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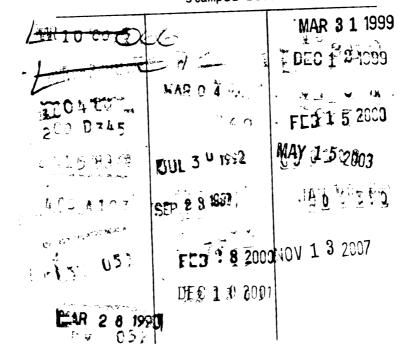

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THE EFFECTS OF POVERTY, INCOME INEQUALITY,

AND UNEMPLOYMENT ON CRIME RATES

By

Joanne Belknap

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ABSTRACT

THE EFFECTS OF POVERTY, INCOME INEQUALITY,
AND UNEMPLOYMENT ON CRIME RATES

By

Joanne Belknap

This study used opportunity theory from sociology/criminology, and expected utility theory from economics to guide an empirical analysis of the relationship between the economic structure and the crime rates. In addition to incorporating variables measuring poverty, labor force participation, and income distribution, it also controlled for demographic variables (e.g., race, education, age, population size and density, urbanization, population mobility, and region), and deterrence variables (police production and severity of punishment). All seven index crime rates (homicide, rape, robbery, aggravated assault, burglary, larceny, and auto theft) constituted the dependent variables. This cross-sectional analysis was conducted on 260 SMSAs in 1980. In addition to using an ordinary regression model, a simultaneous equations model was tested, which allowed the crime rate, police expenditure, and the severity of punishment to all act as both dependent and independent variables. The explanatory ability of both models

(ordinary and simultaneous) was moderately high, and the significance of income levels as important predictors of crime rates was supported. Another important predictor was the racial distribution, and of less importance were the population size and density, and the educational attainment. The simultaneous model was useful in showing that the police expenditure was significantly impacted by the violent crime rate and the tax rate, but that the crime rate was not affected by police expenditure. Unlike the ordinary regression, the simultaneous model showed poverty to significantly affect the (property) crime rate, as did the percent urban. The labor force variables were never significant, nor were any of the deterrent variables. Thus, these findings lend more support to opportunity theory than to expected utility theory (the latter focusing more on risk and deterrence), and suggest the importance of treating crime at a more fundamental level than strictly focusing on the "after the fact" approach of strengthening punishment and police expenditure.

Dedicated with the deepest appreciation to

Dr. Merry Morash

for recognizing my potential

and helping me achieve it

How do you thank

someone who has taken you

from crayons to computer analysis?

v

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I. INTRODUCTION: COMBINING ECONOMIC AND CRIMINOLOGICAL THEORIES

Gordon (1971:55-56) claims there are three approaches to
analyzing the earnings-crime link: conservative, liberal, and
economic. The conservatives view criminals as irrational, while
the liberals view criminals as "pushed toward irrationality."
Economists, on the other hand believe criminal behavior, "like
any other economic activity, is eminently rational" (1971:56).
Model economic analysis "postulates that an individual chooses to
commit a crime depending on expected benefits and costs"
(Freeman,1983:90). This implies that crime rates may be affected
through policies influencing unemployment, income distribution,
certainty and severity of criminal sanctions. "The expected
losses from criminal sanctions enter the criminal problem in much
the same way as would, for example, the nonpecuniary aspects of a
job" (Viscusi,mimeo:1). Block and Lind (1975:487) suggest that
"if one were to stratify the population according to legal
wealth, including both the value of assets and the present value
of future earnings, one would expect to find that the percentage
of individuals engaged in crime would decrease with each
successive increase in wealth."

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Sociologists, on the other hand, tend to see the "decision" to commit crime quite differently. "Criminologists approached the task of explaining illegal activity by attempting to determine those psychological and/or physiological factors that are unique to criminals" (Heineke,1978:1). Further, Heineke (1978:1) believes this inductive approach generally leads to untestable models. Cobb (1973:20-21) refers to this sociological approach as the "sickness hypothesis" which views criminals as sick rather than rational, and therefore see rehabilitation as the only solution to controling criminal behavior. "Thus, the issue that divides the two schools [traditional criminologists and economists] concerns their view of man: whether his behavior is the result of natural causes or whther he freely chooses to behave as he does" (Orsagh,1983:392).

Expected utility theory is a subset of the theory of choice under uncertainty, which implies risk-taking. "The general picture of such a theory [of choice in risk-taking situations] is the following: There is a set of conceivable actions which an individual could take, each of which leads to certain consequences. The individual has in mind an ordering of all possible consequences of actions, saying, for each pair of consequences, either that he prefers one or that he is indifferent between them..." (Arrow,1971:1). For risks to be

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taken, it is implied that there is some expectation of profit
(1971:6).

Both theories view the individual as discrete and autonomous
in the decision-making process (see Monzingo,1977:262 regarding
expected utility theory), and opportunity theory is more like
economic theories and less like other criminological theories in
its view of the decision to be criminal as a somewhat rational
decision. However, these theories clearly have differences which
will be elaborated on in the remainder of this chapter.

> An economist would postulate that, given his en-
> vironment, a criminal would act in a rational
> manner to maximize utility. Thus, two identi-
> cal individuals who face different environmental
> constraints would behave differently with respect
> to criminal intentions, not because their aims
> were different but because their environments
> differed. Note that the ecologist would say that
> the environment is causing the criminal to act,
> whereas the economist would say that the criminal
> is acting, taking his environment into account
> (Chapman,1976:50).

Regarding the ecomomic approach, Orsagh (1983:393-394)
claims: "In the economist's view, man is embedded in an
environment which limits, and in a sense, determines his
choices." Opportunity theory, then, suggests that variables such
as class, race, gender, education, and skill level will all
influence the optimal job opportunities, legitimate and

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illegitimate, one has open to him or her. "Crime should be more
attractive to nonwhites because there is less employment
discrimination in illegal than legal occupations"
(Swimmer,1974a:619).

In the economic framework, the decision to become involved
in crime is influenced both by the effectiveness of criminal
justice deterrents, such as arrest and conviction rates (to be
discussed further), and also by the limitations an ex-offender
faces in the job market due to his/her criminal record.
"Recidivism is thus not necessarily the result of an offender's
myopia, erratic behavior, or lack of self control, but rather may
be the result of choice dictated by opportunities"
(Ehrilich,1975b:319). Swimmer (1974a: 618) claims: "The crime
rate of a city is negatively related to the probability of being
caught which in turn depends upon police expenditure."

Heineke (1978:2) views the criminal choice as a special case
of the economic choice theory, and hypothesizes that "all
individuals, criminal and non-criminal alike respond to
incentives; and if the costs and benefits associated with an
action change, the agent's choices are also likely to change."
Opportunity theory contends that demographic constraints affect
legitimate/illegitimate work decision making. Opportunity theory
is in a sense a sociological theory that is a counterpart to the
economic expected utility theory.

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II. EXPECTED UTILITY THEORY

A. Introduction: Defining Expected Utility Theory

Expected utility theory is an approach to describe how

individuals order uncertain consequences, the point being to

maximize their expected utilities.[1] Kahneman and Tversky

(1979:263) claim: "Expected utility theory has dominated the

analysis of decision making under risk."[2] According to expected

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[1] Savage (1954:69) describes a utility function: "A
function U that arithmetizes the relation of preference among
acts will be called a utility. It will be shown that the
multiplicity of utilities is not complicated, every utility being
simply related to every other."

[2] Decision making under certainty, uncertainty, and risk are
commonly referred to in this literature. Luce and Raiffa
(1957:13) adequately differentiate between the three: "We shall
say that we are in the realm of decision making under: (a)
Certainty if each action is known to lead invariably to a
specific outcome...(b) Risk if each action leads to one of a set
of specific outcomes, each outcome occurring with a known
probability. The probabilities are assumed to be known to the
decision maker...(c)Uncertainty if either action or both has as
its consequences a set of possible specific outcomes, but where
the probabilities of these outcomes are completely unknown or are
not even meaningful."

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utility theory, choices made under uncertainty about "the state

of the world" are made under "the valuation of the consequences

and the relative strength of belief in occurrence of the

different states of the world" (Arrow,1971:45). Kahneman and

Tversky (1979:265) claim: In expected utility theory, the

utilities of outcomes are weighted by their probabilities."

> There is a method of assigning utilities to
> the individual outcomes so that the utility
> assigined to any probability distribution is
> the expected value under that distribution of
> the utility of the outcome. The numbers are
> said to be utilities because they are in the
> same order as the desirability of the distri-
> bution or outcome (desirability itself being
> merely an ordinal concept) (Arrow,1951:425).

B. The History of Expected Utility Theory

Daniel Bernoulli is commonly thought to be the founder of

expected utility theory. "The idea that choices among

alternatives involving risk can be explained by the maximization

of expected utility is ancient, dating back to D. Bernoulli's

celebrated analysis of the St. Petersburg paradox" (Friedman and

Savage,1948:281). Bernoulli's paper on measurement and risk was

first published in 1738, and much later translated from Latin

into English in 1954. He "argued that the individual acts in

such a way as to maximize the mathematical expectation of his

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utility" (Arrow,1958:4). Bernoulli was interested in probability

theory and found that pure monetary expectations did not tell one

which bets were likely, or how the value of money decreases as

one obtains more of it. Therefore, when analyzing betting, the

focus should not be on the money per se, but rather on the value

a person would gain.

> If the utility of each possible profit expectation
> is multiplied by the number of ways in which it
> can occur, and we then divide the sum of these
> products by the total number of possible cases, a
> mean utility (moral expectation) will be obtained,
> and the profit which corresponds to this utility
> will equal the value of the risk in question
> (Bernoulli,1954:24).

This work led economists to looking at marginal utility, but

Bernoulli's approach has since been discredited. Utility theory

remained dormant from this point until 1944 with Von Neumann and

Morgenstern's book titled Theory of Games and Economic Behavior.

They created game theory as a field and conducted a rigorous

approach to create the modern field of utility; focusing on the

individuals' risk in order to gain.

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C. Rational Behavior

Inherent in an analysis of expected utility theory is the assumption of rationality. "In its broadest sense, rational behavior simply means behavior in accordance with some ordering of alternatives in terms of relative desirability..." (Arrow,1971:3). Rational behavior implies actors selecting actions (means) which will best attain pre-determined goals (ends). "When people have: (1) nonprobabilistic preference, (2) transitive preference and indifference, (3) 'forced choice', (4) nonperverse selection rules, we refer to them as rational" (Frolich and Oppenheimer,1978:11). Utility functions, thus, purport to project future behavior. Additionally, rationality assumes that behavior is consistent over time; that people do not radically change their goals.

Riker and Ordeshook (1973:8) claim: "[P]eople behave as if they arranged their preferences in some logical pattern. Such behavior we describe as rational,..." Furthermore they state "[W]e believe it is usually possible to define rationality in terms of expected utility: rational behavior is, then, the choice of that alternative which maximizes expected utility" (1973:20). Arrow (1958:1-2) claims: "What may be termed a rational model of choice (or decision-making) has the following well-known form: an

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individual is assumed to rank all alternative logically possible

decisions in order of preference; in any situation, only some of

the logically possible alternatives are in fact available, due to

budgetary or other limitations, and the individual is assumed to

choose among the alternatives available that one which is highest

on his ranking." Frohlich and Oppenheimer (1978:5) note that the

consequences of actions may be uncertain, however the perceived

consequences still affect the choice determination.

> In choosing among alternatives open to it,
> whether or not these alternatives involve
> risk, a consumer unit (generally a family,
> sometimes an individual) behaves as if (a)
> it had a consistent set of preferences; (b)
> these preferences could be completely de-
> scribed by a function attaching a numerical
> value-- to be designated 'utility'-- to al-
> ternatives each of which is regarded as
> certain; (c) its objective here to make its
> expected utility as large as possible
> (Friedman and Savage,1948:287-288).

D. Applying Expected Utility Theory to Criminal Behavior

The bulk of information on expected utility theory applies

it to decision making concerning the buying of insurance,

gambling, and betting. However, more recently it has been

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applied to the decision of whether to partake in criminal

behavior.   Expected utility theory does appear applicable to the

decision of criminal behavior in that there is risk involved

(i.e., being arrested, incarcerated, etc.), and that the benefits

of committing crimes (even when allowing for the chance of being

"caught") likely result in some people (i.e., those lacking in

education, employment, and other legitimate opportunities)

perceiving it as a "rational choice."   For instance, Kau and

Rubin (1975:75) state: "Nonwhites, because of inferior legitimate

market opportunities and lower opportunity costs of imprisonment,

may be expected to have a significantly greater incidence of

crimes."

Becker (1968:172), who was probably the first to directly

apply expected utility theory to criminal behavior, claims: "The

approach taken here follows the economists' usual analysis of

choice and assumes that a person commits an offense if the

expected utility to him exceeds the utility he could get by using

his time and other resources at other activities." Regarding

punishment, Becker (1968:179) believes costs can be converted to

monetary equivalents, which can be done directly only for fines.

The cost of imprisonment varies depending on the discounted sum

of earnings foregone. Clearly, the unemployed and poor have less

to lose by going to prison in this instance.

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Palmer (1977:6) discusses four costs of criminal behavior:
(1) money spent on resources to commit the crime, (2) the cost if
the individual does not "enjoy the criminal act," (3) the
opportunity cost of investing time in criminal behavior and away
from lawful activities, and (4) the expected loss due to
punishment for the crime. Sullivan (1973:14) similarly attempts
to evaluate the costs and benefits of criminal behavior:

> According to the economic explanation of
> criminality, the individual calculates (1)
> all his practical opportunities of earning
> legitimate income, (2) the amounts of income
> offered by these opportunities, (3) the
> amounts of income offered by various illegal
> methods, (4) the probability of being arres-
> ted if he acts illegally, and (5) the prob-
> able punishment should he be caught. After
> making these calculations, he chooses the act
> or occupation with the highest discounted re-
> turn.

Friedman and Savage (1948:283) claim: "The major economic
decisions of an individual in which risk plays an important role
concern the employment of the resources he controls: what
occupation to follow, what entrepreneurial activity to engage in,
how to invest (nonhuman) capital." Block and Heineke (1973:381)
believe that even returns from the labor market are uncertain and
labor allocation decisions depend on risk-taking behavior, but

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they also admit "the individual uses the labor market as a
'hedge' against uncertainty." Markowitz (1952:151) states the
following concerning the above Friedman-Savage hypothesis: "Each
individual (or consumer unit) acts as if he (a) ascribed (real)
number (called utility) to every level of wealth and (b) acts in
the face of known odds so as to maximize expected utility."

Applicable to the offense decision is Arrow's (1971:6)
statement: "It has been vaguely contended that 'profits are the
reward of risk-taking,' in the sense that the expectation of
profits is a necessary inducement for risk bearing." Similarly,
Knight's (1957:236) belief may also be applied to the crime
decision: "We shall assume, then, that if a man is undergoing a
sacrifice for the sake of a future benefit, the expected reward
must be larger in order to evoke the sacrifice if it is viewed as
contingent than if it is considered certain, and that it will
have to be larger in at least some general proportion to the
degree of felt uncertainty in the anticipation."

Luce and Raiffa (1957:21) believe we need to construct
utility functions on an individual basis, which represents
choices among gambles with expected values for the corresponding
gambles. Assuming the large reward usually associated with
successful completion of an undetected crime, Knight's (1957:237)
statement can be adequately applied to a person with a small or

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no income: "Hence, it is correct to treat all instances of

economic uncertainty as cases of choice between a smaller reward

more confidently and a larger one less confidently anticipated."

Similarly, in a discussion of the risks unskilled workers are

willing to take concerning gambles, Friedman and Savage

(1948:299) claim: "Men will and do take risks to distinguish

themselves, even when they know what the risks are."

In the same vein, Arrow (1971:45) claims: "[I]t is clear

that any choice for actions must be synthesized out of two

components, the valuation of the consequences and the relative

strength of belief in the occurrence of the different states of

the world." In addition, the "risk" involved in a decision also

plays an important part. Diamond and Stiglitz (1974:337) point

out that not only are some situations riskier than others, but

some people are more risk averse than others, thus increases in

risk should affect the more risk averse individuals more than the

less risk averse individuals.

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E. Recent Applications of Expected Utility Theory

Consistent with expected utility theory, Phillips et al. (1980:492) hypothesize that crime rate increases can be explained by "deteriorating economic opportunities." Danziger and Wheeler (1975:114) state: "According to the neoclassical view of crime, individuals calculate the returns from all possible activities-- illegal as well as legal-- and choose those that maximize expected utility." This theory follows the contention of criminals as individual, rational decision makers "capable of scanning the set of occupational choices they feel are open to them and selecting that alternative which stands the highest in their own scale of preferences" (Krohm,1973:31).

Viscusi (mimeo:23) claims that individuals choose to participate in crime "if the expected net rewards from doing so are positive." Similarly, Ehrlich (1974:69) views "the general theory of occupational choice by presenting the offender's decision problem as an optimal allocation of resources under uncertainty to competing activites both inside and outside the market sector, rather than as a choice between mutually exclusive activities." Finally, Heineke (1978:2) claims: "In a sentence, the models of economic choice theory, of which the criminal choice is a special case, hypothesize that all individuals,

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criminal and non-criminal alike respond to incentives; and if the costs and benefits associated with an action change, the agent's choices are also likely to change."

Freeman (1983:91) states: "Because crime is risky, attitude toward risk always plays an important role in the decision." However, Block and Lind (1975:246) claim that criminal actions "are independent of attitudes toward risk." In his discussion of expected utility theory, Markowitz (1952:157) refers to the "fun of participation" hypothesis, although he does not mention crime in its applicability, but rather as a function of behavior under uncertainty. Kau and Rubin (1975:69-70) take this a step further in their discussion on crimes against the person: "The model to explain non-economic crimes is more difficult to specify. The argument in the utility function is no longer measurable in money terms; nonetheless, costs of arrest and conviction would still affect crimes of this sort." It has been pointed out that crime may increase one's "psychic" income, benefits, returns, or gains (Ehrlich,1975:314; Avio and Clark,1976:27; Palmer,1977:5; Sjoquist,1973:439). Thus, "psychic" benefit may be especially pertinent in explaining violent crimes, as these generally result in no material gains, although the role it may play in the

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"gamble" of "getting caught" for property crimes is also feasible
for "risk lovers."[3]

A primary focus in the economists' individual choice model
is the matter of time allocation (Avio and Clark,1976;
Becher,1968:176; Block and Lind,1975:242; Block and
Heineke,1975:314; Ehrlich,1974; Krohm,1973:34; Sjoquist,1973:439;
Witte,1980:59). This is basically viewed as the person's choice
as to whether her or his time is more profitably spent in legal
or illegal activities. However, as Ehrlich (1974:71) points out,
this is not really an "either-or" case. That is, a combination
of legal and illegal activities can be used at one time or be
spread over a life time.

A person's allocation of time-spending will depend on how
"marketable" that person is in the legitimate market. For
example, the assumption here is that a highly skilled, trained,
or educated person would tend to find more benefits in the
legitimate labor market, while the ex-convict, poorly trained,
unskilled, and uneducated person would find more benefits in the
illegitimate market, and therefore be more likely to (re)turn to

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[3]Solberg (1982:457) claims: "Not all persons are risk
averse. A person is called a risk lover if the expected utility
of a gamble is greater than the utility of an amount of money
equal to the expected value of the gamble."

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crime.   Just as expected increases in gains from criminal

activity will likely result in increased criminal activity and

increases in costs will reduce it, increases in the likelihood of

failure or increases in the uncertainty surrounding the risks

should decrease resources allocated to criminal activity

(Heineke,1978:9).

> The costs of engaging in property crimes are
> dependent upon (1) the foregone income that
> could be obtained in a legitimate occupation,
> (2) the costs of being apprehended and charged
> by police and of appearing in court, (3) the
> costs of serving a prison sentence, and (4) the
> reduction of legitimate opportunities for any-
> one with a criminal record (Avio and Clark,
> 1976:14).

Orsagh (1983:394) believes that economists try to explain

criminal behavior through "environmental stimuli mediated by

individual preference." Traditional criminologists, on the other

hand, place more emphasis on what economists call "tastes"--

attitudes, values, and personality. Stern (1978:139) claims that

the economic arguments "singly or collectively, cannot provide a

satisfactory answer and concludes that we have to search outside

the economic models, simple or complicated." Future analysis

requires both disciplines to examine the relationship of certain

economic, demographic, and deterrence variables, with crime

rates.

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F.   <u>Criticisms and Limitations of Expected Utility Theory</u>

Expected utility theory has been met with some cynicism and
reluctance. Friedman and Savage (1948:282) state: "Whether a
numerical utility function will in fact serve to rationalize any
particular class of reactions to risk is an empirical question to
be tested; there is no obvious contradiction such as was once
thought to exist." Similarly, Bernoulli (1954:24) originally put
forth: "However, it hardly seems plausible to make any precise
gereralizations since the utility of an item may change with
circumstances." Savage (1954:98) insists that there do exist
meaningful measures of utility. He claims: "The confusion
arises only because von Neumann and Morgenstern use the already
pre-empted word 'utility' for what I here call the 'von Neumann-
Morgenstern utility'", where "every von Neumann-Morgenstern
utility is an increasing function of every other" in order to
satisfy their classical utility" (1954:98).

Von Neumann and Morgenstern (1964:9) believe that "there
exists at present, no satisfactory treatment of the question of
rational behavior. There, may, for example exist several ways by
which to reach the optimum position..." In the same vein,
Friedman and Savage (1948:292) believes the choices consumer
units make involving risk are usually much more complicated than

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expected utility theory hypotheses portray. "There are two chief
sources of complication: Any particular alternative typically
offers an indefinitely large number of possible incomes, and
'other things' are generally not the same" (1948:292).
Concerning the rational model of choice under uncertainty, Arrow
(1958:4) states: "There are a number of possible states of
nature and a number of possible actions we can take. We do not
know which state of nature, among a certain class, is the true
one."

Kahneman and Tversky (1979:265) criticize expected utility
theory in its weighting the utility of outcomes by their
probabilities. Their findings refute this contention, in finding
that "people overweight outcomes that are considered certain,
relative to outcomes which are merely probable-- a phenomenon
which we label the certainty effect." However, I believe this
supports the occurrence that most people, even the unemployed and
poor, do not commit crimes. That is they feel more secure with a
dependable small income than in taking the risk of being caught
committing a crime. I suggest that there is some "adversity to
risk" factor involved in addition to the poor-have-more-to-gain-
and-less-to-lose argument in the commission of crimes.

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Kahneman and Tversky (1979:271) further criticize expected utility theory through a phenomenon they call the isolation effect. This phenomenon claims that people focus on components distinguishing alternatives rather than what they share, thus resulting in inconsistent preferences "because a pair of prospects can be decomposed into common and distinctive components in more than one way, and different decompositions sometimes lead to different preferences" (1979:271). Again, this does not necessarily impinge on the application of expected utility theory to criminal behavior, since people will differ in their adversity to risk concerning crime commission.

Riker and Ordeshook (1973) defend the plausibility of rationality in expected utility theory. They believe that most researchers' findings of irrationality in decision making result from the researchers' own poor judgement in realizing the subjects' actual goals (1973:16). Riker and Ordeshook (1973) also defend against the focus on people being unable to maximize expected utility because they err. "Rather the question concerns the frequency of error. Is it so general and pervasive that the concept of rationality is useless as description because it is not parsimonious?" (1973:24). Instead, they claim that most error is the result of "misinformation and reasoned rejection of the cost or correction, not from simple stupidity" (1973:31).

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Similarly, Sullivan (1973:142) states: "The basic economic
assumption does not maintain that people do not make mistakes,
but rather that they do their best given their reading of present
and future possibilities and given their resources."

Markowitz (1952) criticizes the Friedman-Savage (1948)
hypothesis elaborated on earlier. He believes their utility
function implies that a "moderately wealthy person is willing to
risk a large fraction of his wealth at actuarially unfair odds"
which is probably highly unlikely (1952:153). Thus, he believes
there needs to be an alternative utility analysis capable of
explaining risk-taking among the rich and poor. He then proposes
a utility function which distinguishes between what he calls
"customary" and "present" wealth.

> To have an exact hypothesis-- the sort one
> finds in physics-- we should have to specify
> two things: (a) the conditions underwhich cus-
> tomary wealth is not equal to present wealth
> (i.e., the conditions referred to as recent
> windfall gains or losses) and (b) the value of
> customary wealth... when customary wealth is
> not equal to present wealth (1952:157).

Finally, Markowitz (1952:157) claims that the 'fun of
participation' (discussed in the last section) does not explain
observable behavior. "It [the 'fun of participation' hypothesis]

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seems to say the utility of a gamble is the expected utility of the outcome plus the utility of playing the game (the latter utility is independent of the outcome of the game)" (1952:157). I do not believe this assertion of the "fun of participation" hypothesis is inconsistent in the explanation of violent crimes, because in most cases interpersonal violence is not precipitated over acquiring an outcome such as property or money, but is more likely to be to gain a sensation, frequently that of power. The sensation of power, then, may be the "fun of participation" associated with violent criminal acts.

G. <u>Summary</u>

This section has summarized expected utility theory regarding its definition, development, limitations, and applications to criminal behavior. Clearly more research needs to be conducted to test expected utility theory, especially as it pertains to the decision under risk, particularly that of criminal behavior. The following section will review opportunity theory, which can be viewed as a sociological counterpart to expected utility theory.

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III.   OPPORTUNITY THEORY

A.   <u>Introduction: The Development of Opportunity Theory</u>

Studies by sociologists and criminologists on the

relationship between economic factors and the crime rate are

largely based on opportunity theory.   Opportunity theory is a

"strain theory."   Strain theory does not view delinquents as

"motivated by deviant values, but rather as by values of the

"American Dream" held by all of American society.[4]   Therefore,

lower-class youth violate the law over frustration at being

unable to attain this dream (Empey,1982:233).

Opportunity theory is most commonly identified as evolving

from Cloward and Ohlin's book <u>Delinquency and Opportunity</u>.

Leonard (1982:122) claims that anomie theory suggested

illegitimate opportunity was easily accessible or unimportant,

Sutherland recognized the importance of illegitimate opportunity

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[4]There will be a discussion in the literature review chapter
that income distribution (relative poverty) appears to have a
greater effect on crime rates than does the porportion of a
population living in poverty (absolute poverty).   Similarly,
economists Block and Heineke (1973:383) claim: "[I]ncreases in
the dispersion of the wage rate induce the individual to supply
more effort in an attempt to compensate for the additional income
uncertainty."

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but ignored legitimate, and Cloward and Ohlin combined the two.

The objective of opportunity theory is to consolidate two

traditional theories: (1) Durkheim's and Merton's anomie theory,

and (2) Sutherland's and Shaw and McKay's "cultural transmission"

and "differential association" theories (Cloward,1959:164;

Cloward and Ohlin,1960:151). "We can now look at the individual,

not simply in relation to one or the other system of means, but

in relation to both legitimate and illegitimate systems"

(1960:151).

Opportunity theory was developed by Cloward and Ohlin

(1959,1960) as an explanation of delinquency of adolescent males

in lower class sections of large urban areas. Empey (1978:290-

291) classifies this view of delinquents as more "rational and

utilitarian" than most delinquency/criminological theories:

"When channels for success are closed to them [adolescent,

working-class, urban males], they simply turn to illegitimate

ones if at all possible." In fact, Gibbons (1979:96-97) claims

of this theory: "The raw material for delinquent gangs consisted

of boys concerned about economic injustice rather than middle-

class status." These youths "internalize conventional goals, but

are blocked by limited economic and educational opportunities"

(Davis,1980:141). Opportunity theory has been expanded to

attempt to explain the effects of unemployment, poverty, and

income inequality on crime rates.

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An inherent theme in Cloward and Ohlin's (1960) opportunity
theory, is the theme of a delinquent "subculture." Their theory
claims that in addition to feeling the frustration of blocked
legitimate access to culturally agreed upon goals, for some
delinquent types to emerge, accessibility to illegitimate means
of goal achievement may be necessary.[5] Thus, they claim:
"Illegitimate figures become no less obscure as role models to
lower-class youth than the role-models of the legitimate world of
finance and corporate enterprise" (1960:206).

> Cloward and Ohlin's use of such terms as
> 'opportunity structures', 'legitimate and il-
> legitimate means,' 'role models,' 'integration
> of age levels,' etc. implies that somewhere
> within the institutional or informal social
> context of an adolescent's life there exist
> individuals who can offer or withhold keys to
> certain sectors of adult status... (Rivera and
> Short,1967:78).

[5]It is interesting to note that the expected utility theory
literature also touched on this idea independently from
opportunity theory. For instance, Friedman and Savage (1948:302)
state: "Opportunities to assume risk may not exist." More
vague, but still applicable is Von Neumann and Morgenstern's
(1964:8) discussion of how there may be a number of actions
capable of leading to the same desired goal, but the chosen
action "may depend upon the knowlege and understanding which the
individual has and upon the paths of action open to him."

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B. <u>Theoretical Criticisms of Opportunity Theory</u>

   1. <u>subculture</u>

   Cloward and Ohlin's portrayal of the subculture has been
questioned not only as to the extent in which it plays a major
role in delinquency, but even in its existence. Matza (1961:632)
criticizes Cloward and Ohlin for perceiving the ranges of access
to both legitimate <u>and</u> illegitimate opportunities to adolescents
in lower classes as much more limited than they actually are. He
does not believe the organized rackets "virtually exhaust
available criminal endeavors...Do not the great majority of
criminals take the path of entrepreneurial petty crime?"
(1961:632). Similarly, Bordua (1961:135) believes Cloward and
Ohlin "may make too much of the necessity for systematic,
organized criminal careers in order for the illegitimate
opportunity structure to have an effect."
   Gibbons (1979:97) claims Cloward and Ohlin's definition of
subculture "limits the applicability of their theory to a
minority of delinquents. Critics contended that much gang
delinquency in working class areas is more spontaneous and
unstructured than acknowledged by Cloward and Ohlin." Kornhauser
(1978:155) claims that Cloward and Ohlin's "conception of working

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class subculture is so tortured as nearly to defy comprehension,

and so bizarre as, when understood to defy belief." Bordua

(1961:133) believes Cloward and Ohlin confuse the "justifacatory

function of delinquent subcultures with their causation."

> In short, there is a strong pressure here to-
> ward a simple isomorphism of culture content
> and problem of adjustment. The complex society
> of street groupings characteristic of slum life
> is given little or no culture creating potien-
> tial of its own. The group is simply the in-
> strument that translates the individual discon-
> tent into the collective solution (Bordua,
> 1962:255).

Taylor et al. (1973:134) believe that Cloward and Ohlin do

not grasp the diversity of subcultures in modern industrial

societies. Toby (1961:283) suggests that in viewing delinquent

behavior as required and a central group activity in delinquent

subcultures, that Cloward and Ohlin fail to see that delinquency

may emerge from personal pathology. "They also ignore delinquent

repsonses to cultural or subcultural phenomena that do not

involve a well-organized group with clear-cut prescriptions and

interests" (1961:283).

Empirical support for the existence of a delinquent

subculture has been confirmed by some researchers (Vold,1958:189;

Moore et al.,1983; Weinber,1976; Yablonsky,1962; Thompson et

al.,1984; Mooris,1965). However, Lermen (1967:7) warns against

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viewing "gangs" and "subcultures" as synonymous, and claims we
need to differentiate between "subculture" and "interaction."
Similarly, Morash (1983:328) found "negligible association
between membership in a stereotypic gang and delinquency."
Although Yablonsky (1962:143) found support for the existence of
a subculture in the form of a gang, he believes Cloward and
Ohlin "tend to minimize the importance of individual personality
factors and characteristics." Rahav (1984:172) concluded that
"age-sex norms are pervasive across the various sectors of the
social structure, and differ only minimally among members of
various social categories."

There has also been research conducted on the role of adults
and orgnization in subcultures as a means of creating legitimate
or illegitimate opportunity, there has also been research
conducted. Downes (1966:189) found that although there appeared
to be a positive relationship between adult and youth crime, "the
nature of the criminality suggests Skid Rows rather than
professional crime...any organization is simply the minimum
required for the commission of these offense types." For the
most part, the studies found the role of significant adults in
youths' lives play an important part in influencing delinquency
(Kobrin et al.,1967; Spergel,1964; Rivera and Short,1967).

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In summary, Cloward and Ohlin's belief in a delinquent subculture has been vigorously challenged both theoretically and empirically. Although some support has been found, the overlying belief is that this approach is too simplistic. For example it ignores individual personality traits, and the existence of upper- and middle-class delinquency, and the limited delinquency among girls in these deviant subcultures. However, the impact of adults with which youth have contact, do appear relevant in affecting delinquent behavior.

2. <u>conventional attachments</u>

Part of the logic behind opportunity theory rests on the assumption that all classes and walks of life hold the same values. Taylor et al. (1973:135) criticize opportunity theory's narrowness: "At no time is the cultural diversity of goals and means, and the multitude of graduations of acceptance and rejection of utilitarianism, existing in modern industrial societies, fully encompassed." They wonder how Cloward and Ohlin would have classified the Black Panthers and hippies in their typology.

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Empirical evidence overwhelmingly suggests that there is a
common "American Dream" that cuts across social class, that there
are universal goals to which everyone aspires, including
delinquents (Short et al.,1965; Gordon et al.,1963; Short and
Strodtbeck,1965; Spergel,1963; Elliot,1962; Sherif and
Sherif,1964; Lerman,1966). However, Thompson et al. (1984:20)
found "while relationships may appear to exist between
attachments and conventional attitudes with delinquent acts,
these relationships diminish to the point of being virtually non-
existent when the effects of delinquent companions is
controlled." Perhaps the effect of common aspirations has been
overemphasized in place of the influence of one's cohorts in
research up to this point.

3.   perceptions of opportunity blocks

The gap between aspirations and expectations that Cloward
and Ohlin propose that the lower class experiences is in some
cases hypothesized to lead to delinquency out of a sense of
injustice or frustration. Bordua (1961:133) criticizes Cloward
and Ohlin for "forcing" themselves into believing the feeling of
injustice is objectively correct, thus injustice flourishes among
those actually "fitted for success" without the legitimate means

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of achieving it. Hirshci (1969:184) claims that the commission

of delinquency is unrelated to whther a boy blames himself or

the social system for his potential failure.

Bordua (1961:134) questions Cloward and Ohlin's belief in

the gang boys actually possessing the requirements even without

structural opportunity blocks. In fact, he seems to blame the

delinquents, claiming they are often "the end product of a long

history of their progressively cutting off opportunity and

destroying their own capacities..." (1961:134). Matza (1961:632)

criticizes Cloward and Ohlin for not seriously considering the

actual range of legitimate opportunities open to lower class

youth.

Empirical support is evident for Cloward and Ohlin's

contention of a perception of blocked opportunities by

delinquents (Spergel,1963; Spergel,1964; Short et al.,1965; Short

and Strodtbeck,1965; Elliot,1962; Cernkovich,1978; Cernkovich and

Giordana,1979; Datesman et al.,1975; Segrave and Hastad; Sherif

and Sherif,1978). Johnstone (1983:295) claims youths resisted

gang recruitment as long as they believed they could achieve

success in conventional manners. Hardman (1969:178) found little

resentment or even awareness of opportunity deprivation, although

it existed. Others agreed that occupational and middle-class

aspirations did not pressure boys toward delinquency

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(Short,1964:115; Reiss and Rhodes,1961:729; Hirschi,1969:185;
Simons et al.,1980:49).

Thus the role of blocked opportunity does not appear
entirely clear. The literature reviewed in this section suggests
that perceptions of opportunities may work through other
variables in affecting delinquency (Cernkovich,1978), and/or
perceived blocked opportunity may cause stress, but this does not
automatically lead to delinquency (Hardman,1969). At any rate,
there is much to be learned concerning the role perception of
blocked opportunities plays with delinquency.

4. social and economic status

Kornhauser (1978:156) accuses Cloward and Ohlin of wrongly
interpreting their data (finding higher income people more
concerned with status and lower income pople more concerned with
money) in a zero-sum manner. "Now certainly it must be true that
money is more salient to those who have little of it...I think it
is safe to assume that all people, of whatever rank, value most
of all that which is a necessity for survival: money" (1978:156).

Vold (1958), whose writings preceded Cloward and Ohlin's
opportunity theory, was irritated with any preoccupatin of using
economic variables to explain crime rates. "If economic

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conditions are influences contributing to the structure and

functioning of various social arrangements, including crime, it

is equally true that the existing social and institutional

structure molds and influences the nature of economic affairs.

Economic conditions are then no longer 'determining

influences'..." (1958:182). Bordua (1962:252) similarly

criticizes Cloward and Ohlin's focus on class position "to the

near exclusion of other social attributes" frequently associated

with those in the lower economic strata such as rural migrants,

immigrants, blacks, etc. Toby (1961:287) criticizes Cloward and

Ohlin because "by assuming that feelings of economic deprivation

are of central motivational importance, they simplify their

analysis of the impact of social structure on the alienated

youngster."

Furthermore, Vold (1958:172) claims the following in a

discussion on middle-class and similar crimes: "If one assumes

that there is a causal significance to the situation under which

30.7% of the population 'produces' 56% of the juvenile

delinquents, one must be prepared to explain why the

'comfortable' and 'luxury' classes 'produce' the other 44%... It

would be more logical to conclude that neither poverty nor

wealth, as these are experienced in modern society, is a major

'determining' influence in crime and delinquency." Cloward and

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Ohlin's theory implies that the middle-class, in addition to
having more legitimate opportunities to gain success, has less
exposure to illegitimate means. I suspect that they have access
to different methods of illegitimate means, or are able to
"purchase" it from the lower class.

Scott and Vaz (1963) believe the age of industry, post World
War I, negatively affected the cohesiveness of the American
family. "The adolescent conspicuously lacks an exact definition
of the expectations and obligations attached to his role in
society and he is left to define for himself what is 'right'
conduct" (1963:327). Membership in a peer group implies the
youth is socially adjusted (1963:330). They claim: "If we are
correct, the opportuntities which exist for the middle-class
adolescent to engage in legitimate, approved activities will
greatly influence the probability of his becoming involved in
illegitimate disapproved behavior" (1963:333).

Matza (1961:632) questions the magnitude of class immobility
that Cloward and Ohlin imply: "It seems important to investigate
the relation between the delinquents' implicit model of the
legitimate system of opportunities-- a closed system-- and the
realities of social mobility in what many sociologists
characterize as approximating an open system." Hirshci
(1969:226) is more direct: "Strain theories are class

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theories...The trouble for these theories thus begins with
failure of social class to be importantly related to
delinquency."

Empirical research has supported an inverse relationship
between social class and delinquency (Hardman,1969:178; Segrave
and Hastad,1983:450-451; Cernkovich,1978:344), however the
reasoning and logic used to come to these findings I believe are
frequently suspect. Others found no relationship, or a
relationship too complex to pass judgement (Cernkovich and
Giordana,1979:148; Elliot,1962:226; Reiss and Rhodes,1961:729).
Tittle et al. (1978:653) analyzed 35 studies using individual-
level data to compare class position and crime/delinquency, and
found the overall mean association to be only -.09, and this
relationship became increasingly weaker in more recent studies,
through to studies since 1970 which found no relationship. They
claim this may be because self-report data is more accurate and
less class biased, or it may be that class has generally become
less important (1978:654).

Cloward and Ohlin have been criticized for their failure to
explain middle-class delinquency. Chambliss (1973:29) found a
community he studied reacted differently toward an upper-middle
class white male gang than to a lower-class white male gang.
Despite similar degrees in delinquency, the former were not seen

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as a problem, and the latter were. Thus, any association between

delinquency and social class may be due to differential labeling.

Cernkovich (1978) claims that structural theories (such as

opportunity theory) have historically been applied to lower class

delinquency, while control theories are applied to middle-class

delinquency. Hirschi (1969:7-8), a control theorist and a

popular critic of strain theory claims:

> If he ever feels called upon to explain
> middle-class delinquency, the strain theorist
> has two options: he can argue that apparently
> middle-class boys committing delinquent acts
> are 'really' lower class boys; or he can re-
> verse his original procedure and ask: What is
> it about the middle class situation that pro-
> duces middle-class delinquency?

A review of evidence from empirical studies challenges

Cloward and Ohlin's obsession with lower class delinquency.

Opportunity theory fails in its inability to explain middle-class

delinquency. Further research and theory building must proceed

in attempting to determine if we must find separate theories for

middle- and lower-class delinquency or if a single theory or

combination of theories can depict delinquency etiology.

5. race/ethnicity

Race and ethnicity are other variables which researchers

have found problematic when considering opportunity theory.

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Bordua (1962:252) states: "Cloward and Ohlin discuss racial and

ethnic differences in the types of delinquent subcultures found

in different neighborhoods but do not seem sensitive to the

possibility that race, ethnicity or rural origin may be heavily

involved in the 'problem of adjustment' to which the delinquent

subcultures are solutions." Yablonsky (1962:184-185) points out:

> Prejudice first appears in the 'community'
> to force the family of the minority group
> gang member into the disorganized slum...
> Most of the newly arrived population are
> unskilled labor, and this too affects their
> economic and financial condition...on the
> more direct discriminatory level, minority
> groups, particularly Negroes and Puerto Ri-
> cans, do not have equal access or are simply
> barred from living in certain neighborhoods
> regardless of financial ability to pay their
> rent regularly.

Cernkovich and Giordano (1979:150) found blocked opportunity

more strongly associated with the delinquency involvement of

whites than nonwhites, regardless of sex. Taylor et al.

(1973:134) state: "Negro adolescents may quickly become aware

that it is their blackness, rather than than any individual

inadequacy shared by their peer group, which prevents them from

competing." Yablonsky (1962:189) found "some individual victims

of prejudice use the gang vehicle of violence as a direct weapon

for 'getting even'." This brief discussion suggests opportunity

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theory needs to be examined more closely to determine the role

that race and ethnicity play.

Clearly, Cloward and Ohlin's opportunity theory was

developed for the explanation of juvenile delinquency. More

recently it has been generalized to understand adult criminality.

Cloward and Ohlin's contention of the importance of the

"subculture" has not been widely supported, however there is some

evidence as to the importance of perceived blocked opportunities.

Therefore, this aspece of opportunity theory, blocked

opportunities, is now being applied to research on adult criminal

behavior and earnings opportunities.

IV. USING AGGREGATE DATA TO TEST THESE THEORIES

Cloward and Ohlin's opportunity theory was clearly developed

using and assuming individual-level data. However, more recent

studies based on opportunity theory and expected utility theory,

especially those concerned with the economics-crime link, have

utilized aggregate level data. Thus, although opportunity theory

was initially a theory of individual behavior, as the last

section of this chapter indicated, it is not at all well

supported. Some researchers borrowed the idea of opportunity--

separate from all of Cloward and Ohlin's ties to the

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"subculture"-- and used it to predict crime rates at the aggregate level.

Due to the problems supporting opportunity theory in an inidividual-level analysis, there exists a great need to conduct more research on opportunity and crime at the aggregate level. Among others, Firebaugh (1978) and Hannan (1970) refute Robinson's (1950:357) contention that ecological correlations cannot "validly be used as substitutes for individual correlations." However, before elaborating on this it is important to review some of the limitations posed by the use of aggregate data.

W.S. Robinson (1950) is believed to be the person who first recognized the problem of ecological fallacy.Babbie (1979:91) defines ecological fallacy as "the danger...of making assertions about one unit of analysis based on the examination of another." Robinson (1950) claims that in ecological correlations "[t]he variables are percentages, descriptive properties of groups, and not descriptive properties of individuals." Wagner (1964) refers to this as the homology thesis-- which is when researchers assume there is consistency across levels of analysis. Thus the problem comes in making insinuations about individuals from aggregate-level data, or vice versa.

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> Lower status areas may have higher crime
> rates becuase a small proportion of people
> within those areas commit a lot of crimes or
> because outsiders come into these areas to do
> mischief. And, it is possible that people who
> live in low status areas and commit crimes are
> not necessarily themselves of low status,
> since the composition of urban units such as
> census tracts are often diverse (Tittle et al.,
> 1978:644).

Researchers since Robinson (1950) have argued that the use

of aggregate-level data is not inherently poor methodology. Land

and Felson (1976:566) claim that most researchers agree that

social indicators, such as the unemployment rate, "are measures

of social conditions." Hannan (1970:23) points out that when

individual measures are not available or realistic (and he uses

delinquency research as an example) "researchers often shift

levels and employ rates of certain behaviors." In fact, Riker

and Ordeshook (1973:33-34) deal with this abstractly in their

discussion of expected utility theory: "Individual perferences

and the choices that reveal them have social consequences.

Indeed these consequences together make up the soical environment

and are in fact social institutions. As such they stand behind

all individual action." Furthermore, Hannan (1970:66) relates

the aggregation problem to theory:

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> But what of the situation when there is like-
> ly to be a substantively interesting causal re-
> lation between the aggregation critereon and
> one or more variables of interest? Without a
> theory specifying such relations, we would
> face an overwhelming range of choices of causal
> specifications of such relations in any fairly
> complex situation. This problem seems to piont
> to a real need in the face of aggregation-
> dissaggregation problems of cross-level theories.
> If we had such theories, we would be in a better
> position to uncover the various biasing aggre-
> gation problems discussed to this point. Better
> yet, we would be able to explicitly include the
> operative variable(s) under a surrogate variable
> (like region) in the model.

Additionally, Mathieson and Passell (1976:83) believe:

"Just as models of collective consumer behavior can have powerful

analytic uses without benefit of a complete psychological theory

of consumption, so too can testable models of 'rational' criminal

behavior fruitfally bypass the fundamental psychological origins

of crime." By using geographical areas as a units of analysis

(as opposed to individual people), and then using percentages,

rates or propensities as the variables, we are attempting to

determine the degree to which "social indicators" (such as the

unemployment rate, the percent poor, the police expenditure per

capita, etc.) are related to social conditions such as suicide,

mental illness, or in this case, the crime rate. We cannot

assume if the findings are significant in the direction expected

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that, for instance, unemployed <u>people</u> commit more crimes, simply

because we find the unemployment rate positively and

significantly related to the crime rate. However, we can claim

that our findings suggest that <u>areas</u> with higher unemployment

rates are more prone to crime, given what we know and allowing

for what we have controlled.

> Of course, measuring the structure of
> dominant/subordinate relations within popu-
> lations requires research at the aggregate
> level, meaning that populations are the
> appropriate units of analysis, not individ-
> ual persons. Interestingly enough, aggre-
> gate empirical examinations of conflict
> criminology have been conspicuously rare,
> even though such examinations promise to
> be quite instructive (Williams and Drake,
> 1980:564).

Babbie (1979:92) claims: "The appropriate unit of analysis

for a given research question is not always clear, and it is

often debated by social scientists, especially across

disciplinary boundaries." In his conclusion of a review of

delinquency and opportunity structures, Gibbons (1979:98) claims:

> The major thrust of this commentary has
> been that real-life social structure in a
> society such as the United States is ex-
> ceedingly complex, involving interwoven
> layers of social variables that are com-
> bined in varied ways and that produce be-
> havioral outcomes such as delinquency. In
> short, theories of gang delinquency are
> not yet rich enough or elaborate enough to

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encompass the varieties of real-life exper-
ience.

In summary, it is time that Cloward and Ohlin's theory be
expanded to include aggregate levels of analysis, since findings
at the individual level have not frequently substantiated their
opportunity theory. By using geographical areas as the units of
analysis, we can use opportunity theory as a basis for
hypothesizing that areas' unemployment and poverty rates will be
negatively related to their crime rates, and the more equally
distributed the income in an area, the lower the crime rates,
ceteris paribus. Therefore, it now becomes pertinent to test
which sorts of social conditions affect the level of crime rates.

CHAPTER TWO: THE LITERATURE REVIEW

I. THE INTRODUCTION

     The literature researching the link between economic factors

and crime rates varies widely in the level of analysis (e.g.,

individual, city, nation, state, etc.) and the choice of

predictor and dependent variables. The present research uses the

most comprehensive combination of variables of which the author

is aware, and focuses on the SMSA[1], as the unit of analysis. The

limited number of variables in prior research is partially due to

the fact that economists and sociologists/criminologists tend to

"stick to" their respective fields when conducting literature

reviews for their research, whereas this research has combined

both disciplines. This research includes as dependent variables

the composite crime rates, as well as rates for the individual

index crimes (homicide, rape, aggravated assault, robbery,

     [1] "The general concept of a standard metropolitan
statistical area (SMSA)... is one of a large population nucleus
together with adjacent communities that have a high degree of
economic and social integration with that nucleus...The SMSAs are
designated and defined by the Office of Information and
Regulatory Affairs, U.S. Office of Managment and Budget (OMB),
which follows a set of official published standards developed by
the interagency Federal Committee on Standard Metropolitan
Statistical Areas" (U.S. Bureau of Census, State and Metropolitan
Data Book, 1982: xv).

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larceny, burglary, and auto theft), and both composite property and violent crime rates. The predictor variables can be grouped into three major categories: economic, demographic, and deterrence variables.

The literature review consists of sections describing previous findings for each of the variables. Because the studies varied in the variables chosen for analysis, Appendix 1 shows which variables were included in which studies. The economic variables consist of income levels and distribution and unemployment and labor force participation rates. The income level variables include mean or median family income, and relative and absolute poverty.[2] The demographic variables comprise racial distribution, geographical region, educational level, population size and density, urban-rural distribution, and age structure. The deterrence variables include the police expenditure and police employment per capita rates, and the certainty and severity of punishment.

_____

[2] Absolute poverty implies the proportion of people living at a subsistence or below level, or rather, the percent of people living in poverty. Relative poverty implies the distribution of income, or rather, income inequality.

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II.   THE ECONOMIC VARIABLES

This section will discuss the major economic variables
thought to influence crime rates: absolute (subsistence) and
relative (income inequality) poverty, mean or median income
levels, and unemployment and labor force participation rates.
The measurement of these variables has been widely disputed and
thus a lengthy discussion is necessary. "No one would gainsay
that there is some correlation between the labor market and
crime, but the strength and magnitude of the link are more subtle
and difficult to determine than one might expect" (Freeman,
1983:90). We might expect this contention to hold for the effect
of poverty and income inequality as well.

A.   Income Levels and Distribution

It has been frequently asserted that decreasing a person's
income, especially below the poverty line, should increase the
propensity for that person to turn to crime. However, analyses
of the poverty level have led researchers to believe that the
degree of absolute poverty may not be nearly as threatening to

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crime rates as the degree of relative poverty. This implies that
income inequality may be more influential on the crime rate than
poverty, per se.

Chester (1976) claims we cannot just focus on poverty, but
rather we must look at "perceived relative deprivation." This
should also enhance our understanding of middle-class and white-
collar crimes. Danziger and Wheeler (1975:119) believe "the
potential criminal is concerned not only with his own income, but
with how this income compares to that of his reference group, and
to the economic structure of the society, as expressed through
the relative distribution of income." This, then, is linked to
strain theory, and the concern becomes lagging rather than lower
incomes (Messner,1982:104). These studies on poverty and income
inequality have focused on units of analysis including individual
data, and data aggregated by police districts, cities, SMSAs,
states (or provinces), and nation-states. Discussions of each of
the variables will be organized by units of analysis.

1.   individual-level data

Viscusi's (mimeo) individual-level analysis of self-reported
data on black youths found: "The differential earning from crime
and legitimate occupations are a significant, but by no means

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dominate determinant of criminal behavior." Witte's (1980) study
used individual-level data to study arrest and conviction
frequencies per month of released prisoners. She found that the
legal wage had a significant, negative relationship with these
frequencies, and the initial wealth variable had a negative (but
insignificant) relationship. Thus, the individual level data
tend to support the hypothesis.

2. <u>national data</u>

Most studies analyzing the link between income variables and
crime rates from a national perspective have shown only partial
or no support for the hypotheses concerning income levels and
crime rates. Land and Felson (1976) conducted a time series
analysis of U.S. national statistics from 1947 to 1972. They
found that inflation (measured by the consumer price index) had
the predicted positive, significant relationship with property
crime rates, but a negative, insignificant relationship with
violent crime rates. However, inconsistent with expected utility
and opportunity theories, prosperity (GNP per capita) had a
significant positive relationship with property crime rates.
(These effects may be spurious: crime, inflation, and GNP per
capita could have all gradually risen over time, but perhaps all
for different reasons.)

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Similarly, other studies had less than conclusive findings concerning the income-crime link. Regarding international differences, Krohn (1976) examined homicide, property and total crime rates in nation-states. He measured income inequality with the Gini index[3] and found it to be positively correlated with homicide, and negatively correlated with property and total crime rates. To measure economic development he used GNP per capita, and found it negatively correlated with homicide, and positively correlated with property and composite crime rates. Messner's (1980) analysis of 39 nations found only income inequality had a significant relationship with murder in the zero-order correlation, while GDP[4] per capita was positive, but insignificant.

Some studies have provided no support for this relationship between income variables and crime rates at the national level. Stack (1984) looked at 62 nations' property crime rates and

[3] The Gini index is generally computed using the Lorenz Curve (Ray and Singer,1973), which consists of two axes representing (1) cumulative proportion of income, and (2) cumulative proportion of the population. "We may find, for example, that the poorest .25 of the population earns only .05 of the nation's income" (Allison,1978:872). A high Gini coefficient implies a high degree of income inequality.

[4] Gross Domestic Product (GDP) is similar to Gross National Product except that it includes only what is produced within the physical boundaries of a country, regardless of who owns them.

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measured inequality by (1) the Gini index of household income,
and (2) the ratio of income share of the top decile to the bottom
decile of households. He measured "economic development" as the
GNP per capita. Surprisingly, he found the relationships between
these variables and property crime rates to be in the opposite
direction to what was hypothesized. He suggests that this may be
because low development may cause both high inequality and low
property crime rates, thus "making the development-property crime
relationship spurious" (1984:241).   Wellford's (1974a) cross-
national analysis found that GNP per capita best explained the
crime rate fluctuations (compared to his other "dimensions of
nations" variables: population and political orientation), and
this relationship was (again) positive, except for homicide and
drug offenses. However, Wellford (1974a:5-7) claimed that none
of his "dimensions of nations" variables "account for much of the
variation in reported crime."

   3. state/province data

     Data collected at the state/province level was generally
supportive of the expected relationship between income levels and
crime rates. Avio and Clark (1976) studied Canadian provinces,
and measured income distribution as the percent of families

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earning less than one-half of the median family income. The

elasticity[5] estimates for this variable were generally positive

and significant and more than one for theft, fraud, and breaking

and entering, and insignificant for robbery. Ehrlich's (1974)

analysis of states found that the percentage of families below

half the median income had positive relationships with property

crime rates. Ehrlich's (1975b) comparison of states measured

income inequality as the percentage of families below the state's

median and the median family income. These varied positively and

significantly with the rates of robbery, burglary, larceny and

auto theft in all regressions and for all census years.

Loftin and Hill's (1974) analysis of states' homicide rates

found the Structural Poverty Index[6] was the best predictor of

homicide rates although the Gini index was also a positive and

significant predictor. Median income did not predict as well as

the Gini Index (1974:720). Although Smith and Parker's (1980)

analysis of states and two types of homicide rates found the

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[5] Elasticities represent the percent change in the crime
rate divided by the percent change in income. An elasticity of
greater than one, thus implies the percent increase in the crime
rate is more than the percent decrease in income.

[6] The Structural Poverty Index is based on infant mortality,
literacy, absolute poverty, and educational rates, and the
percent of children living with one parent and the percent of the
population who failed the armed forces mental test.

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effect of the Gini coefficient was negative and insignificant for each category, the Structural Poverty Index was positive for all, and significant for composite homicide rate, and primary (non-stranger) homicide rates. Thus, most studies using individual states as the unit of analysis have found the predicted relationships between the income variables and crime rates.

4. metropolitan area and county data

Some studies of metropolitan areas were overall, unsupportive of any of the income variables in their predicted effect on the crime rates. Sjoquist's (1973) analysis of 53 cities found absolute poverty tended to have a negative, insignificant effect on the composite property crime (robbery, larceny, and burglary) rate. Income had a positive, insignificant effect. Thus, both of these "wealth" indicators were in the opposite direction to what was hypothesized. Messner (1982) looked at homicide rates in 204 SMSAs and measured relative poverty with the Gini coefficient of family income, and absolute poverty by the percent of the population below the Social Security Administration poverty line, and the percent below $1,000. Both measures of absolute poverty were negatively and significantly related to the homicide rate. However, he found

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relative poverty to have an insignificant, positive coefficient

when demographic variables were controlled.

However, many studies of metropolitan areas have generally

supported the link between some of the income variables and

crime, while discounting others, within the same study. Blau and

Blau (1982) looked at the 125 largest SMSAs to examine the

composite violent crimes, as well as individual murder, rape,

robbery, and assault rates. Absolute poverty was measured by the

percent of the population below the Social Security

Administration poverty index, and was positively (but

insignificantly) related to rape and assault, but <u>negatively</u>

related to the composite violent and robbery rates (significant

for robbery). Income inequality was measured with the Gini

coefficient for family income, and was (as predicted)

consistently positively related to the crime rates, and

signficantly so to murder and assault. Socioeconomic inequality

between races was measured with Duncan's SEI[7] scores, and was

positively and significantly related to each of the crime rates.

Additionally, relative deprivation produced more criminal

violence than absolute poverty. (The coefficients for income

inequality were much higher than those for poverty.)

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[7] Duncan's SEI (socioeconomic inequality) is used to measure
the diferences in average socioeconomic status between whites and
non-whites.

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Another study lacking clear-cut evidence for the income-
crime connection, Jacobs (1981) looked at theft rates (burglary,
grand larceny, and robbery) in SMSAs. He measured economic
inequality using the Gini coefficients on family incomes,
absolute poverty using the percent of families below the poverty
line, and economic development using median income. Economic
inequality was an especially strong and significant determinant
for burglary and larceny, and not as strong, but still positive
for robbery. However, median income had a consistently positive,
significant relationship with the theft rates, but they were very
weak. Although this finding is in opposition to expected utility
and opportunity theories, Jacobs (1981:23) contends that these
relationships support the argument that thefts are more likely to
occur in affluent communities where there is more to steal. There
was no relationship between absolute poverty measures and the
theft rates.

Another study generally supportive, but not consistently so,
to the income-crime relationship, Danziger and Wheeler (1975)
conducted both time series analysis (from 1949 to 1970) and cross
sectional analysis (on 57 SMSAs) for burglary, aggravated
assaults, and robbery rates in the U.S. The time series analysis
found both absolute and relative poverty had significant,
positive relationships with the crime rates. However, while the

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cross-sectional analysis found income inequality significantly and positively related to the crime rates, the coefficient for absolute poverty was insignificant and _negative_.

Other studies tended to find the effect was in the predicted direction, but was not significant. Bechdolt (1975) analyzed property and violent crime rates comparing census tracts in Los Angeles, and comparing police districts in Chicago. The results for Los Angeles found median family income as the only variable which was not significantly (although it was negatively) related to both property and violent crimes. In Chicago it was not found to be significant either. He claims: "[G]iven unemployment, it does not matter how high or low the income of an area is in determining the rate of property crime; what does matter is the rate of unemployment" (1975:138). Allison's (1972) analysis of Chicago and its surrounding communities did not find per capita income to have a significant relationship with the crime rate. Fleisher (1966:130) analyzed 101 cities, Chicago communities, and Cook County suburbs and found "there is a non-negligible negative effect of the income dispersion, or supply variable." However, Weicher (1970) replicated Fleisher's (1966) study replacing his definition of broken family and found the impact of income distribution less significant.

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Bailey (1984) replicated and extended Messner's (1982) research, claiming cities were better units of analysis than SMSAs to study homicide rates. His analysis was for 1970, and comparisons with 1950 and 1960 were made. His economic deprivation variables were absolute deprivation (percent of the population below the poverty level), relative deprivation (the Gini index) and low income (percent of families with an annual income of less than $1,000). His study consistently found absolute poverty and homicide rates were positively and significantly associated (unlike Messner), but found no evidence that relative deprivation contributed significantly to homicide rates (like Messner). In fact, he believes the slight and insignificant relationship between relative deprivation and homicide is merely a function of the association between income inequality and poverty (1984:544).

In contrast to the review above, many metropolitan area studies have provided more clear-cut support of the relationship between income variables and the crime rates in metropolitan areas. DeFronzo (1983) used 39 SMSAs to replicate Messner's study by controlling for the cost of living and governmental assistance. He employed the following economic variables: (1) cost of living adjusted monthly AFDC per family member, (2) cost of living adjusted percent of families living in poverty, (3) the

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income inequality index, (4) cost of living adjusted median

family income, and (5) the Household Activity Index.[8] Both

adjusted absolute poverty and income inequality were positively

related to all seven index crime rates, and these relationships

were significant for burglary and larceny. The adjusted AFDC

assistance per aided family member was negatively related to

homicide, rape, burglary, aggravated assault, and auto theft

rates, and the former three were significant. Thus, they all

tended to be in the expected direction.

Swimmer's (1974a) simultaneous equations[9] approach, where

the dependent variables were the logarithms of the seven index

crime rates and police expenditure[10], found the median income

variable was significantly related to the demand for police

[8]The Household Activity Index is proposed to measure high-
risk victimization households, using the time activities are
spent away from the home and/or the ownership of goods likely to
be stolen.

[9]The use of the simultaneous equtions (or systems) model has
become increasingly popular over the last decade in order to
describe the relationship between crime and economic factors.
This is largely due to (1) the increased awareness of econometric
models, (2) the realization that deterrence variables probably
affect the crime rate and vice versa, and (3) that similar
independent variables affect both the crime rates and the
deterrence variables.

[10] Logarithms of variables are used to either adjust for the
functional form or to decrease the range of values of a variable.

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expenditure. The percent of rich and poor families was
positively related to all index crimes except rape, and was
significantly related to all of the property crimes except
larceny, but not to any of the violent crimes. Williams and
Drake (1980) viewed the arrest rates for the seven major felonies
in SMSAs of 500,000 and larger populations. They measured
economic inequality using the Gini index, and found it
significantly and positively related to all of the crime rates
except auto theft. McCarthy et al. (1975:777) found: "The
relationship between percentage poor and homicide is strong
outside the South, although the relationship between percentage
poor and assault is weaker outside of the South and negative in
the South." Humphries and Wallace (1980) found effects of the
Central City Hardship Index[11] had a positive relationship with
personal and property crime rates.

[11]The Central City Hardship Index (CCHI) was developed by
the Brookings Institute and measures social and economic
disadvantage using unemployment, age structure and dependency,
educational level, income level adjusted regionally, crowded
housing and poverty.

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5.   conclusion

Studies focusing on nation-states as the unit of analysis frequently included GNP per capita as a measure of income level or economic development. This variables was occasionally related to the property crime rate in the predicted (negative) direction (Land and Felson,1976), and was consistently related to the homicide rate as predicted (Krohn,1976; Messner,1980; Wellford,1974a). However, GNP per capita tended to have the opposite effect as predicted by expected utility and opportunity theories on property and composite crime rates (Krohn,1976; Stack,1984; Wellford,1974a). A variable comparable to GNP per capita is the mean or median income. This variable was consistently insignficant, and was negative (as prededicted) in some studies (Bechdolt,1975; Allison,1972), but positive in others (Sjoquist,1973; Jacobs,1981). The type of crime did not appear to affect the findings. An important possibility concerning these findings is that the relationship between (especially property) crime rates and income levels may be expected to be positive in that affluent areas may be likely crime targets.

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Studies employing <u>poverty</u> as a variable tended to find it positively related to the crime rate (Avio and Clark,1976; Ehrlich,1974; Ehrlich,1975b; Blau and Blau,1982; Deonzo,1983; Bailey,1984; Danziger and Wheeler,1975; McCarthy et al.,1975; Humphries and Wallace,1980). However, some studies found poverty had the opposite (negative) effect as predicted (Blau and Blau,1982; Messner,1982; Jacobs,1981; Danziger and Wheeler,1975: Sjoquist,1973). The unit of analysis did not appear to influence the findings, except that research using states consistently found poverty affected the crime rates in the predicted direction (Avio and Clark,1976; Ehrlich,1974; Ehrilch,1975b; Smith and Parker,1980: Loftin and Hill,1974). All three of the studies utilizing a simultaneous equation which included poverty found it to be a significant variable in the predicted direction (Avio and Clark,1976; Ehrlich,1974; Ehrlich,1975b). Although most studies found poverty affected the crime rate in the predicted direction, there were no tendencies for certain crimes to be more affected by poverty than others.

Similar to poverty, most studies using <u>income inequality</u> as a predictor variable found it affected the crime rate in the predicted (positive) direction (Krohn,1976; Messner,1980; Loftin and Hill,1974; Blau and Blau,1982; Messner,1982; DeFronzo,1983; Bailey,1984; Jacobs,1981; Danziger and Wheeler,1975;

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Swimmer,1974a; Williams and Drake,1980; Fleisher,1966). However, some research found income distribution affected the crime rates in the opposite direction (Krohn,1976; Stack,1984; Smith and Parker,1980). It is interesting to note that the findings on income inequality are less ambiguous and more likely to be in the predicted direction, the less encompassing the unit of analysis. That is, the findings for states and nations were inconsistent, while metropolitan areas consistently found income inequality to affect the crime rates in the predicted direction. This suggests that areas larger than states may be inappropriate to test the models. The sophistication of the analysis did not appear to influence the findings on income inequality.

B.   Unemployment and Labor Force Participation

Previous studies have generally found that "rises in unemployment and/or declines in labor participation rates are connected with rises in the crime rate, but... the effect tends to be modest and insufficient to explain the general upward trend of crime" (Freeman,1982:96). Freeman's (1983) literature review suggests that labor force participation is linked more closely with the crime rate than unemployment, implying that those who leave the labor force are the most crime prone. Phillips et al.

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(1972:493) believe that one advantage of labor force
participation data over unemployment data is that "while
unemployment rates reflect cyclical and short run conditions in
the labor market, participation rates capture secular changes,
including the influence of past unemployment rates." Consistent
with opportunity and expected utility theories, then, we
hypothesize that unemployment will be positively related to crime
rates, and labor force participation rates will be negatively
related to crime rates. The remainder of this section will
discuss empirical research testing this hypothesis.

One issue that has been discussed is that of how age affects
the relationship between unemployment and crime. More
specifically, the question is why there is less empirical support
for the unempoloyment-delinquency link, than for the unemployment
and adult crime rate link. Gibbs (1975) accounts for this
difference in the direction of age groups' relationships between
unemployment and crime as being due to "status integration." (He
also uses this concept to explain low crime rates among
older/retired persons.) "Status integration refers to the degree
to which occupancy in a population conforms to a particular
pattern" (1975:971). Gibbs (1975:98) thus hypothesizes that
"unemployment in an age group varies inversely over time with the
property crime rate to the extent that members of the age group

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are not employed."[12]   Gibbs (1975:100) also uses "status

integration" in an effort to explain the low rates of female

criminality: "Further, since the labor force status of women

varies a great deal from place to place and time to time, there

is a basis for anticipating a differential influence of

unemployment on the female crime rate."

1.   individual-level data

The majority of the individual-level research supports the

hypothesis that unemployment and crime are related.   Thornberry

and Christenson (1984) studied 567 of Wolfgang's cohort subjects

and predicted a reciprocal effect interaction between

unemployment and crime rates.   They found unemployment exerts

rather immediate effects on criminality, while criminality exerts

a more long-range effect on unemployment (1984:405).   There were

significant effects from unemployment to crime rates and from

crime to unemployment rates (1984:408).   Also, the model fits

better for the more socially disadvantaged (e.g., ex-delinquents,

[12] In the same vein, Phillips et al. (1972:493) suggests
that labor force participation rates are especially advantageous
over unem-ployment rates regarding youth "since youth have low
participa-tion rates, unemployment will have less weight because
of the considerable fraction of youth outside the labor market."

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blacks, and persons whose fathers were blue- rather than white-collar workers).

Other research supporting the unemployment-crime link included Krohm (1973:33), who analyzed burglars in Chicago and found "...unemployment is no small threat to persons having the sociodemographic characteristics of the typical burglar." He believes the income incentives to commit burglary are especially large for youths because legitimate opportunities are positively related to age, thus there is less reason for older persons to choose crime as an occupation (1973:34). Viscusi (mimeo:32) used individual-level data for his study on black youths, and found that "one is less likely to engage in crime if one is currently employed." Furthermore, those who were not employed or in school "were much more strongly driven by the economic incentive to commit crimes" (Viscusi,mimeo:61). Cobb's (1973) analysis of thieves also found frequent periods of unemployment.

However, some individual-level research was less supportive of the unemployment-crime link. Witte (1980) looked at 641 men released from prison and their post-release arrest and conviction rates. She measured "expected unemployment" as the number of months between the offender's release and his finding his first job. Expected unemployment had a negative but insignificant effect on both dependent variables. It implies that a longer job

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search leads to a decreased crime rate. Schmidt and Witte (1984)

analyzed these same ex-inmates looking at (a) serious consumption

crimes, (b) serious income offenses, (c) nonserious income

offenses, and (d) other crimes. They found the expected

unemployment rate was positively but insignificantly related to

serious income offenses, negatively and insignificantly related

to serious consumption crimes and other crimes, and negatively

and significantly related to nonserious income offenses. They

believe their "expected unemployment rate" variable may actually

be measuring "legitimate job search time" instead of the expected

unemployment rate.

Further, Holzman's (1982)research suggests that

unemployment may not be related to crime He looked at 29,474

U.S. males with at least two convictions for robbery and/or

larceny, and had some interesting findings and speculations

regarding ex-inmates and unemployment and recidivism:

> The results of the present study suggest that
> known recidivists in robbery and/or burglary
> are very likely to be legitimately employed
> while continuing to pursue their criminal ca-
> reers. Furthermore, when one examines the oc-
> cupational status of these recidivists in light
> of the literature on moonlighting, it seems
> reasonable to view their continued involvement
> in property crime as secondary employment of an
> entrepreneurial genre (1982:1971).

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Overall, the individual-level data support the unemployment-
crime relationship. The only studies (Schmidt and Witte,1984 and
Witte,1980) which did not find support for this relationship
questioned their measure of expected unemployment.

2.   metropolitan area and county data

Many studies supported a significant, positive relationship
between unemployment and crime. Sjoquist (1973) analyzed 53
municipalities and found the labor force unemployment rate was
positively and significantly related to the property crime rate.
Using a simultaneous model, Mathur (1978) looked at U.S. cities
with populations over 100,000 in 1960 and 1970, and found
unemployment positively and significantly related to buglary,
larceny, and auto theft in 1960, and larceny in 1970.
Unemployment was occaisionally negatively related to robbery, but
not significantly so. Kau and Rubin (1975) analyzed sixty U.S.
cities in 1960 and 1970 with a simultaneous model and found the
unemployment rate was positively related to both violent and
property crime rates in both years, and this relationship was
significant for violent crime rates in 1960. Jacobs (1981)
looked at 195 SMSAs and found the male unemployment rate had a
positive, significant effect on burglary, grand larceny, and

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robbery, although the effect was not strong. DeFronzo's (1983)

analysis of 39 SMSAs on the seven index crime rates found the

unemployment rate was positively related for all the crimes, and

significant for rape, burglary, and larceny.

Other studies also supported the predicted effect of

unemployment on crime. Bechdolt (1975) analyzed Los Angeles

census tracts and Chicago police districts and both property and

violent crime rate composites. For Los Angeles, male

unemployment rate (as a percent of the labor force) had the most

effect on both property and violent crime rates of all the

independent variables. (It was a positive, significant

relationship.) For the Chicago data, unemployment was the only

significant variable and by far the most important. In fact,

Bechdolt (1975:138) claims that "...given unemployment, it does

not matter how high or low the income of an area is in

determining the rate of property crimes; what matters is the rate

of unemployment.

Further showing a relationship of unemployment and crime,

Phillips and Votey (1975) used a simultaneous systems approach to

study fifty California counties, and found a variable comprising

unemployment, labor force participation, and unemployment rates

for males 18-24, and density had a significant positive effect on

the crime rate. In fact "...measures of economic conditions are

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more important than purely demographic measures" (1975:374).

Chapman (1976) focused on 147 California cities (using a

simultaneous approach) in 1960 and 1970 looking at arrest rates.

He found the male labor force participation rate was negatively

and significantly related to both property and violent crime

rates, and the female labor force participation rate was

positively and significantly related to property crime rates. A

variable representing men not in the labor force or school was

positively and significantly related to the property crime rate.

Most metropolitan area and county studies on unemployment

and crime found the predicted relationship, although these were

not always significant. Using step-wise regression[13], Allison

(1972) analyzed communities within forty miles of Chicago using

14 independent variables and found unemployment was the variable

most related to the composite crime rate, and in fact, claimed

unemployment explained 57% of the variation in the crime rate.

Similarly, Wellford (1974) researched 21 of the largest U.S.

urban centers and combined the independent variables into

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[13] Step-wise regression "picks" the best proxy variables, or
the one(s) best representing the other independent variables,thus
it is affected by the degree of multicollinearity the "chosen
variables" have with the other independent variables. In
addition to the possibility of "picking" the wrong variables, it
can bias the relationship estimates. Therefore, the
meaningfulness of findings using this method are questionable.

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subgroups representing (1) demographics, (2) socioeconomic

characteristics, and (3) crime control. He found the

socioencomic variables (including male unemployment rate and male

nonwhite unemployment rate) explained much more than social

control (1974:200), and "a significant amount of the increase in

the rate of crime is associated with changes in the demographic

and socioeconomic characteristics of the society" (1974:207).

Many studies found the predicted relationship between crime

and unemployment, but this relationship was not significant.

Wilson and Boland (1978) focused on 35 large U.S. cities (using

simultaneous systems) to look at robbery rates and found

unemployment was postively yet insignificantly related to

robbery. Williams and Drake's (1980) anlaysis of 24 SMSAs found

the unemployment rate was positively related to all seven major

felonies, but none of the relationships were significant.

Kvalseth's (1977) step-wise regression of 79 census tracts in

Atlanta using six crime rates and twenty independent variables

found the effects of unemployment were "inconclusive" except that

male unemployment had a significant, positive relationship with

robbery and rape, and female unemployment had a signficant,

positive influence on rape. Similarly, Swimmer's (1974a)

simultaneous equations studying cities found the unemployment

rate postively related with the seven index crime rates, except

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rape (which was negatively related), and all were insignificant.

He claimed the unemployment rate was "the most disappointing

independent variable" (1974a:625). In a similar study on

property and violent crime rates he claimed that unemployment had

a positive, insignificant effect on both property and violent

crime rates, and unemployment and schooling rates had the least

explanatory power of all of the variables (1974b:309).

However, several studies have provided little or no support

for a relationship between unemployment and crime. Fleisher

(1966) focused on 101 cities, Chicago communities, and Cook

County suburbs and found no evidence of unemployment having a

greater effect in the higher than the lower delinquency

subgroups, as did the effect of income inequality. Weicher

(1970) looked at 74 Chicago communities and found the male

unemployment rate was negatively and significantly related to the

delinquency rate. Carr-Hill and Stern (1973) analyzed British

police districts using a simultaneous systems model and found

unemployment unrelated to indictable offenses.

Further studies discounting the predicted relationship

between unemployment and crime include Spector's (1975) analysis

of 103 SMSAs. He found unemployment was negatively, but

insignificantly related to violent crime rates. Danziger and

Wheeler (1975) conducted a cross-sectional analysis of 57 SMSAs,

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and found male unemployment rate was negatively, but
insignificantly related to all three crime rates (burglary,
robbery, and aggravated assault).   Pogue (1975:33) looked at 163
SMSAs for three years using an simultaneous approach, analyzing
the seven index crimes and found that unemployment had "little
systematic impact on the crime rates."   Both the unemployment
rate variable and the change in unemployment had mixed,
insignificant effects.

   3.   state/province data

   Some studies on unemployment and crime focusing on the
state/province level, were supportive of the predicited
relationship.   Avio and Clark (1976) studied eight Canadian
provinces using a simultaneous model and found the overall
unemployment rate had a significant, positive relationship with
both measures of theft and breaking and entering, as did
unemployment of young males.   The overall labor force
participation rate was negatively and significantly related for
some thefts, and the young male labor force participation rate
was significantly and negatively related to robbery.

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Most studies focusing on the state as the unit of analysis did not show any clear-cut support for the effect of unemployment on the crime rate. Hemley and McPheters (1974) analyzed 32 states, focusing on robbery, burglary, and larceny rates. They found the percent employed in manufacturing had a negative and significant relationship with burglary and larceny, and a positive and insignificant relationship with robbery. The state unemployment rate had a negative relationship with robbery, and positive with burglary and larceny, and none of these were significant. The metropolitan unemployment rate had a negative, insignificant relationship with robbery, and a positive significant relationship with burglary and larceny.

Another example of the unclear support of the unemployment-crime relationship was Ehrlich's (1974) analysis of states using a simultaneous approach, focusing on property and violent crime rates and certainty of punishment and police expenditure. He found the male unemployment rate for 14 to 24 year olds inconsistently and insignificantly related. Although the effects of the labor force participation rate on the same age group were inconlusive on the property crime rate, labor force participation had a consistently negative relationship with the violent crime rate (1974:105-6).

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4. <u>national data</u>

The first major attempt to relate unemployment and crime rates was conducted by Glaser and Rice (1959) focusing on property, violent, and misdemeanor crime rates in the United states from 1932 to 1950 (using time-series analysis), and a cross-sectional analysis of Chicago, Boston, and Cincinnati for four census years. They found that unemployment and arrests for property crimes were positively correlated regardless of the age group, and especially for 20 to 45 year olds. However, juvenile crime rates varied inversely with unemployment. The time-series data for the United States showed a neative relationship between unemployment and crime rates for the older age groups, although the cross-sectional analysis did not (1959:684). "It appears that unemployment is closely and directly related to criminality for males only when they are most strongly oriented to occupational stability or mobility" (1959:685).

Fleisher (1963) re-analyzed the Glaser-Rice (1959) data on property crimes for the U.S. from 1932 to 1951, and found the effect of unemployment on juvenile delinquency to be positive and significant, especially for youths sixteen and older. "The principle difference between this analysis and that of Glaser and Rice, is that Glaser and Rice did not attempt to account for the effects of war or to include a trend variable in their regression

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equations" (1963:549). Fleisher (1963:551) also found

unemployment related to property crime rate, regardless of age,

in his cross-sectional analysis.

More current time-series analysis of the U.S. has supported

the earnings opportunity and crime link, but not always

significantly so. Ehrlich (1975) conducted a simultaneous

systems analysis of national U.S. data from 1933 to 1967 in his

study on the effectiveness of capital punishment. The

unemployment rate was positively and usually significantly

related to the homicide rate. The labor force participation rate

was negatively related, but not significantly. Ehrlich

(1975:416) believes his findings suggest a systematic

relationship between employment and earning opportunities and the

frequency of murder. Passell and Taylor (1977) reconducted

Ehrlich's (1975) data collection and analysis in an attempt to

improve this research. They found unemployment positively but

rarely significantly related to the homicide rate, and the labor

force participation rate negatively and significantly related to

the homicide rate. Krohn's step-wise regression analysis of

nation-states found unemployment had a positive relationship with

all three of the (homicide, property, and composite) crime rates,

but was the least important of the 14 independent variables.

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Further research also reported inconsistent findings regarding the crime-unemployment relationship. Cohen et al. (1980) focused on U.S. robbery, burglary, and auto theft rates from 1947 to 1972 and found the unemployment rate positively and significantly related to the burglary rate. However, unemployment was negatively and significantly related to the robbery and auto theft rates. They suggest the latter relationship is a result of people not working being less likely to "expose" their cars to theft (1980:108). Phillips et al. (1972:497) study on larceny, burglary, and robbery looked at 18-19 year olds from 1964 to 1977 and found unemployment was positively and significantly related for nonwhites, but negative for whites. The not-in-the-labor-force rate variable had a significant and positive sign (as expected) for nonwhites, but insignificant for whites. Overall, labor force participation rate had more explanatory power than did the unemployment rate.

The findings in some time-series studies have been inconsistent regarding crime and unemployment, depending on the type of crime. Land and Felson (1976) conducted a time series, simultaneous systems analysis of the U.S. from 1947 to 1972 and found unemployment to be negatively but insignificantly related to violent crime rates, and positive but insignificant for property crime rates. Danziger and Wheeler's (1975) time-series

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analysis of the U.S. from 1949 to 1970 found unemployment was not systematically related to the crime rates; unemployment was positively related with burglary and negatively related with assault and robbery. Similarly, Cook and Zarkin (1985) studied nine business cycles between 1933 and 1981 and crime data for this same period in the U.S., and found through both parametric and non-parametric analyses, that recessions appear to result in significant increases in robbery and burglary (and thus are counter-cyclical), and weaker evidence that auto theft is procyclical, and homicide is insensitive to the business cycle.

Studies focusing on delinquency rates and unemployment rates had inconclusive findings. Fleisher (1966) claimed there was not relationship, Weicher (1970) claimed it was negative and significant, and Phillips et al.'s (1972) time-series study of 18 to 19 year olds claimed unemployment and labor force participation were usually positively related to three property crime rates, and this relationship was significant for nonwhites. Although not an empirical analysis, Calvin (1981:234) reviewed some research on black youth, delinquency, and unemployment, and claims that contrary to previous research (which has misused or not used facts on unemployment among black youth, according to Calvin), that crime by black youth over different time-periods does show a close relationship with the concurrent economic conditions.

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5.   conclusion

In conclusion, regarding composite violent and composite property crime rates, the effects of unemployment and labor force participation are fairly consistently in the hypothesized directions (positive for unemployment, and negative for labor force participation), and frequently significant. However, these relationships are usually not very strong. Concerning homicide, rape, robbery, burglary, and larceny individually, again, the effects of unemployment and labor force participation are usually in the predicted direction, and frequently significant. However, regarding aggravated assault and auto theft, although the effects are usually in the expected directions, they do not tend to be significant.

This review supports the previous contentions that the labor force participation rate is a more accurate measure of who has dropped out of the labor market than the unemployment rate is, and thus the labor force participation rate tends to be a more explanatory variable of crime rates than is the unemployment rate. It is also important to note the role these variables representing the labor market play in affecting both the violent as well as the property crime rates.

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This review indicates that ordinary regression analysis

supports the contention that legitimate earnings opportunities

are more likely to affect property crime rates than violent crime

rates, especially if one classifies robbery as a violent crime.

It also suggests that perhaps (at least time-series) findings may

be more substantiated in the hypothesized direction when the

researcher looks at nonwhites. Positive, significant effects of

unemployment on crime rates were more likely to occur when

analyzing property crimes, than violent crimes, and among the

property crimes, burglary and larceny were much more likely to

have positive, significant findings than was robbery. In fact,

the unemployment rate was frequently negatively related to

robbery, and this relationship was sometimes significant.

An initial reaction to the review of the unemployment/labor

force participation studies using a simultaneous equations model

is their increased amount of support for unemployment (labor

force participation) rates having a positive (negative for labor

force participation) and often significant relationship with

violent crime rates. This is quite different than the ordinary

regression findings. Additionally, the simultaneous systems

approach still supported the existence of a relationship between

unemployment (labor force participation) and the property crime

rates. Overall, the findings using the simultaneous approach

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suggested a link between employment opportunities and the crime

rate, although the findings were not consistent. This review

also suggests that the labor force participation rate may be a

better measure of employment opportunities than the unemployment

rate, in so far as it more clearly affected the crime rates.

III. DEMOGRAPHIC VARIABLES

In addition to the economic variables, we must also examine

and control for demographic variables thought to influence crime

rates. This section will discuss key sociological variables that

have been suggested by previous research to be significant. They

include: race, geographical region, population size and density,

age structure, and educational level.

A. Racial Comoposition

It has been hypothesized that race and crime are related,

with the implication that nonwhites are more crime prone,

especially regarding violent crimes. For instance, Swimmer

(1974b:299) suggests: "Crime should be more attractive to

nonwhites because there is less employment discrimination in

illegal than legal occupations." Pogue (1975:40) claims that the

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significant effect of race on the crime rate "suggests that

standards of law obedience are different for whites and

nonwhites, a reflection perhaps of racial discrimination and the

alienation it entails."

However, more recently this assertion has been challenged.

At any rate, overwhelming support has been indicated for the

significant and positive relationship between race and crime

rates (usually measured as the percent nonwhite) in the

literature (Bailey,1984; Chapman,1976; Danziger and Wheeler,1975;

Ehrlich,1974:94; Jacobs,1981; Messner,1982; Mooris and

Tweeten,1971; Pogue,1975; Sjoquist,1973).

Other studies have found this relationship generally

positive, but not always significant. Swimmer (1974a) found the

percent nonwhite positively related to murder, rape, aggravated

assault, robbery, and larceny rates and significant for all but

the larceny rates. Similarly, Kau and Rubin's (1975) research on

60 cities in 1960 and 1970 found the percent nonwhite

significantly and postively related to both violent and property

crime rates, except this relationship was not significant for

property crime rates in 1960. Mathur's (1978) analysis of cities

found the percent nonwhite positively related to all the seven

index crime rates except rape, and these relationships were

significant for murder, robbery, and assault. Williams and Drake

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(1980) found percent nonwhite positively related with rape, robbery, aggravated assault, burglary, larceny, and auto theft, but only significant with auto theft. (Also, percent nonwhite was significantly and positively related to arrest rate for robbery, consistent with conflict criminology (1980:567)).

The studies tended to support a positive relationship between percent nonwhite and race, often finding this insignificant. In their analysis of homicides, Smith and Parker (1980) found race positive, but not significant. Similarly, Pressman and Carol (1971) found the percent nonwhite postively related to all seven index crime rates, but only significantly related to burglary and larceny, but suggested that race may be "hiding" another variable. Both Swimmer (1974b) and Greenwood and Wadycki (1973) found the effect of percent nonwhite was postive for both composite violent and composite property crime rates, but only significant for violent crime rates.

Wilson and Boland (1978) found the percent nonwhite had a positive but insignificant relationship with robbery rates. Similarly, Phillips and Votey (1975) found that neither percent black nor percent with Spanish surnames were significant in affecting the crime rate. Allison's (1972) step-wise regression analysis showed race to be a less significant variable. Fleisher (1966) found race insignificant concerning delinquency rates,

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while Weicher's (1970) reanalysis of Fleisher's work claimed

blacks were signficantly <u>less</u> likely than whites to be

delinquent.

Other research has controlled for variables thought to

exaggerate or imply a relationship between race and crime which

may be non-existent. Blau and Blau's (1982:125) analysis of

violent crimes found: "When all other influences on crimes of

violence are controlled, and SMSA's racial composition continues

to exert some influence on it, though it is not great, and it is

significant only for murder and assault (as well as all four

types combined) and not for rape and robbery. Ehrlich (1975a:42)

found the percent nonwhite became insignificant when he

introduced a time trend variable. DeFronzo (1983:130) drew the

following conclusions:

> ⸴ Percentage of the population that is black--
> hypothetically an indicator of the percentage of
> the population that shares a criminogenic sub-
> culture, especially with regard to violence--
> had no independent positive effect on rates of
> burglary, larceny, or auto theft. Among violent
> crime, percentage black had significant positive
> effects, except with regard to rape. In the
> case of rates of homicide and aggravated assault,
> the standardized regression coefficients for per-
> centage black were equalled or exceeded in magni-
> tude by the corresponding coefficients for AFDC
> assistance, suggesting that the heretofore gener-
> ally neglected structural factor of level of gov-
> ernmental assistance to the poor may account for

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> at least part of the supposed effect of crimino-
> genic subcultures on crime rates.

Huff and Strahura (1980:465) suggest that the "percentage of blacks exerts substantial indirect effects on both violent and property crime rates, especially through percentage of low income people and police employment rates..." and found only a moderate <u>direct</u> effect of percent black on the violent crime rate. Blau and Blau (1982) claim that when other variables influencing crimes of violence are controlled, that the impact of race is greatly reduced. "The hypothesis inferred is that socioeconomic inequalities are associated with ascribed positions, thereby consolidating and reinforcing ethnic and class differences, engender pervasive conflict in a democracy" (1982:118-119).

Some research exploring the relationship between race and crime have discussed employment opportunities as having a potentially powerful likelihood of distorting this relationship. Thornberry and Christenson (1984:406) claim that the relationship between unemployment and crime is stronger for nonwhites than for whites. Phillips et al. (1972) found variables representing unemployment and "not in the labor force" (NLF) were significant for both racial groups. "Collinearity between the explanatory variables by color is such that one can only obtain significant

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estimates of the impact of changing labor market conditions for

both colors jointly using either the white or the nonwhite

variables" (1972:503). Similarly, Holzman (1982:1782) claims:

"[T]he labor force participation of black offenders more closely

resembles that of the general nonwhite population than the

participation of white offenders resembles that of whites in

conventional society." Avio and Clark's (1976:41) research in

Canada states:

> The significance of the variable representing
> the proportion of the population that is North
> American Indian depends largely upon whether
> labor force variables are included in the equa-
> tion. If so, the North American Indian coeffi-
> cient is generally significant, positive, and
> less than one in value for robbery, breaking
> and entering, and the theft classifications.
> [It also appeared that this variables was rela-
> ted to Indians on reservations.]

Therefore, it appears that differential employment opportunities

for whites and nonwhites could distort the actual relationship

between race and crime, making it appear that nonwhites are more

criminal than whites, while it is likely that nonwhites and

whites respond similarly under the same employment limitations.

In summary, the literature largely supports the contention

that racial composition is related to the crime rates. Although

this is substantiated in the research on property crime rates,

racial composition seems to be more consistently related to the

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violent crimes (except rape). However, certain caveats were
mentioned by numerous researchers (which were elaborated on
above), warning against assuming too much from the significant,
positive findings associated with the percent nonwhite and crime
rates. Most frequently mentioned was the belief that the effects
of racial composition may be confounded with with the effects of
other variables that are strongly related to race. Thus, the
current research, controlling for many of these confounding
economic and demographic variables, will improve on previous
research.

B. Region

Numerous studies predicting crime rates have included region
as a dummy variable representing whether the area studied is in
the South. This variable has been included because the
literature "suggests a subculture of lethal violence in the
South" (Messner,1982:107). This implies a Southern cultural
"tradition" of violence, based on beliefs that oppression,
conflict, broken homes, and exploitation in black ghettoes lead
to condoning and acceptance of violence (Blau and Blau,1982:115).
Some studies have found this variable to have a positive,
significant effect (Danziger and Wheeler,1975; DeFronzo,1983;

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MCarthy et al.,1975; Messner,1982; Swimmer,1974). Greenwood and

Wadycki (1973) found "region" was positively related to both

property and violent crime rates, but only significant for

property crime rates.

In contrast, others have found no significant effect

(Bailey,1984; Blau and Blau,1982; Humphries and Wallace,1980;

Land and Felson,1976; Loftin and Hill,1974; Smith and

Parker,1980). Bailey (1984:542) found no significant

relationship between region and homicide when he controlled for

poverty and inequality. Blau and Blau (1982) conducted a study

of SMSAs, and claim their results "support the hypothesis

advanced here that inequality-- especially ascriptive

inequality-- engenders violence and can explain the higher

incidence of most violent crimes in the South, obviating the need

to interpret it with conjectures about a Southern tradition of

violence" (1982:122). Furthermore, they claim "if there is a

culture of violence, its roots are pronounced economic

inequalities, especially if associated with ascribed position"

(1982:114).

Some research shows no support for the "tradition of

Southern violence" hypothesis. Mooris and Tweeten (1971:42)

found the highest crime rates in the West, and then the

Northcentral, Southern, and Northeastern regions, respectively.

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Fleisher (1966:131) found delinquency tended to be lower in the South.   Similarly, Swimmer (1974b:310) found a negative and significant effect concerning property crime, and a negative insignificant effect concerning violent crime, implying Southern cities have less property crime and about the same violent crime rate as indentical non-Southern cities.   Certainly the hypothesis of a "Southern Culture of Violence" is not well-founded at this point, and the implications of assuming such a belief may be detrimental in influencing stereotypes and misguiding research.

C.   Population Size

Previous research has supported the contention that the population size has a significant, positive impact on crime rates (Messner,1982; Mooris and Tweeten,1971; Pogue,1975; Sjoquist, 1973; Spector,1975; Swimmer,1974b; Webb,1972; Weicher,1970).   Kau and Rubin (1975) found population size positively related to violent and property crime rates in 1960 and 1970 (except negatively related to property crimes in 1970), and this relationship was significant with violent crime rates.   Swimmer (1974a) found population size positively related to murder, rape, aggravated assault, robbery, burglary, and larceny, and significant for all but burglary and larceny. Similarly, Blau and

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Blau (1982) found the population size postively related to the
composite violent crime rate, and to murder, rape, robbery, and
aggravated assault rates, individually; and significant for all
but murder and rape. Jacobs (1981) found the log of the
population positively related to burglary, larceny, and robbery,
and significant for burglary and robbery. Pogue (1975) found the
population size was positively related to the composite crime
rate and with each of the seven index crime rates, and these
relationships were significant concerning the composite, robbery,
and larceny crime rates. Hemley and McPheters (1974) focused on
robbery, burglary, and larceny and found positive relationships
for each of these with the population size, but the only
significant relationship was with robbery.

Others have found population size consistently positive, but
insignificant (Allison,1972; Huff and Strahura,1980;
Messner,1980; Williams and Drake,1980). Bailey's (1984:543)
research on homicide found population size significant for only
one of the three years he studied (1970), and believed this
significance "may reflect the impact of some other (unknown)
factor(s), and not the effect of population size per se."

In summary, the literature overwhelmingly supports a
positive relationship between population size and the crime rate,
regardless of the type of crime. However, the findings are mixed

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concerning the significance levels. It does appear that
composite violent crime rates are more likely to be significantly
related to population size than composite property crime rates.
Of the individual index crime rates, robbery is the most likely
to have a significant, positive relationship with population
size, while in none of the research was the rate of rape found
significantly related to the population size. The remaining
index crime rates (homicide, aggravated assault, burglary, and
larceny) seemed as likely to have signficant relationships with
the population size as they were to have insignificant
relationships.

D.   Population Density

     Research on the relationship between economic variables and
crime rates has frequently included the demographic variable
population density. This variable represents, among other
things, "crowding," or a sense of a less than ideal living
environment. Population density has also been included "to
reflect the fact that the closer the opportunities are, the
greater the likelihood the individual can acquire the information
necessary to perform a crime" (Sjoquist,1973:443).

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Researchers looking at the composite crime rate found
population density had a positive, insignificant effect
(Pogue,1975; Carr-Hill and Stern,1973), while Weicher (1970)
found density had a positive, significant effect on the
delinquency rate. Regarding the composite property crime rate,
most researchers found it was positively related to population
density (Huff and Stahura,1980), many of them finding it a
significant, postive relationship (Bechdolt,1975; Mooris and
Tweeten,1971; Sjoquist;1973). However, some researchers found
property crime rate was negatively and insignificantly related to
the population density (Bechdolt,1975; Greenwood and
Wadycki,1973), and one negatively and significantly related to
property crime rate (Humphries and Wallace,1980). Most of the
research on the violent crime rate found it positively related to
population density (Bechdolt,1975; Huff and Strahura,1980), with
some finding it significant and positive (Bechdolt,1975; Mooris
and Tweeten,1971). Of the studies finding a negative
relationship between violent crime rate and population density,
both reported insignificant findings (Green and Wadycki,19731;
Spector,1975).

All of the research including population density and
homicide rates as the crime rate found they were negatively
related (Messner,1980; Pogue,1975; Pressman and Carol,1971;

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Bailey,1984), but it was rarely significant (Messner,1982).
Regarding rape and population density, Pogue (1975) found this
relationship positive and insignificant, Pressman and Carol
(1971) found it negative and insignificant, and Kvalseth (1977)
found it negative and significant. All the research on
population density and aggravated assault found this relationship
negative (Pressman and Carol,1971; Pogue,1975; Danziger and
Wheeler,1975), but it was rarely significant (Kvalseth,1977).

Research on the relationship between population density and
robbery rates found the relationship to be generally positive
(Pressman and Carol,1971; Wilson and Boland,1978; Pogue,1975) and
sometimes significant (Humphries and Wallace,1980; Cohen et
al.,1980). However, population density was also found negatively
and significantly related to the robbery rates (Kvalseth,1977;
Danziger and Wheeler,1975). There were inconsistent findings
regarding burglary and its relationship with population density.
Cohen et al. (1980) found it positive and significant, while
others found it positive, but insignificant (Pressman and
Carol,1971; Pogue,1975). Others found it negative and
significant (Humphries and Wallace,1980), and still others
negative and insignificant (Danziger and Wheeler,1975). Larceny
was always negatively related to population density (Pogue,1975;
Pressman and Carol,1971), and once this was significant

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(Humphries and Wallace,1980).   Auto theft was always positively
related to the popoulation density (Pogue,1975), and sometimes
significantly so (Pressman and Caorl,1971; Cohen et al.,1980).

In summary, overall composite crime rates, and composite
property and composite violent crime rates appear to be
positively related to population density. Homicide, larceny, and
aggravated assault are usually negatively related to poulation
density, while auto theft and robbery rates tend to be positively
related with population density. The relationships population
density has with rape and burglary were inconclusive.

E.   Urban-Rural Distribution

The relationship between the urban-rural distribution
(usually measured as "percent urban") and the crime rate was not
consistently researched. Those who did analyze this variable
tended to find it positive and insignificant (Smith and
Parker,1980; Phillips and Votey,1975; Loftin and Hill,1974;
Messner,1980). Although Smith and Parker (1980) found this
relationship between percent urban and the crime rate positive
and insignificant for "acquaintance" and the total homicde rate,
it was positIve and significant for the total homicide and
stranger homicide, and positive and insignificant for

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acquaintance homicide. Hemley and McPheters (1974) found the

percent metropolitan was positively and insignificantly related

to the robbery rate, but positively and _significantly_ related to

both the burglary and larceny rates. Carr-Hill and Stern (1973)

found the percent urban postively and significantly related to

the overall crime rate.

From the little research conducted in this area, it appears

that percent urban may be more related to property crimes. At

any rate, most of the research including composite homicide rates

and percent urban found this relationship insignificant (Smith

and Parder,1980; Loftin and Hill,1974; Messner,1980). Clearly,

the effects of this variable are not really understood.

F. Age Structure

Many studies conducted in this area have included the

percent of the population (usually male) between 15 and 24. This

is because youths of this age account for almost 60% of all city

arrests and these tend to be the "peak" crime years (Viscusi,

mimeo:6). Thompson and Cataldo (mimeo:9) claim that "income-

oriented street crime is _both_ a very widespread phenomenon within

poor populations and (within the individual life cycle)

relatively short-lived." Danziger and Wheeler (1975:122) state:

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"Youth are considered to be more prone to crime either because
they have not been completely socialized into accepting societal
norms or because they have extra time on their hands." Ehrlich
(1975b:104) suggests: "Possibly, then, not age per se, but the
general opportunities available to offenders determine their
participation in crimes against property. At any rate, the
hypothesis is that the percentage of males aged 15 to 24 in the
population is positively related to the crime rate.

Most studies which have analyzed the age structure variables
have found it insignificantly related to crime (Bailey,1984;
DeFronzo,1983; Ehrlich,1974; Jacobs,1981; McPheters and
Stronge,1976; Mooris and Tweeten,1971; Messner,1982;
Viscusi,mimeo; Wilson and Boland,1978). Land and Felson
(1976:592) found age structure had a significant relationship
with property crime rates until they included unemployment in
their equation. In this case, it was positively related to
property crime rates and negatively related to violent crime
rates, both relationships insignificant.

Other research has found age structure positively and
significantly related to some crime rates. Carr-Hill and Stern
(1973) found age structure was positively related to the serious
offense rate in 1961 and 1966 in England, and was significant for
the latter year. Danziger and Wheeler (1975:126) found a

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significant negative relationship with robbery, but not burglary
and aggravated assault in his cross-sectional analysis, and in
his time-series analysis found burglary, aggravated assault, and
robbery all postively related with the age structure, and this
relationship was significant regarding aggravated assault. Avio
and Clark (1976:40) found the age structure variable had a
significant, inverse relationship with fraud and robbery, but not
for burglary and different types of thefts. Huff and Stahura
(1980) found age structure had a strong positive effect of
property crime rates, and a weak positive effect on violent crime
rates. Parker and Smith (1979) and Smith and Parker (1980) found
the percentage of the population between 20 and 34 significant
for acquaintance homicides, but not for stranger and composite
homicide rates.

In contrast, some studies provided consistent support
between age structure and various crime rates. Cohen et
al.(1980) found a significant, positive relationship with
burglary, robbery, and auto theft rates. Pogue (1975) found age
structure was postively and significantly related to all of the
seven index crime rates and the composite crime rates. Others
(Passell and Taylor,1977; Loftin and Hill;1974; Ehrlich,1975a)
found age structure positively and significantly related to the
homicide rate. Allison's (1972) step-wise regression analysis of

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delinquency rates found age structure to be a positive and "more significant" variable.

In summary, age structure was consistently positively related to both the composite crime rate and the composite property crime rate. However, these relationships were not consistently significant. Findings regarding age structure and the violent crime rate were never significant, and the direction was inconsistent. Homicide and aggravated assault were usually positively related to the age structure, and this relationship was frequently significant. Robbery was usually negatively related to the age structure, and this relationship was sometimes significant. Burglary was usually positively related to the age structure, and this was occiasionally significant. Separate analyses for rape, larceny, and auto theft with age structure were rarely conducted, but these relationships appeared to be positive, and sometimes significant.

G. Educational Level

It is suggested that the educational level should be representative of earnings opportunities, and thus should be related to the crime rate. Most studies measure schooling as the median years of education for persons over 25. Consistent with

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the expected utility and opportunity theories, we would expect
the relationship between educational level and the crime rate to
be inverse. However, the findings using this variable were
rarely significant, and frequently positive.

Regarding the composite crime or delinquency rate, many
studies found a _significant_ and _positive_ relationship with
educational level (Allison,1972; Pogue,1975; McPheters and
Stronge,1976). However, one study found the predicted negative,
significant relationship between delinquency rates and
educational level (Weicher,1970), and Viscusi's (mimeo:26) study
of delinquents found no significant relationship. Relationships
between homicide and aggravated assault and the educational level
tended to be in the expected (negative) direction, but were never
significant (Mathur,1978; Pogue,1975). Contrary to the theories,
robbery, burglary, and larceny rates were usually _positively_
related to the educational level (Danziger and Wheeler,1975;
Jacobs,1981; Pogue,1975), sometimes significantly. The evidence
concerning the relationship between murder, rape, auto theft,
property and violent crime rates is too limited and inconsistent
to draw any conclusions.

In summary, the findings concerning the relationship between
educational attainment and crime rates are at best disappointing.
Ehrlich (1975b:333-335) posits a number of suggestions for this

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insignificant, inconsistent, and frequently positive relationship

between crime rates and educational attainment: (1) education

may be negatively related to the unreported crime rates, and (2)

"It is essentially the inequalities in the distribution of

schooling and training, not their mean levels, that appear to be

strongly related to the incidence of many crimes." I suggest

that since it is the various property crime rates (robbery,

burglary, and larceny) which tend to most frequently be postively

(and sometimes significantly) related to the educational level,

that property crimes may occur in the areas where the more

affluent (usually associated with the more educated) people live.

Thus, it seems best to hypothesize educational level is

negatively related to violent crime rates and positively related

to the property crime rates, although the latter is inconsistent

with the theories.

H. Population Mobility

Population stability or mobility has sometimes been used as

an independent variable in previous studies exploring the

relationship between the eocnomic structure and crime rates.

THis is usually a measure of anomie, with the idea that the

social fabric is more tightly woven (and thus, commitments to

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societal and moral norms are more binding) in more stable
environments. "Presumably new residents are less likely to
observe the established codes of behavior of the community than
the old residents" (Fleisher,1966:125). Also, a more stable
population aids the criminal justice system, in particular,
police officers, in keeping track of who and where the criminals
are, and subsequently in locating them. (Thus, it would not be
out of the question to have stability act as a predetermined
variable in both the crime and police production equations within
the simultaneous systems model.)

Too few studies incorporated this variable to differentiate
significant and direction of its affects between types of crime,
statistical techniques, and units of analysis. For the most
part, this variables was in the predicted direction, but largely
insignificant (Weicher,1970; Fleisher,1966; Allison,1972;
Phillips and Votey,1975). However, two research found it to be a
signficant predictor of crime rates. McPheters and Stronge's
(1976:392) (non-simultaneous) analysis found their measure for
"urban decay," comprised of the percent change in the white
population, had a significant, positive effect on the crime rate,
and in fact, called it a "major determinant of crime." Hemley
and McPheters' (1974) analysis of 32 states found the "percent
change in the population" _and_ the "net migration" were _both_

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negatively related to robbery rates (significantly for the

former).   However, both measures of stability were positively and

significantly related to burglary and larceny.   Finally, although

Mathieson and Passell (1976) did not include the stability

variable in the crime equation of their simultaneous model, they

found it had a positive, insignificant effect on the arrest rate

in that equation.

IV.   DETERRENCE VARIABLES

   A study determining the relationship between economic

variables (income distribution, poverty and unemployment) and

crime rates, must also examine the relationship between criminal

sanctions and crime rates.   In fact, Stern (1978:139-140)

suggests that the economic approach "cannot be the whole story"

and that we must also examine "the effectiveness of deterrence

damages from offenses and the costs of apprehension and

punishment."   Taylor (1978:38) claims: "Viewed in conjunction

with the behavior of criminals, therefore, the models suggest

that crime and punishment are jointly determined.   Neither can be

said to depend on the other, but together depend on other

variables which are exogenous to both."   This requires a

simutaneous equation to model the interaction.   Freeman's

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(1983:96) review of the literature suggests that studies that

include deterrence variables find them to be more closely related

to crime than the labor market variables.

Tullock (1974:109) points out that for punishment to have a

deterrent effect on crime, potential criminals must have some

information on the certainty (or risk or likelihood) and severity

of punishment. Similarly, Ehrlich (1975b) believes the

probability of imprisonment and the average time spent in state

prisons needs to be measured, and Becker (1968) believes that we

need to include the number of convictions and arrests as well as

the number of offenses in our analysis. However, Block and Lind

(1975) criticize Becker (1968) for attempting to represent all

effects of crime and punishment in monetary equaivalents. Block

and Heineke (1975:323) state that previous researchers may be

misguided, and that enforcement, punishment, and certainty have

"no qualitative supply implications under traditional preference

restrictions."

A. _Police Production: Police Employment and Expenditure_

Police production is usually measured as the number of

police per capita and/or the amount of money spent on police

protection per capita. Frequently, these variables are included

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in models using simultaneous equations, where one of the
equations has police production as the dependent variable.   The
first portion of this section will discuss how police production
variables behave where a crime rate is the dependent variable.
That is, how police production variables affect crime rates.   The
second section will examine how other variables (including the
crime rate) affect police expenditure or police employment.   That
is, where the police production variables are the dependent
variables.

   1.   the effect of police production on crime rates

   The majority of studies researching the impact of police
production on crime rates found no or inconclusive effects.
Using step-wise regression, Allison's (1972) analysis of Chicago
and its communities found the number of citizens per police
department employee and police expenditure per capita to be less
significant variables.   Carr-Hill and Stern's (1973:313) analysis
of British police departments found the effects of "creating"
(increasing the number of) police officers and "expenditure-
increases" (more expenditure per officer) on "the 'true' number
of offenses were obscured by the creating and reporting effects,"
and thus were inconclusive effects.   Humphries and Wallace's
(1980:186-7) analysis of the seven index crimes in 23 cities

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found police force size insignificant, except that cities with large police forces in 1970 "experienced increases in their rate of homicide since 1950, and that police employment is negatively related to auto theft rates. Similarly, Wellford's (1974b:208) analysis of 21 large urban centers in the U.S. found that police budgets and employment did not account for much variation in the crime rate.

Many findings were inconclusive. Mathur (1978) conducted a simultaneous analysis of the seven index crimes in large U.S. cities in 1960 and 1970 and found disappointing results for police expenditure: negative in 1960 and positive in 1970 for most crime equations. In fact, "the deterrent effect of police expenditure can be felt only through certainty of punishment where it had a significant, negative effect for robbery, burglary, and larceny in both years, and murder in 1970 (1978:460). Pogue (1975) conducted a simultaneous, cross-sectional analysis of SMSAs and found police employment and police expenditure did not significantly affect the probability of detecting criminals, and thus the crime rates.   Avio and Clark's (1976) study of Canadian provinces had mixed findings concerning the impact of the police production function on property crime, and the total government spending on police protection. Ehrlich's (1975a:412) analysis of US crime rates

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from 1933 to 1969 found the relationship of police expenditure to crime was inconclusive.

Some studies supported the hypothesis that police production and crime rates are inversely related. Mathieson and Passell (1976:94) conducted a simultaneous approach to research homicide and robbery in New York City precincts and found police employment significantly related to robberies: "...we would expect a 1% increase in police protection to reduce robbery arrests by 180." Swimmer (1974a:629) police expenditure had a significant, negative relationship with all of the crime rates except auto theft, and this relationship was sometimes significant for murder and rape. Swimmer's (1974b) analysis of large American cities found police expenditure had a negative effect on both property and violent crime rates, and this relationship was significant for violent crime rates. Ehrlich's (1974) analysis of the seven index crime rates across states for 1940, 1950, and 1960 found per capita expenditure on police was positively realted to the likelihood of apprehending and convicting felons, and negatively related to the crime rate (1974:108). Land and Felson's (1976) time series analysis of the U.S. reported property and violent crime rates from 1947 to 1972 found police employment was strongly and negatively related to the crime rates. McPheters and Stronge (1976) looked at large

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U.S. central cities with a simultaneous model and found police expenditure had a negative effect on crime rate.

However, more studies supported a <u>positive</u> relationship between police production and crime rates, although this is not what the theories predict. Morris and Tweeten (1971) analyzed 754 cities in 1967 and 1968 and found police employment had positive, significant effects on both violent and property crime rates. Jacob and Rich (1981:121) critiqued Wilson and Boland (1978) in their analysis of nine U.S. cities from 1948 to 1978, and claimed increased police expenditure rates over 31 years generally related to higher robbery rates, probably because citizens were reporting it more. Greenwood and Wadycki's (1973) similar research on 199 SMSAs found police employment was positively and significantly related to both violent and property crime rates (especially violent crime rates), and that police expenditure was positively and significantly related to police employment. Pressman and Carol (1971) conducted a cross-sectional analysis on 95 SMSAs and found a positive and significant correlation between crime rates and police employment, probably because in high crime areas more police are employed.

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In conclusion, the findings on police employment per capita suggest its effects on the various crime rates are inconclusive as a whole.   However, there does appear to be a tendency for police employment rates to have a positive, often significant effect on crime rates, particularly violent crime rates.   It is suggested that this may be due to (1) hiring more police officers in high crime areas, and/or (2) citizens are more likely to report crimes where there are more police officers available to them.   Police expenditure per capita is not included as frequently as police employment per capita in the various models, and the results from this variable also appear inconclusive.   The effects of police expenditure rates on crime rates appear to be insignificant for the most part, and unlike police employment rates, its effects are frequently negative.

2.   The Effect of Crime Rates (and other variables) on Police Production Variables

As mentioned earlier, many of the simultaneous models used police production as both a dependent and independent variable. This section will discuss the effects of various crime rates and other variables on the police production variables.   That is, where police production is the dependent variable.   For the most

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part, the crime rates were positively and significantly related

to police employment (Philips and Votey,1975; Chapman,1976;

Wilson and Boland,1978) and to police expenditure (McPheters and

Stronge,1976; Greenwood and Wadycki,1973). However, Chapman

(1976) found the violent crime rate was negatively and

significantly related to the police employment, and Wilson and

Boland (1978) found the property crime rate was negatively (but

insignificantly) related to police employment. Philips and Votey

(1975) found the percent of non-violent crime positively (but

insignificantly) related to the police employment.

The median income was consistently positively related to the

police production variables (Mooris and Tweeten,1971) and usually

significantly so (Philips and Votey,1975; Greenwood and

Wadycki,1973; Swimmer,1974a). In the same vein, the property tax

per capita[14] (or other measures of budgets affecting the

expenditure on police protection) were consistently related to

the police production variables (Chapman,1976; Greenwood and

Wadycki,1973; Wilson and Boland,1978; McPheters and

[14]Property tax per capita is usually included as a variable
in a simultaneous model of this type in order to "identify" the
system. That is, in order to have a variable which directly
affects one of the dependent variables (in this case police
expenditure or employment), while indirectly affects the other
dependent variable(s) (in this case, the crime rate).

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Stronge,1976).   None of the demographic variables were
consistently related to the police production variables.

In conclusion, models which included equations where police
expenditure or police employment rates were one of the dependent
variables usually found that the crime rate was positively and
significantly related.   Those including the property tax rates
found it consistently positively and significantly related to
these "police production" variables.   Similarly, median family
income always positively, and usually signficantly affected the
police expenditure or police employment rates. There did not
appear to be any pattern in the effect of various demographic
variables on the police production variables.

B.   The Certainty and Severity of Criminal Sanctions

Two other "deterrence" variables sometimes included in
studies focusing on economic opportunities and crime are those of
certainty and severity.   Certainty measures the likelihood of
being apprehended in some manner, while severity measures the
degree of punishment, usually by sentence length.   This section
will review previous research inlcuding these variables.

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Schmidt and Witte's (1984:212) individual level data
supported "the contention that deterrence works and, indeed, that
a percentage increase in the probability of being punished has a
relatively larger effect on the number of arrests or convictions
than does an equal percentage increase in the expected sentence."
Certainty is a greater deterrent than severity. Witte (1980) had
similar findings with the variables representing the probability
of punishment and expected sentence. However, the deterrence
effect varies with the type of crime (1980:79).

Many studies on metropolitan areas have supported the
contention of deterrence impacting on the crime rate. Carr-Hill
and Stern's (1973:313) study on police departments in England and
Wales found the probability of detection and severity of
punishment if caught were significantly and negatively related to
serious offenses. Philip and Votey's (1975:338) simultaneous
analysis of the composite crime rate in 50 California cities
found severity and certainty had a significant, negative
(deterrent) effect on the crime rate. Mathur's (1978:462)
simultaneous analysis of the seven index crimes across large
American cities found: "Both severity and certainty of
punishment retain the appropriate signs and are significant in
the majority of the crime equations," but certainty is a greater
deterrent than severity is to crime. "There is an inverse

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relationship between certainty and severity in all certainty

equations in 1970 and in all certainty equations except murder in

1960" (1978:464).

Other studies continuing to find the expected relationship

between deterrence and crime, include Sjoquist's (1973) cross-

sectional analysis of 53 U.S. municipalities in 1960, which found

average sentence and convictions per arrest to have significant,

negative relationships with property crime rates. In Swimmer's

(1974a:622) analysis of large American cities, expected sentence

(which was the average sentence times the probability of

conviction) was negatively, related with all seven index crime

rates, while this relationship was significant for burglary and

aggravated assault. Swimmer (1974b) found the expected sentence

negatively but insignificantly related to the crime rates.

Similarly, Ehrlich's (1974:94) analysis of the seven index crimes

across states in 1940, 1950, and 1960 found a negative,

significant relationship between each crime category and the two

independent variables representing deterrence: the probability

of apprehension and imprisonment, and the average time served by

offenders in state prisons.

Avio and Clark's (1976:40) analysis of Canadian provinces

found some evidence that apprehension and conviction rates are

negatively related to property crime rates, and certainty of

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arrest/conviction deters property crimes more than severity does
(1976:53). Ehrlich's (1975a:416) analysis of U.S. crimes from
1933 to 1969 found capital punishment was negatively related to
murder rates. Arrest, conviction, and imprisonment rates were
negatively related to the murder rate (1975a:416). Danziger and
Wheeler's time-series analysis of the U.S. found the
probabilities of being charged with a crime, convicted if
charged, and of being sent to prison had a negative relationship
with burglary, robbery, and aggravated assault rates, and was
significant for imprisonment. McPheters (1976) looked at U.S.
robbery rates from 1959 to 1971 and found arrest and certainty
rates had significant, negative effects on the robbery rates.

    In contrast, other studies had inconsistent findings. Pogue
(1975) conducted a cross-sectional analysis of the seven index
crimes in SMSAs and found arrest rate was negatively and
significantly related to the criminal activity. However, the
severity of the sentence was significantly and positively related
with the crime rates, except for burglary and grand larceny,
which were insignificant. Danziger and Wheeler's (1975) cross-
sectional analysis of burglary, robbery, and aggravated assault
in 57 SMSAs found the probability of imprisonment was negatively
related in all cases and significant for burglary and robbery.
The average sentence had a negative relationship with burglary

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and robbery and was significant for burglary, while it had a
positive, insignificant relationship with aggravated assault
(1975:126). Passell and Taylor (1977) re-conducted Ehrlich's
(1975) time-series analysis and found clearance rates per murder
were negatively related to the murder rate, as was the conviction
rate [certainty] related to the murder rate. The execution rate
was negatively related to murder in some regressions and positive
in others. Hemley and McPheters (1974) analyzed 32 states and
found severity negatively related to robbery and burglary, and
positively related to larceny rates. (These relationships were
never significant.) However, certainty was consistently and
negatively related to all three crime rates.

In other cases, the findings have also been inconsistent
concering the effects of deterrence on crime. Kau and Rubin's
(1975) simultaneous, cross-sectional analysis of 60 U.S. cities
in 1960 and 1970 found certainty was consistently negatively
related in both years and for both property and violent crime
rates, and this relationship was significant, except for property
crime rates in 1960. Severity was always _positively_ related
except for violent crime rates in 1960, but it was never
significant. They claim that the "probability of conviction is
by far the most important deterrent of crime" (1975:76).
Chapman's (1976) simultaneous analysis of California cities found

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the percent nonwhite was negatively and significantly related to

the arrest rate, while police employment was positively and

significantly related to the arrest rate.   Parker and Smith's

(1979) analysis of 32 states found sentence certainty (proportion

of homicides admitted to prison) significant and negative for

stranger homicides and insignificant for acquaintance and

composite homicides.   Severity (median prison sentence length)

was insignificant in all cases.   Antunes and Hunt (1973) looked

at the effects of certainty and severity as the only variables

affecting the seven index crime rates in 49 states and found

certainty had a slight to moderate negative relationship with

each of the seven crime rates, while severity had a weak positive

relationship, except with homicide and sometimes larceny.

Black and Orsagh's (1978:626) simultaneous analysis across

states in 1950 and 1960 claimed: "We are unable to discover a

consistent relation between sanctions and homicide."   Futhermore,

"the death penalty had no appreciable deterrent effect on

homicide in the 1950 to 1960 period" (1978:629).   Logan (1972:72)

also used American states as units of analysis with a

simultaneous approach and claimed: "The findings for severity of

imprisonment are not so impressive."   However, he suggests the

role of certainty is probably important, but is likely

curvilinear: "The relation between certainty and crime rate is

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increased in strength and slope under conditions of high severity, relative to conditions of low severity" (1972:71). Chiricos and Waldo's (1970) analysis of all 50 states on six crime rates (all index crime rates except rape) found the effects of certainty and severity, as well as the effects of percent change in certainty and severity had no significant, consistent results over three time periods.

In summary, this section on the certainty and severity of punishment, strongly supports the contention that deterrence "works", and that deterrence variables are important in any model of the economcis-crime link. Certainty of punishment was consistently negatively related to the crime rates, and this relationship was usually significant, regardless of the type of crime. Severity of punishment was usually negatively related to the crime rates, but frequently insignificantly. There is undeniable support that certainty of punishment acts as a greater deterrent to criminal behavior than does the severity of punishment (Witte,1980; Schmidt and Witte,1984; Mathur,1978; Logan,1972; Hemley and McPheters,1974; Avio and Clark,1976).

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V. CONCLUSIONS TO THE REVIEW OF THE LITERATURE

Almost two decades ago Tullock (1969:59) stated: "Among the
various approaches to the study of crime, the economic
perspective has been one of the least developed and utilized."
Although sparse research on this topic existed previously, it has
increased in magnitude and frequency since Becker's article in
the Journal of the Political Economy in 1968. In addition to an
increasingly wider scope of variables included in the models,
there has been an expansion of the units of analysis incorporated
to test the expected utility and opportunity theories, relating
the impact of the economic structure on the crime rate. These
units of analysis have ranged in scope from individuals to
nation-states. Additionally, improved statistical techniques
(such as the simultaneous equations model) assist researchers in
improving the determination of the nature of a system where
demographic, economic, and deterrence variables all influence the
crime rate, and an where an interactive relationship exists
between the crime rate and the deterrence variables.

Studies researching the link between income levels and crime
rates have had mixed findings. (Income level measures include
absolute poverty, relative poverty, median family income, and
mean (or per capita) income.) Research on the mean and median

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income levels have been rarely signficant, and highly

inconsistent in direction and strength. Many researchers have

been surprised to find a positive and often significant

relationship between the mean income and crime rates, and

subsequently suggest it may be actually measuring the affluence

of an area in the sense of that area being a reliable crime

"target." Therefore, I suggest that future research should

determine whether there is a distinction between median family

income and the mean (or per capita) income. Since income

distribution is not symmetric in the United States, the meany

income is usually higher than the median income. Thus it is

likely they are measuring quite different concepts, implying that

future models need to include both.

The absolute poverty has proved to be a more stable

predictor of the crime rate than the mean or median income.

However, not all studies found that absolute poverty was

consistently related to the crime rate in the predicted

(positive) direction. It does appear, however, that studies

utilizing a simultaneous equations model were more likely to find

that absolute poverty had a significant and positive impact on

the crime rate (Avio and Clark,1976; Ehrlich,1974; Ehrlich,

1975b). Absolute poverty did not appear to influence certain

crime rates more than others. Similar to the absolute poverty

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findings, analyses including the relative poverty (usually

measured as the gini coefficient) usually found it affected the

crime rate in the predicted direction, although not always. The

sophistication of the analysis did not appear to affect these

findings.

Regarding variables representing the labor market, prior

research suggests that the unemployment and labor force

participation rates tend to influence the crime rates in the

predicted directions, but not always significantly, and rarely

strongly. An exception to this is that the unemployment rate was

frequently negatively, and often significantly related to the

robbery rate. Another important discovery from this literature

review is that simultaneous equation models tend to increase

support for the contention that employment rates affect violent

as well as property crime rates. If the simultaneous equations

model is indeed an improved manner of depicting the relationship

between crime and the economic structure, then this impact on

violent _and_ property crime makes this research especially

pertinent regarding policy implications. The literature review

suggests that the labor force participation rate may be a better

measure of what is actually happening in the labor market than is

the unemployment rate. This is not surprising since the latter

does not include people who have quit looking for work, are on

welfare, etc.

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Concerning demographic variables, previous research has
widely supported a positive and often significant relationship
between the percent nonwhite and the crime rate. It is possible
that this relationship may not be as strong and as significant if
the research controlled for many of the confounding demographic
and economic variables associated with race and the crime rate.
The literature review suggests that region (whether or not the
area is in the South), may not significantly affect the crime
rate, thus challenging the "Southern Culture of Violence" theory.
The age structure was usually positively related to the composite
and property crime rates, although these relationships were not
always signficant. Age structure is never significantly related
to the violent crime rates in the previous literature, and the
directions were inconsistent. Unlike other types of crime rates,
robbery rates were usually negatively related to the age
structure. Findings concerning educational attainment and crime
rates are often positive and usually insignificant.

Population size is usually positively related to the crime
rate, but not always significantly so. Robbery is most likely to
be signficantly related to the population size, while rape is
never significantly related to the population size. The
remaining crime rate types were inconsistently significantly
related to the population size. Auto theft and robbery rates

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tended to be positively related with population density, while homicide, larceny, and assault, were negatively related to the population density. Rape and burglary had inconsistent relationships with population density. The effects of the percent urban on the crime rate are unclear, and usually insignificant. Population mobility was usually related to the crime rate in the predicted direction, but rarely significantly so.

Police production variables suggest differential impacts of police employment per capita than police expenditure per capita, the former usually being positively and often significantly related to the crime rates, and the latter frequently negatively and insignificantly related to the crime rate. There is a need to collect data on both of these measures of police production in order to distinguish their effects. Simultaneous equations models including police production variables as one of the dependent variables, usually found median family income and the per capita tax positively and significantly related to the police production. Similarly, the crime rates in these equations were, as predicted, positively and significantly related to police production. Research incorporating certainty and severity of punishment usually found them negatively related to the crime rates, significantly so regarding certainty.

CHAPTER THREE: THE METHODOLOGY

I.   INTRODUCTION

Up to this point, the empirical findings and the theories backing the research on the relationship between economic variables and crime rates have been discussed in detail. This chapter will explain the methodology used in the present research to test this relationship, including the sample, the statistical techniques, the variables, and the models. The data for this study were collected from available data documents from a variety of sources. The source of each variable is included in Appendix 2.

II.   THE NEED FOR CURRENT RESEARCH

Current research must take on the task of incorporating the numerous demographic, deterrent, and economic variables identified in the wide range of studies described in the literature review. The research to be described in this dissertation does this. Additionally, it is important that violent crime rates are included in the model, although neither expected utility nor opportunity theories actually apply themselves to violent crimes. (The only exception to this would be opportunity theory's limited acknowledgement of the importance

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of the criminal subcultures necessary for teaching criminal

behavior, which might also be applicable to violent criminal

behavior.) Prior research has suggested that violent crime rates

may be affected by the same demographic, economic, and deterrence

variables influencing property crime rates in models used to test

the afore mentioned theories. Current research must also utilize

a simultaneous equations model in order to capture the reciprocal

effects between deterrence variables and the crime rates. The

research described below meets all of these qualifications.

III. THE SAMPLE

The sample in this study includes 260 of the 318 Standard

Metropolis Statistical Areas (SMSAs) in 1980.[1] Two-hundred and

sixty were chosen because this was the number of SMSAs for which

crime rate data were available. As the literature review

reported, a variety of units of analysis have been employed in

the empirical testing of the earnings opportunities and crime

rate relationship. These have included census tracts, police

districts, urban areas, cities, SMSAs, counties, states, and

nation-states.

[1] A list of these 260 SMSAs constituting the sample is
located in point one of Appendix 2.

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SMSAs were chosen for this research because it was felt that they most adequately represented the conditions necessary for testing the relationship between economic variables and crime rates. For instance, states, and even counties, are too large to fully understand the dynamics economic fluctuations and demographic differences have on influencing the crime rates. On the other hand, census tracts, and even cities, are too small as units of analysis. More specifically, although there may not be much property crime within a "poor" census tract, frustrated and "rational" persons from such a poor area would likely commit property crimes in more affluent census tracts, where the "earnings" from the crime would be greater. SMSAs are cohesive enough to include affluent, as well as rural and outlying areas, in addition to the inner cities. However, they are not so large as to present the generalization problems of a cross-sectional study where states or counties were the unit of analysis.

IV. THE STATISTICAL TECHNIQUE

The literature review chapter referred to prior studies which incorporated a simultaneous systems (or equations) model. The method was described briefly. At this point, I would like to elaborate on the need for such a model in research on the

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relationship between economic and crime variables. In a

discussion on the interaction between economic, deterrent, and

crime variables, Palmer (1977:14) claims: "What we need is some

method which allows the concurrent estimation of systems of two

or more equations where the dependent variable in one equation

can serve as an explanatory variable in the other." The

simultaneous equations model is such a method:

> The distinguishing feature of simultaneous
> models is that the causal structure is no
> longer hierarchical, meaning that at least one
> equation contains a higher ordered endogenous
> variable as an explanatory variable. This gen-
> eral form, where each of the endogenous var-
> iables can interact with all the other endogen-
> ous variables, is much more useful...In cross-
> sectional studies, where data on many individ-
> uals are collected at only one point in time,
> the observations on any variables subject to
> reciprocal influences will appear simultaneous
> because no time-ordering is observed (Hanushek
> and Jackson,1977:246).

In order to more accurately capture the relationship between

crime rates and economic variables, it is necessary to include

the influences that deterrence variables also have on the crime

rates. However, these variables have separate variables

affecting them (thus indirectly affecting the crime rates), and

also, the crime rates might simultaneously influence these

deterrence variables. For instance, areas with high crime rates

may decide to increase police expenditure and/or increase the

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severity of sentences, and this, in turn, should affect the crime

rate.   Greenwood and Wadycki (1973:141) explain why a

simultaneous equations model is appropriate concerning crime

rates and police production variables:

> The model that has been specified above [in
> their model] is circular in the sense that
> crime rates are viewed as determining the amount
> of expenditures that society chooses to devote
> to police protection. Given the cost of police
> protection, the amount of expenditures decided
> upon by society determines the quantity of police
> protection that can be employed. The quantity of
> police protection is in turn a determinant of
> crime rates.

Unfortunately, inherent in the constructing of a

simultaneous equations model is the problem of adequately

"identifying" the model. Wilson and Boland (1978:373) explain

this problem in their study on the effect of police on crime:

> In estimating models of this sort where two
> variables, X and Y, are thought to affect each
> other mutually, it becomes necessary to make
> defensible assumptions that there are addi-
> tional factors that will affect one of the vari-
> ables but not the other. These assumptions,
> called 'identification restrictions,' ensure that
> estimating techniques can separate the effect of
> X on Y from the effect of Y on X.

If the model is not properly "identified" statistically, there

are no results. If the model is not properly identified

according to the theory, then the results are meaningless. This

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point cannot by over-emphasized: <u>The model must by correctly</u>
<u>identified statistically with theoretical justification.</u>
Regarding these restrictions, Fisher and Nagin (1978:371-372)
claim the following: "If an equation is not indentified, one
cannot estimate it. If one tries to do so using false
restrictions to identify the equation, one can draw completely
erroneous conclusions from the estimated relationship."

One method commonly used to determine if the necessary
requirements are achieved in order to identify a model is called
the "order condition." The first step of the order condition is,
for each equation in the model, to count the number of dependent
variables and subtract one. The equation must exclude at least
that number of predetermined (independent) variables. For
example, if an equation has three dependent variables (one on the
left side of the equal sign and two on the right), then it must
exclude at least two of the predetermined variables. If it
excludes exactly that number (two in this case) of predetermined
variables, then it is considered "just identified." If it
excludes more (three or more in this case), then it is "over
identified." And if it has excludes less (one or zero in this
case), then it considered "un-" or "under-identified." Each
equation in the model (or "system") must be just or over
identified in order for the entire model (or "system") to be

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identified. It is fine if the model is either just or over

identified, but it cannot be computed if the entire model (thus,

even one equation) is unidentified.

While the statistical techniques in this research will

include ordinary regressions, additionally it will employ the

simultaneous equations model to further test the hypotheses, with

the expectation that the latter is a more appropriate test of the

empirical questions, for the reasons stated earlier in this

section. This section was necessary to precede the section on

dependent variables, in order to explain why this model will

contain more than one dependent variable. At the conclusion of

the discussion on the various dependent and independent variables

incorporated in this study, sections will follow explaining the

use of cost of living adjustments, and finally, the specific

models to be tested.

V. THE VARIABLES

A. The Dependent Variables

The literature review suggests the importance of including

violent as well as property crime rates in analyzing the link

between the economic structure and crime rates. Although both

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the expected utility and opportunity theories generally pertain

to criminal behavior being "rational" in an effort to achieve the

"American Dream," empirical research also suggests a link between

violent crimes and the earnings opportunities variables. This is

understandable if one considers such issues as that unemployment

and low incomes likely result in low self-esteem, high tension,

and high frustration. In addition to the likelihood of these

"victims" of unemployment and poverty taking their anger out on

those around them, is the plausibility of taking these

frustrations out on those who appear to be living the "American

Dream." However, Webb (1972:646) makes the following

differentiation between violent and property crimes in these

models:

> The violent or expressive crime is gener-
> ally spontaneous or an act of passion, commit-
> ted without relfection or premeditation. The
> property or instrumental offense, on the other
> hand, is generally the result of rational and
> motivated behavior, and as such seems a more
> valid index of the offender's normative orien-
> tations, which are in turn a reflection of the
> underlying social structure.

My argument is that unemployment, poverty, and a high level

of income inequality, while directly negatively affecting a

person's self-perception, may indirectly negatively affect the

"social fabric" of society (i.e., by increasing tension,

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frustration, self-hate,depression, etc.). For these reasons, the current research incorporates each of the seven individual index crime rates for 1980 (homicide, rape, aggravated assault, robbery, burglary, larceny-theft, and motor vehicle theft), as well as the composite crime rate (all seven index crime rates combined), the composite violent crime rate (homicide, rape, aggravated assault, and robbery rates combined), and the composite property crime rate (burglary, larceny-theft, and motor vehicle theft). This is useful to help determine how the various independent variables behave differently in impacting on specific types of crime rates. The crime rates are measured as the crime rate per 100,000 inhabitants within each SMSA.

In addition to the crime rates, there will be other variables in the final model which will behave as both independent and dependent variables. Police employment was measured as the number of police officers per capita, while the police expenditure variable was measured as the amount of money spent per capita on police protection. The severity of the sentence was measured as the median time served for first releases in 1981. This was available as a composite score as well as individual scores for robbery, burglary, and larceny.

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B.   The Independent Variables

The demographic variables in the current research are the
percent nonwhite, the population size, the population density
(measured as the number of persons per square mile), the
geographic region (a dummy variable representing whether the
state was Southern), the percent young males (also called "age
structure," and measured as the percent of males between 15 and
24 years old), the percent urban, and the educational level
(measured as the percent of the population over 25 years old who
have graduated from high school or, alternatively, the percent
with four or more years of college). The economic variables
included the percent in poverty,the average monthly family afdc
payment, the median family income, the mean income, and the
income distribution, as well as the unemployment and labor force
participation rates. For the current research, those variables
acting as both dependent and dependent variables (in addition to
the crime rates) include police expenditure (or police
employment, and the severity of the sentence. (Ideally, some
measure of certainty (i.e., the number of offenses cleared
through arrest) would also have behaved as both a dependent and
independent variable. Unfortunately, no such data were available
for SMSAs for 1980.)

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Furthermore, in order to help identify the simultaneous model and explain the changes in the police production variables, the variable entitled "tax" was callected. This variable was measured as the general revenue from local taxes per capita. It is proposed to directly affect the police production variables (police employment and expenditure), while only indirectly affecting the crime rates. Prison capacity was used for similar purposes in the severity equation, with the idea that the fullness of the prisons should influence how severely the offenders are sentenced. For instance, states with prisons filled to or above capacity will probably result in having their inmates serve less time in order to deal with the overcrowding.

VI. LIMITATIONS OF THE STUDY

Inherent in almost any analysis using secondary data is the problem that the variables are not always collected/measured in a manner considered ideal to the researcher. This research was not exempt from these problems. Probably the most serious limitation the current research faced was that there was no measure of the certainty of punishment available for 1980. If this variable had been available it would have either been multiplied by severity to create one certainty-severity variable which would be the

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dependent variable in one of the simultaneous equations in the

model, or have been the sole dependent variable in its own

equation (with certainty also being a dependent variable in one

equation).

Furthermore, not all of the data were collected for the

"right" years or unit of analysis. For instance, the severity of

the punishment was only available by <u>states</u> for <u>1981</u>, and even

then, not all of the states. Similarly, poverty variables were

not collected for 1980 for the 1980 census, but rather they were

collected for 1979 rates. Additionally, the police production

variables were only available for SMSAs for the fiscal year 1981-

1982. Regarding employment data, Ehrlich (1975:411) claims that

time-series data are better than cross-sectional, since time-

series "measures the variations in both involuntary unemployment

and the duration of such unemployment more effectively than do

variations in U [unemployment] across states at a given point in

time."

One caveat is that of problems with the Uniform Crime

Reports (the source of the crime data for this study). In

particular is the problem of the collection process. "If police

departments have their own definition of crime or desire to

suppress some information, no one will be any the wiser"

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(Swimmer,1974b,303).[2] Furthermore, Swimmer (1974b:304) goes on

to point out: "The thorniest data problem concerns differential

underreporting of crime by victims and police departments across

cities." However: "If all underreporting were uniform, it would

not affect the proposed study" (1974b:304). Ennis (1967:13)

found in a 1966 survey of 10,000 households in all parts of the

Continental United States that "at least twice as much major

crime as is reported occurs..." I can only hope that

underreporting is fairly consistent across the police departments

in this sample, as this is the only available data on crime rates

for SMSAs for 1980. The literature suggests that there is

systematic rather than random bias in the Uniform Crime Reports.

VII. TRANSFORMING THE DATA

     This section will discuss the alleged value of transforming

the data by making cost of living adjustments. Consistent with

James DeFronzo's (1983) suggestions regarding cost of living

     [2] However, this may not just be a function of police
departments cross-sectionally, but also over time. For instance,
Mathieson and Passell (1976:84) believe time-series crime data
"are particularly suspect, especially for recent years in which
public awareness of crime has been great and law enforcement
officials have been under pressure to lower crime rates and raise
both police inputs and police efficiency.

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adjustments and the inclusion of governmental assistance, this

study conducted analyses with and without these adjustments.

DeFronzo found that manipulating the data in this manner improved

on previous research, suggesting that these cost of living

adjustments and governmental assistance are important variables

in determining the link between the economic structure and the

crime rate. It stands to reason that such adjustments and aid

should affect the income level, possibly dramatically, when

making cross-sectional comparisons. For a more detailed account

of how this research followed DeFronzo's (1983) calculations, see

point 10 in Appendix 2.

VIII. CONTRIBUTIONS OF THIS RESEARCH

    This research expands previous research in a number of

ways. First it includes the most comprehensive and wide range of

economic and demographic variables of which the author is aware.

Additionally, the analysis is conducted on all seven index crime

rates, as well as the composite crime rate, and both the

composite violent and composite property crime rates. Frequently

these studies are limited by a small sample size. This study

includes 260 SMSAs, which is one of the largest sample sizes for

this type of study.

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In addition to a large number of cases and variables, this study expands others by its advanced statistical techniques. It incorporates a simultaneous equations systems model, in addition to ordinary regressions with the crime rates. That is, it models the criminal justice system as interactive, where deterrence variables affect and are affected by the crime rates simultaneously. Further, the data are manipulated to account for cost of living adjustments. (The only other person to make cost of living adjustments, DeFronzo (1983) did not include deterrence variables nor use a simultaneous systems approach.) Finally, analysis of 1980 data has not been conducted thus far, at least in publication.

IX.   BUILDING THE MODEL

Various models to test the earnings opportunity and crime rate link have been constructed. (Some of these models are displayed in Appendix 3.) A prior section of this chapter discussed how the current research uses both ordinary regression models and a simultaneous systems model. Some "tips" suggested by previous researcher identifying the model include McPheters and Stronge's warning against overusing demographic variables in the police production equation: "We would argue that such

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variables [as population density, percent nonwhite, age, or housing] are important determinants of police expenditures <u>only to the extent that they are causes of crime rates</u>. Their influence is thus captured in a proper specification of the crime function." Additionally, many researchers have included a measure of income as an exogenous variable in the police production equation (Greenwood and Wadycki,1973:144; Swimmer,1974b:301). For instance Greenwood and Wadycki (1973:144) claim: "Communities with higher income levels tend to make greater expenditures for public goods of various sorts, including police protection, and a positive sign is expected for the income variable." (Symbols for the variables are listed in Appendix 2, point 11.)

This research will start by testing the following ordinary regression models for each of the seven index crime rates, in addition to the composite, composite violent, and composite property crime rates. ("CR" in these models implies these various compositions and types of crimes will all be run for each equation.):

<u>The Ordinary Regression Model</u>

CR = f(POLX(or POLM),SEV,UE,LFP,AFDC,POV,MEDYF,MEANY(or YDIS),
AGE,POP,URB,DENS,MOB,ED,NW,SOUTH)

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The Simultaneous Equations Model

equation 1:
CR - f(MEANY (or YDIS), MEDYF,AFDC,POV,UE,LFP,POP,DENS,URB,MOB,
AGE,ED,NW,SOUTH)

equation 2:
POLX (or POLM) - g(CR,URB,MOB,MEDYF,TAX)

equation 3:
SEV - h(CR,NW,CAPAC)

The results from these models will be discussed in the

following chapter.   Chapter four will elaborate on the strength

and significance of the variables, as well as the importance of

conducting cost of living adjustments.   Chapter Five will discuss

the implications of this research on future research and

concerning policy implications.

CHAPTER FOUR: THE FINDINGS

I. THE INTRODUCTION

     The findings discussed in this chapter result from ordinary
regression techniques (where there is only one dependent variable
and that is the crime rate), and from two-stage least squares
techniques (where there are three dependent variables: the crime
rate, the severity of the sentence, and the police production).
Thus, the two-stage least squares approach is used to compute the
simultaneous equations model. Tables 1 through 8 are included in
Appendix 4, and show the results of the analyses conducted in
this research.

     Tables 1 and 2 are included to inform the reader of the
zero-order correlations between the variables used in this study.
Table 1 focuses on correlations between the predictor variables,
while Table 2 looks at correlations between the predictor
variables and the crime rates. It was noted that there were high
correlations between mean income and the median family income
($r=.88, p \leq .01$ without cost of living adjustments, $r=.83, p \leq .01$ with
cost of living adjustments), which is not surprising since it
seems they would be similar measures of the same phenomenon, the
"normal" income level. The income distribution variable, on the
other hand, was believed to measure income inequality.

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II.   RESULTS FROM THE ORDINARY REGRESSION MODEL

A.   <u>Introduction</u>

When conducting the analysis, it was kept in mind that the median family income and the mean income may <u>not</u> be measuring the same phenomenon, in spite of their high correlation. As mentioned previously, since income is not symmetrically distributed, mean income is a more skewed measure of income, thus "overrepresenting" the outlying higher extremes. The median family income, on the other hand, is more a measure of of "central tendency" incomes, more adequately representing "the norm." For these reasons, regressions included both of these variables <u>and</u> the income distribution.

In the course of the analysis it was discovered that two variables did <u>not</u> significantly increase the R^2.[1] Surprisingly, income distribution was one such variable. It is believed by the

[1] This was determined through the following formula:
$$F_{q,n-p-q-1} = \frac{R^2_f - R^2_r/q}{(1-R^2_f)/n-p-q-1}$$

R^2_f= R with everything in the equation
R^2_r= R with the questionable variable(s) left out
q = number of variables left out
n = sample size
p = number of variables in the complete equation

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author that the inclusion of both median family income and the

mean income, negate the impact of income distribution on the

crime rate. The other variable found not to contribute

significantly to the R^2 was police employment per capita. It

should be noted that police <u>expenditure</u> per capita did

significantly increase the R^2, in addition to frequently being

significant in the ordinary regression equations (although it was

not in the hypothesized direction). Another important finding

was that the regressions had significantly higher R^2s when the

cost of living adjustments were conducted on the variables

representing monetary amounts. For this reason, all such

economic variables were adjusted for the cost of living in the

findings reported in the ordinary regression and two-stage least

squares (simultaneous equations model) findings.

Tables 3 and 4 represent results from the final ordinary

regression models and are differentiated only by the former

measuring educational attainment as the percent of the population

25 and older graduated from high school (ED1), while Table 4

measures educational attainment as the percent 25 and older with

four or more years college (ED2). Because previous research had

inconclusive findings concerning the variable "educational

attainment," it was felt that since there has been a paucity of

analyses including this variable in any form, that two different

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measures might aid in determining the effects of this variable.
Thus, in an "exploratory" manner, analyses were conducted with
both of these measures of educational attainment in the ordinary
regressions.

Consistent throughout the regressions reported in Tables 3
and 4, is the moderately high R^2 and signficance levels (R^2ranges
from .49 to .68,$p \leq .01$ in all cases). This suggests that these
models have achieved a fairly high status of predictive power.
The R tended to be slightly higher when using ED2 (Table 4),
suggesting that it is an improvement over ED1 on predicting the
crime rate. Additionally, the regressions incorporating ED2
tended to have more significant findings. However, the R for
rape was higher using ED1 (R -.68,$p \leq .01$), than for ED2 (R^2
-.58,$p \leq .01$). At any rate, there was little difference between
the models based on the measurement of educational attainment,
especially concerning violent crime rates.

It is interesting to note that the crime rates best
explained through ordinary regression models are the homicide and
robbery rates (R^2-.68,$p \leq .01$ in all cases). This is of particular
interest since the economic structure was expected to have a
greater impact on the property crime rates. Assault and burglary
rates were the most poorly predicted of the crime rates when
using ED1 (R^2-.49,$p \leq .01$), while larceny was also relatively low

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$(R^2 - .55, p \le .01)$. Using ED2, assault was the most poorly explained crime rate $(R^2 - .50, p \le .01)$, with burglary and larceny being relatively low $(R^2 - .57, p \le .01$ in both cases). This is somewhat of a surprise since the theories used to guide this research, expected utility and opportunity theories were designed largely to account for property crime rates, and for the most part have ignored the repercussions of the economic structure on the violent crime rate.

B. The Economic Variables

Concerning the labor market variables, the findings are unexpected. Neither the unemployment nor the labor force participation rates are significant in any of the ordinary regression models. Similarly, the absolute poverty level also remains insignificant throughout the ordinary regression models. However, the mean income and the median family income proved to be important predictor variables of the crime rates. With the exception of larceny rates, the mean income had a significant, positive influence on all of the crime rates, in both Tables 3 and 4. Conversely, the median family income was negatively and significantly (again, except in the case of larceny rates) related to the crime rates in all of the regressions. This

CHAPTER FOUR: THE FINDINGS

suggests that, holding the median family income constant and allowing the mean income to increase, results in higher crime rates. Alternatively, holding the mean income constant and allowing the median family income to increase, results in lower crime rates. This finding suggests why the variable measuring income distribution did not significantly add to the model: including both the mean income and the median family income accurately portrays differences in income distribution. That is to say, these findings analyzing the interactions between these different measures of income level claim that as income distribution becomes more spread out, the crime rates increase.

C. The Demographic Variables

The tables suggest that ED2 has a greater impact on the crime rate than ED1. Not only do the models including ED2 have higher R for the various and composite property crime rates, education is more likely to be significant when ED2 is included. A surprising result from this variable is that in every case that it is significant, it is not in the hypothesized direction. Table 3 claims that the more people that have graduated from high school, the higher the rape rate ($p \leq .05$). Table 4 claims that the higher the percentage of the population with four or more

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years of college, the __higher__ are the composite, larceny, and
property crime rates ($p \leq .01$ in all three cases). These findings
concerning ED2 in Table 4 suggest that areas where more people
have college educations may be __targets__ of property crimes, thus
measuring the affluence of an area. Additionally, especially
concerning the significant positive effect of education on the
rape rate suggests (consistent with findings from victimization
research), that the more educated are the more likely to __report__
crimes against them. It does not seem unlikely that more
educated women would be more likely to report rapes.

The percent of the population that were males between 15 and
24 years old proved to be weak, usually positive, and
insignificant variables in all cases. Whether the SMSA was
located in the South was only significantly related to auto theft
rates, and there were signficantly more auto thefts __outside__ of
the South. However, the percent of nonwhites was one of the most
powerful and consistent predictors of the crime rate,
particularly for violent crime rates. It was positively and
significantly related to the composite, homicide, rape, robbery,
burglary, and composite violent crime rates in both Tables 3 and
4.

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We cannot assume from these findings that nonwhites are simply "more criminal" than whites. A number of explanations have been offered to explain the frequently positive and significant relationship between the percent nonwhite and the crime rate. Pogue (1975:40) believes the significant effect of race on the crime rate "suggests that standards of law obedience are different for whites and nonwhites, a reflection perchaps of racial discrimination and the alienation it entails. In further reference to the variable "percent nonwhite", Swimmer (1974b:300) states: "certain groups in society may become involved in crime as well as other antisocial behavior) as an outlet of frustration." Kau and Rubin (1975:75) point out that the inferior legitimate market opportunities and lower opportunity costs of imprisonment for nonwhites may lead to a "significantly greater incidence of crimes" among nonwhites. Furthermore: "If the property rights of nonwhites are not protected by the established law enforcement authority, then nonwhites may use self-enforcement policies. This self-enforcement policy may lead to more murders and assaults among nonwhites" (1975:75).

Population size was positively and significantly related to homicide and robbery rates and negatively and significantly related to the larceny rates in both Tables 3 and 4. However, in the model including ED2 (Table 4) population size was

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significantly and negatively related to the property crime rate.
The population density was significantly and negatively related
to rape and larceny and positively related to auto theft in both
Tables 3 and 4. Additionally, where ED2 was included (Table 4)
population density was negatively and significantly related to
the overall composite, and composite property crime rates. The
results concerning population density suggest that "crowding"
does not negatively affect the crime rate (with the exception of
auto theft rates), but rather, that more "crowding" may represent
more "protection" by other people from both violent and property
crimes. The percent urban was only signficantly (and positively
so) to the auto theft rate, and this was only when ED1 was used.
In no cases was population mobility significantly related to the
crime rate in the ordinary regression equations.

D. The Deterrence Variables

    The cost of living adjusted police expenditure per capita
was a positive, significant predictor, except for homicide and
burglary in both of the ordinary regression models and auto theft
in Table 3, and rape in Table 4. Prior research has suggested
why the police production variables may be positively related to

CHAPTER FOUR: THE FINDINGS

the crime rates, as opposed to the predicted negative direction.
For example, Greenwood and Wadycki (1973:141) claim that we are
"unable" to specify this relationship since the "police perform
two major functions-- crime prevention and crime detection."
Regarding the positive relationship between police expenditure
and the robbery rates, Jacob and Rich (1981:117) claim: "Thus it
is more likely that increased expenditures led more to increased
citizen reporting and police recording of robberies than to
deterrence of them." It is difficult, particularly without the
use of a simultaneous equations model, to determine the causal
order. That is, police expenditure per capita is likely
positively, strongly, and significantly related to the crime
rates in the ordinary regression models because areas with high
crime rates are spending more on the police. It is probably not
that a higher police expenditure results in a higher crime rate,
unless reporting and/or detection rates are increasing due to the
increased police production. The severity of the sentence was
consistently negatively related to the crime rate, but never
significantly so.

CHAPTER FOUR: THE FINDINGS

III. RESULTS FROM THE SIMULTANEOUS EQUATIONS MODELS

A. Introduction

Because ED2 was deemed a more important variable (if only slightly) in the ordinary regressions, the simultaneous models included ED2 (instead of ED1) in every case. The results from the simultaneous equations models are represented in Tables 5,6,7, and 8 in Appendix 4. Table 5 represents results when using the composite crime rate, Table 6 uses the violent crime rate, and Table 7 models the property crime rate. Table 8 includes both the property and violent crime rates separately (as opposed to Table 5). It should be noted that each of the four models had moderately high R^2s, which were significant ($p \leq .01$), with the exception of the severity equations, which had extremely low and insignificant R^2s.

B. The Economic Variables

As a whole, the economic variables behaved similarly in the simultaneous equations models as in the ordinary regressions. However, there were some differences. For instance, absolute poverty had a positive, significant ($p \leq .05$) effect on the

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property crime rate in the simultaneous models (Tables 7 and 8).
The labor market variables (the unemployment and labor force
participation rates) continued to be insignificant, although
their coefficients were in the predicted directions. Again,
consistent with the ordinary regression models, the median family
income was negatively and significantly related to the crime
rates, and the mean income was positively and significantly
related to the crime rates in all of the models. Government aid
(a cost of living adjusted and family size adjusted computation
of Aid for Dependent Children payment) was again insignificant.

Another economic variable, "tax", represented the budget
affecting the police expenditure, and had the predicted positive,
significant effect on the police expenditure in all four of the
simultaneous models. The median family income did not have a
signficant impact on the police expenditure, although it was in
the predicted, positive direction. Police expenditure had a
positive but insignificant effect on the crime rate. This is
interesting since this variable was strongly and significantly
related to the crime rate in the ordinary regressions. This
suggests that the ordinary regression is not properly capturing
the actual causal ordering. In fact, the models showed that the
violent crime rate had a significant, positive impact on the
police expenditure, thus police expenditure increases with
increases in the violent crime rate ($p \leq .01$).

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C. The Demographic Variables

    The findings concerning the demographic variables were also

consistent with the afore mentioned ordinary regression results.

However, the educational attainment (ED2) had no significant

impact on the crime rate (although it was positive). Similarly,

population size and density, region, age, and mobility rates had

insignificant effects on the crime rates. However, the percent

urban had a significant, positive effect on the overall composite

and composite property crime rates ($p \leq .01$). The mobility

variable (the percent change in the population) had a positive

and significant effect on the police expenditure in all four

models ($p \leq .01$), as did the percent urban ($p \leq .01$). In the

simultaneous equations model, the percent nonwhite was again a

positive and significant predictor of the crime rate ($p \leq .01$).

However, it was a negative, but insignificant predictor of the

sentence severity.

D. The Deterrence Variables

    The results of the deterrence variables were unexpected. In

no instances did the deterrence variables significantly affect

the crime rates. Furthermore, prison capacity was not a

significant predictor of the severity of the sentence.

CHAPTER FOUR: THE FINDINGS

IV. CONCLUSION

This analysis suggests that the findings are importantly
differentiated depending on the statistical technique used.
Although the mean income, the median family income, and the
percent nonwhite remained important predictors of the crime rate
regardless of whether ordinary regression of a simultaneous model
were used ($p \leq .01$), educational attainment and police expenditure
ceased to be significant predictor variables of the crime rate.
This simultaneous model helped us determine that the percent
urban, the percent change in the population (mobility) and the
tax revenue per capita, all positively, and significantly
influence the police expenditure ($p \leq .01$). The simultaneous model
also resulted in absolute poverty becoming a significant,
positive predictor of the property crime rate ($p \leq .05$).

Thus, the key findings of this study are the importance of
income distribution and the percent nonwhite in influencing the
crime rate. Many suggestions for the reason why the percent
nonwhite may lead to increasing crime rates have already been
discussed. The significance of income distribution as a
potential for policy change in affecting the crime rate cannot be
underplayed. The following chapter will discuss these findings,
guidance for future research, and policy implications as
potentially influenced by the findings in this research.

CHAPTER FIVE: THE DISCUSSION

I. THE INTRODUCTION

This dissertation has evaluated the theories and prior research linking economic and demographic variables with crime rates, and has developed a simultaneous equations model to test a refined version of prior theories. It has increased the existing knowledge on the relationship between the economic structure and the crime rate by building a comprehensive model and applying advanced statistical techniques. In addition to testing the model in a new manner on a large sample, it uses the most recent (1980) data available, to continue research conducted on 1970s data. This chapter will discuss the potential changes in policy which are suggested by the findings, as well as the implications for future research.

II. THEORETICAL IMPLICATIONS

Research in the area of economic factors and crime rates has been guided by one of two theories: (1) from the economic perspective, expected utility theory was incorporated, and (2) from the sociological/criminological perspective, opportunity

CHAPTER FIVE: THE DISCUSSION

theory was used. Although these theories are similar in many
respects, such as focusing on the impacts of environmental
constraints on the crime rate, they also differ. Particularly,
expected utility theory suggests that deterrence and risk
variables play a larger role in the crime rate than does
opportunity theory. A fine distinction between the two theories
is that expected utility theory looks at the criminal as a
"rational" person, while opportunity theory views the criminal as
"driven" by outside pressures. Additionally, when these theories
are applied to the violent crime rate, ferreting out differences
between the two theories becomes even more difficult.

The findings of this research tend to lend more support to
opportunity theory than to expected utility theory.
Specifically, the deterrence variables (e.g., police production
and sentence severity) did not prove to affect the crime rate.
Theories do not "own" variables, and the remaining (non-
deterrence) variables seemed equally feasible in representing the
conditions required by both expected utility and opportunity
theories. Overall, opportunity theory appears to be more
substantiated by the current research than does expected utility
theory.

CHAPTER FIVE: THE DISCUSSION

The first chapter discussed the potential use and appropriateness of incorporating aggregate level data to test the theories. If theories are true, they should leave traces that support them at the aggregate level. Although this macro approach is appropriate as stated, for determining what types of conditions about an area predict the crime rate; the usefulness of individual level data cannot be ignored. What is needed are cross-level theories that apply to aggregate and individual level data. Individual level data would most likely prove useful in testing some aspects of the theories not really feasible through aggregate level data. For example, individual level data could help measure "psychic" income and "fun of participation" concepts, while this would be impossible through aggregate level data.

Additionally, individual level data would be more appropriate than aggregate level data for determining individuals' perceptions of the certainty and severity of punishments, and individual level data could help determine opportunity theory's "socialization to crime," such as Cloward and Ohlin's subculture. Obviously, individual level data would be better for predicting individual criminal behavior decisions than would aggregate level data. Determining the interaction between risk, environment, and income distribution with

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individual reasoning in the prediction of individual criminal
behavior decisions would help advance these theories. It would
be interesting to determine the role race would play in the crime
rate using individual level data.

Another problem with these theories is applying them to
women. What we know about female economic and criminal levels is
in complete contrast to what these theories claim: women tend to
be poorer than men _and_ have lower crime rates. Thus, the model
should predict that women commit more crime, while in fact, they
commit less. The impact of gender is also important in this
research as women, on the average, have more flexibility, wider
economic opportunities, thus there is a wider range of
differences between women. Individual level data may help
future research determine the role of gender in these theories.
However, it is also necessary to make gender distinctions at the
aggregate level. Unfortunately, the data collections process
does not always make this gender distinction, specifically
regarding the crime rates for SMSAs. Additionally, it would be
useful to look at the degree of violent crimes that occur within
families and how the economic conditions affect this. Clearly,
there is a lot of potential for the incorporation of gender in
the research leading to advancing these theories.

CHAPTER FIVE: THE DISCUSSION

III. POLICY IMPLICATIONS

A. Economic Variables

A major finding in this analysis was the consistent
negative, significant effect of the median family income on the
crime rate. This suggests the importance of income level as a
potential contributor for policy change in effecting change on
the crime rate. While the absolute poverty was usually
insignificant, it was significantly and positively related to the
property crime rate in the simultaneous equations model. In the
same vein, mean income had a significant, positive effect on the
crime rate, implying that as the median family income is held
constant, and the per capita (or mean) income increases, the
crime rate will increase. Thus, in addition to low median family
incomes and the poverty levels significantly influencing the
crime rate, this findings of mean income points out that income
distribution is also an important predictor of the crime rate.
Of extreme importance in this analysis is the degree to which
these economic variables (median family income and mean income)
were found to affect the violent crime rate in addition to the
property crime rate. The one exception was that absolute poverty

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was not significantly related to the violent crime rate in the simultaneous equations model, while it was significantly (and positively) related to the property crime rate in this model.

This study therefore supports bringing about change in the crime rate at a very fundamental level, that is, by improving income distribution. This is of particular importance when one realizes that the deterrence variables, police production and severity, had no real impact on the crime rate.[1] Thus, the root causes of crime are probably more fundamental and basic than simply "beefing up" the social control mechanisms. This is congruent with Viscusi's (mimeo:62) statement:

> In terms of the relative efficacy of the
> 'carrot' of improved economic opportunities
> and the 'stick' of stricter criminal en-
> forcement, there is strong evidence that
> the 'carrot' is more effective.

The results concerning the labor market were unexpected regarding what was hypothesized from the expected utility and opportunity theories. In no cases were unemployment and labor force participation rate significantly related to the crime rates. It is likely that since these measures do not adequately

[1] The significant, positive effect of police expenditure on the crime rate in the ordinary regressions was "flushed out" in the simultaneous equations models, suggesting that the ordinary regressions do not adequately model the causal ordering.

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account for the length of the unemployment, reasons for unemployment, and the interplay of unemployment with other variables. Unemployment itself may be voluntary (i.e., through retirement, or due to inheritance, etc.), temporary, etc., but the measures used in this research may not account for these issues. Also, while being unemployed may not in itself be enough to convince a person to turn to crime, having a low income relative to others probably does, but the measures used in this research may not account for these issues. Congruent with the labor market findings, the results for the variable measuring government aid were consistently insignificant.

We cannot conclude from these findings that unemployment is not a contributor to the crime rate. It is likely that unemployment, especially over time, is related to some of the economic variables found to be significantly related to the crime rate. For instance, it is very likely that unemployment affects the median family income and the mean income levels. Thus, what is needed is a time-series approach to studying the economic structure as it relates to the crime rate, where it can be determined how unemployment over time affects the income levels.

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B. Demographic Variables

Another important predictor of the crime rate identified in
this (and much of the previous) research, is the effect of racial
distribution on the crime rate. The percent nonwhite was fairly
consistently significantly and positively related to the crime
rates, espeically the violent crime rates. As discussed in
Chapter Four, there are a number of explanations for this. for
example, Swimmer (1974b:299) discusses how the percent of the
population that is nonwhite is "indicative of the size of that
population subgroup facing discrimination." Thus, the results of
these findings are commensurate with Pogue's (1975: 40) findings
and conclusions:

> With respect to public policy, the findings
> of this study support a tentative conclusion
> that criminal activity may be better con-
> trolled by reducing poverty and racial dis-
> crimination than by increasing police spending
> and employment and the severity of criminal
> punishment.

Other findings from this research include very little
support for the importance of most of the demographic variables
(other than racial distribution) in influencing the crime rate.
The positive, significant effect of four or more years of college
on the crime rate, particularly the property crime rates, implies
that this variable measures affluence and "target" crime areas

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more than the lack of educational opportunities. At any rate,
this significant effect of education disappears in the
simultaneous equations model. The age structure (percent males
between 15 and 24) was insignificant in all models. This study
did not find any evidence for the "Southern Culture of Violence"
theory. In fact, the only crime rate significantly related to
region was the auto theft rate, and this claimed that auto thefts
were significantly more likely outside of the South.

The ordinary regression models showed that larger
populations are significantly more likely to have higher robbery
and homicide rate, and significantly lower larceny rates and
overall property crime rates. Furthermore, the ordinary
regression models showed areas which were less densely populated
were more likely to have higher rates of rape, larceny, and auto
theft, in addition to the overall composite and the composite
property crime rates. Thus, population density, as an over-
crowding variable, did not behave in the predicted manner, but
rather the results suggest the sparseness of the population
allows for more criminal behavior, perhaps because of fewer
people around to "protect" against crimes. Only in one ordinary
regression model was the percent urban significantly related, and
this was a positive relationship with the auto theft rate.
Population mobility was not significantly related to the crime
rate in any of the ordinary regressions.

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The simultaneous equations models refuted some of the prior

findings on the demographic variables. In particular, they never

found the percent of the population with four or more years of

college to be significantly related to the crime rates.

Similarly, the population size and density, region, age, and

mobility rates had insignificant effects on the crime rates.

However, the percent urban (unlike in the ordinary regression

models) was found to have a significant, positive effect on the

overall composite and the composite property crime rates.

C.   The Deterrence Variables

As pointed out earlier, the deterrence variables did not

have a significant effect on the crime rates. In none of the

models was the sentence severity related to the crime rate.

Furthermore, the unpredicted positive, significant effect of

police expenditure on the crime rates was "washed out" in the

simultaneous equations models, and showed that instead, the

violent crime rate had a positive, significant effect on the

police expenditure. Unlike most previous research, this research

did not find the median family income to be significantly related

to the police expenditure. However, the tax rate, population

mobility, and the percent urban all had significant, positive

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influences on the police expenditure. Regarding the equation for

severity in the simultaneous equations model, neither the percent

nonwhite nor the prison capacity significantly affected the

sentence severity. In fact, this was clearly the weakest

equation of the model with an extremely low explanation of

variation (the R^2 ranged from .01 to .03).

D. Conclusion

This research has pointed new directions concerning policy

implications. Most important is the need to achieve more

equitably distributed income levels and to decrease racial

discrimination. Unfortunately, in the real world, prescriptions

are easier to formulate than to implement into policy. Miller

(1974) discusses the diversity in ideologies concerning criminal

justice policies, and the subsequent implications for change.

> It does not appear too far-fetched to propose
> the major kinds of necessary social adaptation
> in the U.S. can occur only through the medium of
> ardently ideological social movements-- and that
> the costs of such a process must be borne in
> order to achieve the benefits it ultimately will
> confer (1974:34).

Achieving consensus on ideologies and the subsequent policies is

extremely difficult, therefore the probability of seeing them

come to fruition is even more unlikely.

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Additionally, Morash's (1983) findings on adolescents in
community programs are evidence of the problem of why it is so
difficult to "get at" the root causes of crime.   In her
explanation of why delinquency treatment may be ineffective, she
claims "individual treatment will be overshadowed by the
inadequacy of communities and the larger society to establish
bonds with and meaningful roles for adolescents" (1983:63).
Thus, identifying the need for social, political, and/or economic
change is not sufficient for ensuring its implementation, nor the
desired results.   Unfortunately, to too many, the reactive
approach of decreasing crime through strengthening deterrence
(i.e., through increasing incapacitation, capital punishment,
etc.) appears to be viewed as a solution over the proactive
approach of attempting to deter crime before it occurs, such as
through major social, economic, and political changes.

IV.   IMPLICATIONS FOR FUTURE RESEARCH

This study improved on previous work by including a more
comprehensive set of variables, by building a new model, and
incorporating advanced statistical techniques.   Additionally, it
had a large sample size and adjusted for the cost of living.
This adjustment in the cost of living proved important in

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increasing the explanatory power of the model, and suggests it should be included in future research on the economic structure and the crime rate. The second section of this chapter, "Theorectical Implications," discussed many theoretical issues that should help guide future research. This section will describe future research implications that surfaced specifically through the current data analysis findings.

The simultaneous equations model was useful in differentiating the effects of police expenditure on the crime rate, from the effects of the crime rate on the police expenditure. That is, while the ordinary regression techniques implied increased police expenditure leads to increased crime rates, the simultaneous equations model claims that police expenditure is not significantly related to the crime rate, but rather the violent crime rate is positively and significantly related to the police expenditure. In addition, while the ordinary regression models did not find the percent urban an influential variable on the crime rate, the simultaneous equations model found it had a significant, positive effect on the overall composite and the composite property crime rates. These findings suggest that the simultaneous equations model more adequately represents the true relationship between police expenditure and the crime rate.

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Some of the unexpected findings in this research, such as
the insignificant effect of the labor market variables, may be
due to not accounting for lagged effects. For instance,
unemployment may not lead to crime immediately due to temporary
unemployment payments, optimism of returning to work, etc.
However, it is likely that over an extended time period that
unemployment could lead to crime. Similarly, the "socialization"
to crime probably odes not happen overnight. For these reasons,
the usefulness of time-series data to test these theories is
clear.

Another problem inherent in this and similar research is the
operationalization of the concept of "average income." This
variable, frequently measured as GNP or income per capita, was
found in this and frequently in previous research to be in the
"wrong" direction, often time significant. The problem is that
we cannot be exactly sure what we are measuring: these "mean
income" variables may be measuring (a) legal opportunities, or
(b) potential loot. Since we would expect this variable to
impact on the crime rate in different directions depending on
which one of these concepts you believed the variable was
measuring, the results are clearly problematic. Individual level
data may be more appropriate for distinguishing between these
concepts.

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Finally, the major weakness of this research is that no measure of the certainty of punishment was available. It is believed that such inclusion in the model would allow an improved depiction of the actual "picture," and a greater understanding through the simultaneous equations model. As the literature review explained, the certainty of punishment has consistently proven to be a better predictor of the crime rate than the severity of the punishment. Due to the termination of the Law Enforcement Assistance Administration and a slack in time before the Bureau of Justice Statistics took up collecting some of the data (such as certainty of punishment and police production), they were not collected in a fashion timely for this project. (The police expenditure and employment data used were for the 1981-82 fiscal year). However, certainty is currently being measured by the Bureau of Justice Statistics, and the potential for replicating this and other models including the certainty of punishment should aid in our understanding of the relationship between the economic structure and the crime rate.

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V. THE CONCLUSION

        This dissertation has carefully evaluated expected utility

and opportunity theories, and reviewed the literature. Some

valuable issues surfaced in this research:

        (1) the importance of the economic structure in influencing
the violent as well as the property crime rates,

        (2) the importance of conducting cost of living adjustments
on the variables representing monetary amounts,

        (3)the realization that economic structures affect the crime
rates more significantly and powerfully than the deterrence
measures (thus implying that increasing sanctions are more a
manner of treating the symptom instead of the cause), and

        (4) the need for including a simultaneous equations model
in order to adequately capture interactons between the crime rate
and the deterrence variables in the analysis.

        This research points out the importance of examining crime

causality from a very fundamental level: the economic structure.

In particular is the potential to influence the crime rate

through improved income distribution. Furthermore, this analysis

supported the use of a simultaneous equations model in order to

adequately represent causality between deterrence variables and

the crime rate. Additionally, the inclusion of a large number of

demographic and economic variables helped improve the explanatory

power of the model. In conclusion, the role of the economic

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structure in affecting the crime rate is becoming increasingly

understood, however the need for future research remains.

APPENDIX 1

Variables used in Empirical Analyses of the Earnings-Crime Link[a]

	Income frequency	Absolute poverty	Unemployment	Median income	Labor force participation	Age structure	Racial structure	Region structure	Education level	Population size	Urban density	Population density	Police production	Severity/certainty	Other
Allison (1972)	X	X				X	X		X	X				X	distance between community and city core, %males, expenditure on parks & recreation, mobility
Antunes and Hunt (1973)											X		X		
Avio and Clark (1976)	X	X	X	X		X			X				X		
Bailey (1984)	X	X		X			X		X						
Becholdt (1975)	X	X							X	X					2 other crowding variables
Black and Orsagh (1978)	X	X	X	X		X		X	X	X			X	X	probability of execution, % population living in SMSAs, male/female ratio
Blau and Blau (1982)	X	X					X		X	X					% divorced, Duncan's SEI score[c]
Carr-Hill and Stern (1973)			X		X				X	X	X		X	X	% working and middle class, gains from offenses
Carr-Hill and Stern (1977)			X		X				X	X	X		X		%working and middle class, % violent offenses
Chapman (1976)	X	X	X		X				X						% blue-collar, female LFP, % labor force using public transportation, property value, economic incentive

Appendix 1 continued

Study	Income Inequality	Absolute Poverty	Mean or Median Income	Labor Force Participation	Unemployment Dummy	Age Structure	Racial Structure	Region Dummy	Education Level	Population Size	Urban Population	*Police Production	Severity	Certainty	Other
Chiricos & Waldo (1970)												X		X	% change in severity, % change in certainty over time
Cohen et al. (1980)									X						
Danziger & Wheeler (1975)	X		X						X	X	X	X			
DeFronzo (1983)	X	X	X	X		X	X	X	X	X	X				Household Activity Index[d], AFDC assistance per family
Ehrlich (1974)		X	X	X		X	X			X	X	X		X	% male
Ehrlich (1975a)		X	X	X		X				X	X				
Ehrlich (1975b)	X					X	X			X	X	X		X	
Fleisher (1963)		X	X	X				X			X				number of persons in armed services, time-trend dummy
Fleisher (1966)	X		X	X		X	X			X					mobility, % women over 14 divorced or separated
Glaser & Rice (1959)			X		X					X					
Greenwood & Wadycki (1973)	X	X		X			X		X		X				median value owner occupied housing units, per capita property tax

Appendix 1 continued

Study	Income Inequality	Absolute Poverty	Police Employment	Mean or Median Income	Unemployment	Labor Force Participation	Age Structure	Racial Structure	Region Dummy	Education Level	Population Size	Population Density	% Urban	Severity	% Police Production	Certainty	Other
Hemley & McPheters (1974)	X				X				X		X					X	mobility, net migration
Holzman (1982)				X	X	X	X										type of occupation (individual-level data), annual income
Huff & Stahura (1980)	X		X		X		X	X	X		X	X					
Humphries & Wallace (1980)						X		X	X		X	X	X			X	CCHI[e], % manufacturing in labor force
Jacob & Rich (1981)	X						X				X		X		X		
Jacobs (1981)	X			X	X			X	X	X			X			X	industrialization
Kau & Rubin (1975)	X			X	X	X		X	X		X		X			X	
Krohn (1976)[b]	X	X		X		X											
Land & Felson (1976)[b]	X		X	X	X	X					X						inflation
Loftin & Hill (1974)	X			X		X	X	X	X				X	X			structural poverty index[f], hospital beds/100,000
Loftin & McDowall (1982)												X					
Logan (1972)						X		X					X			X	

Appendix 1 continued

	Income Inequality	Absolute Poverty	Median Income	Unemployment	Labor-Force Participation	Racial Structure	Region Dummy	Education Level	Population Size	% Urban Population Density	Police Production	Severity Certainty	Other
McCarthy et al. (1975)	X					X	X						two other crowding variables
McPheters (1976)						X	X					X	gains from robberies
McPheters & Stronge (1976)	X	X	X	X			X		X				% change in white & black populations, crowding, recreation and education expenditures, % families on welfare aid, % college graduates, % housing substandard, mobility, per capita property value, per capita health expenditures, ratio of central city to SMSA median family income
Mathieson & Passell (1976)	X					X			X			X	dummy for business district, miles of street, police per crime, dummy for Manhattan precincts, dummy for if near large parks or airports, families with incomes over $25,000
Mathur (1978)	X					X	X	X	X	X	X	X	% white-collar, per capita tax revenue
Messner (1980)	X					X	X	X					
Messner (1982)[b]	X	X				X	X	X	X				
Morris & Tweeten (1971)	X	X	X			X	X		X	X			% male

Appendix 1 continued

	Income Inequality	Absolute Poverty	Mean or Median Income	Unemployment	Labor Force Participation	Age Structure	Structure Dummy	Racial Structure	Region Dummy	Education Level	Population Size	% Urban Density	Police Production	Severity	Certainty	Other
Parker & Smith (1979)				X	X		X						X	X		structural poverty index[f]
Passell & Taylor (1977)		X	X	X		X									X	execution rate, time-trend variable
Phillips et al. (1972)		X	X	X												
Phillips & Votey (1975)	X		X	X	X		X				X	X	X	X		% rural-non-farm, % 18-24 in labor force, % high school dropouts, mobility, % children living with single or no parent, % population with Spanish surnames
Pogue (1975)	X			X	X	X	X	X	X		X		X	X	X	% male, mobility, govt'l aid, taxes
Pressman & Carol (1971)	X			X	X	X	X				X		X	X		climate, net in-migration, % family income over $10,000
Schmidt & Witte (1984)		X		X									X		X	expected rate of return in the labor market
Sjoquist (1973)	X			X	X		X		X				X	X	X	gains from legal activity, retail sales per establishment
Smith & Parker (1980)	X		X	X	X		X			X			X		X	hospital beds/100,000, structural poverty index[f]
Spector (1975)			X	X			X						X			

Appendix 1 continued

Study	Income Inequality	Absolute Poverty	Mean or Median Income	Unemployment	Labor Force Participation	Age Structure	Racial Structure Dummy	Region Dummy	Education Level	Population Size	Population Density	% Urban	Police Production	Severity/Certainty	Other
Swimmer (1974a & 1974b)	X	X				X	X	X		X		X		X	% 14-17 year olds in school,taxes, city size in square miles
Thornberry & Christenson (1984)		X													father's occupation, delinquent record
Webb (1972)			X						X						division of labor,social density
Weicher (1970)	X	X	X	X		X	X	X	X	X					mobility, % 1st & 2nd generation, % divorced, % two-parent families, % dilapidated dwellings
Wellford (1974a)[b]	X	X					X		X	X					political orientation
Wellford (1974b)	X	X		X		X	X	X		X		X		X	male non-white unemployment,% owner occupied homes,over-crowded homes, % women divorced/separated, ratio of police budget to city budget
Williams & Drake (1980)	X	X				X	X		X	X					
Wilson & Boland (1978)	X	X		X		X	X	X	X	X		X		X	moving violations/patrol unit,crimes per patrol unit,% officers in 2-officer cars,housing density,taxes
Witte (1980)	X	X											X	X	legal wage rate

a. Types of crime rates and units of analysis are not included because some of these studies incorporate a number of different categories and units within them. In addition, significance levels and R^2s are not indicated because within a study some variables were significant for one type of crime rate, but not for another.

b. Some national studies used GNP/capita to measure economic development. It is recognized as mean income in this table.

c. Duncan's SEI scores are used to measure racial socioeconomic inequality.

d. The Household Activity Index is proposed to measure high-risk victimization households, using time activities are away from the home and/or the ownership of goods likely to be stolen.

e. The Central City Hardship Index (CCHI) developed by the Brookings Institute, measures social and economic disadvantage through the following variables: unemployment, age structure and dependency, educational level, income level adjusted regionally, crowded housing, and poverty.

f. The Structural Poverty Index comprises the following variables: infant mortality, absolute poverty, % single-parent families, educational level, % inductees who failed the Armed Forces mental test, and illiteracy rate.

APPENDIX 2

THE DATA

1. The following SMSAs were included in this research:
Abilene,TX;Akron,OH;Albany,GA,Albany-Schnectady-Troy,NY;
Albuquerque,NM;Alexandria,LA;Allentown-Bethlehem-Easton,PA-
NJ;Altoona,PA;Amarillo,TX;Anaheim-Santa Ana-Garden Grove,
CA;Ann Arbor,MI;Anniston,AL,Appleton-Oshkosh,WI;Asheville,
NC;Atlanta,GA;Atlantic City,NJ;Augusta,GA-SC;Austin,TX;
Bakersfield,CA;Baltimore,MD;Baton Rouge,LA;Battle Creek,MI;
Bay City,MI;Beaumont-Port Arthur-Orange,TX;Billings,MT;
Biloxi-Gulfport,MS;Binghamton,NY-PA;Birmingham,AL;Bismark,
ND;Bloomington,IN;Bloomington-Normal,IL;Boise City,ID;Bos-
ton,MA;Bradenton,FL;Bridgeport,CT;Brockton,MA;Brownsville-
Harlingen-San Benito,TX;Bryan-College Station,TX;Buffalo,NY;
Burlington,NC;Canton,OH;Cedar Rapids,IA; Champaign-Urbana-
Rantoul,IL;Charleston-North Charleston,SC;Charleston,WV;
Charlotte-Gastonia,NC;Chattanooga,TN-GA;Chicago,IL;Cincin-
nati,OH-KY-IN;Clarksville-Hopkinsville,TN-KY;Cleveland,OH;
Colorado Springs,CO;Columbia,MO;Columbia,SC;Columbus,GA-AL;
Columbus,OH;Corpus Christi,TX;Dallas-Fort Worth,TX;Daven-
port-Rock Island-Moline,IA-IL,Dayton,OH;Daytona Beach,FL;
Decatur,IL;Denver-Boulder,CO;Des Moines,IA;Detroit,MI;
Dubuque,IA;Duluth-Superior,MN-WI;Eau Claire,WI;El Paso,TX;
Elkhart,IN;Elmira,NY;Erie,PA;Eugene-Springfield,OR;Evans-
ville,IN-KY;Fall River,MA-RI;Fargo-Moorhead,ND-MN;Fayette-
ville,NC;Fayetteville-Springdale,AR;Flint,MI;Florence,AL;
Fort Lauderdale-Hollywood,FL;Fort Myers-Cape Coral,FL;Fort
Smith,AR-OK;Fort Wayne,IN;Fresno,CA;Gadsden,AL;Gainesville,
FL;Galveston-Texas City,TX;Gary-Hammond-East Chicago,IN;
Grand Forks,ND-MN;Grand Rapids,MI;Great Falls,MT;Green Bay,
WI;Greensboro-Winston-Salem-High Point,NC;Greenville-
Spartanburg,SC;Hamilton-Middletown,OH;Harrisburg,PA;Hart-
ford,CT;Honolulu,HI;Houston,TX;Huntington-Ashlund,WV-KY-OH;
Huntsville,AL;Indianapolis,IN;Iowa City,IA;Jacson,MI;Jack-
son,MS;Jacksonville,FL;Janesville-Beloit,WI;Jersey City,NJ;
Johnson City-Kingsport-Bristol,TN-VA;Johnstown,PA; Kankakee,
IL;Kansas City,MO-KS;Kenosha,WI;Killeen-Temple,TX;Knoxville,
TN;Kokomo,IN;La Cross,WI;Lafayette,LA;Lafayette-West Lafey-
ette,IN;Lake Charles,LA;Lakeland-Winter Haven,FL;Lancaster,
PA;Lansing-East Lansing,MI;Laredo,TX;Las Vegas,NV;Lawrence,
KS;Lawton,OK;Lewistown-Auburn,ME;Lexington-Fayette,KY;Lima,
OH;Lincoln,NB;Little Rock-North Little Rock,AR;Long Branch-
Asbury Park,NJ;Longview-Marshall,TX;Lorain-Elyria,OH;Los
Angeles-Long Beach,CA;Louisville,KY-IN;Lubbock,TX;Lynchburg,

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VA;Macon,GA;Madison,WI;Manchester,NH;Mansfield,OH; McAllen-
Pharr-Edinburg,TX; Melbourne-Titusville-Cocoa,FL;Memphis,TN-
AR-MS;Miami,FL;Midland,TX;Milwaukee,WI;Minnea-polis-St.Paul,
MN-WI;Mobile,AL;Modesto,CA;Monroe,LA;Montgomery,AL;Muskegon-
Norton Shores-Muskegon Heights,MI;Nashville-Davidson,TN;
Nassau-Suffolk,NY;New Brunswick-Perth Amboy-Sayerville,NJ;
New Haven-West Haven,CT;New London-Norwich,CT-RI;New
Orleans, LA;New York,NY-NJ;Newark,NJ;New-port News-Hampton,
VA;Norfolk-Virginia Beach-Portsmouth,VA-NC;Northeast,PA;
Odessa,TX;Oklahoma City,OK;Omaha,NB-IA;Orlando,FL;Owensboro,
KY;Oxnard-Simi Valley-Ventura,CA;Panama City,FL;Parkersburg-
Marietta,WV-OH;Paterson-Clifton Passaic,NJ;Pensacola,FL;
Peoria,IL;Peterburg-Colonial Heights-Hopewell,VA; Philadel-
phia,PA-NJ;Phoenix,AZ;Pinebluff,AR;Pittsburgh,PA; Pitts-
field,MA;Portland,ME;Portland,OR-WA;Poughkeepsie,NY; Provi-
dence-Warwick-Pawtucket,RI-MA;Provo-Orem,UT;Pueblo,CO;
Racine,WI;Raleigh-Durham,NC;Reading,PA;Reno,NV;Richland-
Kennewick-Pasco,WA;Richmond,VA;Riverside-San Bernardino-
Ontario,CA;Roanoke,VA;Rochester,MN;Rochester,NY;Rockford,IL;
Sacramento,CA;Saginaw,MI;St.Cloud,MN;St.Joseph,MO;St.Louis,
MO-IL;Salem,OR;Salinas-Seaside-Monterey,CA;Salt Lake City-
Ogden,UT;San Angelo,TX;San Antonio,TX;San Diego,CA;San
Francisco-Oakland,CA;San Jose,CA;Santa Barbara-Santa Maria-
Lompoc,CA;Santa Cruz,CA;Santa Rosa,CA;Sarasota,FL;Savannah,
GA;Seattle-Everett,WA;Sherman-Denison,TX;Shreveport,LA;Sioux
City,IA-NB;Sioux Falls,SD;South Bend,IN;Spokane,WA;Spring-
field,IL;Springfield,MO;Springfield,OH;Steubenville-Wierton,
OH-WV;Stockton,CA;Syracuse,NY;Tacoma,WA;Tallahassee,FL;
Tampa-St.Petersburg,FL;Terre Haute,IN;Texarkana,TX-AR;
Toledo,OH-MI;Topeka,KS;Trenton,NJ;Tuscon,AZ;Tulsa,OK;Tusca-
loosa,AL;Tyler,TX;Utica-Rome,NY;Vallejo-Fairfield-Napa,CA;
Vineland-Millville-Bridgeton,NJ;Waco,TX;Washington,DC-MD-VA;
West Palm Beach-Boca Raton,FL;Wheeling,WV-OH;Wichita,KS;
Wichita Falls,TX;Williamsport,PA;Wilmington,DE-NJ-MD;Wil-
mington,NC;Worcester,MA;Yakima,WA;York,PA;Youngstown-
Warren,OH.

2. Regarding geographic region, the following states were coded
as Southern: Texas, Oklahoma, Arkansas, Louisiana,
Mississippi, Alabama, Georgia, Florida, South Carolina,
North Carolina, Tennessee, Kentucky, Virginia, West
Virginia, Maryland, Deleware, and Washington,D.C. The
remaining states were coded as non-Southern.

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3. The 1980 crime rates were obtained from the Federal Bureau of Investigation Uniform Crime Reports published in 1981 by the U.S. Department of Justice, entitled Crime in the United States. Similarly, the 1979 crime rates were collected from the 1980 publication of Crime in the United States.

4. Police production variables (police employment and police expenditure) as well as the variable "budget" were gathered from the publication: Local Governments in Metropolitan Areas 1982: A Statistical Abstract Supplement, Census of Governments, U.S. Department of Commerce. Volume 5. GC82(5). Issued March 1985, by the Bureau of Census. Police employment is measured as the number of police officers per capita (Table 4). Police expenditure is the per capita amount of dollars spent on police protection (Table 5). "Budget" is measured as the general revenue from local taxes per capita (Table 5).

5. The data on severity of punishment were secured from the U.S. Department of Justice, Bureau of Justice Statistics, Special Report, entitled Prison Admissions and Releases, 1981 (Table 8). Unfortunately, severity data were not available for 1980, and were only available by state, and not for all states. SMSAs falling in more than one state had to be coded as missing data regarding severity. Additionally, data were not available for all of the individual crime types. Composite scores as well as individual scores for robbery, burglary, and larceny were reported for the median time served (in months) for first releases.

6. The percent nonwhite, population size, population density (measured as the number of inhabitants per square mile), population stability (measured as the percent change in the population from 1970 to 1980), prison capacity (measured as the state correctional facilities capacity in 1979), and average per month afdc payment data were collected from the State Metropolitan Area Data Book 1982 for data on 1980 (except prison capacity data were for 1979). This document is published by the Bureau of Census, U.S. Department of Commerce.

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7. The <u>1980 Census of the Population</u> Volume 1 (Characteristics of the Population) Chapter C (General Social and Economic Characteristics) publication by the Bureau of the Census (PC80-1-C4) was used to collect <u>age structure</u> (or the percent of males between 15 and 24 years old) (Table 115), the <u>educational level</u> (one measured as the percent of the population 25 years and older with high school graduates and another measured as the percent with four or more years of college) (Table 56), the <u>labor force participation rate</u> for all persons sixteen years old and older (Table 120).

8. The <u>1980 Census of the Population</u> Volume 1 (Characteristics of the Population) Chapter C (General Social and Economic Characteristics) Part 1 (United States Summary) published by the Bureau of Census, Issued December 1983 (PC80-1-C1) was used to collect data on <u>median family income</u> for 1979 (Table 247), <u>percent families with incomes below the 1979 poverty level (or absolute poverty)</u> (Table 247) and the <u>percent urban</u> (Table 56). (Income and poverty data are only available for years ending in "9" because that is how the census bureau collects them for the census years.)

9. Unfortunately, the Census Bureau did not conduct a collection of data on income distribution for SMSAs in the 1980 census. In fact, the last available data were for the 1970 census. However, 1980 figures were found by SMSA in the <u>1981 Survey of Buying Power</u>, a sales and marketing management magazine published July 27,1981. The "Effective Buying Income" (also called "EBI," which is measured as the personal income less personal tax and non-tax payments) was reported by percentages of the population falling into each of five categories: the percent of the households with EBI (1) below $8,000, (2) $8,000-$9,999, (3) $10,000-$14,999, (4) $15,000-$24,999, and (5) $25,000 and over. The author would like to thank Dr. Paul Menchik, of the Economics Department at Michigan State University for developing the following formula to determine the income distribution:

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$\bar{X}$ - the weighted average $-\Sigma p_i x_i$

p_i - proportion of the population in each income group

x_i - group mean (or 2 times the limit value)

(Thus, in each case, x_1- \$4,000, x_2- \$9,000, x_3-
\$12,500, x_4- \$20,000, and x_5- \$50,000.)

weight - $p_i \times 100$

$$\frac{\sum_{i=1}^{5} \text{weight } (x_i - \bar{X})^2}{100} = \sigma^2$$

$\sqrt{\sigma^2} = \sigma$

The Coefficient of Variance - $\dfrac{\sigma}{\bar{X}}$ - income distribution

Thus, a high coefficient of variance indicates high income inequality.

10. Consistent with suggestions from James DeFronzo in a recent article in Criminology, this research included variables representing government payments to the poor and cost of living adjustments. The Cost of Living Index was acquired through the American Chamber of Commerce Researchers Association (ACCRA) Index Report on Inter-City Cost of Living Indicators. Census SMSA cost of living assessments are not conducted for more than a small number of SMSAs each year (too small for the purposes of this research), so I was forced to look at this quarterly publication. Unfortunately, this document reported a lot of variation, even between consecutive quarters. Therefore, I collected all of the data available for each SMSA for each quarter between 1979-1981 (thus, 12 quarters), and took the mean. I was, thus, assuming that relatives do not change much and that the high variation between quarters was due to sampling variations. Where the data were available for SMSAs composed of more than one city, I weighted the cost of living index appropriately, depending on what percentage of the SMSA the city constituted. Therefore, this cost of living adjustment is by no means perfect, but it was the best I was able to find and compute. Over half of the SMSAs had data that were complete for 11 or 12 of the quarters. Using DeFronzo's (1983) formulas, a cost of living ratio was calculated for each SMSA. This was done by taking the cost of living index for the individual SMSA and dividing this by

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the mean cost of living index for the sample (100.9 in this
sample). The variables involving monetary values were then
divided by the cost of living ratio for each SMSA in order
to devise new variables adjusted for the cost of living.
Those variables for which cost of living adjustments were
made, include the mean income, median family income, police
expenditure, and budget. Furthermore, DeFronzo's (1983)
example for determining the cost of living afdc payments for
families for each SMSA was followed by dividing the average
per month family payment by the cost of living ratio, and
then dividing this quocient by the average size of families
living in poverty.

11. Variable Codes (Unless otherwise stated, the crime rates are
    for 1980): COMP=composite crime rate,VIOL=composite violent
    crime rate, PROP=composite property crime rate, HOM=homicide
    rate,RAPE=rape rate,ASSLT=assault rate, ROB= robbery rate,
    BURG=burglary rate,LARC=larceny-theft rate, AUTO=motor
    vehicle theft rate,NW=percent nonwhite,POP= population size,
    DENS=population density, ED1=percent population 25 or over
    with high school degree, ED2=percent population 25 or over
    with four or more years of college,AGE= the percent of the
    population which is male and between 15 and 24 years old,
    URB=percent urban,SOUTH=dummy variable representing if SMSA
    is in the South (not in the South=0, South=1),MOB=percent
    change in the population from 1970 to 1980),UE=percent
    unemployed,LFP=labor force participation rate,POV=percent of
    families below the 1979 poverty level (absolute poverty),
    MEDYF=median family income, MEANY=mean income, YDIS=income
    distribution, TAX=budget,or the general revenue from local
    taxes per capita, AFDC=average monthly afdc family payment,
    CAFDC= afdc payments adjusted for cost of living and family
    size using DeFronzo's (1983) formula, POLX= police
    expenditure per capita, POLM= police employment per capita,
    SEVC= median time served for first offense for all offenses,
    CAPAC=State Correctional Facilities' Capacity rates for
    1979). A "C" before any of these variables represents that
    cost of living adjustments have been made.

SIMULTANEOUS MODELS USED IN PRIOR RESEARCH

        Previous researchers have identified the simultaneous
systems model regarding the relationship between the economic
structure and the crime rate in a number of ways. This appendix
lists some of the models used. Variable symbols will be the same
as those used in this research, as listed in point 11 in appendix
2. If the variable is one that was not used in the current
research, it is spelled out in the models below.

Black and Orsagh (1978)
HOM = f(certainty,SEV,probability of execution,MEDYF,NW)
Certainty = g(HOM,MEDYF,POV,NW,POLX,HOM in t-1,UE,AGE,
      % living in SMSA,male/female ratio,POP,REG,ED)
SEV = h(same variables as in Certainty equation)
Probability of Execution = i(same variables as in Certainty)

Carr-Hill and Stern (1973)
COMP = f(certainty,POLM,POLX,URB,%working class)
Certainty = g(AGE,POP,POLX,%violent offenses,%working class)
POLM = h(%violent offenses,%middle class,URB)

Carr-Hill and Stern (1977)
COMP = f(Certainty,%working class,AGE,URB,POLX)
Certainty = g(AGE,POP,POLX,URB,%working class,%violent)
POLM = h(%middle class,%violent,URB)

Chapman (1976)
PROP = f(NW,LFP,Certainty,female LFP,total losses from felony
      crimes per capita)
VIOL = g(NW,LFP,MEDY,PROP,Certainty)
Certainty = h(NW,POLM,%using public transportation to work)
POLM = i(PROP,VIOL,%taking public transportation to work, per
      capita property value,%blue-collar,police wage)

Ehrlich (1974)
CR = f(Certainty,MEDYF,SEV,NW,%families below 1/2 MEDYF)
Certainty = g(SEV,POLX,CR,MEDYF,UE,NW,AGE,REG,POP,ED,%families
      below 1/2 MEDYF,male/female ratio,%population in SMSAs)

Greenwood and Wadycki (1973)
PROP = f(POLM,POV,DENS,NW,REG,median value of owner occupied
      housing units)
VIOL = g(POLM,POV,DENS,NW,REG)
POLX = h(VIOL,PROP,MEDYF,TAX)
POLM = i(POLX)

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<u>Kau and Rubin (1975)</u>
PROP - f(POP,NW,UE,YDIS,SEV,MEANY,Certainty)
VIOL - g(POP,NW,UE,YDIS,SEV,MEANY,Certainty)
Certainty - h(POP,NW,AGE,POLM,MEANY,ED,REGR,PROP,VIOL)

<u>Land and Felson (1976)</u>
PROP - f(PROPT,AGE,POLX,UE,inflation,GNP/POP)
VIOL - g(VIOLT,PROP,AGE,UE,POLX,inflation)
POLX - h(PROPT,VIOLT,GNP/POP,inflation)

<u>McPheters and Stronge (1976)</u>
COMP - f(central city decay,central city affluence,NW,ED,housing
      quality,youth presense,COMPT,POLX)
POLX - g(COMP,TAX)

<u>Mathieson and Passell (1976)</u>
COMP - f(Certainty,MEDYF in precinct,MEDYF in adjacent precincts,
      %families with incomes more than $25,000, dummy for business
      district,dummy for if in presencs of large park or airport)
Certainty - g(POLM/reported crime,MOB)
POLM - h(POP,business dummy,large park or airport dummy,COMP,
      dummy for if in Manhattan,miles of street)

<u>Mathur (1976)</u>
COMP - f(Certainty,SEV,MEDY,YDIS,NW,ED,UE,REG,%white collar)
Certainty - g(SEV,POLX,COMP,POP,POP squared,NW)
POLX - h(COMP,TAX)

<u>Phillips and Votey (1975)</u>
CR - f(Certainty,SEV,and combinations of various socioeconomic
      variables)
Certainty - g(CR,POLM)
POLM - h(CR,MEDYF,%violent offenses,police wage)
Police wage - i(MEDYF,DENS,POLM)

<u>Pogue (1975)</u>
CR - f(MEANY,NW,POV,AGE,POP,UE,DENS,ED,Certainty,%male,change
      in POP,change in UE)
Certainty - g(POP,DENS,POLX,CR)
POLX - h(MEANY,NW,POV,AGE,POP,UE,DENS,ED,POLX,%male,change in
      POP,change in UE)

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<u>Swimmer (1974a)</u>
CR = f(SEV,Certainty,gain/offense,income from illegal
     activities)
POLX = g(MEANY,TAX,safety rate (which is the inverse of the crime
     rate)

<u>Swimmer (1974b)</u>
CR = f(NW,ED,MEDY,UE,POLX,REG,POP,POP squared,YDIS,SEV x
     Certainty)
POLX = g(MEDY,TAX,POP,DENS,PROP,VIOL,REG,POP squared)

<u>Wilson and Boland (1978)</u>
ROB = f(Certainty,AGE,NW,UE,DENS)
Certainty = g(NW,crimes/patrol unit,moving violations/patrol
     unit)
POLM = h(PROP,VIOL,TAX,REG,police officer salary)
Patrol units on the street/100,000 populuation = i(POLM,DENS,
     POP,%officers assigned to two-officer cars)

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THE TABLES

TABLE 1

ZERO-ORDER CORRELATIONS BETWEEN THE CRIME RATES AND THE EXOGENOUS VARIABLES

	UE	LFP	POV	YDIS	HEAVY	CMEAVY	MEDYF	CHEDYF	AFDC	CAFDC	ED1	ED2	AGE	POP	DENS	URB	MOB	SOUTH	NJ	POLM	POLX	CPOLEX	SEV
COMP	-.18**	.15**	.08	-.03	.30**	.25**	.10*	-.00	.03	-.05	.26**	.30**	.01	.20**	.12*	.56**	.34**	.05	.37**	.46**	.59**	.67**	-.07
HOM	-.11*	.01	.40**	.11*	.03	.01	-.15**	-.27**	-.44**	-.52**	-.30**	-.08	-.09	.30**	.11*	.33**	.21**	.49**	.69**	.43**	.28**	.40**	-.15*
RAPE	-.08	.06	-.03	-.04	.03	.13*	.01	.13*	.01	-.25**	-.04	-.01	-.01	.01	-.01	.06	.04	.27**	.02	-.05	-.04	.48**	.02
ROB	-.09	.09	.10	-.22**	.37**	.16*	.20**	-.09	.04	-.10	.03	.11*	-.18**	.62**	.45**	.51**	-.02	.03	.48**	.63**	.57**	.58**	-.01
ASSLT	-.00	-.15**	.11**	.19**	.02	-.02	-.15**	-.25**	-.23**	-.27**	-.09	.03	-.02	.14**	.05	.31**	.28**	.33**	.45**	.31**	.31**	.48**	.11
BURG	-.18**	.08	.18**	.02	.23**	.17*	.00	-.14*	-.10	-.20**	.10*	.17**	-.04	.21**	.17**	.52**	.35**	.18**	.44**	.46**	.50**	.56**	-.13*
LARC	-.18**	.19**	-.06	-.00	.25**	.28**	.12*	.15*	.11*	.13*	.38**	.37**	.11*	-.00	-.10	.41**	.34**	-.06	.15**	.24**	.47**	.54**	-.02
AUTO	-.07	.13*	.08	-.28**	.33**	.19**	.23**	-.02	.16**	-.04	.02	.14**	-.16**	.51**	.55**	.57**	-.03	-.08	.32**	.60**	.53**	.55**	-.03
VIOL	-.06	-.03	.25**	.01	.22**	.08	.01	-.20**	-.14*	-.24**	-.03	.08	-.10*	.42**	.26**	.48**	.18**	.23**	.56**	.34**	.50**	.61**	-.08
PROP	-.19**	.18**	.04	-.04	.30**	.27**	.12*	.04	.06	-.00	.30**	.33**	.03	.15**	.08	.55**	.35**	.01	.31**	.42**	.58**	.64**	-.06

* p ≤ .05
**p ≤ .01

TABLE 2

ZERO-ORDER CORRELATIONS BETWEEN THE EXOGENOUS VARIABLES

	UE	LFP	POV	YDIS	MEANY	CMEANY	MEDYF	CMEDYF	AFDC	CAFDC	ED1	ED2	AGE	POP	DENS	URB	MOB	SOUTH	NW	POLM	POLX	CPOLX
UE	1.00																					
LFP	-.31**	1.00																				
POV	.20**	-.37**	1.00																			
YDIS	-.02	-.56**	.63**	1.00																		
MEANY	-.25**	.45**	-.70**	-.76**	1.00																	
CMEANY	-.22**	.55**	-.71**	-.70**	.90**	1.00																
MEDYF	-.08	.53**	-.72**	-.90**	.88**	.79**	1.00															
CMEDYF	-.04	.56**	-.74**	-.79**	.71**	.83**	.89**	1.00														
AFDCP	.27**	.14**	-.44**	-.49**	.37**	.37**	.21**	.49**	1.00													
CAFDCP	.28**	.13*	-.54**	-.41**	.30**	.49**	.42**	.37**	.97**	1.00												
ED1	-.32**	.44**	-.64**	-.44**	.61**	.49**	.58**	.52**	.42**	.50**	1.00											
ED2	-.55**	.43**	-.29**	-.24**	.44**	.28**	.42**	.31**	.12*	.10	.70**	1.00										
AGE	-.22**	.24**	.10	.15**	-.25**	-.26**	-.12*	-.09	-.12*	-.05	.27**	.50**	1.00									
POP	-.07	.09	.04	-.31**	.36**	.14*	.30**	.04	.22**	.10	.10	.17**	-.14**	1.00								
DENS	.05	.02	.04	-.24**	.18**	.02	.16**	-.05	.23**	.13*	-.08	.04	-.13*	.42**	1.00							
URB	-.31**	.24**	.03	-.25**	.39**	.27**	.24**	.09	.06	.06	.28**	.33**	.04	.37**	.34**	1.00						
MOB	-.28**	-.12*	.20**	.39**	-.04	.06	-.26**	-.27**	-.30**	-.33**	.14**	.23**	.11*	-.16**	-.25**	.18**	1.00					
SOUTH	-.28**	-.22**	.55**	.51**	-.36**	-.27**	-.52**	-.46***	-.79***	-.80***	-.47***	.06	.06	-.13*	-.16**	-.00	.35**	1.00				
NW	-.12*	.07	.53**	.11*	-.08	-.25**	-.15**	-.37**	-.32**	-.53**	-.26**	.05	.13*	.22**	.15**	.34**	.13*	.49**	1.00			
POLM	-.21**	.10	.09	-.20**	.32**	.18**	.19**	.02	.04	-.23**	-.07	.11*	-.18**	.42**	.50**	.57**	.34**	.13*	.49**	1.00		
POLX	-.11*	.18	-.15**	-.38**	.57**	.34**	.44**	.14*	.32**	.14*	.28**	.24**	-.18**	.44**	.37**	.59**	-.01	.12*	.42**	.67**	1.00	
CPOLEX	-.08	.12	-.01	-.25**	.46**	.35**	.30**	.13*	.19**	.12	.19**	.15*	-.18**	.44**	.35**	.63**	.24**	-.16**	.23**	.65***	.98***	1.00
SEV	.10	.11	-.21**	-.26**	.23**	-.01	.29**	.11	.34**	.37**	.28**	.20**	.04	.23**	-.04	.08	.24**	-.22**	-.01	.14*	.14*	.03

* P ≤ .01
** p ≤ .05

TABLE 3

ORDINARY REGRESSIONS USING ED1 AND COST OF LIVING ADJUSTMENTS

	COMP	HOM	RAPE	ROB	ASSLT	BURG	LARC	AUTO	VIOL	PROP
UE	-.03	.06	.10	.05	.18	.00	-.14	.02	.13	-.07
	-22.22	.14	.75	2.85	11.41	.82	-55.56	1.96	14.41	-42.23
LFP	-.08	-.03	-.01	-.01	-.22	-.09	-.08	.04	-.14	-.07
	-27.65	-.04	-.06	-.37	-7.66	-10.19	-17.83	1.80	-8.49	-22.70
POV	.27	.10	.12	-.02	.12	.23	.33	.10	.08	.30
	125.50	.16	.63	-.62	5.24	35.93	90.82	6.61	5.90	126.36
CMEANY	.58**	.60**	.57**	.40*	.51*	.71**	.36	.41*	.54**	.56**
	1.31	.47	.15	.08	.11	.53	.38	.13	.21	1.13
CMEDYF	-.46**	-.37*	-.54**	-.50**	-.48*	-.57**	-.15	-.40*	-.55**	-.40*
	-.37	-.00	-.00	-.03	-.04	-.15	-.69	-.04	-.07	-.29
CAFDC	-.02	-.14	-.02	-.20	-.20	-.01	.21	-.26	-.18	.05
	-1.01	-.03	-.02	-1.09	-1.20	-.17	7.76	-2.26	-1.86	2.79
ED1	.25	-.17	.34*	.15	.20	.17	.23	-.03	.20	.23
	52.54	-.12	.82	2.79	4.03	11.89	29.12	-.91	7.07	43.22
AGE	.08	.05	.04	-.07	.13	.03	.10	.00	.04	.08
	59.49	.13	.34	-4.89	10.06	8.83	47.98	.11	5.04	56.32
POP	-.12	.16*	-.02	.30**	-.08	-.06	-.22*	.14	.12	-.15
	-.00	.83	-.00	.00	-.00	-.00	-.00	.00	.00	-.00
DENS	-.13	-.10	-.22*	.09	-.12	-.03	-.25**	.24**	-.04	-.14
	-.24	-.62	-.00	.01	-.02	-.01	-.26	.06	-.01	-.22
URB	.08	-.02	.02	.05	-.04	.11	.03	.21*	.01	.09
	11.13	-.01	.03	.54	-.58	4.87	2.48	3.83	.31	11.13
MOB	-.01	.02	-.01	-.17	-.11	.08	.04	-.10	-.13	.03
	-6.80	.07	-.18	-16.94	-12.49	31.45	31.44	-16.59	-25.36	31.87
SOUTH	-.25	.00	-.01	-.19	.02	-.18	-.19	-.36**	-.07	-.26
	-822.70	.06	-.43	-55.21	6.63	-193.95	-370.55	-162.68	-39.45	-759.84
NW	.24*	.48**	.49**	.29**	.22	.32**	.17	.05	.34**	.22
	37.32	.26	.86	3.89	3.22	16.13	15.66	1.14	8.73	30.62
CPOLX	.50**	.14	.26*	.27*	.50**	.23	.50**	.23	.41**	.46**
	50.16	.05	.30	2.31	4.86	7.68	29.45	3.22	6.86	41.53
SEV	-.07	-.01	-.07	-.04	.02	-.08	-.10	.01	-.03	-.08
	-28.60	-.13	-.32	-1.43	.88	-10.25	-23.27	.44	-1.73	-29.08
CONST	-2161.99	-1.40	-58.19	49.23	37.77	-453.46	-1968.9	-62.36	.66	-2368.11
F	9.51**	11.30**	8.04**	11.11**	5.06**	6.93**	6.46**	8.27**	9.76**	8.48**
R^2	.64	.68	.61	.68	.49	.49	.55	.61	.65	.62

* $p < .05$
** $p < .01$

a. Standardized betas are listed first for each variable, with the unstandarized listed below the standardized.
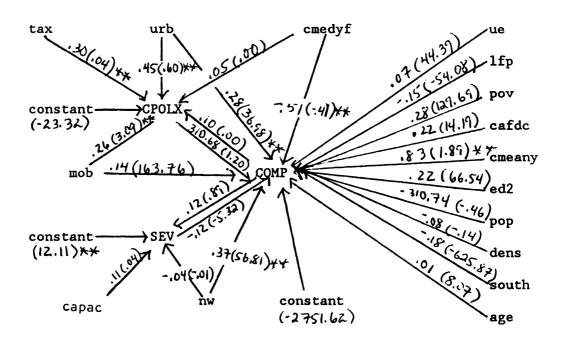
TABLE 4

ORDINARY REGRESSIONS USING ED2 AND COST OF LIVING ADJUSTMENTS

	COMP	HOM	RAPE	ROB	ASSLT	BURG	LARC	AUTO	VIOL	PROP
UE	.07	.03	.09	.10	.25	.04	-.02	.11	.19	.04
	49.56	.06	.67	5.52	15.83	8.25	-10.68	10.06	20.99	20.96
LFP	-.04	-.05	-.00	.00	-.20	-.07	-.05	.05	-.12	-.04
	-15.94	-.06	-.02	.13	-6.88	-8.55	-10.76	2.66	-7.27	-12.60
POV	.09	.17	-.00	-.09	.02	.16	.20	.08	-.02	.18
	63.72	.28	-.02	-3.60	.79	24.25	55.25	5.24	-1.61	74.46
CMEANY	.57**	.60**	.59**	.40*	.50*	.72**	.35	.39*	.55**	.56**
	1.30	.00	.02	.08	.11	.53	.46	.12	.21	1.12
CMEDYF	-.58**	-.33*	-.54**	-.55**	-.55**	-.61**	-.27	-.49**	-.62**	-.52**
	-.47	-.00	-.50	-.04	-.04	-.16	-.13	-.05	-.08	-.37
CAFDC	.01	-.19	.10	-.17	-.16	.03	.23	-.32*	-.14	.07
	.93	-.04	.07	-.93	-.99	.70	8.58	-2.76	-1.45	4.18
ED2	.32**	-.13	.11	.16	.22	.14	.33**	.18	.20	.31**
	97.98	-.14	.37	4.10	6.47	13.66	59.23	7.35	10.21	84.61
AGE	-.01	.07	.07	-.10	.08	.02	.02	-.08	-.00	-.00
	-4.26	.18	.64	-7.05	6.43	3.90	7.17	-8.84	-.23	-.58
POP	-.16	.17*	-.01	.28**	-.11	-.07	-.26**	.10	.10	-.19*
	-.00	.00	-.00	.00	-.00	-.00	-.00	.00	.00	-.00
DENS	-.20*	-.07	-.26**	.05	-.16	-.06	-.32**	.22*	-.08	-.20*
	-.35	-.00	-.01	.01	-.28	-.03	-.33	.05	-.02	-.32
URB	.13	-.05	.09	.07	-.01	.14	.07	.20	.05	.13
	16.93	-.02	.13	.86	-.13	6.25	5.66	3.66	1.11	15.87
MOB	-.04	.01	.06	-.17	-.12	.09	.01	-.17	-.13	-.00
	-43.01	.03	.82	-17.37	-13.85	34.76	4.73	-28.15	- 26.22	-3.33
SOUTH	-.24	.01	-.04	-.19	.02	-.18	-.18	-.33*	-.07	-.25
	-801.61	.12	-1.62	-55.53	6.87	-200.36	-352.41	-151.18	-40.51	-737.23
NW	.22*	.48**	.52**	.29**	.21	.32**	.15	.02	.33**	.20
	33.88	.26	.92	7.44	3.05	16.15	13.30	.36	8.55	27.41
CPOLX	.52**	.14	.23	.28*	.52**	.24	.53**	.27*	.42**	.49**
	53.00	.05	.26	2.38	5.01	7.76	31.34	3.77	7.05	44.12
SEV	-.08	-.00	-.08	-.05	.01	-.08	-.11	.01	-.03	-.09
	-32.95	-.00	-.37	-1.64	.56	-11.11	-25.75	.38	-2.27	-32.72
CONST	1229.95	-7.88	-23.14	212.15	281.84	182.21	-12.56	18.45	410.38	484.33
F	10.26**	11.21**	7.24**	11.21**	5.17**	6.89**	7.03**	8.62**	9.88**	9.16**
R^2	.66	.68	.58	.68	.50	.57	.57	.62	.65	.64

$*\ p \leq .05$
$**p \leq .01$

a. Standardized betas are listed first for each variable, with the unstandardized betas listed below.

TABLE 5

A SIMULTANEOUS MODEL OF THE COMPOSITE CRIME RATE
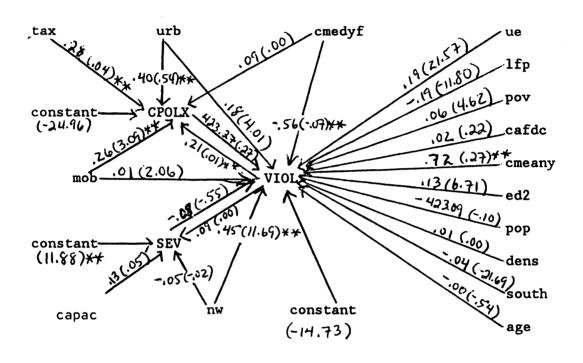

COMP R^2 = .59**
CPOLX R^2 = .50**
SEV R^2 = .03

* $p \leq .05$
**$p \leq .01$

a. Unstandardized betas are in parentheses, standardized are outside of the parentheses.

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TABLE 6

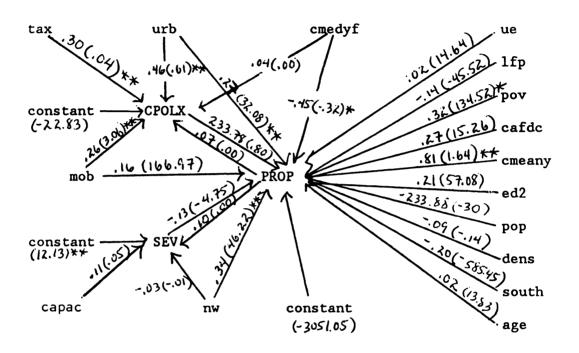## A SIMULTANEOUS MODEL OF THE VIOLENT CRIME RATE

COMP R^2 = .61**
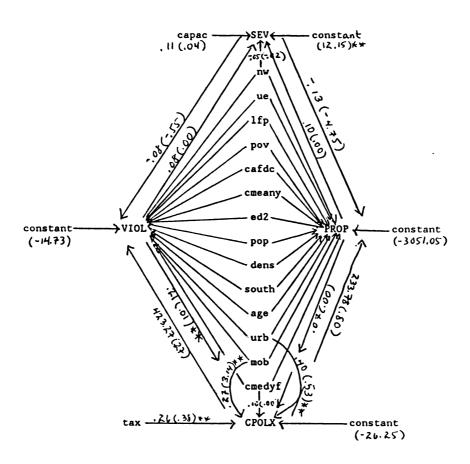CPOLX R^2 = .51**
SEV R^2 = .01

* $p \leq .05$
** $p \leq .01$

a.   Unstandardized betas are in parentheses, standardized are outside of the parentheses.

TABLE 7

A SIMULTANEOUS MODEL OF THE PROPERTY CRIME RATE[a]

COMP R^2 = .57**
CPOLX R^2 = .47**
SEV R^2 = .03

* p≤.05
**p≤.01

a. Unstandardized betas are in parentheses, standardized are outside of the parentheses.

TABLE 8

A SIMULTANEOUS MODEL INCLUDING PROPERTY AND VIOLENT CRIME RATES [a,b]

VIOL R^2 = .61**
PROP R^2 = .57**
CPOLX R^2 = .54**
SEV R^2 = .03

**p≤.01

a. The unstandardized betas are in parentheses, and the standardized are outside of the parentheses.

b. The betas and signifance levels of the exogenous variables nw through cmedyf (listed vertically between SEV and CPOLX) are not given for PROP and VIOL since theses are identical to the betas and significance levels given in Tables 6 and 7.) However, including property and violent crime rates individually in the SEV and CPOLX equations alters the effects of the same exogenous variables on these deterrence endogenous variables, so these are the values printed in this table. Thus, for the impacts of nw through cmedyf on PROP and VIOL in _this_ table, please refer back to Tables 6 and 7.

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