

Journal of Research in Crime and Delinquency

EDITOR:	Mercer L. Sullivan, <i>Rutgers University</i>
ASSOCIATE EDITORS:	Travis C. Pratt, <i>Rutgers University</i> Bonita M. Veysey, <i>Rutgers University</i> Elin Waring, <i>Lehman College, CUNY</i>
ACTING EDITOR:	Clayton A. Hartjen, <i>Rutgers University</i>
EDITORIAL BOARD:	David H. Bayley, <i>University at Albany, SUNY</i> Joel Best, <i>University of Delaware</i> Anthony E. Bottoms, <i>Cambridge University</i> Patricia L. Brantingham, <i>Simon Fraser University</i> Robert Bursik, Jr., <i>University of Missouri–St. Louis</i> Meda Chesney-Lind, <i>University of Hawaii at Manoa</i> Todd R. Clear, <i>John Jay College, CUNY</i> Phillip J. Cook, <i>Duke University</i> Derek Cornish, <i>London School of Economics</i> Francis T. Cullen, <i>University of Cincinnati</i> Delbert Elliott, <i>University of Colorado, Boulder</i> Jeffrey Fagan, <i>Columbia University</i> David P. Farrington, <i>Cambridge University</i> James O. Finckenauer, <i>National Institute of Justice, International Center</i> James J. Fyfe, <i>John Jay College</i> Denise C. Gottfredson, <i>University of Maryland</i> Chris Hale, <i>University of Kent at Canterbury</i> John Hagan, <i>Northwestern University</i> Darnell F. Hawkins, <i>University of Illinois at Chicago</i> Julie Horney, <i>University of Nebraska, Lincoln</i> Malcolm W. Klein, <i>University of Southern California</i> John Laub, <i>University of Maryland</i> Michael D. Maltz, <i>University of Illinois at Chicago</i> Patricia L. McCall, <i>North Carolina State University</i> Joan McCord, <i>Temple University</i> Terrie Moffitt, <i>Social, Genetic, and Developmental Psychiatry Research Center, Institute of Psychiatry</i> Vincent O'Leary, <i>University at Albany, SUNY</i> Ken Pease, <i>Huddersfield University</i> Robert J. Sampson, <i>University of Chicago</i> Lawrence W. Sherman, <i>University of Pennsylvania</i> James F. Short, Jr., <i>Washington State University</i> Wesley G. Skogan, <i>Northwestern University</i> Jerome Skolnick, <i>New York University</i> Terence P. Thornberry, <i>University at Albany</i> Charles R. Tittle, <i>Washington State University</i> Richard E. Tremblay, <i>Universite de Montreal</i> Joseph G. Weis, <i>University of Washington</i> David L. Weisburd, <i>The Hebrew University and the Police Foundation</i> Cathy Spatz Widom, <i>University of Medicine and Dentistry of New Jersey</i> Franklin Zimring, <i>University of California, Berkeley</i>
MANAGING EDITOR:	Kristen Zgoba, <i>Rutgers University</i>
For Sage Publications:	Mark Gage, Jim Kelly, and Joe Cribben

Published in cooperation with the

NATIONAL COUNCIL ON CRIME AND DELINQUENCY

685 Market St., Suite 620, San Francisco, CA 94105

THE NATIONAL COUNCIL ON CRIME AND DELINQUENCY, organized in 1907 and incorporated as a national agency in 1921, includes concerned citizens and professionals in criminal justice. NCCD works to improve the criminal justice system and to maximize the effectiveness of law enforcement, juvenile and criminal courts, and correctional institutions and programs. NCCD has a special focus on the nature and use of post-conviction sanctions, including both incarceration and community programs. NCCD also seeks to stimulate community programs for the prevention, treatment, and control of delinquency and crime. NCCD is a nonprofit organization. Its major research, training, and technical assistance programs are supported through program income or external sponsorship by federal, state, and local governments, or by foundations.

JOURNAL OF
**Research in
Crime and
Delinquency**

Volume 38, Number 4
November 2001

CONTENTS

Building on the Foundation of General Strain Theory: <i>Specifying the Types of Strain Most Likely to Lead to Crime and Delinquency</i> ROBERT AGNEW	319
Student Anger and Aggressive Behavior in School: <i>An Initial Test of Agnew's Macro-Level Strain Theory</i> TIMOTHY BREZINA ALEX R. PIQUERO PAUL MAZEROLLE	362
Policing Is Not a Treatment: <i>Alternatives to the Medical Model of Police Research</i> DAVID THACHER	387
The Effects of Substance Use on Specific Types of Criminal Offending in Young Men JOHN W. WELTE LENING ZHANG WILLIAM F. WIECZOREK	416
Crime and Risky Behavior in Traffic: <i>An Example of Cross-Situational Consistency</i> MARIANNE JUNGER ROBERT WEST REINIER TIMMAN	439
About the Authors	460
Index	463

BUILDING ON THE FOUNDATION OF GENERAL STRAIN THEORY: SPECIFYING THE TYPES OF STRAIN MOST LIKELY TO LEAD TO CRIME AND DELINQUENCY

ROBERT AGNEW

General strain theory (GST) is usually tested by examining the effect of strain on crime. Researchers, however, have little guidance when it comes to selecting among the many hundreds of types of strain and have trouble explaining why only some of them are related to crime. This article builds on GST by describing the characteristics of strainful events and conditions that influence their relationship to crime. Strains are said to be most likely to result in crime when they (1) are seen as unjust, (2) are seen as high in magnitude, (3) are associated with low social control, and (4) create some pressure or incentive to engage in criminal coping. Drawing on these characteristics, it is predicted that some types of strain will not be related to crime, including types that have dominated the research on strain theory, and that others will be related to crime, including types that have been neglected by empirical researchers.

General strain theory (GST) argues that strains or stressors increase the likelihood of negative emotions like anger and frustration. These emotions create pressure for corrective action, and crime is one possible response (Agnew 1992). Crime may be a method for reducing strain (e.g., stealing the money you desire), seeking revenge, or alleviating negative emotions (e.g., through illicit drug use). GST builds on previous strain theories in several ways: most notably, by pointing to several new categories of strain, including the loss of positive stimuli (e.g., loss of a romantic partner, death of a friend), the presentation of negative stimuli (e.g., physical assaults and verbal insults), and new categories of goal blockage (e.g., the failure to achieve justice goals). Recent research demonstrates that many of the specific strains falling under these categories are related to crime and delinquency (see Agnew 2001a for a summary; Aseltine, Gore, and Gordon 2000; Mazerolle et al. 2000; Piquero and Sealock 2000). The specification of these new categories of strain is GST's greatest strength.

This strength, however, is also GST's biggest weakness. GST is so broad that researchers have little guidance as to the specific types of strain to examine in their research. Hundreds of types of strain fall under the major categories of strain listed by GST, as reflected in recent inventories of stressful life events, chronic stressors, and daily life events or hassles (see Cohen, Kessler, and Gordon 1995; Herbert and Cohen 1996 for overviews). And even these inventories do not measure many of the strains described by GST. Furthermore, the broadness of GST makes it difficult to falsify. As Jensen (1995) stated, "if strain can be defined in so many different ways, then strain theory is virtually unfalsifiable. There is always a new measure that might salvage the theory" (p. 152).

It is therefore crucial that GST more precisely specify the types of strain most likely to lead to crime and delinquency. This article represents an attempt to do that. First, strain is defined. Although Agnew (1992) presented a general definition of strain, the term has nevertheless been used in different ways by researchers and it is important to clarify its meaning. Second, previous tests of GST are reviewed to determine what they say about the types of strain most likely to lead to crime. Third, the characteristics of those types of strain most likely to lead to crime are described. Briefly, such strains (1) are seen as unjust, (2) are seen as high in magnitude, (3) are associated with low social control, and (4) create some pressure or incentive to engage in crime. Fourth, these characteristics are then used to predict the likelihood that several types of strain will result in crime. Fifth, suggestions for empirical research are provided.

WHAT IS STRAIN?

Before discussing the types of strain most likely to lead to crime, it is first necessary to clarify what is meant by the term *strain*. Agnew (1992) stated that strain refers to "relationships in which others are not treating the individual as he or she would like to be treated" (p. 48). Even so, researchers use the term in different ways. Some refer to an objective event or condition (e.g., the infliction of physical abuse, the receipt of poor grades at school), some to the individual's evaluation of an event or condition (e.g., whether juveniles like the way their parents or teachers treat them), and some to the emotional reaction to an event or condition (e.g., whether respondents are angry at how others treat them). To help clarify the meaning of strain, the following definitions are proposed.

Objective strains refer to events or conditions that are disliked by most members of a given group. So, if we state that an individual is experiencing objective strain, we mean that he or she is experiencing an event or condition

that is usually disliked by members of his or her group. Many events and conditions are disliked by most people, regardless of group membership (e.g., physical assault, lack of adequate food and shelter). The evaluation of other events and conditions varies with group characteristics, such as gender and age (e.g., Broidy and Agnew 1997; Elder, George, and Shanahan 1996). It is, of course, important for researchers to consider the possibility of such group differences when constructing measures of objective strain.

Empirically, it is possible to determine the objective strains for group members in several ways. Observational research is one method. Anderson (1999), for example, described many of the objective strains in a poor, inner-city, African American community. Surveying a representative sample of group members or people familiar with the group is another method, and both have been employed in the stress research (Turner and Wheaton 1995). In particular, respondents can be asked whether they (or group members) would dislike a range of events and conditions. It is important to present respondents with preestablished lists of events/conditions and to ask them to list events/conditions not on the list. This helps to ensure that a complete list of objective strains is developed.¹

Subjective strains refer to events or conditions that are disliked by the people who are experiencing (or have experienced) them. So, if we state that individuals are experiencing subjective strain, we mean that they are experiencing an event or condition that *they* dislike. One of the key findings to emerge from the stress research is that individuals often differ in their subjective evaluation of the same objective strains. For example, people differ in how they subjectively evaluate such objective strains as divorce and the death of a family member. The subjective evaluation of an objective strain is a function of a range of factors, including individual traits (e.g., irritability), personal and social resources (e.g., self-esteem, self-efficacy, social support), goals/values/identities, and a range of life circumstances (for overviews, see Dohrenwend 1998; Kaplan 1996; Lazarus 1999). Wheaton (1990), for example, found that the quality of ones' prior marriage strongly influenced how people evaluated their divorce, with people in bad marriages evaluating their divorce in positive terms. It is also important to note that an individual's evaluation of an objective strain frequently changes over time as the individual copes with the strain. So, although there is a relationship between objective and subjective strain, it is far from perfect.

Most of the research on strain theory employs measures of objective strain (although see Agnew and White 1992). Researchers ask individuals whether they have experienced a certain event or condition (e.g., Did you fail any classes? Do your parents yell at you?); no effort is made to measure the individual's subjective evaluation of this event/condition. This may cause

researchers to underestimate the support for strain theory because objective strains sometimes create little subjective strain. This does not mean, however, that researchers should simply employ subjective measures of strain. It is important to examine objective strains as well because this allows us to better distinguish external events from the subjective evaluation of such events. We can then examine individual and group differences in both the exposure to external events/conditions likely to cause strain and the subjective evaluation of those events/conditions. Furthermore, we can explore the factors that influence individual and group differences in the subjective evaluation of the same external events and conditions. This is critical if we are to fully explain individual and group differences in crime. As an illustration, Bernard (1990) argued that poor, inner-city residents have higher rates of violence not only because they experience more objective strains but also because they are more sensitive to such strains (also see Thoits 1995 on individual and group differences in the "vulnerability" to stressors).

The emotional response to an event or condition is closely linked to subjective strain. Subjective strain deals with the individual's evaluation of an event or condition. There are many definitions of emotion, but most state that a central component of an emotion is an evaluation of or an affective response to some object or behavior or idea. Most theorists, however, go on to state that emotions involve more than an evaluation or affective response. For example, they also involve changes in physiological or bodily sensations (see Berkowitz 1993; Smith-Lovin 1995; Thoits 1989). Building on this argument, I would contend that subjective strain is distinct from the full emotional reaction to strain.

Two individuals may evaluate an event/condition in the same way; that is, they may both dislike it an equal amount. So, they have the same level of subjective strain. One may become angry in response to the strain, however, whereas the other may become depressed. And they may differ in the degree to which they experience certain emotions, so one may become quite angry, whereas the other may experience only mild anger. So the same subjective strain may result in rather different emotional reactions. Again, a range of individual and environmental factors influences the emotional reaction to subjective strain. The potential utility of distinguishing between subjective strain and the emotional reaction to strain is highlighted by Broidy and Agnew (1997). They argued that males and females often differ in their emotional reaction to subjective strains. Although both males and females may experience anger, the anger of females is more likely to be accompanied by feelings of guilt, depression, and anxiety. These additional emotions are said to reduce the likelihood of other-directed crime, thereby helping us explain gender differences in such crime.

*RESEARCH ON THE TYPES OF STRAIN MOST LIKELY
TO LEAD TO CRIME AND DELINQUENCY*

Agnew (1992) described those types of events and conditions most likely to be classified as objective strains and to result in subjective strain. Such events/conditions involve goal blockage, the loss of positive stimuli, and/or the presentation of negative stimuli. They are also high in magnitude (degree), recent, and of long duration. But as indicated earlier, hundreds of events/conditions meet these criteria, and so there are potentially hundreds of objective and subjective strains. Agnew did *not* discuss whether certain of these strains are more likely to result in crime than others. Rather, he treated these strains as more or less equivalent in terms of their impact on crime. He argued that whether they result in crime is largely a function of the characteristics of the individuals experiencing the strain. In particular, strain is most likely to lead to crime when individuals lack the skills and resources to cope with their strain in a legitimate manner, are low in conventional social support, are low in social control, blame their strain on others, and are disposed to crime. This article builds on Agnew by arguing that the effect of strain on crime is not only a function of individual characteristics but also of the type of strain experienced by the individual. Certain types of strain—either objective or subjective strain—are more likely to result in crime than other types.

Previous research on GST provides some information about the types of strain most likely to lead to crime, although much of this research suffers from two problems that severely limit its utility. First, most tests of GST only examine a small portion of the strains described by Agnew (1992). These tests tend to make use of existing data sets, which were not collected for the purpose of testing GST. As a consequence, many key strain measures are missing—particularly measures of the types of goal blockage described by Agnew and measures of certain types of negative treatment, like peer abuse and experiences with racial discrimination and prejudice. So we have little idea whether these types of strain are related to delinquency. Second, most tests of GST examine the effect of a single, cumulative strain measure on delinquency. In some cases, a measure of stressful life events is employed. Hoffmann and associates, for example, tested GST using a 16- to 18-item measure that focuses on events like “death, illness, or accidents among family or friends; changes in school or residence; parental divorce or separation; and family financial problems” (Hoffmann and Cerbone 1999; Hoffmann and Miller 1998; Hoffmann and Su 1997; also see Aseltine et al. 2000). In other cases, the cumulative strain measure is a composite of several scales and/or items measuring a range of different types of strain, such as neighborhood problems, negative relations with adults, the failure to achieve educational and occupational goals, breaking up with a romantic partner or friend,

and getting lower grades than you deserve (e.g., Mazerolle 1998; Mazerolle et al. 2000; Mazerolle and Piquero 1997). The use of such cumulative measures means that we lack information on the effect of the individual strain measures.

Researchers employ cumulative measures of strain because Agnew (1992) argued that it is not the effect of one specific strain or stressor that is important; rather, it is the cumulative effect of all the strains experienced by the individual. He recommended combining individual strain measures into a single scale so as to better estimate this cumulative effect (pp. 62-63). It is assumed that all or most of the individual strain measures in the cumulative scale make some contribution to crime. As will be argued below, there is good reason to question this assumption. Most cumulative measures encompass a wide range of strains, and it is likely that some contribute to crime and some do not. Given this fact, it is not surprising that most cumulative measures have only a moderate impact on crime. A consideration of different types of strain, however, might reveal that some have a strong impact on crime, whereas others have little or no impact.

Some tests of GST do examine the impact of different types of strain on crime among adolescents. Agnew and White (1992) examined the effect of eight strain measures on delinquency, including both general and specific measures. They found that negative life events, life hassles, negative relations with adults, and parental fighting are significantly associated with delinquency. Neighborhood problems, unpopularity with the opposite sex, occupational strain, and clothing strain are not associated with delinquency. Pateroster and Mazerolle (1994) examined the effect of five strain measures on delinquency. They found that neighborhood problems, negative life events, school/peer hassles, and negative relations with adults are significantly associated with subsequent delinquency, whereas a measure of educational and occupational expectations is not (see Mazerolle 1998 for information on gender differences in the effect of these strain measures). Aseltine et al. (2000) found that family and peer conflict (through anger) are related to selected types of delinquency. Agnew and Brezina (1997) found that poor relations with peers is related to delinquency, whereas unpopularity with peers is not. Piquero and Sealock (2000) found that physical and emotional abuse in the household (toward the juvenile and others) is related to delinquency (also see Brezina 1999). Tests of classic strain theory typically find that the failure to achieve educational and occupational goals is *not* related to delinquency (see Agnew 1995a). The failure to achieve economic goals, however, may be related to delinquency (Burton and Dunaway 1994).

Many other studies have not set out to test GST but have examined types of strain that fall under the theory. Several studies found that adolescent crime is

significantly related to criminal victimization; parental abuse and neglect; parental rejection; disciplinary techniques that are excessive, very strict, erratic, and/or punitive (e.g., nagging, yelling, threats, insults, and/or hitting); family conflict; parental divorce/separation; and negative experiences at school (low grades, poor relations with teachers, and the perception that school is boring and a waste of time). Summaries of these studies are provided in Agnew (1992, 1995b, 1997, 2001a, 2001b). Studies of adults suggest that crime is related to marital problems, work in the secondary labor market, unemployment in certain cases, and possibly the failure to achieve economic goals (Agnew et al. 1996; Baron and Hartnagel 1997; Cernkovich, Giordano, and Rudolph 2000; Colvin 2000; Crutchfield and Pitchford 1997; Sampson and Laub 1993; Uggen 2000). There has not been enough good research on other types of strain to draw any firm conclusions about their relationship to crime.

The above studies, then, suggested that certain types of strain are related to crime whereas others are not. At this point, it seems safe to conclude that crime is related to verbal and physical assaults, including assaults by parents, spouses/partners, teachers, and probably peers. Crime is also related to parental rejection, poor school performance, and work problems, including work in the secondary labor market. Crime is not related to the expected failure to achieve educational/occupational success or to unpopularity with peers. Beyond that, the relationship between various strains and crime is unclear.

These data pose a major problem for GST: Why is it that only some types of strain are related to crime? At present, GST offers little guidance in this area. GST, for example, does not allow us to explain why verbal and physical assaults are related to crime, but the failure to achieve educational/occupational goals and unpopularity with peers is not. All of these strains fall under the categories listed by Agnew (1992), and they are frequently high in magnitude (degree), recent, and of long duration.

Recent versions of GST do argue that certain types of strain are especially relevant to crime (Agnew and Brezina 1997; Broidy and Agnew 1997). Agnew (1997, 2001a, 2001b), for example, argued that although many types of goal blockage may lead to delinquency, the failure to achieve monetary, autonomy, and "masculinity" goals are of special importance. And he argued that although a range of negative or noxious stimuli may cause delinquency, physical and verbal assaults are of special importance. These suggestions, however, are not derived from theory. Rather, they represent ad hoc attempts to explain empirical findings or to incorporate other theoretical and empirical work into GST. Much theoretical and empirical work, for example, suggests that threats to one's status, particularly one's masculine status, contribute to

crime in certain groups (Anderson 1999; Messerschmidt 1993). Likewise, some theoretical and empirical work suggests that the blockage of autonomy goals contributes to delinquency (Agnew 1984; Moffitt 1993; Tittle 1995).

And although empirical research is starting to point to those types of strain that are and are not related to delinquency, it is not wise to depend on such research to fully resolve this issue. There are hundreds of specific types of strain; it will take empirical researchers a long while to determine their relative importance (although observational research and open-ended, intensive interviews can be of some help here). Furthermore, we would still lack an explanation of why some types of strain have a greater effect on crime than other types. The lack of such an explanation might cause us to overlook certain important types of strain. It is therefore important for GST to better explain why some types of strain are more likely to lead to crime than other types.

THE CHARACTERISTICS OF THOSE TYPES OF STRAIN MOST LIKELY TO LEAD TO CRIME

Individuals may cope with strain in a number of ways, only some of which involve crime (see Agnew 1992). Individuals may cope using a variety of cognitive strategies, most of which attempt to redefine strainful events and conditions in ways that minimize their adversity. Individuals may employ behavioral coping strategies that are intended to terminate, reduce, or escape from the strainful events and conditions. Certain of these strategies involve conventional behaviors (e.g., negotiating with the people who harass you), whereas others involve crime (e.g., assaulting the people who harass you). And they may employ emotional coping strategies that are intended to alleviate the negative emotions that result from strain. Certain of these strategies involve conventional actions (e.g., listening to music), whereas others involve crime (e.g., illicit drug use). It is argued here that some types of strain are more likely to result in crime than other types because they influence the ability to cope in a noncriminal versus criminal manner, the perceived costs of noncriminal versus criminal coping, and the disposition for noncriminal versus criminal coping. (As indicated above, these factors are also affected by a range of individual characteristics.)

The characteristics of those types of strain most likely to result in crime are discussed in this section, with the discussion referring to both objective and subjective strains. In brief, it is argued that strains are most likely to result in crime when they (1) are seen as unjust, (2) are seen as high in magnitude, (3) are associated with low social control, and (4) create some pressure or incentive to engage in criminal coping. These characteristics are derived

primarily from the stress, justice, and emotions literatures (see references below); the social interactionist theory of coercive behavior (Tedeschi and Felson 1994); defiance theory (Sherman 1993); reintegrative-shaming theory (Briathwaite 1989); frustration-aggression theory (Berkowitz 1993); techniques of neutralization or moral disengagement theory (Bandura 1990; Sykes and Matza 1957); differential coercion theory (Colvin 2000); social control theory; social-learning theory; and the routine activities perspective (Cullen and Agnew 1999). There is a discussion of why these characteristics are important and how researchers can determine whether specific types of strain possess these characteristics. In the next section, these characteristics are used to predict the likelihood that several specific types of strain will result in crime.

The Strain Is Seen as Unjust

Agnew (1992) presented unjust treatment as a distinct category of strain, classified under "the failure to achieve positively-valued goals." In particular, Agnew spoke of the disjunction between just/fair outcomes and actual outcomes. It is here argued that unjust treatment is *not* a special type of strain distinct from the other types. The issue of injustice applies to all types of strain; that is, it is possible to classify any type of strain according to the extent to which it is seen as unjust. Those types of strain seen as unjust should be more likely to lead to crime, primarily because they are more likely to provoke emotions conducive to crime like anger.

Much data from the emotions and justice literatures indicate that there is a strong link between unjust treatment and anger (see Agnew 1992, 68-69; Averill 1982, 1993; Berkowitz 1993; Hegtvedt and Cook forthcoming; Hegtvedt and Markovsky 1995; Mikula 1986; Mikula, Petri, and Tanzer 1990; Tedeschi and Felson 1994; Tedeschi and Nesler 1993; Tyler 1994; Tyler et al. 1997). And limited data suggest that anger increases the likelihood of crime, particularly violent crime (Agnew 1985; Aseltine et al. 2000; Berkowitz 1993; Brezina 1998; Mazerolle et al. 2000; Mazerolle and Piquero 1998; Piquero and Sealock 2000; Tedeschi and Felson 1994; Tyler et al. 1997). Anger fosters crime because it disrupts cognitive processes in ways that impede noncriminal coping; for example, it leads individuals to disregard information that may help resolve the situation, and it reduces the ability to clearly express grievances. Anger also reduces the actual and perceived costs of crime; for example, angry individuals are less likely to feel guilt for their criminal behavior because they believe that the injustice they suffered justifies crime. Finally, anger energizes the individual for action, creates a sense of power or control, and creates a desire for revenge or retribution—all of which lead individuals to view crime in a more favorable light (see Agnew

1992; Averill 1982, 1993; Cloward and Ohlin 1960; Gottfredson and Hirschi 1990; Tedeschi and Felson 1994; Tedeschi and Nesler 1993; see Tyler et al. 1997 on retributive justice).

Measuring injustice. There are several ways to measure the perceived injustice of particular strains. The perceived injustice of objective strains can be estimated by (1) researchers, with such researchers drawing on the justice and attributions literature (see below) and their knowledge of the group being examined; (2) a panel of judges familiar with the group being examined, with such judges being asked to estimate the likelihood that various strains will be seen as unjust by group members; and/or (3) a representative sample of group members, with such members being asked to rate the injustice of various strains (see Mikula 1993; Mikula et al. 1990). The ratings of judges and group members can be averaged. It is best to provide judges and group members with moderately specific descriptions of the strains being rated because the specific features of the strain can have a large impact on ratings of injustice (see below). For example, instead of asking individuals to rate the injustice of "a close friend dying," it is better to ask them to rate the injustice of "a close friend being shot to death by a rival gang." Data suggest that raters tend to underestimate the extent to which victims perceive the strains they experience as unjust (see Mikula 1986), so these measurement strategies will likely provide conservative estimates of perceived injustice.

The perceived injustice of subjective strains can be estimated by asking victims to rate the injustice of the strains they have experienced. Such ratings will reflect both the characteristics of the strains and the characteristics of the victims. Most notably, victims with attributional biases of the type described by Dodge and Schwartz (1997) will be more likely to rate given strains as unjust. Studies focusing on subjective strains should therefore control for relevant individual characteristics when examining the effect of the perceived injustice of strain on crime (see Herbert and Cohen 1996; Turner and Wheaton 1995).²

Factors influencing perceptions of injustice. It is important for GST to describe why some strains are more likely to be perceived as unjust than others. This allows researchers to better explain individual and group differences in perceptions of injustice, better predict whether given strains will be seen as unjust, and better develop policies that address perceptions of injustice. Several literatures devote much attention to the factors influencing perceptions of injustice, with the justice and attributions literature being most relevant (for overviews, see Crittenden 1983, 1989; Hegtvædt and Cook forthcoming; Hegtvædt and Markovsky 1995; Mikula 1986, 1993; Tedeschi and Felson 1994; Tedeschi and Nesler 1993; Tyler 1990; Tyler et al. 1997).

These literatures suggest that a strainful event or condition is most likely to be seen as unjust when individuals believe that it involves *the voluntary and intentional violation of a relevant justice norm*. This belief is influenced by a range of individual characteristics, most of which are described in the justice and attributions literature *and* by the nature of the strainful event or condition. Most strainful events and conditions involve a perpetrator who does something to a victim in a particular setting or collection of settings. The likelihood that a strainful event will be seen as unjust partly depends on the characteristics of the perpetrator and victim, what the perpetrator does to the victim, what the victim does to the perpetrator, the relationship between the perpetrator and victim, and the setting(s) in which the strain occurs. Perceptions of injustice are also influenced by the interpretation of the event/condition provided by others, especially trusted others, and by (sub)cultural beliefs associated with the event/condition. The contribution of these factors is described below, with the central point being that some strainful events and conditions are more likely than others to be perceived as unjust—holding individual characteristics constant.

Voluntary/intentional. Strainful events and conditions are most likely to be attributed to the voluntary, intentional behavior of others when the following occurs:

1. There is good evidence that the victim's strain was in large measure caused by the behavior of others (as opposed to being caused by the victim's own behavior, bad luck or chance, natural/impersonal forces, or forces of uncertain origin). Such evidence includes the following: A perpetrator directly inflicts the strain on the victim (e.g., punches or insults the victim), a perpetrator is identified by trusted others, and/or (sub)cultural beliefs attribute the victim's strain to the behavior of others.
2. There is good evidence that the perpetrator voluntarily intended to inflict the strain (i.e., freely chose to treat the victim in a way that they knew would probably be disliked). Conversely, there is little evidence that the behavior of the perpetrator was the result of constraint, reasonable accident, or reasonable ignorance. Such evidence includes the following:

Behavior of the perpetrator. The perpetrator states his or her intention to inflict strain, as sometimes happens in cases involving physical and verbal assault. The perpetrator devotes much effort to or incurs high costs in inflicting the strain. The perpetrator violates normative expectations in inflicting strain. The perpetrator does not excuse, apologize for, or express remorse over the harm he or she has caused. Conversely, the perpetrator expresses pleasure or pride over his behavior (see Averill 1993; Tedeschi and Felson 1994; Tedeschi and Nesler 1993).

Severity of harm. Attributions of intent are more likely the greater the actual or intended harm to the victim (see Tedeschi and Felson 1994; Tedeschi and Nesler 1993).

Characteristics of the perpetrator and the relationship between the perpetrator and victim. The perpetrator has the personal and social resources to voluntarily and intentionally inflict the strain (e.g., has sufficient power, is aware of the harmful consequences of his or her behavior). The perpetrator has a known history of intentionally harming the victim or others. The perpetrator is disliked by the victim or has a negative reputation, making attributions of malicious intent more likely. This dislike/negative reputation may be related to the characteristics of the perpetrator (e.g., race, gang membership; see Tedeschi and Felson 1994; Tedeschi and Nesler 1993).

Audience reaction. Others, especially trusted others, tell the victim that the harm inflicted by the perpetrator was intentional.

(Sub)cultural beliefs or causal schema. (Sub)cultural beliefs or causal schema define the strainful event or condition as one that is usually the result of intent.

Criterion 1 is necessary for attributions of intent, and the factors under criterion 2—although not necessary—substantially increase the likelihood of attributions of intent.³

The violation of relevant justice rules. Voluntary and intentional efforts to inflict strain are not necessarily seen as unjust. For example, parents, teachers, employers, and the police voluntarily and intentionally inflict strain on a routine basis, but the victims of such strain often do not view the actions of these others as unjust. The intentional infliction of strain is most likely to be seen as unjust when it is believed to violate a relevant justice norm. We must consider norms related to distributive, procedural, interactional, and retributive justice (for overviews, see Hegtvædt and Markovsky 1995; Mikula 1993; Mikula et al. 1990; Tedeschi and Felson 1994; Tyler et al. 1997).⁴ Drawing on the justice literature, as well as the related literature on the techniques of neutralization/rules of moral disengagement (Bandura 1990; Sykes and Matza 1957), it can be argued that the voluntary and intentional infliction of strain is likely to be seen as unjust to the extent that

- A. Victims believe their strain is *undeserved*. In the United States, victims are more likely to believe that their strain is deserved if it is the result of negatively valued behavior on their part (e.g., a child is punished for misbehaving) or if it is the result of the possession of certain negatively evaluated characteristics—usually achieved characteristics—deemed relevant in the particular situation (e.g., a job applicant gets turned down because he or she does not possess

relevant work experience). Furthermore, the strain must not be excessive given the negatively evaluated behavior or characteristics of the victim. Violations of these conditions foster the impression that strain is undeserved.

- B. Victims believe their strain is *not in the service of a higher cause or authority*—such as God, country, or gang. The infliction of strain is often justified by appeals to higher purposes or authorities; for example, nations may ask individuals to serve in combat to protect their country or gangs may ask members to risk injury for the protection of “turf.”
- C. Victims believe their strain *will result in much net harm to them*. The infliction of strain is often justified by claiming that the strain was minor or negligible—in absolute and/or relative terms. Victims, for example, may be told that they suffered little actual harm or that they suffered much less harm than similar others. Perpetrators may also justify the strain they inflict by claiming that victims will achieve a net benefit from it. Parents, for example, may claim that they need to limit the autonomy of their children to protect them from greater harm. Such claims are most likely to be made and accepted in settings in which personal welfare and development are major goals.
- D. Victims believe that the *process used to decide whether to inflict their strain was unjust*. Victims are more likely to make attributions of procedural injustice when (1) they have no voice in the decision to inflict their strain, (2) they do not accord legitimacy to those who inflict their strain, (3) they do not trust those who inflict their strain—believing they are biased or dishonest, (4) they believe that those inflicting their strain do not make use of accurate or complete information, (5) they believe that different procedures are followed for similar others, (6) they are not treated in a polite or respectful manner, (7) the decision-making process is incompatible with fundamental moral and ethical values, (8) no rationale is given for the decision that was made, and/or (9) there are no mechanisms available to correct bad decisions.
- E. The strain involves treatment perceived as disrespectful, inconsiderate, or aggressive.
- F. The strain violates strongly held social norms, especially those embodied in certain criminal laws (see Tyler et al. 1997).

Perceptions of injustice are likely if criteria A, B, and C are satisfied (having to do with distributive justice); criterion D is satisfied (procedural justice); criterion E is satisfied (interactional justice); and/or criterion F is satisfied (retributive justice). The characteristics of the strainful event/condition often allow us to roughly judge the likelihood that victims will hold the beliefs listed in criteria A through E. For example, a criminal victimization is more likely to generate the beliefs outlined above than is the failure of a poorly educated person to obtain a highly paid job. In addition, the justice literature suggests that we pay special attention to the following factors when trying to estimate the likelihood that individuals hold the above beliefs (e.g., believe their strain is undeserved or involves disrespectful treatment):

1. Do (sub)cultural beliefs define the strain as just or as unjust for one or more of the reasons listed in A through F? Laws defining the strainful treatment as illegal are especially relevant, particularly when the treatment involves the violation of criminal laws with severe penalties.
2. Do others, especially trusted others, support or hinder the adoption of the above beliefs (e.g., tell the victim that their negative treatment is undeserved or disrespectful)? The actions of family and friends, audience members who witness the negative treatment, and the perpetrator of the negative treatment are especially important. For example, victims are less likely to adopt the above beliefs if the perpetrator is a trusted other who offers a convincing justification for their behavior (see Crittenden 1989).
3. Is the victims's negative treatment very different from their past treatment in similar circumstances and/or from the treatment of similar others? Comparisons to past treatment and to the treatment of similar others are especially important in situations in which there are no strong standards defining what is just or fair. Comparison others may include specific others, groups, or more generalized others or "referential structures" (see Hegtvedt and Markovsky 1995). Unfortunately, it is often difficult to predict the comparison others that are selected and the nature of the comparison process—although some progress is being made in this area (see Hegtvedt and Cook forthcoming).

The Strain Is Seen as High in Magnitude

A second factor influencing the likelihood that strainful events and conditions will lead to crime is the perceived magnitude of the strain. Strain that is high in magnitude influences the ability to cope in a noncriminal manner, the perceived costs of noncriminal versus criminal coping, and the disposition to engage in criminal coping. It is more difficult to cognitively minimize the impact of severe strain, emotional coping techniques of a noncriminal nature may be less effective, and behavioral coping of a noncriminal nature may be more difficult (e.g., it is more difficult to legally cope with a large rather than small financial problem). Furthermore, not only is it more difficult to legally cope with severe strain, but such strain often reduces the ability to cope. For example, the victims of severe strain are more likely to suffer from depression, which impedes their ability to cope. Finally, severe strain generates more anger and so also influences the perceived costs of crime and the disposition to engage in crime.

Measuring magnitude. The magnitude of *objective* strains can be estimated by (1) researchers, with such researchers taking account of the factors listed below; (2) a panel of judges familiar with the group, with these judges being asked to estimate the extent to which various strains are likely to be disliked (or seen as undesirable, harmful/threatening, etc.); and/or (3) a

representative sample of group members, with such members being asked to rate the extent to which they dislike various strains. Again, it is best to provide individuals with specific information about the strains being rated.

The magnitude of *subjective* strains can be estimated by asking victims to rate the extent to which they dislike the strains they have experienced. These ratings will reflect both the characteristics of the strains and the characteristics of the victims. In particular, the same strainful event/condition might be seen as high in magnitude by one victim but low by another—depending on such things as the victim's goals/activities/identities, coping ability and resources, and level of social support (see Cohen et al. 1995; Kessler et al. 1995; Lazarus 1999; Taylor and Aspinwall 1996; Thoits 1995; Wheaton 1996). Studies focusing on subjective strains should therefore control for relevant individual characteristics when examining the effect of the perceived magnitude of strain on crime (see Herbert and Cohen 1996 and Turner and Wheaton 1995 for a fuller discussion).

Factors influencing perceptions of magnitude. Drawing on Agnew (1992) and the stress literature, there is reason to believe that several features of the strainful event/condition influence perceptions of magnitude. These include the degree or amount of strain inflicted; the duration and frequency of the strain, including the expected duration into the future; the recency of the strain; and the centrality of the strain, which refers to the extent to which the strain threatens the core goals, needs, values, activities, and/or identities of the victim. At present, it is unclear how these factors combine to influence overall judgments of magnitude.

Degree of strain. The degree or amount of strain inflicted influences judgments of magnitude. As Agnew (1992) pointed out, it is sometimes possible to measure the degree of strain inflicted in terms of a standard metric, like the severity of the physical injuries inflicted or the amount of money lost. This is not possible for many types of strain, however. Furthermore, the metrics used to measure the degree of strain vary from one type of strain to another, making it difficult to make comparisons across types of strain. These problems can be dealt with using techniques from the stress research. Individuals can rate the degree or amount of strain inflicted for different types of strain using a common scale. Such ratings likely reflect the objective characteristics of the strain (e.g., amount of money lost, injury inflicted), (sub)cultural beliefs regarding the degree of strain (e.g., beliefs regarding what is a small versus large financial loss, a minor versus serious insult), audience reactions to the strain (where applicable), and individual characteristics (especially when dealing with subjective strains).

Duration/frequency of strain. The duration and frequency of strain are also likely to influence the perceived magnitude of strain. As Agnew (1992) pointed out, data suggest that strains of long duration (chronic stressors) and/or high frequency have a greater negative impact on the individual (also see Lepore 1995; Turner and Wheaton 1995). Furthermore, data from the stress literature suggest that unresolved strains have a much greater impact on the individual than resolved strains (Herbert and Cohen 1996; Turner and Avison 1992). It is therefore important to determine whether the strain has been resolved. If the strain has not been resolved, it is also important to estimate its expected duration. That is, will the strain be resolved shortly or continue for some time, perhaps increasing in frequency and/or degree? The importance of estimating the expected duration of strain is illustrated in the work of Anderson (1999). As Anderson emphasized, seemingly trivial strains like a negative remark or a stare often generate much distress among inner-city residents, partly because they signal future conflicts of a more serious nature.

Recency. As Agnew (1992) noted, the impact of strains or stressors dissipates over time. Therefore, recent strains should have a larger impact on judgments of magnitude than older strains. At the same time, it is important to note that severe childhood strains may sometimes contribute to later criminal behavior (Elder et al. 1996; Kessler et al. 1995, 1997; Widom 1998).

Centrality of strain. Two individuals might be similar to one another in the degree, duration/frequency, and recency of their strain; yet they may differ dramatically in the perceived magnitude of their strain. One reason for this has to do with the centrality of the strain: Does the strain threaten the core goals, needs, values, activities, and/or identities of the individual? For example, two individuals may perceive the same monetary loss differently because they differ in the value they place on money.

Centrality is conceived of in different ways depending on the researcher and/or research tradition. Classic strain theorists, frustration-aggression theorists, and certain stress researchers focus on the importance of the goals, needs, or terminal values that are blocked or threatened (Berkowitz 1993; Cloward and Ohlin 1960; Cohen 1955; Dohrenwend 2000; Kaplan 1996; Lazarus 1999; Merton 1938; Wethington, Brown, and Kessler 1995). Certain stress researchers focus on the extent to which the strain leads to change (or negative change) in the usual or core activities of daily life (e.g., Dohrenwend 1998; Wheaton 1996). Still others—including strain, stress, social interactionist, and identity theorists—focus on the extent to which strains threaten the core identities of individuals or threaten efforts to establish positive identities (e.g., Berkowitz 1993; Burke 1996; Cohen 1997; Kaplan 1996;

Tedeschi and Felson 1994; Thoits 1991; Tyler 1994; Tyler et al. 1997; Wheaton 1996). These perspectives overlap to a large degree (see Burke 1996; Dohrenwend 1998; Kaplan 1996). For example, one's core identities are in large measure defined in terms of one's goals, values, and activities. In any event, GST can accommodate all these perspectives: Strain is central to the extent that it threatens core goals, needs, values, activities, and/or identities.

Judgments regarding the centrality of strain are partly influenced by the characteristics of the strain. For example, certain strainful events/conditions are such that they threaten a broad range of goals, values, needs, identities, and activities, so they are likely to be high in centrality for the overwhelming majority of people who experience them. Examples include "extreme stressors" (Dohrenwend 1998, 2000) and "traumatic events" (Wheaton, Roszell, and Hall 1997). As Dohrenwend (2000) stated, extreme stressors are such that "all usual activities are disrupted and all of the individual's goals are in jeopardy" (p. 8). Judgments regarding centrality are also influenced by the (sub)cultural beliefs associated with the strainful event/condition and how the event/condition is interpreted by others (e.g., whether audience members define an insult as trivial or a serious challenge to one's manhood).

The Strain Is Caused by or Associated with Low Social Control

A third factor affecting the likelihood that strain will lead to crime is the level of social control associated with the strain. Certain strains are caused by or associated with low social control, such as the strain caused by erratic parental discipline (low direct control), parental rejection (low attachment), work in the secondary labor market (low commitment), or homelessness (low direct control, attachment, and commitment). Such strains are more likely to result in crime because the low social control associated with them reduces the costs of crime. Also, low social control may reduce the ability to cope in a noncriminal manner. Individuals low in direct control, conventional attachments, and conventional commitments generally lack the social supports and resources that facilitate noncriminal coping.

Conversely, certain strains stem from or are associated with high social control. For example, much adolescent strain stems from the efforts of parents to supervise their children (direct control), much parental strain stems from the demands associated with childcare (attachment), and much occupational strain stems from the long working hours and difficult tasks associated with many professional/business jobs (commitment). Such strains are less likely to result in crime because the high social control associated with them increases the costs of crime. High social control may also increase the ability to cope in a noncriminal manner. High control is frequently associated with

the provision of social support and the possession of personal and financial resources that facilitate noncriminal coping.

An excellent illustration of the association between strain and social control is provided in Hirschi's (1969) and Kornhauser's (1978) discussion of classic strain theory. Classic strain theorists focus on one type of strain: the inability to achieve conventional success goals—like educational and occupational success—through legitimate channels. Hirschi and Kornhauser argued that the pursuit of such goals implies some level of social control. As Kornhauser stated,

if the child is sufficiently socialized to have a strong desire for conventional goals, he should be well enough socialized also to have the internalized values governing the conventional means of achieving them. . . . He should also be strongly enough attached to conventional persons and institutions to resist the temptation to use nonnormative means. (P. 47)

The pursuit of conventional success goals therefore implies at least moderately high levels of attachment, commitment, and belief (in conventional norms). And this may explain why the inability to achieve educational and occupational goals is unrelated to crime in most studies (Agnew 1995a).

Measuring social control. Researchers should estimate the extent to which the type of strain being examined is associated with (1) supervision or direct control by conventional others, (2) attachment to conventional others, (3) commitment to conventional institutions, and (4) the acceptance of conventional beliefs, especially beliefs condemning crime. This is easily done in certain cases; for example, the strain being examined stems from or is associated with employment in prestigious, well-paid jobs that indicate a strong commitment to conventional society. In other cases, researchers can employ observational or survey research to determine the association between strain and social control. For example, survey data can be used to determine whether individuals who desire educational and occupational success are high in such types of social control as attachment to conventional others and beliefs condemning crime.

*The Strain Creates Some Pressure or
Incentive to Engage in Criminal Coping*

A final factor affecting the likelihood that strain will lead to crime is the extent to which the strain creates some pressure or incentive to engage in criminal coping. Drawing on social-learning and routine activities theories, it can be argued that the type of strain experienced influences the availability

and appeal of noncriminal and criminal coping options—thereby affecting the pressure/incentive to engage in crime. Certain types of strain are associated with exposure to others who model crime, reinforce crime, and/or present beliefs favorable to crime (e.g., child abuse, being bullied by peers). More directly, certain types of strain are associated with exposure to others who model criminal coping to that type of strain and present beliefs favorable to criminal coping *to that type of strain*. Furthermore, criminal coping may be the only or the most effective way to address the perceived injustice and reduce the perceived magnitude of that type of strain (see Brezina 2000). Anderson's (1999) discussion of life in a poor, inner-city community provides an example.

Anderson (1999) argued that young males in this community are under much pressure to respond to one type of strain—disrespectful treatment—with violence. The perpetrators of disrespectful treatment and others in the community frequently model and present beliefs favorable to criminal coping. And violence is often the only effective way to respond to disrespectful treatment. Efforts to ignore disrespectful treatment or reason with the perpetrators of such treatment often result in further abuse—by both the perpetrator and others in the community. Victims cannot rely on the police or others to intervene on their behalf (also see Black 1983). And the efforts of victims to cognitively reinterpret their strain or engage in emotional coping are also ineffective. The perpetrators of the strain typically escalate their level of abuse, others regularly remind the victim of the disrespectful treatment they have experienced, and subcultural beliefs define such treatment as unjust and high in magnitude. Cognitive reinterpretation is therefore difficult. Violent coping, however, reduces feelings of injustice, reduces the likelihood of further disrespectful treatment, and allows the victim to protect or enhance their identity/status.

Measuring the pressure or incentive for criminal coping. Researchers should consider the following factors when determining whether a particular instance of strain creates some pressure or incentive for criminal coping.

1. Does the strain stem from or is it associated with exposure to others who model, reinforce, and/or present beliefs favorable to crime?
2. What behavioral options of a noncriminal and criminal nature are available to members of the group experiencing the strain in question? Are these options frequently modeled by others? Do they have (sub)cultural support? How effective will these options be in reducing the perceived injustice and magnitude of the strain?
3. What cognitive options of a noncriminal criminal nature are available to members of the group experiencing the strain? Efforts to cognitively cope with

strain usually involve attempts to minimize the injustice, degree, duration/frequency, recency, and/or centrality of the strain. It is more difficult to cognitively minimize the injustice and/or magnitude of some types of strain than others. In particular, minimization is more difficult when (1) the victim receives clear and frequent information on the injustice and magnitude of their strain, with this information coming from such sources as trusted others, witnesses to the strainful event or condition, and members of the community; (2) (sub)cultural beliefs define the strain as unjust and high in magnitude; (3) there is strong (sub)cultural and structural support for the goals, needs, values, activities, and/or identities being challenged; and (4) the strain is unresolved, perhaps increasing in frequency and/or degree.

Information in the above areas can be obtained from observational studies, intensive interviews, and surveys.

CLASSIFYING TYPES OF STRAIN ACCORDING TO THEIR LIKELIHOOD OF LEADING TO CRIME

In sum, strainful events and conditions are most likely to lead to crime when they (1) are seen as unjust, (2) are seen as high in magnitude, (3) are associated with low social control, and (4) create some pressure or incentive for criminal coping. At present, I would argue that all four of these characteristics are roughly equal in importance and that the absence of any one characteristic substantially reduces the likelihood that strain will result in crime—unless the strain is seen as extraordinarily unjust and high in magnitude (see below). These characteristics are next used to predict the relative likelihood that different types of strain will result in crime. Drawing on the existing research where possible, I roughly estimate the likelihood that these strains are seen as unjust, are seen as high in magnitude, are associated with low social control, and create some pressure or incentive for criminal coping. It would of course be desirable to verify my judgments using the research strategies described above.

It is not possible in this short article to make predictions for all types of strain. Instead, I consider several broad types of strain. These types of strain were selected for several reasons: They encompass many of the major types of strain that people face—including family, peer, school, and work-related strains; they include most of the strains examined in tests of classic and GST, as well as certain strains neglected by empirical researchers; and most of these strains can be examined with currently available data sets. The focus on broad types of strain, however, does reduce the accuracy of the predictions. As indicated, it is more difficult to classify broadly defined types of strain on

the above characteristics. For example, it is difficult to predict whether unemployment will be related to crime. As many researchers argue, the relationship between unemployment and crime depends on the circumstances associated with the unemployment. Limited evidence suggests that unemployment is most likely to lead to crime when it is persistent (i.e., high in magnitude) and blamed on others (i.e., seen as unjust) (see Baron and Hartnagel 1997; Box 1987; Colvin 2000; Hagan and McCarthy 1997; Uggen 2000). As a result, the strains below are simply sorted into two groups: those predicted to be unrelated or weakly related to crime and those predicted to be more strongly related to crime.

Types of Strain Unrelated or Weakly Related to Crime

The first condition (strain seen as unjust) allows us to predict that a wide range of strains will be unrelated to crime. At the most general level, these include those types of strain that are clearly the result of reasonable accident or chance, reasonable ignorance, reasonable constraint, the victim's own behavior, or natural causes like extreme weather and disease (as opposed to those types of strain resulting from the voluntary and intentional violation of justice norms). Many of the strains commonly included in the stressful life events scales used to test GST likely fall into this category, like accident, serious illness or injury, serious illness or injury of brother or sister, brother or sister leaving home for college or a job, and family member dying.

The second condition (strain seen as high in magnitude) allows us to predict that strains that are low in magnitude will be unrelated to crime. Certain types of strain are more likely to be seen as low in magnitude than other types. For example, those strains that threaten peripheral goals are more likely to be seen as low in magnitude than those that threaten core goals. There are data ranking the importance of various goals in the United States as a whole and among certain groups (e.g., Rokeach 1973). Such data can be used as a guide in predicting the likelihood that specific strains will be seen as low or high in magnitude (more below). At the same time, it is important to note that many seemingly serious strains—like the death of a family member—may be perceived as low or high in magnitude depending on the circumstances (see Wethington et al. 1995; Wheaton 1990). So, it is important for researchers to estimate the magnitude of the strains they are examining, something that is rarely done in the criminology research.

Considerations of injustice and magnitude—as well the third and fourth conditions (the strain is associated with low social control and creates some pressure or incentive for criminal coping)—allow us to predict that several

other types of strain will not be related to crime. These include types of strain that have dominated the research on strain theory.

The failure to achieve those goals that result from conventional socialization and that are difficult to achieve through illegitimate channels. These goals include educational success, occupational success, and middle-class status. Although the inability to achieve these goals may result in strain of high magnitude, such strain is unlikely to be seen as unjust. Among other things, the failure to achieve such goals is typically blamed on the victim. As Merton (1968) stated, the cultural system in the United States conveys the message that "success or failure are wholly results of personal qualities; that he who fails has only himself to blame" (p. 222; also see Merton 1968:191, 201-03). And much research on the legitimization of stratification suggests that people tend to accept responsibility for their place in the stratification system (see Agnew 1992; Hegtvold and Markovsky 1995; see below for the argument that minority-group members in the United States may sometimes blame others for their failure to achieve conventional success goals). Furthermore, as argued above, the pursuit of conventional success goals implies some level of social control. Finally, the inability to achieve these goals is not likely to create strong pressure for criminal coping. In particular, these goals are not easily achieved through criminal means, like theft and violence. In fact, criminal behavior may undermine the achievement of these goals. Therefore, criminal coping is not likely to be reinforced. These arguments may help explain why empirical research typically finds that crime is unrelated to the disjunction between educational and/or occupational aspirations and expectations (see Agnew 1995a for an overview; Jensen 1995).⁵

Supervision/discipline by parents, teachers, criminal justice officials, and other conventional authority figures that is (1) not overly strict, (2) consistent, (3) contingent on negative behavior, (4) not excessive given the infraction, and (5) not verbally or physically abusive. Such supervision/discipline may generate much strain (e.g., juveniles being grounded, offenders being arrested and sent to prison). But this strain is not likely to be seen as unjust because it is deserved, is administered in a fair way by legitimate authority figures, and is not aggressive or disrespectful. Furthermore, such supervision/discipline creates a high level of direct control and reduces the likelihood of association with delinquent others. Much data demonstrate that parental and school supervision/discipline of the above type is associated with lower levels of delinquency (Agnew 2001b; Sampson and Laub 1993). And some data suggest that this may be true for supervision/discipline by criminal justice officials as well (Lanza-Kaduce and Radosevich 1987; Sherman 1993, 2000; Tyler 1990).

The burdens associated with the care of conventional others to whom one likely has a strong attachment, like children and sick/disabled spouses. Although such care may create great strain, it is not likely to be viewed as unjust. There is a strong cultural expectation that one is supposed to care for children and sick/disabled spouses, an expectation likely to be supported by others in the person's network. In fact, one is usually labeled a bad parent or spouse if such care is not provided. This type of strain implies at least a moderate level of social control: the "victim" may be closely supervised by others inside and outside the family, the victim likely has a strong emotional bond to conventional others, and cultural beliefs strongly support the provision of adequate care. This type of strain also does not create much pressure or incentive for most forms of criminal coping. Caregivers have little opportunity to engage in crime, except for family violence, neglect, certain types of illicit drug use, and possibly shoplifting. Crime is not an effective solution to this type of strain. And the burdens associated with care giving limit association with criminal others.

The impact of this type of strain on crime has not been well examined. Data from the stress literature, however, indicate that females are more likely than males to experience this type of strain (see Broidy and Agnew 1997). This may partly explain gender differences in crime. It may also help explain why such differences are smallest for the crimes of family violence, larceny, and certain types of illicit drug use, such as the misuse of prescription drugs.

The excessive demands associated with conventional pursuits that provide rewards like high pay, prestige, and/or intrinsic satisfaction (or that have a strong likelihood of providing access to such rewards in the future). The prime examples of such pursuits are work in prestigious and/or well-paid jobs (or work in the primary labor market) and attending college. Excessive demands include long working (or studying) hours and work on difficult tasks. Such strain may be seen as high in magnitude, but it is not likely to be seen as unjust. The voluntary or quasi-voluntary nature of these conventional pursuits contributes to self-blame, and the victims of such strain may feel that the excessive demands made on them are justified or offset by the rewards they receive. Such strain is frequently caused by or associated with high social control, including commitment to conventional activities (e.g., one's job or educational pursuits) and supervision (i.e., much time is spent on structured tasks that are closely monitored). And such strain does not create pressure or incentives for criminal coping. The excessive demands limit the opportunity for association with criminal others. Furthermore, crime is typically not an effective solution to such demands (with the exception of cheating and certain types of white-collar crime). This type of strain has not been

well examined, although we do know that time spent studying is negatively related to crime (Agnew 2001b; Hirschi 1969).

Unpopularity with or isolation from peers, especially criminal peers. Such strain may be high in magnitude and may also be seen as unjust. In particular, individuals may blame their unpopularity/isolation on peers who unfairly reject them or on parents who unfairly limit their social life. Such strain, however, may contribute to an increase in social control by increasing time spent with parents or other conventional figures. Also, such strain does not create much pressure or incentive for crime. Little time is spent with peers who may reinforce crime, model crime, and foster beliefs conducive to crime. And related to this, there are fewer opportunities for crime. Data support this prediction: Crime is less common among juveniles who report that they are unpopular with peers, have few close friends, have few delinquent friends, never or seldom date, or seldom engage in unsupervised social activities with peers (Agnew 2001b; Agnew and Brezina 1997; Agnew and Petersen 1989; Osgood et al. 1996).

Isolation from those situations or environments conducive to crime. Such strain is closely related to strain from unpopularity or isolation from peers because these situations/environments are typically settings where unsupervised peers gather. Likewise, this type of strain often stems from peer rejection and the efforts of parents to supervise their children (e.g., setting curfews, prohibiting attendance at parties). This type of strain is unlikely to lead to crime for the reasons indicated in the previous paragraph. Data support this prediction (Agnew 2001b; Agnew and Petersen 1989; Osgood et al. 1996). And the fact that females are more likely to experience this type of strain than males may help explain gender differences in crime (Broidy and Agnew 1997; Jensen and Brownfield 1986; Osgood et al. 1996).

Extreme instances of the above types of strain. Certain of the above types of strain may lead to crime in extreme cases. Extraordinary demands at work or school and extraordinary demands for the care of conventional others may be viewed as unjust because they are far outside the range of past experience or the experience of similar others, they may severely tax efforts at conventional coping, and they may eventually undermine conventional attachments and commitments. As such, these extraordinary demands may lead to crime. This argument finds indirect support in the work of Wells and Rankin (1988), who found a curvilinear relationship between parental supervision and delinquency. Increases in parental supervision up to a point reduce delinquency, but very strict supervision increases delinquency.

Types of Strain More Strongly Related to Crime

As indicated, strainful events and conditions are unlikely to lead to crime *unless* they are (1) seen as unjust, (2) seen as high in magnitude, (3) associated with low social control, *and* (4) create some pressure or incentive for criminal coping. Such strains are likely to include (but are not limited to) the following.

The failure to achieve core goals that are not the result of conventional socialization and that are easily achieved through crime. Such goals include money—particularly the desire for much money in a short period of time (as opposed to the gradual accumulation of savings), thrills/excitement, high levels of autonomy, and masculine status (see Agnew 1997, 2001a, 2001b; Agnew et al. 1996; Anderson 1999; Cernkovich et al. 2000; Colvin 2000; Katz 1988; Matza and Sykes 1961; Messerschmidt 1993; Moffitt 1993; Tittle 1995). These are core goals for at least certain segments of the population. It is difficult to predict whether the failure to achieve these goals will be seen as unjust, although it has been suggested that this is the case where barriers to success are visible and such barriers involve discrimination based on acquired characteristics—like “the mere fact of birth into a particular race, religion, social class, or family” (Cloward and Ohlin 1960:119; also see Anderson 1999; Blau and Blau 1982; Messerschmidt 1993). The pursuit of these goals does *not* imply conventional socialization or high social control. Rather, the pursuit of these goals frequently stems from the possession of certain individual traits, like sensation seeking (White, Labouvie, and Bates 1985), exposure to “subterranean” traditions” or subcultural groups (see Matza and Sykes 1961), and structural conditions—like poverty in the midst of plenty (see Kornhauser 1978). In this area, Cernkovich et al. (2000) demonstrated that the desire for material success does not function as a form of social control. Furthermore, these goals—unlike educational and occupational success—are easily achieved through crime. Crime is frequently used to get money (Agnew et al. 1996; Cernkovich et al. 2000; Colvin 2000), obtain thrills/excitement (Katz 1988), demonstrate or obtain autonomy (Agnew 1984; Moffitt 1993; Tittle 1995), and “accomplish” masculinity (Anderson 1999; Messerschmidt 1993).

Parental rejection. Parents who reject their children do not express love or affection for them, show little interest in them, provide little support to them, and often display hostility toward them. Parental rejection is likely to create much strain because it may seriously threaten many of the child’s goals, values, needs, activities, and/or identities. Parental rejection is likely to be seen

as unjust given cultural expectations and the experiences of other children. Parental rejection is associated with very low rather than high social control. And rejection creates some pressure or incentive to engage in crime, largely because rejected children are more likely to be exposed to deviant/aggressive behaviors by their parents and associate with delinquent peers. Data indicate that parental rejection is strongly related to delinquency (Agnew 2001b; Sampson and Laub 1993).

Supervision/discipline that is very strict, erratic, excessive given the infraction, and/or harsh (use of humiliation/insults, threats, screaming, and/or physical punishments). Such supervision/discipline is likely to be seen as high in magnitude, particularly if the individual is exposed to it on a regular basis by parents, school officials, criminal justice officials, or others. It is likely to be seen as unjust because it violates one or more justice norms. It is associated with low social control; sanctions administered in the above manner do not function as effective direct controls, and they frequently undermine attachments and commitments to conventional others and institutions. Such supervision/discipline also creates some pressure or incentive for crime because the sanctioning agents frequently model aggressive behavior, implicitly or explicitly foster beliefs conducive to aggression, and sometimes reinforce aggression (see Patterson, Reid, and Dishion 1992). This type of discipline is also likely to promote association with delinquent peers. Data indicate that parents, school officials, and possibly criminal justice officials who employ this type of discipline/supervision increase the likelihood of crime (Agnew 2001b; Colvin 2000; Lanza-Kaduce and Radosevich 1987; Patterson et al. 1992; Sampson and Laub 1993; Sherman 1993, 2000; Tyler 1990).

Child neglect and abuse. Child neglect and abuse represent extreme forms of parental rejection and harsh parental discipline, and abuse/neglect should be related to crime for all the reasons listed above for these forms of strain. Data support this prediction (Smith and Thornberry 1995; Widom 1998).

Negative secondary school experiences. Negative school experiences include low grades, negative relations with teachers (e.g., teachers treat unfairly, belittle/humiliate), and the experience of school as boring and a waste of time. These experiences are likely to be seen as high in magnitude given the central role that school plays in the lives of juveniles. They may be seen as unjust. The compulsory nature of school and the dependent status of juveniles contribute to external blame. Also, juveniles may feel that school personnel ask much of them (several hours of their time and attention each

day) but give little in return—which contributes to feelings of distributive injustice. Feelings of injustice are especially likely when students believe they are discriminated against because of ascribed characteristics. Negative school experiences are associated with low rather than high social control. And negative experiences may foster association with delinquent peers. Data indicate that negative school experiences are related to delinquency (Agnew 2001b; Sampson and Laub 1993).

Work in the secondary labor market. Such work commonly involves unpleasant tasks (e.g., simple, repetitive work; physically demanding work; work that requires a subservient stance), little autonomy, coercive control (e.g., threats of being fired), low pay, few benefits, little prestige, and very limited opportunities for advancement. Furthermore, such work is often intermittent in nature. Such work is likely to create much strain, especially given the central role of work for adults. Such work may be seen as unjust. Although individuals often accept responsibility for their position in the stratification system, the high demands and meager benefits of such work are likely to be seen as unjust by many. Such work is associated with low rather than high social control (Crutchfield and Pitchford 1997). And such work may create some pressure or incentive for criminal coping. Crime is often an effective remedy to the problems associated with work in the secondary labor market. And such work often increases the likelihood of exposure to others who are disposed to crime (Colvin 2000; Crutchfield and Pitchford 1997). Data suggest that work in the secondary labor market is associated with crime (Colvin 2000; Crutchfield and Pitchford 1997).

Homelessness, especially youth homelessness. This type of strain is likely to be seen as very high in magnitude because it represents a major challenge to a broad range of goals, needs, values, activities, and identities. Furthermore, homelessness dramatically increases the likelihood that many other types of strain will be experienced, particularly conflicts with and victimization by others (Baron and Hartnagel 1997; Davis 1999; Hagan and McCarthy 1997). Homelessness may be seen as unfair, particularly among youth—whose homelessness is often the result of parental abuse and neglect (Davis 1999; Hagan and McCarthy 1997). And homelessness is strongly associated with low social control and the social learning of crime, as demonstrated in several recent studies (Baron and Hartnagel 1997; Davis 1999; Hagan and McCarthy 1997). Data indicate that homelessness and its attendant problems are associated with crime (Baron and Hartnagel 1997; Hagan and McCarthy 1997).

Abusive peer relations, especially among youth. Peer abuse has been neglected as a type of strain, although data suggest that it is widespread and that it often has a devastating effect on victims (e.g., Ambert 1994; Lockwood 1997). Such abuse may involve insults/ridicule, gossip, threats, attempts to coerce, and physical assaults. Peer abuse is likely to be seen as high in magnitude, especially among youth, where peers are of central importance. Peer abuse is likely to be seen as unjust because it frequently violates one or more justice norms (e.g., is excessive given the infraction, is disrespectful or aggressive, is not administered by legitimate sanctioning agents). Peer abuse is not associated with high social control. Peer abuse among juveniles, in particular, often occurs away from sanctioning agents like parents and teachers. And such abuse is often associated with some pressure or incentive to engage in crime. Peer abuse is especially common in delinquent peer groups and gangs, where the victim is regularly exposed to others who model crime, present beliefs favorable to crime, and reinforce crime (see Agnew 2001b; Colvin 2000). Furthermore, peers often model criminal coping in response to abuse, present beliefs that encourage criminal coping in response to abuse, and differentially reinforce criminal coping in response to abuse.

Criminal victimization. Victimization is typically seen as unjust and high in magnitude. Victimization is not associated with high social control; in fact, victimization is most likely to occur in settings in which social control is low—such as settings where young, unsupervised males gather (Jensen and Brownfield 1986; Lauritsen, Sampson, and Laub 1991; Meier and Miethe 1993). Furthermore, victimization may reduce concern with internal and external sanctions because criminal victimization often provides a justification for crime in the eyes of the victim and others. Finally, criminal victimization is often associated with the social learning of crime. Victimization is more common in delinquent peer groups and gangs, and victimization by definition involves exposure to a criminal model (Lauritsen et al. 1991). Limited data suggest that criminal victimization is strongly related to criminal offending (see Dawkins 1997; Esbensen and Huizinga 1991; Jensen and Brownfield 1986; Lauritsen et al. 1991; Lauritsen, Laub, and Sampson, 1992; Sampson and Lauritsen 1993).

Experiences with prejudice and discrimination based on ascribed characteristics, like race/ethnicity. Data indicate that racial prejudice and discrimination are quite common in the United States (Ambert 1994; Forman, Williams, and Jackson 1997). This type of strain is likely to be seen as unjust and high in magnitude, particularly given the strong cultural emphasis in the United States on egalitarianism. Prejudice/discrimination may reduce social control, particularly attachment and commitment to those individuals and

institutions associated with the prejudice and discrimination. Prejudice/discrimination may also create some pressure or incentive to engage in crime because the victim is exposed to others who violate strongly held social norms. Data indicate that experiences with prejudice and discrimination contribute to psychological distress (Finch, Kolody, and Vega 2000; Schulz et al. 2000), and certain qualitative studies have linked prejudice and discrimination to crime (e.g., Anderson 1999). Quantitative studies, however, have not devoted much attention to experiences with prejudice and discrimination.

Summary

The above list represents the most comprehensive attempt to identify those types of strain that are and are not related to crime. It incorporates and extends the work of classic and contemporary strain theorists. Building on the classic strain theorists, it argues that the inability to achieve certain success goals—particularly educational and occupational goals—is not related to crime, whereas the inability to achieve other success goals—like the rapid acquisition of much money—is related to crime. The list also includes many of the strains that contemporary researchers have identified—like the denial of autonomy needs (Moffitt 1993; Tittle 1995); threats to masculine status (Anderson 1999; Messerschmidt 1993); disrespectful, unfair, or abusive police practices (Sherman 1993, 2000); and the types of coercion discussed in Colvin's (2000) theory of differential coercion.⁶ The list also contains types of strain that have not been extensively discussed in the strain literature—noting which are related to crime and which are not. The general principles listed in the previous section allow us to group all of these strains under one theoretical umbrella.

HOW DO WE TEST THE ABOVE ARGUMENTS?

Strain is most likely to lead to crime when it is seen as unjust, is seen as high in magnitude, is associated with low social control, and creates some pressure or incentive to engage in criminal coping. If these arguments are correct, types of strain that meet these conditions should be more strongly related to crime than types that do not (although the precise relationship between strain and crime is a function of the characteristics of *both* the strain and the people experiencing the strain). So at the most basic level, researchers should test the above arguments by classifying strains on the above characteristics and then examining the relative impact of these strains on crime. The classification of strains just presented can be used as a starting point for such research. Ideally, researchers should compare the criminal behavior of

people who have experienced the above strains. As an alternative, researchers can present people with vignettes describing these types of strain and then ask how likely they or others would be to respond to them with crime (see Mazerolle and Piquero 1997 for a model).

The Cumulative Effect of Strain

This strategy for testing strain theory differs from the approach now taken by most researchers, who examine the impact of cumulative measures of strain on crime—with these cumulative measures often containing types of strain that differ widely on the above characteristics. Although researchers should not ignore the argument that strains may have a cumulative effect on crime, it is most important at this point to determine which types of strain are most strongly related to crime. Once this is determined, researchers can then explore the cumulative impact of strain on crime. Cumulative scales can be created by combining those types of strain that have a significant impact on crime—perhaps weighting them by their regression coefficients. A similar strategy has been successfully employed in the stress literature (Herbert and Cohen 1996; Turner and Wheaton 1995; Wheaton et al. 1997; also see Agnew and White 1992). Or researchers can determine whether strains interact with one another in their impact on crime through the creation of interaction terms (see Wheaton et al. 1997; note the argument that moderate levels of prior stress sometimes *reduce* the negative effects of current stressors).

Distinguishing Strain from Social Control and Social Learning

Researchers testing GST all confront a major problem: Many of the “strain” measures they use—like low grades or harsh parental discipline—can also be taken as social control or social-learning measures. Researchers usually deal with this problem by assigning some measures to the strain camp, some to the social control camp, and some to the social-learning camp. They then try to justify these assignments, although their arguments are often less than convincing. Agnew (1995c) explained why this is so, noting that most variables have implications for strain, social control, *and* social-learning theories. Harsh discipline, for example, is often classified as a type of strain, but some claim that it leads to crime by reducing attachment to parents or implicitly teaching the child that violence is acceptable under certain conditions (see Brezina 1998). It is therefore difficult to classify an independent variable as a purely strain, social control, or social-learning variable. This article makes the same argument: Most types of strain have implications for social control and the social learning of crime. Furthermore, it is argued that

those types of strain most likely to lead to crime are those that are associated with low social control and the social learning of crime.

This argument raises a major problem: If those types of strain most strongly related to crime are associated with low control and the social learning of crime, how do we know whether these strains affect crime for reasons related to strain, social control, or social-learning theories? Agnew's (1995c) solution to this problem was to examine the intervening processes described by these theories. Although these theories have many of the same independent variables in common, they differ in terms of their specification of intervening processes. Strain theory argues that these variables increase crime through their effect on negative emotions, control theory argues that they lower the perceived costs of crime, and social-learning theory argues that they influence the perceived desirability of crime. A few studies have attempted to examine such intervening processes, and they typically find that the processes associated with all three theories are operative (see Agnew 1985; Brezina 1998).⁷ Unfortunately, most existing data sets do not allow for the proper examination of these intervening processes (see Schieman 2000 and Stone 1995 for discussions of certain of the problems involved in measuring the key negative emotion of anger).

There is a second strategy that may be employed to determine if a strain measure affects crime for reasons related to strain, social control, or social-learning theory. Certain strain measures may affect crime because they reduce social control and/or foster the social learning of crime. As indicated, harsh discipline is said to reduce attachment to parents and foster beliefs conducive to violence. In such cases, we can examine the effect of the strain measure on crime while controlling for the relevant social control and social-learning variables. For example, we can examine the effect of harsh discipline on crime while controlling for parental attachment and beliefs conducive to violence. Or we can examine the effect of teacher conflicts while controlling for attachment to teachers, attachment to school, and grades. If the strain measure still affects crime after such controls, support for strain theory is increased. This strategy cannot be followed in all cases, however. Certain strain measures—like low grades—directly index the respondent's level of social control or social learning. Therefore, it is not possible to control for the relevant control or social-learning variables. Also, there is some risk in arguing that the *direct* effect of the strain measure on crime is best explained by strain theory. Researchers may have failed to control for or properly measure all relevant social control and social-learning variables. And it is possible that the strain measure affects crime for reasons other than those offered by strain, social control, and social-learning theories (e.g., genetic factors may influence both exposure to strain and levels of crime).

Finally, a third strategy sometimes allows us to determine whether strain variables affect crime for reasons distinct from those offered by social control theory. According to the logic of control theory, neutral relationships with other individuals and groups should have the same effect on crime as negative relationships. For example, a juvenile who does not care about her parents should be just as delinquent as a juvenile who dislikes or hates her parents. Both juveniles are equally free to engage in delinquency; that is, both have nothing to lose through delinquency. According to the logic of strain theory, however, the juvenile who hates her parents should be higher in delinquency than the juvenile who does not care about her parents. This is because the juvenile who hates her parents is under more strain. Her hatred likely stems from unpleasant relations with her parents, and it is stressful to live with people you hate. This prediction is easily tested with certain data sets, but researchers rarely compare juveniles who dislike/hate their parents with juveniles who neither like nor dislike their parents (see Nye 1958 for an exception). Similar analyses can be conducted in other areas. For example, researchers can compare the criminal behavior of individuals who hate their grades or jobs with those who do not care about their grades or jobs. If strain theory is correct, individuals who hate their grades or jobs should be higher in crime.

None of these strategies allows us to perfectly determine whether strain variables affect crime for reasons related to strain, social control, or social-learning theories, but taken together they can shed much light on this problem.

Measuring Strain

Many current measures of strain are quite simplistic; single-item measures of specific strains are often employed, with these measures providing little information about the magnitude, injustice, or other dimensions of the strain. A similar situation characterizes the stress literature, although stress researchers are starting to collect more detailed information on stressors to better estimate things like their magnitude. For example, some stress researchers have abandoned simple checklist measures and are employing intensive interviews with semistructured probes (see Herbert and Cohen 1996; Wethington et al. 1995; Wheaton 1996). Such techniques were developed because respondents often report trivial stressors when checklist measures are used—even when such checklists attempt to focus on serious stressors (Dohrenwend 2000; Herbert and Cohen 1996; Wethington et al. 1995). Also, many stress researchers now recognize that the circumstances associated with the stressor have an important effect on its impact. It is difficult to employ intensive interviews in the large-scale surveys often conducted by

criminologists, but criminologists can do a much better job of measuring strain in such surveys. As an illustration, one need only compare the measures of economic strain typically employed by criminologists with those commonly used in the family research. Economic strain is not simply measured in terms of low income or a two- or three-item index of socioeconomic status. Rather, family researchers examine such things as (1) family per capita income; (2) unstable work history, which includes changing to a worse job, demotions, and being fired or laid off; (3) debt-to-asset ratio; and (4) increases or decreases in family income in the past year. Furthermore, researchers recognize that these types of economic strain do not affect all families in the same way. So, more direct measures of economic strain are sometimes employed as well. For example, parents are asked about the extent to which the family has enough money for clothing, food, medical care, and bills. They are also asked about the changes they have had to make to cope with economic hardship, like moving, taking an additional job, canceling medical insurance, and obtaining government assistance (e.g., Conger et al. 1992; Fox and Chancey 1998; Voydanoff 1990; also see Agnew et al. 1996; Cernkovich et al. 2000).

CONCLUSION

GST is usually tested by examining the effect of selected types of strain on crime. Researchers, however, have little guidance when it comes to selecting among the many hundreds of types of strain that might be examined. And they have trouble explaining why only some of the strains they do examine are related to crime. This article builds on GST by describing the characteristics of strainful events and conditions that influence their relationship to crime. As indicated, strains are most likely to lead to crime when they (1) are seen as unjust, (2) are seen as high in magnitude, (3) are associated with low social control, and (4) create some pressure or incentive to engage in criminal coping. Based on these characteristics, it is argued that certain types of strain will be unrelated or only weakly related to crime. Such strains include the failure to achieve educational and occupational success, the types of strain that have dominated the research on strain theory. Such strains also include many of the types of strain found in stressful life events scales, which are commonly used to test GST. And it is argued that other types of strain will be more strongly related to crime, including types that have received much attention in the criminology literature (e.g., parental rejection; erratic, harsh parental discipline; child abuse and neglect; negative school experiences) and types that have received little attention (e.g., the inability to achieve selected goals, peer abuse, experiences with prejudice and discrimination).

The arguments presented in this article should have a fundamental impact on future efforts to test GST because they identify those types of strain that should and should not be related to crime. And in doing so, these arguments make it easier to falsify GST. Furthermore, these arguments help explain the contradictory results of past research on strain theory; for example, they help explain why the failure to achieve educational and occupational success is usually not related to crime, whereas verbal and physical assaults usually have a relatively strong relationship to crime.

These arguments also have important policy implications. Agnew (1992) argued that two major policy recommendations flow from GST: reduce the exposure of individuals to strain and reduce the likelihood that individuals will cope with strain through crime (by targeting those individual characteristics conducive to criminal coping). This article suggests a third recommendation: alter the characteristics of strains in ways that reduce the likelihood they will result in crime. Despite our best efforts, many individuals will be exposed to strain. For example, parents, teachers, and criminal justice officials will continue to sanction individuals in ways that are disliked. We can, however, alter the ways in which these sanctions are administered so as to reduce the likelihood that they will (1) be seen as unjust, (2) be seen as high in magnitude, (3) reduce social control, and (4) create some pressure or incentive to engage in crime. In fact, this is one of the central thrusts behind the restorative justice and related movements (see Bazemore 1998; Briathwaite 1989; Sherman 1993, 2000; Tyler 1990). These movements point to ways in which criminal justice officials can increase the perceived justice of sanctions, reduce the perceived magnitude of sanctions, sanction in ways that increase rather than reduce social control, and sanction in ways that create little pressure or incentive for crime. Recommendations in these areas include treating offenders with respect; making them aware of the harm they have caused; giving them some voice in determining sanctions; tempering the use of severe, punitive sanctions; and reintegrating offenders with conventional society through a variety of strategies—like reintegration ceremonies and the creation of positive roles for offenders. Certain parent-training and school-based programs are also structured in ways that reduce the likelihood that strains like disciplinary efforts will be administered in ways that increase the likelihood of criminal coping (see Agnew 1995d, 2001b).

This article, then, extends Agnew's (1992) GST in a way that substantially improves its ability to explain and control crime. Although Agnew (1992) argues that the reaction to strain is largely a function of individual characteristics, this article argues that the reaction to strain is a function of both individual characteristics and the characteristics of the strain that is being experienced. Strain is most likely to lead to crime when individuals possess characteristics conducive to criminal coping (as described in Agnew 1992)

and they experience types of strain conducive to criminal coping (as described above). This extension of strain theory parallels recent developments in the stress literature. Like Agnew (1992), stress researchers argued that the impact of stressors on outcome variables was largely a function of individual characteristics like coping skills and social support. Stress researchers, however, have increasingly come to realize that stressors do not have comparable impacts on outcome variables. Certain stressors are significantly related to outcome variables—most often measures of mental and physical health—whereas others are not (e.g., Aseltine et al. 2000; Aseltine, Gore, and Colten 1998; Brown 1998; Wethington et al. 1995; Wheaton et al. 1997; Dohrenwend 1998). So we must consider both the nature of the stressor and the characteristics of the individual experiencing the stressor.

Like Agnew's (1992) original statement of GST, however, the arguments in this article are in need of further research and elaboration. The predictions regarding the impact of specific types of strain on crime are tentative. Researchers should use the methods described in this article to better determine the extent to which these and other types of strain are seen as unjust, are seen as high in magnitude, are associated with low social control, and create some pressure or incentive for crime. Such research should improve the accuracy of the predictions that are made. Furthermore, researchers should pay attention to the impact of group membership in such research. For example, it is likely that there are group differences in the extent to which certain strains are seen as unjust or high in magnitude.⁸ In addition, researchers should examine whether particular strains have a greater impact on some types of crime than other types. For example, some research suggests that certain strains are more strongly related to aggression/violence than to other types of crime (e.g., Agnew 1990; Aseltine et al. 1998, 2000; Mazerolle et al. 2000; Mazerolle and Piquero 1997). (Likewise, the stress research reveals that some stressors are more strongly related to some types of negative outcomes than to others.) The arguments presented in this article, then, are still in need of much development, but that does not diminish their central thrust—some strains are more likely than others to result in crime.

NOTES

1. Most of the research in criminology simply assumes that certain events or conditions are disliked by most of the people being studied. This is probably a reasonable assumption in most cases (e.g., criminal victimization), although it is a more questionable assumption in other cases (e.g., changing schools). A potentially more serious problem with the criminology research is that researchers rarely employ a complete or comprehensive list of objective strains. Researchers usually only examine a few types of objective strain—often overlooking many of the most important types. For example, interviews with adolescents suggest that peer conflict and abuse

are among the most important types of objective strain in this group, but such conflict/abuse is rarely considered by researchers (although see Agnew 1997; Agnew and Brezina 1997; Ambert 1994; Aseltine, Gore, and Gordon 2000; Seiffge-Krenke 1995). Likewise, experiences with racial prejudice and discrimination are seldom considered by researchers, despite evidence that such experiences are a major type of objective strain among African Americans and others (Ambert 1994; Anderson 1999). Recent research suggests that the failure to examine the full range of stressors can lead researchers to substantially underestimate the effect of stress or strain (Turner, Wheaton, and Lloyd 1995).

2. This is much less of a problem when judges or group members are rating the injustice of objective strains because these ratings are averaged across judges or group members.

3. Attributions of recklessness and negligence may also lead to perceptions of unjust treatment, although they result in less blame than attributions of intent. See Tedeschi and Felson (1994) and Tyler et al. (1997) for discussions in this area.

4. The distributive justice literature focuses on norms governing the distribution of outcomes, with outcomes broadly defined. Such outcomes include the types of strain considered in general strain theory (GST): the blockage of goal-seeking behavior, the removal of positively valued stimuli, and the presentation of negatively valued stimuli. Several rules govern the distribution of outcomes (e.g., equity, need, equality). And a range of factors influences the choice of the most relevant rule(s) and the determination of whether the rule(s) has been violated—with self-interest being a major factor (Hegtvedt and Cook forthcoming; Hegtvedt and Markovsky 1995; Tyler et al. 1997). The procedural justice literature focuses on the process by which people decide how to distribute outcomes. Several factors have been found to influence judgments about the fairness or justice of this process, although the relative importance of these factors varies by type of situation and other variables (Hegtvedt and Markovsky 1995; Lind and Tyler 1988; Sherman 2000; Tyler 1994; Tyler et al. 1997). The interactional justice literature focuses on the norms governing interaction between people, with data indicating that people have a strong desire to be treated in a polite, respectful, considerate, nonaggressive manner (Mikula 1986, 1993; Mikula, Petri, and Tanzer 1990; Tedeschi and Felson 1994). The retributive justice literature focuses on the factors that influence the reaction to people who break social rules, with research indicating that people feel a need to sanction those who intentionally violate rules and with the sanction being proportional to the harm intended or inflicted (Tedeschi and Felson 1994; Tyler et al. 1997). Violations of distributive, procedural, interactional, and retributive justice norms may each influence overall evaluations of justice, although the relative importance of each type of justice varies according to several factors (Tyler et al. 1997).

5. Agnew (1992) argued that the inability to achieve educational and occupational goals would be related to crime if researchers focused on the disjunction between expectations or expected goals and actual achievements. He claimed that expectations are taken more seriously than aspirations. An empirical study by Jensen (1995), however, failed to find support for this argument—although further tests would be useful.

6. Colvin's (2000) theory of differential coercion essentially described a general type of strain—coercion—said to be especially conducive to crime (the theory also presented excellent discussions of the many ways that coercion may contribute to crime and the cultural and structural sources of coercion). Coercion involves “the use or threat of force and intimidation aimed at creating compliance through fear,” including the “actual or threatened removal of social supports,” and “pressure arising from structural arrangements and circumstances that seem beyond individual control,” creating “a sense of desperation that seems to compel an individual toward immediate action.” This broad definition includes most or all of the types of strain said to lead to crime but may also include many of the strains not predicted to affect crime—such as the inability to achieve conventional success goals, demands for the care of conventional others, and isolation from peer groups and situations conducive to crime.

7. One should also take account of the possibility that anger may indirectly affect crime by reducing the perceived costs of crime and increasing the perceived desirability of crime, as indicated earlier in this article.

8. Explaining the origins of such differences is, of course, central to any effort to develop the macro-side of GST (see the excellent discussions in Anderson 1999; Bernard 1990; Colvin 2000; and Messerschmidt 1993).

REFERENCES

- Agnew, Robert. 1984. "Autonomy and Delinquency." *Sociological Perspectives* 27:219-36.
- . 1985. "A Revised Strain Theory of Delinquency." *Social Forces* 64:151-67.
- . 1990. "The Origins of Delinquent Events: An Examination of Offender Accounts." *Journal of Research in Crime and Delinquency* 27:267-94.
- . 1992. "Foundation for a General Strain Theory of Crime and Delinquency." *Criminology* 30:47-87.
- . 1995a. "Strain and Subcultural Theories of Criminality." In *Criminology: A Contemporary Handbook*, edited by Joseph F. Sheley. Belmont, CA: Wadsworth.
- . 1995b. "The Contribution of Social-Psychological Strain Theory to the Explanation of Crime and Delinquency." In *The Legacy of Anomie Theory, Advances in Criminological Theory*, Vol. 6, edited by Freda Adler and William S. Laufer. New Brunswick, NJ: Transaction.
- . 1995c. "Testing the Leading Crime Theories: An Alternative Strategy Focusing on Motivational Processes." *Journal of Research in Crime and Delinquency* 32:363-98.
- . 1995d. "Controlling Delinquency: Recommendations from General Strain Theory." In *Crime and Public Policy*, edited by Hugh D. Barlow. Boulder, CO: Westview.
- . 1997. "Stability and Change in Crime over the Life Course: A Strain Theory Explanation." In *Developmental Theories of Crime and Delinquency, Advances in Criminological Theory*, Vol. 7, edited by Terence P. Thornberry. New Brunswick, NJ: Transaction.
- . 2001a. "An Overview of General Strain Theory." In *Explaining Criminals and Crime*, edited by Raymond Paternoster and Ronet Bachman. Los Angeles: Roxbury.
- . 2001b. *Juvenile Delinquency: Causes and Control*. Los Angeles: Roxbury.
- Agnew, Robert and Timothy Brezina. 1997. "Relational Problems with Peers, Gender and Delinquency." *Youth and Society* 29:84-111.
- Agnew, Robert, Francis T. Cullen, Velmer S. Burton, Jr., T. David Evans, and R. Gregory Dunaway. 1996. "A New Test of Classic Strain Theory." *Justice Quarterly* 13:681-704.
- Agnew, Robert and David M. Petersen. 1989. "Leisure and Delinquency." *Social Problems* 36:332-50.
- Agnew, Robert and Helene Raskin White. 1992. "An Empirical Test of General Strain Theory." *Criminology* 30:475-99.
- Ambert, Ann-Marie. 1994. "A Qualitative Study of Peer Abuse and Its Effects: Theoretical and Empirical Implications." *Journal of Marriage and the Family* 56:119-30.
- Anderson, Elijah. 1999. *Code of the Street*. New York: Norton.
- Aseltine, Robert H., Jr., Susan Gore, and Mary Ellen Colten. 1998. "The Co-occurrence of Depression and Substance Abuse in Late Adolescence." *Development and Psychopathology* 10:549-70.
- Aseltine, Robert H., Jr., Susan Gore, and Jennifer Gordon. 2000. "Life Stress, Anger and Anxiety, and Delinquency: An Empirical Test of General Strain Theory." *Journal of Health and Social Behavior* 41:256-75.

- Averill, James R. 1982. *Anger and Aggression: An Essay on Emotion*. New York: Springer-Verlag.
- . 1993. "Illusions of Anger." In *Aggression and Violence*, edited by Richard B. Felson and James T. Tedeschi. New York: Springer-Verlag.
- Bandura, Albert. 1990. "Selective Activation and Disengagement of Moral Control." *Journal of Social Issues* 46:27-46.
- Baron, Stephen W. and Timothy F. Hartnagel. 1997. "Attributions, Affect, and Crime: Street Youths' Reactions to Unemployment." *Criminology* 35:409-34.
- Bazemore, Gordon. 1998. "Restorative Justice and Earned Redemption." *American Behavioral Scientist* 41:768-813.
- Berkowitz, Leonard. 1993. *Aggression: Its Causes, Consequences, and Control*. New York: McGraw-Hill.
- Bernard, Thomas J. 1990. "Angry Aggression among the 'Truly Disadvantaged.'" *Criminology* 28:73-96.
- Black, Donald. 1983. "Crime as Social Control." *American Sociological Review* 48:34-45.
- Blau, Judith R. and Peter M. Blau. 1982. "The Cost of Inequality: Metropolitan Structure and Violent Crime." *American Sociological Review* 47:114-29.
- Box, Steven. 1987. *Recession, Crime and Punishment*. Basingstoke, UK: Macmillan.
- Briathwaite, John. 1989. *Crime, Shame, and Reintegration*. Cambridge, UK: Cambridge University Press.
- Brezina, Timothy. 1998. "Adolescent Maltreatment and Delinquency: The Question of Intervening Processes." *Journal of Research in Crime and Delinquency* 35:71-99.
- . 1999. "Teenage Violence toward Parents as an Adaptation to Family Strain." *Youth and Society* 30:416-44.
- . 2000. "Delinquent Problem-Solving: An Interpretative Framework for Criminological Theory and Research." *Journal of Research in Crime and Delinquency* 37:3-30.
- Broidy, Lisa and Robert Agnew. 1997. "Gender and Crime: A General Strain Theory Perspective." *Journal of Research in Crime and Delinquency* 34:275-306.
- Brown, George W. 1998. "Loss and Depressive Disorders." In *Adversity, Stress, and Psychopathology*, edited by Bruce P. Dohrenwend. New York: Oxford University Press.
- Burke, Peter J. 1996. "Social Identities and Psychosocial Stress." In *Psychosocial Stress*, edited by Howard B. Kaplan. San Diego, CA: Academic Press.
- Burton, Velmer S., Jr. and R. Gregory Dunaway. 1994. "Strain, Relative Deprivation, and Middle-Class Delinquency." In *Varieties of Criminology*, edited by Greg Barak. Westport, CT: Praeger.
- Cernkovich, Stephen A., Peggy C. Giordano, and Jennifer L. Rudolph. 2000. "Race, Crime, and the American Dream." *Journal of Research in Crime and Delinquency* 37:131-70.
- Cloward, Richard A. and Lloyd E. Ohlin. 1960. *Delinquency and Opportunity*. New York: Free Press.
- Cohen, Albert K. 1955. *Delinquent Boys*. New York: Free Press.
- . 1997. "An Elaboration of Anomie Theory." In *The Future of Anomie Theory*, edited by Nikos Passas and Robert Agnew. Boston: Northeastern University Press.
- Cohen, Sheldon, Ronald C. Kessler, and Lynn Underwood Gordon. 1995. *Measuring Stress*. New York: Oxford University Press.
- Colvin, Mark. 2000. *Crime and Coercion: An Integrated Theory of Chronic Criminality*. New York: St. Martin's.
- Conger, Rand D., Katherine J. Conger, Glen H. Elder, Jr., Frederick O. Lorenz, Ronald L. Simons, and Lee B. Whitbeck. 1992. "A Family Process Model of Economic Hardship and Adjustment of Early Adolescent Boys." *Child Development* 63:526-41.

- Crittenden, Kathleen S. 1983. "Sociological Aspects of Attribution." *Annual Review of Sociology* 9:425-46.
- . 1989. "Causal Attribution in Sociocultural Context." *Sociological Quarterly* 30:1-14.
- Crutchfield, Robert D. and Susan R. Pitchford. 1997. "Work and Crime: The Effects of Labor Stratification." *Social Forces* 76:93-118.
- Cullen, Francis T. and Robert Agnew. 1999. *Criminological Theory: Past to Present*. Los Angeles: Roxbury.
- Davis, Nanette J. 1999. *Youth Crisis*. Westport, CT: Praeger.
- Dawkins, Nicola. 1997. "Striking Back: An Empirical Test of the Impact of Victimization on Violent Crime." Presented at the annual meeting of the American Society of Criminology, San Diego, CA.
- Dodge, Kenneth A. and D. Schwartz. 1997. "Social Information Processing Mechanisms in Aggressive Behavior." In *Handbook of Antisocial Behavior*, edited by David M. Stoff, James Breiling, and Jack D. Maser. New York: John Wiley.
- Dohrenwend, Bruce P. 1998. *Adversity, Stress, and Psychopathology*. New York: Oxford University Press.
- . 2000. "The Role of Adversity and Stress in Psychopathology: Some Evidence and Its Implications for Theory and Research." *Journal of Health and Social Behavior* 41:1-19.
- Elder, Glen H., Jr., Linda K. George, and Michael J. Shanahan. 1996. "Psychosocial Stress over the Life Course." In *Psychosocial Stress*, edited by Howard B. Kaplan. San Diego, CA: Academic Press.
- Esbensen, Finn-Aage and David Huizinga. 1991. "Juvenile Victimization and Delinquency." *Youth and Society* 23:202-28.
- Finch, Brian Karl, Bohdan Kolody, and William A. Vega. 2000. "Perceived Discrimination and Depression among Mexican-Origin Adults in California." *Journal of Health and Social Behavior* 41:295-313.
- Forman, Tyrone A., David R. Williams, and James S. Jackson. 1997. "Race, Place, and Discrimination." *Perspectives on Social Problems* 9:231-61.
- Fox, Greer Linton and Dudley Chancey. 1998. "Sources of Economic Distress." *Journal of Family Issues* 19:725-49.
- Gottfredson, Michael R. and Travis Hirschi. 1990. *A General Theory of Crime*. Stanford, CA: Stanford University Press.
- Hagan, John and Bill McCarthy. 1997. *Mean Streets*. Cambridge, UK: Cambridge University Press.
- Hegtvedt, Karen A. and Karen S. Cook. Forthcoming. "Distributive Justice: Recent Theoretical Developments and Applications." In *The Justice Reader*, edited by Joseph Sanders and V. Lee Hamilton. New York: Plenum.
- Hegtvedt, Karen A. and Barry Markovsky. 1995. "Justice and Injustice." In *Sociological Perspectives on Social Psychology*, edited by Karen S. Cook, Gary Alan Fine, and James S. House. Needham Heights, NY: Allyn and Bacon.
- Herbert, Tracy B. and Sheldon Cohen. 1996. "Measurement Issues in Research on Psychosocial Stress." In *Psychosocial Stress*, edited by Howard B. Kaplan. San Diego, CA: Academic Press.
- Hirschi, Travis. 1969. *Causes of Delinquency*. Berkeley: University of California Press.
- Hoffmann, John P. and Felice Gray Cerbone. 1999. "Stressful Life Events and Delinquency Escalation in Early Adolescence." *Criminology* 37:343-74.
- Hoffmann, John P. and Alan S. Miller. 1998. "A Latent Variable Analysis of Strain Theory." *Journal of Quantitative Criminology* 14:83-110.

- Hoffmann, John P. and S. Susan Su. 1997. "The Conditional Effects of Stress on Delinquency and Drug Use: A Strain Theory Assessment of Sex Differences." *Journal of Research in Crime and Delinquency* 34:46-78.
- Jensen, Gary F. 1995. "Salvaging Structure through Strain: A Theoretical and Empirical Critique." In *The Legacy of Anomie Theory, Advances in Criminological Theory*, Vol. 6, edited by Freda Adler and William S. Laufer. New Brunswick, NJ: Transaction.
- Jensen, Gary F. and David Brownfield. 1986. "Gender, Lifestyles, and Victimization: Beyond Routine Activity." *Violence and Victims* 1:85-99.
- Kaplan, Howard B. 1996. "Psychosocial Stress from the Perspective of Self Theory." In *Psychosocial Stress*, edited by Howard B. Kaplan. San Diego, CA: Academic Press.
- Katz, Jack. 1988. *Seductions of Crime*. New York: Basic Books.
- Kessler, Ronald C., Jacquelyn Gillis-Light, William J. Magee, Kenneth S. Kendler, and Lindon J. Eaves. 1997. "Childhood Adversity and Adult Psychopathology." In *Stress and Adversity over the Life Course*, edited by Ian H. Gotlib and Blair Wheaton. Cambridge, UK: Cambridge University Press.
- Kessler, Ronald C., James S. House, Renee R. Anspach, and David R. Williams. 1995. "Social Psychology and Health." In *Sociological Perspectives on Social Psychology*, edited by Karen S. Cook, Gary Alan Fine, and James S. House. Needham Heights, NY: Allyn and Bacon.
- Kornhauser, Ruth Rosner. 1978. *Social Sources of Delinquency*. Chicago: University of Chicago Press.
- Lanza-Kaduce, Lon and Marcia J. Radosevich. 1987. "Negative Reactions to Processing and Substance Use among Young Incarcerated Males." *Deviant Behavior* 8:137-48.
- Lauritsen, Janet L., John Laub, and Robert J. Sampson. 1992. "Conventional and Delinquent Activities: Implications for the Prevention of Violent Victimization among Adolescents." *Violence and Victims* 7:91-108.
- Lauritsen, Janet L., Robert J. Sampson, and John H. Laub. 1991. "The Link between Offending and Victimization among Adolescents." *Criminology* 29:265-92.
- Lazarus, Richard S. 1999. *Stress and Emotion: A New Synthesis*. New York: Springer.
- Lepore, Stephen J. 1995. "Measurement of Chronic Stressors." In *Measuring Stress*, edited by Sheldon Cohen, Ronald C. Kessler, and Lynn Underwood Gordon. New York: Oxford University Press.
- Lind, E. Allan and Tom R. Tyler. 1988. *The Social Psychology of Procedural Justice*. New York: Plenum.
- Lockwood, Daniel. 1997. *Violence among Middle School and High School Students: Analysis and Implications for Prevention*. Washington, DC: National Institute of Justice.
- Matza, David and Gresham Sykes. 1961. "Juvenile Delinquency and Subterranean Beliefs." *American Sociological Review* 26:713-19.
- Mazerolle, Paul. 1998. "Gender, General Strain, and Delinquency: An Empirical Examination." *Justice Quarterly* 15:65-91.
- Mazerolle, Paul, Velmer S. Burton, Jr., Francis T. Cullen, T. David Evans, and Gary L. Payne. 2000. "Strain, Anger, and Delinquency Adaptations: Specifying General Strain Theory." *Journal of Criminal Justice* 28:89-101.
- Mazerolle, Paul and Alex Piquero. 1997. "Violent Responses to Strain: An Examination of Conditioning Influences." *Violence and Victims* 12:323-43.
- . 1998. "Linking Exposure to Strain with Anger: An Investigation of Deviant Adaptations." *Journal of Criminal Justice* 26:195-211.
- Meier, Robert F. and Terence D. Miethe. 1993. "Understanding Theories of Criminal Victimization." *Crime and Justice: A Review of Research* 17:465-95.

- Merton, Robert K. 1938. "Social Structure and Anomie." *American Sociological Review* 3:672-82.
- . 1968. *Social Theory and Social Structure*. New York: Free Press.
- Messerschmidt, James W. 1993. *Masculinities and Crime*. Lanham, MD: Rowman and Littlefield.
- Mikula, Gerold. 1986. "The Experience of Injustice: Toward a Better Understanding of Its Phenomenology." In *Justice in Social Relations*, edited by Hans Werner Bierhoff, Ronald L. Cohen, and Jerald Greenberg. New York: Plenum.
- . 1993. "On the Experience of Injustice." *European Journal of Social Psychology* 4:223-44.
- Mikula, Gerold, Birgit Petri, and Norbert Tanzer. 1990. "What People Regard as Unjust: Types and Structures of Everyday Experiences of Injustice." *European Journal of Social Psychology* 2:133-49.
- Moffitt, Terrie E. 1993. "'Life-Course Persistent' and 'Adolescent-Limited' Antisocial Behavior: A Developmental Taxonomy." *Psychological Review* 100:674-701.
- Nye, Ivan. 1958. *Family Relationships and Delinquent Behavior*. New York: John Wiley.
- Osgood, D. Wayne, Janet K. Wilson, Patrick M. O'Malley, Jerald G. Bachman, and Lloyd D. Johnston. 1996. "Routine Activities and Individual Deviant Behavior." *American Sociological Review* 61:635-55.
- Paternoster, Raymond and Paul Mazerolle. 1994. "General Strain Theory and Delinquency: A Replication and Extension." *Journal of Research in Crime and Delinquency* 31:235-63.
- Patterson, Gerald R., John B. Reid, and Thomas J. Dishion. 1992. *Antisocial Boys*. Eugene, OR: Castalia.
- Piquero, Nicole Leeper and Miriam D. Sealock. 2000. "Generalizing General Strain Theory: An Examination of an Offending Population." *Justice Quarterly* 17:449-84.
- Rokeach, Milton. 1973. *The Nature of Human Values*. New York: Free Press.
- Sampson, Robert J. and John H. Laub. 1993. *Crime in the Making*. Cambridge, MA: Harvard University Press.
- Sampson, Robert J. and Janet L. Lauritsen. 1993. "Violent Victimization and Offending: Individual-, Situational-, and Community-Level Risk Factors." In *Understanding and Preventing Violence*, Vol. 3, *Social Influences*, edited by the National Research Council. Washington, DC: National Research Council.
- Schieman, Scott. 2000. "Education and the Activation, Course, and Management of Anger." *Journal of Health and Social Behavior* 41:20-39.
- Schulz, Amy, David Williams, Barbara Israel, Adam Becker, Edith Parker, Sherman A. James, and James Jackson. 2000. "Unfair Treatment, Neighborhood Effects, and Mental Health in the Detroit Metropolitan Area." *Journal of Health and Social Behavior* 41:314-32.
- Seiffge-Krenke, Inge. 1995. *Stress, Coping, and Relationships in Adolescence*. Mahwah, NJ: Lawrence Erlbaum.
- Sherman, Lawrence W. 1993. "Defiance, Deterrence, and Irrelevance: A Theory of Criminal Sanctions." *Journal of Research in Crime and Delinquency* 30:445-73.
- . 2000. "The Defiant Imagination: Consilience and the Science of Sanctions." Presented at the University of Pennsylvania, Philadelphia.
- Smith, Carolyn and Terence P. Thornberry. 1995. "The Relationship between Childhood Maltreatment and Adolescent Involvement in Delinquency." *Criminology* 33:451-81.
- Smith-Lovin, Lynn. 1995. "The Sociology of Affect and Emotion." In "Sociological Perspectives on Social Psychology," edited by Karen S. Cook, Gary Alan Fine, and James S. House. Needham Heights, NY: Allyn and Bacon.

- Stone, Arthur A. 1995. "Measurement of Affective Response." In *Measuring Stress*, edited by Sheldon Cohen, Ronald C. Kessler, and Lynn Underwood Gordon. New York: Oxford University Press.
- Sykes, Gresham M. and David Matza. 1957. "Techniques of Neutralization: A Theory of Delinquency." *American Sociological Review* 22:664-70.
- Taylor, Shelley E. and Lisa G. Aspinwall. 1996. "Mediating and Moderating Processes in Psychosocial Stress: Appraisal, Coping, Resistance, and Vulnerability." In *Psychosocial Stress*, edited by Howard B. Kaplan. San Diego, CA: Academic Press.
- Tedeschi, James T. and Richard B. Felson. 1994. *Violence, Aggression, and Coercive Actions*. Washington, DC: American Psychological Association.
- Tedeschi, James T. and Mitchell S. Nesler. 1993. "Grievances: Development and Reaction." In *Aggression and Violence*, edited by Richard B. Felson and James T. Tedeschi. Washington, DC: American Psychological Association.
- Thoits, Peggy A. 1989. "The Sociology of Emotions." *Annual Review of Sociology* 15:317-42.
- . 1991. "On Merging Identity Theory and Stress Research." *Social Psychology Quarterly* 54:101-12.
- . 1995. "Stress, Coping, and Social Support Processes: Where Are We? What Next?" *Journal of Health and Social Behavior* (Extra Issue):53-79.
- Tittle, Charles R. 1995. *Control Balance: Toward a General Theory of Deviance*. Boulder, CO: Westview.
- Turner, Jay R. and William R. Avison. 1992. "Innovations in the Measurement of Life Stress: Crisis Theory and the Significance of Event Resolution." *Journal of Health and Social Behavior* 33:36-50.
- Turner, R. Jay and Blair Wheaton. 1995. "Checklist Measurement of Stressful Life Events." In *Measuring Stress*, edited by Sheldon Cohen, Ronald C. Kessler, and Lynn Underwood Gordon. New York: Oxford University Press.
- Turner, R. Jay, Blair Wheaton, and Donald A. Lloyd. 1995. "The Epidemiology of Social Stress." *American Sociological Review* 60:104-25.
- Tyler, Tom. 1990. *Why People Obey the Law*. New Haven, CT: Yale University Press.
- . 1994. "Psychological Models of the Justice Process: Antecedents of Distributive and Procedural Justice." *Journal of Personality and Social Psychology* 67:850-63.
- Tyler, Tom R., Robert J. Boeckmann, Heather J. Smith, and Yuen J. Huo. 1997. *Social Justice in a Diverse Society*. Boulder, CO: Westview.
- Uggen, Christopher. 2000. "Work as a Turning Point in the Life Course of Criminals: A Duration Model of Age, Employment, and Recidivism." *American Sociological Review* 67:529-46.
- Voydanoff, Patricia. 1990. "Economic Distress and Family Relations: A Review of the Eighties." *Journal of Marriage and the Family* 52:1099-115.
- Wells, Edward L. and Joseph H. Rankin. 1988. "Direct Parental Controls and Delinquency." *Criminology* 26:263-84.
- Wethington, Elaine, George W. Brown, and Ronald C. Kessler. 1995. "Interview Measurement of Stressful Life Events." In *Measuring Stress*, edited by Sheldon Cohen, Ronald C. Kessler, and Lynn Underwood Gordon. New York: Oxford University Press.
- Wheaton, Blair. 1990. "Life Transitions, Role Histories, and Mental Health." *American Sociological Review* 55:209-24.
- . 1996. "The Domains and Boundaries of Stress Concepts." In *Psychosocial Stress*, edited by Howard B. Kaplan. San Diego, CA: Academic Press.
- Wheaton, Blair, Patricia Roszell, and Kimberlee Hall. 1997. "The Impact of Twenty Childhood and Adult Traumatic Stressors on the Risk of Psychiatric Disorder." In *Stress and Adversity over the Life Course: Trajectories and Turning Points*, edited by Ian H. Gotlib. New York: Cambridge University Press.

- White, Helene Raskin, Erich W. Labouvie, and Marsha E. Bates. 1985. "The Relationship between Sensation Seeking and Delinquency: A Longitudinal Analysis." *Journal of Research in Crime and Delinquency* 22:197-211.
- Widom, Cathy Spatz. 1998. "Childhood Victimization: Early Adversity and Subsequent Psychopathology." In *Adversity, Stress, and Psychopathology*, edited by Bruce P. Dohrenwend. New York: Oxford University Press.

STUDENT ANGER AND AGGRESSIVE BEHAVIOR IN SCHOOL: AN INITIAL TEST OF AGNEW'S MACRO-LEVEL STRAIN THEORY

TIMOTHY BREZINA
ALEX R. PIQUERO
PAUL MAZEROLLE

Variation in criminal/delinquent behavior across communities, schools, and other social units is usually explained in terms of social disorganization and subcultural values. Agnew's macro-level strain theory (MST), however, provides an additional explanation. MST contends that macro-level differences in crime and deviance can also be explained in terms of aggregate levels of anger and frustration. Following Agnew's recommendations, the authors conduct an initial school-level test of MST using data on aggressive student behavior from a national sample of public high schools. The results of the assessment lend partial support to the theory, showing that student-to-student conflict is partly a function of the level of anger in the student population. Other forms of aggressive student behavior, however, are not likewise affected. Nonetheless, the authors believe the findings are sufficiently promising to warrant further examination of MST, and they offer some suggestions in this regard.

In recent years, the criminological community has witnessed a resurgence of interest in strain theory. This development is largely attributable to Agnew's (1992) formulation of general strain theory (GST). According to GST, individuals may encounter aversive social relations in which they experience goal blockage, are presented with noxious stimuli, and/or are deprived of positively valued stimuli. These relations tend to generate negative affect,

An earlier version of this article was presented at the 1999 meetings of the Academy of Criminal Justice Sciences, Orlando. We wish to thank the editor and several anonymous reviewers for their helpful comments and suggestions. Address correspondence to Dr. Timothy Brezina, Department of Sociology, Tulane University, 220 Newcomb Hall, New Orleans, LA 70118; e-mail: tbrezin@tulane.edu.

JOURNAL OF RESEARCH IN CRIME AND DELINQUENCY, Vol. 38 No. 4, November 2001 362-386
© 2001 Sage Publications

create pressures for corrective action, and increase the likelihood of criminal/delinquent behavior. Anger plays a central role in GST and is said to have a particularly strong connection to delinquency because it “energizes” strained individuals to action, lowers inhibitions, increases felt injury, and “creates a desire for retaliation and revenge” (Agnew 1992:60).

Agnew’s (1992) version of strain theory highlighted various independent variables and provided rather clear guidelines for empirical testing. For this reason, GST has attracted much attention from researchers (e.g., Brezina 1996; Hoffmann and Miller 1998; Mazerolle and Piquero 1997; Paternoster and Mazerolle 1994). In particular, Agnew highlighted the assumptions and intervening processes that most clearly distinguish strain theory from competing theoretical frameworks. Whereas social control theory assumes that individuals are “freed” into delinquency, and social-learning theory assumes that individuals come to view delinquency as a form of desirable or justifiable behavior, strain theory assumes that individuals are *pressured* into delinquency by their circumstances. Moreover, strain theory is the only major crime theory to emphasize the importance of anger and other negative emotions (Agnew 1995a).

Initial tests of GST have been promising. Strain in parental and school relations (e.g., parental punitiveness, negative comments from teachers, and frustration with school) has been linked to delinquency in several studies, controlling for social control and social-learning factors (Agnew 1985; Agnew and White 1992; Brezina 1998; Broidy 2001; Hoffmann and Miller 1998; Mazerolle 1998; Mazerolle and Piquero 1997, 1998; Paternoster and Mazerolle 1994; Piquero and Sealock 2000). In addition, certain data indicate that anger is an important intervening mechanism linking strain to delinquent outcomes, especially interpersonal violence or aggression (Agnew 1985; Brezina 1998; Broidy 2001; Mazerolle and Piquero 1997, 1998; but see Mazerolle et al. 2000). Although more testing will be required to fully evaluate the theory, these initial results suggest that GST may have an important place to occupy in contemporary criminological theory.

It is important to note, however, that Agnew (1992:75) presented his formulation of strain theory as a foundation for further theoretical development rather than a “fully developed alternative” to earlier strain theories. GST, for example, was pitched at the individual level of analysis. This fact represents a potential limitation of the theory because, as Agnew recognized, the macro implications of GST had not been fully developed.

In a recent article, Agnew (1999) addressed this issue by presenting an extended and elaborated version of GST that is designed to explain community-level (or macro-level) differences in criminal and delinquent

behavior. In addition to social disorganization and subcultural values, this version of GST contends that aggregate-level variation in crime/delinquency can also be explained in terms of frustrating social conditions and aggregate levels of anger and frustration. The characteristics of certain communities are said to be particularly aversive. As a result, these communities are inhabited by a high percentage of angry/frustrated individuals and thus exhibit relatively high rates of criminal/delinquent behavior.

The purpose of this study is to conduct an initial test of Agnew's macro-level version of strain theory (henceforth, MST). As Agnew (1999) observed, currently available data sets do not allow for an adequate test of the theory at the community level of analysis. However, Agnew (1999:140) suggested that available school-level data can be used to conduct an initial evaluation of MST. If the core propositions of MST are correct, variation in problem behavior across schools should be associated with aggregate-level student anger, controlling for other relevant variables.

Following Agnew's (1999:140) recommendations, we conducted an initial school-level assessment of MST using data on aggressive student behavior from a national sample of public high schools. Like Agnew, we believe that school-level data can shed useful light on the possible merits of MST, and, at least for a preliminary test of the theory, school-level data appear to have certain advantages. As Agnew stated, MST "is best tested with data from smaller areas" (p. 124). Unlike metropolitan areas and other large social units, schools can be expected to be more homogeneous in terms of the major independent and dependent variables. Schools are also more likely to have definite boundaries, with more extensive interaction between members (Felson et al. 1994).

Although the main purpose of this study is to examine the merits of MST, our focus on aggressive student behavior should also be of interest to criminologists. There is growing concern with student conflict, aggression, and violence in our schools, and many psychologists believe that anger is an important contributing factor (Furlong and Smith 1994). Yet, despite some evidence of a correlation between anger and student aggression, "anger, particularly among children and adolescents, has received only limited research attention" (Smith et al. 1998:2). Our analyses will help to elucidate the processes through which anger affects student behavior. This study, then, will add to the literature on problem behaviors in school as well as the literature on strain theory. Before turning to the results of the data analyses, we provide a brief summary of MST and describe how it applies to aggressive/disruptive behavior in the school setting.

A BRIEF SUMMARY OF AGNEW'S MST

The Dominant Theories of Macro-Level Variation in Crime and Delinquency

Variation in criminal and delinquent behavior across macro-level social units (e.g., schools, neighborhoods, and metropolitan areas) is usually explained in terms of social disorganization/social control theories and, to a lesser extent, subcultural deviance theories. The dominance of these two theoretical perspectives is readily apparent in the community crime literature.

According to social disorganization theorists, some communities exhibit relatively high rates of crime and delinquency because they have lost the ability to control their members (Bursik 1988; Bursik and Grasmik 1993). Due to high rates of residential mobility, family disruption, economic deprivation, or other manifestations of social disorganization, high-crime communities tend to suffer from low participation in community life, weak commitment to community institutions, and inadequate supervision of youths (Sampson, Raudenbush, and Earls 1997). As a result, members of disorganized communities have more freedom to engage in crime and delinquency. The results of numerous empirical studies are, in fact, consistent with a social control explanation (e.g., Bellair 1997; Elliott et al. 1996; Sampson 1987; Sampson and Groves 1989; Veysey and Messner 1999).

Subcultural deviance explanations are also prominent in the community crime literature, although there is less direct support for these explanations (Cao, Adams, and Jensen 1997; but see Anderson 1994; Heimer 1997; Markowitz and Felson 1998; Matsueda et al. 1992). According to subcultural accounts, the characteristics of disadvantaged communities foster the development of subcultures that hold values conducive to crime and deviance. Anderson (1994), for example, observed that much social interaction in high-crime neighborhoods is governed by the "code of the streets." Residents who live by the code actively campaign for respect in the streets by abusing others and view violence as a necessary or acceptable response to slights and provocations (see also Luckenbill and Doyle 1989).

The dominance of social disorganization and subcultural deviance explanations is also apparent in the literature on school disorder. In the attempt to explain variation in delinquent or disruptive behavior across schools, researchers typically examine the effects of social disorganization and student values. Studies in this area have focused on the contribution of internal or institutional factors (e.g., overall levels of student commitment, approval of delinquent conduct, and other aspects of "school climate"), the contribution of external factors related to the status of the surrounding community

(e.g., local rates of poverty, crime, and residential stability), or some combination of internal and external factors (Ennett et al. 1997; Felson et al. 1994; Gottfredson and Gottfredson, 1985; Hellman and Beaton 1986; Tygart 1988; Welsh, Greene, and Jenkins 1999; Welsh, Stokes, and Greene 2000). In general, the results of these studies indicate that variables derived from social disorganization and subcultural deviance theories can help to explain why some schools are plagued by relatively high levels of crime, delinquency, and problem behavior.

Agnew's MST

MST provides an additional explanation of aggregate-level variation in criminal and delinquent behavior. In terms of community-level differences in crime and deviance, MST contends that these differences are a function not only of differences in social control and values "but also of differences in the *motivation* for crime" (Agnew 1999:126, emphasis added). In addition to low social control and subcultural orientations, Agnew argued that the characteristics of disadvantaged communities (e.g., inequality, blocked opportunity, and various life stressors) contribute to strain and high levels of anger/frustration (for a complete description of the possible sources of community strain and anger, see Agnew 1999). Disadvantaged communities, then, suffer from a relatively high proportion of strained and angry individuals in the resident population. This is another reason for the high levels of crime and delinquency observed in these communities, based on the assumption that strain/anger is a major source of deviant motivation.

A further and particularly intriguing argument of MST is that a high concentration of angry residents, in itself, can escalate crime. When communities suffer from a high density of angry persons, this increases the likelihood that residents will make contact with angry, upset, and potentially hostile individuals. It also increases the likelihood that angry individuals will interact with one another. This situation has the potential to generate much "interpersonal friction" and, ultimately, higher levels of conflict and aggression (see also Bernard 1990).

Agnew (1999) also considered the community-level factors that are likely to condition the effects of strain and anger on crime. Individuals may cope with strain and anger in a variety of ways (e.g., attack the source of adversity or use cognitive techniques to minimize subjective strain), and not all involve crime or delinquency. The likelihood of criminal versus conventional coping is likely to be shaped by such factors as the availability of conventional coping resources in a community, the presence of subcultures that encourage deviant adaptations to strain, level of community social control, and extent of criminal opportunity.

Several of these conditioning variables are borrowed from social disorganization and subcultural deviance theories. This is a noteworthy observation because it highlights the fact that, although MST provides an additional explanation for community crime rates, it is not meant to replace social disorganization and subcultural deviance theories (Agnew 1999). Rather, MST is proposed as a supplement to these theories. As Agnew (1999) argued, "a full explanation of community differences in crime rates must draw on a range of theories, including those which examine the ways in which communities *motivate* as well as *control* crime" (p. 147).

Although Agnew (1999) focused on the application of MST to community differences in crime rates, he suggested that key aspects of the theory can be used to explain variation in crime and deviance across other social units, including schools. (As described below, he stated that school-level data can be used to conduct a preliminary test of the theory.) In particular, school-level variation in crime, delinquency, and problem behavior is likely to be a function not only of social disorganization and subcultural values but also the level of anger in the student population. Moreover, when a school harbors a relatively angry student population, this increases the likelihood that students will interact with angry/upset peers and, hence, "get into conflicts" (Agnew 1999:141).

ASSESSING THE EMPIRICAL VALIDITY OF AGNEW'S MST

Testing Core Propositions with School-Level Data

MST asserts that a full explanation of macro-level variation in crime and deviance requires attention to aggregate levels of anger/frustration in addition to variables derived from social disorganization and subcultural deviance theories. To determine the validity of this assertion, it will be necessary to estimate the effects of MST, social disorganization, and subcultural deviance variables simultaneously, in multivariate analyses (Agnew 1995c, 1999; Agnew et al. 1996).

As Agnew (1999) observed, attempts have not yet been made to measure all of the necessary variables at the community level of analysis. However, he noted that appropriate school-level data are available, namely, data contained in the Youth in Transition Survey (YIT) (Bachman 1975). This data set contains an adequate range of theoretically relevant variables and can be used to conduct an initial test of key MST propositions. As Agnew (1999) stated:

The Youth in Transition (YIT) data set contains a measure of anger/frustration that can be aggregated to the school level. We can, therefore, estimate the per-

centage of angry/frustrated individuals in each school. The YIT data also allow us to construct rough measures of school disorganization and school values conducive to crime/violence. . . . [If MST is correct,] we would expect the aggregate measure of anger/frustration to be related to school crime rates even after school disorganization and values are controlled. (P. 140)

The ability to construct an aggregate measure of student anger also permits a test of the interpersonal-friction argument of MST. If a high density of angry students promotes interpersonal conflict and aggression, “we would also expect the aggregate measure of anger/frustration to be related to individual crime, even after individual anger/frustration and other individual-level variables [are] controlled” (Agnew 1999:140).

As stated earlier, school-level data may be particularly suitable for a preliminary test of MST because the theory is best tested with data from smaller units of analyses. We can also note that school-level data may be especially suitable for testing the interpersonal-friction argument. Students rarely have the opportunity to choose which schools they attend, and they generally have little control over their interactions with other students. For example, it is not always possible for students to avoid interactions with other students; they may be assigned to the same classes or be forced to navigate the same passageways. Thus, students may be forced to interact with others, even if they find these interactions to be hostile or unpleasant. This feature of the school environment should maximize the likelihood of finding support for the interpersonal-friction argument of MST—if, in fact, this argument is valid.

A Focus on Aggressive Behavior

In the next section of the article, we describe the details of an initial test of MST. Our test of MST conforms to Agnew’s (1999) recommendations with, perhaps, one exception. Although Agnew (1999) did not outline hypotheses that are specific to particular types of criminal, delinquent, or deviant outcomes, our analyses focus strictly on aggressive/disruptive student behaviors, such as fighting and arguing with teachers and peers. This focus is mainly a function of limitations inherent in the YIT data (see below).

For several reasons, our focus on aggressive behavior should not be a major problem for an initial school-level test of MST. First, the interpersonal-friction argument appears to be mainly relevant to aggressive behavior, particularly conflict between students. Second, researchers have noted that, due to the theory’s focus on anger, GST arguments are especially relevant to aggressive behavior (Mazerolle and Piquero 1997). Data indicate that anger has a more substantial effect on aggression than other forms of deviant conduct¹ (Agnew 1985:160; see also Mazerolle et al. 2000; Mazerolle and

Piquero 1998; Piquero and Sealock 2000). This finding is consistent with a sizable psychological literature documenting the aggression-provoking qualities of anger. Anger typically occurs when individuals have attributed blameworthiness to others. Moreover, angry arousal increases the likelihood that further conflict will lead to an aggressive response because it tends to lower the individual's threshold for perceived wrong or injury. Thus, if a person is already in a state of arousal, "even a casual remark" may be interpreted as an affront and "any further obstruction as an unwarranted infringement" on the individual's rights (Averill 1982:142; see also Berkowitz 1993; Bernard 1990; Zillman 1979).

We should also note that, although the focus of our analyses includes attention to relatively minor aggressive acts, such acts can lead to more serious forms of aggression in the school context. Research conducted by Lockwood (1997:2) indicated that violent incidents at school typically originate from seemingly trivial "opening moves," such as a push or shove, an insult, an accusation of wrongdoing, verbal teasing, or other "minor affronts." (In fact, Lockwood suggested that reducing the frequency of minor affronts may be the most promising approach to the problem of school violence.)

In the analyses presented below, our main goal is to test the core propositions of MST as they apply to aggressive behavior at school. Due to data limitations and other restrictions, we do not attempt to examine factors that may condition the effects of anger on student aggression.² Although this fact limits the breadth of our assessment, at this point it seems most useful to determine whether the central arguments of MST are at all valid. Similar preliminary investigations of core theoretical propositions have been undertaken and have been useful in the assessment of self-control (Grasmick et al. 1993), general strain (Agnew and White 1992), and control balance (Piquero and Hickman 1999) theories.

DATA AND METHODS

To conduct an initial test of MST, we draw on individual and school-level data from the first and second waves of the YIT survey (Bachman 1975). The YIT data set has been used in previous research on schools and problem behavior, mainly to test arguments derived from social control and subcultural deviance theories (Felson et al. 1994). Prior research, then, provides a useful starting point for this study. We can now add an aggregate measure of anger to the list of independent variables.³

The initial wave of the survey (time 1) is based on a national sample of 2,213 male public high school students in the 10th grade, drawn from 87 randomly selected schools.⁴ According to the principal author of the study, the

YIT sample constitutes “an essentially bias-free representation of tenth-grade boys in public high schools throughout the United States” (Bachman 1975:1). The second wave of the survey (time 2) is based on data collected from 1,886 (85 percent) of the original respondents the following school year, when they were in the 11th grade. Data presented by Bachman, O’Malley, and Johnston (1978:257-61) indicate that the survey results were not seriously biased by either panel attrition or repeated measurement effects.⁵

The YIT data were obtained from personal interviews and questionnaires administered to the respondents. A school identification code is provided for each respondent, and thus it is possible to aggregate individual-level data (e.g., anger, commitment to school, deviant beliefs, and aggressive behavior) to the school level.

Most of the study variables described below are measured at both the individual and school level. For continuous variables, the school-level measures represent the means of the individual-level variables. For dichotomous variables (such as race), the school-level variables are equivalent to the proportion of students in each school who share a particular characteristic or attribute (see the appendix for descriptive statistics and correlations among the school-level measures).

Measurement of Dependent Variables

Although the YIT survey contains several delinquency scales, most of these scales are not well suited for the purposes of this study. First, the items in most of the delinquency scales ask respondents to report the number of times they engaged various acts during the past three years. These scales, then, index behaviors that may have occurred before students were actually enrolled in the various schools included in the sample. This is a problem if we wish to estimate the level of problem behavior at each school.

Second, most of the scales fail to measure delinquent/disruptive behavior that is specific to the school context. This is a potential problem if we are interested in estimating the effect of school-context variables on student behavior because it is reasonable to assume that such variables would mainly affect behavior occurring in or around schools.

Fortunately, the YIT data set contains several items that allow us to avoid these problems. During each wave of data collection, respondents were asked to report the general frequency in which they engaged in various aggressive and disruptive behaviors at their school. Responses to these items were used to construct the dependent variables.⁶

Respondents who score high on a three-item scale of Aggressive Behavior say they often (1) “fight or argue with other students,” (2) argue “with their

teachers,” and (3) do things they “know will make the teacher angry” (factor loadings range from .77 to .86). Responses to each item in the scale range from 1 (*never* engage in the behavior) to 5 (*almost always* engage in the behavior). The mean of the items constitutes the scale score. To test the interpersonal-friction argument of MST, we conduct separate analyses using the single-item measure of fighting/arguing with other students (item 1 in the above scale), which we label Conflict with Peers.

In the analyses reported below, we control for the effects of prior aggression/conflict to increase confidence in proper temporal ordering. In particular, we estimate the effects of time 2 school-context variables on time 2 Aggressive Behavior and Conflict with Peers while controlling for time 1 aggression/conflict.

Measurement of Independent Variables

A number of independent variables were constructed with the aid of factor analysis. For example, a number of items relating to anger/frustration were factor analyzed using principal components extraction and an orthogonal method of rotation. Items that loaded high onto a single factor (at least .50) were then selected to form an anger scale. The scale items are equally weighted, and the average of these items constitutes the scale score. (All of the following independent variables are measured at time 2.)

Anger. High scorers on a six-item Anger scale say they often (1) feel like a “powder keg ready to explode,” (2) feel like “losing their temper,” (3) feel like swearing, (4) feel like being rude, (5) lose their temper easily, and (6) are irritated by small things (factor loadings range from .59 to .75). In short, these are angry and frustrated individuals (see also Agnew 1985; Brezina 1996).

Commitment to School. High scorers on a four-item measure of Commitment to School state that it is “very good” to (1) study constantly “in order to become a well-educated person,” (2) work hard “to achieve academic honors,” (3) strive to get “the top grade-point average in the group,” and (4) study hard “to get good grades” (factor loadings range from .70 to .83). In short, these individuals are highly committed to conventional academic goals. This measure has been used in past research to index social control (e.g., Agnew 1985; Brezina 1996; Felson et al. 1994).

Approval of Aggression. High scorers on this three-item scale express beliefs or values that are conducive to aggressive behavior in response to various types of provocation (see Felson et al. 1994). In particular, these individuals devalue nonaggressive responses to personal attacks and wrongdoing,

stating that it is *not good* to (1) turn the other cheek and forgive others when they harm you, (2) reply to anger with gentleness, and (3) be kind to people “even when they do things against one’s beliefs” (factor loadings range from .66 to .80). This measure has been used in past research to index adherence to a subculture of aggression or violence (Felson et al. 1994).

Measurement of Control Variables

A number of control variables are entered into the analyses including the following dummy variables: race (1 = Black), family stability (scored 1 if the respondent lives with both his mother and father), and residential stability (scored 1 if the respondent [a] had lived in his present locality for six or more years at time 1, and [b] had not experienced a change of residence by time 2). The analyses also control for socioeconomic status and school size, each measured at time 1. Socioeconomic status is measured by a six-item index constructed by the original investigators (Bachman 1975), which combines information on father’s occupational status, father’s education, mother’s education, number of rooms per person in the home, number of books in the home, and a checklist of other possessions (e.g., a map or globe, a set of encyclopedias, a camera). The mean of the six items constitutes the scale score. The measure of school size is based on total student enrollment.

Analyses

The data analyses proceed in three steps. First, we conduct analyses of variance (ANOVA) to determine the amount of variation in aggression/conflict occurring within and between schools. It is important to demonstrate that a sufficient amount of between-school variation in aggression/conflict exists to warrant further consideration, especially in light of MST predictions. If levels of student conflict and aggression do not vary across schools, then there will be nothing for school-level variables to explain (Felson et al. 1994).

Second, we conduct aggregate school-level multivariate analyses based on ordinary least squares regression (OLS). The OLS analyses focus on the ability of school characteristics (such as the aggregate measure of student anger) to explain *school-level differences* in overall aggression/conflict. In these analyses, both explanatory and outcome measures are aggregated to the school level.

Third, we conduct contextual analyses based on hierarchical linear modeling (HLM), version 4.04 (Bryk and Raudenbush 1992). The contextual analyses focus on the ability of school-level characteristics to explain *individual differences* in aggression/conflict, net of the influence of individual-level

characteristics. Contextual analyses, then, will allow us to estimate the effects of aggregate-level anger on student aggression/conflict while controlling for individual anger and other variables. By controlling for individual-level characteristics, we gain confidence that the observed effects of school climate variables are not simply a reflection of individual characteristics, which may also vary across schools. Such analyses are required to test the interpersonal-friction proposition of MST.

RESULTS

ANOVA

The results of one-way ANOVA (not shown) indicate that, although most of the variation in the dependent variables occurs within schools (93 to 94 percent), a significant proportion of the total variance occurs between schools. Approximately 7 percent of the variation in Aggressive Behavior (F value = 1.43, $p < .05$) and 6 percent of the variation in Conflict with Peers (F value = 1.28, $p < .05$) occurs between schools. Although the amount of between-school variation in student aggression/conflict is not large, contextual variables at any level of analysis “rarely explain more than 5 percent to 10 percent of the total variance in any dependent variable” (Felson et al. 1994:163; see also Welsh et al. 1999). Thus, the ANOVA results are typical for this line of research and suggest that schools are meaningful contexts for the study of aggressive behavior.

Aggregate-Level Analyses

Table 1 presents the results of the aggregate-level analyses.⁷ The first equation in Table 1 shows the effects of the aggregate-level variables on Aggressive Behavior, whereas the second equation shows the effects of these variables on Conflict with Peers. The results provide mixed support for MST. Anger fails to exhibit a significant effect on Aggressive Behavior, indicating that schools with relatively angry student populations do not necessarily witness high levels of fighting and arguing directed at both teachers and peers. However, anger exhibits a significant effect on the more specific measure of Conflict with Peers ($p > .05$), controlling for prior conflict and other variables.

Thus, although the aggregate-level measure of student anger does not affect aggressive behaviors of a relatively general nature, it does predict student-to-student conflict.⁸ This pattern of results is not entirely consistent

TABLE 1: Aggregate Analyses of the Determinants of Aggressive Student Behaviors

	<i>Time 2 Dependent Variables</i>							
	<i>Aggressive Behavior</i>				<i>Conflict with Peers</i>			
	b	(B)	SE	t Value	b	(B)	SE	t Value
Time 2 independent variables								
Anger	.154	(.155)	.098	1.574	.283	(.255)	.099	2.864*
Approval of aggression	.272	(.440)	.080	3.418*	.235	(.340)	.080	2.952*
Commitment to school	.063	(.071)	.109	0.575	.146	(.148)	.111	1.307
Control variables								
Family stability	-.108	(-.089)	.139	-0.777	-.089	(-.066)	.141	-0.632
Residential stability	.099	(.076)	.127	0.781	.146	(.101)	.127	1.145
Percent Black	-.017	(-.027)	.081	-0.209	.129	(.182)	.081	1.598
Socioeconomic status	.053	(.132)	.045	1.180	.071	(.159)	.046	1.544
School size	-.000	(-.305)	.000	-3.124*	-.000	(-.257)	.000	-2.936*
Time 1 Aggressive Behavior	.223	(.231)	.093	2.386*	—	—	—	—
Time 1 Conflict with Peers	—	—	—	—	.418	(.405)	.089	4.670*
R ²	.409				.520			

NOTE: $N = 87$. Unstandardized effects shown, with standardized effects in parentheses.
 * $p < .05$ (two-tailed test).

with the expectations of MST, although it is line with the interpersonal-friction argument of the theory (the contextual analyses reported below allow for a more direct test of the interpersonal-friction argument).

According to the results in Table 1, interschool variation in Aggressive Behavior is a function of subcultural values (approval of aggression), prior history of aggressive behavior at the school, and school size ($p < .05$). Interschool variation in Conflict with Peers is also a function of subcultural values, prior conflict with peers, and school size—along with anger.

Interestingly, the effect of school size is negative in both equations, indicating that schools with relatively large student enrollments tend to experience lower levels of aggression/conflict. Overall, the effect of school size has been inconsistent in past research. Some researchers have observed a positive association between school size and disorder (Gottfredson and Gottfredson 1985), suggesting that large schools have difficulty exerting social control. However, like the present study, Welsh and his colleagues (1999) observe a *negative* association between school size and disorder (or problem behavior). Although the association was not statistically significant in their analyses, the authors note that large student populations may reduce certain types of problem behavior, particularly interpersonal conflict: “Perhaps students more

easily blend into the crowd in a large school—they welcome anonymity and/or successfully practice avoidance so as to reduce conflicts” (Welsh et al. 1999:104). Clearly, additional research on school size is needed, particularly the effects of school size on different types of delinquent/disruptive behavior.

Contextual Analyses

Our HLM analyses involved the specification of multilevel models (for both Aggressive Behavior and Conflict with Peers) that incorporate the influence of individual-level and school-level characteristics (note, however, that school size has no counterpart at the individual level). An individual-level model is designed to assess the contribution of individual characteristics (within-schools factors) to student aggression/conflict. A school-level model is designed to assess the added contribution of school climate variables (between-schools factors). In the school-level model, the means (or intercepts) of aggression/conflict for each school (derived from the individual-level model) serve as outcome measures. The school-level model, then, estimates the effects of school climate variables on student aggression/conflict after adjusting for the influence of individual-level characteristics.⁹

Table 2 presents the results of the contextual analyses. As seen in Table 2, the results of the contextual analyses parallel the outcomes of our earlier aggregate-level analyses. School-level anger fails to exhibit a significant effect on Aggressive Behavior. However, school-level anger has a significant effect on Conflict with Peers ($p < .05$), controlling for individual anger and other variables. Consistent with the interpersonal-friction argument of MST, the latter finding suggests that a student is more likely to engage in fights and arguments with schoolmates if he attends a school that harbors a relatively angry student population, controlling for his own level of anger. In such schools, students may have frequent contact with angry and potentially hostile peers and, consequently, high levels of exposure to the type of interactions that promote conflict and aggression.¹⁰

A few other school-level effects in Table 2 are noteworthy. Approval of aggression exhibits a significant school-level effect on Aggressive Behavior ($p < .05$), controlling for approval of aggression at the individual level. As Felson and his colleagues (1994) discuss, this finding suggests the operation of a social control process. In addition to any internal pressure caused by personal adherence to aggression-oriented values, students may feel external pressure to engage in aggressive behaviors when such acts are valued by schoolmates (e.g., pressure to argue with, and to show contempt for, teachers for the purpose of impression management).

Unexpectedly, approval of aggression at the school level fails to exhibit a significant effect on the more specific measure of Conflict with Peers,

TABLE 2: Contextual Analyses of the Determinants of Aggressive Student Behaviors

	<i>Time 2 Dependent Variables</i>					
	<i>Aggressive Behavior</i>			<i>Conflict with Peers</i>		
	<i>b</i>	<i>SE</i>	<i>t Value</i>	<i>b</i>	<i>SE</i>	<i>t Value</i>
Time 2 independent variables						
School level						
Anger	.130	.101	1.286	.274	.113	2.426*
Approval of aggression	.226	.081	2.779*	.128	.089	1.434
Commitment to school	-.018	.112	-0.164	.043	.126	0.342
Family stability	-.229	.146	-1.566	-.227	.164	-1.379
Residential stability	.046	.129	0.358	.077	.143	0.539
Percent Black	-.053	.086	-0.616	.124	.097	1.286
Socioeconomic status	.065	.046	1.408	.069	.052	1.326
School size	-.000	.000	-2.903*	-.000	.000	-2.544*
Time 1 Aggressive Behavior	.243	.094	2.573*	—	—	—
Time 1 Conflict with Peers	—	—	—	.449	.099	4.514*
Individual level						
Anger	.275	.021	12.686*	.306	.027	10.985*
Approval of aggression	.101	.015	6.489*	.097	.020	4.822*
Commitment to school	-.067	.019	-3.400*	-.067	.025	-2.626*
Family stability	-.051	.035	-1.462	-.004	.045	-0.110
Residential stability	.030	.031	0.971	.006	.040	0.170
Race (1 = Black)	-.025	.086	-0.289	.074	.111	0.662
Socioeconomic status	.014	.019	0.744	.008	.025	0.326
Time 1 Aggressive Behavior	.322	.021	15.167*	—	—	—
Time 1 Conflict with Peers	—	—	—	.236	.023	10.173*

NOTE: Unstandardized effects shown.

* $p < .05$ (two-tailed test).

suggesting that fights and arguments with schoolmates are not encouraged by the same process. The effect in this case would be marginally insignificant ($p = .07$) in a one-tailed test, so we are reluctant to draw definitive conclusions about the relationship between aggression-oriented values and various types of aggressive behavior. However, one possible explanation for the

inconsistent effects of school-level values involves the type of audience that is likely to witness student-to-teacher versus student-to-student aggression. Student-to-teacher interaction typically occurs in the classroom, in front of a captive audience of one's peers. This fact may increase the likelihood that a student will feel external pressure to display aggressive/disruptive behavior. Although conflicts that erupt between students often have an audience, this is not always the case¹¹ (Lockwood 1997). Thus, in hostile encounters with other students, external pressure to respond with verbal or physical aggression may not be felt with the same degree of consistency.

Returning to the results in Table 2, we see that prior aggression/conflict and school size exhibit significant effects on both Aggressive Behavior and Conflict with Peers ($p < .05$). The effect of prior aggression/conflict at the school level suggests that a student is more likely to engage in aggressive behavior if he attends a school that has had problems with student aggression/conflict in the past, controlling for his own recent history of aggressive behavior. It is possible that, at the school level, our measures of prior aggression/conflict help to capture the effects of relevant school characteristics that have been omitted from the analyses, such as poor disciplinary practices or other factors that increase the likelihood of problem behavior among students.

At the individual level, four variables exhibit significant and consistent effects on both Aggressive Behavior and Conflict with Peers: anger, approval of aggression, commitment to school, and prior behavior. Students who are angry, personally adhere to aggression-oriented values, are weakly committed to school, and have a recent history of aggressive behavior tend to exhibit relatively high levels of aggression/conflict in the school setting.

SUMMARY AND CONCLUSION

Following Agnew's (1999) recommendations, we conducted a preliminary test of core MST propositions using school-level data. Drawing on data from a national sample of public high schools, we were able to construct an aggregate measure of student anger and estimate its relationship to school-level variation in aggressive/disruptive behavior. We were also able to estimate the relationship between aggregate-level student anger and individual differences in aggressive behavior, controlling for individual anger and other individual-level variables.

The results of our analyses provide mixed support for MST. According to MST, school-level differences in problem behavior should be a function, in part, of anger in the student population. In OLS analyses, an aggregate measure of student anger was significantly associated with school-level differ-

ences in student-to-student aggression (i.e., the frequency with which students report fights and arguments with other students), controlling for social disorganization and subcultural deviance variables. However, student anger failed to have a significant effect on a more general measure of aggressive/disruptive behavior that also included aggression directed toward teachers (arguing with teachers and doing things to make teachers angry). In short, the aggregate measure of student anger exhibited a behavior-specific effect.

Although Agnew (1999) did not explicitly outline behavior-specific hypotheses in his statement of MST, the pattern of effects we observe in our analyses is not particularly surprising in light of the interpersonal-friction argument contained in the theory. One reason why a high level of anger in the student population is said to foster problem behavior is because it contributes to interpersonal friction within this population. A high density of angry/upset students increases the likelihood that a student will interact with angry/upset peers and thus “get into conflicts” (Agnew 1999:141). This line of argument, in turn, implies an escalation of behaviors that seem more closely related to student-to-student aggression than student-to-teacher aggression.

Moreover, Agnew (1999:141) hinted at the idea that the interpersonal-friction argument may best apply to those segments of the population that are involved in extensive interpersonal interaction, such as “young males” who “spend much idle time in public settings” and are subject to frequent contact with each other (see also Bernard 1990). This fact may help to explain the behavior-specific effect we have observed. Students far outnumber teachers, and, for this reason alone, two-way interactions between students are likely to be more extensive than two-way interactions between students and teachers. Interactions between students are also likely to be less structured than student-teacher exchanges, perhaps creating more opportunity for the development of interpersonal friction and conflict.

With the aid of contextual (HLM) analyses, we were able to conduct a direct test of the interpersonal-friction argument. The results of this test indicate that a student is more likely to engage in fights and arguments with fellow schoolmates when levels of anger in the overall student population are high, controlling for individual anger, recent history of aggressive behavior, and other individual-level characteristics. This finding lends further support to the interpersonal-friction argument of MST, as applied to the school context.

Although the results of our analyses are mixed overall, with the effect of aggregate student anger limited to student-to-student conflict, we believe they are sufficiently encouraging to inspire further testing of MST—both at the level of schools and other macro-level social units. Depending on the outcome of such research, it may be necessary to further specify the theory, perhaps noting a special relevance of the theory to aggression and conflict

between equal-status individuals engaged in extensive interpersonal interaction. In any event, we believe the attention that the theory brings to the relationship between aggregate-level anger and interpersonal friction is itself a significant contribution. Based on the findings of our preliminary examination, the interpersonal-friction argument of MST appears to identify an additional macro-level source of aggressive behavior that is worthy of attention.

We recognize that, due to several limitations, our test of MST sheds only a limited amount of light on the merits of the theory. These limitations should be addressed in future research. First, future tests of MST would benefit from the examination of a broad range of dependent outcomes, including serious acts of crime and violence, as well as different types of negative emotions because it is possible that the emotion-behavior relationship varies by crime type (Piquero and Sealock 2000).

Second, although the theory is best tested with data from smaller areas (e.g., "face blocks" and "nominal communities"), it will be desirable to test MST with data from social units of various size, including neighborhoods, metropolitan areas, and beyond (Agnew 1999:124; see also Linsky, Bachman, and Straus 1995; Messner and Rosenfeld 1994). Because MST appears to shed light on certain aspects of problem behavior in schools, additional school-level tests of MST should also be pursued with the goal of incorporating a wider range of possibly relevant variables, such as local community, school administration, and personality factors. We recognize the possibility that our own models may be limited due to the exclusion of such variables, although our study is not unique in this regard (see also Felson et al. 1994; Welsh et al. 1999).

Third, in the course of testing the core propositions of MST with school-level data, we focused solely on main effects. We were not able to determine whether certain processes condition the effect of student anger on behavior (see note 2), nor did we explore the possible sources of student anger. If MST is correct, a number of factors are likely to shape the effect of aggregate-level anger on behavioral outcomes, such as the availability of legitimate coping resources and the presence of subcultures that encourage/reward deviant adaptations. We would also expect high levels of aggregate-level anger to result, in part from frustrating environmental conditions. In the case of schools, such conditions may include exposure to authoritarian teachers, unpleasant school surroundings (e.g., dilapidated buildings), and difficult/boring instructional materials¹² (Brezina 1996; Mayer et al. 1983). Thus, two additional issues to address in future tests of MST include the possibility of interaction effects and the sources of anger.

Further testing of MST along these lines and across different social units will require the collection of novel data, namely, data on a full range of theoretically relevant processes, including anger/frustration as well as social

disorganization and subcultural values.¹³ However, the results of our initial examination lend tentative support to certain aspects of the theory, suggesting that such efforts will be worthwhile. We believe that further evaluation of MST is also warranted because the theory appears to have implications for the control of crime, delinquency, and problem behavior. For instance, the theory draws attention to the social density of angry/upset individuals and the fact that it may vary from one context to the other. If further testing of MST generates additional empirical support, this should provide policymakers with a strong incentive to pursue anger-reduction and anger-management interventions on a wide scale, especially in schools and other settings plagued by high levels of anger and frustration (see also Agnew 1995b; Furlong and Smith 1994; Mayer et al. 1983).

APPENDIX

Pearson Correlation Matrix, Means, and Standard Deviations for the School-Level Variables (*N* = 87)

		<i>X</i> ¹	<i>X</i> ²	<i>X</i> ³	<i>X</i> ⁴	<i>X</i> ⁵	<i>X</i> ⁶	<i>X</i> ⁷	<i>X</i> ⁸	<i>X</i> ⁹	<i>X</i> ¹⁰	<i>X</i> ¹¹	<i>X</i> ¹²
T2 Anger	<i>X</i> ¹	1.00											
T2 Approval of Aggression	<i>X</i> ²	.10	1.00										
T2 Commitment to School	<i>X</i> ³	-.28	-.35	1.00									
T2 Family Stability	<i>X</i> ⁴	.21	-.29	-.31	1.00								
T2 Residential Stability	<i>X</i> ⁵	-.05	.03	.01	.21	1.00							
T2 Percent Black	<i>X</i> ⁶	-.31	.36	.38	-.49	.05	1.00						
T1 Socioeconomic Status	<i>X</i> ⁷	.28	-.29	-.25	.29	-.10	-.41	1.00					
T1 School Size	<i>X</i> ⁸	-.03	.01	.04	-.13	.19	.05	.21	1.00				
T1 Aggressive Behavior	<i>X</i> ⁹	.20	.21	-.30	.04	-.11	-.19	-.03	-.20	1.00			
T2 Aggressive Behavior	<i>X</i> ¹⁰	.27	.45	-.23	-.09	-.05	.05	-.05	-.29	.38	1.00		
T1 Conflict w/ Peers	<i>X</i> ¹¹	.11	.24	-.24	-.11	-.05	-.03	-.21	-.13	.75	.34	1.00	
T2 Conflict w/ Peers	<i>X</i> ¹²	.28	.46	-.11	-.20	-.00	.25	-.14	-.23	.33	.78	.45	1.00
Mean		2.45	2.20	5.02	0.78	0.73	0.13	4.99	1230.14	2.18	2.10	2.33	2.11
Standard deviation		0.18	0.27	0.20	0.15	0.13	0.29	0.42	902.53	0.18	0.17	0.19	0.19

NOTE: T1 = time 1; T2 = time 2.

NOTES

1. The criminogenic effects of anger are not limited to aggression, however. As Felson (1992:4) observes, anger also affects theft and other behaviors “not usually thought to have an aggressive motive”—perhaps because these behaviors can also represent the expression of a grievance (see also Agnew 1985).

2. Problems with multicollinearity interfered with our attempts to examine conditioning influences. For example, we constructed several school-level multiplicative interaction terms to test for interactions between anger and subcultural values and between anger and social disorganization. The variance inflation factors for these terms exceed 4.0, the cutoff point generally accepted as an indication of multicollinearity problems (Fox 1991). Moreover, the use of strategies specifically designed to reduce multicollinearity did not resolve the problem (see Aiken and West 1991). (When the interaction terms are excluded from the analyses, none of the variance inflation factors for the study variables exceeds 2.14.)

3. We include in our analyses all of the independent variables that exhibited a consistent and statistically significant effect in the study by Felson et al. (1994). However, we also include a measure of anger, and, whereas Felson and his colleagues tended to rely on general measures of delinquency/violence, our dependent measures focus specifically on aggressive behaviors in the school setting. As discussed later in the Data and Method section, we believe that school-specific outcome measures are particularly appropriate for the purposes of this study.

4. Unfortunately, the data are limited to male students. However, we do not view the exclusion of female students as a serious problem because males are more likely to engage in aggressive behavior. Also, although research suggests that females tend to experience anger as often as males, it is believed that males are more likely to respond to anger with aggression (for a review of relevant research, see Broidy and Agnew 1997; see also Mirowsky and Ross 1995).

5. Data indicate that the respondents lost to attrition were slightly more likely than regular participants to live in urban areas, come from broken homes, be Black, and be of lower socioeconomic status. In most cases, the difference was small, “usually less than five percent of a standard deviation” (Bachman, O’Malley, and Johnston 1978:259).

6. Because low-frequency offenders are likely to make fewer self-report errors than high-frequency offenders, the use of ordinal response categories—rather than raw frequencies—is preferable and should contribute to the general reliability of the delinquency scale (see Huizinga and Elliott 1986).

7. The number of students sampled in each school is not equal. The number ranges from 10 to 41, with a mean 25.4 and a standard deviation of 6.7. As Felson et al. (1994) noted, this is a potential problem because an unequal sample size across schools may cause the error terms to be heteroskedastic. To address this issue, we estimated the equations using weighted least squares, with the square root of the school sample size as the weight. Weighted and unweighted analyses produced an identical pattern of results (see also Felson et al. 1994).

8. We also examined the effects of the school-context variables on several items involving nonaggressive student misconduct, such as truancy, coming to class late, and copying someone else’s assignments. The effect of anger was insignificant on these measures, reinforcing our conclusion that the effect of school-level anger is specific to student-to-student aggression (conflict with peers).

9. A detailed summary of the contextual (HLM) analysis is available from the authors on request.

10. Although we followed Agnew’s (1999:140) recommendations, it should be noted that our contextual analyses provide a rather conservative test of the interpersonal-friction argument because we control for individual anger and other individual-level characteristics. According to

the results, aggregate-level anger increases the likelihood of fighting/conflict among students in general, net of individual anger. Perhaps a high density of angry students in the school population increases the chances that *any* student will experience aversive interactions with angry/upset peers and will engage in fights/arguments (perhaps in a defensive, if not offensive, role). It is still possible that the effect of aggregate-level anger is stronger among students who are themselves particularly angry (as MST might predict), although this possibility would involve a complicated interaction effect between aggregate-level and individual-level characteristics. Future tests of MST should explore such an interaction effect.

11. In Lockwood's (1997) study of school-based violent incidents, third parties (e.g., friends or relatives) were absent in approximately 40 percent of the cases.

12. Anger may also reflect an individual trait or disposition. However, this possibility is not necessarily at odds with strain theory. As Agnew (1997) described, an angry or aggressive temperament is believed to be a product of both biological factors and early socialization experiences of an aversive nature, such as harsh discipline. The ultimate sources of student anger, then, may be related to strain-related processes that are both internal and external to the school environment.

13. Longitudinal data would be desirable, especially data that allow for the examination of short-term, lagged effects—to permit the estimation of causal ordering between variables. Although individual-level data indicate that anger increases the likelihood of subsequent aggression, the issue of causal order remains a concern because data also show that the relationship between anger and aggression can flow in the opposite direction (Felson 1992; see also Averill 1982). In the present study, we did not examine lagged effects because the time lag separating the waves of data is excessive (we would not expect the density of angry students in the 10th grade to have much of an effect on behavior reported in the 11th grade). Instead, we controlled for prior behavior. This strategy increases confidence in our interpretation of effects, although it does not completely eliminate the potential problem of causal order.

REFERENCES

- Agnew, Robert. 1985. "A Revised Strain Theory of Delinquency." *Social Forces* 64:151-67.
- . 1992. "Foundation for a General Strain Theory of Crime and Delinquency." *Criminology* 30:47-87.
- . 1995a. "The Contribution of Social-Psychological Strain Theory to the Explanation of Crime and Delinquency." Pp. 113-37 in *The Legacy of Anomie Theory: Advances in Criminological Theory, Volume 6*, edited by Freda Adler and William S. Laufer. New Brunswick, NJ: Transaction.
- . 1995b. "Controlling Delinquency: Recommendations from General Strain Theory." Pp. 43-70 in *Crime and Public Policy*, edited by Hugh D. Barlow. Boulder, CO: Westview.
- . 1995c. "Testing the Leading Crime Theories: An Alternative Strategy Focusing on Motivational Processes." *Journal of Research in Crime and Delinquency* 32:363-98.
- . 1997. "Stability and Change in Crime over the Life Course: A Strain Theory Explanation." Pp. 101-32 in *Developmental Theories of Crime and Delinquency: Advances in Criminological Theory, Volume 7*, edited by Terence P. Thornberry. New Brunswick, NJ: Transaction.
- . 1999. "A General Strain Theory of Community Differences in Crime Rates." *Journal of Research in Crime and Delinquency* 36:123-55.
- Agnew, Robert, Francis T. Cullen, Velmer S. Burton, Jr., T. David Evans, and R. Gregory Dunaway. 1996. "A New Test of Classic Strain Theory." *Justice Quarterly* 13:681-704.

- Agnew, Robert and Helene R. White. 1992. "An Empirical Test of General Strain Theory." *Criminology* 30:475-99.
- Aiken, Leona S. and Stephen G. West. 1991. *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, CA: Sage.
- Anderson, Elijah. 1994. "The Code of the Streets." *Atlantic Monthly* 273 (May): 81-94.
- Averill, James R. 1982. *Anger and Aggression*. New York: Springer-Verlag.
- Bachman, Jerald G. 1975. *Youth in Transition: Documentation Manual*. Ann Arbor, MI: Institute for Social Research.
- Bachman, Jerald G., Patick M. O'Malley, and Jerome Johnston. 1978. *Youth in Transition, Volume 6: Adolescence to Adulthood*. Ann Arbor, MI: Institute for Social Research.
- Bellair, Paul E. 1997. "Social Interaction and Community Crime: Examining the Importance of Neighborhood Networks." *Criminology* 35:677-703.
- Berkowitz, Leonard. 1993. *Aggression: Its Causes, Consequences, and Control*. Philadelphia: Temple University Press.
- Bernard, Thomas J. 1990. "Angry Aggression among the Truly Disadvantaged." *Criminology* 28:73-96.
- Brezina, Timothy. 1996. "Adapting to Strain: An Examination of Delinquent Coping Responses." *Criminology* 34:39-60.
- . 1998. "Adolescent Maltreatment and Delinquency: The Question of Intervening Processes." *Journal of Research in Crime and Delinquency* 35:71-99.
- Broidy, Lisa M. 2001. "A Test of General Strain Theory." *Criminology* 39:9-35.
- Broidy, Lisa and Robert Agnew. 1997. "Gender and Crime: A General Strain Theory Perspective." *Journal of Research in Crime and Delinquency* 34:275-306.
- Bryk, Anthony and Stephen Raudenbush. 1992. *Hierarchical Linear Modeling*. Newbury Park, CA: Sage.
- Bursik, Robert J., Jr. 1988. "Social Disorganization and Theories of Crime and Delinquency: Problems and Prospects." *Criminology* 26:519-51.
- Bursik, Robert J., Jr. and Harold G. Grasmick. 1993. *Neighborhoods and Crime*. New York: Lexington.
- Cao, Lijun, Anthony Adams, and Vickie J. Jensen. 1997. "A Test of the Black Subculture of Violence Thesis: A Research Note." *Criminology* 35:367-79.
- Elliott, Delbert S., William J. Wilson, David Huizinga, Robert J. Sampson, Amanda Elliott, and Bruce Rankin. 1996. "The Effects of Neighborhood Disadvantage on Adolescent Development." *Journal of Research in Crime and Delinquency* 33:389-426.
- Ennett, Susan T., Robert L. Flewelling, Richard C. Lindrooth, and Edward C. Norton. 1997. "School and Neighborhood Characteristics Associated with School Rates of Alcohol, Cigarette, and Marijuana Use." *Journal of Health and Social Behavior* 38:55-71.
- Felson, Richard B. 1992. "'Kick 'Em When They're Down': Explanations of the Relationship between Stress and Interpersonal Aggression and Violence." *Sociological Quarterly* 33:1-16.
- Felson, Richard B., Allen E. Liska, Scott J. South, and Thomas L. McNulty. 1994. "The Subculture of Violence and Delinquency: Individual vs. School Context Effects." *Social Forces* 73:155-73.
- Fox, John. 1991. *Regression Diagnostics*. Newbury Park, CA: Sage.
- Furlong, Michael and Douglas Smith. 1994. *Anger, Hostility, and Aggression: Assessment, Prevention, and Intervention Strategies for Youth*. Brandon, VT: Clinical Psychology.
- Gottfredson, Gary D. and Denise C. Gottfredson. 1985. *Victimization in Schools*. New York: Plenum.

- Grasmick, Harold G., Charles R. Tittle, Robert J. Bursik, Jr., and Bruce J. Arneklev. 1993. "Testing the Core Empirical Implications of Gottfredson and Hirschi's General Theory of Crime." *Journal of Research in Crime and Delinquency* 30:5-29.
- Heimer, Karen. 1997. "Socioeconomic Status, Subcultural Definitions, and Violent Delinquency." *Social Forces* 75:799-833.
- Hellman, Daryl A. and Susan Beaton. 1986. "The Pattern of Violence in Urban Public Schools: The Influence of School and Community." *Journal of Research in Crime and Delinquency* 23:102-27.
- Hoffmann, John P. and Alan S. Miller. 1998. "A Latent Variable Analysis of General Strain Theory." *Journal of Quantitative Criminology* 14:83-110.
- Huizinga, David and Delbert S. Elliott. 1986. "Reassessing the Reliability and Validity of Self Report Delinquency Measures." *Journal of Quantitative Criminology* 2:293-327.
- Linsky, Arnold S., Ronet Bachman, and Murray A. Straus. 1995. *Stress, Culture, and Aggression*. New Haven, CT: Yale University Press.
- Lockwood, Daniel. 1997. "Violence among Middle School and High School Students: Analysis and Implications for Prevention." Washington, DC: U.S. Department of Justice.
- Luckenbill, David F. and Daniel P. Doyle. 1989. "Structural Position and Violence: Developing a Cultural Explanation." *Criminology* 27:419-53.
- Markowitz, Fred E. and Richard B. Felson. 1998. "Socio-Demographic Differences in Attitudes and Violence." *Criminology* 36:117-38.
- Matsueda, Ross L., Rosemary Gartner, Irving Pilavin, and Michael Polakowski. 1992. "The Prestige of Criminal and Conventional Occupations: A Subcultural Model of Criminal Activity." *American Sociological Review* 57:752-70.
- Mayer, G. Roy, Tom Butterworth, Mary Nafpaktitis, and Beth Sulzer-Azaroff. 1983. "Preventing School Vandalism and Improving Discipline: A Three-Year Study." *Journal of Applied Behavior Analysis* 16:355-69.
- Mazerolle, Paul. 1998. "Gender, General Strain, and Delinquency: An Empirical Examination." *Justice Quarterly* 15:65-91.
- Mazerolle, Paul, Velmer S. Burton, Jr., Francis T. Cullen, T. David Evans, and Gary L. Payne. 2000. "Strain, Anger, and Delinquent Adaptations: Specifying General Strain Theory." *Journal of Criminal Justice* 28:89-101.
- Mazerolle, Paul and Alex Piquero. 1997. "Violent Responses to Strain: An Examination of Conditioning Influences." *Violence and Victims* 12:323-43.
- . 1998. "Linking Exposure to Strain with Anger: An Investigation of Deviant Adaptations." *Journal of Criminal Justice* 26:195-211.
- Messner, Steven F. and Richard Rosenfeld. 1994. *Crime and the American Dream*. Belmont, CA: Wadsworth.
- Mirowsky, John and Catherine E. Ross. 1995. "Sex Differences in Distress: Real or Artifact?" *American Sociological Review* 60:449-68.
- Paternoster, Raymond and Paul Mazerolle. 1994. "General Strain Theory and Delinquency: A Replication and Extension." *Journal of Research in Crime and Delinquency* 31:235-63.
- Piquero, Alex R. and Matthew Hickman. 1999. "An Empirical Test of Tittle's Control Balance Theory." *Criminology* 37:319-41.
- Piquero, Nicole Leeper and Miriam D. Sealock. 2000. "Generalizing General Strain Theory: An Examination of an Offending Population." *Justice Quarterly* 17:449-84.
- Sampson, Robert J. 1987. "Urban Black Violence: The Effect of Male Joblessness and Family Disruption." *American Journal of Sociology* 93:348-82.
- Sampson, Robert J. and W. Byron Groves. 1989. "Community Structure and Crime: Testing Social-Disorganization Theory." *American Journal of Sociology* 94:774-802.

- Sampson, Robert J., Stephen W. Raudenbush, and Felton Earls. 1997. "Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy." *Science* 277:918-24.
- Smith, Douglas C., Michael Furlong, Michael Bates, and John D. Laughlin. 1998. "Development of the Multidimensional School Anger Inventory for Males." *Psychology in the Schools* 35:1-15.
- Tygart, Clarence E. 1988. "Strain Theory and Public School Vandalism: Academic Tracking, School Social Status, and Students' Academic Achievement." *Youth and Society* 20:106-18.
- Veysey, Bonita M. and Steven F. Messner. 1999. "Further Testing of Social Disorganization Theory: An Elaboration of Sampson and Groves's 'Community Structure and Crime.'" *Journal of Research in Crime and Delinquency* 36:156-74.
- Welsh, Wayne N., Jack R. Greene, and Patricia H. Jenkins. 1999. "School Disorder: The Influence of Individual, Institutional, and Community Factors." *Criminology* 37:73-115.
- Welsh, Wayne N., Robert Stokes, and Jack R. Greene. 2000. "A Macro-Level Model of School Disorder." *Journal of Research in Crime and Delinquency* 37:243-83.
- Zillmann, Dolf. 1979. *Hostility and Aggression*. Hillsdale, NJ: Lawrence Erlbaum.

POLICING IS NOT A TREATMENT: ALTERNATIVES TO THE MEDICAL MODEL OF POLICE RESEARCH

DAVID THACHER

Recent research about policing often aspires to emulate the model of medical research—randomized experiments designed to establish conclusively what works. This approach to scientific research produces instrumental knowledge about the best means to a given end, and it can contribute usefully to many important debates in policing. But by itself, it cannot speak to the full range of concerns relevant to criminal justice practice, which is characterized by a great variety and ambiguity of values. Police will benefit from instrumental knowledge, but they will also benefit from better forms of practical reasoning—something that scholarship can help to develop in ways that this article describes. Knowledge about policing should be more like legal knowledge than medical knowledge (or more precisely, than the aspect of medical knowledge that criminal justice scholars have emphasized).

The past two decades have seen a new model of research come to dominate the study of policing. Exemplified by the domestic violence experiments funded by the National Institute of Justice, this model of research has sought to demonstrate what works in policing in the same way that the medical community demonstrates what works in medicine. It marshals the randomized experiment in a struggle to understand how police can best reduce crime. It is a model that has increasingly been proposed or applied throughout the field of criminal justice (e.g., Blumstein and Petersilia 1995; DiIulio 1991:chap. 6; MacKenzie 2000; Sherman et al. 1997), and at times it has commanded a large share of research effort and money from key funding sources like the National Institute of Justice. Most important, it has also come to dominate the thinking of many leading researchers. For example, in a recent special issue of *Crime and Delinquency* devoted to experimental criminology, the issue editors asserted, no doubt correctly, that “there is little disagreement that ex-

I would like to thank Martin Rein and the editor and anonymous reviewers of this journal for helpful comments on an earlier draft of this article. Address correspondence to David Thacher, Gerald R. Ford School of Public Policy, University of Michigan, 440 Lorch Hall, Ann Arbor, MI 48109-1220.

JOURNAL OF RESEARCH IN CRIME AND DELINQUENCY, Vol. 38 No. 4, November 2001 387-415
© 2001 Sage Publications

periments provide a superior method for assessing the effectiveness of a given intervention” (Feder and Boruch 2000).

This research model has been advanced most forcefully and clearly by Lawrence Sherman, who has drawn on the powerful analogy of medical research to justify and guide the development of this type of police research.¹ In Sherman’s (1984) view, different uses of police discretion can be understood as different “treatments” likely to have different effects, and researchers can use randomized trials to determine which of these treatments works best. Just as the medical community subjects new drugs and treatments to controlled experiments to determine their worth, so the policing community should investigate discrete ways to use its discretion—whether to make arrests for domestic disputes or shoplifting, whether to stop motorists to search for guns, and so on (cf. Sherman 1992, 1998, 2000). Sherman has drawn extensively on the analogy of medical research to articulate the methods and ethics of this sort of research, suggesting, for example, that failure to heed its conclusions might constitute police “malpractice” (pp. 72, 75). More recently, he put forth an ambitious proposal to organize police work around evidence, calling for empirically tested guidelines and performance measures that would codify the most recent research results, drawing again on models in medicine for guidance (Sherman 1998).

This type of research has helped to advance knowledge about policing in many ways, and as John DiIulio (1991) has pointed out, it is often the *only* sort of knowledge that has any hope of overcoming the ingrained ideological positions that characterize the most polarized policy debates (pp. 252-58). Nevertheless, if taken to extremes, the aspiration to model police research solely after experimental research in medicine could lead the field astray. This article will explain the nature of that risk, and it will advance an argument about how the research agenda in policing should be expanded. The basic argument is that as an institution, policing is characterized by a high degree of value pluralism and that this fact limits (but does not eliminate) the role that any type of instrumental knowledge can play in guiding decision-making. Police will clearly benefit from instrumental knowledge such as that produced through experiments. But they will also benefit from better forms of practical reasoning, including better interpretations of ambiguous values and better ideas about how trade-offs among values should be made—something that research can help to develop by moving beyond the medical research paradigm. Knowledge about policing should look more like legal knowledge than medical knowledge (or at least the aspects of medical knowledge that have been emphasized in criminal justice accounts of that field, since even medicine has never survived on a diet of instrumental knowledge alone).

*VALUE PLURALISM AND THE LIMITS
OF INSTRUMENTAL REASONING*

Decisions about what should be done are practical decisions, requiring the people who make them to take everything relevant into account (Toulmin 1988; Williams 1985). But what constitutes "everything" varies from institution to institution as well as from decision to decision within an institutional setting. In some cases, everything encompasses many things, and to act properly means to understand many goals and resolve the conflicts among them. But in other cases, everything encompasses only a few relevant considerations, and it is only necessary to decide the best means to a limited number of clear goals. One way to describe the relative variety and clarity of considerations that is relevant to a decision is through the idea of value pluralism, which can be viewed as a characteristic of institutional settings that is large when there are many ambiguous values and small when there are only a few straightforward aims. The level of value pluralism, in turn, has important implications for the form that useful knowledge should take.

Experimental research produces instrumental knowledge, or knowledge about the best means to a given end. As Max Weber (1958) has put it, the findings of this brand of social science lead to conclusions of the form, "if you take such and such a stand, then, according to scientific experience, you have to use such and such a *means* in order to carry out your conviction" (p. 151). That type of conclusion can go a long way toward answering the question of what should be done in situations in which value pluralism is small because all that matters is which means is most effective at promoting one clear and overriding end. But when value pluralism is large, instrumental knowledge leaves many questions unanswered and cannot serve as a firm guide to action. If ends are ambiguous, changing, multiple, and conflicting, the question of what means promote them cannot even arise in a straightforward way. As Donald Schön (1983) has put it,

Technical rationality depends on agreement about ends. When ends are fixed and clear, then the decision to act can present itself as an instrumental problem. But when ends are confused and conflicting, there is as yet no "problem" to solve. A conflict of ends cannot be resolved by the use of techniques derived from applied research [i.e., instrumental knowledge]. (P. 41)²

Instrumental knowledge can offer limited guidance in this type of situation, but it cannot fully answer the question of what is to be done. It must remain silent about precisely the aspects of that question that are most vexing—what it is that the vague ends ought to mean in this situation and how to resolve the

conflicts among them. The remainder of this section will explain the difficulties that this commonsense observation raises for the medical model of police research. The next section will then ask whether other types of scholarship can answer the questions raised by value pluralism.

Value Pluralism in Policing

When criminal justice scholars have drawn on the model of medical research, they have described that field in terms of its body of instrumental knowledge, especially the findings of randomized experiments about the health effects of drugs and clinical procedures. That body of knowledge does not make up the whole of medical scholarship (for example, it leaves out the study of medical ethics), but it obviously has extremely significant implications for some aspects of medical practice. It is particularly important for individual treatment decisions in which the patient's health is the overriding concern, and decisions like that lie at the center of the discussions of medical research and medical practice that have appeared in the criminal justice literature. Sherman (1984), for example, has described the relationship between an oncologist's practice and scientific knowledge about the effects of cancer treatment in this way:

If cancer treatment experiments consistently showed that chemotherapy produced higher survival rates than radiation for all types of people, oncologists would probably feel bound to prescribe chemotherapy. They could be sued for malpractice if they tried to vary the recommended treatment according to the race, age, sex, or "moral worth" of the patient (unless there was an interaction effect between those variables and the chemotherapy treatment). (P. 75)

In this example, an oncologist's decision about whether to use chemotherapy depends only on the best knowledge about how that treatment will affect the patient's likelihood of survival. Other considerations, such as the patient's moral worth, are irrelevant unless they mediate the health effects of the treatment. In more recent writings, Sherman (1998) has acknowledged that in practice, doctors do not always carry out the conclusions of medical research as readily as the oncologist in his earlier example. But the normative picture has not changed: The focus is still on medical decisions in which doctors *should* apply research findings to their patients because health is the overriding value. Given this image of medical decision-making, instrumental knowledge is immensely important for medical practice, to the point that departures from the prescriptions of research probably constitute malpractice.

In reality, medical decisions are often more complicated than Sherman's (1984) example has suggested because they involve a wider variety of

considerations than the single goal of improving a patient's health. As I will argue later, there may be many legitimate reasons why an oncologist would not treat her patient with chemotherapy even if research showed that that treatment produces the highest rates of survival. But for present purposes, it is not important to decide how accurately the oncology example captures medical decision-making in general.³ What is important is that it is clearly incomplete as an analogy for policing. That does not mean that instrumental knowledge is irrelevant for police, but it does mean that such knowledge cannot answer many of the questions that policing confronts.

Police face more difficulty than Sherman's (1984) oncologist in part because they confront a broader range and a more ambiguous mix of values. Reducing crime is clearly one important goal for the police. But it must compete with other goals like equity, due process, just deserts, and parsimony. The movement for scientific research based on randomized experiments has largely ignored this fact, behaving as if policing was solely concerned with crime reduction. This criticism may sound unfair. Some of these researchers have suggested that experimentation could just as easily focus on other values as on crime reduction (even if it has not yet done so very often), and they have sometimes recognized constraints on the ability of police to adopt their scientific conclusions. I will return to these issues in a moment. Here, it is enough to note that Sherman himself has acknowledged the point being made here, suggesting that experiments in police discretion are attractive primarily to a "professional crime control" model of policing—one that sees crime reduction as the overriding value in police work (Sherman 1984:69 ff.). His defense of experiments in policing rests on this simplification of the values police work should serve. For example, he has rightly noted that a continued commitment to the idea that the police deliver justice (as opposed to preventing crimes) "will pose a major obstacle to immediate implementation of any new policies based on the results of [experimental] research" (Sherman 1984:75). More recently, he noted that experiments will not appeal to those who defend the importance of "retribution" (Sherman 1998:9).

The problem is that ideals like justice and retribution, as well as many other values that are distinct from crime prevention, do and should still hold considerable sway over police agencies. If medicine truly were committed to a single, self-evident value like health, it would be the exception rather than the rule. Many and perhaps most spheres of life are governed by multiple and conflicting values (Berlin 1988; Larmore 1987). In policing, the continuing importance of multiple values derives in part from the type of institution it is, namely, a public institution that wields the state's monopoly on force. Citizens grant the state that monopoly on the condition that it will be used fairly, parsimoniously, and equitably (e.g., Rawls 1971). More generally, the use of force raises the general demands of morality, which insist we treat people as

ends in themselves—individuals with rights and dignity, not simply means to whatever end we wish to pursue (whether the end is crime reduction or something else) (Kant 1964). These considerations have played important roles in justifying values like just deserts in criminal justice, and those values compete strongly with crime reduction, qualifying any conclusions we might reach solely on its grounds (e.g., von Hirsch 1985). Moreover, even the ideal that police should promote public safety is ambiguous. “Safety” may have as much to do with disorder and fear as it has to do with crime prevention, and each of those ideals—including the ideal of crime prevention, since “crime” takes many forms—is itself subject to interpretation and argument (Moore and Trojanowicz 1988; Zimring and Hawkins 1997).

Consequently, a central problem facing the police is how to apply and weigh the ambiguous and conflicting considerations of desert, equity, liberty, and safety—not simply how best to achieve any of them in isolation. Sherman (1998) and others have sometimes lamented the resistance of police to the conclusions of recent scientific experiments about crime prevention. But although some portion of this resistance may truly stem from misguided traditionalism and irrationality, another, irreducibly large portion probably stems from the inappropriateness of the conclusions for an institution tied to many values. It is simply not possible to develop legitimate guidelines about what the police should do based only on instrumental knowledge about the effect of police actions on crime.

Again, similar observations apply even to medicine, so there, too, instrumental knowledge cannot tell doctors everything they need to know; there, too, “resistance” to research findings may reflect a commitment to other values rather than plain irrationality. Nevertheless, medicine has at least one device for reducing its value conflicts that is not available to policing. Health care is organized as a voluntary relationship, and the patient can usually opt out of it—she can ignore doctor’s orders or withhold consent for surgery. Doctor’s orders are not really orders in the same way as decisions by police are. They are trumped by the value of free choice, which in turn enables patients to decide their own trade-offs among substantive values. A patient at risk for lung cancer may reject her doctor’s well-researched advice to quit smoking, reasoning that the added years of life are not worth the price of abandoning this indulgence. Another patient whose health depends on a blood transfusion may decline the treatment for religious reasons. A chronically ill patient may reject treatment that might prolong her life to spare her family (or even herself) from protracted suffering. In all of these examples, the voluntary nature of the health care relationship preserves some possibility for other values to influence medical decisions, without much need for the doctors (or the researchers who tell them what works) to weigh those values in their own decision-making.

One should not, of course, put too much weight on these observations. In practice, the notion of informed consent turns out to be complicated because it ignores the reality of sick patients who “are often fearful and anxious, suffering the physical and psychological effects of their illness, and deeply desirous of putting their treatment in the hands of health care professionals they can trust,” as one medical ethicist put it (Brock 1991:116; cf. Miller 1981). Consequently, doctors themselves must often consider values other than health in deciding what to do or recommend, and research findings that tell them which treatments promote health can no longer dictate their decisions. That problem has stimulated extensive scholarship about medical ethics, which is as much a part of medical knowledge as the findings of randomized experiments are. Nevertheless, here it is enough to note that even a problematic notion of informed consent can sometimes simplify the doctor’s task. It helps to disentangle health from other values and carve out a space where doctors can pursue it with fewer distractions. The larger that space is, the greater the share of doctors’ decisions that instrumental knowledge can direct with authority.

Police demands, on the other hand, are final, so the values they neglect cannot be picked up by someone else. Police must always make their decisions with an eye to all the relevant values. They cannot disregard equity and presume that those who value it more highly will opt out of their demands, the way that those who value quality of life or other considerations more than they value health can ignore their doctors. That is an important reason why research anchored in a single value like crime control can almost never legitimately prescribe police action on its own.

Consider the value of just deserts (e.g., von Hirsch 1976, 1985, 1993). As the gatekeepers to the punishment system, and as an agency whose actions inevitably ascribe a measure of blame, police must take some guidance from this principle in deciding when to make arrests. But guidelines based only on research about crime prevention will give desert no sway at all. To take only the simplest example, the well-known conclusions of the National Institute of Justice’s domestic violence experiments suggest that police will have the most success reducing this crime if they arrest the employed but not the unemployed and residents of affluent neighborhoods but not poor ones (Sherman 1998). But guidelines that prescribed this course of action would run badly afoul of desert principles. Two offenders who committed the same offense and who were therefore equally blameworthy would receive widely disparate treatments—a clear violation of the proportionality that desert demands. Some proponents of the just deserts ideal would even object to the use of prior record (aka “repeat calls”) on these grounds. “Evidence-based policing” raises the same objections as selective incapacitation (von Hirsch 1985).⁴ In an era when the central problems of policing involve equity and the

use of authority as much as crime prevention, it is especially important to investigate those objections thoroughly.

Sherman has acknowledged these points in many places. For example, in his review of the domestic violence experiments, he asserted that "law, ethics, and politics all forbid" the use of considerations like employment status as a basis for police policy for arrest (Sherman 1992:185). At other times, however, he has been more ambiguous. For example, in his most recent statement about this dilemma, Sherman reviewed the evidence just described and then suggested that "this research evidence could support guidelines for policing domestic violence that differed by neighborhood and absence or presence of the offender [another factor that interacts with arrest to predict recidivism]" (Sherman 1998:8). The trouble is that this proposal has implications for the values of just deserts and equity that cannot be addressed by research about crime prevention, and for that reason it calls for a different type of investigation and debate. Sherman himself insightfully analyzed some of these questions in his own work on the domestic violence experiments (esp. Sherman 1992). But in general, the policing field has not carried this dialogue forward by analyzing the full range of implications that Sherman's guidelines and other policy suggestions would have, nor has it engaged the normative questions raised by similar conclusions drawn in other experimental research. Reference to law and ethics usually signals the end of inquiry, not the beginning of it.

Benchmarks raise many of the same difficulties as guidelines do. In recent work, Sherman (1998) has suggested that independent of the use of guidelines, agencies should use benchmarks that evaluate officers or districts against predictions about how much recidivism they should expect (predictions based largely on demographic characteristics of their caseloads), and he also suggested that a national system of performance measurement should rank police departments according to their risk-adjusted crime rates, just as states have ranked hospitals according to their death rates for different diseases. But these systems would crowd out important values. Officers, districts, and departments would be judged poor performers if they resisted the urge to reduce crime to protect values like due process, desert, and parsimony. Performance measurement can surely shape behavior powerfully, but it is precisely for that reason that we must be certain we measure the right thing. Even for medicine, health alone is probably the wrong index of success when used in isolation.⁵ For policing, crime alone is clearly not the right thing to measure (Moore et al. 1999).

It helps to some degree to draw normative boundaries around a domain where crime prevention holds sway, just as patient consent partially bounds medical action in pursuit of health. Sherman (1984) has implied this solution by suggesting that research implications could be countermanded if they

discriminated on the basis of “constitutionally forbidden considerations” (p. 78). But it is not obvious that this trump card gives all the weight to desert and equity that it should; there may very well be some residual role for those values to play, as is often the case where values conflict (Williams 1978). The situated judgments police make about whether to arrest an individual may involve an attempt to give proper consideration to those other values.

Situated decision-making like this often makes considerable sense. When faced with multiple values, the best solution is often not to try to rank them properly at the outset (which is what the law does when it forbids or permits police to take certain factors into account and what cost-effectiveness analysts do when they weight distinct values in an overarching objective function). Instead, it is often better to bring all of them to bear on particular situations. By doing that, it is sometimes possible to arrive at solutions that strike most people as legitimate, even when the same people *cannot* agree on the relative worth of each value in the abstract (Jonsen and Toulmin 1988; Sunstein 1995). Indeed, trade-offs among ultimate values are extremely difficult to make, so it should not be surprising if the proper choice depends heavily on context. When police make situated decisions about whether to invoke the criminal law, they may be engaging in this sort of practical reasoning—not the “capriciousness” or “malpractice” that Sherman (1984:79) and others have sometimes described as the only alternative to the prescriptions of experimental research.

It is because they work in an environment of great value pluralism that police cannot avoid these dilemmas. As Frank Remington (1965) wrote 35 years ago, police practices must “be tested against an objective which is inevitably an ambiguous and uncertain one” (p. 361). For that reason, instrumental knowledge can only speak to a limited portion of the decisions police must make. Often, the core uncertainty in policing is not about which means best realize a clear and given end but about how exactly each of many ambiguous ends is relevant in a particular situation and which end deserves how much priority over the others. This idea has important implications for the form that police research should take.

TOWARD A DIFFERENT AGENDA FOR POLICE RESEARCH

Because value pluralism looms so large in policing, the type of research that has recently overtaken the field can never speak to more than a partial share of its practical concerns. At the least, this observation may explain some of the “resistance” of police to new research findings. When police cling to their judgments in the face of contrary research, they are not necessarily exercising “whim and prejudice” and “capriciousness” (Sherman

1984:81, 79). It possible that they are guided, implicitly or explicitly, by important values that research has neglected.

Apart from this caution, what does value pluralism entail for the content of useful police research? On one view, we should simply be fanning out the subjects of research, analyzing them using same methods throughout. In *Preventing Crime*, the magnum opus of the medical model school in police research, Sherman et al. (1997) wrote the following:

Many if not most government programs, of course, have multiple objectives. . . . Considerations of those other goals [apart from crime prevention] can be entirely appropriate in other contexts, and can be examined by scientific program evaluations. . . . Causing police to treat domestic violence victims more politely, to provide victim assistance, or to gather better evidence at the scene could all be important objectives of police training. Controlled experiments could show whether training accomplishes those important goals. (P. 2-16)

Few careful evaluations of this sort have actually been done,⁶ but those who hold this view suggest that they could be in principle. More strongly, they insist that they *should* be evaluated in this way. Sherman et al. (1997) wrote: "Absent a strong scientific approach to program evaluation . . . descriptive evaluations of efforts say little about results for other goals besides crime prevention" (p. 2-16).

There is much truth to this position, and solid research into the way in which police actions affect values other than crime control could be very useful for policing because it would strengthen the ability to assess different possible courses of action. At the same time, some of these other values may be more closely tied to police actions than crime prevention is. In other words, the actions are more deontological than instrumental. When that is the case, experimentation is beside the point. We may not know a priori what effect a specific arrest is likely to have on recidivism, so it is essential to do good causal research to find out. But knowing whether a specific arrest upholds due process is different: The analysis involves interpretation rather than causation. As Sherman (1984) lucidly has observed in his original article on this subject, experimental research is most important in cases in which there is some "outcome" that is separated in time from the "treatment," as in the case of recidivism in domestic violence.

Of course, it is still possible to ask whether some managerial intervention leads officers to respect due process or other values more than they otherwise would have. Sherman et al. (1997) suggested this possibility in the quotation above, which suggests that research might ask whether a particular training curriculum causes officers to treat victims more politely. Again, that sort of

research could contribute in important ways to needed knowledge about policing. But it is important to note that it sets a higher standard than experimental researchers currently apply to studies of crime reduction because it calls for knowledge about the way in which managerial action can promote desired officer actions rather than knowledge about which officer actions should be desired. Applying the same standard to their research, it would be necessary to study not simply whether arrest deters domestic violence but also whether a particular policy or managerial practice encourages officers to *use* arrest where it is prescribed. Such research is not logically outside the scope of the experimentalist paradigm, but in practice it has not been taken up.

More important, framing the research issue in this way—as a question of the effect of managerial action on the behavior of officers—displaces more immediate and equally difficult and important questions. Those questions center on the meaning and appropriateness of the officers' actions: how exactly an ambiguous value like “due process” or even “politeness” is relevant to different kinds of situations that police officers confront and how those values should be balanced against other aims in a particular context. In principle, the research on police management that Sherman suggested would address these questions along the way because it is not possible to say whether managerial actions promote politeness without determining what the value of politeness should mean in specific situations. In practice, however, experimental research (like positivist research in general) usually neglects the sophisticated normative analysis that this type of question calls for (Miller 1999; Selznick 1961; Zald 1991). Where the logic of the experimental method dominates, the definition of scientific rigor pays detailed attention to how well a study eliminated rival hypotheses (e.g., Sherman et al. 1997), but it usually has little to say about whether the research has developed and justified an appropriate definition of the policy objectives that it uses as a yardstick.

This lacuna is not especially harmful for research that focuses on relatively clear goals like crime prevention (although even in that case, it may be appropriate to analyze the nature and importance of the crimes prevented, e.g., Zimring and Hawkins 1997). It becomes more problematic when scholars venture into more ambiguous territory. The study of disorder, for example, calls for sophisticated analysis of what order means in a community that has only rarely been undertaken in the scholarly literature on that subject (see Skogan 1990:chaps. 1-2). The study of equity (Thacher 2001b; Thurrow 1970), due process (Skolnick 1966), excessive force (Klockars 1996), and accountability (Thacher 2001a) also requires at least as much sophisticated normative interpretation as skillful causal analysis. Some of the most

important uncertainties about how police actions promote or hinder these values are not uncertainties about what consequences the actions have. Instead, they are uncertainties about the proper interpretation of these values, how they apply in particular situations, and what it would mean for either the actions themselves or their consequences to promote them.

In sum, if there are many, sometimes-ambiguous values that should guide a practice (rather than a single clear-cut value like crime prevention or health), then instrumental knowledge may not be able to inform many of its most pressing concerns. Working amidst value pluralism means that problem setting—figuring out which values are important in a situation and deciding how to evaluate different courses of action—is at least as important as problem-solving. Police need better structures of practical reasoning (Millgram 1997) as much as they need better instrumental knowledge.

Positivism and Practice

The positivist tradition in social science denies that scholarship can play a role in answering questions like these, arguing that science has no special competence to decide questions involving values (Black 1973; Weber 1958). On this view, social science cannot inform practice at all unless there is a clear division of labor between the two. That division of labor is best described as a client-professional arrangement between the practitioner and the analyst—one in which the practitioner provides the analyst with a clear set of (weighted) values and the analyst determines how well different interventions promote them. Joan Petersilia and Susan Turner (1993) have provided an example of this position in a description of their own work in evaluating intensive supervision parole programs: “The criteria for judging an ISP program’s success should be straightforward,” they wrote: “Did it achieve what it was intended to accomplish? However, there are often diverse, sometimes conflicting, perceptions about ISP’s character and objectives.” Their solution is to advocate for clarification:

Jurisdictions need at the outset to specify their objectives, what mechanisms are supposed to accomplish those objectives, and how program effectiveness will be judged. . . . If crime control rather than rehabilitation is the primary goal, that should be made explicit at the outset. If a jurisdiction is primarily interested in delivery of an intermediate punishment, even if it does not reduce recidivism rates, that also should be made clear. Otherwise, the public will see the observed changes in recidivism rates as an indication of “failure.” (P. 326)

The authors expressed a very real frustration of the evaluation researcher committed to the position that she herself cannot traffic in values—the posi-

tion that to the extent that values must underpin the analysis at all, they should come explicitly from practitioners. But this position is not entirely consistent, for it ends up taking its own strong normative position in telling policymakers how to make policy, that is, insisting that policy must take clear, unambiguous, and final positions on central value concerns (as when Petersilia and Turner 1993 implore policymakers that their ultimate aims "should be made explicit at the outset"). Practically speaking, it may not be terribly important if this stance reveals an inconsistency in the positivist philosophy. What is important, however, is that it is not a realistic prescription for public policy. There are good reasons to believe that policymakers do not want to be so single-minded in their pronouncements and that that fractured body called "the public" does not want them to do so either. Building a political coalition for any policy means tying together diverse and contradictory aims, and the almost inevitable result is different from an unambiguous, crystallized purpose. Moreover, many philosophers argue that public policy often promotes multiple aims that are all valuable to nearly everyone, that cannot all be satisfied at once, and that cannot be weighted or ranked in their order of importance in the abstract (Berlin 1988; Chang 1997; Tribe 1972). When it does, it is not possible even in principle to describe anything like a "social welfare function" that specifies the relevant values precisely and describes the way in which those values should be traded off against one another, which is what positivism would demand to transform normative questions into technical ones successfully. Martin Rein (1976) made these points 25 years ago:

"Clients" can rarely provide a clear, unambiguous, and internally consistent statement about what they value. This is especially true of government, where competing interests are so widespread that consensus can often be purchased only at the price of ambiguity. Indeed, the aims of policy are always ambiguous, inconsistent, and conflicting, and as a result there is no simple consensual criterion, such as effectiveness, against which to judge performance. (P. 62)

Thus, the division of labor between politics and analysis can rarely be made cleanly, so the analyst cannot escape the challenges of value pluralism.

From a positivist perspective, this diagnosis of policing as a field unavoidably plagued by value pluralism has no implications for the form that knowledge should take; it only has implications for its scope. A strict positivist who accepted my diagnosis would suggest that institutions other than science (notably, the police themselves and, especially, those who oversee them) would have to take full responsibility for deciding what is to be done in the many cases in which values are unclear or in conflict (Black 1973).⁷ Policing may simply be what Charles Lindblom (1981) has called an "indeterminate practice," one in which scientific knowledge has little role to play. As

suggested above, this conclusion should at least caution us against criticizing police for their resistance to scientific knowledge, which may not address the full range of their concerns. It might also caution us to moderate our claims about how much research can offer and, therefore, what level of resources it should command.

Scholarship and Practical Reasoning

Perhaps because, as an academic myself, I can hardly stomach the latter conclusion, I do not believe that scholarship has nothing to say about the problems raised by value pluralism. This is not the place to mount yet another extensive critique of the positivist position and the possibilities it neglects. But there are vibrant traditions of scholarship that have helped to inform the questions raised by value pluralism.

Some of those traditions are close at hand for students of policing. Within criminal justice, the field of penology saw a resurgence of philosophical literature in the 1970s that was at least as influential as empirical research in shaping punishment practice. Most important, by clarifying and justifying neglected concepts like desert and parsimony, and by challenging long-standing but unexamined utilitarian ideals, these studies helped to call the dominant rehabilitative ethic into question and thereby catalyze significant changes in punishment practices (e.g., Morris 1974, 1982; von Hirsch 1976, 1985). Empirical research about what works in reducing recidivism also influenced these changes (esp. Lipton, Martinson, and Wilks 1975). But evaluation research did not stand on its own, leaving all the relevant value questions to practitioners on the assumption that scholars had no business trafficking in values. Normative scholarship complemented the empirical (though of course, the conclusions offered by both are contested). Analogous scholarship has been scarce in policing, but Kleinig (1996) is one important example.

It would be misleading, however, to suggest that scholarship must be one or the other—that *only* nonempirical philosophical studies can address the concerns raised by value pluralism. Much empirical scholarship does grapple with values. One way to seek knowledge that can help police to cope with value pluralism—knowledge about the content of ambiguous values and ways of thinking about trade-offs among them—is by closely studying the nuances of police practice and thinking. The tradition of qualitative research, which lately seems to have lost influence in policy-oriented police research, sometimes aims precisely to develop this sort of knowledge.⁸ In at least one of its many manifestations, it examines the content of everyday understandings to clarify their contours—“to figure out from what the native says and does what the devil he thinks he’s up to,” as Clifford Geertz (1983) put it famously,

if a bit archaically. This account of the aims of ethnography is very close to Isaiah Berlin's (1999) account of the aims of philosophy:

The task of philosophy, often a difficult and painful one, is to extricate and bring to light the hidden categories and models in terms of which human beings think . . . , to reveal what is obscure or contradictory in them, [and] to discern the conflicts between them that prevent the construction of more adequate ways of organising and describing and explaining experience. (P. 10)

Thus, the type of ethnographic analysis that Geertz described can serve as an essential first step in normative inquiry by articulating the core values that currently underlie a practice, as well as the way in which those values are brought to bear on particular situations. Because it is grounded in empirical study, it helps to contextualize normative considerations by locating them in the situations in which they actually arise (Hoffmaster 1992; Toulmin 1988). Moreover, this descriptive work can serve as a starting point for normative argument. By revealing the implicit frameworks that guide police decision-making, this research opens those frameworks up for critical scrutiny. Even though researchers themselves cannot claim to know the best structure of practical reasoning for certain, their work can open up a dialogue about it among scholars, the policing profession, and outside stakeholders.

Police research used to give these issues considerable attention. Many of the exploratory studies during the early years of police research at least partly took this form (e.g., Skolnick 1966; Westley 1971; Wilson 1968). None of them tried self-consciously to develop the sort of structure of practical reasoning that this article has argued is a pressing concern in policing. But some of them served an important critical purpose in revealing the way in which police interpreted important ideals, such as due process. Later research went further than that, notably, William Ker Muir's (1977) study of police as "streetcorner politicians." Through a mixture of philosophy and qualitative analysis, Muir developed a useful framework that described some of the central ethical choices police officers made in their daily work and offered arguments about how good police officers made them. By suggesting the nature of the "tragic view of human nature" that officers needed and the ways in which police organizations could promote it, Muir offered practical guidance for policing.

These earlier studies spoke to many concerns that experimental criminology as it is practiced today cannot address on its own. But to do justice to the most vexing problems that value pluralism poses for the police, scholarship needs to investigate those problems in a sustained and cumulative way. It is not possible to give a complete account of what that research program might look like here, but the next section will describe two examples of research

that offer glimpses of one possibility. The remainder of the article will then explain how those projects might serve as a starting point for a program of police research organized along the lines of legal scholarship rather than medical scholarship, with the aim of complementing rather than replacing the experimental program.

Police Research as Legal Inquiry

One example of research that potentially leaves room for both normative and empirical inquiry is George Kelling's (1996) recent work on police discretion, which in turn built on earlier ideas advanced by Frank Remington (1965) and others. In work with several police agencies, Kelling organized dialogues with police and citizens to develop guidelines that could inform the use of discretion. The basic method was to present the participants with prototypical situations in the form of vignettes and ask for their considered judgments about how the police should act. For example, the problems posed might involve whether police should break up a particular sidewalk gathering, whether they should ask a particular driver to consent to a vehicle search, or how they should handle complaints about a particular disorderly person. In the process of considering these situations, it is possible to clarify the considerations that the participants bring to bear on the use of police discretion—especially, which values they invoke and how context affects the way they apply them—and to subject those considerations to critical scrutiny. In short, it involves figuring out—in this case from what they say—what the devil they think they are up to.

The process Kelling (1996) has outlined could easily be informed by instrumental knowledge about what works, but it cannot be reduced to it. Its merit lies in the room it makes for the full exercise of practical reason—both problem setting and problem-solving—as opposed to the sole exercise of instrumental reason. Moreover, it pays proper attention to context. Rather than seeking to develop abstract statements about what principles should guide police decision-making in general, Kelling's approach sought to develop specific guidelines about what should be done in prototypical situations. This approach develops a taxonomy of hard cases rather than a statement of abstract principles, and in doing so makes room for situated judgments that are sensitive to context (Jonsen and Toulmin 1988; Sunstein 1996).

Carl Klockars (1996) has proposed a similar process of guideline development focused on police use of force (although he has not explicitly used the language of "guidelines"). Unsatisfied by the weak definition of excessive force enforced by the courts, Klockars suggested that police agencies themselves should develop more demanding standards for reducing the amount of

force that officers use. His general definition held that "excessive force should be defined as the use of more force than a highly skilled police officer would find necessary to use in a particular situation" (p. 8). That definition itself is subject to debate (Alpert and Smith 1994), but what is most significant is the way in which Klockars proposed to institutionalize it.

Klockars (1996) acknowledged that the law cannot enforce the "highly-skilled police officer" standard of excessive force, not least because most officers who run afoul of it lack the necessary *mens rea* (he noted that excessive force "can spring from good intentions as well as bad, mistakes and misperceptions, lack of experience, overconfidence . . . or a hundred other factors that might influence an officer to behave in a particular situation in a less than expert way," p. 8). Instead, he proposed an elaborate and nonpunitive system of administrative review within police departments. In each instance in which an officer uses a significant level of force, the officer's immediate supervisor must interview the officer and any witnesses to take a report on the incident, which describes the type of force used and the details of the situation. The supervisor then assesses whether the force used was appropriate by applying the highly skilled police officer standard to the facts of the situation (the assumption being that supervisors are themselves highly skilled police officers), and his report is then passed up the chain of command for further review by police managers. In cases in which departmental management concludes that the force used was excessive but not illegal, the officer is counseled on ways of handling similar situations that use force more parsimoniously.

In the system that Klockars (1996) envisioned, police agencies refine their understanding of what excessive force means by reviewing a series of cases that come to their attention. Over time, a department would develop a repertoire of preferred responses to standard police encounters that (ideally) minimize the use of authority while preserving an appropriate degree of police effectiveness. As in Kelling's (1996) research, the process would develop a taxonomy of cases that prescribed how police should handle different situations, here with an eye to reducing the use of force. There would be no universal "minimal standard" for the use of force but a variety of standards that are sensitive to context.

Neither of these proposals was put forward as with the idea of cumulative scholarly inquiry in mind, but both could support such an enterprise. One approach would be for scholars to focus on the most difficult cases uncovered by Kelling's (1996) dialogues or Klockars' (1996) departmental reviews, such as those that raise difficult questions about how much "effectiveness" to trade for parsimonious use of authority. Academic scholars might analyze the normative dilemmas that these situations raise in the same way that medical ethicists analyze the "hard cases" that confront doctors and the way that

appellate courts review the hard cases that arise in law. In doing so, they might restrict their attention to the facts of the situation described in the guidelines and accompanying vignettes (in the case of Kelling's proposal) or the reports that police themselves produce (in the case of Klockars' proposal). But they might also return to the field to develop their own profile of the relevant events. Indeed, independent of any police commitment to the processes that Kelling and Klockars described, academics could already describe such hard cases and analyze them from a normative point of view. Much of the academic study of medical ethics takes this form, and hundreds of dialogues have emerged in that literature about how doctors ought to handle particular situations that have been described in the literature (e.g., Miller 1981). The entire field of law can be described in similar terms.

Such a scholarly role could serve two important purposes. First, one important weakness of both proposals is that they isolate individual police departments from one another; scholarly involvement could serve to bridge the gaps among them. For example, in the case of Klockars's (1996) proposal, police officers within a department would learn from one another about how they should handle prototypical situations, but they would not learn from officers in other departments. To the extent that the excessive force problem is a problem of bad barrels rather than bad apples, this isolation undermines the best hope for a solution. An important function of professional communities and the scholars who participate in them is precisely to facilitate the transfer of knowledge across organizational lines (Rein 1983). Second, by playing a role in disseminating and debating information about police practices, scholars and the professional community at large (including Peace Officer Standards and Training commissions and foundations such as the Police Executive Research Forum) could help to increase the transparency and accountability of decision-making by individual police departments. This goal seems especially important in the case of Klockars's proposal, which explicitly excluded outside input into police decision-making. Although Klockars made a strong case for the value of *police* review of the use of force (he argued that in general, laypeople are less demanding than the police themselves because they are often unaware of alternatives to the actions that an officer has taken), it does not seem right to prevent outside oversight of police standards altogether.

The type of work that Kelling (1996) and Klockars (1996) exemplified could form the basis for a research agenda along the model of legal knowledge rather than medical knowledge. Legal knowledge evolves through a combination of judicial opinions, which confront data in the form of specific factual situations and analyses by legal scholars in law review articles. Mark Moore (1982) has described the logic of this approach in an article that proposed it as a model for research in public management:

In law school cases [i.e., court decisions], there is typically a specific fact situation and a question of what the law requires a judge to decide in that situation. . . . Much of the "case," then, is a judge reasoning about how the law is to be applied—which facts are relevant, which law takes precedence, what social interest counts more than others, and so on. Given a certain number of fact situations and different legal rulings, someone will decide to write a law review article that seeks to expose an underlying logic that makes varied court decisions coherent. It is the form of reasoning, the specific decisions, and the more or less successful integration of diverse findings that constitutes the body of legal knowledge, and the act of putting this together that constitutes legal scholarship. (Pp. 72-73)

It is not hard to see how this strategy would apply to the type of work proposed by Kelling and Klockars. In each proposal, the goal was precisely to articulate and make sense of the considered judgments that police officers and others make about what should be done in different fact situations. In a more thoroughgoing version of the legal model of police research, those initial judgments and the associated reasoning could make up the raw material for a broader analysis of underlying principles, that is, for the development of general principles "that make varied court decisions [or police guidelines] coherent." Of course, the status of the judgments themselves—whether they can be taken to be *correct* judgments—is subject to debate, and that weakness might be seen as fatal to the whole enterprise. But other fields like medical ethics, political philosophy, and even law have flourished in the face of the same challenge.⁹ It is not possible to describe how those fields have responded to that challenge in detail here, but suffice it to say that they have engaged in fruitful debates about the notion of a "considered judgment" and about how best to integrate judgments whose rightness is inherently uncertain into defensible normative theory (e.g., Dworkin 1977, 1985; Rawls 1971:19-21, 48-50).

The ongoing findings of this research, then, involve considered judgments about what police should do in particular cases (judgments that are always subject to revision in the light of new arguments) together with general principles that help to integrate and perhaps justify those judgments. Those principles can then help to inform analysis of future cases. To be sure, some legal scholars and moral theorists downplay the development of general principles, pointing out that demands to unite diverse judgments can be impossible to meet, they can be socially destructive if they are taken to extremes, and often they may not even be necessary—the judgments themselves can illuminate future cases with the assistance of analogies, which show how future cases are more like some precedents than others (Jonsen and Toulmin 1988; Sunstein 1995, 1996). Other legal scholars, however, insist that it simply is not possible to decide the hardest cases without developing and elaborating

general principles about what the law should try to accomplish (or at least what particular bodies of law should try to accomplish).¹⁰ Ronald Dworkin (1986) is the most prominent proponent of that view, arguing that judges and legal scholars face an unavoidable need to identify general principles that underlie the complex detail of existing legal practice to make appropriate decisions about new hard cases. He described that process of identifying underlying principles as one of “constructive interpretation,” which involves showing the best purpose that the practice can be taken to serve. According to Dworkin (1985), a good interpretation of this sort must satisfy two criteria: “It must both fit that practice and show its point or value.” The latter notion—the notion of showing the point or value of a legal practice—is particularly important in Dworkin’s scheme, and he clarified it as follows:

Law is a political enterprise, whose general point, if it has one, lies in coordinating social and individual effort, of resolving individual disputes, or securing justice between citizens and between them and their government. . . . An interpretation of any body or division of law, like the law of accidents, must show the value of that body of law in political terms by demonstrating the best principle or policy it can be taken to serve. (P. 160)

On this view, legal interpretation begins with assessments of how to resolve particular cases, but it does not end there. It develops further by trying to articulate general principles that underlie the individual decisions, showing the “point or purpose” that those disparate decisions serve. For Dworkin, those general principles are ultimately grounded in political theory. Legal inquiry draws on that body of theory to decide individual cases, and it contributes to it by investigating how well different theoretical principles can account for considered legal judgments (Dworkin 1977, 2000). In the present context, it is interesting to note that Dworkin explicitly argued that his conception of “constructive interpretation” applies not only to legal practice in particular but to social practices in general (Dworkin 1986).

This image of legal inquiry represents a model of scholarship that can support both empirical study and normative analysis in a theoretically sophisticated way—in a way that draws on and contributes to a distinctive body of normative social theory. The work by Klockars (1996) and Kelling (1996) has suggested how it might apply to the study of policing. Neither of those scholars has directly engaged bodies of political and social theory that might integrate the diverse findings that their studies would produce, so for the most part, that task remains for future researchers. Nevertheless, existing research in other areas of policing has sometimes taken that additional step.

Consider the study of police-community partnerships. This aspect of community policing raises important questions about whether and how

citizen participation in administrative agencies is consistent with the ideal of equitable decision-making—an ambiguous but important value that surely calls for clarification because concerns about inequity have preoccupied the community policing field for years (e.g., Koven 1992; Skogan 1990). In engaging those questions, most scholarship has drawn implicitly or explicitly on pluralist political theory to assess whether community partnerships are equitable. From a pluralist perspective, that means asking whether all communities have an equal chance to articulate their interests because pluralism conceives of “the public interest” as some aggregation of all individual interests (Henig 1978; Skogan 1988; Skogan and Hartnett 1997; cf. Dahl 1961, 1989; Olson 1971; Truman 1951). As it turns out, most research has found that poor and minority neighborhoods are less likely to organize than others (Henig 1978; Skogan 1988; Skogan and Hartnett 1997), suggesting that police-community partnerships risk undermining the ability of the police to promote the public interest equitably.

More recent research, however, argues that the pluralist interpretation of police-community partnerships is incomplete. It cannot account for our considered judgments about those partnerships (i.e., whether specific policy and strategy decisions made in the context of police-community partnerships are appropriate), and it offers an impoverished view of their point or purpose. As I have argued elsewhere (Thacher 2001a), a constructive interpretation of police-community partnerships must recognize that they involve more than the articulation and aggregation of individual interests. Partnerships are better conceived of as sites of public deliberation about the common good. From that perspective, the key principle that distinguishes appropriate partnership decisions from inappropriate ones is not the principle that all affected interests should be directly represented in the partnership; they never are. Instead, the key principle is that due attention must be paid to the proper design of what John Dewey (1927) has called “the methods and conditions of debate.” In particular, police have an obligation to focus the attention of a partnership on the question of the common good, to call attention to the needs and wants of absent publics, and to bring in objective information that sheds light on the wisdom of neighborhood demands. When they meet these obligations, police-community partnerships are able to promote the broader public interest in an equitable way even in cases in which the community participants are patently unrepresentative—where groups that have a clear stake in the decisions are underrepresented or absent (Fung 1998; Thacher 2001a).

In short, this research about community partnerships argues that Dewey’s (1927) political theory offers a constructive interpretation of this aspect of police practice in two senses: It shows the point or purpose of many police actions that pluralism has no place for (those that involve improving the methods and conditions of debate), and it can account for our considered

judgments more adequately than pluralism can (it allows for the possibility—often encountered in practice—that unrepresentative partnerships can lead to equitable results). To support these claims, it is obviously necessary to look closely at the details of what happens in actual police-community partnerships—particularly at how police manage the hard cases that they confront, such as those involving unrepresentative partnerships—because the quality of an interpretation that tries to show the point or purpose of a practice rests in large part on whether it can be shown to fit the details of that practice. (For example, to say that Deweyian political theory offers a more compelling account of police-community partnerships than pluralism does is in part to claim that the police can and sometimes do take actions that can fairly be interpreted as improving the methods and conditions of debate.) It is also necessary to advance and at least tentatively defend judgments about the appropriateness of police practice in specific cases and to show that those judgments are more consistent with the principles of Deweyian political theory than with pluralism.

This account is obviously a schematic one because it leaves many key questions unanswered. I have only gestured at what exactly it means to say that a constructive interpretation “fits” a practice, and I have ignored difficult questions such as how to choose between two interpretations of a practice when both of them seem to fit. By way of reference, the field of legal philosophy has engaged in an extensive debate about these issues (e.g., Dworkin 1985). My goal here is simply to suggest in broad outline how police research might follow the model of legal inquiry to investigate the difficult questions that value pluralism raises.

CONCLUSION

It should not be surprising if the model of legal inquiry is at least as relevant for police research as the model of experimental research in medicine: Policing is, after all, a legal institution. Indeed, some part of this knowledge has already been developing in the legal world through decisions about the constitutionality of different police practices. This article has proposed that such inquiry needs to be extended further into the operation of police departments than that part covered by constitutional law because many aspects of police decision-making can usefully be subjected to a scrutiny that is both empirical and normative. As Klockars (1996) has pointed out for the specific case of excessive force, legal requirements often set only minimal standards that good police work should aspire to exceed. In other cases, the law provides no guidance at all about important police decisions (Kelling 1996). In still other cases, the courts have chosen to lay down standards for the police

even though they are unable to do so adequately only because the police have not assumed enough responsibility themselves (Remington 1965). Scholarship of the sort that this article has described would help to fill these voids and to develop and refine the structures of practical reasoning that are so crucial in an environment of value pluralism.

These suggestions should not be read as arguments against the study of the impacts that different criminal justice interventions have (providing that the field asks those questions broadly enough to encompass all the relevant values without reducing everything but "crime reduction" to an undifferentiated group of "financial and other costs" that are themselves evaluated quite weakly). Part of the professional knowledge of a good police officer will surely consist of the sort of instrumental knowledge that researchers like Sherman have developed so skillfully. But there is always a danger that this research could undermine other important aspects of policing by crowding them out of our conception of what good police work consists of. Overuse of the medical model for police research (at least, as that model has been portrayed among criminal justice scholars) carries precisely this danger. Because that type of research only develops instrumental knowledge, its findings cannot speak to the full range of police concerns.

Even if the experimental agenda were carried to its unlikely conclusion, an irreducible area of ambiguity would remain because experimentation can never dictate how police should reassemble the pieces of value that it has taken apart to study. The area of ambiguity that will always remain involves the normative questions of how to think about each of the different values and how to think about the trade-offs among them. In a field plagued by value pluralism, these are among the most pressing problems that research and practice confront. They cannot be solved through experimental research into the impact of different interventions, but they can be approached through philosophical and qualitative research, perhaps through the model of legal research that this article has described.

NOTES

1. This article will mostly focus on Lawrence Sherman's work because he has been among the most articulate and thoughtful proponents of the medical model. But the same metaphor underlies many other treatments of criminal justice research. For example, Alfred Blumstein and Joan Petersilia (1995) have argued that criminal justice should emulate medicine, which they see as the exemplar of a field in which practitioners value empirical research highly. They contrasted the medical field in this respect with the legal profession, in which "every case is addressed in its own terms" and in which "the search for generalizable knowledge that is the essence of empirical research—and that should provide a basis for public policy—is not a central aspect of legal professional work" (p. 471). This critique is not entirely fair, and because the point is relevant to a

central claim in this article, it is necessary to address it briefly here. Judicial opinions do lead to the development of knowledge about how abstract principles apply in particular cases (not just the case at hand but others that are more like it than any case that has come before), and the principles themselves evolve in the course of their application. Both developments involve the creation of new generalizable knowledge. It would be more precise to say that legal knowledge alone tends not to develop causal knowledge, but causal knowledge is not the only type of knowledge that should provide the basis for public policy (Rein 1976).

2. Nathan Glazer (1974) gave this point a more institutional expression 30 years ago, suggesting that the level of value pluralism in a professional field influences its intellectual organization. Glazer focused especially on what he called "the schools of the minor professions" (including schools of social work, urban planning, education, and divinity), arguing that the inability of those fields to settle on a "fixed and unambiguous end" made it difficult for them to develop a fixed content of professional training. Medicine, by contrast, was, according to Glazer, "disciplined by an unambiguous end-health," which "settles men's minds" and identifies "a base of knowledge which is unambiguously indicated as relevant for professional education," namely, knowledge about how best to promote health (p. 363). Glazer's influential analysis suffered from several weaknesses, including a failure to recognize the existence of knowledge other than instrumental knowledge and an overly simple view of the ends of the major professions—including medicine, in which the value of health is not always as clear and predominant as he suggested. Nevertheless, he was surely correct to suggest that clear and simple ends make it easier to develop a professional curriculum based on conventional science.

3. In truth, and contrary to the suggestion of Glazer (1974), even doctors can rarely avoid value pluralism. The value of health is surely a predominant concern for much of medical practice, but it is neither an exclusive goal nor always an unambiguous one. Particularly as technology has extended our ability to prolong life, "health" has increasingly become a contested concept, and its relationship to quality of life has blurred (Mordacci and Sobel 1998; Toulmin 1988). Moreover, the last part of the twentieth century witnessed a growing recognition that values other than health (including justice, autonomy, and quality of life) should play significant roles in medical decisions (Cassell 2000). All of these developments mean that even doctors cannot make their decisions solely on the basis of instrumental knowledge about the effects of a treatment on health. They must obviously consider whether a treatment is likely to cure the disease it is designed to cure, and instrumental knowledge helps them to make that judgment. But they must also consider issues of quality of life, pain management, cost, appropriate levels of risk, patient autonomy, and even justice (Brock 1991; Buchanan 1991; Cassell 2000). The need for doctors to grapple with the way in which these values apply to treatment decisions has driven a renaissance in the field of medical ethics (Toulmin 1982). Moreover, even within the experimentalist fold, it has led to critiques of existing methods for assessing the value of treatments. For example, one group of health economists has criticized conventional cost-effectiveness analysis in medicine for neglecting many ethical considerations, such as a special concern for alleviating the most extreme suffering. In response, these scholars have proposed a more encompassing calculus designed to capture those values (Gold et al. 1996; Menzel et al. 1999; for a critique of this general strategy, see Tribe 1972). For these reasons, a picture of the medical model of research that only includes randomized experiments that investigate survival rates or other health effects is incomplete. Even those who accept the conclusion that knowledge about policing should look like knowledge about medicine should not restrict themselves to experimental research, at least as it is usually practiced today.

Nevertheless, the image of experimental research driving medical practice may have some truth to it, at least as a historical matter. Toward the end of the 1950s, the medical field became more and more specialized and more and more committed to a narrow concept of health—indeed, to a focus on the proper functioning of individual organs. It was precisely in this

environment that scientific medicine flourished, and the public image of medicine became tied to its bases in experimental research. Eric Cassell (2000), a prominent critic of this development, explained that "with increasing knowledge about science and medicine, the public bought into medical definitions of treatment, improvement, and cure—largely devoted to parts of the patient rather than to the person of the patient." Given this technical definition of the doctor's role, the findings of medical science became a doctor's most important tool: "It is not doctors, one might guess from the attitude of the public, but their scientific knowledge and technology that diagnose, treat, and cure" (p. 15).

4. Similar problems arise where arrest is not recommended. For example, if research concluded that counseling best reduced the risk of domestic violence recidivism, police still might decide to make arrests on desert grounds. This is a generic problem that plagues public health approaches to crime prevention because those approaches do not assign just condemnation to deplorable acts (Moore 1995).

Note that von Hirsch himself might well reject my application of the desert principle to policing, for he viewed his theory specifically as a theory of punishment—not as a theory of the criminal justice system in general (von Hirsch 1993). He has been particularly critical of the idea that it applies before adjudication on the grounds that desert does not apply until a person has been judged legally guilty (von Hirsch 1985). But that view depends on a highly legalistic conception of guilt, and it would lead to obvious violations of proportionality among the sentences of those who are factually (as opposed to legally) situated similarly (cf. Thurrow 1970).

5. The problem is that hospital decision-making does regularly involve values other than health. For example, city hospitals that accept uninsured patients on equity grounds may end up with a more difficult caseload of patients who have only come to them in extremis, lacking proper preventative medicine and therefore suffering from more acute forms of disease. These hospitals will then have worse "success" rates even if their doctors are equally skilled.

6. The most common exceptions are studies that focus on fear reduction and order maintenance (e.g., Mazerolle, Kadleck, and Roehl 1998; Pate et al. 1989).

7. Legal sociologist Donald Black (who has had an important influence on many policing scholars) is one example of a scholar who has taken this position. Black (1973) accepted the validity of what he called "impact" studies—studies "that compare reality to legal ideals with a very plain and specific operational meaning. . . . [that is,] a statute whose purpose is rather clearly discernible or a judicial decision unambiguously declarative of policy. The *Miranda* decision, for example" (p. 43). But he firmly criticized anything less well specified, where ideals are ambiguous or inconsistent:

Sociologists, however, may launch these implementation studies where legislation or judicial opinion is considerably more ambiguous than in *Miranda*. In such instances, the 'impact' may be difficult to measure. What must be done, for example, to implement *In re Gault*? Though it is generally recognized that *Gault* guarantees to juvenile suspects constitutional rights previously accorded only to adults, the extent of these juvenile rights is not at all clear. Hence it becomes difficult, if not impossible, to identify the degree to which *Gault* has been implemented. (Pp. 43-44)

Even worse, Black felt, are studies in which sociologists try to "compare legal reality to an ideal grounded in neither statutory nor case law," such as "rule of law," "arbitrariness," and so on (p. 44). In Black's view, science should not approach such subjects at all, or else it should reduce them to "impact" studies by simplifying the relevant ideals. The problem is that none of Black's criticisms suggests that it is not important to investigate these difficult questions—whether the law is arbitrary, what *In Re Gault* has wrought, or the status in practice of any number of vague and conflicting legal and social ideals. Black did not deny this, but he did deny that sociologists

or anyone else claiming title to the mantle of science are the right people to study these questions. But in reality, who else will take up the charge? And who should: Is it better to have no one but advocates research these questions? Is there no place for a commitment to impartiality, rigor, and systematic inquiry—even if as elusive ideals—in the study of such centrally important social questions?

8. Interestingly, one student of medical ethics articulated this same connection between qualitative research and some forms of ethical analysis (Hoffmaster 1992). His proposal for research that is both empirical and normative speaks to the disillusionment some medical ethicists have felt over scholarship that remains at the level of philosophical abstractions. Often, that type of purely normative analysis develops principles that do not apply in a straightforward way to concrete situations. Investigating normative judgments in context may offer more promise (Jonsen and Toulmin 1988).

9. In contrast to the other fields of normative inquiry listed in the text, the law can often point to the institutional pedigree of a decision to legitimize it (Hart 1994). But as Ronald Dworkin (1977) has pointed out, institutional pedigree cannot do all the work it is sometimes claimed to do in the legal system, in part because some court decisions will inevitably come to be seen as mistakes.

10. The discussion in the text has drawn a sharp distinction between these two theories of legal interpretation, and that is how the literature on the subject has usually viewed them. But in practice, the two views sometimes look very similar: Dworkin's best legal interpretations are steeped in a detailed account of legal practice (e.g., Dworkin 2000), and Sunstein (1996) explicitly has allowed for the development of broad principles in some situations. Indeed, these two legal scholars have recently come to fairly broad agreement about some central points of interpretive theory. See especially the fairly civil dialogue between Dworkin (1997) and Sunstein (1997) associated with Dworkin's Order of the Coif lecture.

REFERENCES

- Alpert, Geoffrey P. and William C. Smith. 1994. "Police Culture and the Use of Excessive Force." *Journal of Criminal Law & Criminology* 85:481-501.
- Berlin, Isaiah. 1988. "On the Pursuit of the Ideal." *New York Review of Books*, March 17, pp. 11-17.
- . 1999. "The Purpose of Philosophy." Pp. 1-11 in *Concepts and Categories*. Princeton, NJ: Princeton University Press.
- Black, Donald. 1973. "The Boundaries of Legal Sociology." Pp. 41-56 in *The Social Organization of Law*, edited by Donald Black and Maureen Mileski. New York: Academic Press.
- Blumstein, Alfred and Joan Petersilia. 1995. "Investing in Criminal Justice Research." Pp. 465-87 in *Crime*, edited by Joan Petersilia and James Q. Wilson. San Francisco: Institute for Contemporary Studies.
- Brock, Dan. 1991. "Facts and Values in the Physician-Patient Relationship." Pp. 113-38 in *Ethics, Trust, and the Professions*, edited by Edmund Pellegrino, Robert Veatch, and John Langan. Washington, DC: Georgetown University Press.
- Buchanan, Allen. 1991. "The Physician's Knowledge and the Patient's Best Interest." Pp. 83-112 in *Ethics, Trust, and the Professions*, edited by Edmund Pellegrino, Robert Veatch, and John Langan. Washington, DC: Georgetown University Press.
- Cassell, Eric J. 2000. "The Principles of the Belmont Report Revisited." *Hastings Center Report* 30:12-21.

- Chang, Ruth. 1997. *Incommensurability, Incomparability, and Practical Reason*. Cambridge, MA: Harvard University Press.
- Dahl, Robert. 1961. *Who Governs?* New Haven, CT: Yale University Press.
- . 1989. *Democracy and Its Critics*. New Haven, CT: Yale University Press.
- Dewey, John. 1927. *The Public and Its Problems*. Athens, OH: Swallow.
- DiIulio, John. 1991. *No Escape: The Future of American Corrections*. New York: Basic Books.
- Dworkin, Ronald. 1977. *Taking Rights Seriously*. Cambridge, MA: Harvard University Press.
- . 1985. "How Law is Like Literature." Pp. 146-66 in *A Matter of Principle*. Cambridge, MA: Harvard University Press.
- . 1986. *Law's Empire*. Cambridge, MA: Harvard University Press.
- . 1997. "In Praise of Theory" and "Reply." *Arizona State Law Journal* 29:353-76, 431-56.
- . 2000. *Sovereign Virtue: The Theory and Practice of Equality*. Cambridge, MA: Harvard University Press.
- Feder, Lynn and Robert Boruch. 2000. "The Need for Experiments in Criminal Justice Settings." *Crime and Delinquency* 46:291-94.
- Fung, Archon. 1998. "Street Level Democracy: A Theory of Popular Pragmatic Deliberation and Its Practice in Chicago School Reform and Community Policing, 1988-1997." Ph.D. dissertation, MIT Department of Political Science.
- Geertz, Clifford. 1983. *Local Knowledge: Further Essays in Interpretive Anthropology*. New York: Basic Books.
- Glazer, Nathan. 1974. "Schools of the Minor Professions." *Minerva* 12:347-64.
- Gold, Marthe R., Joanna Siegel, Louise B. Russell, and Milton Weinstein, eds. 1996. *Cost-Effectiveness in Health and Medicine*. New York: Oxford University Press.
- Hart, H.L.A. 1994. *The Concept of Law*, 2d ed. Oxford, UK: Clarendon.
- Henig, Jeffrey. 1978. "Copping a Cop: Neighborhood Organizations and Police Patrol Allocation." *Journal of Voluntary Action Research* 7:75-84.
- Hoffmaster, Barry. 1992. "Can Ethnography Save the Life of Medical Ethics?" *Social Science and Medicine* 35:1421-31.
- Jonsen, Albert and Stephen Toulmin. 1988. *The Abuse of Casuistry: A History of Moral Reasoning*. Berkeley: University of California Press.
- Kant, Immanuel. 1964. *Groundwork of the Metaphysics of Morals*. New York: Harper Torchbook.
- Kelling, George L. 1996. "Police Discretion: Revisiting Police Guidelines." Unpublished draft.
- Kleinig, John. 1996. *The Ethics of Policing*. Cambridge, UK: Cambridge University Press.
- Klockars, Carl. 1996. "A Theory of Excessive Force and Its Control." Pp. 1-19 in *Police Violence: Understanding and Controlling Police Abuse of Force*, edited by William A. Geller and Hans Toch. New Haven, CT: Yale University Press.
- Koven, Steven. 1992. "Coproduction of Law Enforcement Services: Benefits and Implications." *Urban Affairs Quarterly* 27:457-69.
- Larmore, Charles. 1987. *Patterns of Moral Complexity*. New York: Cambridge University Press.
- Lindblom, Charles. 1981. "Comments on Decisions in Organizations." Pp. 245-48 in *Perspectives on Organizational Design and Behavior*, edited by Andrew Van de Ven and William Joyce. New York: John Wiley.
- Lipton, Douglas, Robert Martinson, and Judith Wilks. 1975. *The Effectiveness of Correctional Treatment: A Survey of Treatment Evaluation Studies*. New York: Praeger.
- MacKenzie, Doris Layton. 2000. "Evidence-Based Corrections: Identifying What Works." *Crime and Delinquency* 46:457-71.

- Mazerolle, Lorraine Green, Colleen Kadleck, and Jan Roehl. 1998. "Controlling Drug and Disorder Problems: The Role of Place Managers." *Criminology* 36:371-403.
- Menzel, Paul, Marthe R. Gold, Erik Nord, Jose-Louis Pinto-Prades, Jeff Richardson, and Peter Ubel. 1999. "Toward a Broader View of Values in Cost-Effectiveness Analysis of Health." *Hastings Center Report* 29 (3): 7-15.
- Miller, Bruce L. 1981. "Autonomy and the Refusal of Lifesaving Treatment." *Hastings Center Report* 11 (August): 22-28.
- Miller, David. 1999. "Social Science and Political Philosophy." Pp. 42-60 in *Principles of Social Justice*. Cambridge, MA: Harvard University Press.
- Millgram, Elijah. 1997. "Incommensurability and Practical Reasoning." Pp. 151-69 in *Incommensurability, Incomparability, and Practical Reason*, edited by Ruth Chang. Cambridge, MA: Harvard University Press.
- Moore, Mark H. 1982. "Notes on the Design of a Curriculum in Public Management." Unpublished manuscript, John F. Kennedy School of Government, Harvard University.
- . 1995. "Public Health and Criminal Justice Approaches to Prevention." Pp. 237-62 in *Building a Safer Society: Strategic Approaches to Crime Prevention*, edited by Michael Tonry and David P. Farrington. Chicago: University of Chicago Press.
- Moore, Mark H., with David Thacher, Andrea Dodge, and Tobias Moore. 1999. *Recognizing and Realizing Public Value in Policing: The Challenge of Measuring Police Performance*. New York: Sloan Foundation.
- Moore, Mark H. and Robert Trojanowicz. 1988. "Policing and the Fear of Crime." *Perspectives on Policing*, June, no. 3.
- Mordacci, Roberto and Richard Sobel. 1998. "Health: A Comprehensive Concept." *Hastings Center Report* 28:34-37.
- Morris, Norval. 1974. *The Future of Imprisonment*. Chicago: University of Chicago Press.
- . 1982. *Madness and the Criminal Law*. Chicago: University of Chicago Press.
- Muir, William Ker. 1977. *Police: Streetcorner Politicians*. Chicago: University of Chicago Press.
- Olson, Mancur. 1971. *The Logic of Collective Action*. Cambridge, MA: Harvard University Press.
- Pate, Anthony, Mary Ann Wycoff, Wesley Skogan, and Lawrence Sherman. 1989. *Reducing Fear of Crime in Houston and Newark*. Washington, DC: Police Foundation.
- Petersilia, Joan and Susan Turner. 1993. "Intensive Probation and Parole." Pp. 281-335 in *Crime and Justice: A Review of Research*. Vol. 17, edited by Michael Tonry and Norval Morris. Chicago: University of Chicago Press.
- Rawls, John. 1971. *A Theory of Justice*. Cambridge, MA: Harvard University Press.
- Rein, Martin. 1976. *Social Science and Public Policy*. New York: Penguin.
- . 1983. "Practice Worries." Pp. 138-57 in *From Policy to Practice*. Armonk, NY: M. E. Sharpe.
- Remington, Frank. 1965. "Police in a Democratic Society." *Journal of Criminal Law, Criminology, and Police Science* 56:361-65.
- Schön, Donald. 1983. *The Reflective Practitioner*. New York: Basic Books.
- Selznick, Philip. 1961. "Sociology and Natural Law." *Natural Law Forum* 6:84-108.
- Sherman, Lawrence. 1984. "Experiments in Police Discretion: Scientific Boon or Dangerous Knowledge." *Law and Contemporary Problems* 47:61-81.
- . 1992. *Policing Domestic Violence*. New York: Free Press.
- . 1998. "Evidence-Based Policing." *Ideas in American Policing*, July. Washington, DC: Police Foundation.
- . 2000. "Reducing Incarceration Rates: The Promise of Experimental Criminology." *Crime and Delinquency* 46:299-314.

- Sherman, Lawrence, Denise Gottfredson, Doris MacKenzie, John Eck, Peter Reuter, and Shawn Bushway. 1997. *Preventing Crime: What Works, What Doesn't, What's Promising*. Washington, DC: U.S. Department of Justice, Office of Justice Programs.
- Skogan, Wesley. 1988. "Community Organizations and Crime." Pp. 39-78 in *Crime and Justice*. Vol. 10, edited by Michael Tonry and Norval Morris. Chicago: University of Chicago Press.
- . 1990. *Disorder and Decline*. Berkeley: University of California Press.
- Skogan, Wesley and Susan Hartnett. 1997. *Community Policing: Chicago Style*. New York: Oxford University Press.
- Skolnick, Jerome. 1966. *Justice without Trial: Law Enforcement in a Democratic Society*. New York: John Wiley.
- Sunstein, Cass R. 1995. "Incompletely Theorized Agreements." *Harvard Law Review* 108:1733-72.
- . 1996. *Legal Reasoning and Political Conflict*. New York: Oxford University Press.
- . 1997. "From Theory to Practice." *Arizona State Law Journal* 29:389-404.
- Thacher, David 2001a. "Equity and Community Policing: A New View of Community Partnerships." *Criminal Justice Ethics* 20 (1): 3-16.
- . 2001b. "From Racial Profiling to Racial Justice: Rethinking Equity in Police Stops and Searches." Unpublished manuscript, University of Michigan.
- Thurow, Lester. 1970. "Equity Versus Efficiency in Law Enforcement." *Public Policy* 18:451-59.
- Toulmin, Stephen. 1982. "How Medicine Saved the Life of Ethics." *Perspectives in Biology and Medicine* 25:736-50.
- . 1988. "The Recovery of Practical Philosophy." *American Scholar* 57:337-52.
- Tribe, Lawrence H. 1972. "Policy Science: Analysis or Ideology." *Philosophy and Public Affairs* 2:66-110.
- Truman, David. 1951. *The Governmental Process*. New York: Knopf.
- von Hirsch, Andrew. 1976. "Doing Justice: The Choice of Punishments." Report of the Committee for the Study of Incarceration. New York: Hill and Wang.
- . 1985. *Past or Future Crimes: Deservedness and Dangerousness in the Sentencing of Criminals*. New Brunswick, NJ: Rutgers University Press.
- . 1993. *Censure and Sanctions*. New York: Oxford University Press.
- Weber, Max. 1958. "Science as Vocation." Pp. 129-56 in *From Max Weber*, edited by H. H. Gerth and C. Wright Mills. New York: Oxford University Press.
- Westley, William. 1971. *Violence and the Police*. Cambridge, MA: MIT Press.
- Williams, Bernard. 1978. "Ethical Consistency." Pp. 91-109 in *Practical Reasoning*, edited by Joseph Raz. New York: Oxford.
- . 1985. *Ethics and the Limits of Philosophy*. Cambridge, MA: Harvard University Press.
- Wilson, James Q. 1968. *Varieties of Police Behavior*. Cambridge, MA: Harvard University Press.
- Zald, Mayer. 1991. "Sociology As a Discipline: Quasi-Science, Quasi-Humanities." *American Sociologist* 22:165-87.
- Zimring, Franklin and Gordon Hawkins. 1997. *Crime Is Not the Problem: Lethal Violence in America*. New York: Oxford University Press.

THE EFFECTS OF SUBSTANCE USE ON SPECIFIC TYPES OF CRIMINAL OFFENDING IN YOUNG MEN

JOHN W. WELTE
LENING ZHANG
WILLIAM F. WIECZOREK

This study examined the causal relationship between substance use and delinquency. Subjects were 596 males aged 16 to 19 from Buffalo, New York. Two interviews were conducted 18 months apart. Cross-lagged and synchronous structural equation panel models were fit for both early and late onset of delinquency groups with five types of delinquency: minor, general, serious, property, and violent offenses. The results showed a significant difference between early-onset and late-onset groups concerning the relationship between substance use and delinquency. Early-onset models showed no causal relationship between substance use and delinquency. The late-onset models showed that minor offenses have significant lagged and synchronous positive effects on drug use, drug use exhibited significant lagged and synchronous positive effects on general offenses, and drinking has significant lagged and synchronous negative effects on property offenses. The implications of these findings are discussed.

The question of the causal relationship between substance abuse and criminal offending has bedeviled researchers. Common sense suggests that substance abuse might promote criminal behavior and vice versa. Although a positive correlation is one of the most reliable results obtainable in criminology, the causal relationship has proved difficult to demonstrate. Goldstein (1985) described three classes of causal connection between substance use and crime: (1) The short- or long-term effect of the drug causes proneness to criminal behavior, (2) remunerative crimes are committed to get money for drugs, and (3) violent conflict and robbery are among those involved with the drug trade.

Pieces of the puzzle have at least partially fallen into place. Under Goldstein's (1985) first type of causal connection, the short-term effect of

Please direct all correspondence to John Welte, Research Institute on Addictions, 1021 Main Street, Buffalo, NY 14203; e-mail: welte@ria.buffalo.edu. This research was funded by grant AA08157 awarded by the National Institute on Alcohol Abuse and Alcoholism to John Welte.

JOURNAL OF RESEARCH IN CRIME AND DELINQUENCY, Vol. 38 No. 4, November 2001 416-438
© 2001 Sage Publications

alcohol seems to promote aggressive or violent behavior. Alcohol in low doses has been shown to increase aggressive behavior in rodents and monkeys (e.g., Miczek and Thompson 1983). In human experimental situations, alcohol has been shown to enhance such indicators of aggression as the willingness, if provoked, to administer (what the subject believes to be) a heavy electric shock to another person (Bennett, Buss, and Carpenter 1969). Nonexperimental studies have also indicated an alcohol/violence link. Zhang, Wiczorek, and Welte (1997) found that heavy drinking was positively associated with violent offending in young males who also display hostility and deviant attitudes. Fagan, Hansen, and Jang (1983) reported that the severity of spouse abuse was positively associated with alcohol use but negatively associated with other substance use. Wiczorek and Welte (1994) showed that use of alcohol by the assailant was positively associated with the extent of injury to the victim. Parker (1995) conducted a longitudinal analysis of the relationship between alcohol availability and homicide in which U.S. cities were the units of analysis. A positive effect of alcohol availability on homicide rates was found, particularly in high-poverty cities.

Falling under Goldstein's (1985) second classification, there is also substantial evidence that heroin addiction promotes property crime to raise money to support the heroin habit. In a classic study, Ball et al. (1981) followed Baltimore heroin users for more than 10 years. They reported rates of remunerative crime six times higher when the user's habits were at peak level than when they were abstinent. Similar results have been found in studies in other cities (Altschuler and Brounstein 1991; Wilson and Herrnstein 1985; for a detailed review of related studies, see Chaiken and Chaiken 1990). And, of course, falling under Goldstein's third pathway, theft and violence associated with the drug business itself is well documented (Johnson et al. 1990).

Direct causation of criminality by drug use includes the possibility of long-term effects. The panel study is one of the methods commonly used by social scientists to sort out long-term causal relationships in a nonexperimental setting. Because repeated measures allow the examination of changes within each subject, the temporal order of changes in the states of different variables can be determined. Earlier states of the same variable can be held constant. Researchers have naturally used this method to attack the causal thicket of alcohol, drugs, and crime. An early effort was that of Johnston, O'Malley, and Eveland (1978), who followed a high school class of 1969 five times from ages 15 through 23. They demonstrated that delinquency differences between drug users and nonusers existed *before* drug use began. Cross-lagged correlations of drugs-delinquency and delinquency-drugs were similar. Their conclusion was that nonaddictive use of drugs does not cause drug users to become "the more delinquent people we know them to be on the average." They saw the reverse as more plausible—that "delinquency leads to

drug use,” and they hypothesized that delinquent peer groups might be responsible. Speckart and Anglin (1986) used structural equation modeling with a “two-wave, two-variable” approach to study adult narcotics users in a longitudinal study with a one-year lag between waves. They found no prediction of property crime in wave 2 by narcotics use in wave 1 or vice versa. They concluded that one year was too great a time lag between waves and that a much shorter lag might demonstrate a causal effect of narcotics use on remunerative crime.

Elliott, Huizinga, and Menard (1989) conducted an extensive analysis of data from the National Youth Survey concerning the issue of cross causality among substance use, delinquency, and mental health problems. They concluded that “these results offer little support for the idea that drug use leads to crime, either in the long term . . . or more immediate time frame” (p. 189). They added that alcohol use does appear to be implicated in rape and aggravated assault. Newcomb and McGee (1989) employed a two-wave panel study of high school students with one year between the waves. They found that drinking at wave 1 increased criminal behavior at wave 2, even when sensation seeking was held constant as a background factor. No influence of criminal behavior at wave 1 on drinking at wave 2 was found. Dembo et al. (1994) published a two-wave structural model with juvenile detainees as subjects and one year between waves. Family problems, peer’s troubled behavior, alcohol/drug use, and delinquent behavior were included in both waves. They failed to find the wave 1 alcohol/drug to wave 2 delinquency path to be significant. In fact, they found no cross-lagged paths to be significant. Stacy and Newcomb (1995) studied young adults (72 percent female) with eight years between waves. In their structural equation model, the drug path from drug use in adolescence to criminal deviance in adulthood was significant. Apospori et al. (1995) studied Dade County, Florida sixth and seventh graders with a year between waves. They found that for the White teenagers, deviance predicted subsequent drug use. Drug use did not predict delinquency for any racial/ethnic group.

These studies are fairly representative of the literature as a whole. Some conclusions might be drawn from these studies of adolescents and young adults. First, there are inconsistent findings regarding the causal relationship between substance use and criminal behavior. Some studies have provided evidence for the relationship, whereas others have not. Second, these studies suggest that the causal relationship is dynamic and reciprocal rather than unidirectional. Substance use may increase the probability of crime involvement, and crime may lead to substance abuse. Third, the casual relationship may be contingent on the characteristics of population that is under study. For some groups, the relationship may be significant, and for others it may not.

Building on these previous studies, the present analysis represented an effort to further examine the causal relationship between substance use and criminal behavior by undertaking a longitudinal study of substance use and criminal behavior in young men. First, we formulated two models, a cross-lagged model and a synchronous model, to capture the dynamic and reciprocal relationship between substance use and delinquency (see Figures 1 and 2). The cross-lagged model specified lagged reciprocal effects between drinking, drug use, and delinquency. The synchronous model assessed a simultaneous reciprocal relationship between drinking, drug use, and delinquency. These models allowed us to simultaneously examine the effect of substance use on delinquency and the effect of delinquency on substance use.

Second, the present study tested the proposed cross-lagged and synchronous models with both early-onset delinquents and late-onset (or nondelinquent) young males and compared the results. The inconsistent findings of previous studies imply that the relationship between substance use and criminal behavior may operate differently in different groups. Many previous studies have focused on within-individual variations in substance use and criminal behavior across time. It is also important to assess between-group differences in the relationship between substance use and delinquency (Loeber and Le Blanc 1990).

We assessed the between-group difference for the proposed models by selecting a critical variable—age of onset of delinquency—to split our sample. There is a theoretical and empirical basis for thinking that age of onset of delinquency might moderate the relationship between substance abuse and criminal offending. Recently, Moffitt (1993, 1997) framed a developmental taxonomy of criminal offenders. She proposed, and provided empirical support for, two types of antisocial careers. The life-course-persistent type originates in childhood, continues throughout life, and corresponds roughly to the notion of a sociopath. It is a pathological condition that originates with neuropsychological problems and poor parenting in early childhood. The adolescence-limited type originates in adolescence and tends to desist in young adulthood. It is not pathological and originates in a “maturity gap”—trying to be more mature than possible in adolescence. Moffitt (1993) wrote, “For delinquents whose criminal activity is confined to the adolescent years, the causal factors may be proximal, specific to the period of adolescent development, and theory must account for the discontinuity in their lives” (p. 674). Although Moffitt allowed that both life-course-persistent and adolescence-limited delinquents can be “ensnared” by alcohol and drug abuse, the life-course-persistent type maintains antisocial behavior throughout life. It is reasonable to hypothesize that alcohol and drug use in adolescence would delay the “maturing out” of the adolescence-limited delinquent. This implies

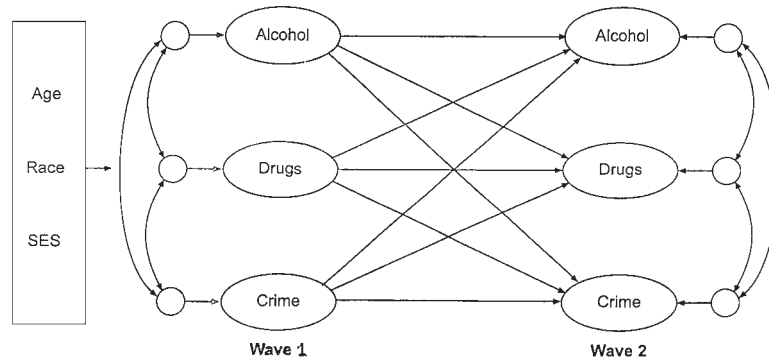


Figure 1: Basic Cross-Lagged Model

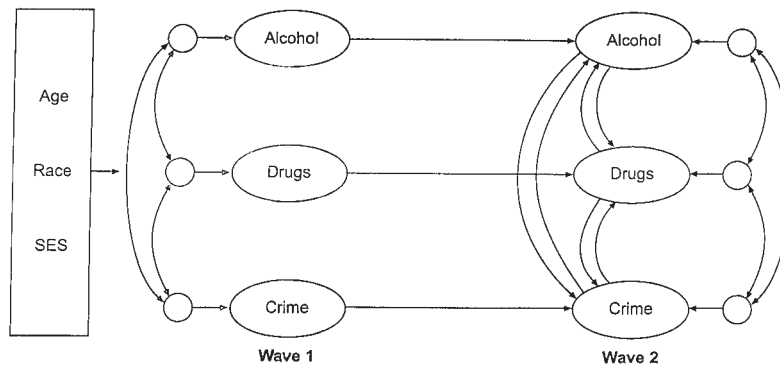


Figure 2: Basic Synchronous Model

that the relationship between substance use and delinquency should be more significant for late-onset adolescents than early-onset ones. In Moffitt's formulation, the early-onset delinquent is similar to the person with weak self-control described by Gottfredson and Hirschi (1990). Gottfredson and Hirschi specify self-control as a general construct, established in early childhood, that provides an explanation of all criminal, deviant, and reckless acts. Criminal acts and other imprudent behaviors should not be causally related because these acts and behaviors share a common cause—low self-control.

For both theories, early onset delinquency is a manifestation of psychopathy or low self-control that develops in early childhood. The relationship

among the various deviant acts of early-onset delinquents is explained as spurious—caused in common by a latent personality trait. However, in the absence of a permanent antisocial trait, various deviant acts of late-onset adolescents may be causally related. Therefore, age of onset of delinquency is an important variable to differentiate adolescent populations.

There is a large body of studies that have addressed the effect of early onset of delinquency on later delinquency, sociopathy, and substance abuse (for a detail review of these studies, see Loeber and Le Blanc 1990). Consistent with both Moffitt's (1993, 1997) and Gottfredson and Hirschi's (1990) theories, these studies have documented that "many chronic offenders tend to have experienced an early onset of problem behavior and delinquency" (Loeber and Le Blanc 1990:397). These chronic offenders often have poor socialization and troubles in early childhood that result in psychopathic personality traits (e.g., Loeber, Stouthamer-Loeber, and Green 1991). Their trajectory of criminal career significantly differs from that of late-onset adolescents. They constitute a distinct group that has attracted the attention of researchers and also has attracted efforts at social control (Blumstein, Cohen, and Farrington 1988; Blumstein et al. 1986).

In sum, the present study first formulated two models (cross lagged and synchronous) to capture the dynamic and reciprocal relationship between substance use and delinquency as previous studies implied. Second, this study conjectured that the dynamics of substance use and delinquency might differ between early-onset delinquents and late-onset (or nondelinquent) adolescents. The major hypothesis of the present study is that the causal relationship between substance use and delinquency should be more significant for the late-onset adolescents than the early-onset ones.

DATA AND METHOD

Study Design

The present study used data from the Buffalo Longitudinal Survey of Young Men (BLSYM). The BLSYM was a panel study of adolescent substance use and delinquency with a probability sample of 625 males aged 16 to 19 from Buffalo, New York. These males were selected by random digit dial, oversampling areas with high crime rates, and screening by telephone to further oversample delinquents. The oversampling from high-crime areas was accomplished as follows. In a pilot study, we had previously established that young males who live in high-crime districts will self-report more criminal behavior. To estimate the crime rates for the local telephone districts, we overlaid crime rate information obtained from local authorities onto a map of

telephone districts obtained from the New York Telephone Company. Using a specialized computer program, we then generated a telephone sample with higher sampling fractions in high crime areas. This telephone sample was subsequently fed to the Research Institute's Computer Assisted Telephone Interview (CATI) system. Telephone screening was done by asking the potential respondent nine questions known to be correlated with delinquent behavior (e.g., repeated a grade, got into many fights when age 8-11, absent parent). If they answered three or more in the delinquent direction, we attempted to recruit them; otherwise, a recruitment attempt was made a random one third of the time. These methods represented an intelligent compromise between an equal probability general population sample, which might not contain enough deviant behavior to analyze, and an institutional sample, which might contain serious ascertainment bias.

Face-to-face structured interviews were conducted by trained interviewers at the Research Institute on Addictions. The first-wave interviews were conducted from October 1992 through January 1994. Second-wave interviews were conducted with 596 respondents approximately 18 months after their first-wave interview. The sample attrition rate was 4.6 percent for the second wave. This sample attrition rate had no substantial effect on the representativeness of the sample (for a brief description of the sample at wave 1, see Table 1).

One major purpose of the BLSYM was to investigate the role of substance use in intensifying and prolonging delinquent behavior. To achieve this purpose, the survey selected a male sample with an age range of 16 to 19 years. As previous studies indicated (e.g., Farrington 1983), males commit far more delinquent acts than females and commit particularly high proportions of the most physically threatening crimes. Males also have much higher rates of substance use than females (e.g., Vaillant 1983). Therefore, the effect of substance use on the maturing out of delinquency is more likely to be significant for males. The survey included rich information about substance use and delinquency involvement that allowed us to assess the proposed models for early-onset and late-onset groups.

Variables

All variables in the present study were measured on the basis of respondents' self-reports of their substance use and delinquent acts. We used alcohol consumption and drug use separately in this analysis because drinking and drug use may have different links with criminal acts. Three composite indicators were constructed for the latent variable that reflects alcohol consumption: the average alcohol consumption in drinks per day for the past year, the proportion of days on which the respondent drank five or more

TABLE 1: Description of Sample at Wave 1 (in percentages)

	<i>Entire Sample</i>	<i>Early Onset of Delinquency</i>	<i>Late and No Onset of Delinquency</i>	
	N = 596	N = 299	N = 297	Chi-Square
Race				
White	49	51	47	Not significant
Black	45	43	46	
Other	6	6	7	
Age				
16-17	55	56	54	Not significant
18-19	45	44	46	
Income				
Less than \$15,000	34	35	33	Not significant
\$15,000 or more	66	65	67	
Alcohol				
Abstain	24	17	32	< .0001
Less than 2 drinks/day	45	46	43	
2 drinks/day or more	31	37	25	
Drugs in past year				
0 times	48	38	58	< .0001
1-20 times	25	30	20	
21+ times	22	32	22	
Crimes in past year				
0-5	29	13	46	< .0001
6-50	31	36	30	
51+	40	51	28	

drinks, and the total number of *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association 1987) (*DSM-III-R*) signs and symptoms displayed in the past year. The average alcohol consumption was constructed from quantity and frequency questions for six forms of alcohol: beer, malt liquor, wine, wine coolers, fortified wine, and liquor. The *DSM-III-R* signs and symptoms were determined using the Diagnostic Interview Schedule questions (Robins et al. 1989). Similarly, we created three composite indicators of the drug use latent variable. They were the total instances of use of any illicit drug in the past year, total negative consequences from marijuana use in the past year, and total negative consequences from illicit drug use other than marijuana use in the past year.

Delinquency was conceptualized in five types for analysis: minor, general, index, property, and violent offenses. It was speculated that the dynamics of substance use and delinquency might differ for different types of delinquent acts. For instance, as the disinhibition assumption argues, people who use alcohol heavily might be more likely to be involved in violence but not in

property crime because "alcohol was thought to loosen behavioral constraints by affecting specific brain centers or intellectual capacities" (Collins 1988:109; also see Fagan 1990:290-93; Welte and Miller 1987:314). Previous studies (e.g., Huizinga, Menard, and Elliott 1989) indicated that minor delinquency was a cause of illicit drug use. We adopted 34 items of delinquency from the National Youth Survey (Elliott, Huizinga, and Ageton 1985) to measure these five latent constructs: minor, general, index, property, and violent offenses. The minor (8 items), general (18 items), and index (8 items) variables are mutually exclusive subscales that comprise all 34 items and were defined by Elliott et al. (1985). The property (12 items) and violent (6 items) are subscales that we invented by simply examining the content of the items. These two scales do not overlap with each other but do overlap with the minor, general, and index scales. These delinquency items showed substantial internal consistency reliability. The 34 items analyzed together had a Cronbach's alpha of .85. The subscales, of course, had lesser reliability depending on the number of items. They ranged from .76 for the general delinquency scale with 18 items down to .49 for the minor delinquency scale with only 8 items.

We constructed three measured variables for each of the latent variables by aggregating the raw items. The latent variable for minor delinquency was represented by theft, disorderly or rowdy acts, and miscellaneous minor delinquency. General delinquency was represented by theft, vice, and miscellaneous general delinquency. Index crime was represented by theft, violent acts, and miscellaneous index crimes. Property delinquency was represented by index property crimes, general property crimes, and minor property crimes. Violent delinquency was represented by aggravated assault, rape, gang fights, and hitting someone. We used a log transformation to normalize the distribution of each of these composite indicators.

Age of onset of delinquency was measured by asking respondents about how old they were when they first committed any of the 34 items of delinquency. There is no universally recognized standard to distinguish between early and late onset of delinquency. We follow previous studies that used the ages of 12 or 13 as the dividing line (Cohen 1986; Farrington 1983; Tolan 1987). The age of onset variable was coded so that respondents who had an onset at age 12 or younger were placed in the early-onset group; those with onset of 13 or older were placed in the late-onset group. Those (14.6 percent) who never committed any delinquent acts were also included in the late-onset group.

In addition to these primary variables, the present study also included several important control variables: age, race, and family socioeconomic status

(SES). These variables may have confounding effects on the relationship between substance use and delinquency. Race was a dummy variable (1 = White; 0 = non-White, including Black, Asian, American Indian, and mixed race). Age was measured in years. Family SES was based on adolescent family income and parental education. Both family income and parental (father and mother, respectively) education were expressed as variables ranging from 1 to 9 (1 = \$6,000 or less to 9 = \$90,000 or more for family income and 1 = less than high school graduate to 9 = Ph.D. or professional degree for parental education). We averaged these two measures to create a variable for family SES.

Structural Equation Panel Models

The aim of our analysis was to detect reciprocal relationships between drinking/drug use and criminal offending. To pursue this aim, we used two structural equation models shown in Figures 1 and 2 (Finkel 1995). Figure 1 shows the cross-lagged model. It contained all possible paths from deviance latent variables (i.e., alcohol, drugs, and crime) in wave 1 to the analogous variables in wave 2 so that influence of drinking/drug use on criminal offending or criminal offending on drinking/drug use 18 months later could be detected by the emergence of a significant coefficient. Figure 2 demonstrates the synchronous model, designed to detect causal influence of one deviance variable on another around the same time within wave 2. Readers familiar with the use of structural equation models for panel analysis will realize that much is not shown in Figures 1 and 2. The observed variables that are linked with the latent alcohol, drug, and crime variables are described above. Also included in the models, but not shown in the figures, were error terms for each observed variable and covariances between each of these error terms and its opposite number in the other wave. Paths ran from each background variable to the deviance variables in both waves, which was not shown explicitly to avoid cluttering. Alcohol consumption, drug use, and delinquent acts were measured in both waves. The background variables were measured at wave 1.

Ten panel models were fit by doing group analysis (early vs. late onset of delinquency) for each type of delinquency, five for the cross-lagged model and five for the synchronous model. In a panel model, each wave 2 variable is considered while controlling for its own wave 1 value as well as the effects of the background control variables. Amos (version 3.6, Arbuckle 1997) was used to estimate the proposed models. Maximum likelihood was used as a method of fitting the models.

RESULTS

Before doing group analysis of the proposed models, we first estimated the models for the entire sample with the five types of delinquency. No significant paths were found between drinking/drug use and any of the delinquency types for both cross-lagged and synchronous models when the effects of background control variables were held constant.

Next, we assessed the between-group differences of the proposed cross-lagged and synchronous models for early-onset and late-onset groups of the sample with different types of delinquency. For minor offenses with the cross-lagged model (see Table 2), the results showed no significant path between minor offenses and drinking/drug use for the early-onset group (see the left-hand side of Table 2). In contrast, for the late-onset group, minor offenses at wave 1 significantly and positively affected drug use at wave 2 ($b = 0.89$; see the part in the right-hand side of Table 2). Amos has a feature that allows us to test the significance of this path difference for the two groups. The results indicate that the late-onset group has a significant difference from the early-onset group for this path coefficient, meaning that minor offenses significantly influence later drug use only for the late-onset group (see the rightmost column of Table 2 for this significant difference).

Analyses of the cross-lagged model with general offenses and property offenses were performed next. For the late-onset group, drug use had a significant lagged effect on general offenses ($b = 0.07$), whereas for the early-onset group, drug use had no such effect (see Table 3). A significance test of this path for the two groups indicated that the path approaches significance but does not reach the $p < .05$ level. For property offenses, two significant paths were found for the late-onset group (see Table 4). Property offenses at wave 1 significantly and positively affected drug use at wave 2 ($b = 1.38$), and there was a significant and negative effect of drinking at wave 1 on property offenses at wave 2 (-0.07). In comparison, no lagged effect was found for the early-onset group. The significance of the two paths for the two groups was tested. The path from drinking to property offenses was significantly different between the two groups. However, there was no significant difference between the two groups in the path from property offenses to drug use, although it was significant within the early-onset group.

Our estimates of the synchronous model with minor, general, and property offenses produced similar results (see Tables 5, 6, and 7). Minor offenses had a significant effect on drug use in the same wave ($b = 1.26$), drug use exhibited a significant effect on general offenses in the same wave ($b = 0.08$), and drinking influenced property offenses significantly and negatively within the same wave ($b = -0.10$). All these paths had a significant difference between

(text continues on p. 433)

TABLE 2: Unstandardized and Standardized Parameter Estimates of the Cross-Lagged Model of the Relationship between Substance Use and Minor Offense for Two Groups Divided by the Age Onset of Delinquency

Dependent Variable	Age Onset of Delinquency						Path Difference
	Early			Late			
	Predetermined Variable						
	Alcohol Consumption 1	Drug Use 1	Minor Offense 1	Alcohol Consumption 1	Drug Use 1	Minor Offense 1	
Alcohol consumption 2	0.57*	0.03	0.11	0.64*	−0.02	0.08	Significant, $p < 0.05$
	(0.09)	(0.05)	(0.14)	(0.09)	(0.05)	(0.12)	
	[0.60]	[0.05]	[0.06]	[0.70]	[−0.04]	[0.04]	
Drug use 2	−0.14	0.86*	−0.22	−0.38	0.76*	0.89*	
	(0.23)	(0.15)	(0.33)	(0.23)	(0.14)	(0.32)	
	[−0.08]	[0.86]	[−0.07]	[−0.27]	[0.89]	[0.33]	
Minor offense 2	−0.04	0.03	0.61*	−0.06	0.06	0.74*	
	(0.09)	(0.04)	(0.22)	(0.07)	(0.04)	(0.15)	
	[−0.07]	[0.09]	[0.64]	[−0.14]	[0.21]	[0.83]	

NOTE: $\chi^2 = 588.738$; $df = 300$; goodness-of-fit index = 0.913; comparative fit index = 0.942; $N = 596$. Standardized errors are reported in parentheses; standardized parameter estimates are reported in brackets; age, race, and family socioeconomic status are included in the estimate, but their effects are not reported in the table. Significant stability coefficients are found for each latent construct of drinking, drug use, and minor offense, but they are also not reported in the table.

* $p < .05$.

TABLE 3: Unstandardized and Standardized Parameter Estimates of the Cross-Lagged Model of the Relationship between Substance Use and General Offense for Two Groups Divided by the Age Onset of Delinquency

Dependent Variable	Age Onset of Delinquency						Path Difference
	Early			Late			
	Predetermined Variable						
	Alcohol Consumption 1	Drug Use 1	General Offense 1	Alcohol Consumption 1	Drug Use 1	General Offense 1	
Alcohol consumption 2	0.58* (0.09) [0.61]	0.01 (0.06) [0.03]	0.10 (0.19) [0.05]	0.67* (0.09) [0.72]	−0.02 (0.06) [−0.04]	0.01 (0.21) [0.00]	
Drug use 2	−0.22 (0.22) [−0.13]	0.88* (0.19) [0.88]	−0.04 (0.47) [−0.01]	−0.22 (0.20) [−0.16]	0.84* (0.18) [0.93]	0.12 (0.48) [0.03]	
General offense 2	0.08 (0.04) [0.20]	−0.01 (0.03) [−0.02]	0.350* (0.11) [0.46]	−0.03 (0.03) [−0.08]	0.07* (0.03) [0.33]	0.51* (0.10) [0.57]	Significant, $p < .10$

NOTE: $\chi^2 = 607.203$; $df = 300$; goodness-of-fit index = 0.913; comparative fit index = 0.949; $N = 596$. Standardized errors are reported in parentheses; standardized parameter estimates are reported in brackets; age, race, and family socioeconomic statuses are included in the estimate, but their effects are not reported in the table. Significant stability coefficients are found for each latent construct of drinking, drug use, and general offense, but they are also not reported in the table.

* $p < .05$.

TABLE 4: Unstandardized and Standardized Parameter Estimates of the Cross-Lagged Model of the Relationship between Substance Use and Property Offense for Two Groups Divided by the Age Onset of Delinquency

Dependent Variable	Age Onset of Delinquency						Path Difference
	Early			Late			
	Predetermined Variable						
	Alcohol Consumption 1	Drug Use 1	Property Offense 1	Alcohol Consumption 1	Drug Use 1	Property Offense 1	
Alcohol consumption 2	0.61* (0.09) [0.64]	0.04 (0.05) [0.07]	−0.18 (0.32) [−0.05]	0.64* (0.08) [0.70]	−0.04 (0.05) [−0.07]	0.37 (0.25) [0.10]	Not significant
Drug use 2	−0.16 (0.23) [−0.10]	0.83* (0.15) [0.83]	0.06 (0.76) [0.01]	−0.21 (0.19) [−0.15]	0.71* (0.14) [0.81]	1.38* (0.54) [0.24]	
Property offense 2	0.02 (0.04) [0.09]	−0.01 (0.02) [−0.08]	0.59* (0.15) [0.53]	−0.07* (0.03) [−0.27]	0.01 (0.02) [0.08]	1.02* (0.13) [1.02]	Significant, $p < .05$

NOTE: $\chi^2 = 637.941$; $df = 300$; goodness-of-fit index = 0.908; comparative fit index = 0.937; $N = 596$. Standardized errors are reported in parentheses; standardized parameter estimates are reported in brackets; age, race, and family socioeconomic statuses are included in the estimate, but their effects are not reported in the table. Significant stability coefficients are found for each latent construct of drinking, drug use, and property offense, but they are also not reported in the table.

* $p < .05$.

TABLE 5: Unstandardized and Standardized Parameter Estimates of the Synchronous Model of the Relationship between Substance Use and Minor Offense for Two Groups Divided by the Age Onset of Delinquency

Dependent Variable	Age Onset of Delinquency						Path Difference
	Early			Late			
	Predetermined Variable						
	Alcohol Consumption 2	Drug Use 2	Minor Offense 2	Alcohol Consumption 2	Drug Use 2	Minor Offense 2	
Alcohol consumption 2	—	0.02 (0.06) [0.04]	0.19 (0.22) [0.10]	—	−0.04 (0.07) [−0.06]	0.15 (0.20) [0.07]	Significant, $p < .05$
Drug use 2	−0.26 (0.42) [−0.15]	—	−0.32 (0.58) [−0.10]	−0.47 (0.33) [−0.31]	—	1.26* (0.44) [0.41]	
Minor offense 2	−0.06 (0.15) [−0.11]	0.03 (0.05) [0.11]	—	−0.05 (0.09) [−0.11]	0.08 (0.04) [0.23]	—	

NOTE: $\chi^2 = 588.738$; $df = 300$; goodness-of-fit index = 0.913; comparative fit index = 0.942; $N = 596$. Standardized errors are reported in parentheses; standardized parameter estimates are reported in brackets; age, race, and family socioeconomic status are included in the estimate, but their effects are not reported in the table. Significant stability coefficients are found for each latent construct of drinking, drug use, and minor offense, but they are also not reported in the table.

* $p < .05$.

TABLE 6: Unstandardized and Standardized Parameter Estimates of the Synchronous Model of the Relationship between Substance Use and General Offense for Two Groups Divided by the Age Onset of Delinquency

Dependent Variable	Age Onset of Delinquency						Path Difference
	Early			Late			
	Predetermined Variable						
	Alcohol Consumption 2	Drug Use 2	General Offense 2	Alcohol Consumption 2	Drug Use 2	General Offense 2	
Alcohol consumption 2	—	0.02 (0.06) [0.03]	0.28 (0.51) [0.11]	—	−0.03 (0.10) [−0.04]	0.01 (0.43) [0.00]	
Drug use 2	−0.38 (0.46) [−0.21]	—	−0.02 (1.48) [−0.01]	−0.32 (0.31) [−0.21]	—	0.24 (0.96) [0.05]	
General offense 2	0.13 (0.07) [0.32]	−0.01 (0.04) [−0.03]	—	−0.01 (0.04) [−0.03]	0.08* (0.03) [0.35]	—	Significant, $p < .05$

NOTE: $\chi^2 = 607.203$; $df = 300$; goodness-of-fit index = 0.913; comparative fit index = 0.949; $N = 596$. Standardized errors are reported in parentheses; standardized parameter estimates are reported in brackets; age, race, and family socioeconomic status are included in the estimate, but their effects are not reported in the table. Significant stability coefficients are found for each latent construct of drinking, drug use, and general offense, but they are also not reported in the table.

* $p < .05$.

TABLE 7: Unstandardized and Standardized Parameter Estimates of the Synchronous Model of the Relationship between Substance Use and Property Offense for Two Groups Divided by the Age Onset of Delinquency

Dependent Variable	Age Onset of Delinquency						Path Difference
	Early			Late			
	Predetermined Variable						
	Alcohol Consumption 2	Drug Use 2	Property Offense 2	Alcohol Consumption 2	Drug Use 2	Property Offense 2	
Alcohol consumption 2	—	0.04 (0.06) [0.07]	−0.32 (0.55) [−0.09]	—	−0.06 (0.08) [−0.10]	0.45 (0.30) [0.12]	Not significant
Drug use 2	−0.27 (0.41) [−0.15]	—	0.02 (10.28) [0.00]	−0.18 (0.28) [−0.12]	—	1.42* (0.53) [0.25]	
Property offense 2	0.04 (0.06) [−0.13]	−0.02 (0.02) [−0.10]	—	−0.10* (0.04) [−0.37]	0.01 (0.03) [0.06]	—	

NOTE: $\chi^2 = 637.941$; $df = 300$; goodness-of-fit index = 0.908; comparative fit index 0.937; $N = 596$. Standardized errors are reported in parentheses; standardized parameter estimates are reported in brackets; age, race, and family socioeconomic status are included in the estimate, but their effects are not reported in the table. Significant stability coefficients are found for each latent construct of drinking, drug use, and property offense, but they are also not reported in the table.

* $p < .05$.

the two groups. Although property offenses had a significant effect on drug use in the same wave ($b = 1.42$), the path difference was not significant between the two groups.

However, estimates of both cross-lagged and synchronous models with index and violent offenses indicated that no significant paths were found, meaning that there was no relationship between drinking/drug use and either of these offense types for either group. The between-group difference did not operate for these two types of offenses as it did for the others.

In addition, for each model with different types of offenses, all latent constructs of drinking, drug use, and offense exhibited significant stability coefficients from waves 1 to 2 so that drinking, drug use, and offenses remained fairly stable across the 18 months between waves. For the sake of clear organization, the stability coefficients have been omitted from the tables showing the synchronous models (Tables 5-7). They were in all cases virtually identical to the corresponding coefficients in the cross-lagged model (Tables 2-4).

Finally, because background control variables—age, race, and family SES—were included in each model with each type of offense, these demographic variables exhibited some effects on drinking, drug use, and criminal offending. The effects of these demographic variables on the wave 1 values of drinking, drug use, and criminal offending are shown in Table 8. For example, race had a significant effect on drinking in both the early- and late-onset groups—Whites drank more than non-Whites. Age significantly and positively influenced drinking and drug involvement. Most interestingly, SES was related negatively to most of the problem behavior variables but only in the late-onset group. For late-onset young males, higher SES members exhibited less drinking, drug use, and delinquency. For the early-onset males, social class did not make any difference.

SUMMARY AND DISCUSSION

Building on previous studies, the present study assessed the between-group difference in the relationship of substance use to delinquency by using two structural equation panel models—a cross-lagged model and a synchronous model. Following an implication of the work of Moffitt (1993, 1997), we hypothesized that the relationship between substance use and delinquency may be different between early-onset and late-onset delinquents. Using data from the BLSYM, we performed group comparison analyses with the panel models with different types of delinquency as the dependent variables. Several findings emerged.

First, our estimates of the proposed models for the entire sample provide no support for the assertion that substance abuse and criminal offending

TABLE 8: Standardized Parameters for Demographics Predicting Alcohol, Drugs, and Crime in Wave 1

		<i>Early</i>	<i>Late</i>
SES	Alcohol 1	0.02	-0.12*
SES	Drug 1	0.00	-0.18*
SES	Minor offense 1	0.00	-0.07
SES	General offense 1	-0.09	-0.16*
SES	Property offense 1	0.00	-0.06
Race	Alcohol 1	0.27*	0.24*
Race	Drug 1	0.06	0.12
Race	Minor offense 1	0.17*	0.02
Race	General offense 1	-0.18*	-0.01
Race	Property offense 1	0.16*	0.23*
Age	Alcohol 1	0.21*	0.27*
Age	Drug 1	0.15*	0.19*
Age	Minor offense 1	-0.16*	0.08
Age	General offense 1	-0.03	0.07
Age	Property offense 1	-0.27*	-0.01

NOTE: These parameters are taken from the six models in Tables 2 through 4, which are generated by crossing three types of crime with the early and late onset groups. These parameters are identical in cross-lagged and synchronous models, and the alcohol and drug parameters are identical in the models for each crime type. Redundant parameters are shown once.

* $p < .05$.

significantly influence each other when the effects of demographic variables are held constant. This result is consistent with the findings of most, but not all, similar studies. This result is also consistent with a possible acute influence of alcohol or drugs that are in the offender's system at the time of the act, particularly if this influence was on the severity of criminal acts and not on their incidence. As mentioned in the introduction, this seems to be the case for the alcohol/violence relationship.

Second, our group analyses of the data indicate a consistent pattern for both cross-lagged and synchronous models with minor, general, and property offenses. For early-onset males, no significant relationship was found between substance use and any of these types of delinquency. In contrast, for the late-onset males, the data indicated several significant relationships between substance use and different types of delinquency. Minor delinquency has both lagged and synchronous positive effects on drug use, suggesting that minor delinquent acts promote future drug use. Drug use has both a lagged and synchronous positive impact on general delinquent offenses. Commission of property offenses has both a lagged and synchronous influence on drug use, whereas drinking has both lagged and synchronous negative effects on property offenses. Tests of path difference indicated that all these effects were significantly different between the two groups except the

lagged and synchronous affects of property offenses on drug use. At the risk of being repetitive, let us note again that these significant causal effects of substance abuse on criminal offending, and vice versa, were all found among late-onset delinquents. There were no such effects among early-onset delinquents, suggesting that for them, the strong correlations among these various manifestations of deviance are spurious and probably attributable to the influence of a latent antisocial personality trait that was established in early childhood and is stable in late adolescence. These significant group differences in the dynamics of substance use and delinquency are consistent with our hypothesis that the relationship between substance use and delinquency is more likely to be causal for the late-onset males than for the early-onset males. Among the late-onset males, deviant behavior is less a function of a stable long-term personality trait and more a function of their specific life circumstances at a given time. Engaging in minor offenses is likely to promote drug use by providing the entree to a delinquent subculture in which drugs are more accessible and acceptable. This effect would, of course, be stronger on late-onset adolescence-limited delinquents because the life-course-persistent offender does not require social pressure or permission for deviant acts. Our results also show that drug use in turn increases the probability of more serious delinquency in the form of general offenses. It is plausible that drug use might delay the maturing out from delinquency by rendering the young male less desirable to prospective employers or female partners, thus helping to ensnare him longer in the delinquent lifestyle. This would only be the case for late-onset delinquents who are, in Moffitt's (1993, 1997) term, adolescence limited. The life-course-persistent offender does not, by definition, mature out. The positive effect of property crime on drug use might be simply economic—the property offenses supply the money for drugs. The negative effect of drinking on property offenses is more problematic, and interpretation is necessarily speculative. Perhaps chronic alcohol use makes the young male seem a less reliable crime partner—an effect documented by the work of Cordilia (1985). As a limitation of our findings, we should note that these statistically significant effects in the late-onset group were relatively small in magnitude. Their standardized coefficients ranged in absolute value from .24 to .41. Even among late-onset males, a large portion of the covariance between substance involvement and criminal offending was probably due to common predispositions.

This study found no indication of a causal relationship between substance use and index or violent crime. This may be because by the time a young offender (even an adolescence-limited one) has progressed to the most serious crimes, his criminal career has a life of its own and is no longer causally connected to substance use. Our failure to find any positive effect of alcohol on violent offending is slightly surprising but explainable. In these analyses,

we are not dealing with the acute effects of substance use on behavior. Our synchronous analyses are based on substance involvement during the same one-year period as the criminal offending but do not imply that the respondent had the substance in his system when he committed the act. As mentioned above, a substantial part of the alcohol and violence literature supports the notion that alcohol influences the severity of violent acts but does not cause violent acts that would not have occurred otherwise.

It is interesting to note that SES had a negative effect on delinquency and substance involvement only in the late-onset group. We might speculate that, all other things being equal, the lower class males are more likely to be exposed to a deviant social environment. The early-onset males have established patterns of deviant behavior and have found their niche in a deviant subculture; for them, social class makes no difference.

In summary, the findings of the present study suggest that the relationship of substance use and delinquency depends on the type of offender and also on the type of offense. The alcohol/drug/crime nexus is contingent on the characteristics of the group under study. Second, the relationship between substance use and delinquency is reciprocal rather than unidirectional. Substance use and delinquency may influence each other, depending on the nature of the substance and the delinquent acts. Finally, the dynamic between substance use and delinquency is less pronounced for the more serious types of delinquency. Serious offenses may have other connections with drugs, such as drug trafficking rather than drug use. Further research is needed to address these issues.

REFERENCES

- Altschuler, D. M. and P. J. Brounstein. 1991. "Patterns of Drug Use, Drug Trafficking, and Other Delinquency among Inner-City Adolescent Males in Washington, D.C." *Criminology* 29:589-621.
- American Psychiatric Association. 1987. *Diagnostic and Statistical Manual of Mental Disorders*, 3d ed., rev. Washington, DC: American Psychiatric Association.
- Apospori, E. A., W. A. Vega, R. S. Zimmerman, G. J. Warheit, and A. G. Gil. 1995. "A Longitudinal Study of the Conditional Effects of Deviant Behavior on Drug Use among Three Racial/Ethnic Groups of Adolescents." Pp. 211-30 in *Drugs, Crime, and Other Deviant Adaptations: Longitudinal Studies. Longitudinal Research in the Social and Behavioral Sciences: An Interdisciplinary Series*, edited by H. B. Kaplan. New York: Plenum.
- Arbuckle, J. L. 1997. *Amos Users' Guide*. Chicago: SPSS Inc.
- Ball, J. C., L. Rosen, J. A. Flueck, and D. N. Nurco. 1981. "The Criminality of Heroin Addicts: When Addicted and When Off Opiates." Pp. 39-65 in *The Drugs-Crime Connection*, edited by J. A. Inciardi. Beverly Hills, CA: Sage.
- Bennett, R. M., A. H. Buss, and J. A. Carpenter. 1969. "Alcohol and Human Physical Aggression." *Quarterly Journal of Studies on Alcohol* 30:870-76.

- Blumstein, A., J. Cohen, and D. P. Farrington. 1988. "Criminal Career Research: Its Value for Criminology." *Criminology* 26:1-36.
- Blumstein, A., J. Cohen, A. Roth, and C. A. Visser. 1986. *Criminal Career and "Career Criminals"*. Washington, DC: National Academy Press.
- Chaiken, J. M. and M. R. Chaiken. 1990. "Drugs and Predatory Crime." Pp. 203-40 in *Drugs and Crime*. Vol. 13, edited by M. Tonry and J. Q. Wilson. Chicago: University of Chicago Press.
- Cohen, J. 1986. "Research on Criminal Careers: Individual Frequency Rates and Offense Seriousness." Pp. 292-418 in *Criminal Career and "Career Criminals"*. Vol. 1, edited by A. Blumstein, J. Cohen, A. Roth, and C. A. Visser. Washington, DC: National Academy Press.
- Collins, J. J. 1988. "Suggested Explanatory Frameworks to Clarify the Alcohol Use/Violence Relationship." *Contemporary Drug Problems* 15:107-21.
- Cordilia, A. 1985. "Alcohol and Property Crime: Exploring the Casual Nexus." *Journal of Studies on Alcohol* 46 (2): 161-71.
- Dembo, R., L. Williams, W. Wothke, and J. Schmeidler. 1994. "The Relationships among Family Problems, Friends' Troubled Behavior, and High Risk Youths' Alcohol/Other Drug Use and Delinquent Behavior: A Longitudinal Study." *International Journal of the Addictions* 29 (11): 1419-42.
- Elliott, D. S., D. Huizinga, and S. S. Ageton. 1985. *Explaining Delinquency and Drug Use*. Beverly Hills, CA: Sage.
- Elliott, D. S., D. Huizinga, and S. Menard. 1989. *Multiple Problem Youth: Delinquency, Substance Use and Mental Health Problems*. New York: Springer-Verlag.
- Fagan, J. A. 1990. "Intoxication and Aggression." Pp. 241-320 in *Drugs and Crime*. Vol. 13, edited by M. Tonry and J. Q. Wilson. Chicago: University of Chicago Press.
- Fagan, J. A., K. V. Hansen, and M. Jang. 1983. "Profiles of Chronically Violent Delinquents: An Empirical Test of an Integrated Theory of Violent Delinquency." Pp. 91-120 in *Evaluating Juvenile Justice*, edited by J. Kleugal. Beverly Hills, CA: Sage.
- Farrington, D. P. 1983. "Offending from 10 to 25 Years of Age." Pp. 17-37 in *Prospective Studies of Crime and Delinquency*, edited by K. T. VanDusen and S. A. Mednick. Boston: Kluwer and Nijhoff.
- Finkel, S. E. 1995. *Causal Analysis with Panel Data*. Sage University Paper series on Quantitative Applications in the Social Sciences, 07-105. Thousand Oaks, CA: Sage.
- Goldstein, P. J. 1985. "Drugs and Violent Behavior." *Journal of Drug Issues* (Fall): 493-506.
- Gottfredson, M. R. and T. Hirschi. 1990. *A General Theory of Crime*. Stanford, CA: Stanford University Press.
- Huizinga, D. H., S. Menard, and D. S. Elliott. 1989. "Delinquency and Drug Use: Temporal and Developmental Patterns." *Justice Quarterly* 6:419-55.
- Johnson, B. D., T. Williams, K. A. Dei, and H. Sanabria. 1990. "Drug Abuse in the Inner City: Impact on Hard-Drug Users and the Community." Pp. 9-68 in *Drugs and Crime*. Vol. 13, edited by M. Tonry and J. Q. Wilson. Chicago: University of Chicago Press.
- Johnston, L. D., P. M. O'Malley, and L. K. Eveland. 1978. "Drugs and Delinquency: A Search for Causal Connections." Pp. 137-56 in *Longitudinal Research on Drug Use: Empirical Findings and Methodological Issues*, edited by D. B. Kandel. Washington, DC: Hemisphere.
- Loeber, R. and M. Le Blanc. 1990. "Toward a Developmental Criminology." Pp. 375-473 in *Drugs and Crime*. Vol. 12, edited by M. Tonry and J. Q. Wilson. Chicago: University of Chicago Press.
- Loeber, R., M. Stouthamer-Loeber, and S. Green. 1991. "Age at Onset of Problem Behaviour in Boys, and Later Disruptive and Delinquent Behaviours." *Criminal Behavior and Mental Health* 1 (3): 229-46.

- Miczek, K. A. and M. L. Thompson. 1983. "Drugs of Abuse and Aggression: An Ethnopharmacological Analysis." Pp. 164-88 in *Alcohol, Drug Abuse and Aggression*, edited by E. Gottheil, K. A. Druley, T. E. Skoloda, and H. M. Waxman. Springfield, IL: Charles C Thomas.
- Moffitt, T. E. 1993. "Adolescence-Limited and Life-Course-Persistent Antisocial Behavior: A Developmental Taxonomy." *Psychology Review* 100 (4): 674-701.
- . 1997. "Adolescence-Limited and Life-Course-Persistent Offending: A Complementary Pair of Developmental Theories." Pp. 11-54 in *Developmental Theories of Crime and Delinquency*, edited by T. P. Thornberry. New Brunswick, NJ: Transaction Publishers.
- Newcomb, M. D. and L. McGee. 1989. "Adolescent Alcohol Use and Other Delinquent Behaviors: A One-Year Longitudinal Analysis Controlling for Sensation Seeking." *Criminal Justice and Behavior* 16 (3): 345-69.
- Parker, R. N. 1995. *Alcohol and Homicide*. Albany: State University of New York Press.
- Robins, L. N., J. Helzer, L. Cottler, and E. Goldring. 1989. *NIMH Diagnostic Schedule: Version III Revised (DIS-III-R)*. St. Louis, MO: Washington University.
- Speckart, G. and M. D. Anglin. 1986. "Narcotics and Crime: A Causal Modeling Approach." *Journal of Quantitative Criminology* 2 (1): 3-28.
- Stacy, A. W. and M. D. Newcomb. 1995. "Long-Term Social-Psychological Influences on Deviant Attitudes and Criminal Behavior." Pp. 99-127 in *Drugs, Crime, and Other Deviant Adaptations: Longitudinal Studies. Longitudinal Research in the Social and Behavioral Sciences: An Interdisciplinary Series*, edited by H. B. Kaplan. New York: Plenum.
- Tolan, P. H. 1987. "Implications of Age of Onset for Delinquency Risk." *Journal of Abnormal Child Psychology* 16:47-65.
- Vaillant, G. E. 1983. *The Natural History of Alcoholism*. Cambridge, MA: Harvard University Press.
- Welte, J. W. and B. A. Miller. 1987. "Alcohol Use by Violent and Property Offenders." *Drug and Alcohol Dependence* 19:313-24.
- Wieczorek, W. F. and J. W. Welte. 1994. "Alcohol Involvement in Serious Violence." Presented at the American Society on Criminology Conference, Miami, FL.
- Wilson, J. Q. and R. J. Herrnstein. 1985. *Crime and Human Nature*. New York: Simon and Schuster.
- Zhang, L., W. F. Wieczorek, and J. W. Welte. 1997. "The Nexus between Alcohol and Violent Crime." *Alcohol: Clinical and Experimental Research* 21 (7): 1264-71.

CRIME AND RISKY BEHAVIOR IN TRAFFIC: AN EXAMPLE OF CROSS-SITUATIONAL CONSISTENCY

MARIANNE JUNGER
ROBERT WEST
REINIER TIMMAN

This study looks at the relationship between risky behavior in traffic and criminal behavior. Analyses were based on a random sample of 1531 persons involved in traffic accidents. The data came from two independent police databases: the accident registration system and a national database on offending. Descriptions of the accidents by the police were used to identify individuals who had displayed risky traffic behavior contributing to or causing an accident; evidence of offending was based on a register of contacts with police. This methodology meant that there was no self-selection bias or self-report bias as may occur in survey data. Exposure to traffic accident risk was controlled for. Log-linear analyses, controlling for gender and age, revealed that persons who displayed risky traffic behavior leading to the accident had an odds ratio of 2.6 for having a police record for violent crime; of 2.5 for vandalism, 1.5 for property crime, and 5.3 for having been involved in traffic crime. The results were consistent with the idea of a common factor underlying risky behavior in traffic and criminal behavior. This underlying trait may represent a general disregard for the long term adverse consequences of one's actions and could be labeled risk-taking, impulsiveness, or lack of self-control.

An important issue in the social sciences concerns the extent to which behavior in specific situations can be understood in terms of more general traits or behavioral tendencies. This study examined the issue of cross-situational

The authors gratefully acknowledge M. Diepeveen for the carefully gathering of the data, D. Nagin for reviewing our article and his useful comments, P. Versteegh and A. Visser of the The Hague police department, P. Lourens of the University of Groningen, G.J.J. Vermeulen of the Department of Transport (Ministerie van Verkeer en Waterstaat), and the employees of the Advisory Services Traffic and Transport (Adviesdienst Verkeer en Vervoer) for their friendly cooperation. An important part of the work for this publication was done while the first author was working at the Netherlands Institute for the Study of Crime and Law Enforcement, Leiden, the Netherlands. Correspondence concerning this article should be addressed to Marianne Junger, Department of Developmental Psychology, Faculty of Social Sciences, Utrecht University, Utrecht, P.O. Box 80.140, 3508 TC Utrecht, the Netherlands.

JOURNAL OF RESEARCH IN CRIME AND DELINQUENCY, Vol. 38 No. 4, November 2001 439-459
© 2001 Sage Publications

consistency, specifically with regard to the relationship between criminal behavior and risky behavior in the traffic environment. We hypothesized that both criminal behavior and risky behavior in traffic reflect a general tendency for risk taking, by which we mean not taking appropriate account of the possibility of negative consequences of one's actions. To test this hypothesis, information was used from a random sample of 1,000 accidents registered by the traffic police. Most accidents involve more than one participant. We compared the criminal records of those participants identified from the police report as contributing to the accident by risky driving with those who could be considered passive victims. The study design was unique in avoiding selection bias in the data or in the measures used. The design also controlled for risk of accident purely because of amount of exposure to traffic. Different types of crime were examined, and driving under the influence of alcohol (DUI) was controlled for as a possible intervening variable.

The cross-situational consistency of behavior is a theme that has been discussed not only in criminology but also in related fields such as social psychology, personality research, and traffic research (for reviews, see Bem and Allen 1974; Bem and Funder 1978; Burton 1963; Chaplin and Goldberg 1985; Conley 1984; Epstein and O'Brien 1985; Krahé 1990; Mischel and Peake 1982; Peake and Mischel 1984; Pervin 1989, 1994). In the field of criminology, the debate on the cross-situational consistency of behavior has been formulated mostly as a problem of specialization versus generality of types of crime committed (Gottfredson and Hirschi 1990).

Gottfredson and Hirschi (1990) have argued, within the framework of their self-control theory, that human behavior is consistent across various situations. They propose that individuals with low self-control have a high probability of succumbing to the temptations of short-term pleasures with little regard for the long-term negative consequences. As a result, they are likely to be involved in many forms of risky behavior and suffer from the negative consequences of these behaviors, such as divorce, employment instability, illnesses, and accidents.

Several studies have reported a fair degree of generality in risky behavior consistent with self-control theory (Arneklev et al. 1993; Brownfield and Sorenson 1993; Forde and Kennedy 1997; Gibbs and Giever 1995; Gibbs, Giever, and Martin 1998; Grasmick et al. 1993; Keane and Arnold 1996; Longshore, Turner, and Stein 1996; Nagin and Paternoster 1994; Paternoster and Brame 1998; Paternoster and Simpson 1996; Piquero and Tibbetts 1996; Polakowski 1994; Pratt and Cullen 2000; Sorenson and Brownfield 1995; Tittle 1995; Wood, Pfefferbaum, and Arneklev 1993), including one that investigated driving behavior (Keane, Maxim, and Teevan 1993).

Accident involvement is a potentially useful index of risky traffic behavior, and several studies have reported a relationship between accident

involvement and antisocial behavior. Research in the United States, the Netherlands, Sweden, and Canada has indicated a relatively strong relation between accidents and crime (Farrington and Junger 1995; Glueck and Glueck 1950; Hansen 1988; Junger and Wiegersma 1995; Lawton et al. 1997; Robins 1966; Sivak 1983; Tillman and Hobbs 1949; West 1997; West, Elander, and French 1993; West and Farrington 1977; West et al. 1997; Yeager and Otnow-Lewis 1990). For example, Junger, Terlouw, and van der Heijden (1995) found that among nondelinquent children, only 28 percent reported accident involvement, whereas among the most delinquent children, this figure was 72 percent. The relation was monotonic: The higher the involvement in delinquent behavior, the higher the likelihood of having been involved in an accident. The relation also held after controlling for age, gender, and different types of criminal behavior (violence, vandalism, and property crime).

The problem with these studies is that most of them could not control for alcohol use and for exposure to accident risk (although some controlled for exposure: Soderstrom, Birschbach, and Dischinger 1990; Soderstrom, Dischinger, Ho, and Soderstrom 1993; West 1997; and West, Train, Junger West, and Pickering 1998). It is possible that both of these factors (alone or in combination) might be sufficient to explain the covariation between crime and accidents (Deery and Love 1996; Huizinga and Jacob-Chien 1998; Moskowitz and Burns 1990; Oei and Kerschbaumer 1990; Ross 1992; Soderstrom et al. 1993; Stroebe and Stroebe 1995; Wick 1992).

Furthermore, the relationship between accidents and crime could also be the result of the differential exposure of criminals to traffic. Thus, the relatively high exposure of criminals to traffic (Agnew and Petersen 1989; Hirschi 1969; Junger and Wiegersma 1995; Paternoster and Brame 1998; West and Farrington 1977) may be sufficient to explain the relationship between crime and accidents.

There were several advantages to the present methodology over previous studies. It controlled for exposure to accident risk by comparing individuals who were both involved in the accident, one as perpetrator and the other as victim.

Second, our study did not rely on self-reports from individuals involved. It therefore avoided bias arising from nonresponse (criminals are harder to reach for an interview; see Junger-Tas and Haen-Marshall 1999). It also avoided a self-presentation bias (Moskowitz 1982; Pervin 1994). Third, the present study was based on two completely separate sources of information so there was no possibility for contamination of the measure of risky behavior with the crime measures.

METHOD

Study Design

A random sample was drawn of 1,000 out of nearly 10,000 accidents in The Hague, the Netherlands, registered in 1994 in the police accident registration system. A search was then made on individuals identified from the accident reports in the separate police National Database on Offenders (NDO). This database records all individuals charged with a criminal offence, whether or not they were subsequently convicted.

A total of 1,843 traffic users¹ were involved in the 1,000 accidents (passengers were not included). Fifty-one persons involved in an accident could not be identified from the accident forms and therefore could not be traced in the NDO. Twenty persons were older than 79 years of age, and 13 were younger than 12 years, and because the NDO only covers people between the ages of 12 and 79, these were excluded. A further 93 hit-and-run drivers could not be identified, and 2 accidents were judged to be caused by dogs. In addition, 4 persons found in the accident registration system could not be traced from the original accident forms (this was necessary for the coding of risky behavior). Overall, this left a total of 1,660 persons for analyses. For 40 of them, their age was unknown; for another 3, gender was unknown; and for 86, both age and gender were unknown. As a result, information on 903 accidents involving 1,181 men and 350 women was used: a total of 1,531 persons.

Measures

Risky behavior in traffic. Risky traffic behavior was defined as behavior immediately preceding the accident and that probably contributed to the accident. It was assessed from the standard forms that police officers complete when they are at the scene of an accident. It includes speeding, right-of-way violations, ignoring traffic signals, DUI, illegal passing, tailgating, cutting in, and driving the wrong way down a one-way street. Information such as not being insured or not wearing a seatbelt was not considered as risky traffic behavior because the risk taken was not a potential cause of the accident.

The risky behaviors were not, in most cases, criminal violations. Thus, driving too fast for the conditions or too close to the vehicle in front were common causes of accidents but not in themselves illegal acts.

An exception to this rule, obviously, was DUI. However, the fact that a police officer mentions alcohol use in the accident registration form means that he suspects alcohol use, but this does not indicate whether the traffic user had a blood alcohol concentration greater than the legal limit of 0.5 percent in the Netherlands.²

In fact, none of the accidents in the data set led to criminal prosecution, even for DUI. Nevertheless, we constructed two scales of risky behavior, one with and one without DUI to be certain that the findings would not be caused merely by DUI, and repeated the analyses for both scales.

Our measure of risky behavior was different from the attribution of legal responsibility. It has been customary for police officers filling in accident registration forms to fill in as the first party involved the name of the, in their view, most responsible person and, as the second party involved, the less responsible traffic user. This leads to an automatic division, at least in cases of accidents with two parties involved, of 50 percent "guilty" and 50 percent nonguilty parties. The logic in this reporting system is the legal system and relates to possible civil law claims and insurance repayments. It does not necessarily relate to the goal of the present study, which was recording risk taking and not legal responsibility. We thought that it was plausible that, in some cases, accidents might be the result of two parties taking risks, whereas many accidents may occur in which none of the parties involved took a risk but might be the result of, for example, lack of experience of one of the parties involved. The present study required a system that would allow for this possibility and that would not be determined by a legal system that generally requires a guilty party.

Discussion with the staff involved in the maintenance of the accident registration system suggests that police officers filling in the accident forms probably tend to underreport risky behavior. In part, this is due to the difficulty of knowing what happened. For example, because the police usually arrive at the scene of the accident after it happened, it is hard to know if one of the parties involved drove too fast. It is known that there is some underreporting of alcohol use (Mathijssen 1997). Hence, the risky behavior measure in all probability underestimates the true amount of risky behavior in traffic.

Two researchers each coded half of the accidents. For a reliability check, both coded 100 accidents, and in these cases there was 100 percent agreement on whether there was evidence of risk taking.

Crime. To measure crime, the NDO was used. A first distinction was made between traffic crime and all other crime. The following measures on criminal behavior were composed. Traffic crime consists of criminal offenses falling under traffic law (excluding joyriding; see below) and includes DUI, hit-and-run accidents, driving after having received a disqualification to drive, refusing a blood test, or failing to stop for a signal of a police officer, causing an accident resulting in serious injury or death, and other traffic crime. This last category consists of various types of traffic crime such as vehicle defects or forgery of driving documents. Traffic violations are not

registered in this system. As a result, the measure of traffic crime does not overlap with the measure of risky behavior, with the exception of DUI. This problem was dealt with by repeating the findings based on the entire sample and on a sample that excludes DUI drivers.

Crimes defined under the criminal law were subdivided into (1) *violent crime*, all crimes involving aggression toward other persons (assault, aggravated assault, murder, attempted murder, verbal violence, robberies) and sexual crime (e.g., rape and incest); (2) *vandalism*, the destruction of property and arson; (3) *property crime*, including fraud, trade in stolen goods and all nonviolent forms of theft, burglary, and joyriding;³ (4) *other crime*, mainly involved with dealing in drugs, the illegal possession of firearms, and a very heterogeneous set of other offenses. All crime measures were dichotomies (0 = no police contacts, 1 = police contacts). These offenses fall under the Dutch criminal law, and, for ease of presentation, we refer to them as "criminal law offenses." It excludes DUI and status offenses (such as curfew offenses and running away from home; status offenses are not defined as a crime in the Netherlands).

The NDO registers keep offenses in the database for a limited number of years, depending on their seriousness. For example, DUI is kept for 5 years whereas murder is kept for 30 years (I.T. Organisatie 1995). In addition, if an offender stays criminally active, his or her entire record will be kept in the NDO. As a result, the record of individuals in the NDO is a crude measure of criminal activity according to the time since the latest police contact, the seriousness, and the frequency of the offender's criminal activity. For this reason, all crime measures had two versions: an "ever" measure and a measure of crime during the past 5 years.

It should be noted that the accident registration system and the NDO are two completely independent systems that are operated by different departments within the police force. It is almost impossible for information coming from one system to be influenced by information found in the other. Both systems are incompatible, and it took the researchers considerable effort to trace persons recorded in one system (in this case, the accident registration system) and verify whether they were known in the other system (in this case, the NDO). We believe, therefore, that we have two completely independent measures of the tendency to take risks in traffic and the tendency to commit crime.

Control variables. It was anticipated that both sex and age would be related to the occurrence of risky traffic behavior and to crime. For this reason, all the analyses controlled for sex and age. Information on gender, age, and nationality was available from the accident registration system. Age was coded into four categories. The categories were chosen along the quartiles of the age distribution. Information on nationality may be unreliable, as this

seemed to be of less importance to police officers in completing the accident registration form.

Overlap between crime and accidents. It is possible that a particular crime and an accident are both part of the same chain of events. For example, it sometimes happens that a robber leaves the scene of the robbery by car and has an accident or that a youngster steals a car and causes an accident (Tremblay et al. 1995). Such combinations of a crime and an accident in a single chain of events did not occur in this sample.

Analyses. Because we were interested in the relationship between criminal behavior and risky traffic behavior with neither of these representing an outcome measure, log-linear analyses were preferred over logistic regression (while recognizing that the underlying mathematical theory is the same in both cases). In the first step, conditional independence models were estimated in which risky behavior was considered to be independent of criminal activity, controlling for age and gender. Subsequently adding the interaction between risky behavior and criminal activity and higher order models, a best model was selected on the basis of improvements of model fit, assessed with the likelihood ratio chi-square statistic. For the selected log-linear model, odds ratios were derived from the parameter estimates (Agresti 1990; see also the appendix). These are appropriate for skewed frequency of data of this kind (Junger, Terlouw, and van der Heijden 1995).

The analyses were undertaken first of all using the entire sample and then repeated for the Dutch in the sample to control for a possible confounding effect of nationality on driving behavior, criminal activity, or both. They were also repeated for a sample excluding individuals identified in police records of the accident as suspected of DUI (Wilson 1992). The same analyses were also repeated for "crime during the last five years" to control for possible selective loss of information due to the fact that the NDO keeps less serious crimes in the system for five years but keeps more serious crimes in the system for a longer period of time (see above). Finally, for the purpose of illustration, we also computed simple cross tabulations and chi-squared values.

RESULTS

The sample contained more men than women (see Table 1), as might be expected in a traffic accident sample (Baker et al. 1992). Most persons involved were registered as Dutch (72.9 percent). The median age was 33 years. Most traffic users were driving a car (85.7 percent); others were driving a motorcycle (1.0 percent), a moped (5.8 percent), or a bicycle (5.1 percent).

TABLE 1: Characteristics of the Sample

	N	%
Total	1,531	100.0
Gender		
Male	1,181	77.1
Female	350	22.9
Age		
12-25	382	25.0
26-33	392	25.6
34-44	380	24.8
45-79	377	24.6
Nationality		
Dutch	1,117	73.0
Surinam	150	9.8
Dutch Antilles	16	1.0
Turkey	74	4.8
Morocco	42	2.7
Other nationality	132	8.6
Type of risky behavior ^a		
No risky behavior	1,348	88.0
Any risky behavior	183	12.0
Driving under the influence of alcohol (DUI)	61	4.0
Driving too fast	36	2.4
Ignoring traffic lights	23	1.5
Incorrect positioning	22	1.4
Other type of risky behavior	58	3.8
Type of crime in police records, ever ^a		
No crime	1,126	73.5
Any crime	405	26.5
Traffic crimes	170	11.1
Driving under the influence of alcohol (DUI)	103	6.7
Hit-and-run accidents	64	4.2
Causing an accident involving serious injury or death	32	2.1
Other traffic crime ^b	28	1.8
Criminal law offenses	342	22.3
Violent crime	177	11.6
Vandalism	96	6.3
Property crime	242	15.8
Other criminal law offenses	57	3.7
Type of crime in police records, last 5 years ^a		
No crime	1,264	82.6
Any crime	267	17.4
Traffic crimes	112	7.3
Driving under the influence of alcohol (DUI)	72	4.7
Hit and run accidents	33	2.2
Causing an accident involving serious injury or death	19	1.2
Other traffic crime ^b	7	0.5
Criminal law offenses	180	11.8

TABLE 1: Continued

	N	%
Violent crime	84	5.5
Vandalism	35	2.3
Property crime	110	7.2
Other criminal law offenses	33	2.2

a. Traffic users may be registered in more than one category.

b. The remaining categories (< 0.5 percent) consisted of illegal overtaking, failing to give priority, driving on a street or in a direction that is forbidden, reckless driving, cutting in, and aggressive driving.

There were 1.5 percent pedestrians, and 0.9 percent was other types of traffic users. In most accidents, two traffic users were involved (57.5 percent), but there were also single-vehicle accidents (37.4 percent). In 4.1 percent of the cases, there were three traffic users involved in the crash, and in 1.0 percent, four or five traffic users were involved.

Risky Traffic Behavior

Overall, 12.0 percent of the persons were identified from police reports as having displayed at least one form of risky behavior. Eighteen (1.2 percent) displayed two forms of risky behavior, and for one individual, the police records mention three forms of risky behavior. DUI was the most common form of risky behavior (4.0 percent), followed by driving too fast (2.4 percent), ignoring traffic lights (1.5 percent), and incorrect positioning (1.4 percent; also see Table 1).⁴

Preliminary Analyses

Before continuing to the main analyses, it is worth noting that our sample of road users involved in accidents in general had a high rate of criminal activity (men: 31.0 percent compared with 15.2 percent for the population of The Hague as a whole, $\chi^2(1) = 225.3$, $p < .001$; women: 11.4 percent versus 3.5 percent, $\chi^2(1) = 63.4$, $p < .001$). This held for all age groups (see Figure 1).

It is also worth noting that traffic crime and criminal law offenses were related relatively strongly. The odds ratio between traffic crime and all criminal law offenses combined was equal to 8.1. Similar findings held for the subscales (the data can be obtained from first author). In general, participation in one type of crime was related to participation in other types of crime.

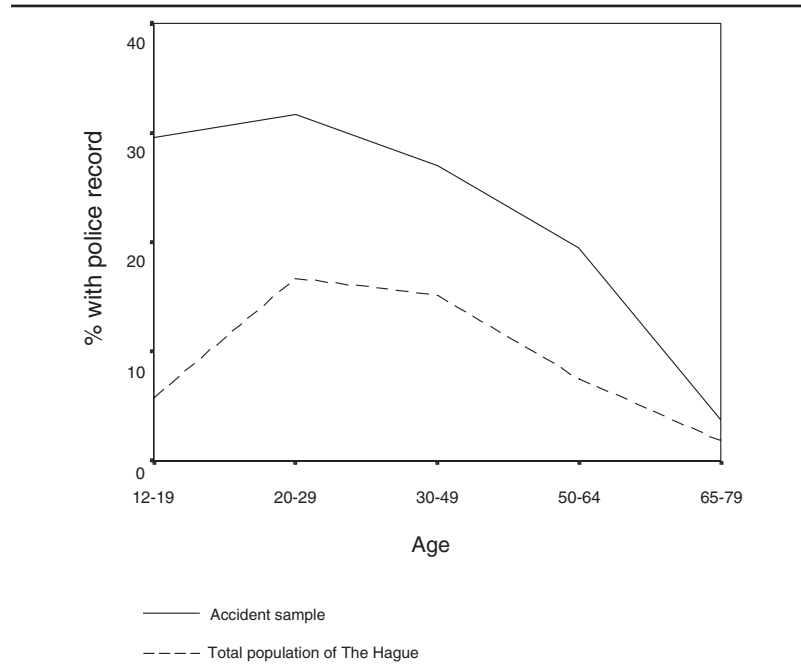


Figure 1: Percentage of Individuals in the Database of Offenders, Inhabitants of the City of The Hague Compared with the Traffic Users in Accidents
 NOTE: For reasons of availability of the data, a different categorization of age is used.

Risky Behavior in Traffic and Criminal Behavior

The log-linear analysis shows that risky behavior in traffic was related to all measures of criminal behavior (Table 2). Overall, the fact that someone was involved in crime more than doubled the likelihood that he or she would be involved in risky behavior in traffic. The odds ratio for risky behavior and traffic crime was 5.3; for violent crime, it was 2.6; for vandalism, 2.5; and for property crime, 1.5 (Table 2).

The results also suggest that age influenced the odds ratios of risky behavior and crime. Risky behavior was more strongly related to crime in the older age groups (34 and older) compared with the younger age groups. This increase in the odds ratio according to age was found for each type of crime. However, it was statistically significant only in the case of traffic crime. Gender did not have a significant effect on the relationship between risky behavior in traffic and crime.

When the above analysis was repeated for the Dutch individuals only, the odds ratios were almost identical. When the analysis was again repeated on

TABLE 2: Odds Ratios of Risky Behavior in Traffic and Traffic and Criminal Law Offenses, Odds Ratio (95 percent confidence interval)

<i>Type of Crime</i>	<i>N</i>	<i>Overall</i>		<i>12-25 Years</i>		<i>26-33 Years</i>		<i>34-44 Years</i>		<i>45-79 Years</i>	
		<i>1,531</i>		<i>382</i>		<i>392</i>		<i>380</i>		<i>377</i>	
Traffic crime	174	5.3***	(3.6-7.8)	4.1*	(1.9-8.8)	2.2*	(1.0-5.0)	8.6*	(3.9-18.9)	10.1*	(4.6-22.1)
Criminal law offenses	341	2.2***	(1.6-3.2)	1.8	(1.0-3.1)	1.5	(0.8-3.1)	2.9	(1.4-6.3)	4.9	(2.4-9.9)
Violent crime	177	2.6***	(1.8-3.9)	2.1	(0.1-56.6)	1.9	(0.9-3.9)	3.1	(1.4-7.2)	6.4	(0.2-176.2)
Vandalism	96	2.5***	(1.5-4.1)	1.9	(0.1-41.5)	2.4	(0.1-91.6)	1.4	(0.1-15.4)	7.9	(0.4-175.1)
Property crime	240	1.5*	(1.0-2.2)	1.2	(0.2-5.9)	1.2	(0.6-2.3)	2.4	(1.1-5.2)	2.7	(0.5-13.6)

NOTE: *N* = 1,531

p* < .05. **p* < .001.

the sample excluding all individuals ($N = 61$) with DUI as risky behavior, the odds ratios between risky behavior and criminal law offenses remained almost identical. There were two interesting exceptions: the odds ratio for traffic crime dropped from 5.3 to 2.1, a value that was approximately the same as the odds ratio for criminal law offenses, which was 2.2 (see Table 3). Another difference was that the age interaction was less pronounced and did not reach statistical significance.

The results for crime recorded during the past five years were generally similar to those of crime ever recorded, but there were a few differences (see Table 4). No significant age or gender interactions were found. The odds ratio between risky behavior and traffic crime was higher, namely, 8.3 instead of 5.3. The odds ratios for criminal law offenses were almost identical, namely, 2.0 instead of 2.2. The odds ratios for the separate forms of criminal law offenses were slightly lower and varying between 1.6 and 2.1 instead of 1.5 and 2.6. The significance levels were somewhat lower. Generally, the same findings held for the selection of drivers who did not drink before the accident: the odds ratio between traffic crimes and risky behavior dropped markedly. The other odds ratios varied between 2.3 for criminal law offenses and 1.9 for vandalism.

Cross tabulations were computed, illustrating the relationships between various forms of crime and risky behavior with and without DUI (Table 5). As neither gender nor age influenced these relationships substantially, these tables represent the associations relatively well. All the relationships between offending and risky behavior were statistically significant, with the exception of having been charged with hit-and-run accidents. For example, if one looks at criminal law offenses, having been registered for a criminal law offense increased the likelihood of risky behavior—including DUI—from 9.4 percent (no record) to 20.8 percent. Having been registered for a criminal law offense increased the likelihood of risky behavior—without DUI—from 6.9 percent (no record) to 14 percent.

DISCUSSION

Controlling for exposure and alcohol use, the findings showed that risky behavior in traffic was related to criminal involvement for the three forms of criminal law offenses included in this study, namely, violent crime, vandalism, and property crime. This supports the idea that behavior is consistent across situations and the idea that there are relatively broad traits underlying diverse forms of behavior including crime (Gottfredson and Hirschi 1990; Osgood et al. 1988; Robins and Wish 1977; Rowe, Osgood, and Nicewander 1990; Tellegen 1991). The evidence from the present study is strong given the

TABLE 3: Odds Ratios of Risky Behavior in Traffic and Traffic and Index Crime; Selection of Traffic Users Who Did Not Drink Prior to the Accident, Odds Ratio (95 percent confidence interval)

<i>Type of Crime</i>	N	<i>Overall</i>		<i>12-25 Years</i>		<i>26-33 Years</i>		<i>34-44 Years</i>		<i>45-79 Years</i>	
		<i>1,470</i>		<i>367</i>		<i>382</i>		<i>363</i>		<i>358</i>	
Traffic crime	135	2.1*	(1.2-3.6)	1.6	(0.6-4.7)	0.8	(0.2-2.9)	3.2	(1.0-9.9)	4.9	(1.6-14.9)
Criminal law offenses	318	2.2***	(1.5-3.3)	1.8	(1.0-3.3)	1.6	(0.8-3.6)	3.8	(1.3-10.6)	4.1	(1.7-9.9)
Violent crime	163	2.6*	(1.7-4.2)	2.1	(0.1-55.0)	1.9	(0.8-4.2)	5.6	(2.1-15.1)	5.3	(0.2-146.1)
Vandalism	91	3.0*	(1.7-5.4)	1.7	(0.1-30.8)	3.6	(0.0-285.6)	1.9	(0.1-47.0)	10.6	(0.6-189.0)
Property crime	227	1.5	(0.9-2.3)	1.3	(0.2-7.9)	1.3	(0.6-2.9)	2.0	(0.7-5.6)	2.5	(0.4-16.4)

* $p < .05$. *** $p < .001$.

TABLE 4: Odds Ratios of Risky Behavior and Crime in the Past Five Years, Odds Ratio (95 percent confidence interval)

<i>Type of Crime</i>	<i>Total Group</i>		<i>Selection of Traffic Users Who Did Not Use Alcohol</i>	
Traffic crime	8.3	(5.4-12.8)***	3.1	(1.6-5.8)**
Criminal law offenses	2.0	(1.3-3.0)**	2.3	(1.5-3.7)***
Violent crime	2.1	(1.2-3.6)*	2.4	(1.3-4.3)**
Vandalism	1.6	(0.7-3.8)	1.9	(0.8-4.8)
Property crime	1.6	(1.0-2.7)	2.0	(1.2-3.5)*

NOTE: $N = 1,531$.* $p < .05$. ** $p < .01$. *** $p < .001$.

fact that, as mentioned above, the measures of the key variables—crime and risky behavior—come from different registrations systems and therefore do not have the problem of shared-method variance, which has been a point much criticized by authors questioning the value of studies supporting cross-situation consistency but that were based on ratings (Mischel 1968; Mischel and Peake 1982; Nisbett and Ross 1991).

Of course, this study could not address the question of what trait or traits underlay the association observed. It could involve risk seeking (Arnett, Offer, and Fine 1997), conventionality-unconventionality (Donovan, Jessor, and Costa 1991), or sensation seeking (Mawson et al. 1996). It may also involve ability to control impulses (Pulkkinen 1982) or an aversion to delay of gratification (Mischel 1981).

There was an interaction with age: The association between risky behavior and crime was weaker for younger individuals. This trend was similar but nonsignificant for violent and property crime. This could be because younger people are generally more likely to commit crimes than older people, and committing a crime is therefore less related to traits and more related to opportunities. It is also possible that our measure of crime, based on the NDO, is influenced by age. For older persons, the police have had more time to build a criminal record, and if persons commit more serious crimes, they will stay in the NDO for a longer time. If one considers NDO as a crude way of measuring an underlying tendency to commit a crime, NDO may provide a more accurate measure of this tendency in older persons and a less accurate measure for younger persons. This might lead to the present age trend. In other words, we measured crime with relatively less error in older persons and relatively more error in younger persons, and more error reduces relationships. A similar reasoning suggests that self-reported delinquency “ever” measures provide a better measurement of the propensity for crime than “last year” measures (Hindelang, Hirschi, and Weis 1981).

TABLE 5: Risky Behavior in Traffic and Traffic Criminal Law Offenses

	<i>Risky Behavior Including DUI</i>				<i>Risky Behavior Without DUI</i>			
	<i>No Record</i>		<i>Recorded for a Crime</i>		<i>No Record</i>		<i>Recorded for a Crime</i>	
	N	%	N	%	N	%	N	%
Any crime	1,126	(8.1)	405	(22.7)	1,126	(7.0)	405	(12.6)
Traffic crimes	1,361	(9.3)	170	(32.9)	1,361	(8.0)	170	(12.4)
Driving under the influence of alcohol	1,428	(9.5)	103	(45.6)	1,428	(8.1)	103	(14.6)
Hit and run accidents	1,467	(11.6)	64	(20.3)	1,467	(8.6)	64	(6.3) ^a
Causing an accident involving serious injury or death	1,499	(11.4)	32	(37.5)	1,499	(8.1)	32	(25.0)
Criminal law offenses	1,189	(9.4)	342	(20.8)	1,189	6.9	342	(14.0)
Violent crime	1,354	(10.3)	177	(24.9)	1,354	(7.4)	177	(16.9)
Vandalism	1,435	(11.1)	96	(25.0)	1,435	(7.7)	96	(19.8)
Property crime	1,289	(10.9)	242	(17.4)	1,289	(7.8)	242	(12.0)

NOTE: *N* = 1,531. DUI = driving under the influence of alcohol; all tables: chi-square *p* < .05.

a. Chi-square not significant.

The study also found a positive relationship between risky traffic behavior and traffic crime. This may be interpreted as temporal stability of traffic behavior within the individual. The main traffic crimes in this study—namely, DUI and causing an accident involving serious injury or death—are similar to the measures of risk taking. Only a few studies have looked at the stability of drivers' records, accidents, and risky behavior, and these found similar results (Brezina 1969; Burg 1970; Robertson and Baker 1975; Soderstrom, Birschbach, and Dischinger 1990; Soderstrom et al. 1993). These findings are in line with the general finding that there is temporal stability for many forms of social behavior (Mischel 1968; Mischel and Peake 1982).

This study probably provides a lower limit to the true magnitude of the relation between risky behavior in traffic and criminal behavior. The reason is that both concepts were measured crudely and were thus subject to random error. It should also be noted that the data relate to only one country at a particular time. Although we believe that the underlying mechanisms should remain similar over time and geographic region, their manifestation in terms of links between observed behaviors may not. This is an issue that merits further exploration.

APPENDIX

Log-Linear Analysis: Principle of the Uniform Association Model

We used the conditional uniform association model. For a two-way table, the uniform association model can be written as the following:

$$\log \pi_{ij} = u + u_{1(i)} + u_{2(j)} + \Phi_{ij},$$

where π_{ij} is the probability for cell (i, j) ($i = 1, \dots, I; j = 1, \dots, J$); u , $u_{1(i)}$, and $u_{2(j)}$ are marginal effects. Interest extends to the term Φ_{ij} because it is directly related to the log odds ratio as

$$\log (\pi_{ij} / (\pi_{i j'}) / (\pi_{i' j} / \pi_{i' j'})) = \Phi(i - i')(j - j').$$

For adjacent cells in the table, the uniform association model states that the log-odds ratio is constant and equal to Φ because for adjacent cells, $i - i' = 1$ and $j - j' = 1$. The odds ratio is then equal to $\exp \Phi$. The conditional association model estimates separate parameters Φ for each of the eight levels of the stratifying variables, which are here age "a" (four categories) and sex "s." Thus, the parameter Φ_{as} indicates the strength of the association in table (a, s) as measured by the log-odds ratio (for more details, see Agresti 1990).

Table A1 gives the results of log-linear analyses for the uniform association model for the relation between risky behavior and traffic crimes. The fit of the models is determined by the likelihood ratio chi-square. The advantage of this chi-square over Pearson's chi-square is that models can be compared by subtracting the likelihood chi-squares and degrees of freedom of the models. If an added effect yields a significant difference with a model without that effect, it means that the adding of that effect improves the model. The difference between models 1 and 2 is significant, $G^2(1) - G^2(2) = 66.9$; $df(1) - df(2) = 1$; $p = .000$, indicating that there is a relation between risky behavior and nontraffic crimes. Also, the difference between models 4 and 2 is significant, $G^2(2) - G^2(4) = 9.6$; $df(2) - df(4) = 3$; $p = .022$, which means that there is also a significant age effect. However, the difference between model 3 and model 2 is not significant, $G^2(2) - G^2(3) = 0.001$; $df(2) - df(3) = 1$; $p = .975$, so adding the gender factor to the model does not improve the model significantly.

TABLE A1: Risky Behavior and Traffic Crimes

Model	G^2	df	p	Differences in			
				Model	G^2	df	p
(1) = no relation	79.0	8	.000				
(2) = relation	12.1	7	.098	(1)-(2)	66.9	1	.000
(3) = (2) + gender effect	12.1	6	.060	(2)-(3)	0.0	1	.975
(4) = (2) + age effect ^a	2.5	4	.652	(2)-(4)	9.6	3	.022
(5) = (3) + age effect	2.3	3	.522	(3)-(5)	9.8	3	.020
(6) = (4) + gender effect	2.3	3	.522	(4)-(6)	0.2	1	.648
(7) = (5/6) + interaction	0.0	0	1.000	(6)-(7)	2.3	3	.522

NOTE: G^2 = likelihood ratio chi square.

a. Best model.

NOTES

1. This includes pedestrians, motorists, motorcyclists, cyclists, or persons otherwise involved in a traffic accident.

2. It was very unusual at the time of the data collection for police officers to have a Breathalyzer to determine whether the blood alcohol concentration was greater than the legal limit (0.5 percent). Therefore, the mentioning of alcohol use reflects an educated guess on the part of the police officer who filled in the form.

3. Joyriding is usually defined as a property crime in criminological research (Junger-Tas, Terlouw, and Klein 1994). There were nine cases of joyriding. Analyses with and without joyriding as a measure of property crime produce almost identical results. Finally, as mentioned elsewhere, it should be mentioned that in no case was joyriding confounded with an accident registered in the present sample.

4. A study of patients treated at an emergency unit in a hospital (Groningen, the Netherlands) over the past 20 years shows that 8.0 percent of all patients involved in crashes were under the influence of alcohol (Kingma and Klasen 1993). In the present study, this percentage is 4.0. This supports the view, as mentioned above, that alcohol use is underreported on the standard forms completed by the police. This difference, however, could also be (partly) caused by the fact that

alcohol does increase the likelihood of becoming injured in an accident (Simpson and Mayhew 1991) and accordingly to be transported to an emergency unit of a hospital.

REFERENCES

- Agnew, Robert and David M. Petersen. 1989. "Leisure and Delinquency." *Social Problems* 36:332-50.
- Agresti, Alan. 1990. *Categorical Data Analysis*. New York: John Wiley.
- Arneklev, Bruce J., Harold G. Grasmick, Charles R. Tittle, and Robert J. Bursik. 1993. "Low Self-Control and Imprudent Behavior." *Journal of Quantitative Criminology* 9:225-47.
- Arnett, Jeffrey Jensen, Daniel Offer, and Mark A. Fine. 1997. "Reckless Driving in Adolescence: 'state' and 'trait' factors." *Accident Analysis and Prevention* 29:57-63.
- Baker, Susan P., Brian O'Neill, Marvin J. Ginsburg, and Guohua Li. 1992. *The Injury Fact Book*. Oxford, UK: Oxford University Press.
- Bem, Daryl J. and Andrea Allen. 1974. "On Predicting Some of the People Some of the Time: The Search for Cross-Situational Consistencies in Behavior." *Psychological Review* 81:506-20.
- Bem, Daryl J. and David C. Funder. 1978. "Predicting More of the People More of the Time: Assessing the Personality of Situations." *Psychological Review* 85:485-501.
- Brezina, E. H. 1969. "Traffic Accidents and Offences: An Observational Study of the Ontario Driver Population." *Accident Analysis & Prevention* 1:373-95.
- Brownfield, David and Ann Marie Sorenson. 1993. "Self-Control and Juvenile Delinquency: Theoretical Issues and an Empirical Assessment of Selected Elements of a General Theory of Crime." *Deviant Behavior: An Interdisciplinary Journal* 14:243-64.
- Burg, Albert. 1970. "The Stability of Driving Record over Time." *Accident Analysis and Prevention* 2:57-65.
- Burton, Roger V. 1963. "Generality of Honesty Reconsidered." *Psychological Review* 70:481-99.
- Chaplin, William F. and Lewis R. Goldberg. 1985. "A Failure to Replicate the Bem and Allen Study of Individual Differences in Cross-Situational Consistency." *Journal of Personality and Social Psychology* 47:1074-90.
- Conley, James J. 1984. "Relation of Temporal Stability and Cross-Situational Consistency in Personality: Comment on the Mischel-Epstein Debate." *Psychological Review* 91:491-96.
- Deery, Hamish A. and Anthony W. Love. 1996. "The Effect of a Moderate Dose of Alcohol on the Traffic Hazard Perception Profile of Young Drink-Drivers." *Addiction* 91:815-27.
- Donovan, John E., Richard Jessor, and Frances M. Costa. 1991. "Adolescent Health Behavior and Conventionality-Unconventionality: An Extension of Problem-Behavior Theory." *Health Psychology* 10:52-61.
- Epstein, Seymour and Edward J. O'Brien. 1985. "The Person-Situation Debate in Historical and Current Perspective." *Psychological Bulletin* 98:513-37.
- Farrington, David P. and Marianne Junger. 1995. "Illnesses, Injuries and Crime, Accidents, Self-Control and Crime." *Criminal Behavior and Mental Health* 5:255-478.
- Forde, David R. and Leslie W. Kennedy. 1997. "Risky Lifestyles, Routine Activities, and the General Theory Of Crime." *Justice Quarterly* 14:265-94.
- Gibbs, John J. and Dennis Giever. 1995. "Self-Control and its Manifestations among University Students: An Empirical Test of Gottfredson and Hirschi's Theory." *Justice Quarterly* 12:231-55.

- Gibbs, John J., Dennis Giever, and Jamie S. Martin. 1998. "Parental Management and Self-Control: An Empirical Test of Gottfredson and Hirschi's General Theory." *Journal of Research in Crime and Delinquency* 35:40-70.
- Glueck, Sheldon and Eleanor Glueck. 1950. *Unraveling Juvenile Delinquency*. New York: Commonwealth Fund, Oxford University Press.
- Gottfredson, Michael R. and Travis Hirschi. 1990. *A General Theory of Crime*. Stanford, CA: Stanford University Press.
- Grasmick, Harold G., Charles R. Tittle, Robert J. Bursik, and Bruce J. Arneklev. 1993. "Testing the Core Empirical Implications of Gottfredson and Hirschi's General Theory of Crime." *Journal of Research in Crime and Delinquency* 30:5-29.
- Hansen, Curtiss P. 1988. "Personality Characteristics of the Accident Involved Employee." *Journal of Business and Psychology* 3:346-65.
- Hindelang, Michael J., Travis Hirschi, and Joseph G. Weis. 1981. *Measuring Delinquency*. Beverly Hills, CA: Sage.
- Hirschi, Travis. 1969. *Causes of Delinquency*. Berkeley: University of California Press.
- Huizinga, David and Cynthia Jacob-Chien. 1998. "The Contemporaneous Co-Occurrence of Serious and Violent Juvenile Offending and Other Problem Behaviors." Pp. 47-67 in *Serious & Violent Juvenile Offenders*, edited by R. Loeber and D. Farrington. Thousand Oaks, CA: Sage.
- I. T. Organisatie. 1995. "HKS Tabellen: Landelijk Beheerde Tabellen (National Database on Offenders)." Korps Landelijke Politiediensten, Driebergen, the Netherlands.
- Junger, Marianne, G. J. Terlouw, and Peter G. M. van der Heijden. 1995. "Crime, Accidents and Social Control." *Criminal Behavior and Mental Health* 5:386-410.
- Junger, Marianne and Auke Wieggersma. 1995. "The Relations between Accidents, Deviance and Leisure Time." *Criminal Behavior and Mental Health* 5:144-74.
- Junger-Tas, Josine and Ineke Haen-Marshall. 1999. "The Self Report Methodology in Crime Research: Strength and Weaknesses." Pp. 291-367 in *Building a Safer Society: Strategic Approaches to Crime Prevention*. Vol. 25, *Crime and Justice*, edited by M. Tonry and D. P. Farrington. Chicago: University of Chicago Press.
- Junger-Tas, Josine, Gert-Jan Terlouw, and Malcolm W. Klein. 1994. *Delinquent Behavior among Young People in the Western World: First Results of the International Self-Report Delinquency Study*. Amsterdam, the Netherlands: Kugler.
- Keane, Carl and Robert Arnold. 1996. "Examining the Relationship between Criminal Victimization and Accidents: A Routine Activities Approach." *Canadian Review of Sociology and Anthropology* 33:457-79.
- Keane, Carl, Paul S. Maxim, and James J. Teevan. 1993. "Drinking and Driving, Self-Control, and Gender: Testing a General Theory of Crime." *Journal of Crime and Delinquency* 30:30-46.
- Kingma, J. and H. J. Klasen. 1993. "Alcoholgebruik bij Verkeerslachtoffers." Academisch Ziekenhuis Groningen, Groningen, the Netherlands.
- Krahé, Barbara. 1990. *Situation Cognition and Coherence in Personality: An Individual-Centered Approach*. Cambridge, UK: Cambridge University Press.
- Lawton, Rebecca, Dianne Parker, Stephen G. Stradling, and Anthony S. R. Manstead. 1997. "Predicting Road Accidents: The Role of Social Deviance and Violations." *British Journal of Psychology* 88:249-62.
- Longshore, Douglas, Susan Turner, and Judith A. Stein. 1996. "Self-Control in a Criminal Sample: An Examination of Construct Validity." *Criminology* 34:209-28.
- Mathijssen, M.P.M. 1997. "Rijden onder Invloed in Nederland, 1995-1996 [Driving under the Influence of Alcohol in the Netherlands, 1995-1996]: Ontwikkeling van het alcoholgebruik

- van automobilisten in weekendnachten." Stichting Wetenschappelijk Onderzoek Verkeersveiligheid SWOV, Leidschendam, the Netherlands.
- Mawson, A. R., J. J. Biundo, D. I. Clemmer, K. W. Jacobs, V. K. Ktsanes, and J. C. Rice. 1996. "Sensation Seeking, Criminality, and Spinal Cord Injury: A Case Control Study." *American Journal of Epidemiology* 144:463-72.
- Mischel, Walter. 1968. *Personality and Assessment*. New York: John Wiley.
- . 1981. *Introduction to Personality*. New York: CBS College.
- Mischel, Walter and Philip K. Peake. 1982. "Beyond Déjà vu in the Search for Cross-Situational Consistency." *Psychological Review* 89:730-55.
- Moskowitz, D. S. 1982. "Coherence and Cross-Situational Generality in Personality: A New Analysis of Old Problems." *Journal of Personality and Social Psychology* 43:754-68.
- Moskowitz, Herbert and Marcelline Burns. 1990. "Effects of Alcohol on Driving Performance." *Alcohol Health and Research World* 14:12-14.
- Nagin, Daniel S. and Raymond Paternoster. 1994. "Personal Capital and Social Control: The Deterrence Implications of a Theory of Individual Differences in Criminal Offending." *Criminology* 32:581-606.
- Nisbett, Richard E. and Lee Ross. 1991. *The Person and the Situation: Essential Contributions of Social Psychology*. Philadelphia: Temple University Press.
- Oei, Tian P. and D. M. Kerschbaumer. 1990. "Peer Attitudes, Sex, and the Effects of Alcohol on Simulated Driving Performance." *American Journal of Drug and Alcohol Abuse* 16:135-46.
- Osgood, Wayne D., Lloyd D. Johnston, Patrick M. O'Malley, and Jerald G. Bachman. 1988. "The Generality of Deviance in Late Adolescence and Early Adulthood." *American Sociological Review* 53:81-93.
- Paternoster, Raymond and Robert Brame. 1998. "The Structural Similarity of Processes Generating Criminal and Analogous Behaviors." *Criminology* 36:633-69.
- Paternoster, Raymond and Sally Simpson. 1996. "Sanction Threats and Appeals to Morality: Testing a Rational Choice Model of Corporate Crime." *Law & Society Review* 30:549-83.
- Peake, Philip K. and Walter Mischel. 1984. "Getting Lost in the Search for Large Coefficients: Reply to Conley (1984)." *Psychological Review* 91:497-501.
- Pervin, Lawrence A. 1989. "Persons, Situations, Interactions: The History of a Controversy and a Discussion of Theoretical Models. Special Issue: Theory Development Forum." *Academy of Management Review* 14:350-60.
- . 1994. "A Critical Analysis of Current Trait Theory." *Psychological Inquiry* 5:103-13.
- Piquero, Alex and Stephen Tibbetts. 1996. "Specifying the Direct and Indirect Effects of Low Self-Control and Situational Factors in Offenders' Decision Making: Towards a More Complete Model of Rational Offending." *Justice Quarterly* 13:481-510.
- Polakowski, Michael. 1994. "Linking Self- and Social Control with Deviance: Illuminating the Structure Underlying a General Theory of Crime and Its Relation to Deviant Activity." *Journal of Quantitative Criminology* 10:41-78.
- Pratt, T. C., and F. T. Cullen. 2000. "The Empirical Status of Gottfredson and Hirschi's General Theory of Crime: A Meta-Analysis." *Criminology* 38:931-64.
- Pulkkinen, Lea. 1982. "Self-Control and Continuity from Childhood to Late Adolescence." *Life-Span Development and Behaviour* 4:64-105.
- Robertson, Leon S. and Susan P. Baker. 1975. "Prior Violation Records of 1447 Drivers Involved in Fatal Crashes." *Accident Analysis and Prevention* 7:121-28.
- Robins, Lee N. 1966. *Deviant Children Grown Up*. Baltimore: Williams and Wilkins.
- Robins, Lee N. and Eric Wish. 1977. "Childhood Deviance as a Developmental Process: A Study of 223 Urban Black Men from Birth to 18." *Social Forces* 56:448-73.
- Ross, H. Laurence. 1992. *Confronting Drunk Driving: Social Policy for Saving Lives*. London: Yale University Press.

- Rowe, David C., D. Wayne Osgood, and W. Alan Nicewander. 1990. "A Latent Trait Approach to Unifying Criminal Careers." *Criminology* 28:237-70.
- Simpson, H. M. and D. R. Mayhew. 1991. "The Hard Core Drinking Driver." Ottawa: Traffic Injury Research Foundation of Canada.
- Sivak, Michael. 1983. "Society's Aggression Level as a Predictor of Traffic Fatality Rate." *Journal of Safety Research* 14:93-99.
- Soderstrom, Carl A., Jane M. Birschbach, and Patricia C. Dischinger. 1990. "Injured Drivers and Alcohol Use: Culpability, Convictions, and Pre- and Post-Crash Driving History." *Journal of Trauma* 30:1208-14.
- Soderstrom, Carl A., Patricia C. Dischinger, Shiu Man Ho, and Margaret T. Soderstrom. 1993. "Alcohol Use, Driving Records, and Crash Culpability among Injured Motorcycle Drivers." *Accident Analysis and Prevention* 25:711-16.
- Sorenson, Ann and David Brownsfield. 1995. "Adolescent Drug Use and a General Theory of Crime: An Analysis of a Theoretical Integration." *Canadian Journal of Criminology* 37:19-38.
- Stroebe, W. and M. S. Stroebe. 1995. *Social Psychology and Health*. Duckingham, UK: Open University Press.
- Tellegen, Auke. 1991. "Personality Traits: Issues of Definition, Evidence, and Assessment." Pp. 10-35 in *Personality and Psychopathology*, Vol. 2, *Thinking Clearly about psychology*, edited by W. M. Grove and D. Cichetti. Minneapolis: University of Minnesota Press.
- Tillman, W. A. and G. E. Hobbs. 1949. "The Accident-Prone Automobile Driver." *American Journal of Psychiatry* 106:321-31.
- Tittle, Charles R. 1995. *Control Balance: Toward a General Theory of Deviance*. Boulder, CO: Westview.
- Tremblay, Richard E., Bernard Boulerice, Marianne Junger, and Louise Arseneault. 1995. "Does Low Self-Control during Childhood Explain the Association between Delinquency and Accidents in Early Adolescence?" *Criminal Behaviour and Mental Health* 5:439-51.
- West, D. J. and D. P. Farrington. 1977. *The Delinquent Way of Life*. London: Heineman Educational.
- West, Robert J. 1997. *Cross-Cultural Generalisability of Relationship between Anti-Social Motivation and Traffic Accident Risk*. Crowthorne Berkshire, UK: Transport Research Laboratory.
- West, Robert J., James Elander, and Davina French. 1993. "Mild Social Deviance, Type-A Behaviour Pattern and Decision-Making Style as Predictors of Self-Reported Driving Style and Traffic Accident Risk." *British Journal of Psychology* 84:207-19.
- West, Robert, Helen Train, Marianne Junger, Alan Pickering, Eric Taylor, and Anne West. 1997. *Childhood Accidents and Their Relationship with Problem Behaviour*. London: St. George's Hospital Medical School.
- West, Robert, Helen Train, Marianne Junger, Anne West, and Alan Pickering. 1998. "Accidents and Problem Behaviour." *The Psychologist* 12:395-97.
- Wick, Robert L. 1992. "Alcohol and Pilot Performance Decrements." *Alcohol, Drugs and Driving* 8:207-15.
- Wilson, R. J. 1992. "Convicted Impaired Drivers and High-Risk Drivers: How Similar Are They?" *Journal of Studies on Alcohol* 53:335-44.
- Wood, Peter B., Betty Pfefferbaum, and Bruce J. Arneklev. 1993. "Risk-Taking and Self-Control: Social Psychological Correlates of Delinquency." *Journal of Crime and Justice* 16:111-30.
- Yeager, C. A. and D. Otnow-Lewis. 1990. "Mortality in a Group of Formally Incarcerated Juvenile Delinquents." *American Journal of Psychiatry* 147:612-14.

ABOUT THE AUTHORS

Robert Agnew is a professor of sociology at Emory University in Atlanta. His teaching and research interests focus on the causes of crime and delinquency, especially his general strain theory of crime. His most recent publication is the textbook titled *Juvenile Delinquency: Causes and Control* (Roxbury, 2001).

Timothy Brezina received his Ph.D. in sociology from Emory University in 1996 and is currently an assistant professor of sociology at Tulane University. His current research examines the personal consequences of delinquency as experienced by the offender. Recent publications appear in the journals *Criminology*, *Journal of Research in Crime and Delinquency*, *Justice Quarterly*, and *Youth & Society*.

Marianne Junger studied sociology at the University of Leiden and obtained her Ph.D. at the Free University of Amsterdam. Since November 2000, she has been working at the Department of Developmental Psychology of Utrecht University. She has published in *The British Journal of Criminology*, *Criminal Justice and Behavior*, the *Journal of Quantitative Criminology*, and the *Journal of Research in Crime and Delinquency*. Her current research interests include the generality of deviance, theories of crime, with a special focus on the relation between crime, accidents, and health.

Paul Mazerolle received his Ph.D. in criminology from the University of Maryland in 1995. His research investigates issues related to criminal careers, criminological theory, and developmental factors in crime causation. His publications have appeared in the *Journal of Research in Crime and Delinquency*, *Journal of Quantitative Criminology*, *Justice Quarterly*, *Violence and Victims*, and *Studies on Crime and Crime Prevention*.

Alex R. Piquero received his Ph.D. in criminology from the University of Maryland and is currently an associate professor of criminology and sociology at the Center for Studies in Criminology and Law at the University of Florida, member of the National Consortium on Violence Research, and network associate with the MacArthur Foundation's Research Network on

Adolescent Development and Juvenile Justice. His research interests include criminological theory, life-course criminology, and quantitative research methods.

David Thacher is an assistant professor of public policy and urban planning at the University of Michigan. He received his Ph.D. from the Massachusetts Institute of Technology in 1999. His research focuses on how public institutions should cope with conflicting and ambiguous values.

Reinier Timman studied psychology at the University of Leiden. From 1997 to 1999, he worked as a methodologist at the Netherlands Institute of Criminality and Law Enforcement (NISCALE). Since 1999, he has been working as a researcher at the Erasmus University Rotterdam. His interests are in the field of longitudinal research methods, hierarchical regression, linear structural models, and loglinear models. He collaborated on this study when he worked at NISCALE.

John W. Welte is a senior research scientist at the Research Institute on Addictions in Buffalo, New York. His research interests include the substance abuse/crime nexus, the epidemiology of substance abuse, and the etiology and epidemiology of pathological gambling. He is currently principal investigator of a national survey of pathological gambling.

Robert West has been working in the field of accidents since 1985. His research has focused on psychological factors underlying accident involvement. He has conducted studies on links between personality, driving style, and accidents in experienced and novice drivers and on characteristics of children that put them at increased risk of a pedestrian or diving accident. His other main area of research is nicotine dependence. He has published more than 150 articles, books, and chapters.

William F. Wieczorek is the director of the Center for Health and Social Research at the State University College at Buffalo. His research interests include the substance abuse/crime nexus, geographic influences on alcohol and drug abuse, and intervention with DWI offenders. He is currently principal investigator of a study of geographic influences on the health outcomes of drug abuse.

Lening Zhang is an assistant professor of behavioral science at St. Francis College in Loretto, Pennsylvania. He holds a doctorate in sociology from the State University of New York at Albany. He has conducted criminological research in both the United States and China. His research interests include substance abuse, victimization, and the criminal justice system.

INDEX

to

JOURNAL OF RESEARCH IN CRIME AND DELINQUENCY

Volume 38

Number 1 (February 2001) pp. 1-88

Number 2 (May 2001) pp. 89-192

Number 3 (August 2001) pp. 193-316

Number 4 (November 2001) pp. 317-468

Authors:

- AGNEW, ROBERT, "Building on the Foundation of General Strain Theory: Specifying the Types of Strain Most Likely to Lead to Crime and Delinquency," 319.
- ARMSTRONG, GAYLENE STYVE, see MacKenzie, D. L.
- BAIER, COLIN J., and BRADLEY R. E. WRIGHT, " 'If You Love Me, Keep My Commandments': A Meta-Analysis of the Effect of Religion on Crime," 3.
- BRAGA, ANTHONY A., DAVID M. KENNEDY, ELIN J. WARING, and ANNE MORRISON PIEHL, "Problem-Oriented Policing, Deterrence, and Youth Violence: An Evaluation of Boston's Operation Ceasefire," 195.
- BREZINA, TIMOTHY, ALEX R. PIQUERO, and PAUL MAZEROLLE, "Student Anger and Aggressive Behavior in School: An Initial Test of Agnew's Macro-Level Strain Theory," 362.
- CATALANO, RICHARD F., see Herrenkohl, T. I.
- CATALANO, RICHARD F., see Huang, B.
- DE LI, SPENCER, see Johnson, B. R.
- DOBRIN, ADAM, "The Risk of Offending on Homicide Victimization: A Case Control Study," 154.
- FLEWELLING, ROBERT L., see Paschall, M. J.
- GOVER, ANGELA R., see MacKenzie, D. L.
- GROFF, ELIZABETH R., and NANCY G. LA VIGNE, "Mapping an Opportunity Surface of Residential Burglary," 257.
- HAWKINS, J. DAVID, see Herrenkohl, T. I.
- HAWKINS, J. DAVID, see Huang, B.
- HAY, CARTER, "An Exploratory Test of Braithwaite's Reintegrative Shaming Theory," 132.
- HERRENKOHL, TODD I., BU HUANG, RICK KOSTERMAN, J. DAVID HAWKINS, RICHARD F. CATALANO, and BRIAN H. SMITH, "A Comparison of Social Development Processes Leading to Violent Behavior in Late Adolescence for Childhood Initiators and Adolescent Initiators of Violence," 45.
- HESSING, DICK, see Vazsonyi, A. T.

- HUANG, BU, see Herrenkohl, T. I.
- HUANG, BU, HELENE R. WHITE, RICK KOSTERMAN, RICHARD F. CATALANO, and J. DAVID HAWKINS, "Developmental Associations between Alcohol and Interpersonal Aggression during Adolescence," 64.
- JANG, SUNG JOON, see Johnson, B. R.
- JOHNSON, BYRON R., SUNG JOON JANG, DAVID B. LARSON, and SPENCER DE LI, "Does Adolescent Religious Commitment Matter? A Reexamination of the Effects of Religiosity on Delinquency," 22.
- JUNGER, MARIANNE, see Vazsonyi, A. T.
- JUNGER, MARIANNE, ROBERT WEST, and REINIER TIMMAN, "Crime and Risky Behavior in Traffic: An Example of Cross-Situational Consistency," 439.
- KENNEDY, DAVID M., see Braga, A. A.
- KOSTERMAN, RICK, see Herrenkohl, T. I.
- KOSTERMAN, RICK, see Huang, B.
- LARSON, DAVID B., see Johnson, B. R.
- LA VIGNE, NANCY G., see Groff, E. R.
- MACKENZIE, DORIS LAYTON, DAVID B. WILSON, GAYLENE STYVE ARMSTRONG, and ANGELA R. GOVER, "The Impact of Boot Camps and Traditional Institutions on Juvenile Residents: Perceptions, Adjustment, and Change," 279.
- MAZEROLLE, PAUL, see Brezina, T.
- ORNSTEIN, MIRIAM L., see Paschall, M. J.
- PASCHALL, MALLIE J., MIRIAM L. ORNSTEIN, and ROBERT L. FLEWELLING, "African American Male Adolescents' Involvement in the Criminal Justice System: The Criterion Validity of Self-Report Measures in a Prospective Study," 174.
- PICKERING, LLOYD E., see Vazsonyi, A. T.
- PIEHL, ANNE MORRISON, see Braga, A. A.
- PIQUERO, ALEX R., see Brezina, T.
- SMITH, BRIAN H., see Herrenkohl, T. I.
- STOUTLAND, SARA E., "The Multiple Dimensions of Trust in Resident/Police Relations in Boston," 226.
- THACHER, DAVID, "Policing Is Not a Treatment: Alternatives to the Medical Model of Police Research," 387.
- TIMMAN, REINIER, see Junger, M.
- VAZSONYI, ALEXANDER T., LLOYD E. PICKERING, MARIANNE JUNGER, and DICK HESSING, "An Empirical Test of a General Theory of Crime: A Four-Nation Comparative Study of Self-Control and the Prediction of Deviance," 91.
- WARING, ELIN J., see Braga, A. A.
- WELTE, JOHN W., LENING ZHANG, and WILLIAM F. WIECZOREK, "The Effects of Substance Use on Specific Types of Criminal Offending in Young Men," 416.
- WEST, ROBERT, see Junger, M.
- WHITE, HELENE R., see Huang, B.
- WIECZOREK, WILLIAM F., see Welte, J. W.
- WILSON, DAVID B., see MacKenzie, D. L.
- WRIGHT, BRADLEY R. E., see Baier, C. J.
- ZHANG, LENING, see Welte, J. W.

Articles:

- "African American Male Adolescents' Involvement in the Criminal Justice System: The Criterion Validity of Self-Report Measures in a Prospective Study," Paschall et al., 174.
- "Building on the Foundation of General Strain Theory: Specifying the Types of Strain Most Likely to Lead to Crime and Delinquency," Agnew, 319.
- "A Comparison of Social Development Processes Leading to Violent Behavior in Late Adolescence for Childhood Initiators and Adolescent Initiators of Violence," Herrenkohl et al., 45.
- "Crime and Risky Behavior in Traffic: An Example of Cross-Situational Consistency," Junger et al., 439.
- "Developmental Associations between Alcohol and Interpersonal Aggression during Adolescence," Huang et al., 64.
- "Does Adolescent Religious Commitment Matter? A Reexamination of the Effects of Religiosity on Delinquency," Johnson et al., 22.
- "The Effects of Substance Use on Specific Types of Criminal Offending in Young Men," Welte et al., 416.
- "An Empirical Test of a General Theory of Crime: A Four-Nation Comparative Study of Self-Control and the Prediction of Deviance," Vazsonyi et al., 91.
- "An Exploratory Test of Braithwaite's Reintegrative Shaming Theory," Hay, 132.
- "'If You Love Me, Keep My Commandments': A Meta-Analysis of the Effect of Religion on Crime," Baier and Wright, 3.
- "The Impact of Boot Camps and Traditional Institutions on Juvenile Residents: Perceptions, Adjustment, and Change," MacKenzie et al., 279.
- "Mapping an Opportunity Surface of Residential Burglary," Groff and La Vigne, 257.
- "The Multiple Dimensions of Trust in Resident/Police Relations in Boston," Stoutland, 226.
- "Policing Is Not a Treatment: Alternatives to the Medical Model of Police Research," Thacher, 387.
- "Problem-Oriented Policing, Deterrence, and Youth Violence: An Evaluation of Boston's Operation Ceasefire," Braga et al., 195.
- "The Risk of Offending on Homicide Victimization: A Case Control Study," Dobrin, 154.
- "Student Anger and Aggressive Behavior in School: An Initial Test of Agnew's Macro-Level Strain Theory," Brezina et al., 362.