THE RELATIONSHIP OF CRIME AND OIL DEVELOPMENT IN THE COASTAL REGIONS OF LOUISIANA

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I dedicate this work to my parents. They have always offered unwavering support of my educational goals. My accomplishments would not have been possible without their love and many sacrifices. Although they may not always understand what sociology is or know exactly why I loved it from the very first sociology class I took at William and Mary, they have never questioned the long road that I chose to take. Thank you for your encouragement and for doing everything that you could to make this sometimes difficult process easier for me.

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ABSTRACT

This project examines the relationship between patterns of crime and the development of the oil and gas extraction industry in the coastal regions of Louisiana. The suggestion of a link between these phenomena has often been made, but little systematic research has been conducted to determine if there is indeed a crime-oil development nexus. Limited previous research has focused primarily on the issue of "boom and bust" cycles on some forms of deviant behavior, but the data and the methods used were inadequate, and thus, the resulting conclusions were often misleading or possibly erroneous.

During the course of this project, a comprehensive database is constructed that facilitates a longitudinal analysis of concomitant variation in crime patterns and oil extraction activity. Annual crime data are obtained at the parish and county level for all years beginning in 1974 and merged with corresponding social and economic data. This dataset allows for a multivariate pooled time series analysis, with adequate controls, to determine the degree of influence between oil activity and crime patterns.

The results from the analysis suggest that changes in oil activity and high levels of labor market involvement in the offshore oil industry are not strongly associated with community disruption in the form of crime. The only statistically significant effects due to changes in oil activity are decreased levels of homicide and aggravated assault. Oil development is not associated with any other crime in the analysis despite accounting for the boom and bust cycles of the oil industry over a 25 year period for 12 parishes that are highly involved in the industry. As the industry becomes more active and undergoes an increased labor demand, incidents of homicide and assault decline in the community. This finding does not support some previous boomtown model research that argues that energy development causes higher rates of social

disruption, including higher crime rates (Seydlitz et al. 1993a; Brookshire and D'Arge 1980; Dixon 1978; Finsterbusch 1982; Freudenburg and Jones 1991; Gramling and Brabant 1986).

CHAPTER 1

INTRODUCTION

1.1 Statement of the Problem

By the end of the 1960s, the oil industry, including offshore production, was an integral part of the social and economic organization of the coastal regions of Louisiana, as it has continued to be for the last three decades (Gramling 1996). The focus of this study is specific to one enduring, but largely unanswered question regarding the possible concomitant social changes that have occurred with the presence and growth of the oil and gas industry – what, if any, has been its influence on crime? While it often has been suggested that the social and economic impact of the oil and gas industry has contributed to various social problems in the region, there has been little systematic research on the subject of crime. Much of the evidence suggesting a connection between petroleum development and crime is anecdotal or speculative in nature, and to the extent that empirical research has been conducted, it has been limited in scope and inconclusive in results (Seydlitz et al. 1993a,b). This study addresses the possible relationship between the development of oil and gas extraction activities and the nature, volume, and distribution of crime in the involved parishes of south Louisiana.

1.2 Limitations of Previous Research

Raising the question of a connection between a large scale, ongoing economic transformation and crime in communities poses a number of difficulties to framing an adequate empirically based answer. With respect to this question, these difficulties have not been overcome in the previous studies that have addressed it. There are a number of reasons for this. For example, Seydlitz et al. (1993a,b) examined the relationship of changes in oil industry activity to levels of homicide and suicide in Louisiana parishes. They found that homicide rates

were higher when oil industry activity was greater and when oil industry activity was rapidly changing. There are, however, a number of problems in the design and data used that should lead us to interpret these conclusions with caution. One is a focus on serious, but statistically infrequent types of deviant behaviors. For example, homicide and suicide rates, particularly for small units of analysis (e.g., parishes) may vary substantially with relatively small changes in the frequency of the incidents. Thus, the random variation in the rate may be great, but nevertheless random, and a relationship to other variables can be misleading. A lack of adequate controls in the design also may pose problems particularly with respect to internal validity. This seems to be a particular problem with the research cited above. Analysis of petroleum production activity as a predictor of crime patterns without simultaneous control for factors that may disturb this relationship (i.e., create a problem of spuriousness), also may lead to misleading or invalid conclusions. Changes, like rising or falling crime rates, cannot be assumed to be unique to the communities studied, but may be occurring in the broader environment as well. This reflects the problem of "history", or events occurring in addition to the experimental variable (Campbell and Stanley 1966). Thus, if similar patterns in crime rates are occurring in other communities, independently of the presence of oil industry activity, it would suggest the latter should not be considered causal. In addition, many endogenous changes in or characteristics of communities (e.g., population size, age structure, mobility, economic inequality, urbanization, employment or unemployment, to name but a few) may be associated with some feature of the economic substructure, as well as with crime. Thus, what appears to be a direct or "causal" connection with the latter may be indirect or even independent. A research design must be particularly sensitive to this problem.

There has been a long tradition in sociology focusing on the influence that social and economic changes have on levels of crime and deviance. Many studies have suggested that rapid economic development and growth in the form of "boomtowns" initiate patterns of disruption in communities that impact the capacity of social institutions to effectively regulate behavior (see Murdock and Leistritz 1979). The result, even in the presence of an improving economic environment, often is declining satisfaction with community life, lower community integration, increasing fear of crime, and perhaps crime itself, and this is true particularly for rural and small communities (Krannich et al. 1989; Krannich et al. 1985; Brown et al. 1989; England and Albrecht 1984; Freudenberg and Jones 1991; Sampson and Groves 1989; Howell and Weber 1982).

One of the unique features of oil and gas extraction is its cycles of expansion and contraction in supply and demand. It has been suggested this pattern is analogous to "boomtown" communities. However, this analogy may not be completely appropriate (Wilkinson et al. 1982; Gramling and Brabant 1986; Luton and Cluck 2004). Oil development in the region, beginning before WWII, has taken place in a broad context of social change, secularization, and economic development, both locally and nationally. Changing crime patterns must be understood as occurring in this broader context, and are unlikely to be reducible to a single aspect of it. While this study will be sensitive to the role that flux in oil production may play (probably indirectly) in changes in crime patterns, it is within this broader context of social change that I will seek to interpret patterns of crime in the region.

1.3 Theoretical Perspectives

This study will be guided by a framework that conceptualizes crime as a characteristic of communities as such. This is to say that the main objective will be to explain variance in the

volume, distribution, and forms of crime in communities as opposed to explaining individual criminal acts. From a sociological point of view, it would be a violation of scientific logic to suggest a direct causal link between the general increase in economic prosperity that is associated with oil development and the propensity of particular individuals to commit crime. It also would not be consistent with a sociological imagination to suggest a single factor alone, such as the oil extraction industry, can validly explain changes in complex and heterogeneous phenomena such as crime. Indeed, Sampson and Wilson (1995) argue that such economic deprivation explanations suffer from the " 'materialist fallacy' – that economic (or materialist) causes necessarily produce economic motivations" (45). Ecological studies cannot assume that unemployed or underemployed individuals are the ones committing the crimes. Instead, a deleterious labor market may elevate crime rates among both the employed and underemployed populations through its impact on the community at large. High rates of unemployment and work instability may lower stakes in conformity and social control due to residents' disengagement from community institutions, thereby increasing crime. Moreover, the relationship between labor market conditions and crime is more complex than economic motivation within individuals. Getting a job means more than having an income. It is a basic framework for daily life that provides opportunities to learn new skills, expand social networks, and gain familiarity with organizational life. In short, work life is one of the most important conduits to mainstream society. For as employment prospects improve, stakes in conformity are gradually developed as people become more closely linked to their communities. Therefore, job opportunities have consequences that extend far beyond economic success. Participation in the labor force creates a sense of allegiance to the wider community and therefore enhances a community's prospects for social control.

This investigation initially will be informed by sociological perspectives on crime and deviance that are applicable to the community-level analysis: social disorganization theory and the routine activities perspective. Social disorganization theory suggests that differences or changes in community-level patterns of crime and deviance may be understood as a consequence of changes in the structure of institutions (e.g., familial, occupational, educational, etc.), that reduce the capacity of communities to control the behavior of their members, thus increasing the proportion of acts which fall outside the normative boundaries (Kornhauser 1978; Sampson and Groves 1989; Shaw and McKay 1942). Social disorganization is a consequence, and to an extent unavoidable, aspect of social change. While formal controls such as the threat of legal punishments and the effectiveness of law enforcement are important variables in the study of crime patterns, focusing on the effects of social change and disorganization leads us to emphasize that role of "relational controls" in preventing deviance. Relational controls refer to the kinds of rewards and values persons receive as a consequence of being embedded in a network of conventional social relationships. These kinds of controls may be thought of as "stakes in conformity" that persons risk if they engage in norm violations (Hirschi 1969; Sampson 1986; Bursik and Grasmick 1993). To cite but one example, the family is an important institution of social control not simply because it is a source of "morality," but because it is characterized by attachment, commitment, and involvement that participants stand to lose as a result of deviance. Thus to the extent that a higher proportion of a community's population is "free" from the family (e.g., young adults living alone), so will crime and deviance be proportionately higher, all other things being equal. To the extent that change occurs in the economic infrastructure that influence the household/family composition and structure, which it has in modern societies generally, it may contribute to higher levels in some types of crime. The

impacts of development and change must be understood in terms of their indirect positive and/or negative effects on crime rates through effects on community social organization.

Another perspective in the sociology of crime that can be adapted to the purposes of this research is the routine activities theory of crime events. This perspective primarily is an explanation of trends and cycles in criminal victimization patterns. In this framework, high levels of unemployment lead to large numbers of people spending most of their days and nights either at home or near their home thereby increasing the number of guardians at home and in the neighborhood. From this point of view, most crime events require the convergence in time and space of (1) likely offenders, (2) suitable targets, and (3) the lack of capable guardianship (Cohen and Felson 1979; Sherman et al. 1989; Osgood et al. 1996). Moreover, it is proposed that high levels of unemployment will increase guardianship and reduce the availability of potential targets. Therefore, unemployment is expected to be negatively associated with crime. Patterns of crime events, then, will be affected by social processes that affect any one or all of these necessary conditions. Human communities are conceptualized as systems of temporal interdependence where social interaction in the population is structured by "routine" patterns of activity and interpersonal contact. To the extent that social change produces changes in typical patterns of activity in communities that promote or reduce the probability of the three factors converging in time and space, changes in crime rates will occur. For example, if the employment structure of a community changes in such a way that it increases females' participation in the labor force, one predictable consequence is a rise in the rate of household burglary. This occurs not necessarily because of an increase in the proportion of motivated offenders (criminals) in the population, but because of the effect that dual employment of husband and wife has on guardianship, and perhaps also because higher household incomes

increase the value of home contents (suitable targets). Thus, if major economic change occurs, of which oil development would be but one aspect, its effects on social system activity may indirectly influence crime. In this sense, improvement in economic well-being and economic opportunity may entail a cost of higher levels of some forms of crime. However, it is equally plausible that change may occur in a form that may constrain that convergence of these factors, thus reducing the rate of crime events (Liska and Warner 1991).

As these perspectives suggest, understanding crime at the community level is multifaceted in nature. In studying the possibility of an oil-crime nexus, previous work has not been sufficiently sensitive to this fact either in design or interpretation. It is the purpose of this project to offer the empirical foundation for a more hermeneutic understanding of this complex question.

The previous discussed literature suggests that the ways in which the oil and gas industry affects local communities may differ from studies that have focused on western boomtown communities. Given the very limited number of studies that have attempted to address this question, it is important that additional research be conducted, especially research that examines crime across a number of counties that are highly affected by the oil and gas industry. This research is even more important in light of the United States' increasing need for energy supplies. Due to the increase demand of oil and gas, coastal communities in the Gulf region will likely experience periods of high oil prices and high levels of oil extraction and production, which will result in higher labor demands in coastal communities. One way to predict the future for these communities is to better understand the nature of social impacts that occurred during boom and bust cycles in the past.

1.4 Objectives of the Project

This study addresses the need for research that focuses specifically on the relationship of oil and gas activity and crime. There are two principal objectives of this study. First, I seek to develop a comprehensive dataset that will facilitate the analysis of crime patterns in the Gulf of Mexico region since 1970. The dataset will merge annual FBI Uniform Crime Reports (UCR) data with annual parish-level social and economic data (including indicators of oil industry activity) for the same time period. The second major objective is to test the general proposition guiding the research: that there is an independent effect of oil industry activity on crime patterns in the involved parishes of south Louisiana. This will be accomplished through a multivariate pooled time-series analysis that will test the association of oil activity in the form of "boom" and "bust" cycles using a control sample of similar, but non-oil involved U.S. counties.

The study is presented in five chapters. Following this introduction, chapter two presents a review of relevant literature. This review includes a discussion of the following theoretical perspectives: (1) the boomtown community impact model and social disruption; (2) extraction industries and their impact on community crime rates; (3) the oil and gas industry's relationship to crime; (4) social disorganization theory and crime; and (5) routine activities theory and crime. The third chapter discusses the methodology used to evaluate the research expectations of the study. Chapters four and five present the major findings of the study, a discussion of the conclusions, suggestions for future research, and policy implications of the study's findings.

CHAPTER 2

REVIEW OF LITERATURE

2.1 Boomtowns and Social Disruption

The impacts of energy development have been a major subject of debate among sociologists for quite some time. Early rural sociological research on energy development focused mainly on western mining communities or "boomtowns" in the United States and Canada (McKell et al. 1984; Wilkinson et al. 1982; Albrecht 1982). These communities primarily developed in response to the energy price shocks of the 1970s and early 1980s. Boomtown theorists argue that the extraction of natural resources requires large and rapid labor demands that cannot be filled by local residents. Therefore, the new employment possibilities result in high levels of new inmigrants living and working in small, rural, and often geographically isolated communities (Cortese and Jones 1977:77; Albrecht 1978:73). As the population increases suddenly due to labor demand, the community resources and infrastructure are strained. Communities cannot sustain or manage the high demand for public and private housing (Gilmore 1976:536), schools, hospitals, law enforcement, criminal justice, roads, electricity, recreation and parks, libraries, water, sewer and sanitation, and fire and emergency services. The local tax bases are unable to keep up with the new and sudden demand for resources (Bates 1978:76; Albrecht 1978:81-83; Cortese and Jones 1977:81-83; Gilmore 1976:536-537). The population increase not only affects the community's demographic patterns and demands for infrastructure and services, it also affects the nature of the local economy. While the new labor pool energizes existing local businesses, it also increases costs for housing (due to limited supply) and labor (due to the increase in competition for workers). In some

instances, local businesses cannot survive due to the increased level of competition (Cortese and Jones 1977:80).

Initially, one may expect primarily positive effects due to the increased demand for labor. New jobs result in higher personal and household incomes as well as expenditures, which in turn, stimulate local businesses. As local businesses increase their revenues, local government also benefits through increases in the sales and property tax base. Under these circumstances, local communities should be able to offset the additional costs incurred for providing additional housing and public services. However, the boomtown model examines more than just the adaptation to rapid population growth in a single community. Sociologists, demographers, and human ecologists have studied the impacts of population growth on individuals and communities long before the energy-related boomtowns of the 1970s and 1980s (e.g., Park et al 1925; Shaw and McKay 1942). The primary differences in the boomtown model are that (1) the population increases occurred in rural, agricultural, and predominately socially homogenous areas so the population did not simply increase – it also diversified (Albrecht 1978:88); (2) the population increases were due to a single energy-related project; (3) the labor demand could not be completely filled by local residents or local commuters (given that the towns were geographically isolated from other communities); and (4) the population increase was often followed by a rapid population decline soon after the project was completed. The workers moved in during the construction phase of the project during a stage of high labor demand, suddenly impacted the local residents, businesses, and resources, and then left the town as soon as the project declined or when a new employment opportunity or new industry project arose somewhere else.

Luton and Cluck (2004:5-6) outline five main consequences of rapid population increases in their review of the traditional boomtown model. First, demographic effects are caused by new labor demands of the project. Second, economic effects occur that are a result of both the labor demand and the resulting demographic changes in the community. Third, infrastructure and public services are impacted. These include higher demands for housing, courts, police, schools, health services, and modes of transportation. Fourth, communities undergo fiscal impacts due to the changes in the local tax base. These changes are the result of the extractive project, the change in population, and the demographic effects. Although local governments initially collect more money due to taxes and fees, they also have higher expenditures for roads, safety, infrastructure, and health care services. Finally, Luton and Cluck (2004) discuss the social and cultural impacts due to the initial population increase in boomtowns. These impacts include changes in community characteristics such as community identity, social norms, values, and social networks. It also includes the identification of social groups that are both positively and negatively affected by the population increase and an examination of how these effects are distributed among these different groups in the community. Although all five types of effects are important in understanding the boomtown theoretical model, this last category of effects, *social effects*, is the primary focus of this study. A number of social consequences due to boomtowns are discussed at length in the following section.

2.2 Extractive Industries, Social Problems, and Crime

Bunker's model of extraction predicts many of the deleterious social conditions that can be caused by energy development. This boomtown-related model differentiates communities by their participation in extraction versus production activities (Bunker 1984). His theory outlines several reasons why extraction-based communities tend to be more volatile than communities

that are more active in energy production processes. He argues that in extraction communities, such as boomtowns, "…the exploitation of natural resources uses and destroys values which cannot be calculated in terms of labor or capital." (1019). Bunker also states that the natural extraction economy "impoverishes the environment on which local populations depend, both for their own production and for the extraction of commodities for export." (1019-1020). As a result, extractive activities affect communities differently compared to production-related activities because extractive economies have fewer lateral linkages, can be quite volatile, isolated, and tend towards stagnation (1057-1059).

Most of the early boomtown research links rapid population increases to a variety of social problems such as divorce, suicide, alcoholism, mental illness, social isolation, alienation, and crime (Kohrs 1974:1; Bates 1978:74; Albrecht 1978:76-81; Summers and Branch 1982:24-25, 28-29). According to Kohrs, "The history of power production – synonymous with boom development – in Wyoming is a dismal record of human ecosystem wastage" (1974:1). As a clinical director of a counseling center in Wyoming, he continues to assert that overcrowding and inadequate planning for meeting needs have resulted in "drunkenness, anomie, mental discord, suicide attempts and teen-age rebellion" (2). He then refers to the following "Gillette Syndrome" as one common reason for divorce in boomtowns:

> A housewife, after fighting mud, wind, and inadequate water and disposal systems, a crowded mobile home and muddy children all day, snaps at her husband as he returns from a 16-hour shift. He responds by heading back downtown and spending the night at a bar drinking and trading stories with me from similar circumstances [p.3].

Despite the many economic advantages that accompany new employment opportunities, the boomtown is generally described as a community plagued by social problems. One example is Cortese's study (1982) of the effects of rapid growth on major local organizations within a

community – schools, health and social services, local business organizations, local government, and churches. Through examining these organizations due to their relationship to the major social institutions of education, social services, the economy, the polity, and religion, he finds that the long range implications of population change are more qualitative. "Local institutions are called upon to do things that they had not done before, or to do things in a different way" (117). One example of this social malaise is the rift between old timers and newcomers in boomtown communities. He found the economic benefits were unevenly distributed in the population and came with "rather severe costs" (124). Local residents held considerably strong feelings of hostility toward the business people who benefited from the boom. Local government officials complained that "[t]he newcomers bring with them expectations that are unrealistic or foreign to the longtime residents." (126). In turn, this creates conflicts over funding of community projects and services.

During rapid growth, communities become more culturally diverse and less provincial and socially isolated. There is a trend toward professionalism and respect for expertise and toward specialization and bureaucratization. There is a growth in size and centralization, a change toward the increased profit motive, a greater reliance on formal institutions, more inequality, and greater expectations and demands placed on social institutions. In particular, two long-range effects in boomtowns were the increasing loss of autonomy within each of these institutional areas and a similar loss in identity and reduced cohesion in communities undergoing rapid population growth.

Cortese's (1982) conclusions about the negative social impacts due to boomtowns are a common thread throughout the boomtown literature. However, many of the studies also report contradictory results and suffer from methodological flaws. Wilkinson et al.'s (1982) critical

review of local social disruption and western energy development outlines several weaknesses in the boomtown literature. The authors object to the "…assumption that local social effects of western energy development are severe and negative." (Wilkinson et al. 1982:276). They note several studies that are frequently cited but yet make these claims with very little evidence. "Flaws in scholarship are apparent in this literature in citations of undocumented assertions as evidence, questionable interpretations of empirical data, overgeneralizations of conclusions, and absence of controls in measures of relationships." (278). Finally, the authors note, "[i]nadequate attention in this literature is given to the possibility that increased incidence of recorded behaviors might result from such factors as changes in the recording system, changes in age composition of the local population, or changes in budgets, staff sizes, or policies of agencies responsible for locating and dealing with the behaviors" (280-281). The cited data on rapid, energy-related growth in the West does not prove disruption, "In the sense of increased rates of what are commonly called social problems" (281).

Wilkinson et al. summarize the reasons given for the disruptions. Some researchers emphasize crowding and excessive demands on public services, or contrasts in lifestyle, interests and resources of new and old inhabitants. "Riff-raff" can temporarily contribute to the problem (281) and transient populations are associated with crime rates. Population growth can cause a breakdown in social controls, create antagonism between former friends, and reduce "neighboring." Consequently, population diversification may increase conflict in the community. The exploitation of local resources by outsiders also may increase conflict levels. The authors also note that western energy development research "is not based on a cogent theory." However, they argue, that "many of the postulates suggested …relate, at least implicitly" to a theoretical perspective that could be traced to Tönnies, Durkheim, Maine,

Redfield, and Becker – a distinction between "rural and urban forms of social organization" (282-283). Wilkinson et al. assert that the conclusions of many of the western energy development discussions are consistent with this perspective (283).

Wilkinson et al. (1982) counteract this perspective, noting that "the relatively short histories of most western communities would not be sufficient for development of the kinds of relationships indicated in the classical rural type and this type may never have even existed in the United States (284; see also Dewey 1963:66; Mann 1965:4; Bernard 1973:96). Communities in this region have been marked by recurring conflicts and upheavals, by fluctuating ties with the larger society, and by periods of heavy in- and out-migration. The area has a marked individualistic bias. "The historical evidence supports, instead, the observation that the form of social organization described as urban in the classical typologies has prevailed, more or less, in this area and that local communities in this region have developed in close contact with trends and forces in the larger society" (284). Second, the authors argue that no convincing evidence exists that levels of stress are lower in rural areas compared to urban ones (285). Third, while there is some evidence that economic change can create stress, this evidence in not overwhelming. If these communities have experienced change before, they probably have developed "…social and personal mechanisms for coping with change…" (285). The distribution of losses and gains should also be considered. Entrenched power figures (ranchers, politicians) may experience more stress than other old timers who benefit from the changes. Also, one should not assume that communities are equally dominated and exploited from outside interests and are left to pay the cost (286). Nor is it clear that outside domination is unique to these communities or new (287).

Considering the points discussed above concerning the "social disruption" thesis, the authors conclude: "we do not know, on the basis of scientific evidence, whether energy development leads to increase rates of divorce, crime, mental illness, alcohol abuse, child abuse, and other disruptions in small towns; and we do not know, on the basis of explicitly relevant evidence, whether a rural form of community life is being overrun, as claimed, by the urban society in its quest for energy" (288).

A series of articles responded to Wilkinson et al.'s (1982) critique of boomtown studies that linked energy extraction to social disruption. Albrecht (1982) begins the debate by agreeing with Wilkinson et al's concern that studies on this subject tend (1) to quote from each other with little empirical support for their conclusions, (2) to identify the same questions repeatedly without actual data about their occurrence, and (3) to present community data without a clear demonstration that the described problems are related to rapid energy-related growth. However, Albrecht objects to Wilkinson et al.'s selective use of literature and asserts that the authors ignore important studies of energy-impacted communities that document problems such as high job turnover and increased rates of crime, mental illness, illegitimacy, alcohol and drug use, marital conflict, and divorce. Moreover, Albrecht (1982) argues that there is a "virtual absence of any firm empirical support for the conclusion that these impacts do not occur" (228). He differs from Wilkinson et al. by claiming that the small western communities in question, with their concentrations of Mormons, Native Americans, and Mexican Americans, and their histories of semi-isolation and communitarian values, are unlike most U.S. rural communities. These western communities do in fact exhibit many classic gemeinschaft characteristics and thus are highly vulnerable to rapid population change (Albrecht 302). Albrecht also highlights several unique factors for why small western communities were severely disrupted by rapid change: (1)

growth rates were extremely rapid; (2) geographic isolation meant workers could not live in nearby urban centers and commute; (3) the populations of many of the communities were less in 1970 than in the early 1900s; (4) the social and cultural homogeneity of many of the communities made them unprepared to deal with a different population; and (5) there was a virtual absence of well-developed local infrastructure such as schools, law enforcement, hospitals, etc. (302-303).

Finally, Finsterbusch (1982) offers a position somewhere in the middle of Wilkinson's strong critique of the boomtown literature and Albrecht's general support of many of its conclusions. Finsterbusch argues that two factors are important in determining the degree to which communities are disrupted by energy development. First, the degree to which the community is stable, homogeneous, nonindustrialized, folkish, and integrated affects how disruptive the boom changes will be. Wilkinson et al. (1982) point out that many western communities have a history of growth and decline and a fair amount of population turnover, so they should not be shocked by booms. Second, the characteristics of the newcomers must be considered in evaluating boom effects. Part of the exaggerated boomtown stereotype is the view of the newcomer as a young, transient, hellion. However, Finsterbusch points out that most newcomers to boomtowns, albeit young, are married workers with families (318-319). He concludes that the boomtown research to date indicates that rapid energy development can be socially and psychologically disruptive, but it does not provide researchers with a clear understanding of what is the typical or common boomtown pattern (316).

Much of the research discussed above broadly examined the impact of extractive industries on communities. Brabant and Gramling's (1997) study, however, discusses one specific social characteristic – poverty. Brabant and Gramling use qualitative methods in the

form of case studies to examine the effect of the oil boom and 1986 bust on poverty in the Lafayette and St. Mary Parishes in Louisiana. They explain four theoretical frameworks in relation to resource extraction and poverty: rational underinvestment; bureaucratic power; rural restructuring; and lastly moral exclusion. They state that prior to the oil boom there were some poverty-stricken individuals due to unemployment but the majority of the pre-boom poor were the underemployed. They document that the oil industry's boom in St. Mary Parish created many jobs for the underemployed. This boom also brought immigration to the parish for those looking for employment. However, once the oil bust occurred, the welfare and unemployment lines once again began to 'line around the corner'. They conclude that no single theoretical perspective can adequately explain the variation of poverty that emerged in southern Louisiana during this period.

Almost all of the studies in this review focus on determining the variety of community effects due to the boom and bust cycles of industry development. Brown and Krannich (2005), however, examine whether the negative effects associated with the bust period of boomtown models actually recover over time. They study the Intermountain Power Project (IPP) and its effects on the community of Delta, Utah. By looking at 24 years of longitudinal data from the period before the announcement of the project to the period after the deconstruction phase, the authors are able to examine the full effects of the project on the community. Their independent variables include community change (demographic changes), age, education, gender, and length of residence (residential stability). The dependent variables are community satisfaction, plans to move, friends in the community, and borrowing with neighbors. While they found that all of the indicators decreased between the baseline year and the years representing the period of boom growth, they also found that within approximately a decade of the boom period three of the four

indicators returned to or exceeded pre-boom levels. Community satisfaction levels were higher during the post-bust period, especially among long-term residents. Levels of friendship within the community were substantially higher than those observed in the pre-boom period. Plans to move also rose to their pre-boom levels. Borrowing from neighbors exhibited only very modest increases in the years following the boom era. However, since much of the variance is not explained within the data, the researchers conclude that "community change associated with the boom-bust cycle and its aftermath was not the primary cause of modest shifts in borrowing patterns in Delta" (42-43). The authors argue that while the community is negatively affected by the boom-bust cycle, time does heal the wounds. This is because the project becomes part of the community and not a new entity to be reconciled. This research is a significant contribution to the long tradition of boomtown energy-related research because it calls for more detailed theories based on extraction-based projects in place of the traditional boom-bust cycle.

2.3 Offshore Oil Industry and Crime

There are a very limited number of studies that have addressed the impact of offshore oil and gas extraction and crime in the Gulf of Mexico (Seydlitz et al. 1993a,b), where there are approximately 3,800 active oil platforms on the federal Outer Continental Shelf (OCS). The Gulf of Mexico OCS is responsible for approximately 25% of the gas and 30% or the oil produced in the United States. Despite the importance of this region and its vast natural resources, the nature of the relationship between the offshore oil and gas industry and crime remains unclear. Much of the evidence suggesting a connection between petroleum development and crime is anecdotal or speculative in nature, and to the extent that empirical research has been conducted, it has been limited in scope and inconclusive in results (Seydlitz et al. 1993a,b). Few studies in the energy development literature have addressed the impact of offshore oil, while

even fewer have utilized annual data, focused on more than one community, and accounted for the degree of involvement of the community in the oil industry (Seydlitz et al. 1993a:93). Seydlitz et al.'s study was designed "…to test traditional sociological theories which suggest that rapid industrial growth and immigration lead to disorganization in the community's social structure and local networks and thus increase social problems" (Seydlitz et al. 1993b:77).

Comparisons were made on two groups of parishes (counties) defined as highly involved and minimally involved based on percent employment in mining and percent of total household income from the oil industry. To address the issue of commute-to-work, all parishes were assigned to a category based on percentage of people working in the parish who were employed in oil and gas extraction, manufacturing and wholesale trade and the parentage of total income of parish residents that came from wages and salaries from oil and gas activities. Independent variables for industry activity included the average per barrel price and number of development wells drilled (Seydlitz et al. 1993b).

The study findings showed that when price and number of wells were higher, homicide and suicide rates were higher, especially in the more involved parishes and that these rates were also higher when industry activity was rapidly changing than when they were not rapidly changing (Seydlitz et al. 1993b:86). However, the study also found, "that the social problems experienced by communities due to changing activity in a major industry do not significantly differ by the community's degree of involvement in the community" although, long-term from 1956 to 1987, the suicide rates in involved parishes had increased faster than the rates in minimally involved parishes (88). Overall, the authors conclude that the data confirms both the social disorganization and relative deprivation hypotheses since suicide and homicide rates are higher during periods of greater industry activity (92).

2.4 Social Disorganization Theory and Crime

Social disorganization research dating back to the Chicago School emphasizes the importance of major institutions in preventing delinquency and crime (Kornhauser 1978; Sampson and Groves 1989; Shaw and McKay 1942). Shaw and McKay (1942) argued that certain areas surrounding central cities sustained high crime rates over many years despite rapid population turnovers of various ethnic and racial groups. The transition zone contained the highest crime rates and was characterized by high rates of single-parent households, dilapidated housing, poverty, low educational attainment, and a heterogeneous population. The Chicago School sociologists did not believe that there was anything abnormal about the particular crime-prone population in these areas. Instead, they argued that the structure of the community and its inability to exert social control on its members was the reason why crime rates were high.

Although macro-level theories such as social disorganization do not test individual-level intentions or actions, an assumption still exists that there will be less crime when individuals are integrated into social institutions such as family, work, and school. The strength of the community's social organization is dependent upon both formal and informal social networks (Bursik and Grasmick 1993). Informal social networks include relationships with acquaintances, friends, and relatives, while formal social networks include institutional stability and organizational participation among community members (Sampson and Wilson 1995). As the younger population, in particular, becomes attached to these institutions, the community can better socialize its members into conventional ways of behavior. Thus, residents develop stakes in conformity that reduce the relative rewards of crime, and as a result, crime rates in the overall community declines (Shaw and McKay 1942; Kornhauser 1978). However, when these networks are weakened by the overall conditions within the community, social controls on

criminal behavior are also weakened. Under these conditions, communities experience higher crime rates, including higher homicide rates. For example, Skogan (1990) finds that neighborhood disorder is closely tied to both higher crime rates and higher levels of fear of crime among residents.

Social disorganization theorists would argue that high levels of poverty, single-parent households, mobility, and heterogeneity do not directly increase community crime rates. Instead, social disorganization prevents the formation and effectiveness of informal social controls thereby increasing crime (Bursik 1988; Sampson and Groves 1989). To be true to aggregate-level theorizing, it is not necessary that individual offenders possess the attributes of the independent variables. In other words, macro-level explanations of high crime rates do not require that individual offenders lack social bonds with families, schools, peers, and work. The only requirement is that these characteristics exist in sufficient quantities to influence a community's capacity for exerting social control over its members (see Shihadeh and Ousey 1998). For example, macro-level relationships are not always empirically replicated in individual-level relationships even if the concepts measured are similar across analyses. For example, Shihadeh and Steffensmeier (1994) find a strong relationship between the proportion of female-headed households and black crime rates (particularly for juveniles) (see also Sampson 1987). However, this association does not imply that criminal offenders are more likely to come from single-parent households. Instead, communities that experience high levels of family disruption are less likely to exert social control over its members.

2.5 Routine Activities Theory and Crime

Another perspective in the sociology of crime that can be adapted to the purposes of this research is the routine activities theory of crime events. This perspective primarily is an

explanation of trends and cycles in criminal victimization patterns. In this framework, high levels of unemployment lead to large numbers of people spending most of their days and nights either at home or near their home thereby increasing the number of guardians at home and in the neighborhood. From this point of view, most crime events require the convergence in time and space of (1) likely offenders, (2) suitable targets, and (3) the lack of capable guardianship (Cohen and Felson 1979; Sherman et al. 1989; Osgood et al. 1996). Moreover, it is proposed that high levels of unemployment will increase guardianship and reduce the availability of potential targets. Therefore, unemployment is expected to be negatively associated with crime. Patterns of crime events, then, will be affected by social processes that affect any one or all of these necessary conditions. Human communities are conceptualized as systems of temporal interdependence where social interaction in the population is structured by "routine" patterns of activity and interpersonal contact. To the extent that social change produces changes in typical patterns of activity in communities that promote or reduce the probability of the three factors converging in time and space, changes in crime rates will occur. For example, if the employment structure of a community changes in such a way that it increases females' participation in the labor force, one predictable consequence is a rise in the rate of household burglary. This occurs not necessarily because of an increase in the proportion of motivated offenders (criminals) in the population, but because of the effect that dual employment of husband and wife has on guardianship, and perhaps also because higher household incomes increase the value of home contents (suitable targets). Thus, if major economic change occurs, of which oil development would be but one aspect, its effects on social system activity may indirectly influence crime. In this sense, improvement in economic well-being and economic opportunity may entail a cost of higher levels of some forms of crime. However, it is equally

plausible that change may occur in a form that may constrain that convergence of these factors, thus reducing the rate of crime events (Liska and Warner 1991).

As these perspectives suggest, understanding crime at the community level is multifaceted in nature. In studying the possibility of an oil-crime nexus, previous work has not been sufficiently sensitive to this fact either in design or interpretation. It is the purpose of this project to offer the empirical foundation for a more hermeneutic understanding of this complex question.

This study examines the impact of offshore oil and gas activities on community levels of crime. The following analysis provides a model (see Figure 2.1) of the relationship between industry development and change (oil industry employment) and community social disruption (homicide, robbery, burglary, larceny, and aggravated assault rates) within thirteen Louisiana parishes for a twenty-five year period. Additional control variables are included in the model to account for the effects of social disorganization and routine activities within communities.

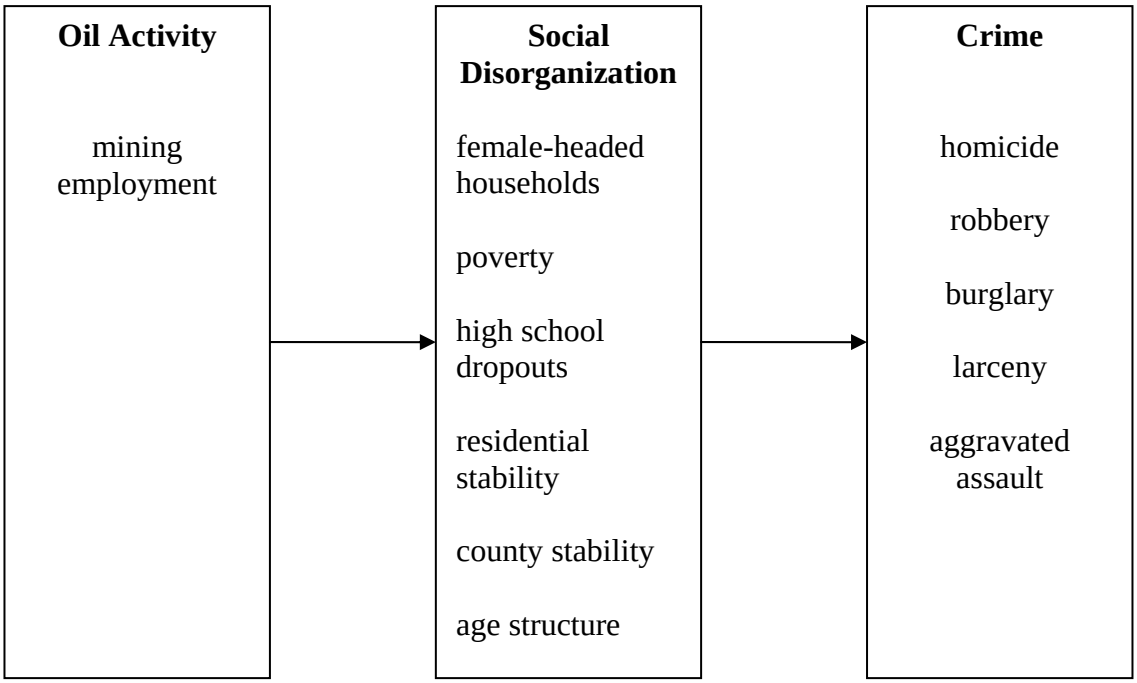

Figure 2.1 Conceptual Model

CHAPTER 3

DATA AND METHODS

The unit of analysis in this study is parish and county-level data for the years 1974-1998. Twelve Louisiana parishes that are highly involved in the offshore oil and gas industry are included in the sample (see Table 3.1). To determine the degree of involvement, an average of the parishes' ranks on two criteria is used: the percentage of people working in the parish in oil and gas extraction, manufacturing, and wholesale trade at each designated time interval, and the percentage of total income of the parish residents that comes from wages and salaries in oil and gas activities at each designated time interval. These criteria are obtained through the use of U.S. Census data.

Table 3.1 Louisiana Oil-involved Parishes Used in the Analysis:

Acadia Parish
Calcasieu Parish
Cameron Parish
Iberia Parish
Lafayette Parish
Lafourche Parish
Plaquemines Parish
St. Bernard Parish
St. Charles Parish
St. Mary Parish
Terrebonne Parish
Vermilion Parish
N=12

Parish-level crime data are obtained from the Uniform Crime Reports of the FBI. These data include incident information for Part I crimes (major/felony offenses) for the years 1974-1998. Offense data include all crimes reported to the police. The crime data used in the analysis are not available in published form at the county (parish) level for all 25 years. Therefore, county/parish-level offense data are obtained through a specially requested tabulation from the Uniform Crime Reports of the FBI.

The crime data are merged with the corresponding parish- and county-level social and economic data contained in the decennial U.S. Census Summary Tape Files 3 for 1970-2000 and data obtained from the Bureau of Economic Analysis' Regional Economic Information System (REIS) for 1974-1998. Theoretically relevant control and independent variables that previous research suggests may disturb the relationship, if any, between oil-dependent economies and crime include: age structure, population, residential stability, percent female-headed households, percent black, percent Latino, and percent of the population that is in poverty.[1] *Age structure* and *parish/county population size* (natural log transformed due to positive skew) are common and necessary controls due to their association with general levels of homicide and other crime (Shihadeh and Steffensmeier 1994; Cohen and Land 1987; LaFree and Drass 1996; Ousey 1999; Steffensmeier and Harer 1987). Age structure is measured using the percentage of youth aged 16-24. *Residential stability* reflects an important ecological characteristic that may influence the degree of social organization and social control in communities and thus affect general levels of crime (Stark 1987; Sampson 1983). It is measured as the percentage of residents in a community

[1] Since the sample is not confined to census years and parish/county-level annual data for the socioeconomic indicators are not available from other sources, the values of the control variables obtained through census data must be estimated for the nine years between each decennial census. These estimates are interpolated using 1970, 1980, 1990, and 2000 county-level census data. However, annual data are used for the dependent variables (crime rates) and the primary explanatory variable (percent mining employment) due to their availability from the FBI and the Bureau of Economic Analysis.

that lived in the same home five years ago. Mobility is also measured using the *percentage of the population that lived in the same county* five years ago. *Education* is included as the percentage of residents that are at least 25 years old and who did not earn a high school degree. *Percent black* and *percent Latino* (natural log transformed due to positive skew) are included as controls for racial/ethnic differences in crime (Curtis 1975; Shihadeh and Flynn 1996; Martinez 1996) and because racial/ethnic differences in arrests for UCR crimes have been indicated in previous research (Hindelang et al. 1979:999). *The percentage of female-headed households with children under the age of 18* in the community is included due to its association with aggregate levels of crime in previous studies (Shihadeh and Steffensmeier 1994). The *percentage of the population in poverty* is included in the model to control for the level of economically marginal persons in communities due to the association between economic deprivation and high rates of crime. Finally, a dummy variable is included to differentiate the *oil-involved parishes* from the control counties that do not have a significant amount of oil- and gas-related employment (oil-involved parishes = 1; other = 0). In addition to these relevant control variables, the *percentage of jobs that is related to the oil and gas industry* is used as a measure of annual oil activity. This measure is used as the primary independent variable in the analyses. Predictive models of crime rates containing all relevant control and independent variables are then constructed and tested.

Additionally, 24 counties (see Table 3.2) across the United States are selected using U.S. census data that share some similar socioeconomic characteristics with the sample of 12 Louisiana parishes (i.e., population size, racial composition, etc.). However, unlike the coastal parishes of Louisiana, these counties do not have economies that are based on either oil and gas extraction or production. Examining crime patterns in these counties provides an additional

control in determining or specifying if there is any uniqueness in the oil/gas economies of the Louisiana parishes. This comparison sample of counties is determined via the degree of involvement in oil- and gas-related activities, calculated as an average of each county's ranks on two criteria: the percentage of people working in the county in oil and gas extraction, manufacturing, and wholesale trade at each designated time interval, and the percentage of total income of the county residents that comes from wages and salaries in oil and gas activities at each designated time interval. Data for these two samples of parishes and counties across 25 years allow for the examination of the research question using pooled time-series analyses.

Table 3.2 Sample of Control Counties Used in the Analysis that are Not Involved in the Oil Industry:

Angelina County, TX
Bacon County, GA
Buncombe County, NC
Campbell County, VA
Cowlitz County, WA
Eau Claire, WI
Ellis County, KS
Gaston County, NC
Grady County, OK
Hardin County, TX
Hutchinson County, TX
Jefferson, WI
Laurens County, SC
Mississippi County, AR
Rice County, MN
Sebastian County, AR
Sullivan County, NY
Tompkins County, NY
Tuscaloosa County, AL
Walker County, AL
Walker County, GA
Ward County, ND
York County, ME
Yuma, County, CO
N=24

Time-series analysis is appropriate to situations in which a given aspect of the research problem is on some cyclical schedule such as occurs with the boom/bust cycles of the oil and gas industry. Pooled time series analysis is appropriate when time-series data are available on a cross-section of aggregate units. Using pooled time series analysis, the effect of the boom and bust (if any) on crime rates is twice demonstrated (or refuted), once against the control sample of non-oil economy counties and once against the pre-boom/pre-bust crime rates in the sample of oil economy Louisiana parishes. One common problem in historical, time-series analysis (such as that conducted by Seydlitz and colleagues) is the tendency to distort historical reality. For Seydlitz et al. (1993a), this occurred when they treated their data as a generic series of data that could be examined independent of the historical context in which they are imbedded. This may have led to erroneous conclusions about the relationship between oil industry activity and homicide and suicide rates. Time series analysis, on the other hand, permits an examination of historical context by comparison and hence, improves the validity of findings in the proposed research described here.

I use annual time series-data on 36 parishes and counties from 1974 to 1998[2] to examine the impact of changes in measures of oil and gas activity on changes in violent crime rates. The dependent variables include homicide, robbery, burglary, larceny, and aggravated assault rates per 100,000 residents and are obtained from the FBI Uniform Crime Reports. Because some Type I crimes tend not to be normally distributed, I calculate the natural logarithm to induce normality. In this analysis, only the homicide rate demonstrated a high positive skew and therefore it is the only crime variable that is transformed to its natural logarithm. Radzinowicz (1939) provides an early caution that employment conditions and crime will probably differ

[2] The data are aggregated by parish/county and year.

across types of crimes and social groups. Given that previous macro-level research suggests that economic factors are more likely to have an effect on property offenses than on violent offenses (Chiricos 1987; Land et al. 1995), I also include three indicators of property-related crimes (i.e., robbery, burglary, and larceny).[3]

Pooled time series models combine time series (regular temporal observations on a unit of analysis) and cross-sections (observations on a unit of analysis at single time points) to form one data set (Sayrs 1989:7). The units of analysis may be health organizations, businesses, schools, cities, states, or counties, to name a few. There are two primary reasons why this technique is used: (1) an increasing number of researchers have data collected in both formats, and (2) pooling time series and cross-sectional data can greatly increase sample size, improving an otherwise statistically problematic situation (Sayrs 1989:5). Combining cross-sectional and time series data captures variation across different units in space, as well as the variation that emerges over time (Sayrs 1989:7). Pooled time series analysis is particularly useful in applied research when the length of the time series is relatively short and/or the sample of cross-sections is small. Many time series methods require at least thirty time points thereby limiting the types of analyses that can be performed (Sayrs 1989:7).

An additional improvement in this proposed methodology, relative to the method of Seydlitz et al. (1993a), is the use of regression equations that correct for first-order autocorrelation within each sample of parishes/counties. This allow the models to rule out or include rival interpretations of changes in crime rates by allowing for the effect of variables I

[3] I attempted to include all 13 Louisiana parishes that were used in Seydlitz et al.'s (1993a,b) analysis to make a direct comparison to their analysis of Louisiana parishes. However, St. James Parish and its two corresponding control counties (Perry, IL and Manistee, MI) were removed from the sample due to missing crime rates for several years. Therefore, this study's analysis includes annual data for 12 Louisiana parishes and 24 control counties over 25 years (1974-1998). For each model, N = 900 (36 parishes/counties x 25 years).

have identified as relevant controls (other than an effect of boom/bust cycles). In this way, it is possible to address a common problem in time-series analysis, and one in which Seydlitz and colleagues did not address in their study: serial correlation of errors. Serial correlation of errors is problematic because it tends to produce an underestimation of error variance which artificially improves the fit of the regression line and makes parameter estimates appear more reliable than they are. Using the proper tools, specifically, methods designed to examine temporal processes in historical context, circumvents these problems of analysis.

This analysis provides the most comprehensive study to date of the relationship between oil industry activity and crime patterns in coastal Louisiana. This information improves our understanding of the unique impacts, if any, of the presence of the oil and gas industry on the social environment of the region. In addition, the study is able to test whether resource extraction has a negative effect on Gulf of Mexico coastal communities. Traditional sociological theories suggest that rapid industrial transformations disorganize communities, thereby leading to social problems such as crime. However, there are many aspects of the offshore oil industry that differ from traditional boomtowns in the western regions of the U.S. This study compares and contrasts coastal Louisiana communities to these traditional western boomtowns. In addition, it examines the impact of oil industry cycles on crime using data over a 25 year period to isolate any effects of the industry from other ongoing community social processes.

CHAPTER 4

DESCRIPTIVE AND POOLED TIME SERIES ANALYSIS RESULTS

4.1 Descriptive Analysis

In this chapter, findings are presented that demonstrate the relationship between oil and gas activity levels and homicide, robbery, burglary, larceny, and assault offense rates for 36 parishes and counties between 1974 and 1998. Table 4.1 includes data for both the Louisiana parishes and the control counties over the 25 year period. First, it displays the means and standard deviations for the five offense rates (dependent variables). The mean homicide rate across the 900 parish/county-years is 6.58 per 100,000 population. The mean rate for robbery is 51.62, 893.47 for burglary, 2110.59 for larceny, and 272.75 for aggravated assault. The independent variable, *percent mining employment*, shows that the average percentage of jobs across all parishes/counties and years is 4.57. Although this variable measures the employment level within the mining industry classification, I use it to indicate change over time in the cyclical patterns of the oil and gas industry.

The next set of variables is used in the analysis as control variables to isolate the effect, if any, of changes in the oil industry on aggregate levels of crime. The average population across the parish-years is 69,586. This indicates that on average the counties selected for the sample are relatively small and rural. The average black population is 11.47%, while the mean percentage of Latinos is only 2.07. This statistic may be misleading given that Latinos are the fastest growing ethnic or racial group in the United States (Bastian 1990). Of course, much of the increase in the Latino population has occurred over the last decade. In addition, Census data preceding 2000 did not estimate the Latino population in as much detail or with as much accuracy. 16.51% of county/parish households are headed by females who have children under

Table 4.1 Descriptive Statistics for Variables in Pooled Time Series Models, 1974-1998:

Variable	Mean	Standard Deviation
Homicide Rate (per 100,000)[a]	6.58	6.33
Robbery Rate (per 100,000)[a]	51.62	47.63
Burglary Rate (per 100,000)[a]	893.47	498.36
Larceny Rate (per 100,000)[a]	2110.59	1081.29
Aggravated Assault Rate (per 100,000)[a]	272.75	262.49
Percent Mining Employment	4.57	6.10
Population Size	69,586	43,189
Percent Black	11.47	9.84
Percent Latino[a]	2.07	2.12
Percent Female-Headed Households	16.51	7.30
Percent Poor	15.64	5.16
Percent High School Dropouts	16.84	4.43
Percent Residential Stability	57.32	6.44
Percent County Stability	30.21	13.64
Percent Aged 16-24	22.06	5.69

[a] Original metric shown. Natural log transformation used in the analysis (see text).

the age of 18. This measure is used to reflect the level of informal social control within communities. The mean rates for poverty and high school dropouts are similar when comparing the units of analysis. The average level of poverty across the communities over time is 15.64% while the mean percentage of high school dropouts (residents aged 25 and over) is 16.84.

The last three control variables measure the degree of community transition and change. For example, 57.32% of community residents in the sample parishes and counties currently live in the same house as they did five years ago. In a related measure, 30.21% of community residents lived in the same county during years of the decennial census as they did five years prior. Finally, the population aged 16-24 shows that approximately 22.06% of all community residents belong to an age category that is most at-risk for criminal involvement (both violent and property offenses). It is also a useful control variable in that it may reflect the differences in transient populations that are often mentioned in the boomtown literature to explain increased levels of community social disruption.

Tables 4.2 and 4.3 separates and further analyzes the descriptive information that is displayed in Table 4.1. These next two tables show the differences between means for the fifteen variables in the sample of oil-involved Louisiana parishes and the sample of control counties that do not have a significant amount of oil- and gas-related activities. In comparing the crime rates between the two samples of parishes/counties, it is clear that the oil-involved parishes have significantly higher homicide, robbery, and aggravated assault rates. However, the control group of counties has higher burglary and larceny rates than the oil-involved communities. Moreover, the parishes that are highly involved in oil and gas activities also tend to have higher rates of *violent* crime, while the control counties show higher levels of *property* crime. One possible explanation for this difference may be due to regional differences in the rates of violent crime

Table 4.2 Descriptive Statistics for Variables in Louisiana Oil-Involved Parishes, 1974-1998:

Variable	Mean	Standard Deviation
Homicide Rate (per 100,000)[a]	7.10 *	5.59
Robbery Rate (per 100,000)[a]	56.56 **	46.89
Burglary Rate (per 100,000)[a]	757.06 ***	416.70
Larceny Rate (per 100,000)[a]	1727.75 ***	958.65
Aggravated Assault Rate (per 100,000)[a]	364.42 ***	306.73
Percent Mining Employment	9.27 ***	6.48
Population Size	64,697 **	37,551
Percent Black	18.23 ***	7.96
Percent Latino[a]	2.28 **	1.48
Percent Female-Headed Households	17.12 *	7.06
Percent Poor	18.60 ***	4.78
Percent High School Dropouts	17.45 ***	1.90
Percent Residential Stability	61.78 ***	4.44
Percent County Stability	29.96	12.78
Percent Aged 16-24	22.28	4.63

[a] Original metric shown. Natural log transformation used in the analysis (see text).
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ - Difference between means between Oil-involved Parishes and Non-Oil-involved Control Counties

Table 4.3 Descriptive Statistics for Variables in Control Counties that are not Oil-Involved, 1974-1998:

Variable	Mean	Standard Deviation
Homicide Rate (per 100,000)[a]	6.31 *	6.65
Robbery Rate (per 100,000)[a]	49.14 **	47.84
Burglary Rate (per 100,000)[a]	961.68 ***	521.62
Larceny Rate (per 100,000)[a]	2302.01 ***	1089.00
Aggravated Assault Rate (per 100,000)[a]	226.92 ***	223.91
Percent Mining Employment	2.21 ***	4.27
Population Size	72,129 **	45,673
Percent Black	8.10 ***	8.90
Percent Latino[a]	1.96 **	2.37
Percent Female-Headed Households	16.20 *	7.40
Percent Poor	14.16 ***	4.69
Percent High School Dropouts	16.54 ***	5.23
Percent Residential Stability	55.09 ***	6.12
Percent County Stability	30.33	14.06
Percent Aged 16-24	21.96	6.15

[a] Original metric shown. Natural log transformation used in the analysis (see text).
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ - Difference between means between Oil-involved Parishes and Non-Oil-involved Control Counties

(Gastil 1971; Hackney 1969; Nisbett and Cohen 1996). A regional dummy variable (e.g., South = 1; other = 0) was not included in the analysis because of its strong zero-order correlation with other explanatory variables in the model. Because a regional control could not be included to avoid multicollinearity[4], the significant differences in crime between the two groups may reflect these regional effects on crime. Since all of the oil-involved parishes are in Louisiana, the higher rates of violent crime may be a consequence of the parishes' location rather than oil industry effects alone.

In addition to the significant difference in the mean crime rates, Table 4.3 also shows a noticeable difference in the levels of mining employment. The selection of the sample of Louisiana parishes and the sample of control counties was based on these differences in the labor market. Therefore, it is expected that the coastal parishes have approximately 9.27% mining-related (predominately oil and gas) jobs over the 25 year period, while the control group only has 2.21% (much of which is assumed to be not oil and gas related).

The other control variables that show significant mean differences between the two groups include: percent black, percent poverty, and residential stability. The mean rates for these variables are significantly higher among the oil-involved group than in the control group. More specifically, 18.23% of the population is black and 18.60% fall below the poverty line in the Louisiana parishes compared to only 8.10% and 14.16% in the control counties. Finally, oil-involved community residents are significantly more likely to live in the same house over time

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Multicollinearity is the high degree of correlation between independent variables in multivariate models. Macro-level models can be particularly susceptible to this problem. There can be several problems that arise when multicollinearity exists. These problems include the wide variation of parameter estimations and the inflation of standard errors (Neter, Wasserman, and Kuter 1985). Diagnostic tools to detect multicollinearity include the examination of variance inflation factors (VIFs) for each regression model estimated. No models in this study have variance inflation factors that exceed 4.0. The level that multicollinearity is considered to be severe is between 5.0 and 10.0 (Neter et al. 1985; Judge et al. 1988). As an additional precaution, I also do not include any explanatory variables in the pooled time series models that have zero-order correlations with other exogenous variables that exceed 0.70.

(61.78%) than are residents living in other areas of the country (55.09%). This level of residential stability may reflect a high degree of community cohesiveness and strong informal social control over the activities of the community's inhabitants.

4.2 Heteroskedasticity Diagnostics

A common statistical problem often encountered in macro-level research is *heteroskedasticity*. Heteroskedasticity is the unequal variance in the regression errors. This problem can arise in a number of ways and there are several tests that can be used to diagnose this problem. Typically, a test designed to examine the null hypothesis of homoskedasticity (equal error variance) against some specific alternative heteroskedasticity specification is implemented if residual plots show that the variability of actual *y* values (or of the residuals) increases as the predicted *y* increases (Griffith, Hill, and Judge 1993). An examination of residual scatter plots for the variables included in the study's analysis did not indicate the presence of heteroskedasticity.

4.3 Pooled Time Series Analysis

This section presents the results of five pooled time series regression models that estimate community differences in the rates of homicide, robbery, burglary, larceny, and aggravated assault. The parameter estimates in Table 4.4 measure the effect of the exogenous variables on crimes across 36 parishes/counties and 25 years. Unstandardized regression coefficients are presented with their corresponding standard errors listed directly below. In examining the five models, the percentage of mining employment has a significant and negative association with homicide (b = -0.051) and aggravated assault (b = -4.657). Therefore, as oil activity increases over time and across parishes, the levels of homicide and aggravated assault

significantly declines. Oil activity is not significantly associated with any of the other crime offenses.

Although oil and gas activity does not strongly predict variation in most of the macro-crime patterns, there are several other control variables in the model that do affect these types of criminal activities. For example, parish/county population (Ln) is significantly associated with all crime types. However, the direction of the association is mixed. Population size has a positive association with the rates of robbery (b = 18.060), burglary (b = 245.980), and larceny (b = 377.902), but has a negative relationship with homicide (b = -0.621) and aggravated assault (b = -49.763). Since crime tends to increase in larger communities, the negative relationship between population size and homicide and assault are contrary to most macro-level crime models. In this analysis, it appears that the smaller communities have higher rates of murder and assault.

The percentage of blacks and Latinos in a community is strongly associated with most forms of crime. Black population has a positive and significant relationship with homicide (b = 0.048), robbery (b = 1.949), burglary (b = 11.615), larceny (b = 25.409), and aggravated assault (b = 14.197). This pattern is commonly found in other macro-level research on community crime and race (e.g., Shihadeh and Ousey 1998). The percentage of Latinos is positively associated with robbery (b = 5.665) and burglary rates (b = 72.405). However, a higher proportion of Latinos in a community has a negative effect on aggravated assault offenses (b = -21.353).

A high level of female-housed households with children under 18 years of age in a community decreases the burglary (b = -5.024, larceny (b = -13.102), and aggravated assault rates (b = -4.420). In addition, the residential stability measure also has a significant negative

association with all five offense types: homicide (b = -0.062), robbery (b = -2.056), burglary (b = -28.656), larceny (b = -87.845), and assault (b = -11.239). These findings suggest that increased guardianship in communities decrease the opportunities for crime in communities. Communities that have higher levels of stability are more able to exert social pressure on residents to conform to mainstream activities. The negative effect of female-headed households is contrary to other macro-level crime research that has found a positive relationship between the proportion of single parent households and community crime (e.g., Shihadeh and Steffensmeier 1994). It is possible, however, that a high level of female-headed households does not necessarily indicate a lack of guardianship in a community. Single mothers in some communities may be less likely to work outside the home and/or may be more integrated in their community than two-parent households. Single mothers may be more likely to know their neighbors and to rely on other residents to help out in looking after their children. In these circumstances, it seems plausible that a high percentage of female-headed households may actually lower crime by creating networks of informal social control.

The poverty measure in Table 4.4 shows a negative association with larceny (b = -16.596) and aggravated assault rates (b = -11.647). Therefore, as economic deprivation increases in a community, larceny and assault offenses decrease. This finding also seems to support routine activities theory in that poorer communities may offer less suitable targets for some time types of crime. In other words, there may be fewer people and businesses to steal from in economically disadvantaged areas. This may be especially true in rural parishes and counties.

The percentage of high school dropouts shows a strong positive relationship with all five crimes. Low levels of educational attainment in a community raises the rates of homicide (b =

0.090), robbery (b = 3.451), burglary (b = 36.141), larceny (b = 34.151), and assault (b = 20.695). In addition, age structure (proportion of the population aged 16-24) is also positively associated with robbery (b = 0.928), larceny (b = 33.844), and assault (b = 7.652). This finding is consistent with previous studies that have found positive associations between the relative size of the crime-prone youth population and community levels of crime (Cohen and Land 1987; LaFree and Drass 1996; Ousey 1999; Steffensmeier and Harer 1987). Table 4.4 shows one unexpected finding concerning the age-crime relationship. Age structure has a negative association with homicide (b = -0.040). Although this is an unexpected finding, one possible explanation is that homicide is a crime that tends to have slightly older offenders when compared to property crimes such as burglary and larceny. Therefore, the age range chosen for this control variable may not be wide enough to capture many homicide offenders that are in their late 20s and early 30s. This may be particularly true in rural areas.

Two other exogenous variables that are associated with crime in Table 4.4 include county residential stability and oil-involved parishes. The county stability measure is used in the models to reflect inter-parish/county changes in residential populations. One unexpected finding is that this measure does not have the same effect on community crime rates as the within-parish/county stability variable. While residential stability seems to create a downward pressure on all types of crime, the county stability indicator is positively associated with robbery (b = 0.884), larceny (b = 16.967), and aggravated assault (b = 3.985).

Finally, the dummy variable, oil-involved parishes, shows the difference in the relationship between oil activity and aggregate crime rates among the two samples of communities. The model results demonstrate that the Louisiana oil-involved parishes have significantly lower burglary (b = -196.797) and larceny rates (b = -197.295) compared to the

control counties. However, there is a strong positive association (b = 129.623) between the oil-involved parishes and aggravated assault rates. These findings in Table 4.4 are consistent with the difference in mean significance tests displayed in Tables 4.2 and 4.3.[5]

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[5] One and two year lag effects for percent mining employment were also tested in the pooled time series model to allow sufficient time for crime rates to react to oil industry fluctuations. No substantive differences appeared in the model results after accounting for the possibility of lagged effects.

Table 4.4 Pooled Time Series Parameter Estimates Predicting Parish/County-level Crime Rates, 1974-1998:

Variable	Homicide (Ln)	Robbery	Burglary	Larceny	Aggravated Assault
Percent Mining Employment	-0.051 ***	-0.169	-1.405	1.933	-4.657 ***
	0.012	0.264	2.903	5.430	1.594
Population Size (Ln)	-0.621 ***	18.060 ***	245.980 ***	377.902 ***	-49.763 ***
	0.101	2.098	23.075	43.162	12.672
Percent Black	0.048 ***	1.949 ***	11.615 ***	25.409 ***	14.197 ***
	0.008	0.199	2.189	4.094	1.202
Percent Latino (Ln)	0.071	5.665 ***	72.405 ***	-26.063	-21.353 **
	0.072	1.669	18.356	34.334	10.080
Percent Female-Headed Households	-0.013	-0.231	-5.024 *	-13.102 **	-4.420 ***
	0.010	0.246	2.700	5.051	1.483
Percent Poor	0.024	-0.488	4.681	-16.596 **	-11.647 ***
	0.015	0.366	4.027	7.532	2.211
Percent High School Dropouts	0.090 ***	3.451 ***	36.141 ***	34.151 ***	20.695 ***
	0.023	0.469	5.152	9.637	2.829
Percent Residential Stability	-0.062 ***	-2.056 ***	-28.656 ***	-87.845 ***	-11.239 ***
	0.014	0.318	3.499	6.544	1.921
Percent County Stability	-0.001	0.884 ***	-0.926	16.967 ***	3.985 ***
	0.005	0.121	1.328	2.483	0.729
Percent Aged 16-24	-0.040 ***	0.928 ***	-2.069	33.844 ***	7.652 ***
	0.013	0.289	3.184	5.955	1.748
Oil-involved Parish	0.299	0.096	-196.797 ***	-197.295 **	129.623 ***
	0.211	4.653	51.169	95.710	28.099
R2	0.253	0.453	0.397	0.529	0.346

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

CHAPTER 5

SUMMARY OF FINDINGS AND STUDY IMPLICATIONS

The results from the pooled time series models suggest that changes in oil activity and high levels of labor market involvement in the offshore oil industry are not strongly associated with community disruption in the form of crime. The only statistically significant effects due to changes in oil activity are decreased levels of homicide and aggravated assault. Oil development is not associated with any other crime in the analysis despite accounting for the boom and bust cycles of the oil industry over a 25 year period and using data for 12 parishes that are highly involved in the industry. As the industry becomes more active and undergoes an increased labor demand, incidents of assault decline in the community. This finding does not support some previous boomtown model research that argues that energy development causes higher rates of social disruption, including higher crime rates (Seydlitz et al. 1993a; Brookshire and D'Arge 1980; Dixon 1978; Finsterbusch 1982; Freudenburg and Jones 1991; Gramling and Brabant 1986).

In contrast, the findings of this study support the idea that crime in energy extractive communities is caused by other mediating factors. For example, Wilkinson et al. (1984) found "…little evidence of additive effects of recent growth and energy development on the violent crime rate in nonmetropolitan counties of the major energy-producing states." (241). Instead, Wilkinson et al. argued that "[l]ongstanding structural problems are better predictors of the violent crime rate than are recent changes associated with energy development." (241). Wilkinson et al.'s study (1984) showed the importance of incorporating control variables and using a comparative research design (254). Both of these research design elements are included in the analysis of this study. Control variables are incorporated into the pooled time series

models to isolate the effect of the primary explanatory variable – oil and gas activity. In addition to using control variables, a set of control counties that are not involved in the oil and gas industry is used as a means of comparison. These two methodological improvements help to determine whether changes in community-level rates of crime are "due to resource extraction activities or to national, regional, or state changes" (Seydlitz et al. 1993a:96-97).

Once control variables are included in the regression models, the results clearly indicate that change in industrial activity is not the strongest predictor of community crime rates. Instead, factors such as educational failure, residential instability, and a young age structure are more directly and consistently associated with higher levels of crime. This study examines the effect of industry development and change on both violent and property crimes. Although the findings do indicate a significant difference between the crime rates of the Louisiana oil-involved parishes and the control group of counties (i.e., parishes have higher assault rates and the control group has lower burglary and larceny rates), there is also substantial evidence that other macro-social processes significantly contribute to an increase in crime. Low educational attainment, percentage black, young age structure, and residential stability play an important role in explaining the increase in crime across the communities over the 25 year period. These community characteristics were not controlled for in the majority of previous studies on the impact of oil and gas extraction on communities (Seydlitz et al. 1993a,b).

The effects of the boomtown model were a subject of debate preceding the bust of oil prices in the late 1970s and early 1980s. However, this debate practically disappeared after the bust period and most research generally supported the model during this time due to the decline in socioeconomic conditions (see Luton and Cluck 2004). This study addresses the theoretical appropriateness of using the boomtown model to (1) determine the impact of energy

development on crime and (2) to ascertain whether the boomtown model adequately describes oil-involved communities in the Gulf of Mexico region. Although some research has suggested that the boomtown model may not be an appropriate tool for energy-related impact assessment (Wilkinson et al. 1982; Gramling and Brabant 1986; Luton and Cluck 2004), there has been very little empirical evidence to support this claim (for exceptions see Brookshire and D'Arge 1980; Wilkinson et al. 1984). This study's findings provide additional empirical support to the claim that the boomtown model is not the most appropriate theoretical model to use when examining the role of the offshore oil industry on community patterns of crime. Instead, other macro-criminological theories such as social disorganization theory, are more useful in explaining the impacts of natural resource development in oil-involved Louisiana parishes.

Although this study has addressed the major methodological deficiencies in the limited number of studies on energy development and crime (Seydlitz et al. 1993a,b), there are several limitations that should be addressed in future research. First, this study used the percentage of mining-related jobs in a county or parish as an indicator of oil industry activity. This measure may include additional forms of mining-related employment – not just oil and gas related jobs. Although the majority of mining-related employment in Louisiana is oil and gas related, this may not be the case for other communities. There is also no publicly available annual employment data at the community-level that separates offshore and onshore jobs. The focus of this study is offshore oil and gas effects; however, some assumptions had to be made based on the geographic location of the communities due to the lack of available data on this specific industry. The REIS employment data are not complete or are undisclosed for confidentiality reasons for some counties in the 25 year period of the analysis. Missing employment data were estimated for the some years. In addition to employment data deficiencies, most of the control variables were

interpolated for the nine years in between each census. Annual data are required for pooled time series analysis, and therefore the data had to be estimated in some years because annual data at the parish/county level are not available from other sources.

Other limitations of the study include the lack of information on less serious forms of disorder such as public intoxication, drug use, and mental disorders. There was lack of annual data at the parish/county level to measure these forms of social disruption. Additionally, UCR arrest rates for this 25 year period were missing for several counties. Therefore, it was not possible to examine the differential effects of the oil industry on age and race disaggregated crimes. Despite the data limitations, this study provides clear empirical support that longstanding structural problems are better predictors of crime in oil-involved rural communities than oil development itself.

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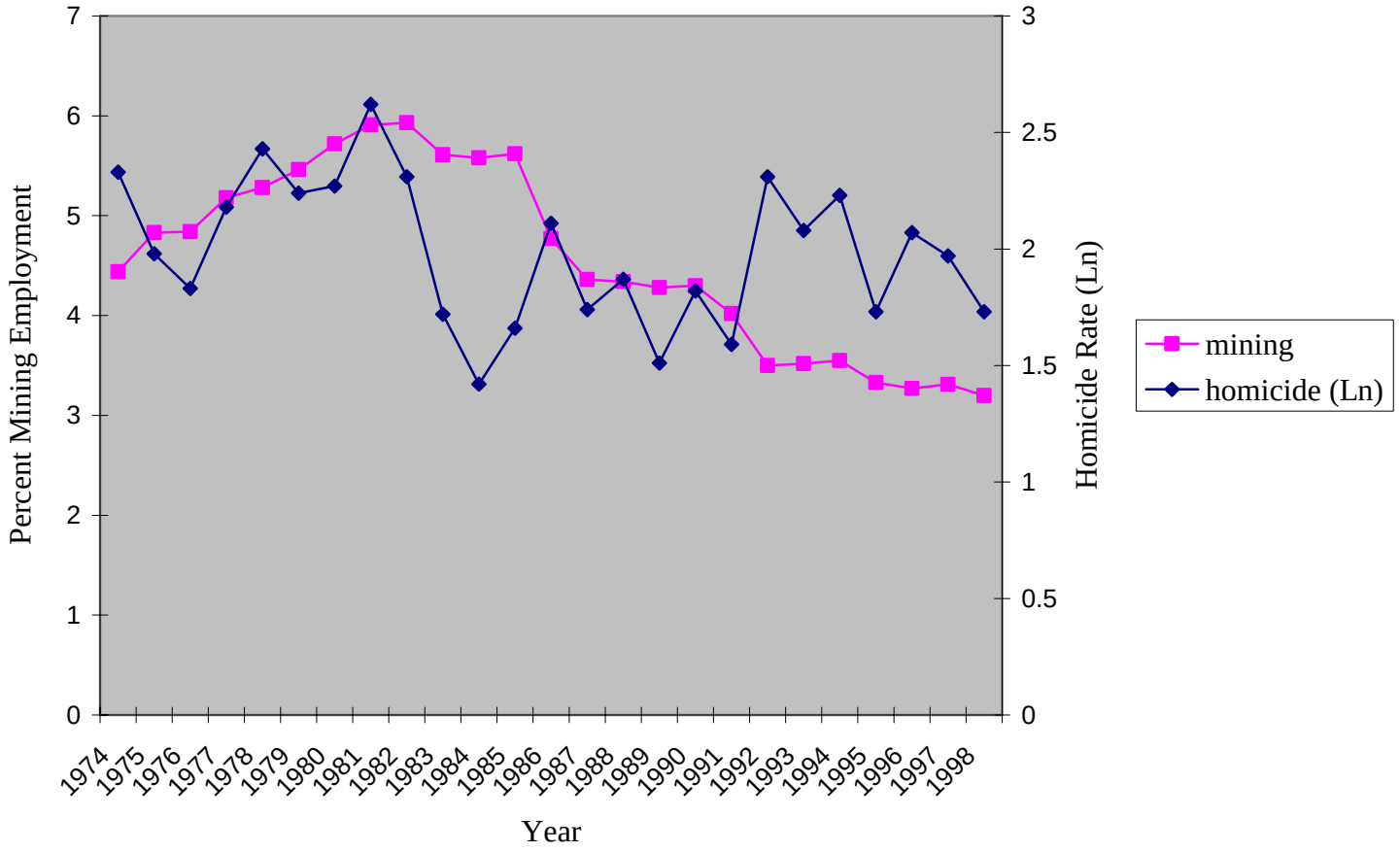
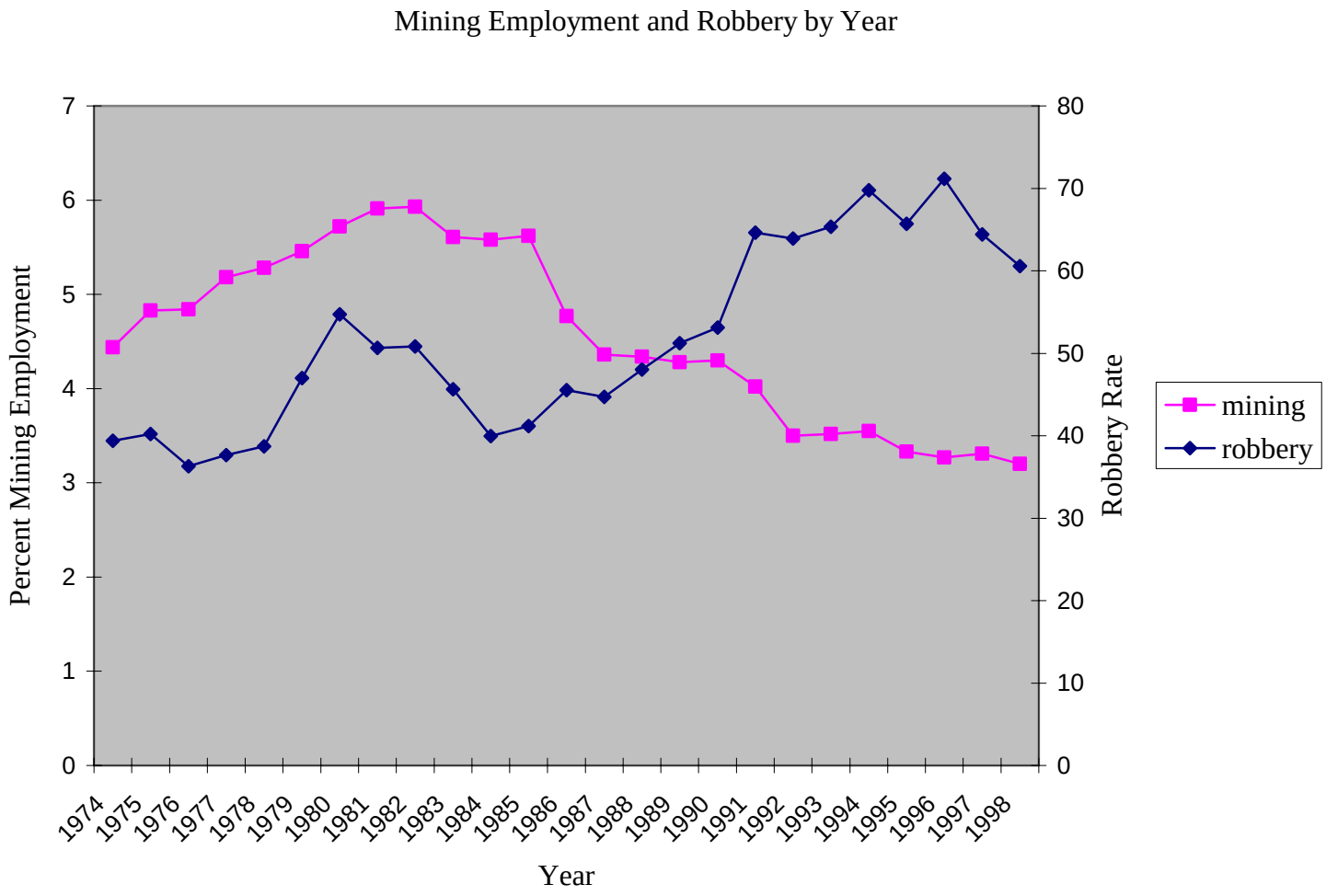
APPENDIX A

TIME SERIES CHARTS

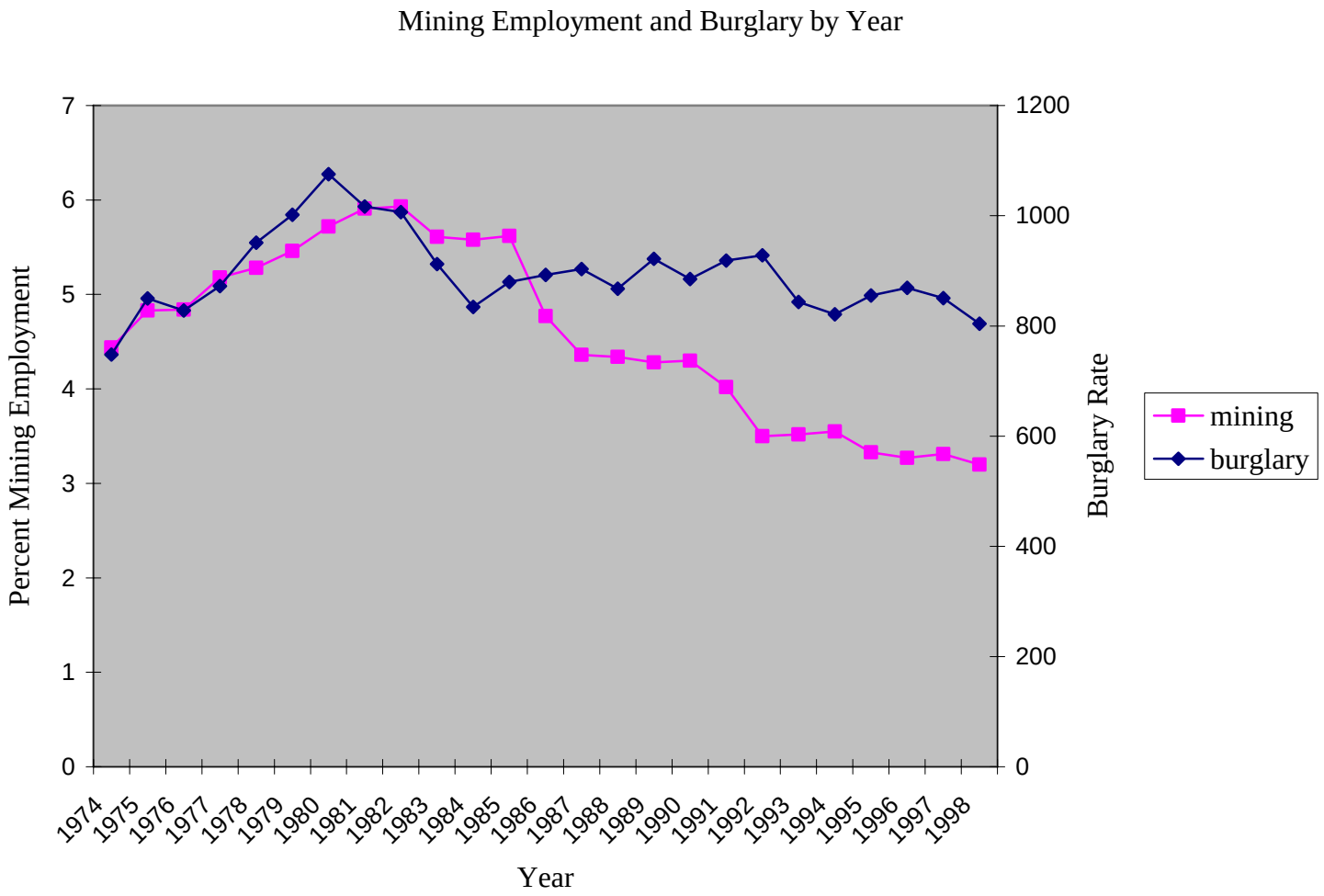
Mining Employment and Homicide (Ln) by Year



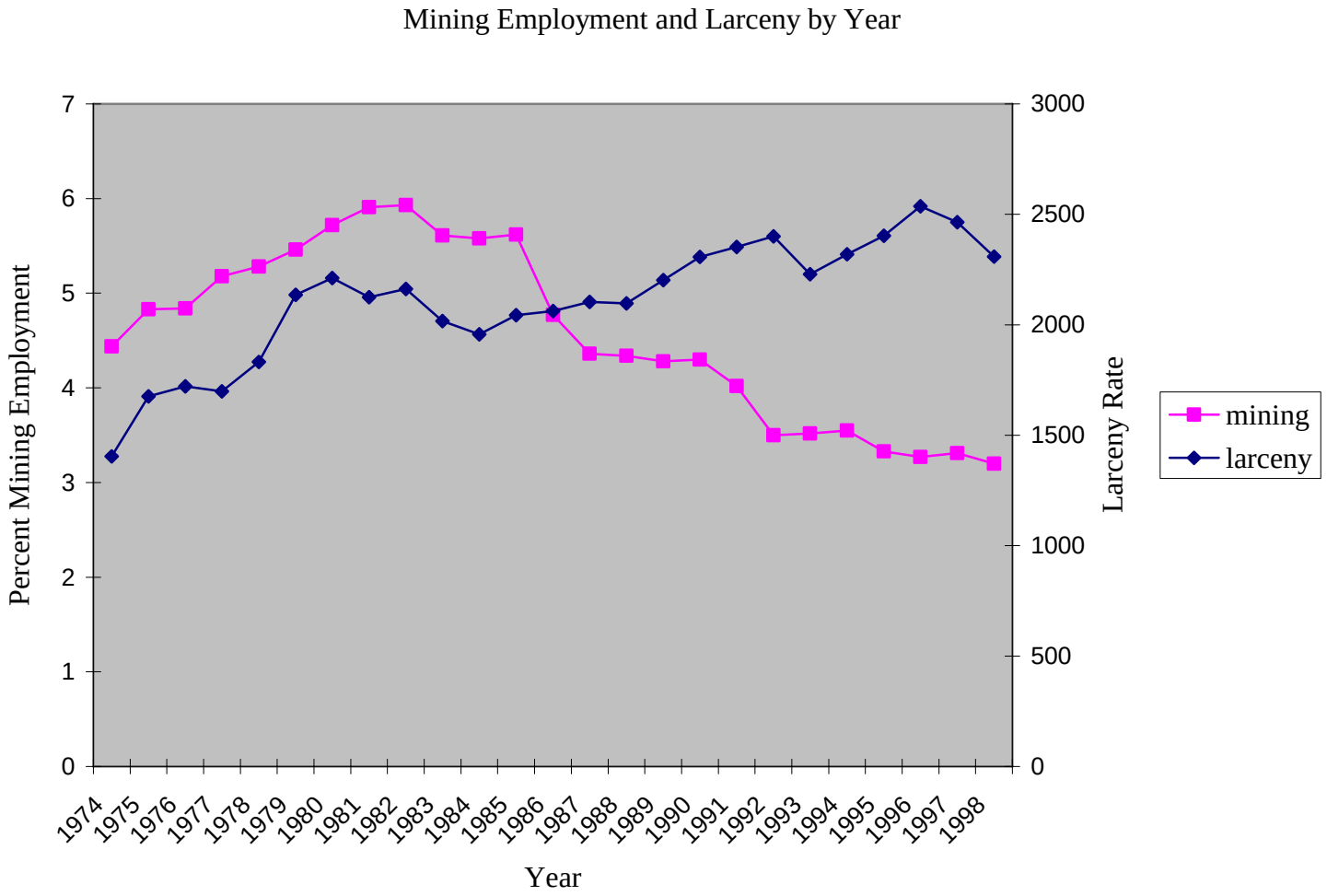
(Appendix A continued)



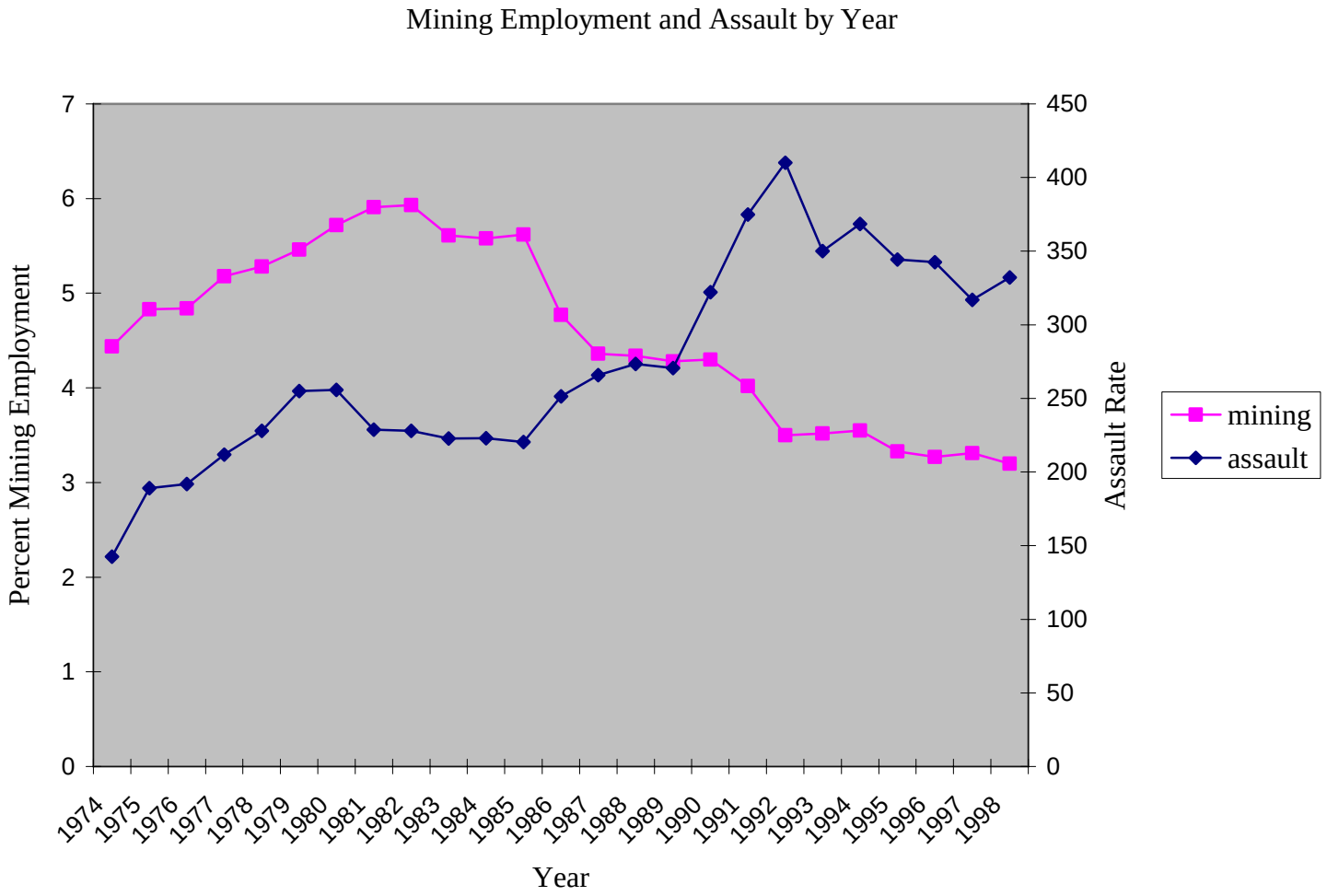
(Appendix A continued)



(Appendix A continued)



(Appendix A continued)



APPENDIX B

ZERO-ORDER CORRELATION MATRIX

	1.	2.	3.	4.	5.	6.	7.	8.
1. Percent Mining Employment	1.000							
2. Percent Black	0.219	1.000						
3. Percent Latino (Ln)	0.161	-0.065	1.000					
4. Population Size (Ln)	-0.247**	0.135**	-0.135**	1.000				
5. Percent Female-Headed Households	-0.084*	0.253**	-0.145**	0.140**	1.000			
6. Percent Poor	0.217**	0.583**	-0.112**	-0.126**	0.247**	1.000		
7. Percent High School Dropouts	0.137**	0.440**	-0.120**	-0.116**	0.210**	0.279**	1.000	
8. Percent Residential Stability	0.224**	0.313**	-0.042	-0.249**	-0.144**	0.225**	0.528**	1.000
9. Percent County Stability	-.0.078*	0.068*	0.195**	0.133**	-0.340**	0.121**	-0.222**	-0.076*
10. Percent Aged 16-24	-0.018	-0.019	-0.083*	0.155**	-0.183**	0.113**	-0.415**	-0.261**
11. Oil-involved Parish	0.546**	0.486**	0.173**	-0.048	0.059	0.405**	0.097**	0.490**
12. Homicide Rate (Ln)	-0.010	0.323**	0.045	-0.270**	0.126**	0.266**	0.305**	0.084*
13. Robbery Rate	-0.016	0.457**	0.086*	0.398**	0.077*	0.213**	0.172**	-0.121**
14. Burglary Rate	-.0.133**	0.196**	0.048	0.421**	0.144**	0.046	0.145**	-0.302**
15. Larceny Rate	-0.167**	0.060	0.001	0.461**	-0.026	-0.036	-0.256**	-0.564**
16. Assault Rate	0.100**	0.515**	0.011	0.055	0.008	0.251**	0.243**	0.095**

* $p < 0.05$, ** $p < 0.01$

(Appendix B continued)

	9.	10.	11.	12.	13.	14.	15.	16.
1. Percent Mining Employment								
2. Percent Black								
3. Percent Latino (Ln)								
4. Population Size (Ln)								
5. Percent Female-Headed Households								
6. Percent Poor								
7. Percent High School Dropouts								
8. Percent Residential Stability								
9. Percent County Stability	1.000							
10. Percent Aged 16-24	-0.064	1.000						
11. Oil-involved Parish	-0.013	0.026	1.000					
12. Homicide Rate (Ln)	0.030	-0.155**	0.068	1.000				
13. Robbery Rate	0.309**	0.059	0.074*	0.183**	1.000			
14. Burglary Rate	0.080*	0.000	-0.194**	0.123**	0.677**	1.000		
15. Larceny Rate	0.301**	0.291**	-0.250**	-0.060	0.607**	0.671**	1.000	
16. Assault Rate	0.182**	0.063	0.247**	0.218**	0.596**	0.428**	0.355**	1.000

* $p < 0.05$, ** $p < 0.01$

APPENDIX C

DISCLAIMER

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VITA

Asha Devi Luthra was born on September 11, 1974, in Wise, Virginia. After graduating in 1992 from J.J. Kelly High School in Wise, she entered the College of William and Mary in Williamsburg, Virginia. She completed her bachelor of arts degree in sociology in the spring of 1996 and entered graduate school at Louisiana State University in August of 1996. She completed her master of arts degree in sociology in August of 1998 and continued to pursue her doctorate degree in sociology. While working towards her doctorate at Louisiana State University, she began her career as a sociologist in 2003 with the United States Department of the Interior, Minerals Management Service, in New Orleans, Louisiana.