.9	9.3	6.0
25 - 34 years old	76.0	23.7	16.5	6.5
35 - 44 years old	79.2	14.6	19.6	4.9
45 - 54 years old	77.7	9.6	22.0	3.0
55 - 64 years old	53.8	7.2	17.4	2.1
65+ years old	28.8	4.3	17.9	2.4

In sum, beyond the very high homicide victimization rates in Russia, two related factors stand out in terms of the demographic variation of homicide rates in the country. The first is the dramatically different pattern for homicide as a function of age. Both homicide victims and offenders appear to be much older in Russia than in the United States. In fact, the highest victimization rates are found among the 35-44 and 45-54 year old age groups. Second, this different pattern is even more marked for females, where women 45-54 have the highest victimization rates. Further, females 55-64 and 65 years

old and older are more at risk than the 25-34 year old age group, which has the highest victimization rate in the United States.

Patterns over time

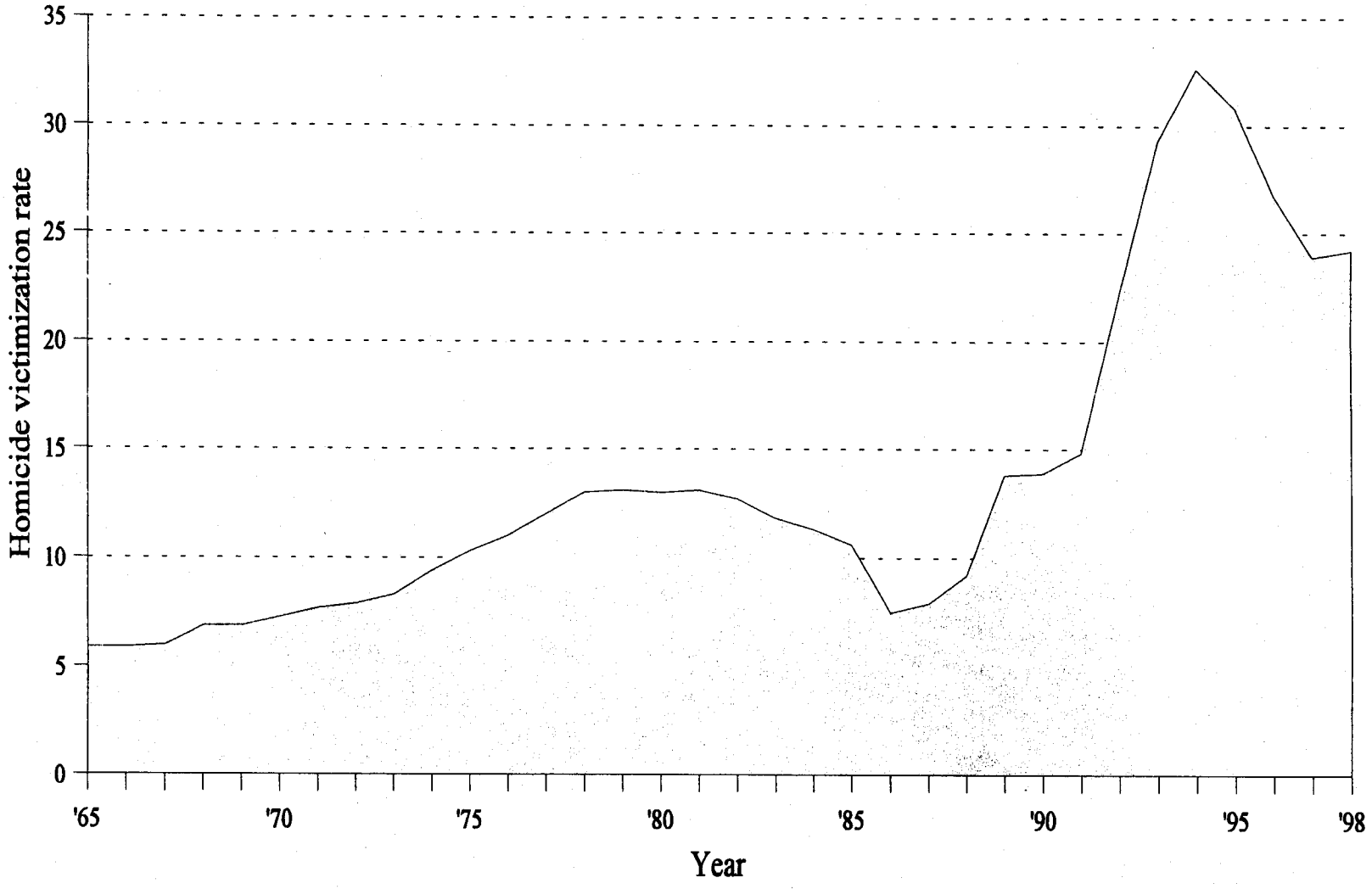
Until recently, victimization data on homicides in Russia were not publicly available. In this section, I use newly available data to describe the pattern of homicide rates in Russia from 1965 to 1998. Overall rates are presented here, as are trends in homicide victimization by sex and by age.

Trends in overall homicide rates

Figure 4.3 below presents the homicide victimization rate in Russia between 1965 and 1998. There are two basic recognizable patterns here, which correspond to specific time frames. The first period begins in 1965 and ends around 1988. There was a slow but steady increase in the homicide rate from 1965, when the rate was 5.9 per 100,000, until 1978, when the rate hit a high of about 13.0 per 100,000. The homicide rate remained constant from 1978 until 1981, and then began a slow decline to a rate of 10.6 per 100,000 in 1985.

Following this slow rise and fall, there was a sudden drop in the homicide victimization rate from 10.6 per 100,000 in 1985, to 7.5 per 100,000 in 1986, representing a 30% decrease in the homicide rate in a single year. This abrupt change is made more dramatic by the slow and steady trend of the previous 20 years. The rate remains at this low level in 1987, but is back up to 9.2 per 100,000 in 1988, and rises even higher in the following years. The sudden decrease, followed by a just as dramatic

Figure 4.3. Homicide victimization rates per 100,000 in Russia, 1965-1998.



increase two years later, is likely due in large part to the anti-alcohol campaign instituted by Soviet President Mikhail Gorbachev during this time (see the brief discussion of this topic in the following chapter).

The second distinct phase for homicide rates in Russia during the last three decades begins in 1989, and is especially marked after 1991. Following the demise of the anti-alcohol campaign, the homicide rate quickly rose above previously high levels, hitting 13.8, 13.9, and 14.4 per 100,000 in 1989, 1990, and 1991, respectively. There was then an even sharper surge upward during the next three years, with the homicide rate hitting a high of 32.6 per 100,000 in 1994. The rate then began to drop, eventually leveling off at around 24 per 100,000 in 1997. Thus, between 1988 and 1994, the homicide rate rose an incredible 3½ times. Even following its reduction and stabilization, the 1998 rate of 24.2 per 100,000 is still about 2½ times higher than a decade earlier.

The major political, economic, and social changes experienced by Russia during the 1990s are well-known and were alluded to earlier in this dissertation. It is likely that these reductions in social and economic well-being, as well as concomitant increases in aggregate levels of alcohol consumption, have played a role in the dramatic increase in the homicide rate in the 1990s. Chapter 5 examines these issues in further detail.

Patterns of sex-specific homicide rates

Long-term patterns of sex-specific homicide rates have been similar during the last three decades. For example, the male homicide rate started at around 9 per 100,000 in 1965, gradually rose until it peaked at about 20 per 100,000 in the late 1970s and early 1980s, then declined again to around 11.5 per 100,000 by 1987. It then more than

quadrupled, to a high of 50 per 100,000 in 1994, before pulling back and stabilizing in the low 40s. The female homicide victimization rate was around 3 per 100,000 in 1965, crested a little above 7 in the late 1970s and early 1980s, then declined to about 4.5 per 100,000 in 1987. The female rate then tripled over the next seven years, reaching of a high of nearly 14 per 100,000 in 1994, before declining to less than 11 per 100,000 in 1997. Figure 4.4 below presents sex-specific homicide victimizations from 1965 to 1997.

Patterns of age-specific homicide rates

Figures 4.5a and 4.5b display age-specific homicide victimization rates in Russia from 1965 to 1998 (note that the latter graph is twice the scale of the former). The information is broken into two figures for clarity of presentation, and the age groups are based on categories commonly studied in the United States.

The same general pattern for most of the age groups that is displayed in the overall homicide rates during this time period is also recognizable here (see Figure 4.1). For example, though on different scales, all age groups older than 15 are similar to each other and the overall pattern. Each rises slowly but steadily from a low point in 1965 until cresting around 1980. Each then declines for several years before hitting a trough during the years of the anti-alcohol campaign. They then rise sharply, especially the 25-34, 35-44, and 45-54 year old groups, until hitting highs in 1993 and 1994. Finally each then drops slightly and levels off by the mid- to late 1990s.

There are two exceptions to this general pattern, however. First, Figure 4.5a reveals that deaths due to homicide for infants less than one year old in Russia show a pattern that departs from other age categories. The rate peaks at around 10 per 100,000 in

Figure 4.4. Sex-specific homicide victimization rates in Russia, 1965-1997.

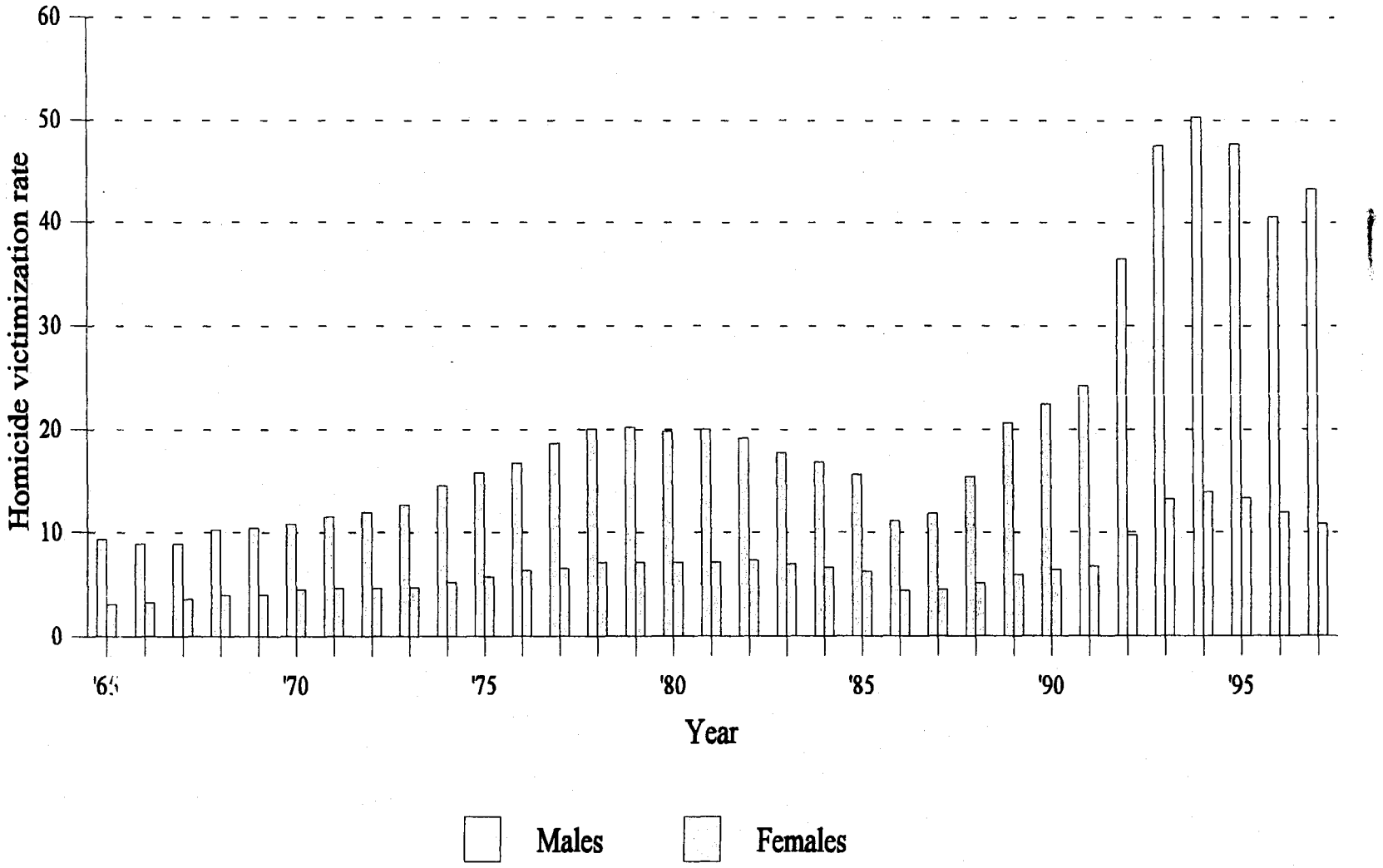


Figure 4.5a. Age-specific (< 25 years old) homicide victimization rates in Russia, 1965-1998.

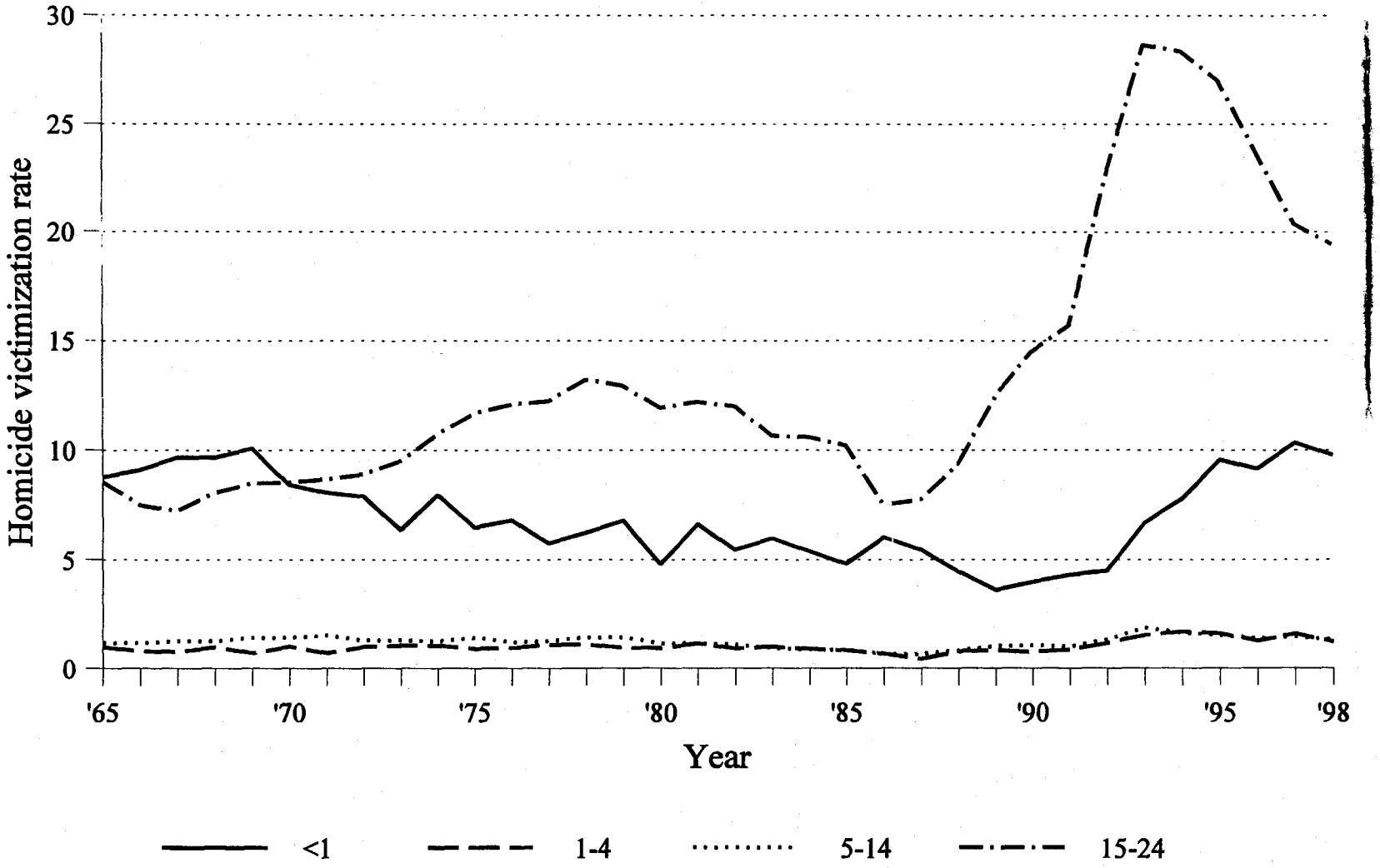
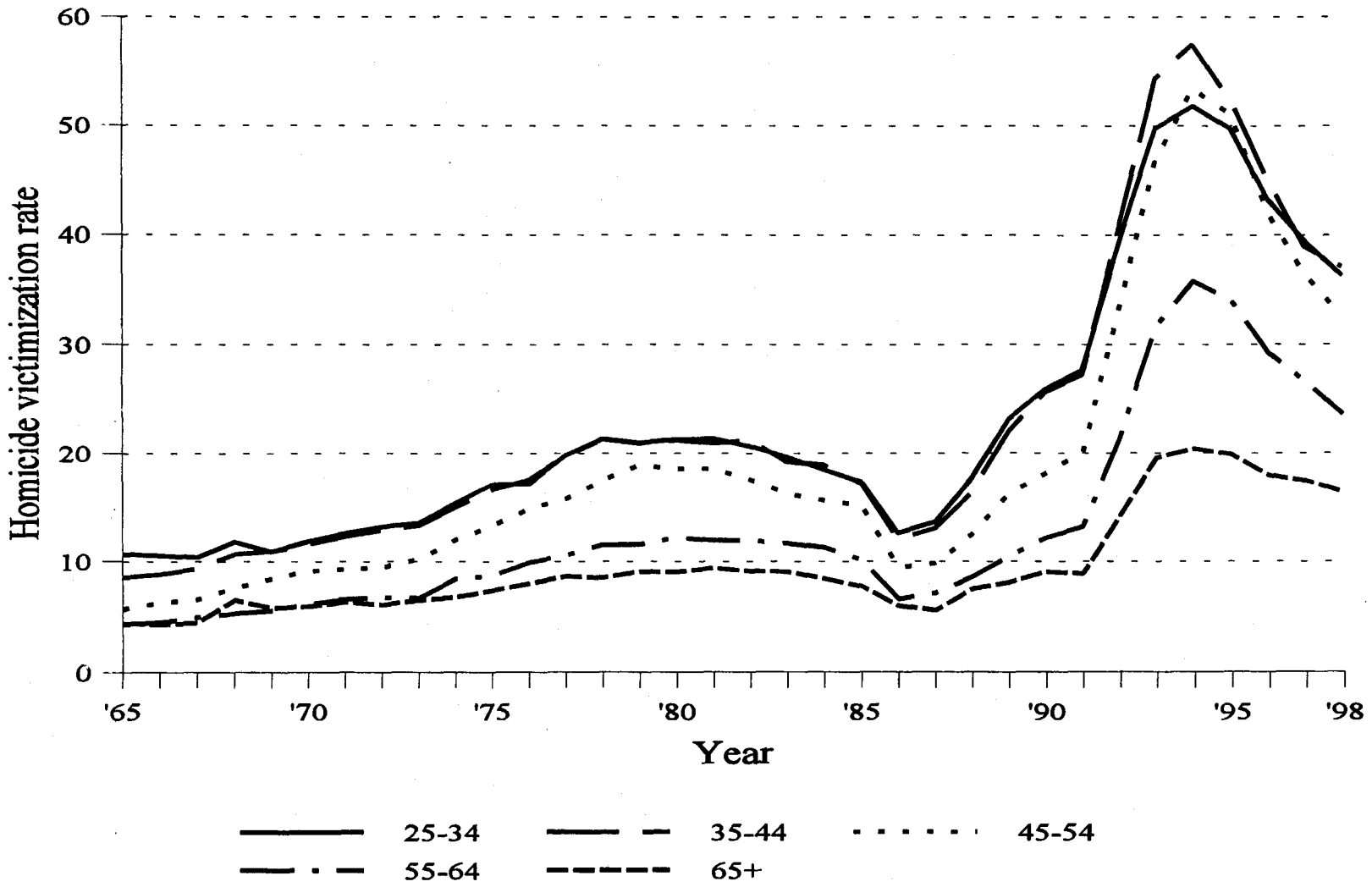


Figure 4.5b. Age-specific (> 25 years old) homicide victimization rates in Russia, 1965-1998.



the late 1960s, slowly and steadily declines to a low of 3.6 in 1989, and then quickly climbs back to around 10 per 100,000 in the mid-1990s. Second, the homicide victimization rates for the 1-4 and 5-14 age groups also exhibit patterns that are different from the rest, but similar to each other. Both remain within a relatively low and narrow range for most of the period under study. In one respect, though, the rates for these groups are similar to the other categories: they bottom out in the mid- to late 1980s and then rise to new highs in the early 1990s.[6]

In sum, there are several important aspects of the variation of homicide rates during the last three decades in Russia. The first is the two distinct trends over this time: the slow and steady rise and fall from the mid-1960s to the mid-1980s, when there was sharp drop during the anti-alcohol campaign, and then the dramatic increase after the cessation of the campaign, especially following the breakup of the Soviet Union. Second, as expected, male victimization rates are much higher than female rates, and this is reinforced during the transition years of the 1990s, when male rates increased more than female rates. Third, there are three general patterns for the variation of homicide rates over time for different age categories: (a) the rate for infants less than one year old began high, slowly decreased for twenty years, then again hit high levels in the 1990s, (b) the 1-4 and 5-14 age groups are similar to each other during this period, both in terms of their

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[6]An examination of the joint distributions by sex and age do show marked differences in homicide rates between males and females (e.g., homicide rates reach the extremely high rates of 80 and even 90 per 100,000 for males between 25 and 54 in 1994), but the temporal patterns for the age groups are similar and thus are not presented here.

low rates and the narrow range within which they vary, and (c) although on somewhat different scales, those in the 15-24, 25-34, 35-44, 45-54, 55-64, and 65 and older age groups all follow the three distinct patterns just discussed over this time frame. Though different in absolute levels, the corresponding categories for males and females follow similar patterns throughout. Finally, these data show that homicide victimization rates in Russia were generally higher than those in the United States throughout this entire time period, even before the breakup up of the Soviet Union. This runs counter to previous work that depended upon government-reported crime data and that suggested rates of violence in Communist Russia were much lower than in the United States.

Spatial variation

This section presents data on the spatial variation of homicide rates in Russia. It first examines the pattern of homicide victimization rates in the large economic regions of Russia and then discusses the distribution of victimization rates among the smaller administrative regions.

Homicide rates in the economic regions

As discussed earlier, the 12 economic regions of Russia are made up of several smaller administrative regions grouped together for record-keeping and descriptive purposes (much like the nine United State Census Regions). Appendix A lists each of the 12 economic regions, together with the smaller administrative regions of which each consists. Table 4.4 below lists the economic regions in order of ascending homicide victimization rates.

This table shows the high homicide rates in each of the economic regions, ranging from 14.5 per 100,000 population in the Central Chernozem region to nearly 55 per 100,000 in Eastern Siberia. Figure 4.6 below displays the geographical location of each the regions. This map reveals a distinct pattern of ascending homicide rates moving across the country from west to east. For example, the seven Economic Regions with the lowest homicide victimization rates are all in western Russia. Even within western Russia, there appears to be a pattern, though less distinct, of ascending rates as one moves east (rates in the Volga and Volga-Vyatka regions, for example, are higher than rates in the Central Chernozem, Northern Caucasus, and Kaliningrad regions further to the west). Moving east, we see the Ural region and

part of the Northern region, both of which have higher homicide victimization rates than all the western regions. Continuing east, Western Siberia has even higher rates, followed by the Fareast region and, finally, Eastern Siberia.

This pattern of ascending homicide rates as we move eastward across Russia presents both theoretical and empirical considerations. Theoretically, the immediate question is, "why does this phenomenon exist?" Perhaps there are cultural reasons for the lower rates in the west?[7] Alternatively, it may be that the regions vary on the structural factors examined in the next chapter, thus partially explaining this pattern of ascending homicide rates. Empirically, this pattern may be indicative of spatial autocorrelation,

[7]Similarly, the high proportion of Muslims living in the Northern Caucasus region might be one source of the relatively low homicide rate in that region.

Table. 4.4. Homicide rates per 100,000 for the 12 economic regions of Russia, 1995.

Economic Region	Population	Homicide victimization rate
Overall rate in Russia	145,743,000	30.2
Central Chernozem	7,595,000	14.5
Northern Caucasus	17,169,000	16.8
Kaliningrad	4,289,000	19.1
Volga-Vyatka	8,269,000	23.3
Volga	16,658,000	24.1
Northwest	4,651,000	27.3
Central	29,326,000	28.3
Northern	5,908,000	32.4
Ural	20,202,000	36.5
Western Siberia	15,001,000	40.2
Fareast	7,609,000	42.4
Eastern Siberia	9,129,000	54.2

which can bias the standard error down and negatively influence the validity of the estimates. This potential limitation is examined further in the following chapter.

Homicide rates in the administrative regions

The stem-and-leaf plot in Figure 4.7 provides a graphical illustration of the distribution of homicide rates in Russia. The median rate is 29 homicide victimizations per 100,000 population, the mean is 31.5, and the standard deviation is 19.0.

MAP OF ECONOMIC REGIONS

Figure 4.7. Distribution of regional homicide rates in Russia.

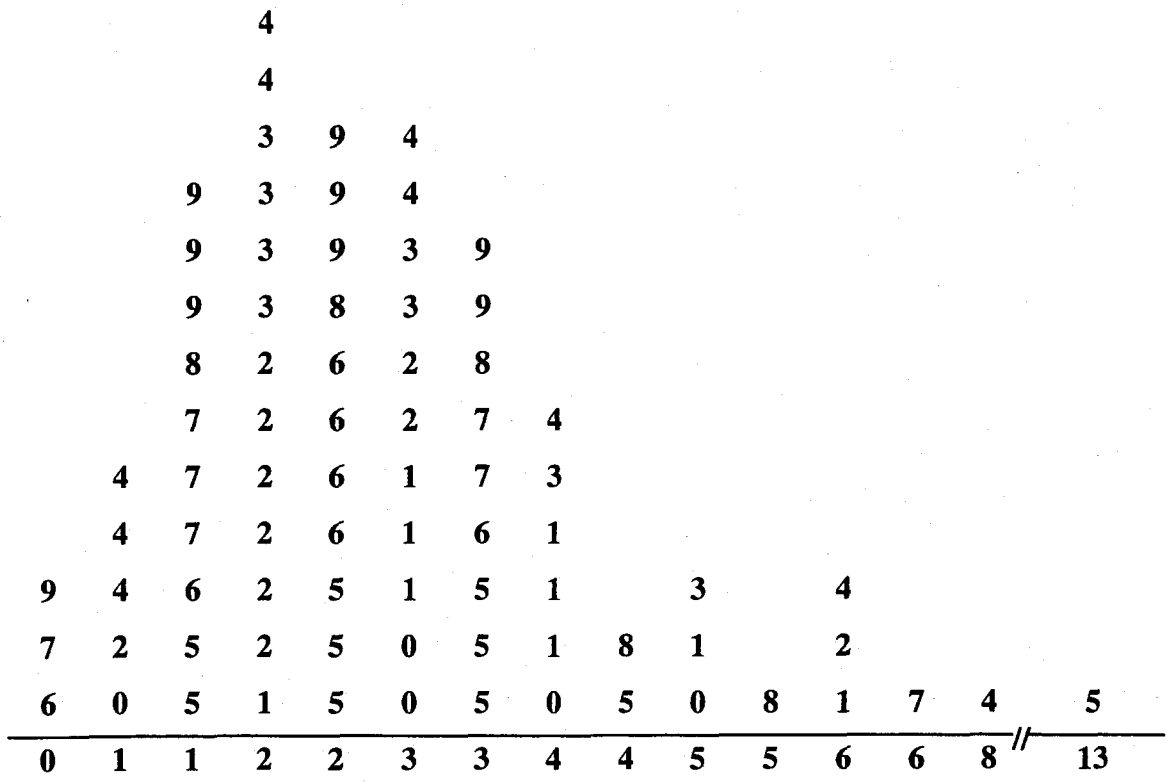


Table 4.5 below shows the homicide victimization rates for each of the administrative regions in Russia in 1995, and these rates are graphically illustrated in Figure 4.8. The lowest regional homicide rate that year was 5.6 per 100,000 population in Voronezh Oblast, which is located in the Central Chernozem Economic Region. It is interesting to note that Voronezh is well below the mean on several of the structural measures, such as poverty and the proportion of single-parent households in the region.

Other low rates include Kabardino-Balkaria (7.0), Dagestan (9.1), Northern Ossetia (10.1), Karachai-Cherkessia (11.3), and Ingushetia (13.9). All of these regions

Table 4.5. Regional homicide victimization rates per 100,000 in Russia, 1995.

Region	Rate	Region	Rate	Region	Rate	Region	Rate
Karelia	38.5	Tula	31.7	Adygei	21.1	Omsk	30.9
Komi	42.8	Yaroslavl	29.3	Dagestan	9.1	Tomsk	35.3
Arkhangel	35.0	Marii El	40.2	Ingushetia	13.9	Tyumen	83.9
Vologda	22.8	Mordovia	23.0	Kabardina	7.0	Buryatia	47.9
Murmansk	24.6	Chuvashia	15.1	Karachaevo	11.3	Tyva	135.1
S. Petersburg	24.9	Kirov	25.2	S. Osetia	10.1	Khakasia	37.6
Leningrad O.	31.6	Nizhegrd.	20.9	Krasnodar	25.2	Krasnoyar	42.4
Novgorod	32.0	Belgorod	14.1	Stavropol	18.8	Irkutsk	66.6
Pskov	24.2	Voronezh	5.6	Rostov	14.4	Chitin	61.1
Bryansk	13.9	Kursk	16.5	Bashkort.	20.4	Sakha	25.6
Vladimir	23.0	Lipetsk	16.5	Udmurtia	38.2	Ev. Aut. O.	49.1
Ivanov	28.1	Tambov	24.7	Kurgan	33.1	Chukot	21.8
Kaluga	19.0	Kalmykia	29.7	Orenburg	34.7	Primorskii	43.6
Kostroma	22.4	Tatarstan	30.3	Perm	41.4	Khabarov	52.2
Moscow	26.1	Astrakhan	13.9	Sverdlov	44.4	Amur	35.8
Moscow O.	36.2	Volgograd	22.5	Chelyabinsk	40.5	Kamchatka	33.7
Orlov	17.3	Penzen	16.3	Altai Rep.	60.0	Magadan	60.3
Ryazan	28.3	Samara	20.8	Altai Krai	34.5	Sakhalin	48.6
Smolensk	21.0	Saratov	28.3	Kemerov	66.4	Kaliningd.	19.1
Tver	31.9	Ulyanov	21.8	Novosibirsk	27.4		

Note. Data for Autonomous Okrugs are usually included as part of the larger administrative unit of which they are a part, and in this table I have done the same for mortality data. For this reason, data are included for only 79 regions in this table (the 80 regions minus the Chechen Republic, for which homicide data are not available).

MAP OF ADMINISTRATIVE REGIONS

with comparatively low homicide rates, with the exception of the Voronezh, are located in the Northern Caucasus, where Muslim populations are high compared with the rest of the country. Similarly, though the proportion of the population living below the poverty line in each of these regions is above average, the rate of single-parent households is well-below average in the regions, and the level of alcohol consumption in these regions is a fraction of the all-Russian mean. Finally, although low when compared to other regional homicide rates in Russia, it should be stressed that with the exception of Voronezh, Kabardino-Balkaria, and Dagestan, every administrative region in Russia had a rate higher than the homicide victimization rate of 9.4 per 100,000 population in the entire United States in 1995.

The highest regional rate is in the Tyvan Republic, which had 135 homicide victimizations per 100,000 population in 1995. Throughout the 1990s, the homicide rate in the region was above 90. In 1995, there were 416 homicides in Tyva, meaning that there was more than one homicide for every 1,000 people in the region.[8] Tyva is located in Eastern Siberia, bordering Mongolia to the north. It is largely rural (there are no cities in Tyva with more than 100,000 people), and nearly three-quarters (73.2%) of the population live below the poverty line. The proportion of single-parent households is also well above average in Tyva, and the rate of alcohol consumption in the region is more than 1.5 times the mean.

[8]To put the1995 figure in perspective, a similar rate on this campus would result in about 16 murders of SUNY students annually.

The Tyumen Oblast, at 83.9 per 100,000 population, also has a very high homicide victimization rate. Tyumen is located in Western Siberia and is home to large reserves of fossil fuels, resulting in levels of poverty and unemployment that are well below average in the region. However, the large number of relatively well-paying jobs in the extraction industry also likely plays an important role in the heightened levels of mobility (nearly 3.5 times the national mean), diversity (more than 1.5 times the mean), and alcohol consumption (1.5 times the mean) in Tyumen. Further, young males between the ages of 15 and 29 make up more than a quarter (27.3%) of the regional population, which is 2.5 times the all-Russian mean.

Other administrative regions with high homicide rates include Primorskii Krai (43.6 per 100,000 population), Sakhalin Oblast (48.6), Khabarov Krai (52.2), the Altai Republic (60.0), and the Magadan (60.3), Chita (61.1), Kemerovo (66.4), and Irkutsk Oblasts (66.6). All of these regions are in eastern Russia: Altai, Kemerevo, and Tyumen in Western Siberia; Chita, Irkutsk, and Tyva in the Eastern Siberian Region; and Khabarovsk, Magadan, Primorskii Krai, and Sakhalin in the Fareast.

In sum, there are several important aspects of the spatial variation of homicide rates in Russia. The first is the generally high rates among the regions. There are several entire regions that have higher homicide victimization rates than many of the worst large cities in the United States. Second, the pattern of ascending homicide rates as we move eastward across Russia presents interesting theoretical and empirical considerations to be addressed. These include the possible structural and cultural sources of this pattern, as

well as potential spatial autocorrelation. Finally, although the homicide rates are generally high, they are widely distributed–ranging from a low of 5.6 to a high of 135.1–and vary considerably from region to region. The theoretical evaluation in the next chapter attempts to partially explain this variation in terms of social structure.

Summary and conclusions

This chapter has employed newly available mortality and crime data to examine the demographic, temporal, and spatial patterns of homicide rates in Russia.

The analysis of demographic variation presents unexpected findings in terms of the age distribution of homicide victims and offenders. The evidence suggests that both homicide offenders and victims in Russia are markedly older than their counterparts in the United States. Those most at risk of homicide victimization, for example, are in the 35-44 and 45-54 age groups, a dramatic difference from what we normally find in the U.S. Further, this pattern is exaggerated for females, with even those 65 and older more at risk of becoming victims than women age 25-34, the most victimized female age group in the United States.

The temporal analysis reveals two general trends in the homicide victimization rate from 1965 to 1988. The end of the first era–which encompasses the brief years of the anti-alcohol campaign in the mid-1980s–and the transition years of the 1990s produced dramatic movements in the homicide rate. This section of the chapter also examines differences over time in homicide rates by age and sex.

Finally, the description of the spatial variation of homicide rates in Russia shows a distinct pattern of ascending rates from west to east. It also shows that more than 95% of

the Russian regions have homicide victimization rates higher than the 1995 rate for the United States, and that several *entire regions* have rates greater than those found in many large American *cities*, such as Detroit, Houston, and Washington, D.C., which traditionally have the highest rates in the U.S. Further, even though homicide rates are elevated throughout Russia, the discussion reveals that the rates are widely distributed and that they vary considerably from region to region.

This substantial spatial variation of homicide rates among Russian regions is the topic of Chapter 5. More specifically, the statistical analysis in the next chapter employs theories commonly tested in the United States, together with the newly available data from Russia (discussed in Chapter 3), in an attempt to partially explain the spatial variation of homicide victimization rates in Russia in terms of the structural characteristics of the regions.

Chapter 5:

Model estimation

This chapter employs the data described in Chapter 3 in order to answer the second research question posed at the beginning of this dissertation: *Which structural factors commonly tested in the United States partially explain the variation of homicide rates among Russian regions*?

Methodology

Ordinary Least Squares regression is employed to estimate the model parameters. This technique requires several assumptions about the data. This section discusses these assumptions in terms of the Russian data.

The model

We must make several assumptions about the relationships between the variables and about the errors when using the OLS estimator. These are discussed here in terms of the Russian data employed in this study.

Transformations. An initial estimation of the model using the original values of the independent and dependent variables does not provide a good fit to the data. Given the structure of these data, I therefore decided to estimate a log-log model. Not only does this model provide a better fit to the data, but taking the natural logarithm of the original values results in a more normal distribution for many of the variables, since several are positively skewed, and it helps to pull the few extreme values closer to the rest of the distribution. Further, the log-log model also allows for an intuitive interpretation of the estimates, with the slope representing the percent change in the dependent variable associated with a one-percent change in the independent variable. Finally, transforming

the data in this manner often makes them conform more closely to the assumptions of the linear model, which are discussed next.

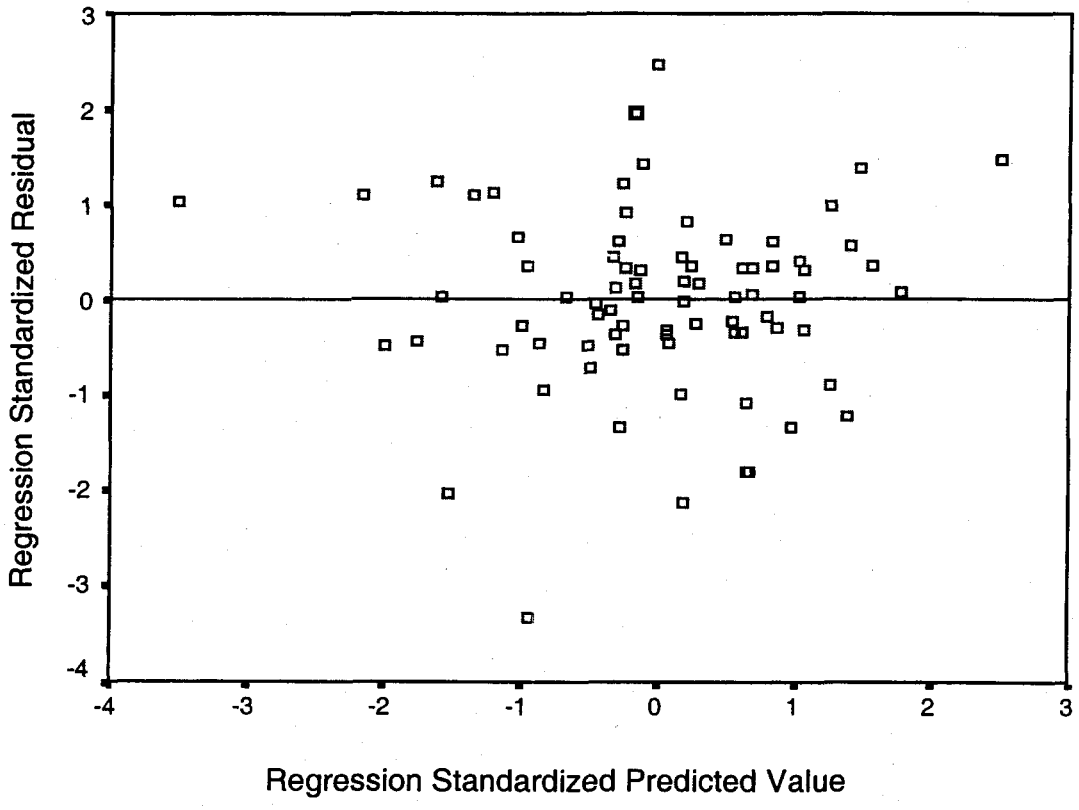
Linearity. One of the assumptions we make is that the relationships between the independent and dependent variables are linear. I examined the scatterplots of the logged dependent variable with each of the logged independent variables. These plots (which are shown in Appendix E) reveal no obvious departures from linearity, so it appears that this assumption holds.

Multicollinearity. A second assumption is that there is no perfect collinearity among the independent variables. Even if not perfectly collinear, high collinearity can also create problems for the regression model, and it is often the case that highly aggregated structural measures such as those employed here are highly collinear. Multiple correlation among the independent variables means that the estimates are not unique because they share information with other Xs. As a result, the estimates of the coefficients are imprecise and the standard errors are large, resulting in an unstable model that is sensitive to even small changes (Fox, 1991). This does not appear to be the case here. An examination of the variance inflation factors in the preliminary model shows that the highest (2.14 for poverty) is not close to the commonly accepted harmful level of 10 (see Pindyck and Rubinfeld, 1998). Thus it appears that this is a reasonable assumption with these data.

Homoscedastic error variance. Another assumption we make with OLS is that the disturbances are constant. It is easy to check this by plotting them against the fitted

values of homicide from this preliminary log-log model (shown as Model 1 in Table 5.2). Figure 5.1 shows this plot; the pattern suggests that this assumption holds for these data.

Figure 5.1. Scatterplot of residuals against Predicted Ys.



However, given that homicide is such a rare event and that the range of population sizes of the regions is so wide, it may be that the disturbances vary systematically based upon regional population. That is, the disturbances may be larger for less populous regions and smaller for more populous regions. Figures 5.2 and 5.3, however, suggest that this is not the case.

Figure 5.2. Scatterplot of residuals against the regional logged population size.

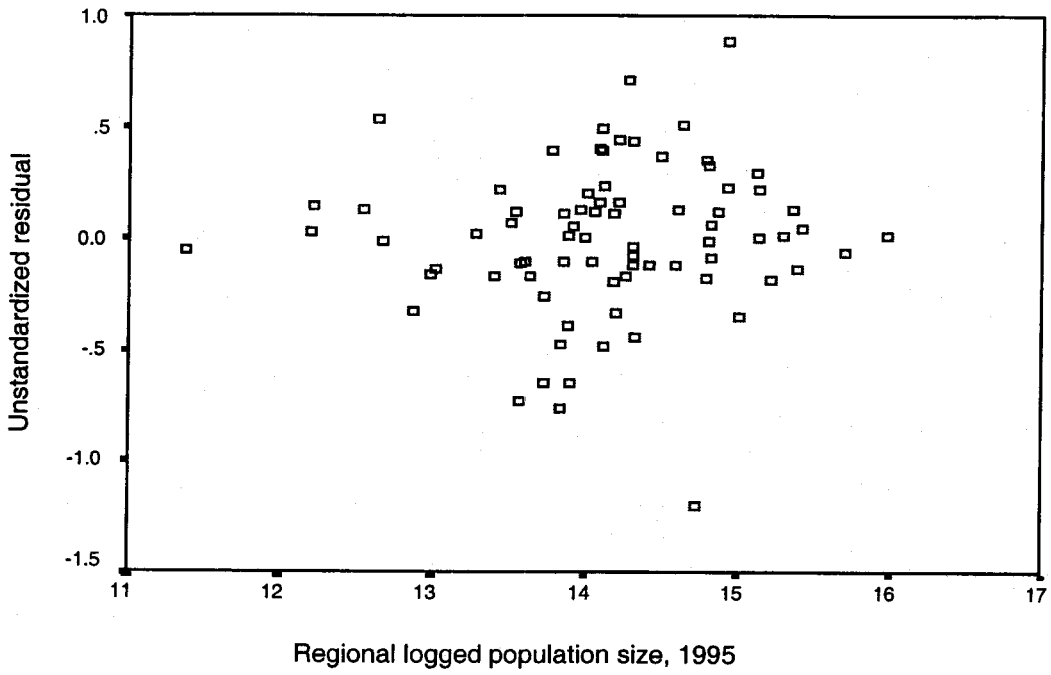
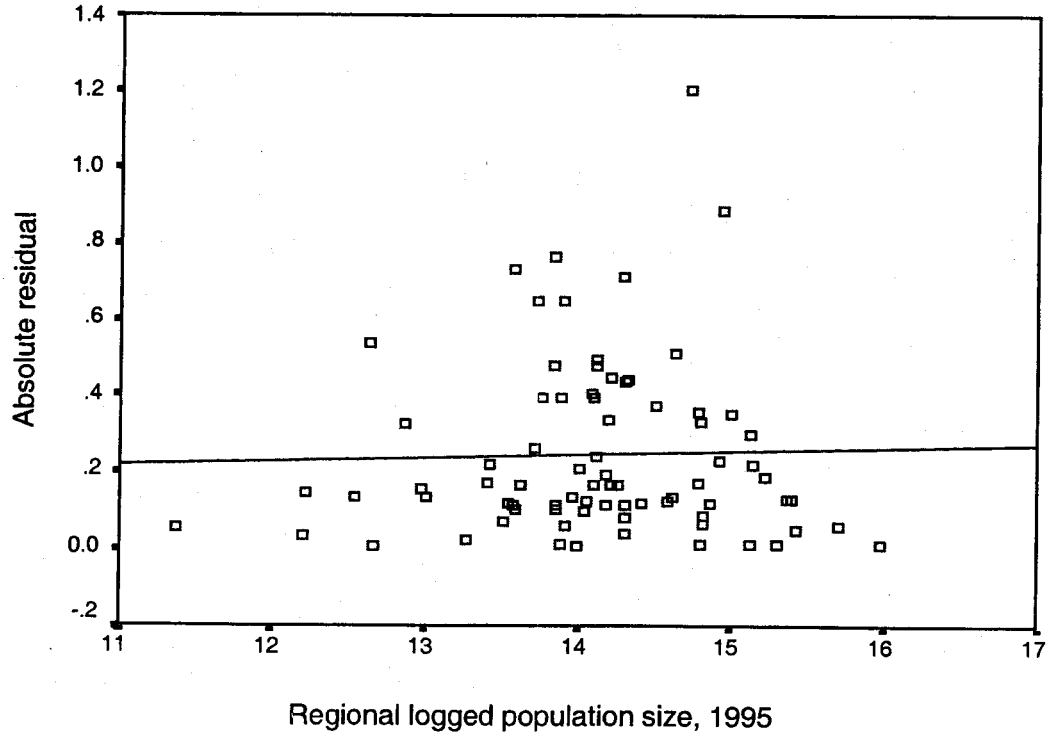


Figure 5.3. Scatterplot of absolute residuals with regional logged population size.

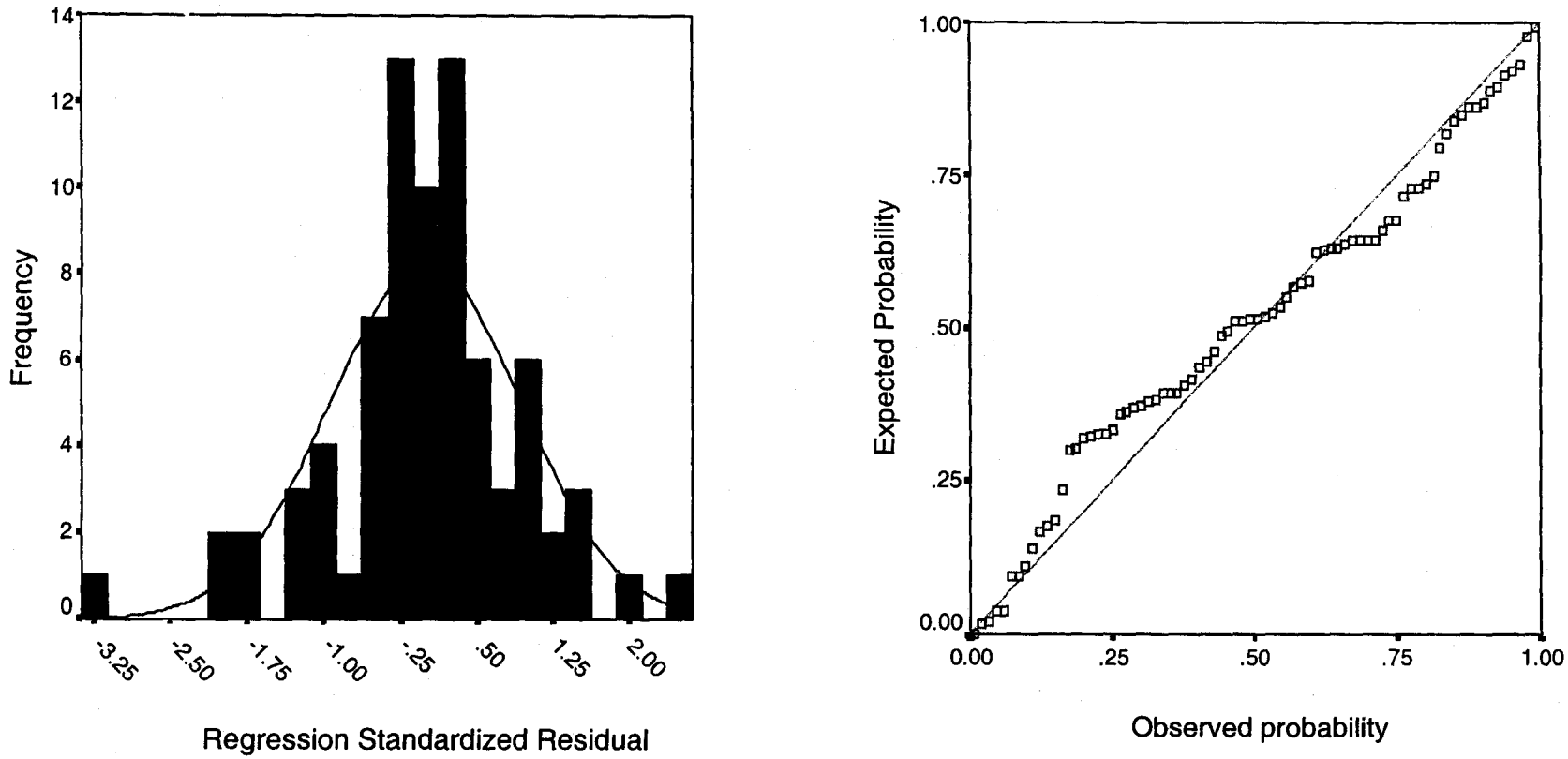


Errors are normally distributed. This is the most stringent of the assumptions, and therefore I used several methods to check it. I first examined the values of the studentized residuals in order to see if more than the expected number lie beyond two standard deviations. Second, I examined the distribution of the residuals via a simple histogram. Finally, I examined the normal probability plot, where the residual is plotted with its expected value under normality (Neter et al., 1996). The histogram and normal probability plots are shown in Figure 5.4. All three methods suggest that the distribution of the errors does not depart substantially from normality.

Uncorrelated errors. A final OLS assumption is that the prediction errors are independent of each other. In other words, we should not be able to predict the error for one unit by knowing the error of another unit. This is a common problem in time-series analysis, where the data are ordered based upon the time of measurement, but it can create difficulties with cross-sectional analysis, as well, and spatial autocorrelation is a potential problem with this study.

The maps in Figures 4.6 and 4.7 show that homicide rates in the administrative regions are often similar in size to those near them and that the homicide rates of the regions steadily increase from west to east. Thus it may be that knowledge of the disturbance term in a region such as Dagestan, which like other regions in the Northern Caucasus has a low homicide rate, may allow us to predict the disturbance term in neighboring regions. The result is an unbiased but inefficient estimate of the slope and underestimated standard errors. The latter increases the t-statistic and the chance of erroneously rejecting the null hypotheses.

Figure 5.4. Histogram of the residuals and the normal probability plot.



Outliers

Outliers are extreme observations that may unduly influence the regression line. It could be that a particular relationship exists between most of the cases in the analysis, but that one or a few cases differ so substantially from the others that this relationship is masked, or that these outliers influence the regression line so strongly that there appears to be a relationship where none exists. Since there are a relatively few number of cases here, and since the stem-and-leaf plots in Appendix D show extreme values on a few of the variables, I closely consider the possibility of outliers and their potential influence on the model.

First, I examined the scatterplots of the independent variable with each of the dependent variables and took note of the few cases that seemed to be potential outliers. Second, I examined the leverage values to check for outliers on the X-axis. Third, I examined both the studentized and studentized deleted residuals to check for outliers on the Y-axis. Fourth, I examined the dfBetas to check for influential cases. Neter, Kutner, Nachtsheim, and Wasserman (1996) suggest that for small to medium sized data sets, cases with a dfBeta greater than 1 in absolute value is a potentially influential case. For all cases on all variables, the largest dfBeta (in absolute terms) is -.80 for Tyumen Oblast on the mobility variable. Aside from this, no other values exceed .65, and there are only a few values that are greater than .50. However, in order to be safe, after a final model was selected, alternative models were also estimated that excluded cases such as Voronezh, Kemerov, Tyumen, and the Jewish Autonomous Oblast that had the highest values on the

influence statistics. Excluding these cases, both by themselves and in combination, had no effect on the inferences drawn.[1]

In sum, this data set appears to meet the assumptions required for the use of the Ordinary Least Squares estimator. With both the independent and the dependent variables transformed via natural logarithms, there are no apparent non-linear relationships, multicollinearity does not seem to be a problem, and the disturbances are homoscedastic and do not depart substantially from normality. Further, it does not appear as if one or a few outlying cases unduly influence the inferences drawn from the model. The next section describes the results of the model estimation.

Social structure and homicide victimization rates in Russia

Table 5.1 displays the correlation matrix. With two exceptions, the bivariate correlations of the independent variables with the homicide victimization rate are in the expected direction. This is not the case, however, with the unemployment rate and urbanization. First, the bivariate correlations suggest that as both the unemployment rate and the percent of a region's population living in cities greater than 100,000 population increase, the homicide rate decreases. This is discussed further in terms of the multivariate results.

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[1]This is not the case in the model estimated with the original non-logged values. First, the dfBetas show generally higher scores, with several greater than or approaching critical values. Second, when some of these cases are removed from the analysis, both individually and in concert, the inferences change. This suggests that the model employing the original values is unstable and the inferences potentially dependent upon a small number of cases, providing another reason to select the log-log model, which does not seem to be sensitive to potentially influential cases.

Table 5.1. Correlation matrix of logarithmically transformed variables (n=78).

	Homicide	Poverty	Gini	Unemp	Space	Mobility	Diversity	Single	Urban	Alcohol	Males
Homicide	1.000										
Poverty	.042	1.000									
Gini	.273	.382	1.000								
Unemp	-.078	.568	.205	1.000							
Space	-.237	-.538	-.425	-.347	1.000						
Mobility	.372	.115	.501	-.015	-.171	1.000					
Diversity	.123	.403	.489	.390	-.567	.205	1.000				
Single	.523	-.134	.072	.090	.002	.064	.024	1.000			
Urban	-.216	-.355	-.315	-.355	.267	-.352	-.233	-.194	1.000		
Alcohol	.527	-.324	-.105	-.246	.144	.257	-.265	.239	.063	1.000	
Males	.324	-.334	.191	-.144	.153	.325	.025	.400	.027	.237	1.000

The model estimated here is as follows:

Homicide = $\alpha + \beta_1$ (Ln Poverty) + β_2 (Ln Gini) + β_3 (Ln Unemployment) + β_4 (Ln Mobility) + β_5 (Ln Diversity) + β_6 (Ln Single-parent households) + β_7 (Ln Percent urban) + β_8 (Ln Alcohol consumption) + β_9 (Ln Percent males aged 25-54) + ε

Though not an exact replication, this is consistent with most models estimated to examine the relationship between social structure and homicide in the United States. Table 5.2 displays these results as Model 1. Remember that this is a log-log model, and thus the slope estimates are interpreted in terms of percentage changes. The results are discussed below in terms of each of the theories.

Strain

Strain theory suggests that poor economic and living conditions create strain in both individuals and communities. Within individuals, the stress resulting for poor living conditions is expected to lead to aggression and violence. Beyond the individual level, some communities have little control over the poor conditions of their neighborhood due to larger issues such as levels of unemployment and the shift in the nature of available jobs, which are functions of a market economy. Further, poor communities have few resources from which to draw in order to attract attention to their problems from outside the community (such as police and local governments) and to bring to bear on regulating the behavior of their members within the neighborhood itself. Commonly tested elements of strain are poverty, inequality, unemployment, and living space.

Poverty. Poverty is defined here as the proportion of the regional population living below subsistence minimum. This variable is found to be positively and

Table 5.2. Results for homicide victimization rates regressed on strain, social disorganization, and control variables (continues on following page).[a]

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	-1.658	-6.905	-7.690	-7.460	-5.734	-5.669
	(-0.774)	(-2.298)	(-2.915)	(-2.506)	(-1.846)	(-2.055)
	(0.221)	(0.013)	(0.003)	(0.008)	(0.035)	(0.022)
Poverty	.473	1.682	1.584	1.638	1.557	1.212
	(2.623)	(2.861)	(2.754)	(2.825)	(2.633)	(2.205)
	(0.006)	(0.003)	(0.004)	(0.003)	(0.005)	(0.016)
Gini	.531	.622	.413	.740	.684	-.051
	(0.957)	(1.152)	(0.776)	(1.380)	(1.270)	(-0.097)
	(0.171)	(0.127)	(0.221)	(0.086)	(0.104)	(0.923)
Unempl	-.427	-.177	-.189	-.088	-.220	-.135
	(-2.536)	(-1.172)	(-1.263)	(-0.562)	(-1.433)	(-0.978)
	(0.007)	(0.123)	(0.106)	(0.288)	(0.079)	(0.462)
Mobility	.103	.069	-.102	.127	.071	-.005
	(0.577)	(0.386)	(-0.549)	(0.708)	(0.399)	(-0.032)
	(0.283)	(0.351)	(0.293)	(0.241)	(0.346)	(0.488)
Diversity	.104	.119	.058	.128	.082	.112
	(1.512)	(1.744)	(0.800)	(1.907)	(1.119)	(1.807)
	(0.068)	(0.043)	(0.214)	(0.031)	(0.134)	(0.038)
Singles	1.710	1.597	1.312	1.558	1.421	1.259
	(4.638)	(4.380)	(3.899)	(4.332)	(3.696)	(3.664)
	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)
% Urban	-.036	.005	-.035	.029	-.009	4.9×10^{-4}
	(-0.734)	(0.099)	(-0.687)	(0.561)	(-0.172)	(0.011)
	(0.233)	(0.461)	(0.247)	(0.289)	(0.432)	(0.496)
Alcohol	.275	.266	.269	.211	.257	.263
	(5.343)	(5.253)	(5.465)	(3.573)	(5.071)	(5.713)
	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)
M25-54[b]	.421	-.208	—	-.652	-.169	-.554
	(0.648)	(-0.343)		(-1.004)	(-0.281)	(-0.989)
	(0.260)	(0.367)		(0.160)	(0.390)	(0.163)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
M15-29[b]	—	—	1.100 (1.889) (0.032)	—	—	—
Caucasus[b]	—	—	—	-.355 (-1.748) (0.043)	—	—
Chernozem[b]	—	—	—	—	-.275 (-1.364) (0.089)	—
East[b]	—	—	—	—	—	.430 (3.850) (<.001)
Adj. R^2	.555	.562	.570	.596	.568	.636
N[c]	78	78	77	78	78	78

Note. Numbers below each slope coefficient are t-statistics and p-values, respectively.

[a]Model 2 is a reestimation of the original model using fitted values of poverty. Models 3-6 each use the fitted values of poverty.

[b]The "M25-54" represents the proportion of a region's population that is male and between the ages of 25 and 54. "M15-29" is the proportion male and between the ages of 15 and 29. "Caucasus" is a dummy variable coded 1 for regions in the Northern Caucasus Economic Region and 0 otherwise (see Appendix A for a list of regions and the Economic Region of which they are a part). "Chernozem" is a dummy variable coded 1 for regions in the Central Chernozem Economic Region and 0 otherwise. "East" is a dummy variable coded 1 for regions in the Western Siberia, Eastern Siberia, and Fareastern Economic Regions and 0 otherwise.

[c]In model 3, the exclusion of a single influential case (Tyumen, which has a high homicide rate and an inordinately high proportion of young males due to a large number of relatively well-paying jobs in the fossil fuel extraction industry) changed the inference drawn for the young male variable (but not for the other variables). So that the inferences would not be dependent upon one case, Tyumen was taken out of this model, leaving 77 instead of 78 cases.

significantly related to the variation of homicide victimization rates among the Russian regions (b = .473, p = .006).[2] The coefficient suggests that an increase of one percent in the proportion of a region's population living in poverty results in an increase of about one-half of one percent in that region's homicide rate. This result is in line with the literature review in Chapter 2, which reveals that poverty is the most consistent predictor of homicide rates in the numerous studies on this topic.

Unemployment. The level of unemployment within a region likely influences the level of poverty. Beyond the economic impact, more people with fewer legitimate means of spending their time might create a problem of social control within communities (see Chiricos, 1987). Both possibilities lead to a prediction of a positive relationship between unemployment and crime, though empirical studies of this relationship have been inconsistent.

This model produces a result that is the opposite of the one expected. The relationship between the unemployment rate and the variation of homicide in Russia is negative and significant (b = -0.427, p = .007). The slope coefficient suggests that a one percent increase in the unemployment rate in the Russian regions results in a decrease of about one-half of one percent in the homicide victimization rate. Given the theories of both motivation and social control that suggest the opposite effect, this finding may seem counterintuitive. Cantor and Land (1985), however, argue that unemployment may have both a positive *and* a negative relationship with violence, the latter due to an opportunity

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[2]Given the hypotheses for each theory, all p-values reported in the tables and text are for one-tailed tests.

effect. For example, following the logic of Cohen and Felson (1979), a higher rate of unemployment may create increased levels of guardianship over property. Since homicide is often the result of robbery and other similar property-related crimes, Cantor and Land argue that an increase in unemployment may increase guardianship, thereby creating a decrease in property crimes. Since homicide is often the result of robbery and other similar property-related crimes, a decrease in property crimes may thus lead to a decrease in property-related violent crimes. This hypothesis cannot be tested here, but it is one possible explanation of this unexpected finding.

Reconciliation of this unexpected finding is beyond the scope of the current study. Although the alternative models presented in Table 5.2 and discussed below suggest that this finding might not be stable, there are counter hypotheses to strain theory that might predict this result. Whatever the case may be, the finding certainly deserves further attention.

Inequality. Inequality is operationalized here as the Gini coefficient of income inequality. Several theorists suggest that it is not the presence of absolute poverty that creates strain, but that anger and stress occur when one compares him- or herself with others who are better off economically. The results here indicate that inequality is not a significant factor ($p = .171$) in the variation of homicide rates in Russia. Again, this is consistent with literature review in Chapter 2 which showed that the results of tests for the relationship between inequality and homicide rates have been inconsistent at best.

In sum, the results of the test for strain theory are difficult to interpret when taken together. This is due to both unclear theory and data limitations. First, although structural forces may create inequity, as it is discussed in the homicide literature the strain of inequality is an individual-level concept, not a structural one. The data do not exist, however, to test this relationship at the individual level. Similarly, poverty may operate in many ways to influence homicide rates. Again, however, the data do not usually exist to test the entire structure of theories predicting a positive relationship between the two. Thus there are different mechanisms and different levels of analyses involved with inequality and poverty, not to mention the information that aggregated measures of each will share. Thus it might be better to interpret the results of each not in terms of a general concept called strain but more specifically to only poverty or only inequality, however they may operate.

In any event, the findings here suggest that whatever the mechanism may be, there is a significant relationship in Russia between the level of poverty and the variation of homicide rates. This is the expected result, given the consistent positive and significant findings of the effects of poverty on homicide in the West. The results for inequality, however, are non-significant. Given the inconsistent findings for this relationship in the United States, this was also the expected outcome. What is unexpected, however, is the finding of a negative and significant relationship between unemployment and homicide. Two potential hypotheses for this finding are provided above, but the model selection process does not show this to be a consistent finding.

Social disorganization

Social disorganization theorists argue that community factors may mediate larger structural elements in the production of crime. When community cohesiveness is broken down, however, the community's ability to regulate the behavior of its members decreases. The commonly tested elements of disorganization theory are poverty, mobility, ethnic heterogeneity, family instability, and density. The results of poverty were already discussed above; the findings for the other components of disorganization are described below.

Mobility. The influx of migrants into a region may result in a decrease in community cohesiveness. These newcomers have been cut off from their friends and relatives in their former place of residence and have yet to forge strong bonds with their new neighbors. It is also likely that they have moved for economic reasons, and thus may have low or no incomes and move into areas with like others. It is thus expected that higher rates of mobility will generate higher rates of violence due to a lack of social control that results from weak bonds within the community. This is found not to be the case in Russia, where there seems to be no relationship ($p = .283$) between the mobility rate and the variation of homicide rates.

In terms of social disorganization theory, there is at least one Russia-specific reason why mobility might not have the expected effect on homicide rates. Given the forced migrations of ethnic groups during the Soviet era, some of the current migration may be of non-ethnic Russians back to their native areas. Arriving into a community of

like others may create more cohesion, not less, thereby negating the expected positive effect of mobility on homicide.

Heterogeneity. Ethnic heterogeneity is also expected to decrease social control, since communities that are culturally diverse may find it difficult to create shared understandings. Lieberson's (1969) measure of population diversity is employed here to measure ethnic heterogeneity and the variable is found to have a non-significant ($p = .068$) relationship with the variation of homicide rates in Russia.

There are a few reasons that this relationship may deserve further attention. Most importantly, the only available data for this measure are from the last census, which was in 1989 (the next census in Russia is scheduled for 2002). Without the rigid controls of the Soviet government, it is now easier for Russians to move from place to place, and migration has thus increased. This migration has likely changed the ethnic composition of many regions. The changing ethnic composition in certain areas as a result of this migration, together with increased levels of poverty and thus a sharpened struggle for scarce resources, may create ethnic tension where before it was latent. Further, though not significant at the .05 level, the diversity measure has a significance value of $p < .10$ in some of the models estimated. Thus it would be prudent to employ more reliable data before making any strong inferences about this relationship.

Density. The population density component of social disorganization is expected to create unstable ties due to the difficulty of recognizing who does and does not belong in the community when so many people live in such a small geographic area. If we are

unsure who our neighbors are, we are less likely to interact with people we see and more likely to retreat into the privacy our home without creating ties to the community.

Since the level of aggregation is so high in this study, it makes more sense to speak in terms of urbanization than population density, and thus this concept is operationalized as the proportion of a region's population living in cities greater than 100,000 population. The results suggest that in Russia there is no relationship between the proportion of urban dwellers in a region and its homicide victimization rate ($p = .233$). Given the findings for previous relationships, one potential reason for the lack of an effect may be that the problems of urbanization are offset by the reduction of poverty in regions with higher proportions of the population living in urban areas.

Family disruption. The measure of family disruption in this study is the proportion of a region's population that is single and living with at least one child under the age of 18. This measure is not simply one of supervision of adolescents within the community, but a more general measure of social cohesion. Single parents, both male and female, tend to have fewer community ties than married parents. Thus single parents have both fewer familial attachments and fewer community attachments, and social disorganization theory argues that as local ties are weakened, it becomes more difficult for the community to control the behavior of its members.

The results in Table 5.2 show that the proportion of single-parent households is positively and significantly related to the variation of homicide victimization rates ($b = 1.710$, $p < .001$). The estimated slope coefficient suggests that a one-percent increase in the proportion of single-parent households in a region increases its homicide rate by

1.7%. Given the consistent results of this concept of social disorganization as a significant predictor of offending rates in the United States, this is an expected finding.

Overall, social disorganization theory receives partial support in this study. First, immigration, ethnic diversity, and urbanization are found to have no effects on homicide rates, though I argue that there are specific reasons for believing that more reliable data should be employed to test the heterogeneity hypothesis before drawing strong conclusions. Second, both poverty and single-parent households are found to positively and significantly influence the variation of homicide rates in the country.

Controls

Two variables were added to the general model as controls, the proportion of a region's population that is male and between the ages of 25 and 54 and a measure of the level of alcohol consumption in the region.

Proportion of males aged 25-54. The analysis in Chapter 4 shows that both homicide victims and offenders tend to be older in Russia than in the United States. In particular, males in the 25-34, 35-44, and 45-54 age groups have much higher homicide victimization rates than other sex and age categories in the country. In order to control for this, a variable is included in the model that measures the proportion of this sex and age cohort in a region's population. Though the finding may be a result of the small range of variation on this measure, the results suggest that there is no effect of this control variable on the level of homicide rates in a region ($p = .260$).

Alcohol consumption. For reasons discussed at length in Chapter 3, alcohol consumption in this study is measured as the rate per 100,000 population of deaths due to alcohol poisoning in each region. Controlling for all of the other structural variables in the model, the results suggest that as the level of alcohol consumption in a region increases so does its homicide rate ($b = .275$, $p < .001$). The estimated slope coefficient shows that a one-percent increase in the level of alcohol consumption increases the homicide rate by more than one-quarter of one percent.

Given both Russia's recent and more extended history of struggles with alcohol consumption, this finding is not a surprise. In May of 1985, the Central Committee of the Communist Party, alarmed by the increasing social problems resulting from very high levels of alcohol consumption in the country, passed legislation aimed at curtailing State production and distribution of alcoholic beverages; the campaign began on June 1, 1985. Over the next two years, both sales and consumption dropped by nearly one-third, and several alcohol-related causes of death (such as cirrhosis of the liver, alcohol poisoning, and blood alcohol positive violent deaths) also fell sharply (Nemtsov, 1998).

The campaign was short-lived, however, and measures of consumption began to rise again in 1987, when a major aspect of the legislation was canceled. At the beginning of 1988, State sales of alcohol increased, and in October of that year enforcement of the remaining portion of the anti-alcohol legislation began to decline rapidly. This is reflected in the homicide rate, which declined rapidly in 1986, remained low in 1987, and began to rise again in 1988.

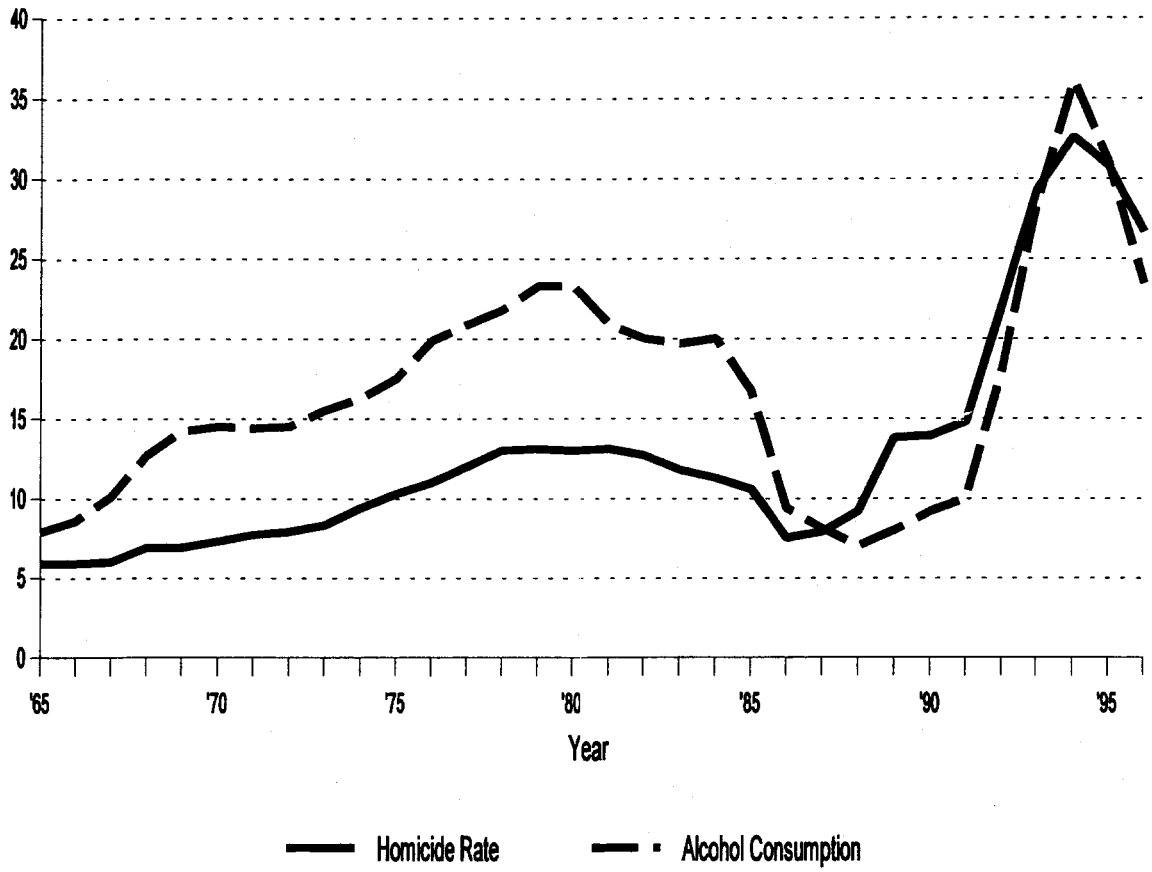
The role of the anti-alcohol campaign in the decrease of homicide rates during this period is hypothetical. However, given the documentation of the high prevalence of alcohol in both offenders and victims of homicide, as well as the traditionally high levels of alcohol consumption in Russia, this seems a plausible explanation. For example, crime data reveal that of the 24,350 persons arrested for homicide in Russia in 1995, 17,891 (or nearly 75%) were under the influence of alcohol (Ministry of the Interior of the Russian Federation, 1996).

Further, preliminary research on the connection between aggregate levels of alcohol consumption and homicide rates in Russia also hints at a positive relationship (see Nemtsov, 1998). Figure 5.5 below, for example, shows the level of alcohol consumption (measured, as discussed in Chapter 3, as the number of deaths per 100,000 population due to alcohol poisoning) and the homicide rate in Russia from 1965 to 1996. The two trends follow each other closely during this period. The evidence of a relationship here, together with preliminary findings from other studies, suggests a need for further research on the relationship between alcohol consumption and homicide in Russia.

Alternative models

This section describes alternative models to the one just discussed. First, alternative measures for two of the variables above are then included in the model to test for any changes. Second, dummy variables are included in the model in order to see if the wide disparity in homicide rates–especially the very low rates in the Central Chernozem

Figure 5.5. Alcohol consumption and homicide rates in Russia, 1965-1996.



and the Northern Caucasus and the very high rates in the regions beyond the Urals–is accounted for by the structural variables in the model or if these differences remain significant even when these variables are controlled.

Measurement error and the use of an instrumental variable. Measurement error in an independent variable will create both biased and inconsistent estimates because it violates the assumption that the regressors are independent of the error term. For reasons discussed at length in the "Errors-in-variable" section in Chapter 3, I am especially concerned about measurement error in the independent variable poverty. One

way to overcome this problem and to obtain consistent estimates of the regression parameters is through the use of an instrumental variable.

As discussed in Chapter 3, regional infant mortality rate is employed as an instrumental variable for poverty and a two-stage least squares (2SLS) procedure is used to estimate the model.[3] In the first stage, the instrumental variable is employed to estimate the level of poverty in each region, thereby making the correlation between poverty and the error term zero. The natural log is taken of these fitted values for poverty, and then the second stage is simply a reestimation of the original model using these fitted values. The results of this reestimated model are shown as Model 2 in Table 5.2.

For the most part, the inferences drawn from the original model hold here, but there are two changes in this reestimation that should be noted. First, the estimated parameters for poverty have increased, but the slope more substantially so, resulting in an increase of the t-statistic for poverty. The slope now indicates that a one-percent increase in the level of poverty leads to a one and two-thirds percent increase in homicide victimization rates (b = 1.682, p = .003), controlling for the other variables in the model. Though the mechanisms through which poverty are working to influence homicide rates are not clear, this result presents a stronger case for a relationship between the two.

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[3]Another possible procedure with 2SLS is to estimate the independent variable with suspected measurement error by regressing it on the other independent variables in the model. However, this is likely to lead to problems with multicollinearity in the second stage of model estimation, which is the case here, as several variance inflation factors in the second stage were very high. This method is thus not employed here.

The second change is that the unemployment variable is no longer a significant predictor of homicide rates (p = .123). One potential reason for this is multicollinearity. Though their effects on homicide are in the opposite directions, unemployment and the original measure of poverty are positively correlated at nearly .6. Using the estimated values of poverty, there is a very low correlation between poverty and unemployment (r = .068) and the variance inflation factors for each in the multivariate model have decreased substantially.

Young males. The analysis in Chapter 4 reveals that males aged 25 to 54 have the highest homicide victimization rates in Russia, and that arrested homicide offenders in the country also tend to be older than their American counterparts. A variable representing the proportion of males aged 25 to 54 in each region was included in the original model above in order to control for this. I decided to create a measure of males aged 15 to 29, as well, since this is often tested in models estimated in the United States. This model contains a highly influential case, Tyumen. This oblast has an extremely high proportion of males in this age category (27.3%)–likely due to the high number of relatively well paying jobs in the mining and drilling industries–and a very high homicide rate (over 80 per 100,000). The inclusion of this one case leads to a different inference being drawn for the young male variable (though its inclusion or exclusion does not influence the rest of the model). I therefore excluded Tyumen from the analysis so that the inference about young males would not depend so heavily on this one case. Model 3 in Table 5.2 shows the results of this estimation. The results suggest that the proportion of young males in a region may be positively related to its homicide rate (b = 1.10, p =

.032). However, when Models 4-6 were estimated with this age category included (not shown in the Table above), the p-value for young males was not below the .05 level. Still, however, it is low enough to warrant consideration in future research.

Living space. Centerwall (1984, 1995) has employed living space (in his work, "household crowding") as a measure of poverty (e.g., the inability to purchase more living space). In Russia, however, the housing market is more a function of supply than demand. In other words, there have been severe housing shortages in many parts of the country, especially in large urban areas, for decades. This variable might not only represent economic poverty, however, but perhaps another type of stress related to possessing little or no space to one's own and living in constant contact with others. A case might be made that this is especially true in Russia, where it is common in most Russian cities for two or more extended families to live in an apartment originally meant for only one family. I tested this alternative measure of strain by adding it to the original model estimated in Table 5.2 (results are not shown here). Though in the expected negative direction, the outcome is non-significant ($b = -0.715$, $p = .094$). When retaining this variable and removing poverty, however, there is a negative and significant relationship ($b = -1.308$, $p = .010$) between the amount of living space per person in a region and its homicide rate. Thus it does seem as if the amount of living space per person is acting as a proxy measure for the level of poverty.

Regional differences. Due to large differences in the homicide rates of some economic regions (see Table 4.4 and Figure 4.7 in Chapter 4), I examined three sets of potential regional differences.

First, not only does the *Northern Caucasus* economic region exhibit a substantially lower homicide rate (16.8 per 100,000) than most other economic regions, but much of the region is marked by a different cultural composition, as well. Most obvious is the high proportion of non-ethnic Russian Muslims in the area. Given this ethnic and religious composition, one would expect rates of violence to be lower in this region. I therefore included a dummy variable in the model to compare the Northern Caucasus region against the rest of the country. The results are shown in Model 4 in Table 5.2. The outcome suggests that there may be a difference between this area and the rest of the country in terms of homicide rates when the other variables are taken into account ($b = -.355$, $p = .043$). Although the levels of poverty of the regions in this area are higher than average, alcohol consumption among the Muslims is much lower and there are lower proportions of single-parent households in these regions. This group is also less mobile, and they likely have tighter bonds due to higher religious involvement. This is a good example of the interrelated nature of culture and structure, since culture differences seem to manifest themselves in structural differences, as well. So, although the homicide rates in the region are much lower than in the rest of the country, the variables included in this model account for this difference.

Second, the *Central Chernozem* economic region, which is located south of Moscow and northwest of the Northern Caucasus, has the lowest homicide rate (14.5 per 100,000) of all the economic regions in Russia. I included a dummy variable representing this region in the model in order to see if this difference is significant. The results are shown in Model 5 in Table 5.2. It appears as if the structural differences in the

Chernozem may account for the lower levels of homicide rates there, since the estimation results show a non-significant relationship (p = .089) between this economic region and the rest of Russia when the structural variables are controlled. The p-value is relatively low, but there are very few administrative regions within this are on which to make a comparison, thus strong conclusions are not warranted. Given the structural characteristics of this economic region, however, a non-significant finding would not be unexpected. This is a mostly rural agricultural area that is overwhelmingly ethnic Russian. The levels of unemployment and poverty are lower than average, as is the proportion of single-parent households in the region. Thus it appears that the low homicide rates of the regions in this area are likely accounted for via the structural variables in the model.

Finally, the three economic regions east of the Urals–*Western Siberia*, *Eastern Siberia*, and the *Fareast*–all have higher homicide rates than the rest of the country (see Table 4.4 and Figure 4.7), especially Eastern Siberia, where the rate is 54.2 per 100,000. The final column in Table 5.2 above shows a model that includes a dummy variable for the regions in these three areas. With the exception of levels of alcohol consumption, which are much higher than average in these eastern regions, these areas are not remarkable in their values on the other structural variables. This is evident in the results of this model, which show that even when controlling for the structural variables, these eastern regions still have homicide rates that are significantly higher than the rest of the country. One possible explanation is that Siberia has long been thought of as a frontier in Russia, as an area where there is greater freedom from the control of the state than in

other parts of the country. This general lack of formal control–along the nature of the relationships this might create–could partially explain the higher homicide rates in this area. Whatever the mechanism may be, however, this finding certainly deserves further research attention.

In sum, this model selection process is helpful in understanding the effects of social structure on the variation of homicide rates in Russia. First, there is reason to believe that there might be considerable error in measuring poverty in Russia, which would create biased and inconsistent estimates. As a remedial measure, I employed infant mortality as an instrumental variable for poverty in a 2-stage least squares procedure. One result is that the unemployment variable is no longer significant predictor of homicide rates. A second result is that the slope coefficient for poverty increases dramatically and its t-statistic gets larger. The new estimate indicates that a one percent increase in the proportion of the regional population living below the poverty line leads to an increase in the homicide rate of more than one and one-half percent.

Second, instead of using the proportion of males aged 25 to 54 as a control, I substituted the proportion of males in the regional population that are between the ages of 15 and 29, a popular control variable in studies conducted in the United States. The results for this measure are not clear, though it appears that it may have an impact on homicide rates. I also included the amount of living space per person as an alternative indicator of strain. Simply adding it to the model resulted in non-significant findings,

while substituting it for poverty results in a positive and significant impact on homicide rates, suggesting that this variable may be measuring the level of poverty within a region.

Third, I used dummy variables in order to examine the large variation in the homicide rates between western and eastern Russia. In the cases of the Northern Caucasus and Central Chernozem Economic Regions, the substantially lower rates seem to be accounted for by their structural characteristics, though it appears that Muslim culture in the Northern Caucasus may play a role in the lower homicide rates in the region. This is not the case for the extremely high homicide rates in the three economic regions east of the Urals, however. Even after controlling for the effects of the structural variables, the homicide rates in the regions of Western Siberia, Eastern Siberia, and the Fareast remain significantly higher than in the rest of the country, a finding that is deserving of further scrutiny.

Fourth, using Model 6 as the standard, I systematically excluded certain types of regions from the model in order to test their impact on the results. I first took out the two Federal Cities (Moscow and St. Petersburg) that are officially treated as "regions." Their exclusion had no impact on the results. There were also a few cases (Voronezh, Kemerov, Tyumen, and the Jewish Autonomous Oblast) with dfBetas approaching the critical range.

Finally, I excluded the eight regions in which fewer than 25% of the population live in cities larger than 100,000.[4] In a separate model, I also excluded the 17 regions

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[4]These cases are Leningrad Oblast, Kalmykia, the Altai Republic, Tyva, Sakha, the Jewish Autonomous Oblast, the Chukot Autonomous Okrug, and the Amur Oblast

with populations less than one million people.[5] In both cases, there were no changes in the inferences drawn from the model.

Summary and conclusions

This chapter has used a variety of statistical techniques in order to answer the second main research question of this project and to evaluate the theoretical perspectives laid out in Chapter 2. The results provide partial support for selected hypotheses, as well as inviting further questions.

First, the measure of poverty–the proportion of a region's population living below subsistence minimum–is consistently positive and significant across all the models. An alternative measure, the amount of living space per person, also has a similar result. In general, although the exact mechanisms through which poverty operates are not explicit, the findings suggest that as poverty increases so does the homicide rate. Other economic measures, such as unemployment and the Gini coefficient of income inequality, fail to produce consistent significant results.

Second, the results provide partial support for social disorganization theory. Measures of urbanization and mobility show no influence on homicide rates. The measure of diversity employed here also produces only chance findings. However, given the age of the data and t-statistics approaching significant values in some models, it may be appropriate to test this relationship again with more reliable data before drawing strong conclusions about this hypothesis. The disorganization theory does receive some support,

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[5]These cases are Karelia, Novgorod, Pskov, Kostroma, Orlov, the Marii El Republic, Mordovia, Kalmykia, Khakasia, Tyva, the Jewish Autonomous Oblast, the Chukot Autonomous Okrug, Kamchatka, Magadan, Sakhalin, and the Kaliningrad Oblast.

however, in terms of the poverty and family disruption variables. The former has already been discussed. The latter is not simply a measure of the health of families, but may also be seen as representing a more general level of social cohesion, as well. The family disruption variable is consistently positive and significant at the $p < .001$ level across all models.

One of the control variables, the level of alcohol consumption in the region, is also positive and significant at the $p < .001$ level across all the models. Alcohol consumption and related health and social problems is a long-standing issue in Russia. This evidence of its influence on the variation of homicide rates increases this concern.

Models were also estimated that examined the large variation in homicide rates across the country that might not be attributable to the structural factors that are the focus of this study. The findings suggest that the low rates in the Northern Caucasus and the Central Chernozem appear to be the result of their structural characteristics, though in the Northern Caucasus the Muslim culture appears to manifest itself in a few of these structural measures. The homicide rates in Western Siberia, Eastern Siberia, and the Fareast, however, remain significantly higher than in the rest of the country even after controlling for their structural attributes.

These results of the influence of social structure on homicide rates in Russia are obviously of inherent value by themselves. This value increases, however, with the ability to compare them to results of similar studies in the United States. The next chapter does this both specifically–by employing comparable measures to construct a similar model for U.S. states and comparing the results with those from Russia–and more

generally, by briefly discussing the findings from Russia in terms of the literature review in Chapter 2.

Chapter 6:

Comparison of findings from Russia and the United States

The final research question posed in Chapter 1 is *How do the findings from Russia compare to those from similar models employing data from the United States?* In order to answer this question, this chapter compares the findings in two ways. In the first section of this chapter, a comparable model is estimated using data from the United States and specific comparisons are made between the Russian and U.S. results. In the second section, the Russian findings are compared to the results from the many previous studies conducted on social structure and homicide in the United States. This is done by referencing the literature review in Chapter 2 and the tabular summary of this review in Appendix B.

Comparison of Russian findings to results from a similar model estimated with United States data

This section discusses the results when comparable models are estimated with Russian and U.S. data. Two brief subsections reference the data and the model selection processes, and then direct comparisons are made between the two models in terms of the strain, social disorganization, and control variables.

Data

The Russian data are discussed at length in Chapter 3. The data from the United States employed to estimate the models below are defined in Appendix E; descriptive statistics for the American data are contained in that appendix, as well.

Model estimation

Since direct comparisons are to be made between the results of the models estimated in Russia and the United States, I constructed a model in the U.S. that was as

close as possible to a replication of the final model selected to fit the Russian data. Thus model estimation proceeded nearly exactly the same for the American as for the Russian data. The natural logarithm was taken for each variable. A preliminary model was then estimated to look for obvious violations of the OLS assumptions. Scatterplots of the logged independent variable with each of the dependent variables revealed no obvious departures from linearity. An examination of the variance inflation factors shows that multicollinearity does not appear to be an issue, though it is a little higher, on average, than with the Russian data. A plot of the disturbances against the fitted Y values reveals no obvious heteroscedasticity. Further, the distribution of the residuals and a normal probability plot suggest that the disturbances do not depart substantially from normality. Finally, an examination of the dfBetas and the distribution of the residuals and studentized residuals suggests that there may be a few potentially influential cases. However, removing these cases alone and in combination from the final model did not make a difference in the inferences drawn from the model.

Table 6.1 displays the correlation matrix. The bivariate correlations of each of the independent variables with the homicide victimization rate are in the expected direction. Ethnic heterogeneity, inequality, female-headed households, household crowding, poverty, urbanization, and unemployment are all positively correlated with homicide victimization rates at higher than .45, with the inequality and heterogeneity measures correlated with homicide at .714 and .811, respectively. Table 6.2 displays the results of

Table 6.1. Correlation matrix of logarithmically transformed variables (n=50).

	Homicide	Poverty	Gini	Unemp	Space	Mobility	Diversity	Single	Urban	Alcohol	Males
Homicide	1.000										
Poverty	.523	1.000									
Gini	.714	.709	1.000								
Unemp	.466	.382	.515	1.000							
Space	.548	.375	.330	.489	1.000						
Mobility	.136	-.039	-.134	-.112	.178	1.000					
Diversity	.811	.364	.539	.388	.716	.035	1.000				
Single	.633	.445	.569	.451	.330	-.155	.484	1.000			
Urban	.479	-.006	.306	.084	.454	.105	.597	.200	1.000		
Alcohol	.084	.179	-.083	.237	.353	.316	.148	.156	.010	1.000	
Males	.191	.213	.030	-.052	.367	.160	.181	.209	.077	.682	1.000

the final model from the United States alongside those from Russia (taken from Model 6 in Table 5.2).

Comparison of results

Although comparable in many ways, there are inherent differences in the data–such as the units of analysis and small differences in types of measures–that make direct comparisons difficult. Similarly, the null hypotheses in each model, that the slope coefficient for each variable is zero (i.e., H_0: $\beta = 0$), does not necessarily tell us whether the slope for a particular variable in Russia is the same as its counterpart in the United States (i.e., H_0: $\beta_{U.S.} = \beta_{Russia}$). Again, differences in the data sets make a test for differences in slopes questionable. For these reasons, the comparison of the findings that follows is very general in nature.

Strain. The social strain variables represented here are poverty, unemployment, and inequality. The findings for the effects of poverty on homicide victimization rates in both countries are similar. Both are positive, significantly different from zero, and of similar strength. In both countries, for example, and increase of one percent in the proportion of the population living below the poverty line leads to an increase of around one percent in the homicide rate.

The findings for unemployment are not as clear. In Russia, the results of model estimation show a negative but non-significant effect of unemployment on homicide rates. In the United States, however, unemployment has a positive and significant effect

Table 6.2. Results for homicide victimization rates regressed on strain, social disorganization, and control variables in Russia and the United States.

Variable	Russia	United States
Constant	-5.669 (.022)	-4.313 (.036)
Poverty	1.212 (.016)	1.005 (.003)
Unemployment	-.135 (.166)	.411 (.022)
Gini	-.051 (.462)	1.743 (.059)
Mobility	-.005 (.488)	.875 (<.001)
Diversity	.112 (.038)	.383 (< .001)
Singles	1.259 (< .001)	.625 (.027)
% Urban	4.9×10^{-4} (.496)	.062 (.072)
Alcohol	.263 (< .001)	-.092 (.224)
Middle / Young Males[a]	-.554 (.163)	-.130 (.420)
East / South[b]	.430 (< .001)	.142 (.094)
R^2	.636	.878
N	78	50

Note. Numbers in parentheses are p-values (one-tailed tests).

[a]In Russia, this variable represents the proportion of males aged 25 to 54. In the United States, it represents the proportion of males aged 15 to 29.

[b]In Russia, this variable represents all regions east of the Ural mountains. In the United States, it represents states in the Census South.

on homicide rates, with a one percent increase in unemployment associated with a nearly half-percent increase in the homicide rate.

The results for inequality are difficult to interpret. In Russia, the effect of the Gini coefficient on homicide rates is negative, though very small, and non-significant ($p = .462$).[1] In the United States, the slope is positive and nearly significant ($p = .059$). A p-value of this size does not warrant strong conclusions about the influence of inequality on homicide in the U.S. A strict interpretation would suggest null effects in both countries, though this is difficult to state with conviction given these estimates.

Overall, the influence of the social strain variables on homicide rates are relatively similar across both Russia and the United States. For example, in the case of poverty, both are positive, significant, and of similar magnitudes, and for inequality, both are non-significant. The one exception is unemployment, which is negative and non-significant in Russia but positive and significant in the United States.

Social disorganization. In general, the social disorganization variables show similar effects on homicide rates in Russia and the United States. First, poverty is also an element of social disorganization, and the similarities of the results of this variable was just discussed.

Second, the results are also similar in both countries for ethnic heterogeneity, family disruption, and urbanization. In Russia, the heterogeneity variable is positive ($b = .112$), with a p-value of .038. In the United States, the relationship between heterogeneity and homicide rates is positive and significant ($b = .383$, $p < .001$), with a one percent

[1]The p-values reported in the tables and text are for one-tailed tests.

increase in the diversity variable is associated with an increase of a little over one-third of one percent in the homicide rate. The influence of family disruption on homicide rates in Russia is positive and significant, with a one percent increase in single-parent households associated with a one and one-quarter percent increase in homicide rates ($b = 1.259$, $p < .001$). In the United States, an increase in female-headed households is also associated with an increase in homicide rates ($b = .625$, $p = .027$). The findings for urbanization are also similar in both countries to the extent that both show positive, though non-significant effects ($b = .0005$ and $p = .496$ in Russia, $b = .062$, $p = .072$ in the United States), though the p-value for this relationship in the United States restricts any strong conclusions.

The one instance where results are different in Russia and the United States for an element of social disorganization is mobility. In Russia, the influence of mobility on homicide rates appears to be small, negative, and non-significant. In the United States, on the other hand, a one percent increase in the mobility rate is associated with a nearly one percent increase in homicide rates ($b = .875$, $p < .001$).

In sum, the findings for the effects of social disorganization on homicide rates are very similar in Russia and the United States. For poverty, heterogeneity, and family disruption, the effects are all positive, relatively similar in magnitude, and significant (at the .05 level) or very nearly so. In both Russia and the U.S., the proportion of a state's residents living in cities larger than 100,000 population does not appear to have an influence on homicide rates. Finally, the one exception is mobility, which does not appear to be associated with homicide in Russia, but does show a positive and significant relationship with homicide rates in the United States.

Controls. The operationalization and measures of the control variables are different in Russia than in the United States, thus they are mentioned only very briefly here. First, alcohol consumption in Russia appears to be positively and significantly related to homicide rates ($b = .263$, $p < .001$), while in the United States the effect is negative and non-significant. In Russia, males age 25-54 have the highest homicide victimization rates, whereas in the United States, males age 15-29 have the highest rates. Including as a control variable the proportion of men in these age categories in each country, respectively, showed negative and non-significant effects on homicide rates. Finally, the inclusion of regional dummy variables for the section of each country showing the highest homicide rates reveals non-significant results for the South dummy in the United States, but positive and significant differences between the regions east of the Urals and the rest of the Russia.

In sum, a comparison of the results when similar models are estimated in Russia and the United States yields consistent findings across the two nations. Two of the three strain variables show analogous results and four of the five social disorganization variables also show similar results. This is one indication that, despite the unique events in Russia during the last decade and despite the obvious cultural differences between the two nations, the effects of social structure on homicide appear to operate in comparable ways in Russia and the United States.

Comparison of Russian results with previous findings from similar studies in the United States

This section compares the Russian results with the overall findings of the many studies done to date on social structure and violence in the West. The findings from this past empirical work are discussed at length in Chapter 2, and Appendix B summarizes the results from these studies in tabular form. Given small differences both among the previous studies themselves and between them and the current examination of Russia, this comparison is brief and references only the most basic patterns.

Strain

The positive relationship between poverty and violence is one of the most consistent findings in the Western literature on social structure and violence. This is obvious from a quick look at the table in Appendix B. These consistent results have lead Sampson and Lauritsen (1990) to conclude that "almost without exception, studies of violence find a positive and usually large correlation between some measure of poverty and violence–especially homicide" (p. 63). The outcome of this preliminary study of social structure and violence in Russia suggests that a similar positive and significant relationship exists between poverty and homicide victimization rates in that country. Table 5.2 in Chapter 5 shows that the association between these two is significant at the .05 level in two and at the .01 level in four of the six models estimated, and overall it appears that a one percent increase in the proportion of the regional population living below the poverty line in Russia is associated with a greater than one percent increase in homicide victimization rates.

Studies by Messner (1982) and Blau and Blau (1982) were largely responsible for bringing the issue of inequality and homicide to the forefront of research on social structure and violence. The review in Chapter 2, however, shows that the findings for a relationship between inequality and homicide rates in the United States have not been as consistent as those for poverty. Again, a brief examination of the table in Appendix B makes this clear. Thus the finding of no relationship between inequality and homicide victimization rates in Russia found here across all six models is no surprise, and is consistent with what one would expect given the results from studies in the United States.

Social disorganization

Social disorganization theory suggests that crime is the result of a breakdown in social bonds that result from a lack of community organization. Following Durkheim (1933), early American theorists suggested that (1) interpersonal relationships are weakened with the increase in a community's size and density (Wirth, 1938), (2) different ethnic groups living in close proximity to each other will also result in overall disorganization because the variation in cultural values make it difficult to create a shared understanding of community issues (Sellin, 1938), and (3) social integration and social control are further disrupted by the economic deprivation and transient nature that is often characteristic of these communities (Shaw and McKay, 1942).

Since the early 1980s, the structural elements of social disorganization have become an integral part of models examining social structure and homicide in the United States. The findings relating each of these factors to homicide rates have been fairly consistent over time, and the Russian results show many similarities with these findings.

First, the relationship between poverty and homicide rates in each country has already been discussed. Second, family disruption has repeatedly been found to be associated with rates of violence in studies conducted in the United States. In this study of Russia, family disruption is significant at the .001 level in each of the six models, with the slope coefficients suggesting that a one percent increase in single-parent households is associated with greater than one percent increase in homicide rates.

Third, the heterogeneity element is usually operationalized in the United States as the proportion of the population that is African-American, and this measure is consistently found to have an impact on the homicide rate. In this study, we see that the measure of heterogeneity displays positive and significant effects on homicide rates in Russia. Fourth, tests for the relationship between population density and rates of violence have consistently shown null effects in the United States. The findings are the same in Russia, with non-significant results across all six models.

Finally, there have been a fewer number of studies that have examined the relationship between residential mobility and violence, though some support has been shown for this hypothesis in several of them. In Russia, however, the models estimated here consistently provide null findings for this relationship. A concept such as this, however, may demand a certain threshold before the influence is initiated, and in Russia the level of mobility among the population is still so low that this has yet to show an impact.

Summary and conclusions

In sum, although there are a few small differences between Russia and the United States on selected variables, the overall patterns for the effects of social structure on homicide rates between the two countries are quite similar. The findings for poverty and inequality are generally the same in both Russia and the United States. The results in both nations concerning social disorganization and homicide are also very similar. So, even though there are some minor differences, the influence of social structure on violence rates do show similar patterns across the countries, despite the wide cultural differences between the two countries and despite Russia's unique contemporary experience. As suggested in Chapter 1, theories gain considerable explanatory power when they provide consistent empirical results across varying circumstances. Thus the preliminary results from this study seem to be a strong indication that social structure does play an important role in the level of violence, despite any cultural differences that may exist.

Some differences are to be expected, however. These differences may be empirical, resulting from the inability to accurately measure the theoretical elements in both countries or from measures that simply are not comparable across countries. We might also expect differences in terms of theory, as well. For example, Russia and the United States are vastly different cultures, and they also exhibit wide different social, political, and economic histories. Further, Russia's contemporary experience is not only very different from the United States', but is unique in the world. For example, the data for this study are from the mid-1990s, during which time Russia was in the midst of

profound changes that not only negatively influenced many of the theoretical concepts employed in this study, but created some of the bleakest times the country has ever faced. On the other hand, the United States was experiencing long-running economic success at this time, which likely positively influenced many of the theoretical concepts used here. However, a general comparison of Table 3.2 in Chapter 3 and Table F.2 in Appendix E shows levels of poverty, unemployment, mobility, family disruption, and alcohol consumption–all of which are found to be significantly related to homicide rates in at least one of the two countries–that are lower in the United States, where homicide rates are lower, and much higher in Russia, where homicide rates are higher. Thus, if we accept as valid the models estimated here, they might be expected to explain the large differences in homicide rates between Russia and the United States in terms of the variation on these social structural factors. A more detailed discussion of these potential sources of disparity in the model, as well as the similarities displayed here, is contained in the Chapter 7.

Chapter 7:

Summary and conclusions

This study has examined social structure and homicide in Russia. The dissolution of the Soviet Union and the shift toward rule of law and a free market economy in Russia have increased the availability and validity of demographic, economic, mortality, and crime data that before were largely inaccessible. In this study, these newly available data were employed in order to describe the temporal, demographic, and spatial variation of homicide rates among the 89 Russian regions. Further, structural models developed to fit patterns of homicide in the United States are estimated with these data in order to evaluate the cross-sectional effects of these factors on the variation of homicide rates among Russia regions. This concluding chapter first surveys the results of the analyses, then reviews the potential limitations of this study, then ends with a description of the empirical and theoretical implications of this study.

Survey of results

This section highlights the major findings of this study in reference to the three major research questions posed in Chapter 1. It begins with a brief overview of the Russian data employed for this project.

The data

Until the last decade, much of the data used here were kept secret by the Soviet government. Crime statistics were sometimes falsified and repressed and mortality data that might paint the country in a negative light–such as statistics on homicide and infant mortality–were not made public. As the country moves toward a more transparent government and the rule of law, however, the availability and validity of these data are increasing. I have taken advantage of this situation by employing governmental data on

crime, demography, the economy, and health in order to answer the three main questions of this research. The data employed here are drawn from official records–such as the State Committee on Statistics, the Ministry of Health, and the Ministry of the Interior–and are described in detail in Chapter 3.

Demographic, temporal, and spatial patterns

The purpose of this chapter was to answer the first research question posed in Chapter 1: *How do Russian homicide rates vary in terms of demographic groups, time, and space*?

The analysis of demographic variation presents unexpected findings in terms of the age distribution of homicide victims and offenders. The evidence suggests that both homicide offenders and victims in Russia are markedly older than their counterparts in the United States. Those most at risk of homicide victimization, for example, are in the 35-44 and 45-54 age groups, a dramatic difference from what we normally find in the U.S. Further, this pattern is exaggerated for females, with those 65 and older more at risk of becoming victims than women between the ages of 25 and 34, which is the most victimized female age group in the United States.

The temporal analysis reveals two general trends in the homicide victimization rate from 1965 to 1988. The end of the first era–which encompasses the brief years of the anti-alcohol campaign in the mid-1980s–and the transition years of the 1990s produced dramatic movements in the homicide rate. This section of the chapter also examined differences over time in homicide rates by age and sex revealing three distinct patterns

based upon age: one for infants less than one year old, one for those in the 1-4 and 5-14 age groups, and one for all the age groups above 15 years old.

Finally, the description of the spatial variation of homicide rates in Russia reveals a distinct pattern of ascending rates from west to east. It also shows that more than 95% of the Russian regions have homicide victimization rates higher than the overall U.S. rate in 1995, and that several *entire regions* have rates greater than those found in many large American *cities*, such as Detroit, Houston, and Washington, D.C., that traditionally have the highest rates in the U.S. Further, even though homicide rates are elevated throughout Russia, the discussion reveals that the rates are widely distributed and that they vary considerably from region to region. The potential structural sources of this regional variation was the topic of Chapter 5.

Model estimation

The focus of chapter 5 was to answer the second research question posed at the beginning of this dissertation: *Which structural factors commonly tested in the United States partially explain the variation of homicide rates among Russian regions*? The chapter briefly reviewed the data and methodology of this project and then described the results of the model-building process conducted in order to partially explain the variation of homicide victimization rates in Russia in terms of the social structure of the regions. The results provide partial support for selected hypotheses, but also invite further questions to be explored.

First, the measure of poverty–the proportion of a region's population living below subsistence minimum–is consistently positive and significant across all the models. An

alternative measure, the amount of living space per person, also has a similar result. In general, although the exact mechanisms through which poverty operates are not explicit, the findings suggest that as poverty increases so does the homicide rate. Other economic measures, such as unemployment and the Gini coefficient of income inequality, fail to produce significant results.

Second, the results provide partial support for social disorganization theory. Measures of urbanism and mobility show no influence on homicide rates. The disorganization theory receives support, however, in terms of the poverty, ethnic heterogeneity, and family disruption variables. Poverty has already been discussed. The ethnic heterogeneity measure is not consistently significant across all models, but it is in most models and in the final model. I argued that recent events in Russia may have sparked ethnic antagonisms in a way that the decade-old data on this topic on regional ethnic composition necessarily employed here cannot discover, and thus that it may be appropriate to test this relationship again with more reliable data before drawing strong conclusions about this relationship either way. Finally, family disruption is not simply a measure of the health of families, but may also be seen as representing a more general level of social cohesion and involvement within a community, as well. The family disruption variable is consistently positive and significant across all of the models in this study.

The relationship between the level of alcohol consumption in the region and its homicide rate is also positive and significant across all of the models. Alcohol consumption and related health and social problems are long-standing issues in Russia,

and this evidence of the influence of alcohol on the variation of homicide rates increases this concern.

Models were also estimated that examined the large variation in homicide rates across the country that might not be attributable to the structural factors that are the focus of this study. The findings suggest that the low rates in the Central Chernozem may be the result of their structural characteristics, while low rates in the Northern Caucasus cannot be solely attributed to these factors, but instead may be the result of the Muslim culture that prevails in much of this area. Further, the homicide rates in Western Siberia, Eastern Siberia, and the Fareast remain significantly higher than in the rest of the country even after controlling for their structural attributes.

The results of the influence of social structure on homicide rates in Russia are obviously of inherent value by themselves. This value increases, however, with the ability to compare them to the results of similar studies conducted in the United States. Chapter 6 does this by answering the third and final research question

Comparing results from Russia and the United States

The purpose of Chapter 6 was to answer the final research question posed at the beginning of this dissertation: *How do the findings from Russia compare to those from similar models estimated with data from the United States?*

The findings from Chapter 6 suggest that, although there are a few small differences between the results for individual variables in Russia and the United States, the overall patterns for the effects of social structure on homicide rates between the two countries are quite similar. The findings for poverty and inequality are generally the same

in both Russia and the United States. Further, the results in both nations concerning social disorganization and homicide are also very similar. So, even though there are some minor differences, the influence of social structure on rates of violence do show similar patterns across the two countries, despite the wide cultural and historical differences between the and despite Russia's unique contemporary experience. Thus the preliminary results from this study indicate that social structure plays an important role in the level of violence, despite any other differences that may exist.

Limitations

Since this is the first empirical attempt to examine the issue of social structure and violence in Russia, the limitations of this project have been discussed explicitly throughout the text. They are reviewed here not only in order to refresh the reader's memory, but to provide suggestions for future research in this area that might handle these limitations more adeptly.

First, any new research that employees rarely used data must be careful of their validity. My discussion of the data in Chapter 3 argues that these data are valid and that tentative conclusions can be drawn from their use. However, the more information gathered about the data sources and their potential limitations, the better. The availability, publication, and presentation of data by the Russian government is evolving. In some cases, it is already easier to obtain the data employed here than it was when this project began, and the presentation of these data are becoming increasingly user-friendly. Further, despite the difficulties arising from the lack of resources, the agencies that collect these data are staffed by skilled employees who can provide valuable insight into the

nuances of the data collection process. As a result, future research could focus more closely on the validity of selected measures, such as the mortality and crime data relating to homicide, in order to assess their limitations. Understanding of and access to more recent and refined data will improve research on social structure and on crime in Russia.

Second, the level of aggregation in this study is the Russian region. These regions vary widely in their size, but are analogous to U.S. states. This high level of abstraction makes it difficult to draw strong conclusions about the exact nature of the relationships between the independent and dependent variables. Future research could improve upon this by obtaining data on Russian cities for comparative research, or perhaps study a particular city, such as Moscow, more closely by examining the different districts and neighborhoods within it.

A third potential limitation of this study is Russia's unique contemporary experiences. These conditions were present not only at the time represented by these data (1995), but still exist today and are likely to continue for many years. In most situations, structural factors are relatively stable over long periods of time. In Russia, however, there were sharp trends in many of the measures employed here between the late 1980s and early 1990s. For most measures, these trends peaked by 1993 or 1994, then dropped, then leveled off. However, this transition period still makes a cross-sectional study difficult, since non-stationary data might be the result of changing conditions from year-to-year. Future research could use more recent data to replicate this study in order to determine if the same pattern in the relationships discovered here still exist.

Another aspect of the contemporary Russian experience is that a transition such as this may create unique circumstances that are not present in a more stable society. A political and economic shift unlike any other is taking place in the country. At the same time, Russian citizens' confidence in their leaders and in authority figures, such as the police, has dropped markedly. Ideological values so strongly encouraged only a decade ago are widely discouraged today, but have yet to be replaced. This confusion over acceptable norms and values, taken together with increased troubles in nearly every sphere of every institution of Russian society, may create conditions that influence social structure and crime that are not accounted for by a model borrowed from the United States. Thus it may be necessary to try to define and measure these aspects in an attempt to see if they play a role in the variation of homicide rates in Russia. If so, then an alternative model is obviously required.

A fourth potential limitation to the current study is model misspecification. This may be especially salient here in two ways. The first issue is a misspecification of the relationships between the independent and dependent variables. The model employed here does not test intervening variables that might tell us *how* poverty or alcohol or single-parent households influence the rate of violence in a region, but simply that a relationship does seem to exist. In other words, an important charge for future research on this topic is to add structure to this basic model that describes the nature of these relationships and provides insight into the process through which each of these structural characteristics operate to influence homicide rates.

A second issue of misspecification is the exclusion of factors that may influence homicide, the other independent variables, or both. This is a possibility, since the model estimated here is borrowed from the American experience and since it seems to provide a better fit to the U.S. data than to the Russian data. The unique situation of the transition, as just discussed, and Russia's distinct culture and history may demand further theorizing about the relationship between structure and homicide in the country, which might result in the addition to the model of structural and cultural factors that are not currently included. Thus a Russia-specific model may provide a better fit to the data. This new model may still contain many or all of the theoretical concepts included here, but with an added element or two that might help us better understand the nature of the relationship between social structure and homicide in Russia.

A final limitation to this study is aggregation bias. This issue was discussed at length in the "Interpreting the regression coefficients" section of Chapter 3. In short, since the data are unavailable to control for individual characteristics, the slope coefficients presented here actually represent a mixture of the group- and individual-level effects. I have handled this in two ways with these analyses. In Chapter 5, it is assumed that individual-level effects are minimal and that the structural influences predominate. This may not be the case, but this assumption allows us to give some meaning to the coefficients and to derive a causal structure from them. In Chapter 6, on the other hand, we are looking only at a general comparison of the overall results when a comparable model is estimated in both Russia and the United States. This is a simple descriptive

process that does not demand an exact interpretation of the coefficients, but rather simply compares the results in one context to those in another.

This response does not free us from the issues of aggregation bias, however. We can temporarily put these problems aside with assumptions that allow us to make statements about the results, but the larger difficulty still exists and should not be ignored. Thus future research on the topic of social structure and violence should examine ways to better account for this bias, perhaps by taking advantage of techniques that allow the researcher to include both individual- and group-level measures in their models.

In sum, there are several limitations that make it necessary to place some constraints on the findings reported here. These include issues related to measurement, levels of analysis, Russia's unique culture and its current experience with the transition, model misspecification, and aggregation bias. Despite these limitations, however, this project has opened up an avenue of research possibilities in Russia that before did not exist, and the findings provide important implications for research on social structure and violence, which are described in the next section.

Implications: What do these findings mean for research on social structure and violence?

Many researchers have attempted to apply grand theories such as "modernization," "civilization," and "dependency" to explain the variation in the level of violence among different nations. However, criticism of these theories, based upon their neglect of country-specific cultural and historical contexts, has led some comparativists to call for case studies employing disaggregated data in order to build a more solid

foundation for comparisons (see Archer and Gartner, 1984; Arthur and Marenin, 1995; LaFree and Kick, 1986; Lynch, 1995; Neapolitan, 1997). For example, Russian culture, history, and politics are very different from the United States, and so it may not make sense to compare social structure and violence in these nations if these dissimilarities are so fundamental as to place them in completely separate and unique categories.

Yet at the same time, science demands that a theory be widely applicable under a broad range of conditions in order for it to gain power. Thus Durkheim (1895/1938) commands us to follow the development of social facts through all social species, suggesting that "comparative sociology...is sociology itself" (p. 139). In doing so, we should achieve the goal of comparative criminology, which, according to Clinard and Abbott (1973), is to distinguish "between universals applicable to all societies and unique characteristics representative of one or a small set of societies" (p. 2). If we discover that our models work similarly across different social species, then we gain confidence that our ideas are not culture-bound and that our sociological understanding of crime is not derived from one society that has experienced a unique set of historical events (Clinard, 1960). In simpler terms, we must ask whether what we know is based upon a representative sample. Of course, we might expect some systematic differences across widely varying cultures, but a strong theory should generate hypotheses that generalize to a wide array of circumstances.

With the selection of Russia and the with the analyses undertaken here, we not only have a case study of a nation that is very different from the United States in terms of culture, history, politics, and contemporary experience, but also a basic comparison of the

results from the two countries in order to make a preliminary judgment about the generalizability of our models developed to explain social structure and violence. By analyzing the disaggregated Russian data, the case study aspect provides us with local knowledge of the topic in Russia; by employing a model developed in the U.S. as a starting point, and by comparing the results of the model in Russia with the findings from the United States, the comparative aspect generates universal knowledge.

The first step

The dramatic increase in the homicide rate in Russia in the late 1980s and early 1990s, and its sustained high level throughout the 1990s, demands scientific attention. Ironically, the events of this period also led for the first time to the possibility of studying social structure and violence in the country. Scientific inquiry into this topic was impossible in the past, due to the Soviet government's secrecy and the suppression and falsification of data relating to these issues.

Even today daunting barriers still exist, such as language and ready access to information concerning the collection and definition of data. Thus one of the major breakthroughs of this study is simply the collection of and knowledge about Russian data–data that might not otherwise have been brought together in a single database–that before were inaccessible to Western researchers. This opens the door for others to improve upon the work done here by gaining access to more and refined data, and challenges us to examine more closely the data collection process and thus the validity of some of these measures.

Only by taking this first step are we able to begin analyses that determine the generalizability of Western models and to generate new provincial and universal knowledge about the topic of social structure and violence. The answers to the research questions posed in this project suggest that, in spite of many reasons why we might expect differences in the results from these two nations, an overall pattern of similarity remains.

Differences and similarities

One of the main premises of this study is that despite cultural differences, social structure will act in similar ways to influence homicide rates. However, there are still empirical and theoretical reasons to expect that the fit of the model to the data will be different in Russia than in the United States. Empirically, it may be that in reality the model fits the data equally well in both countries, but that the research limitations discussed above–such as aggregation bias or violations of OLS assumptions–create different results.

There are also theoretical reasons to expect differences. First, it appears that the model provides a better fit to the data in the United States than in Russia. This should be no surprise since the basis for the Russian model is several decades of research on the topic of social structure and homicide in the United States. In other words, since no research has been done on this topic in Russia, the logical first step seems to be to borrow from what we have learned in the U.S. But the Russian situation may be so different in certain respects that it demands closer attention to factors that American researchers have discarded or overlooked. Two examples from this study are the findings that both

offenders and victims of homicide in Russia appear to be much older, on average, than their American counterparts and that levels of alcohol consumption appear to be significantly related to homicide rates in Russia.

On a related issue, a second point is that Russian culture is very different from American culture. It has developed from, and in return influenced, a unique social, political, and economic history that pre-dates the United States by centuries. This does not mean that social structure does not matter or that it might not operate in a similar manner, but it may mean that some structural factors interact with Russian culture to create different outcomes than they would create when interacting with American culture. Thus the influence of alcohol on violence, for example, may be conditioned on the unique role it plays in Russian society. Similarly, the history of slavery and racism in the United States may be the reason that heterogeneity appears to be so strongly related to violence here. Therefore, we should expect some differences in the fit of the model between the two countries given their diverse histories and cultures.

A third major reason we might expect differences is the unique contemporary experience of Russia. Although Russia had been gradually opening up for years, the death of communist rule in the country was fairly sudden and unexpected. It resulted in widespread social problems, from economic shock and failing schools to a deep-seated mistrust of government officials and a struggle to define the most basic of social norms and values. The transition that Russia is facing is historically unique. Empirically, it may be that this results in the data employed here being non-stationary, making it difficult to obtain reliable cross-sectional results. Theoretically, it could be that truly unique social

and cultural conditions are at work and that we should not expect a model borrowed from the United States to fit these circumstances.

Thus we see several reasons why we should not expect the same model of social structure and homicide to fit the data equally well in Russia and the United States. Even if it did, we might be thwarted by empirical issues. However, given the vast social, cultural, political, economic, and historical differences between the two nations–as well as the current acute conditions in Russia–it would be understandable if the model borrowed from the United States explained little, if any, of the variation of homicide rates in Russia.

But this is not the case at all. There are certainly small differences between Russia and the United States when a comparable model is estimated, but both the specific and general comparisons reveal that the overall patterns are quite similar. This is an indication that, despite cultural differences, social structure plays an important role in the variation of homicide rates. Thus not only are we able to ascertain how structural characteristics influence the variation of homicide rates within Russia, but we now have further evidence that social structure influences rates of violence in similar and predictable ways across vastly different circumstances. This provides us with an increased confidence in the ability of our models, despite their shortcomings, to generalize to conditions well beyond those under which they were created.

In sum, this first systematic study of social structure and violence in Russia provides a descriptive analysis of the temporal, demographic, and spatial patterns of

homicide in the country, borrows from models developed in the United States in an attempt to explain the widely varying homicide rates among Russian regions, and compares the results of comparable models estimated in Russia and the United States. Different, and sometimes striking, patterns emerge in terms of the demographic and temporal patterns of the homicide rate in Russia. Despite these differences, however, we also see that multivariate models constructed to explain the variation of homicide rates in the United States also provide a good fit to the data in Russia. Keeping the limitations in mind, this suggests that social structure does indeed play an important role in the production of homicide rates, in spite of cultural differences, and that the models developed in the United States may be generalizeable to nations that are very different from our own. This study thus opens the door to further research on this and similar topics in the country, and the results challenge us to mor closely examine the data and the pattern of relationships between social structure and homicide in Russia.

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Appendices

Appendix A

List of Russian administrative regions by economic region

Northern Economic Region: Arkhangel'sk Oblast, Karelian Republic, Komi Republic, Murmansk Oblast, Nenets Okrug, Vologda Oblast.

North-West Economic Region: Leningrad Oblast, Novgorod Oblast, Pskov Oblast, St. Petersburg (Federal City).

Central Economic Region: Bryansk Oblast, Ivanavo Oblast, Kaluga Oblast, Kostroma Oblast, Moscow (Federal City), Moscow Oblast, Orel Oblast, Ryazan Oblast, Smolensk Oblast, Tver Oblast, Tula Oblast, Vladimir Oblast, Yaroslavl' Oblast.

Volgo-Vyatka Economic Region: Chuvash Republic, Kirov Oblast, Marii-El Republic, Mordovian Republic, Nizhnii Novgorod Oblast.

Central Chernozem Economic Republic: Belgorod Oblast, Kursk Oblast, Lipetsk Oblast, Tambov Oblast, Voronezh Oblast.

Povolzhie Economic Region: Astrakhan Oblast, Kalmyk Republic, Penza Oblast, Samara Oblast, Saratov Oblast, Tatarstan Republic, Ulyanovsk Oblast, Volgograd Oblast.

North Caucasus Economic Region: Adygei Republic, Chechen Republic, Dagestan Republic, Ingush Republic, Kabardino-Balkaria Republic, Karachai-Cherkessia Republic, Krasnodar Krai, North Ossetia Republic, Rostov Oblast, Stravropol' Krai.

Ural Economic Region: Bashkortostan Republic, Chelyabinsk Oblast, Komi-Permyak Okrug, Kurgan Oblast, Perm Oblast, Orenburg Oblast, Sverdlovsk Oblast, Udmurt Republic.

Western Siberia Economic Region: Altai Krai, Altai Republic, Kemerevo Oblast,

Khanty-Mansi Okrug, Novosibirsk Oblast, Omsk Oblast, Tomsk Oblast, Tyumen Oblast, Yamalo-Nenets Okrug.

Eastern Siberia Economic Region: Agin Buryat Okrug, Buryat Republic, Evenki Okrug, Chita Oblast, Irkutsk Oblast, Khakassia Republic, Krasnoyarsk Krai, Tyva Republic, Taimyr Okrug, Ust-Orda Okrug.

Far Eastern Economic Region: Amur Oblast, Chukot Okrug, Jewish Republic, Kamchatka Oblast, Khabarovsk Krai, Koryak Okrug, Magadan Oblast, Primorski Krai, Sakhalin Oblast, Yakutsk-Sakha Republic.

Kaliningrad Economic Region: Kaliningrad Oblast is on the Baltic Sea, separated from Russia proper by the Baltic states of Latvia and Lithuania. For this reason, it is not included as part of any of the above regions and stands alone as its own economic region.

Appendix B

Table B.1. Summary of findings of prior research on the structural covariates of homicide

Study	Year of Data	Level of Analysis	Inequality	Poverty	Divorce Rate	Pop. size/Dens./ % Urban	% Black	South
Hackney (1969)[a]	1940	State						
		Model 1 (n=48)	*	0	*	*/*/0	*	+
		Model 2 (n=48)	*	0	*	*/*/0	*	+
Gastil (1971)		State	*	+	*	0/*/0	+	+
Loftin & Hill (1974)[a]	1960	State						
		Model 1 (n=48)	+	+	*	*/*/0	0	0
		Model 2 (n=48)	+	+	*	*/*/0	0	0
Parker & Smith (1979)[a]	1970	State (n=48)	*	+	*	*/*/+	0	0
Messner (1980)[a]	Various years	Nation (n=39)	0	+	*	0/0/0	*	*

		Model 4 (n=204)	*	-	*	+/-/*	+	+

Study	Year	Unit	Inequality	Poverty	Divorce	Population	% Black	South
DeFronzo (1983)	1970	SMSA						
		Model 1 (n=39)	*	0	*	+/*/*	+	*
		Model 2 (n=39)	0	*	*	0/*/*	+	0
Messner (1983a)[a]	1970	City						
		Model 1 (n=256)	0	+	*	+/0/*	+	0
		Model 2 (n=91)	0	0	*	+/0/*	+	0
Messner (1983b)[a]	1970	SMSA						
		Model 1 (n=204)	0	+	*	+/-/*	+	+
		Model 2 (n=204)	0	+	*	+/-/*	+	+
		Model 3 (n=143)	0	+	*	+/-/*	+	*
		Model 4 (n=61)	-	+	*	+/-/*	0	*

Smith & Parker (1980)[a]	1970	State (n=48)	0	+	*	*/*/0	0	0

Study	Year	Unit	Inequality	Poverty	Divorce	Population	% Black	South
Blau & Blau (1982)[a]	1970	SMSA (n=125)	+/+	0	+	0/*/*	+	*
Crutchfield, Geerken, & Gove (1982)	1970	SMSA (n=65)	*	0	*	0/*/*	+	*
Hansmann & Quigley (1982)	Not Reported	Nation						
		Model 1 (n=58)	*	0	*	*/0/0	*	*
		Model 2 (n=40)	0	0	*	*/0/0	*	*
Messner (1982)	1970	SMSA						
		Model 1 (n=204)	0	-	*	+/-/*	+	+
		Model 2 (n=204)	0	*	*	+/-/*	+	+
		Model 3 (n=204)	*	-	*	+/-/*	+	+

Study	Year	Unit	Inequality	Poverty	Divorce	Population	% Black	South
Bailey (1984)[a]	1960	City						
		Model 1 (n=73)	0	+	*	0/0/*	+	0
		Model 2 (n=73)	*	+	*	0/0/*	+	0
		Model 3 (n=138)	0	*	*	0/0/*	+	+
		Model 4 (n=138)	*	+	*	0/0/*	+	+
	1970	City						
		Model 1 (n=153)	0	+	*	+/0/*	+	0
		Model 2 (n=153)	*	+	*	+/0/*	+	0
		Model 3 (n=153)	0	*	*	+/0/*	+	0
		Model 4 (n=153)	*	0	*	+/0/*	+	0
Jackson (1984)[a]	1970	City						

		Model 1 (n=408)	0	+	*	+/0/*	+	0
		Model 2 (n=265)	0	+	*	+/0/*	+	0
		Model 3 (n=143)	0	0	*	+/+/*	+	0
Study	Year	Unit	Inequality	Poverty	Divorce	Population	% Black	South
Williams (1984)[a]	1970	SMSA						
		Model 1 (n=125)	0	+	+	0/*/*	+	*
		Model 2 (n=125)	0/+	+	*	+/0/*	+	0
Loftin & Parker (1985)[a]	1970	City (n=49)	*	+	*	+/0/*	+	0
Simpson (1985)[a]	1970	SMSA						
		Model 1 (n=125)	+	0	+	0/*/*	+	0
		Model 2 (n=125)	+	0	0	0/*/*	+	+
Avison & Loring (1986)[a]	1967-1971	Nation						

		Model 1 (n=32)	+	*	*	*/0/*	*	*
		Model 2 (n=32)	0	*	*	*/0/*	*	*
Blau & Golden (1986)	1970	SMSA (n=125)	*/0	+	+	+/*/*	+	+

Study	Year	Unit	Inequality	Poverty	Divorce	Population	% Black	South
Huff-Corzine								
et al. (1986)[a]	1970	State						
		Model 1 (n=48)	0	+	*	*/*/0	+	+
		Model 2 (n=48)	0	+	*	*/*/0	+	+
Krahn et al. (1986)[a]		Nation (n=61)	0	0	*	*/*/*	*	*
McDowall (1986)[a]	1926-							
	1978	Detroit-Year						
		Model 1 (n=52)	*	0	*	*/*/*	+	*

		Model 2 (n=52)	*	+	*	*/*/*	+	*
Messner &								
Tardiff (1986)	1980	Neighborhood						
		Model 1 (n=26)	0	0	+	0/*/*	0	*
		Model 2 (n=26)	0	*	+	+/*/*	0	*
		Model 3 (n=26)	*	0	+	+/*/*	0	*

Study	Year	Unit	Inequality	Poverty	Divorce	Population	% Black	South
Sampson (1986)[a]	1980	City						
		Model 1 (n=171)	*/+	*	+	+/*/*	+	*
		Model 2 (n=158)	*	+	+	+/*/*	0	*
		Model 3 (n=150)	*	0	0	0/*/*	+	*
Logan &								
Messner (1987)[a]	1970	Suburban rings (n=54)		0	*	0/*/*	+	+
	1980	Suburban rings (n=53)		+	*	0/*/*	0	+

Sampson (1987)[a]	1980	City						
		Model 1 (n=153)	*	0	+	+/0/*	0	0
		Model 2 (n=153)	*	+	0	+/0/*	0	+
		Model 3 (n=153)	*	0	+	+/0/*	0	0
		Model 4 (n=153)	*	+	+	+/0/*	0	+

Study	Year	Unit	Inequality	Poverty	Divorce	Population	% Black	South
Baron &								
Straus (1988)	1980	State						
		Model 1 (n=50)	*	+	+	*/*/+	0	0
		Model 2 (n=50)	+	*	0	*/*/+	+	0
Williams &								
Flewelling (1988)[a]	1980	City (n=168)	*	+	+	*/+/*	+	0

Crutchfield (1989)[a]	1980	Seattle Census						
		Tract (n=121)	*/+	0	0	*/0/*	+	*
Messner (1989)[a]	Various							
	years	Nation						
		Model 1 (n=51)	0/+	*	*	0/0/0	*	*
		Model 2 (n=32)	0/+	*	*	0/0/0	*	*
Parker (1989)[a]	1970	City (n=299)	0	+	*	+/-/*	0	0

Study	Year	Unit	Inequality	Poverty	Divorce	Population	% Black	South
Balkwell (1990)[a]	1980	SMSA						
		Model 1 (n=150)	0/+	*	+	+/*/*	+	*
		Model 2 (n=150)	*/+	+	+	+/*/*	+	+
Land et al. (1990)[a]	1960	City (n=528)		+	+	+	*	+
		SMSA (n=182)		+	+	0	*	+

		State (N=50)	+	+	+	*	+
	1970	City (n=729)	+	+	+	*	+
		SMSA (n=187)	+	+	+	*	0
		State (N=50)	+	+	+	*	0
	1980	City (n=904)	+	+	+	*	+
		SMSA (n=259)	+	+	+	*	+
		State (N=50)	+	+	+	*	0

Study	Year	Unit	Inequality	Poverty	Divorce	Population	% Black	South
Kennedy et al. (1991)[a]	Various	CMA						
	years	Model 1 (n=24)	+	*	0	0/0/*	*	0
		Model 2 (n=24)	0	*	0	0/0/*	*	0
Harer &								
Steffensmeier (1992)[a]	1980	SMSA						

		Model 1 (n=125)	+	0	*	0/*/*	0	0
		Model 2 (n=125)	+	+	*	0/*/*	0	0
		Model 3 (n=125)	0	0	*	0/*/*	0	0
LaFree et al. (1992)	1957-							
	1988	US-year (n=31)	-	*	0	*/*/*	*	*
Messner &								
Golden (1992)[a]	1980	City						
		Model 1 (n=154)	*	+	+	+/*/*	*	0
		Model 2 (n=154)	*/+	+	+	+/*/*	*	0

Study	Year	Unit	Inequality	Poverty	Divorce	Population	% Black	South
Peterson &								
Krivo (1993)[a]	1980	City (n=125)	*/0/0	0	0	0/*/*	+	0
Shihadeh &								
Steffensmeier (1994)[a]	1980	City						

		Model 1 (n=158)	0	*	+	+/0/*	0	0
		Model 2 (n=158)	0	*	0	0/0/*	0	0
Kposowa et al. (1995)[a]	1980	County						
		Model 1 (n=408)	+	-	+	*/+/0	+	0
		Model 2 (n=1681)	-	+	+	*/0/0	+	+
		Model 3 (n=3076)	0	+	+	*/+/+	+	+
		Model 4 (n=1058)	-	+	+	*/+/0	+	*
		Model 5 (n=405)	-	+	*	*/0/+	0	0

Study	Year	Unit	Inequality	Poverty	Divorce	Population	% Black	South
Fowles &								
Merva (1996)[a]	1975-							
	1990	SMSA-Year	+	+	*	*/+/*	+	+

Martinez (1996)[a]	1980	City						
		Model 1 (n=111)	*/+	0	0	+/*/*	-	+
		Model 2 (n=111)	+	-	0	+/*/*	-	+
Shihadeh & Flynn (1996)[a]	1990	City (n=151)	*	0	0	+/*/*	*	0
Shihadeh & Ousey (1996)[a]	1980	City (n=136)	*/0	0	+	+/0/0	0	0

Study	Year	Unit	Inequality	Poverty	Divorce	Population	% Black	South
Kovandzic et al. (1998)	1990	City						

		Model 1 (n=190)	+	+	+	+/0/*	+	0
		Model 2 (n=190)	+	+	+	+/0/*	+	0
		Model 3 (n=190)	+	+	+	+/0/*	+	0
Neapolitan (1998)	Various years	Nation						
		Model 1 (n=79)	+	0	*	*/+/*	*	*
		Model 2 (n=118)	+	+	*	*/0/*	*	*
		Model 3 (n=103)	+	0	*	*/0/*	*	*
		Model 4 (n=76)	+	0	*	*/0/*	*	*

Study	Year	Unit	Inequality	Poverty	Divorce	Population	% Black	South
Shihadeh &								

Ousey (1998)[a]	1990	City					
		Model 1 (n=100)	+	*	+/-/*	+	*
		Model 2 (n=100)	+	*	+/0/*	0	*
		Model 3 (n=100)	+	*	0/-/*	+	*
		Model 4 (n=100)	+	*	+/0/*	+	*

Note. + denotes a statistically significant positive relationship; - denotes a statistically significant negative relationship; 0 denotes a null effect; * denotes that the covariate is not included in the model. A complete list of measures employed can be found in Appendix C.

[a]Denotes an identification or specification unique to the study. In order to conserve space in the table, notes on these features are located in Appendix C.

Appendix C

Notes and variable lists for studies presented in Appendix B (in chronological order)

Hackney (1969). *Note*: First model is for white homicide, second model is for nonwhite homicide. *Variable list*: White homicide rate (model 1), White homicide rate (model 2), Per capita personal income, Percentage of workforce unemployed, Wealth (state's per capita income in 1950), Median age of population, Urbanization (percentage of population living in towns of more than 2,500 people), Education (median number of school years completed by those 25 and older), South (dummy).

Gastil (1971). *Variable list*: Homicide rate, Median income, Percent black, Percent age 20-34, Percent urban, Doctors per 100,000 population, Hospital beds per 100,000 population, Median years of school completed, Population size, Percent in cities over 300,000, Southerness Index.

Loftin and Hill (1974). *Note*: Model 1 is a replication of Hackney's (1969) study (using a "Confederate South" dummy) and model 2 is a replication of Gastil's (1971) study (using a "Southerness index"). Both models also include a "structural poverty index" (operationalized below) and a percent nonwhite (instead of percent black) measure. *Variable list*: Mean homicide rate 1959-1961, Structural Poverty Index (includes (1) the infant mortality rate, (2) the percent of the population over 25 years of age with fewer than five years of schooling, (3) the percent of the population that is illiterate, (4) the percent of families with less than $1,000 income, (5) failing scores on the Armed Forces Mental Test, and (6) the percent of children living with one parent),

Gini coefficient, Percent nonwhite, Percent age 20-34, Percent rural, Hospital beds per 100,000 population, "Confederate South" (model 1), "Southernness Index" (model 2).

Parker and Smith (1979). *Note*: The authors disaggregate on the dependent variable, presenting findings for "primary" (victim and offender are family or friends) and "nonprimary" (victim and offender are strangers) homicides. Only the findings for "total" homicides are reported here. Also, the authors use percent nonwhite instead of percent black. *Variable list*: Total homicide rate, Loftin and Hill's (1974) Structural Poverty Index, Percent nonwhite, Percent urban, Percent age 20-34, South (dummy), Severity of punishment (median months served on a prison sentence for homicide by those released from prison in 1970), Certainty of punishment (number of admissions to prison on a sentence of homicide in 1970 divided by the number of homicides reported in the *Uniform crime reports* for 1970).

Messner (1980). *Note*: The author discusses his GDP per capita variable as "economic development" and not poverty. However, this type of measure is most often used as a measure of affluence–and Messner (1982) himself later refers to it as such in referring to these findings–and so it is reported this way here. *Variable list*: Homicide rate (log base 10), Economic development (GDP per capita; log base 10), Gini coefficient, Population size, Population density, Urbanization (percentage of population living in cities of 100,000 or more).

Smith and Parker (1980). *Note*: The authors use percent nonwhite instead of percent black. *Variable list*: Total homicide rate, Structural Poverty Index, Gini

coefficient, Percent nonwhite, Percent age 20-34, Percent urban, Hospital beds per 100,000 population, Non-South (dummy).

Blau and Blau (1982). *Note*: In an attempt to test their theory that inequality based upon ascribed status is more important than simple income inequality, the authors employ the variable "racial socioeconomic inequality" (defined below) in the model along with income inequality. *Variable list*: Homicide rate (Log base 10), Percent poor, Gini coefficient, Racial socioeconomic inequality (the ratio of mean economic status of whites to mean economic status of nonwhites), Percent black, Percent divorced, Population size, South (dummy).

Crutchfield, Geerken, and Gove (1982). Mean homicide rate 1969-1971, Percent families below poverty level, Percent black, Percent males age 10-18, Median education, Population size, Percent unemployed, Total mobility (sum of census categories related to movement within SMSAs between 1965-1970, expressed as a percentage of the total population + percent of the population that had moved into SMSAs from non-metropolitan areas and other SMSAs from 1965-1970).

Hansmann and Quigley (1982). *Note*: The authors also test hypotheses that predict that religious, ethnic, and linguistic heterogeneity will lead to higher rates of homicide within a country. The first is non-significant in both models; the second is significant in the first model and non-significant in the second model; the third is significant in the first model and non-significant in the second model. The authors were able to obtain data on each variable except income inequality for the 58 nations in their sample and these nations are used in model 1. The second model contains only those

cases for which a value of income inequality could be generated. *Variable list*: Homicide rate, Religious heterogeneity, Ethnic heterogeneity, Language heterogeneity, Gini coefficient, Percent of population age 15-24, GNP per capita, Density, Percent urban (>100,000).

Messner (1982). *Note*: Model 4 employs "percentage of families with an income below $1,000" as the poverty variable. *Variable list*: Homicide rate, Percent below poverty line (Models 1, 2, and 3), Proportion of families with incomes below $1,000 (Model 4), Gini coefficient, Proportion of population that is black, Proportion of population age 15-29, Population size (log base 10), Population density (log base 10), South (dummy).

DeFronzo (1983). *Variable list*: Homicide rate, Cost-of-living-adjusted monthly AFDC assistance per family member, Cost-of-living-adjusted percentage of families living in poverty, Gini coefficient, Percent unemployed, Cost-of-living-adjusted median family income, Cohen and Felson's (1979) "household activity index," Percent males age 15-24, Percent black, Population size (log base 10), South (dummy).

Messner (1983a). *Note*: Model 1 is for non-southern cities, model 2 is for southern cities. *Variable list*: Mean homicide rate 1969-1971, Percent below official poverty level, Gini coefficient, Total population (log base 10), Population density (log base 10), Proportion of population age 15-29.

Messner (1983b). *Note*: Model 1 uses a "Confederate South" dummy, model 2 employs a "Southerness index," model 3 tests only non-southern SMSAs, and model 4 tests only southern SMSAs. *Variable list*: Mean homicide rate 1969-1971, Loftin and

Hill's (1974) structural poverty index (but (a) did not employ percent illiterate and (b) cities were assigned their state's failure rate on the Armed Forces Mental Test since neither were available for cities), Gini coefficient, Hackney's "Confederate South" (dummy), Gastil's "Southernness index" (again, cities were assigned the index of their respective states), Percent black, Percent age 20-34, Population size (log base 10), Population density (log base 10).

Bailey (1984). *Note*: Model 4, for both 1960 and 1970, defines poverty as family income less than $1,000. *Variable list*: Homicide rate (log base 10), Percent of population below poverty level, Gini coefficient, Percentage of families with an income below $1,000, Percent black, Percent age 15-29, South (dummy), Population size (log base 10), Population density (log base 10).

Jackson (1984). *Note*: The models are based upon city size. Model one reports all cities in the United States with a population equal to or greater than 25,000, model 2 is for cities with more than 50,000 residents, and model 3 is for cities with populations between 25,000 and 50,000. Also, the models presented by the author report null findings for inter-racial income inequality, not overall inequality. However, she does state that using the Gini coefficient does not alter the findings. *Variable list*: Homicide rate, Household activity ratio (the number of husband-present female labor-force participants + the number of non-husband-wife households divided by the total number of households in the city), Percent unemployed, Proportion of the population age 15-24, Population size, Population density, Percent poor, Percent black, inter-racial income inequality, South (dummy).

Williams (1984). *Note*: Following Blau and Blau (1982), the author reports racial inequality (defined below) along with overall income inequality. *Variable list*: Homicide rate, Percent poor, Gini coefficient, Racial inequality (log base 10 of difference between median income of white families and median income of black families), Percent black, Percent black squared, South (dummy), Population size (log base 10), Population density (log base 10).

Loftin and Parker (1985). *Note*: The authors argue that models testing the relationship between poverty and homicide have been misspecified due to measurement error. In an attempt to correct for this, they introduce an instrumental variable–infant mortality. In their original equation, there is no relationship between poverty and homicide. When they introduce the instrumental variable into the equation, however, a positive relationship between poverty and homicide surfaces. The authors also report that they did employ the Gini coefficient as a measure of income inequality in models that are not reported in the article, but found no impact. Percent nonwhite is used instead of percent black. Finally, the authors disaggregate on the basis of the "type" of homicide (family, other primary, robbery, other felony), only the findings for the total homicide rate are reported here. *Variable list*: Total homicide rate, Infant mortality (used as an instrumental variable), Percent below poverty line, Proportion of population nonwhite, Proportion of population age 18-24 (log base 10), Population size (log base 10), Population density.

Simpson (1985). *Note*: Model 1 employs a dummy variable for southern region, model 2 uses a southern index. *Variable list*: Homicide rate, Poverty, Income inequality,

SES difference in income, Percent black (logit), Percent white males age 15-29 (logit), Percent white males age 15-29 squared, Percent divorced (logit), Population size (log base 10), South (dummy; model 1), Gastil's "Southernness index" (model 2).

Avison and Loring (1986). *Note*: In their final model, the authors find income inequality to be non-significant. However, they do include an interaction term, multiplying their inequality and heterogeneity variables, which they do find to be significantly related to homicide rates. *Variable list*: Average homicide rate 1967-1971, Gini coefficient, Ethnic/linguistic heterogeneity, Level of economic development (measured as energy consumption per capita), Population density, Labor force participation (proportion of total male population in labor force), Proportion of population age 15-24.

Blau and Golden (1986). *Note*: The authors use "percentage of the population southern born" as a measure of southern culture. They also use a measure of racial inequality (defined below) instead of overall inequality. *Variable list*: (All variables in this analysis are logarithmically transformed): Homicide rate, Percent poor, Racial SES inequality (ratio of median white to median black score on Social Economic Index), Percent males age 15-19, Percent black, Percent divorced, Percent Southern-born, Deterrence (ratio of arrests made per crimes committed).

Huff-Corzine et al. (1986). *Note*: Model 1 uses the "Southerness Index" and model 2 the percentage of the population born in the south as measures of southern culture. They also use percent nonwhite instead of percent black. Next, the authors employ both OLS and Normalized Ridge Regressions and report findings disaggregated

by race. Only the results for the aggregated measure are shown here. *Variable list*: Homicide rate, Loftin and Hill's (1974) Structural Poverty Index, Gini coefficient, Percent nonwhite, Percent age 20-34, Percent rural, Hospital beds per 100,000, Gastil's "Southernness Index" (model 1), Percent of population born in South (log base 10; model 2).

Krahn et al. (1986). *Note*: The authors use data from several different years in their analyses, only the findings from the model employing the average homicide rate are reported here. *Variable list*: Homicide rate (average of rates from 1960, 1965, 1971, 1975; log base 10), Average annual population growth rate from 1960 to 1970, Gini coefficient, GDP per capita (log base 10), Democracy index.

McDowall (1986). *Note*: The first model reports short-term effects, the second model reports long-term effects. The author reports a significant relationship between poverty and homicide rates in the short-term, but at the $p<.10$ level. Analysis reveals that the estimate is less than twice its standard error and thus, in order to be consistent with the other results reported here, I report this as a null finding. The long-term effect is significant at the $p<.05$ level. *Variable List*: Homicide rate (log base 10), Poverty (ratio of infant mortality rate in Detroit to that of United States; log base 10), Percent unemployed in Michigan (log base 10), Michigan per capita annual income (log base 10), Percent white (log base 10), Percent age 15-34 (log base 10), One-year lagged homicide rates (log base 10).

Messner and Tardiff (1986). *Variable list*: Homicide rate (log base 10), Poor (percentage of population with incomes of less than 75% of the poverty line), Gini

coefficient, Percent black (log base 10), Percent males 15-24, Percent divorced, Population size (log base 10), Commercial district (dummy).

Sampson (1986). *Note*: The author employs racial income inequality in the first model instead of overall inequality. Model 2 reports the findings for whites, model 3 reports findings for blacks. *Variable list*: Average race-age and sex-age offending rates 1980-1982 (log base 10), Racial income inequality, Divorce rate, Occupational status, Percent black, Population size, West (dummy), White two-parent households (model 1), Black two-parent households (model 2), White poverty (model 1), Black poverty (model 2), Police aggressiveness, Local incarceration risk, State prison risk.

Logan and Messner (1987). *Note*: The authors use suburban "rings" as their level of analysis, and obtain values for these areas by subtracting city measures from overall SMSA measures. Also, poverty and inequality are combined into a single index by transforming the measures into standardized scores and summing. Finally, the authors' main hypothesis, which is supported in their findings, is that segregation by race within suburban areas increases rates of homicide. *Variable list*: Homicide rate, Racial segregation (index of dissimilarity), Residential mobility (percent of suburban occupied housing units in which the current occupants have resided less than five years), Percent black, Poverty-Inequality index (see definition in *Note* above), Population age 15-29, Population size (log base 10), South (dummy).

Sampson (1987). *Note*: Models 1 and 3 are for black juvenile homicide; models 2 and 4 are for black adult homicide. Models 1 and 2 test both direct effects of the dependent variables on offending rates as well as indirect effects through the percentage

of black female-headed households (for example, the poverty measure has no significant direct effect on offending rates in model 1, but it does have significant and negative impact on the percentage of female-headed households that, in turn, has a positive direct effect on offending rates); models 3 and 4 test only for direct effects. The percentage of female-headed households is used instead of percent divorced. North and West are the dummy variables used instead of South. *Variable list*: Estimated race-specific and age-specific offending rates, Employed black males per 100 black women, Black median age, Black per capita income, Mean black welfare payment, North (dummy), West (dummy), Structural density, Population size, Percent black, Percentage of black households headed by females.

Baron and Straus (1988). *Note*: The authors employ a "family integration index" (defined below) instead of percent divorced. *Variable list*: Homicide rate, Proportion of families with incomes below poverty level, Gini coefficient, "Confederate South" (dummy), Percent black, Percent population age 18-24, Percent population residing in SMSAs, Inverse of "Family Integration Index" (average of 3 z-scored variables: Percent of households with both husband and wife present, inverse of the percent of persons living alone, the number of families per 100,000 population).

Williams and Flewelling (1988). *Note*: The authors disaggregate on the basis of the dependent variable ("type" of homicide). Only the model with total homicide rates is reported here. *Variable list*: Homicide rate (log base 10), Percent poor (log base 10), Percent black (log base 10), Justifiable homicide ratio (as a measure of subculture of

violence; log base 10), Divorce rate (log base 10), Population density (log base 10), "Confederate South" (dummy).

Crutchfield (1989). *Note*: The author uses "within-census tract inequality" instead of overall inequality and percent nonwhite instead of percent black. *Variable list*: Average homicide rates 1979-81, Percent unemployed, Percent employed who work full time, Percent of employed who work in secondary sector jobs, Percent of population below poverty line, Within-census tract income inequality, Inequality between census tracts, Percent white, Crowding rate (number of persons per 1000 population living in dwellings with more than 1.01 persons per room), divorce rate, Percent males age 14-24, Central Business District (dummy).

Messner (1989). *Note*: The author reports cross-national findings using homicide data from both Interpol (model 1) and the World Health Organization (model 2). Following Blau and Blau (1982), the author's main hypothesis is that economic discrimination based upon ascribed status will lead to increased rates of homicide. This measure is included in the model along with overall inequality (which is found to be non-significant) and the results support the hypothesis in both models. *Variable list*: Average homicide rate 1977-1982 (log base 10), Economic discrimination, Income inequality, Percent urban, Ethno-linguistic heterogeneity, Population size (log base 10), Population density (log base 10), Democracy index, Percent male age 15-29, Development index, Population less than 15 years old.

Parker (1989). *Note*: The author disaggregates the dependent variable on the basis of "type" of homicide; only the results for overall homicide rates are reported here. Also,

he reports his inequality measure to be significant but uses a one-tailed test. Were a two-tailed test to be used, the finding would be non-significant. In order to be consistent with the other studies charted here, this non-significant finding is reported. *Variable list*: Average homicide rate 1969-1971, Loftin and Hill's (1974) Structural Poverty Index (minus illiteracy rate), Gini coefficient, Percent black, Percent age 20-34, Confederate South, Population size (log base 10), Population density (log base 10).

Balkwell (1990). *Note*: Model 1 here is actually the author's model 2 in the article and model 2 here is actually the author's model 4. The author also uses ethnic inequality, along with overall inequality, in the model. *Variable list*: Homicide rate, Gini coefficient (model 1), Percent black (model 2), Population size (log base 10; models 1 and 2), Ethnic inequality (models 1 and 2), Percent divorced (models 1 and 2), Percent black (model 2), Percent living in poverty (log base 10; model 2), South (dummy; model 2).

Land et al. (1990). *Note*: In their final analysis, the authors do not use measures of absolute and relative deprivation but instead employ principal components analysis to create a factor they call "resource deprivation/affluence" that consists of median family income, the percentage of families living below the poverty line, the Gini index, the percentage of the population that is black, and the percentage of children 18 and under not living with both parents. In like manner they create a "population structure" factor that combines population size and density. *Variable list*: Population structure (see note above), Resource deprivation/affluence (see note above), Percent divorced, Percent age 15-29, Unemployment rate, South (dummy).

Kennedy et al. (1991). *Note*: The authors report on Canadian Census Metropolitan Areas (CMAs) with a population of greater than 100,000 (n=24). Model 1 presents findings for 1976 data and model 2 presents findings for 1981 data. Two measures of inequality are used, the Gini coefficient and income dissimilarity (see below for definition), the latter is non-significant in both models and is not reported in Table 1. *Variable list*: Homicide rates (each is a 5-year average), Gini coefficient, Income dissimilarity (a comparison of the distribution of family incomes within a CMA with the distribution of family income for all of Canada), Percent unemployed, Percent changed residences within last three years, Percent male 20-34, Percent divorced, Population size, Population density, East/West dummy.

Harer and Steffensmeier (1992). *Note*: The authors use arrest rates and disaggregate on the basis of race. Model 1 reports overall findings before disaggregation; model 2 reports findings for whites (and thus employs "white poverty" and "white inequality"); Model 3 reports findings for blacks (thus employing "black poverty" and "black inequality"). *Variable List*: Race-specific arrest rates for homicide (log base 10), Poverty, White-to-black income difference, Gini coefficient, Percent age 15-24, Percent black, Police per capita, South (dummy).

LaFree et al. (1992). *Variable list*: Homicide rate (log base 10), Median family income (log base 10), Median years of schooling for males (log base 10), Percent female-headed households (log base 10), Percent male age 14-29 (log base 10), Prison rate (log base 10), Consumer Price Index (log base 10), Criminal opportunity (log base 10).

Messner and Golden (1992). *Note*: Drawing on Land et al. (1990), the authors use the "resource deprivation/affluence" factor in place of relative and absolute measures of deprivation. The second model includes a measure of racial inequality. *Variable list*: Homicide rate, Racial *SES* inequality, Population size, Resource deprivation/ affluence, Percent divorced, Percent ages 15-29, South (dummy), Sex ratio.

Peterson and Krivo (1993). *Note*: The authors disaggregate on the basis of the dependent variable ("type" of homicide); only the model with total homicide rates is reported here. The authors do not measure overall inequality but within-black inequality and white-black inequality. Finally, and notably, the authors employ a measure of black-white residential segregation and find this to be positively and significantly related to homicide rates. *Variable list*: Black homicide victimization rate 1979-1981, Black-white residential segregation across census tracts, racial concentration (ratio of black-white residential segregation across census tracts), Gini for blacks only, Black-white income inequality (ratio of white to black median family income), Poverty, Percent of black population older than 24 who graduated high school, Percent of employed blacks in professional and managerial occupations, Percent black, Percent black males 15-34, Black divorce rate, Population size (log base 10), South (dummy).

Shihadeh and Steffensmeier (1994). *Note*: The authors employ white-black, black-black, and overall inequality. None are reported to have direct effects. However, black-black inequality does have significant positive indirect effects on black juvenile homicide (but not adult homicide) via black family disruption. Female-headed households is used in place of percent divorced. Model 1 reports findings for black

juveniles and model 2 reports findings for black adults. *Variable list*: Race-specific arrest rates for homicide, Gini coefficient, Racial inequality (the difference between the log of white mean family income and the log of the black mean family income), Black-to-black inequality (Gini coefficient computed for black families only), Percent of black female-headed households, Male Marriage Pool Index (number of employed 16-64 year old black males per 100 similarly aged black females), Mean public assistance payment, Per capita family income, Median age of black males, Population size (log), Percent black, South (dummy), West (dummy), Structural density (percent of housing units in a city that are located in attached units of five or more).

Kposowa et al. (1995). *Note*: Model 1 reports on all counties with a population greater than 100,000; model 2 reports on counties with a population of less than 25,000; model 3 reports all counties in the sample (which includes over 95% of all counties in the United States); model 4 reports southern counties; model 5 reports on counties within which blacks comprise at least 25% of the population. *Variable list*: Average homicide rate 1979-1981, Percent below poverty level, Gini coefficient, Percent black, Percent church membership, Percent urban, Percent unemployed, Percent high school graduates, Percent professional workers (a measure of occupational status), Population density, Median age, Percent age 5-17, Percent Hispanic, Percent Native American, "Confederate South" (dummy).

Fowles and Merva (1996). *Note*: The authors use a pooled-time series, cross-sectional data set of 28 SMSAs over 15 years. They also use percent nonwhite in place of percent black. *Variable list*: Homicide rate, Gini coefficient, Change in unemployment,

Percent poverty, Percent young, Percent white, Percent of workers with at least some college education, Population density, South (dummy), Year.

Martinez (1996). *Note*: The author does not use overall inequality but instead employs measures of Anglo-Latino and Latino-Latino inequality (the former is non-significant and the latter significant in both models). Percent Latino is used in place of percent black. The region variable is Southwest (dummy) instead of South. Finally, model 1 employs OLS regression and model 2 employs Weighted Least Squares regression. *Variable list*: Latino homicide victimization rate, Latino poverty, Anglo-Latino income inequality (ratio of Anglo to Latino median family income), Latino income inequality (Gini coefficient for Latino families only), Percent of Latinos over 24 who graduated high school, Percent Latino, Percent Latino males age 15-24, Percent divorced, Population size (log), Southwest region (dummy), Immigration (Index of foreign-born Latinos and Latinos living abroad in 1975).

Shihadeh and Flynn (1996). *Note*: The authors have disaggregated by race and thus these results are for black homicides only. Black female-headed households is used instead of divorce rate. Finally, the thrust of the study is racial segregation measured as black "isolation," as opposed to the use of the index of dissimilarity. *Variable list*: Black homicide arrest rates (log base 10), Black isolation (Lieberson's (1981) interaction index: the probability that a randomly drawn black interacts with a white), Index of dissimilarity, Black employment (proportion of blacks age 16-64 who are employed), Black poverty (proportion living below the poverty line), Proportion of blacks who rent, Black youth attachment (proportion of blacks 16-19 who are not in labor force, not in school, not in

armed forces, and do not have a high school diploma), Black female-headed households, Black empowerment (proportion of all city council members that are black divided by proportion of city's voting age population that is black), Black education (proportion 25 or older with high school diploma), Population size (log base 10), Black males age 15-34, South (dummy), Proportion of all households that are vacant.

Shihadeh and Ousey (1996). *Note*: The results presented here are for black homicide rates only. Within-black inequality it tested but not overall inequality. The percentage of female-headed households with children under 18-years old is used instead of divorce rate. Structural density (percentage of black housing in the city that is located in attached clusters of five units or more) is used instead of the number of persons per area. The percent of SMSA residents who reside in the surrounding suburbs is employed instead of percent urban. This is done because the authors are concerned with the segregating effects of suburbanization on blacks in central cities. Their hypothesis is that suburbanization leads to socially isolated black communities within center cities, which in turn creates conditions that result in higher crime rates. The findings support their hypothesis. *Variable list*: Black homicide arrest rates (1979-1981), Suburbanization (percentage of SMSA residents who live in suburbs), South (dummy), Within-black inequality, Boundedness (ratio of the center city land area to the SMSA land area), Black MMPI (number of employed black males age 16-64 per 100 black females similarly aged), Black family structure (percent of female-headed households with children under 18 years old), Black city-suburb inequality (ratio of black mean family income in city center to black mean family income in suburbs), Black poverty (proportion of blacks

living below the poverty line), Black welfare (mean public assistance payments to city center blacks), Structural density (see *Note* above for definition), Proportion black.

Neapolitan (1998). *Note*: Model 1 uses data from the countries reported on by Rushton (1995); model 2 reports on all countries in the author's sample; model 3 reports results on "nations in transition"; model 4 reports results on "developing nations." *Variable list*: Adjusted homicide rates, GNP per person (log base 10), Gini coefficient, Ethnic heterogeneity, Mean household size, Percent urban, Percent age 15-29, Majority "race" of nation (Asian, black, white).

Shihadeh and Ousey (1998). *Note*: Models 1 and 3 are for black homicide, models 2 and 4 are for white homicide. The economic deprivation measure is a factor–created via principle components analysis–consisting of unemployment rates and poverty rates. The authors' posit that industrial restructuring, which they define as the availability of low-skilled jobs, indirectly affects the homicide rate through economic deprivation (i.e., industrial restructuring has decreased the number of low-skilled jobs available to center city residents, which in turn has led to increased economic deprivation and increased rates of violent crime). *Variable list*: Homicide arrest rates (log base 10), Low skill jobs (proportion of all jobs located in low-skill sectors), Economic deprivation, Proportion of population older than 25 without a high school diploma, Proportion who are renters, Index of dissimilarity, Structural density, Rustbelt (regional dummy), Median age, Proportion black, Population (log base 10).

Appendix D

Stem and leaf plots for dependent and independent variables

***see "stems" file

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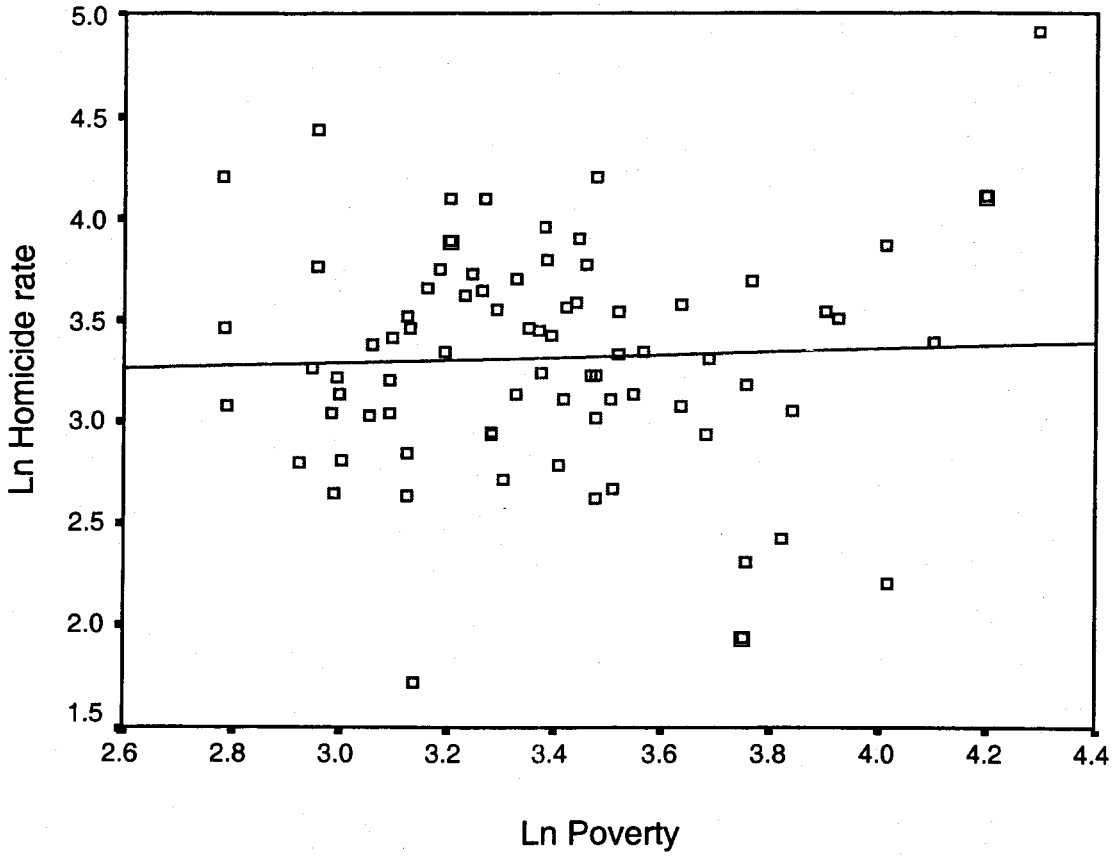
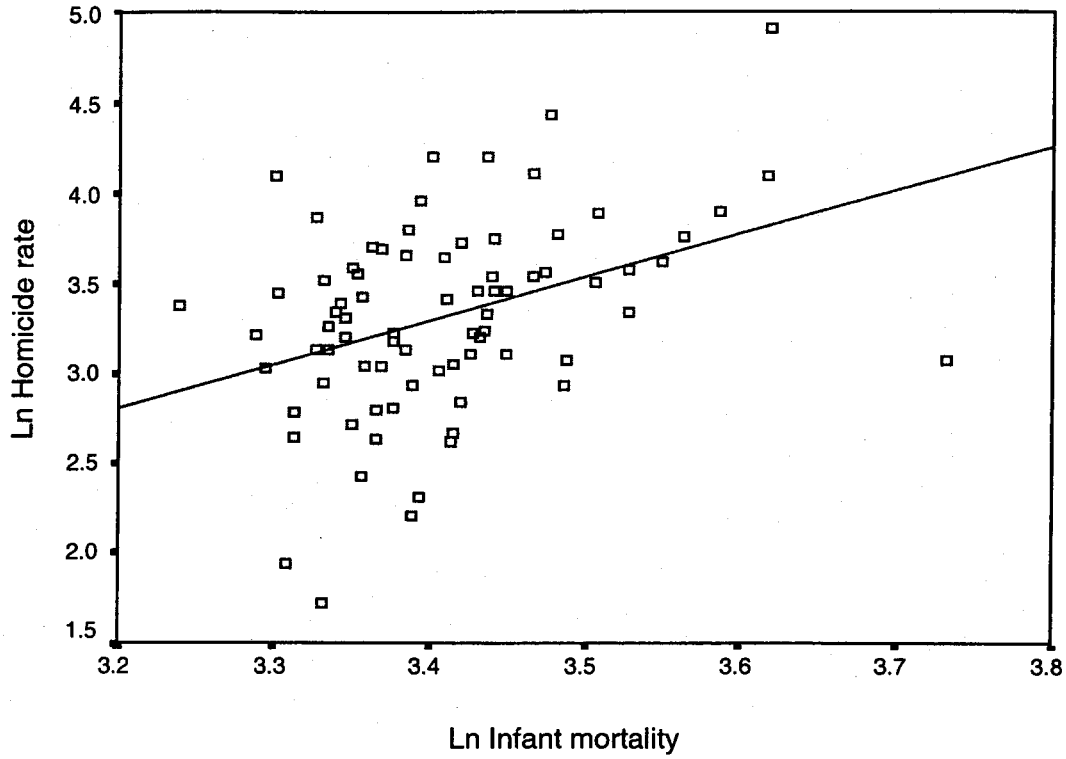
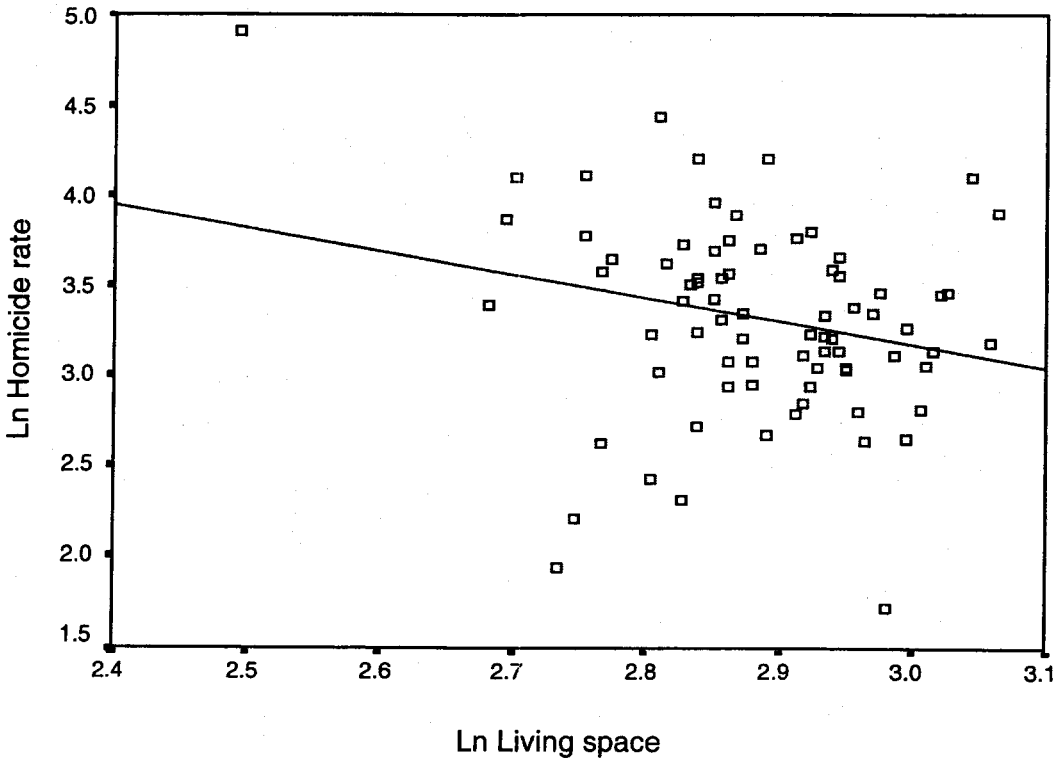
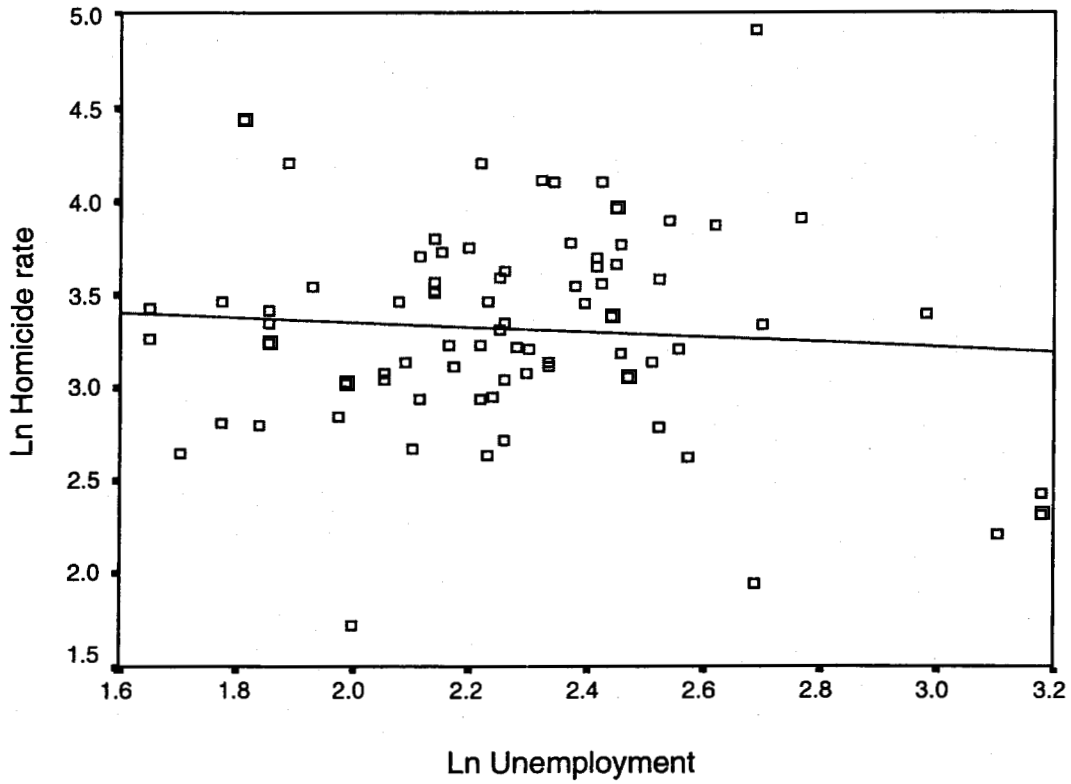
Appendix E

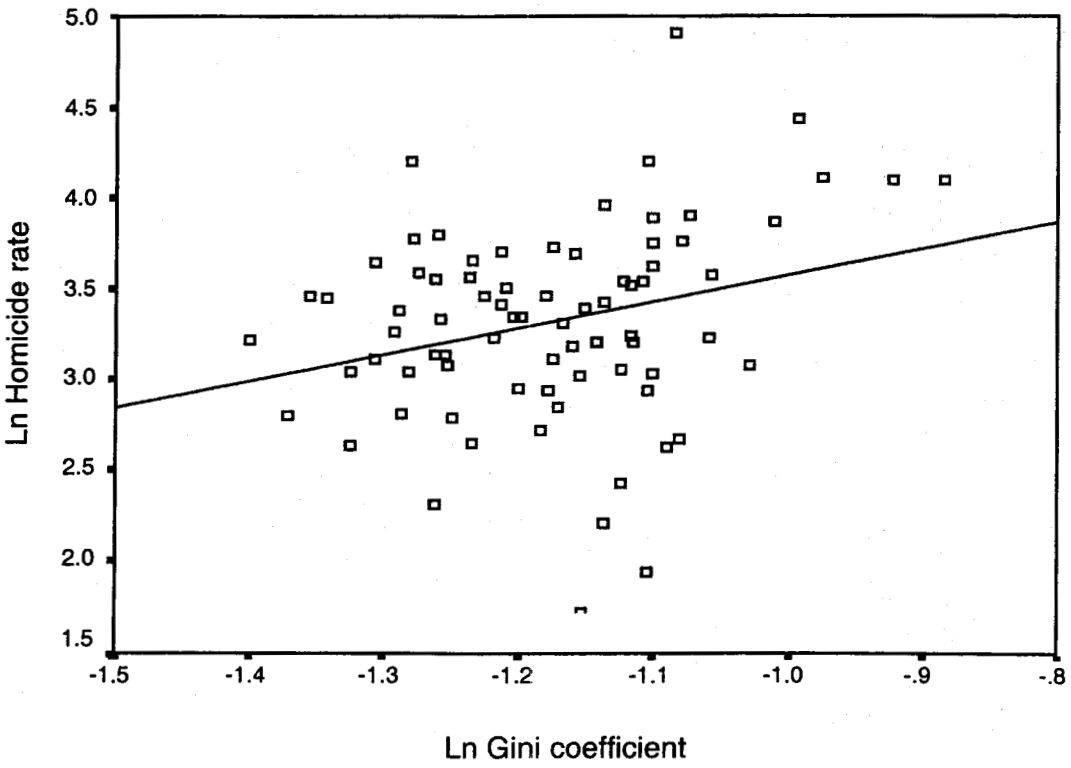
Scatterplots of logged independent variables with logged homicide rates

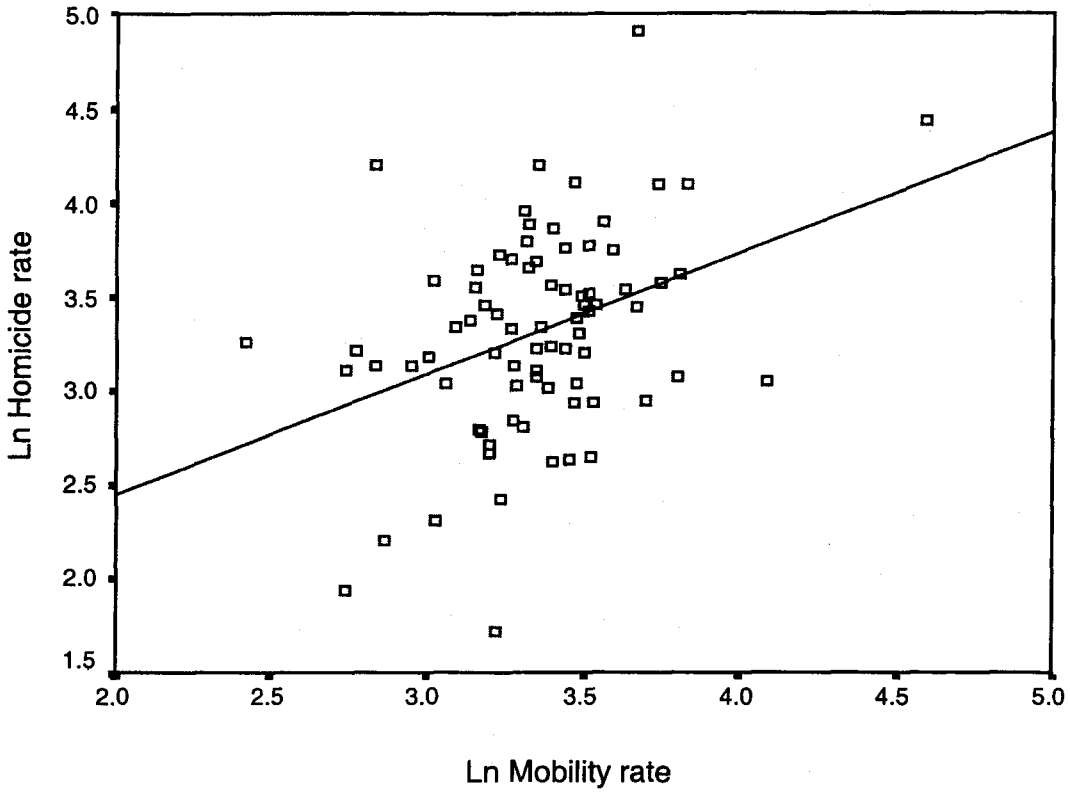


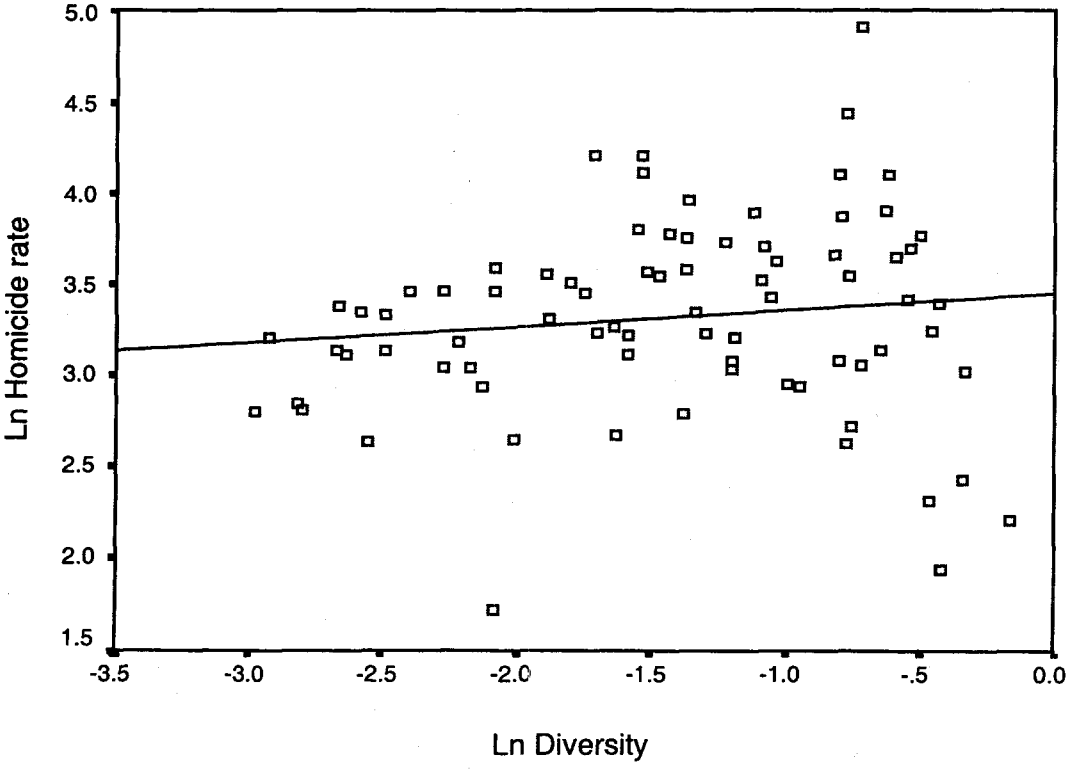


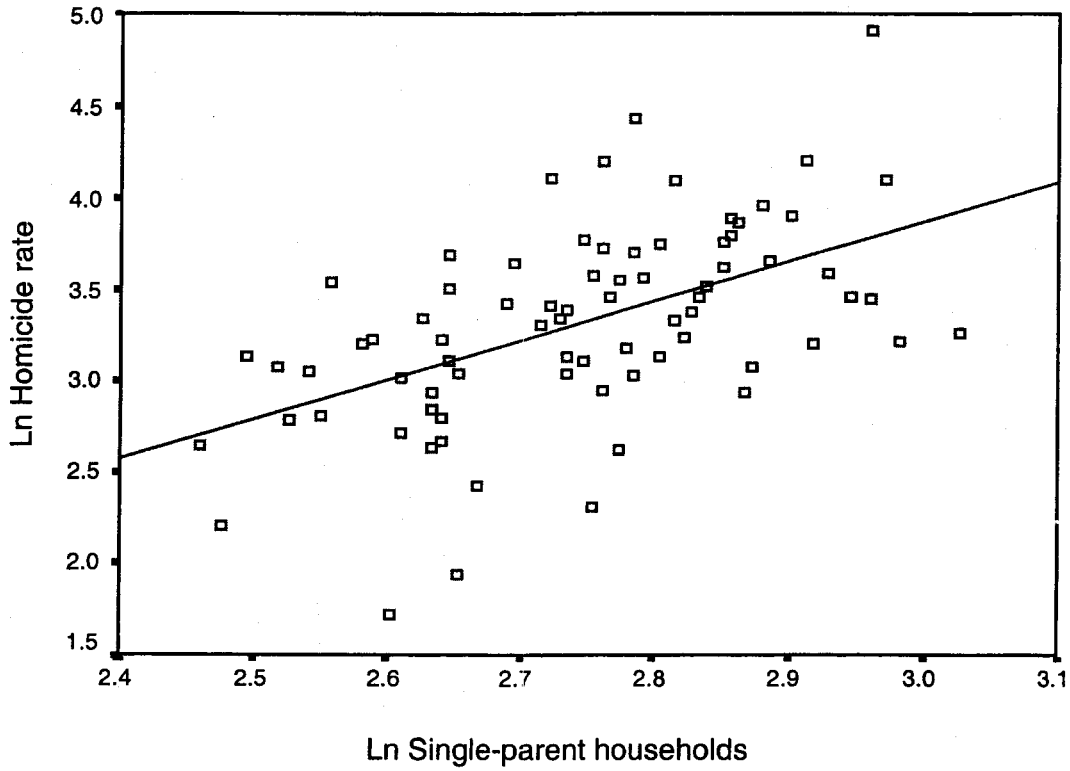


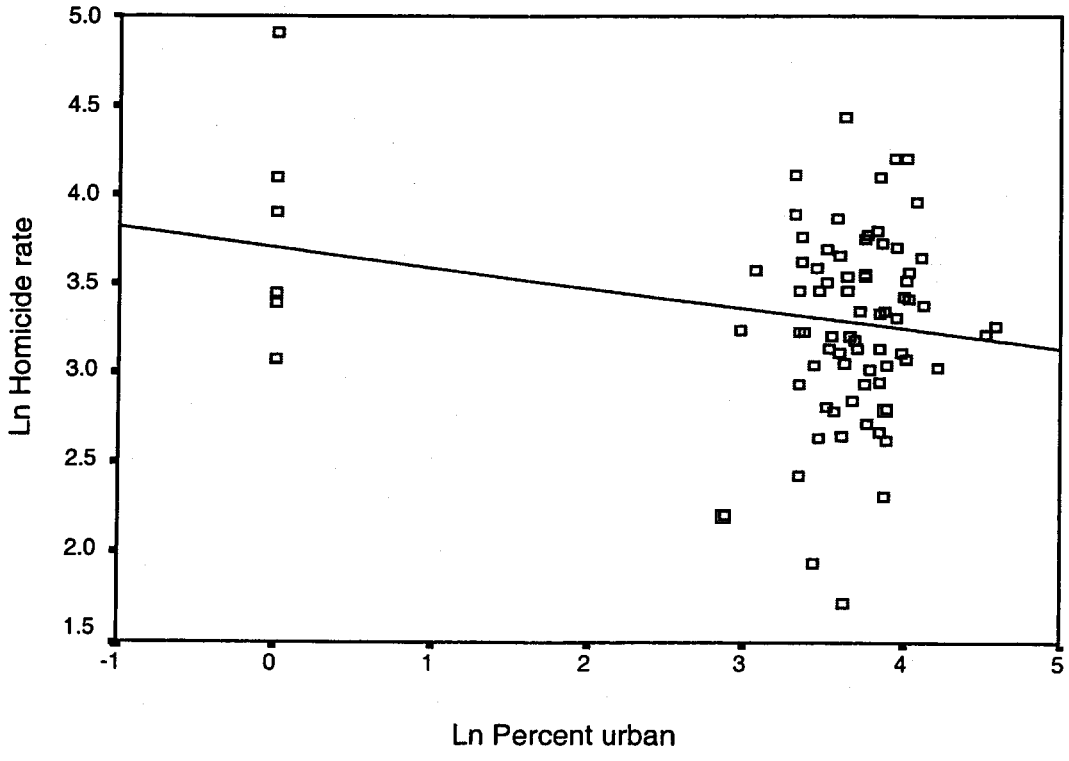


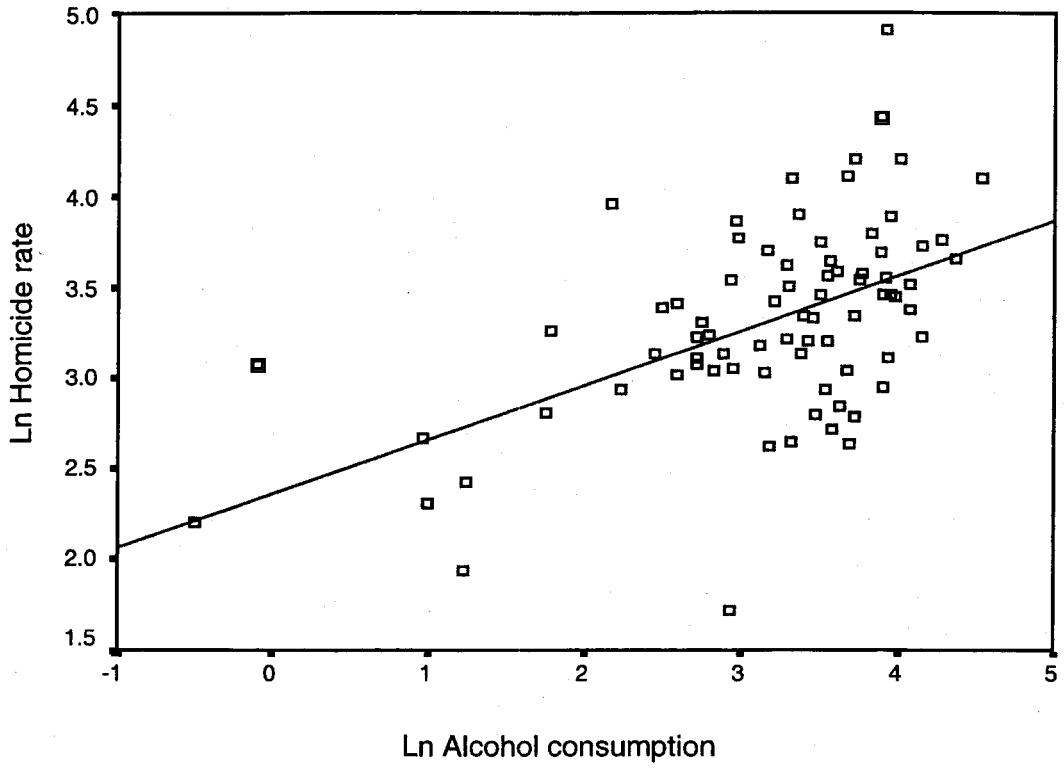


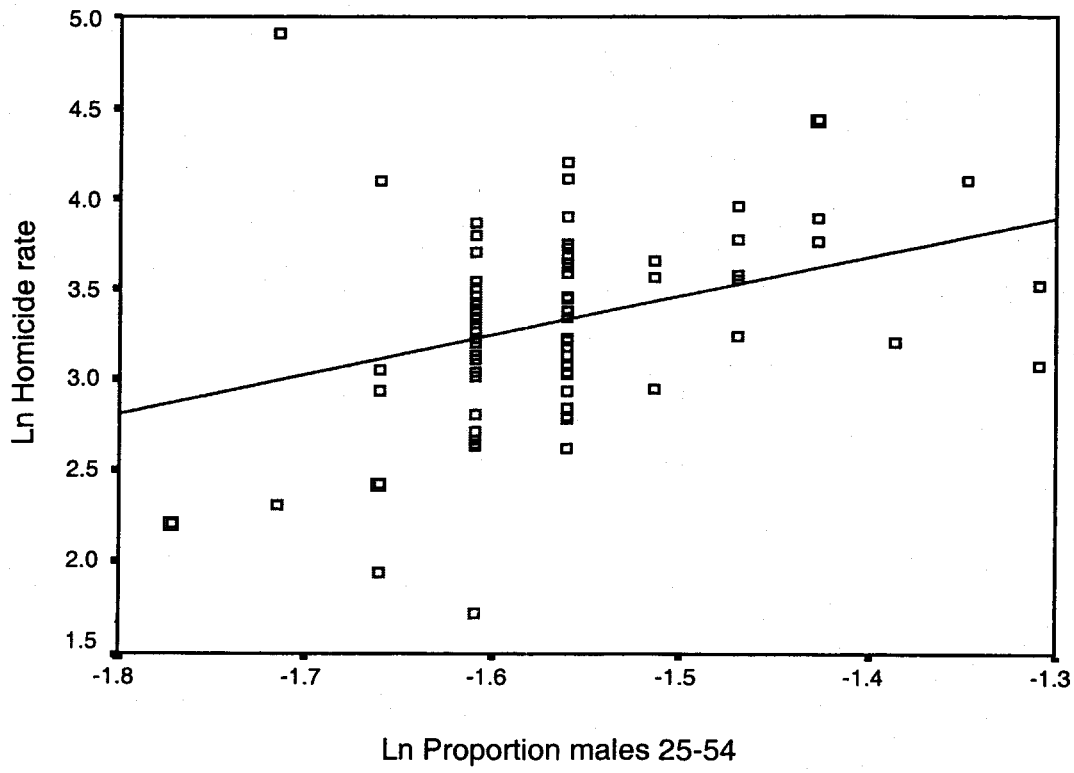


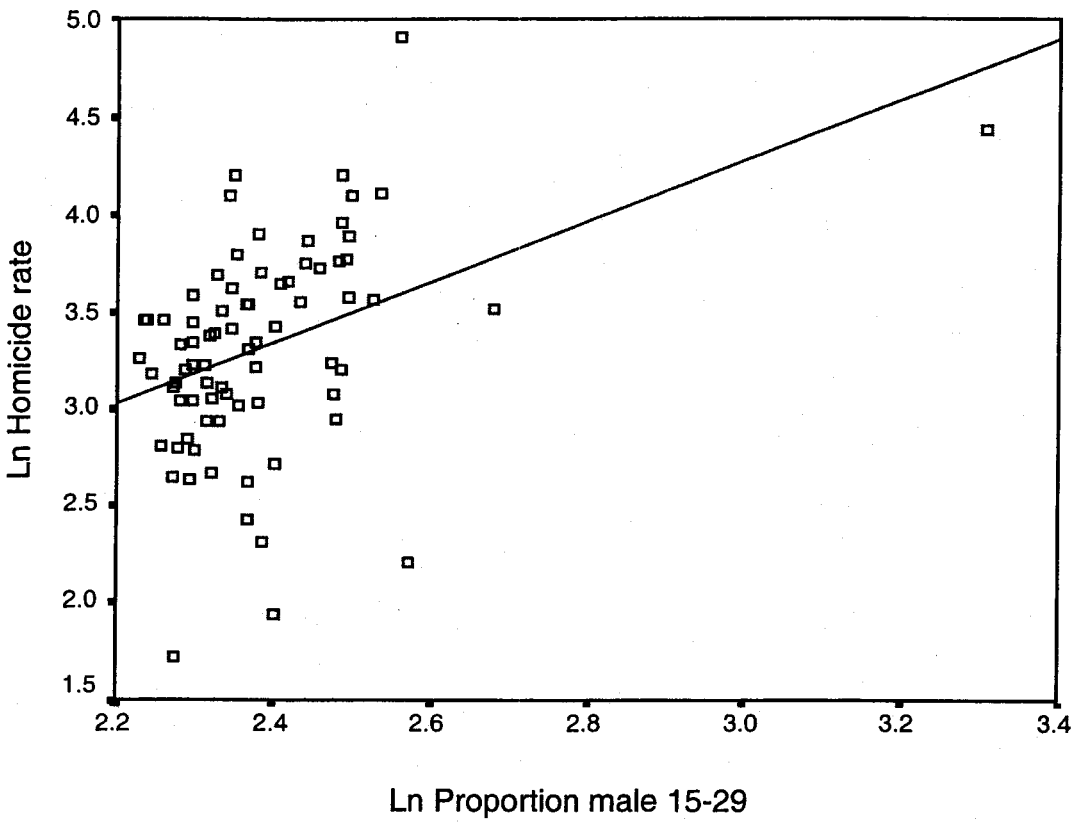












Appendix F

Description of United States data

Chapter 6 compares the results of comparable models estimated in Russia and the United States. Chapter 3 describes the Russian data in detail, since the publications in which the data are located are in Russian and since the data themselves have been rarely used by Western researchers. The data for the United States on these structural factors, however, are much more common and the reader is likely to be more familiar with them. For this reason, this brief description of them is placed here in an appendix so as not to lengthen the discussion in Chapter 3. Each of the theoretical elements is listed below, together with how it is operationalized and the source of these data. The closest comparable unit of analysis to the Russian region is the U.S. state.

Table F.1. Description of United States data.

Theoretical element	Description
Homicide	Any purposeful killing of one person by another, whether or not the homicide is defined as criminal. As for Russia, these are mortality data and thus represent victimizations. They are contained in E960-E978 of the International Classification of Diseases codes and are available for 1995 from the Centers for Disease Control (2000a).
Poverty	The percentage of the population living below the poverty line. The threshold is for families. The measure is based on monetary income before taxes and excludes non-cash benefits such as public housing, medicaid, and food stamps. The data are 1995 estimates and are available from the United States Census Bureau (2000a).

Theoretical element	Description
Infant mortality	Used as an instrumental variable for poverty. Defined as the number of infant deaths (of children under one year old) per 1,000 live births. Data are for 1995 and are available from the Centers for Disease Control (2000b).
Unemployment	Percentage of the working age civilian labor force that is unemployed. Data are for 1995 and are available from the United States Bureau of Labor Statistics (2000).
Living space	Defined as the percentage of the population living in households with 1.01 or greater persons per room. Available from the Census Bureau's (1994). Data are from the 1990 census.
Inequality	Gini ratio, calculated using household incomes. Data are from 1989. Available from the United States Census Bureau (2000b).
Mobility	Rate per 1,000 population of people moving into or within the state. Inmigrant data are for the period March 1995 to March 1996 and are available from the Census Bureau's Current Population Survey (Table 21, p. 70). Data on within-state movers are taken from the 1990 census (available from the 1994 *County and city data book*), which provides a measure of the percentage of the entire population that moved residences at least once during the previous five years. This percentage was divided by five and multiplied by the 1990 state population to get an estimate of the yearly turnover. This number was then added to the number of inmigrants, divided by the population, and multiplied by 1,000 to get the rate per 1,000.
Heterogeneity	Lieberson's measure of population diversity (see discussion in Chapter 3) based on 1995 population estimates for the categories of White Hispanic, White non-Hispanic, Black, American Indian, and Asian/Pacific Islander. Taken from the United States Census Bureau (2000c), ST-98-27.

Theoretical element	Description
Family disruption	Proportion of all households that are headed by females with at least one child under 18 present. Available from the Census Bureau's (1994) *County and city data book.* Data are from the 1990 census.
Urbanization	Percentage of the state population living in cities greater than 100,000 population. Data are for 1995, taken from the United States Census Bureau (2000d) publication ST-98-7.
Young males	Proportion of population male and between 15 and 29 years old. Data are 1995 estimates and are available from the Census Bureau (2000e).
Alcohol consumption	Rate per 100,000 population of deaths due to chronic liver disease and cirrhosis, specified as alcohol. This is 571.0 - 571.3 in the ICD codes. Data are for 1995 and are available from the Centers for Disease Control (2000c).

Table F.2 below provides the mean and standard deviation for each of the variables in the United States. The corresponding values for the Russian data can be found in Table 3.2.

Table F.2. Descriptive statistics for United States data.

Variable	State mean	Standard deviation
Homicide rate	7.31	3.88
Poverty	12.94	4.13
Infant mortality	7.50	1.35
Unemployment	5.19	1.18
Living space	15.90	2.81
Inequality	0.43	0.02
Mobility	98.86	15.81
Heterogeneity	0.31	0.16
Family disruption	6.25	1.01
Urbanization	19.23	13.70
% young males	10.64	0.63
Alcohol consumption	4.58	1.70