

DOES THE PERCEIVED RISK OF PUNISHMENT DETER CRIMINALLY PRONE INDIVIDUALS? RATIONAL CHOICE, SELF-CONTROL, AND CRIME

BRADLEY R. E. WRIGHT
AVSHALOM CASPI
TERRIE E. MOFFITT
RAY PATERNOSTER

Society's efforts to deter crime with punishment may be ineffective because those individuals most prone to commit crime often act impulsively, with little thought for the future, and so they may be unmoved by the threat of later punishment. Deterrence messages they receive, therefore, may fall on deaf ears. This article examines this issue by testing the relationship between criminal propensity, perceived risks and costs of punishment, and criminal behavior. The authors analyzed data from the Dunedin (New Zealand) Study, a longitudinal study of individuals from birth through age 26 (N = 1,002). They found that in fact, deterrence perceptions had their greatest impact on criminally prone study members.

Keywords: *deterrence theory; criminal propensity*

Society controls its members by threatening punishments, both formal, such as arrest and imprisonment, and informal, such as social disapproval and withholding of resources. Policymakers, as well as the general public, have widely accepted the punishment-as-deterrence doctrine (Liska and Messner 1999), and so the punishment of criminals, more than other, positive

We thank the Dunedin Study members, their parents, teachers, and peer informants, Dunedin Unit Director Richie Poulton, and Study founder Phil Silva. We thank HonaLee Harrington and Colin Baier for research assistance. The Dunedin Multidisciplinary Health and Development Research Unit is supported by the New Zealand Health Research Council. This research received support from the National Consortium on Violence Research (NCOVR), which is supported under grant #SBR 9513040 from the National Science Foundation, from the William Freeman Vilas Trust at the University of Wisconsin, from US-NIMH grants MH45070, MH49414, from the William T. Grant Foundation, and from Air New Zealand.

JOURNAL OF RESEARCH IN CRIME AND DELINQUENCY, Vol. 41 No. 2, May 2004 180-213
DOI: 10.1177/0022427803260263
© 2004 Sage Publications

interventions is politically viable under the rubric of “getting tough on crime.” Given society’s considerable faith in, and resources spent on, punishing wrong-doers, we have a vested interest in knowing whether in fact threatened punishments deter criminal behavior, and so social scientists have long studied punishment as deterrence (e.g., Beccaria 1963; Becker 1968; Bentham 1948; Piliavin et al. 1986). Of particular significance is the question, Does the threat of punishment differ according to a person’s motivation or propensity to commit crime?

There are three basic, though seemingly contradictory, answers to this question that can be derived from the existing literature: (1) All individuals respond roughly in the same manner to sanction threats (criminal motivation does not matter); (2) because they are impulsive and present-oriented, criminal offenders are less responsive to sanction threats which are distant in time, and the irrelevance of sanctions increases as criminal propensity increases (high motivation reduces any deterrent impact); and (3) because those low in criminal propensity are not motivated to commit crimes or are likely inhibited by other considerations (moral concerns, for example) sanction threats should have the greatest effect among those high in criminal propensity and the deterrent effect of sanctions should increase as criminal propensity increases.

Some careful scholarship has already been directed at the issue of the relationship between the deterrent effect of sanction threats and criminal propensity. For several reasons that we will discuss at greater length in the next section of the article, however, we think this important issue is still unsettled and warrants additional research. First, the findings from these studies have been contradictory—some report a weak deterrent effect for those least prone to crime whereas some a strong effect. Moreover, sometimes the magnitude of the deterrent effect in different groups varies for the certainty and severity of punishment. Second, many of these studies have relied on student samples, relatively minor offending, and outcome variables of self-reported intentions to offend. Samples of university students may not have sufficient variation in criminal propensity to fully test the relevant hypothesis of an interaction between deterrence variables and criminal propensity. These studies have also used self-reported intentions to offend, and although intentions to offend are a staple in this literature, they may encourage “trash talk” or boastfulness among those with a criminal propensity. This trash talk would take the form of responding to a scenario that they would commit a criminal act even in the face of certain and severe punishment but acting in the real world in a more prudent manner. Finally, the position that sanction threats effectively inhibit the criminal behavior even among those with high levels of criminal propensity is also consistent with the empirical literature and harmonious with compelling theoretical positions.

In this article, we reexamine the relationship among stable differences in criminal propensity, sanction threats, and criminal activity. We analyze data from the Dunedin (New Zealand) Multidisciplinary Health and Development Study. The Dunedin study is of a birth cohort of approximately 1,037 study members followed up from birth to age 26. Detailed psychological, medical, and sociological information has been collected on all subjects, including self-reported and official delinquent and criminal offending. Because it is comprised of a birth cohort, contains substantial information on each respondent, and is longitudinal, this study offers strategic advantages for examining the interaction between criminal propensity and sanction threats in its effect on offending.

*SANCTION THREATS AND CRIMINAL PROPENSITY:
RATIONAL CHOICE AND THEORIES OF STABLE
INDIVIDUAL DIFFERENCES*

The substantive question driving this article is whether the deterrent effect of sanction threats varies depending upon individuals' level of motivation or propensity to commit crime. Consultation with criminological theory can lead to several different, and equally compelling, answers.

First, classical deterrence theorists argue that criminal motivation or propensity is irrelevant for deterrence. In this view, the motivation to commit crimes is taken to be constant across persons, and therefore, the costs of crime deter all people equally, regardless of their initial inclination or disinclination toward offending (Taylor, Walton, and Young 1973). What accounts for between individual differences in criminal offending, therefore, are the situational contingencies of the costs and benefits of crime rather than differences in personality, peer group association, income, or social status.

A second answer, drawn from criminal propensity theories, asserts that the threatened punishments of crime deter criminally prone individuals less than others because of their impulsive, risk-taking, and present-oriented natures. Impulsivity leads the criminally prone to neglect the long-term consequences of their behavior to focus instead on their immediate benefits (Gottfredson and Hirschi 1990:95; Wilson and Herrnstein 1985). By seeking immediate gratification, those at high levels of criminal propensity are relatively unmoved by the potential pains of punishment that are both uncertain and removed in the future. As such, the "emotional force" of present desires overwhelms the apprehension of pain in the future (Fry 1951), and the deterrent effect of sanction threats diminishes as presently oriented people discount future punishments.¹ A related argument would be that the highly impulsive behavior and self-centeredness of criminally prone persons renders it

difficult for them to establish long-term social relationships, persist in educational training, or commit themselves to long-term career goals. In sum, they are unable to make a meaningful investment in conventionality and as a result have much less at stake than others. With fewer conventional investments, criminally prone persons would have little at risk that could potentially be lost through formal or informal sanctions.

This theoretical position is not that sanction threats are irrelevant for the criminally prone, just that they are less influential than among those with lower levels of criminal propensity. Even seasoned propensity theorists like Gottfredson and Hirschi (1990) and Wilson and Herrnstein (1985) have argued that individual differences in criminal propensity, and its attendant traits of impulsivity and present-orientation, *are differences in degree*. This implies both that all persons discount future consequences somewhat and that all persons are attuned to the situational incentives and disincentives of their actions. In other words, even those who are high in criminal propensity and impulsivity are capable of some foresight and are, therefore, somewhat attuned to the situational contingencies of their behavior. The argument is that they are simply *less responsive* than others to the attendant costs of their criminal behavior. As Nagin and Paternoster (1993:471) have argued, on average, criminal offenders are oriented to the present rather than the future and, because of that fact, “future consequences have only a *de minimus* impact on their decision calculus.”

A third theoretical position is that the costs of crime are likely to deter criminally prone individuals substantially more than others. This prediction is found in diverse theoretical arguments. For example, Talcott Parsons (1937) in his classic work, *The Structure of Social Action*, argued that the calculation of the costs of crime vary by one’s morality. Because unsocialized and amoral individuals are more willing to commit crime, the calculation of its costs and benefits have greater salience, whereas among those for whom “a rule is accepted as moral obligation, the attitude of calculation is lacking” (Parsons 1937:403). A similar theoretical position was carved out by Etzioni (1988) in his treatise on moral attitudes and economic behavior. He argued that strong moral beliefs about the inappropriateness of some behavior creates “non-market” areas—areas of life and behavior in which individuals act in strict accordance with their moral beliefs and neglect more instrumental considerations. In these nonmarket areas of behavior, considerations of the potential costs and benefits of one’s actions are irrelevant.

The view that strongly socialized individuals are immune to the influence of sanction threats is also given expression in criminological theory. Toby (1964:333) noted that “only the unsocialized (and therefore amoral) individual . . . is deterred from expressing deviant impulses by a nice calculation of pleasures and punishments.” Silberman (1976:443) echoed this view when

he argued that “those who are already deterred from committing a deviant act because they are committed to conform to the norm cannot be deterred further by the threat of punishment” (see also, Bachman et al. 1992; Paternoster and Simpson 1996; Trasler 1993; Tittle 1977, 1980; Wilkins 1962). In this third theoretical view, then, deterrence will best inhibit the criminal activity of those who are actively at risk of offending. Those who are effectively inhibited from crime by other considerations will be immune to the threat of punishment.

We can illustrate this perspective with a simple metaphor. A restaurant owner can sell more prime rib by lowering its price, but not to vegetarian patrons. The price of prime rib here represents the situational inducement toward ordering meat, but vegetarianism represents a predisposition away from it, and thus the effect of meat pricing significantly varies by levels of meat eating. Likewise, the effects of deterrence perceptions might similarly vary by levels of criminal propensity.

With this as background, we recognize a fourth possible position. Perhaps sanction threats are ineffective in deterring both those who are oversocialized and refrain from criminal activity by such things as moral compulsions and those who are so impulsive and pathologically present-oriented that they completely discount the future consequences of their actions. This view would predict an inverted “U” shape for the susceptibility of sanction threats—no deterrent effect at either the lowest levels of criminal propensity (the “oversocialized”) or at the highest (the most impulsive and present-oriented). The deterrent “bang” would only be felt in the midrange of criminal propensity. This group could easily be characterized as Zimring and Hawkins’s (1968, 1973) *marginal offender*. The marginal offender is a wavering one, who is at risk of and therefore at the margins of offending, neither strongly committed to conformity nor crime. Zimring and Hawkins’s view is that these marginal offenders will be particularly responsive to sanction threats.

*SANCTION THREATS AND CRIMINAL PROPENSITY:
DOES CRIMINAL PROPENSITY CONDITION
THE EFFECT OF SANCTION THREATS?*

In the previous section, we outlined four possible and equally compelling theoretical rationales for both the existence and direction of an interaction between individual criminal propensity and the deterrent effect of sanction threats. Although the theoretical arguments may be equally compelling, it is possible that there is a body of empirical literature that may unambiguously put the issue to rest with strong evidence in support of only one of these.

Unfortunately, although the empirical evidence may provide tentative support for the view that sanction threats work best among those with the lowest levels of criminal propensity, this evidence can hardly be characterized as "unambiguous." In fact, the extant findings seem so contradictory that it is hazardous to draw any firm conclusion about how criminal propensity or criminal "character" conditions the effect of sanction threats.

There is, first of all, an abundant volume of qualitative research on active and frequent offenders that can be appealed to. A careful reading of this research would seem to support the two contrary positions that many, if not most, criminal offenders pay little heed to sanction threats, and that active offenders modify their behavior in response to the risks of punishment, and, ultimately, the fear of punishment is influential in getting some of them to desist. For example, in his study of 113 California robbers, Feeney (1986) reports that more than one half reported that they did no planning at all prior to their last crime, and although the proportion who reported some planning increased among the most active robbers, it never exceeded one third of the total. Without some degree of planning, it is difficult to believe that the risk of getting caught and punished influenced the thinking of these robbers. This lack of planning of crimes and contemplation of possible consequences was also a common theme among Shover's (1996:156) persistent thieves: "One of the most striking aspects of the crime-commission decision making of persistent thieves and hustlers is that a substantial proportion seem to give little or no thought to the possibility of arrest and confinement when deciding whether to commit crime." In Wright and Decker's (1994:127-28) study of burglars in St. Louis, they found that about two thirds of the offenders simply avoided thinking about the possibility that they would get caught (see also Shover 1996:157). Other studies of frequent criminals have also noted the lack of regard for the possible legal consequences, implying that sanction threats have little influence among active offenders (Bennett and Wright 1984; Walsh 1986; Wright and Decker 1994; Wright and Rossi 1985), a finding supported by some quantitative data as well (Piliavin et al. 1986).

Against these findings however are others, often reported in the same research, that argue that the risks and costs of crime do affect the decision making of even the most frequent offenders. For example, Shover (1996) argues that the fear of getting caught and returning to prison is one of the primary factors leading his persistent thieves to desist from crime. The fear of apprehension and punishment as a factor in criminal desistance was also noted by Cusson and Pinsonneault (1986:75-7) who describe the inhibition of crime among previously active armed robbers as "delayed deterrence." The process of delayed deterrence is composed of a combination of the fear of increased certainty and severity of punishment. This growing apprehension over the costs of crime among high-risk criminal offenders and its cre-

ation of a delayed deterrence effect has been noted by others (Cromwell, Olson, and Avary 1991; Meisenhelder 1977; West 1978). Furthermore, both qualitative and quantitative studies of offenders have consistently found that in terms of selecting their targets, frequent criminals do try to minimize the risk that they take (Decker, Wright, and Logie 1993; Piquero and Rengert 1999; Rengert and Wasilchick 1985; Shover 1996; Walsh 1986; Wright and Decker 1994).

What these various studies of active offenders seems to indicate is that at least some active offenders do pay attention to sanction threats at least some of the time. This rather ambiguous conclusion that "maybe criminals are affected by the costs of crime, and maybe they are not" is perfectly captured in Shover's (1996:162) observation that

notwithstanding variation in target selection by type of crime, age, and the number of offenders, it is equally clear that street-level persistent thieves are sensitive to the risk of failure. They behave purposefully and even rationally. It would be a mistake, however, to infer from this that they are aware of and sensitive to even substantial variation or changes in the schedule of threatened punishments. Most often they are not.

What we do not know from this abundant literature is whether these fits of rational conduct are more or less prevalent among those with less criminal propensity. Therefore, although this research may shed some light on the issue, the most probative evidence would come from studies that directly compared any deterrent effect among groups differing in criminal propensity. There are a few studies that do exactly this, although it remains unclear as to what conclusion may safely be drawn.

In their attempt to reconcile individual difference and rational choice theories of crime, Nagin and Paternoster (1994) found that a composite measure of informal sanction risk did interact with a measure of self-control (impulsivity/self-centeredness) in its effect on the self-reported intention to commit three crimes, drunk driving, larceny, and sexual assault. For two of the three offenses, larceny and sexual assault, the deterrent effect of informal sanctions was significantly greater among those high in self-control (low in criminal propensity) than for those at the highest level. These findings would argue for the theoretical position that sanction threats work best when criminal propensity is low than when it is high. However, they did not find this pattern of effects for the offense of larceny, and the deterrent effect of informal sanctions was not monotonically related to the level of self-control. There were no statistically significant differences between those in the mid-range of self-control and either the low or high levels for any of the three offenses.

In a series of laboratory experiments, Block and Gerety (1995) examined the effect of variations in the certainty and severity of punishment on hypothetical criminal activity (collusive pricing) among college students and a sample of incarcerated offenders. Drawing on Becker's (1968) classic paper on the economics of crime and punishment, they hypothesized that criminals are risk takers and would, therefore, be influenced more by the certainty of punishment than its severity. The conventional sample, they argued, would be risk averse, and would be more responsive to variations in the severity of punishment. They found that both groups were responsive to sanction threats but in qualitatively different ways. As predicted, the students were more sensitive to variations in the severity than the certainty of punishment, whereas the offenders were more responsive to the certainty than severity of punishment. This study seems to show that one dimension of sanction threats (certainty) works best among the most prone to crime whereas another (severity) works best among the least.

Nagin and Pogarsky (2001:874) hypothesized that the deterrent effect for the perceived severity of punishment would be smaller for those who were more present-oriented (crime prone) because the costs of criminal activity are generally far removed in the future. Their prediction that the deterrent effect of the severity of punishment should be weaker among those at high risk of crime is consistent with the expectation argued by Block and Gerety (1995). In the Nagin and Pogarsky (2001) study of drunk driving among a sample of college students, they were able to identify a group who were characterized as being particularly present oriented. For this group that tended to discount future consequences, Nagin and Pogarsky predicted a diminished deterrent effect for sanction threats. They also identified another group that was the virtual opposite of present-oriented. These "negative discounters" preferred immediate punishment and were extraordinarily future-oriented. Among this group, a stronger than average deterrent effect was predicted. Only partial support was found for these two predictions. The two interaction effects of Severity \times Present Orientation and Severity \times Negative Discounters were not statistically significant. However, the authors did report that the latter interaction was substantively large—the severity effect for those with a strong future orientation was about four times as large as those with a present orientation.

In a related piece of research, Pogarsky (2002) argued that sanction threats would be ineffective in inhibiting the criminal behavior of both "acute conformists" (those who comply with rules out of moral obligation), and the "incorrigible" (those driven by strong, sometimes pathological urges, those with severe cognitive deficits, and the impulsive), and most effective among "detractable" offenders (those neither strongly committed to conformity nor deviance). With a sample of university students, he found that perceptions of

both the certainty and severity of punishment were inversely related to self-reported intentions to drink and drive only among those defined as "deterable." Among the group of incorrigibles, neither the severity nor certainty of punishment had any effect on intentions to drink and drive.

Although these findings would appear to support the position that sanction threats are ineffective among those with the greatest criminal propensity, there are some uncertainties. First, the group that Pogarsky defined as "incorrigible" might not be the most impulsive but only those, who for other reasons, are not responsive to variations in sanction risk and cost. He measured the impulsivity of his respondents and reported that there were no differences among the "acute conformists," "deterables," and "incorrigibles" on this trait. Second, the groups labeled as "deterable" and "incorrigible" were defined on the basis of their receptivity to sanction threats, and it should not be surprising that there were differences in their response to certainty and severity. For example, those deemed "incorrigible" reported at least a 50 percent likelihood of drinking and driving in response to a hypothetical scenario, and their self-reported intention to offend was unaffected by one scenario condition that there was "absolutely no chance" that they would be caught. The "deterables" were more likely to report that they would drink and drive under the "absolutely no chance" of getting caught condition than in the absence of that condition. They were, therefore, by definition amenable to appeals to punishment.

Finally, Piquero and Pogarsky (2002) conducted two hypothesis tests of relevance to our concern about the conditional effect of sanction threats. With a sample of university students and a scenario methodology, they examined whether the effect of variation in the certainty and severity of punishment on intentions to commit a crime varied between groups who differed in their prior offending and their impulsivity. Consistent with the prediction that those high in criminal propensity are more responsive to sanction threats, they found that the deterrent effect for both the certainty and severity of punishment was higher among those who have some offending experience compared with those with no prior offending reported. Contrary to Block and Gerety (1995), they found that those most at risk for criminal activity because of their high levels of impulsivity were more responsive to the severity of punishment than they were to its certainty compared with those low in impulsivity. There was a significant deterrent effect for perceived severity among those high in impulsivity (and a weak and nonsignificant effect for perceived certainty), and a significant deterrent effect for perceived certainty among those low in impulsivity (and a weak and nonsignificant effect for perceived severity). These findings are, however, consistent with the argument made by Silberman (1976) that threats of severe rather than certain punishment is necessary to deter those predisposed to crime because they are

generally unmoved by its certainty.² We should also note that these contradictory findings are possible because of the weak positive relationship between impulsivity and both prior and self-reported intentions to offend ($r = .23$ and $.13$, respectively).³

In sum, appealing to the empirical literature on the question as to whether those high in criminal propensity are more or less responsive to sanction threats than those less at risk is unsatisfying. Although some studies have found evidence that the criminally prone are less affected by the certainty and severity of punishment, most of these have come from research involving university students responding to hypothetical crime scenarios. Although generally such a methodology is a sound way to examine issues pertaining to rational choice and offending, it may not be the most effective strategy in addressing the possible conditional effect of impulsivity.

Ideally, one would want to have substantial variation across persons in criminal propensity. University samples are likely to have substantially truncated variation in traits like criminal propensity, impulsivity, and present-orientation. This is not, of course to say that there is no variation in such samples, but it is to say that because university attendance requires a nontrivial amount of perseverance and future orientation, it is likely that college samples will not include those at the upper tail of criminal propensity. What samples of university students may capture, particularly with respect to commonly studied crimes like drinking and driving, sexual assault, petty theft, drug use, and cheating, are “marginal offenders,” who because there are no strong moral inhibitions against nor strong motivations toward such acts, are going to be responsive to instrumental factors such as the risks and possible penalties involved.

Furthermore, this line of research frequently uses intentions to commit crimes in response to hypothetical scenarios as the outcome variable. Again, although generally a sound and productive strategy with abundant advantages over other methodologies, it is possible that it may lead to bias. Suppose a manifestation of criminal propensity/impulsivity is a tendency toward boastful “trash talk,” saying you will commit a crime in response to a hypothetical scenario in spite of clear sanction costs. Such talk is cheap and in real situations these persons might be more responsive to risks and penalties. The observed outcome in scenario research, however, will be a diminished effect of sanction threats among those with both chutzpah and a proneness toward crime and antisocial behavior.⁴

In sum, we think that whether and how criminal propensity/impulsivity conditions the effect of sanction threats is both a terribly important yet unsettled question in the field. It is clear that the position of classical deterrence theory that criminal motivation is constant is untenable, yet the exact causal significance of motivation still is not clear. We have tried to suggest that there

are several equally compelling theoretical and empirical reasons for very different arguments about the conditional effect that criminal propensity might have. In the current article we hope to address this issue with a more general sample of respondents and self-reported behavior rather than intentions to behave. In the next section we will outline our general methodology, the sample, and our key measures. This is followed by our results and concludes with a discussion of the implications of our findings.⁵

METHOD

Data

We conducted our analyses of data from the Dunedin Multidisciplinary Health and Development Study (Silva and Stanton 1996). The members of the Dunedin study are children born from April 1972 through March 1973 in Dunedin, New Zealand, a city of approximately 120,000 people. A total of 1,037 study members (91 percent of the eligible births) participated in the first follow-up assessment at age 3. These study members formed the base sample for a longitudinal study that has since been followed up, with high levels of participation, at ages 5 ($n = 991$), 7 ($n = 954$), 9 ($n = 955$), 11 ($n = 925$), 13 ($n = 850$), 15 ($n = 976$), 18 ($n = 1,008$), 21 ($n = 992$), and 26 ($n = 980$). The study members were given a diverse battery of psychological, medical, and sociological measures at each assessment. Data about the study members were collected from the study members themselves, parents, teachers, informants, and trained observers.

In general, the rates of criminal offending in New Zealand approximate those found in other industrialized countries such as the United States, Canada, Australia, and the Netherlands (Junger-Tas, Terlouw, and Klein 1994; van Dijk and Mayhew 1992). Likewise, the rates of crime victimization in New Zealand are close to those of other countries (van Dijk and Mayhew 1992) as are rates of violent crime (Zimring and Hawkins 1997). More specifically, various cross-national comparisons have found that the findings from the Dunedin study generalize to other industrialized countries, especially in the area of criminal behavior. For example, the predictors of problem behavior among the Dunedin Study members are the same as those in a similar longitudinal sample of Black and White youth collected in Pittsburgh (Moffitt et al. 1995).

Our analysis of these longitudinal, observational data may shed light on the theoretical issues framing this study because previous empirical studies have tended to rely on scenario experiment research designs. This experimental approach, however, explicitly instructs participants to weigh commit-

ting crimes in light of clearly stated consequences. In the real world, however, and as we discussed above, individuals vary widely in their likelihood of even thinking about committing crimes and in their attention to its consequences. As such, experimental studies may create an overly artificial world of decision making, and, at the very least, it is worthwhile to revisit these issues with different data.

The Dunedin data offers other benefits as well. Being longitudinal, they link important concepts across the life-course, including criminal propensity, perceptions of punishments, and criminal behavior. They also cover an entire birth cohort, and thus they then contain a wide range of antisocial, criminal behavior. In contrast, data from university studies contain a much more narrow range of behavior because criminal propensity negatively predicts education (Wright et al. 2001).

Measures

Our analyses of the Dunedin Study capitalize on its longitudinal design by examining criminal propensity measured in childhood, adolescence, and early adulthood (i.e., ages 3 through 21), deterrence perceptions in late adolescence and early adulthood (ages 18 and 21), and criminal behavior in early adulthood (ages 21 and 26).

We analyzed three separate measures of criminal propensity: low self-control in childhood, low self-control in adolescence, and self-perceived criminality. The variable "childhood low self-control" was measured at ages 3, 5, 7, 9, 11, and it comprises nine separate subscales: *Lack of Control* was measured by trained observers at ages 3 and 5. *Hyperactivity* and *Antisocial Behavior* were collected from parents and teachers at ages 5, 7, 9, and 11 using Rutter Behavioral Scales (Rutter, Tizard, and Whitmore 1970). *Impulsivity*, *Lack Of Persistence*, and *Hyperactivity* were collected from parents and teachers at ages 9 and 11 using scales derived from the *Diagnostic Statistical Manual of Mental Disorders III* (McGee et al. 1992). *Hyperactivity*, *Inattention*, and *Impulsivity* were self-reported by the study members at age 11 using the Diagnostic Interview Schedule for Children (Costello et al. 1982). The variable "childhood low self-control" sums these nine scales, and, all together, it contains information from 167 separate measurement items (Wright et al. 1999a). This variable, like the others in our analyses, is named in the direction of its coding, so a study member scoring high on "low self-control" has low levels of self-control.⁶

The variable "adolescent low self-control" comprises seven subscales: *Hyperactivity* was self-reported by study members at age 15 using a scale from the Diagnostic Interview Schedule for Children (Costello et al. 1982). *Inattention* was collected from parents at age 15 using the Peterson-Quay

Behavioral Checklist (Quay and Peterson 1987). *Impulsivity*, *Physical Response to Conflict*, and *Risk-taking* were self-reported by study members at age 18 using the Multidimensional Personality Questionnaire (Tellegen and Waller 1994). *Impulsivity* and *Inattention* were collected from informants at age 18 with single-item measures. "Adolescent low self-control" sums these scales and contains information from 76 measurement items (Wright et al. 1999a).

The variable "self-perceived criminality" was measured at both ages 18 and 21 with the following question: "Compared to most people your age, about how would you rate yourself on this scale from 1 to 10? 1 = *you do less illegal things than the average person*, 10 = *you do more illegal things than the average person*, and 5 = *you are about like most people*." Study members responded to the 1-10 scale using a visual ladder. We recognize that some readers may find this measure of criminal propensity to be controversial due to possible overlap of the outcome measure of self-reported delinquent acts; however, we use it in this article for several reasons. Most fundamentally, we view self-perceived criminality as a distinct theoretical construct from criminal behavior for it incorporates individuals' reference groups as well as other cognitive processes that generate self-appraisal.⁷ Also, the study of deterrence emphasizes the importance of *perceived* punishments and rewards, and so its clearest linkage to criminal propensity would also be in the realm of perceptions (i.e., self-perceived criminality).⁸

We analyzed two types of deterrence perceptions. The first, "getting caught," was measured at ages 18 and 21 (which we combined into one variable) and then again at age 26 (a second variable). At each age, study members responded to a series of questions about the detection of seven different criminal behaviors. Study members were asked, "If you did _____ [crime] on 10 different days, how many times do you think that you would get caught for doing it?" Their answers were coded from 0 to 10 days, with higher scores indicating a greater risk of detection. The crimes inquired about included shoplifting, car theft, burglary, and using stolen credit cards (all three ages), marijuana use, hitting someone in a fight, and driving while drunk (ages 21 and 26 only).

The second type of perception variable, "social sanctions," was measured at ages 21 and 26 (two separate variables). Study members answered a series of questions about what would happen to them if others found out that they had committed various crimes. The first question asked "Would you lose the respect and good opinion of your close friends if they knew that you _____?" The crimes inserted here were shoplifting, car theft, burglary, using stolen credit cards, marijuana use, hit someone in a fight, and driving while drunk. The study members could answer "yes," "maybe," or "no." The remaining questions referred to the same crimes and asked, "Would you lose the respect

and good opinion of your parents and relatives if they found out that you _____?" "Would it harm your future job prospects if people knew that you _____?" "Would it harm your chance to attract or keep your ideal partner if people knew that you _____?"

Unfortunately, the otherwise rich Dunedin data set does not measure study members' perceptions about the rewards of crime. Based on the theoretical discussion above, we would expect that these rewards would have their strongest pull toward crime among those individuals most prone to crime—just as the costs of crime should most affect these same, criminally prone people. However, we cannot test this expectation of reward perceptions with our data. The omission of reward data might alter our findings, however, if reward-perceptions make spurious the causal linkage between cost-perceptions and criminal behavior. We have no a priori reason to expect this type of spuriousness, though, nor have previous studies of rewards in deterrence models suggested its existence (e.g., Bachman et al. 1992; Paternoster and Simpson 1996; Piliavin et al. 1986).

In our analyses, we standardized the criminal-propensity and deterrence-perception variables described above to have a mean of zero and a standard deviation of one. This standardization makes regression coefficients easier to interpret, with a one standard deviation change in X producing some estimated change in Y. Centering these main effects at zero also reduces multicollinearity in interactive models (Jaccard, Turrisi, and Wan 1990:31).

We constructed our dependent variables with self-reported offending data measured at age 26 with an instrument developed by Elliott and Huizinga (1989) for the National Youth Survey (and adapted for use in the Dunedin Study). This instrument asked study members about their participation in 48 different criminal acts, commonly committed by young adults, during the previous year. These criminal acts included traditionally studied crimes such as theft, burglary, assault, fraud, and drug offenses. They also included other crimes such as credit card fraud, prostitution, embezzlement, disability fraud, abusing a child, and moving from an apartment without paying the final bills. For sensitivity analyses, we also analyzed the self-reported crime data from the age-21 interview.

From these self-reported data, we created two measures of criminal behavior—a variety scale and a relative frequency scale. The variety scale assigns 1 point for every *type* of crime committed by study members in the previous year, regardless of how often they committed the crime. Previous studies have found that adolescents and young adults often do not specialize in one type of criminal behavior (Piquero et al. 1999), and so the range of their criminal behavior is an important dimension. Variety scales have been described as the best operational measure of general criminal offending (Hirschi and Gottfredson 1995:134).

To complement the variety scale, we also created a type of frequency scale. We did this by first identifying major subscales of the self-reported crime data—Drug Use, Violence, Theft, Aggression, and Fraud. We did not simply sum together the frequencies of these subscales, however, because they had widely varying distributions. Drug Use, for example, ranged from 0 to 2,408 acts whereas violent crime ranged only from 0 to 4. These differences reflect the differing severity of these crimes. Instead, we standardized the subscales into a common metric with a mean of zero and a standard deviation of one, and we then summed together the standardized subscales to measure the *relative* frequency of study members' crime—relative in that it measures the frequency of criminal acts relative to other study members. The resulting measure was highly skewed to the right, so we analyzed its logarithm.

Our multivariate analyses controlled for gender and social class. The gender variable was a dummy variable coded 1 = male and 0 = female. The social class variable measured the socioeconomic status (SES) of study members' families with a 6-point scale developed by Elley and Irving (1976). This scale places parents' occupations into one of six categories based on the educational levels and income associated with that occupation in data from the New Zealand census. The scale ranges from 1 = "unskilled laborer" to 6 = "professional." For our analyses, we combined SES levels from birth through age 15 to create a summary measure of study members' socioeconomic conditions while they were growing up (Wright et al. 1999b).

The data analyzed from the Dunedin Study had relatively few missing cases, usually for only about 2 percent to 3 percent of study members. To account for the missing data in our independent variables, we recoded the missing cases to the mean of the observed cases, and then we created a separate dummy variable that indicated which cases were recoded. We then included both the recoded substantive variable and the corresponding missing-dummy variable into our regression equations. This procedure allowed us both to analyze more study members and to test if those with missing data differed from those without. We did not present the missing-dummy results, however, unless they were statistically significant.

RESULTS

The Distribution of Deterrence Perceptions

We begin our analyses by examining the distribution of deterrence perceptions across levels of criminal propensity. This distribution matters because if criminally prone individuals never view crime as costly or risky,

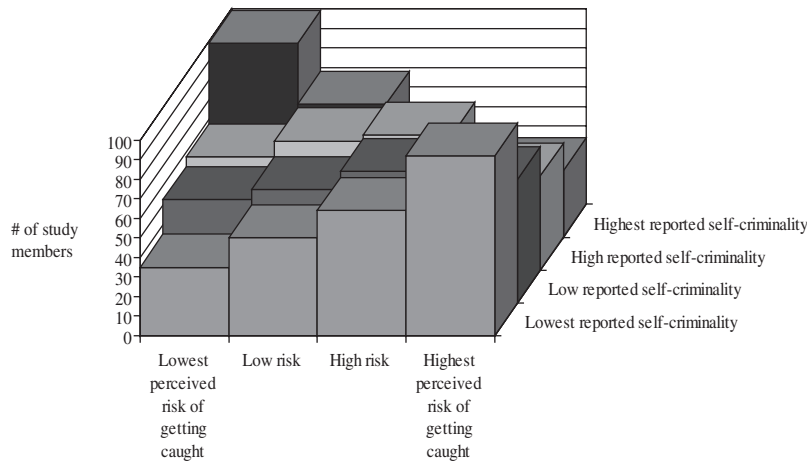


Figure 1: The Distribution of Perceived Risk of Getting Caught by Reported Self-Perceived Criminality

then it makes no sense to assess the deterrent effect of such perceptions on these people. To examine this issue, we plotted the joint distribution of “getting caught” at ages 18 and 21 and “self-perceived criminality” in Figure 1. To create this figure, we recoded each variable into quartiles. We then created a four-by-four table and plotted how many study members fell into each of the 16 (4×4) cells.⁹

If indeed “getting caught” and “self-perceived criminality” had no statistical association, then each bar in Figure 1 should have had a similar height of about 60 study members (one-sixteenth of the total study size), and the figure would have had a flat surface. What we observe in Figure 1, however, is more of a saddle-shaped surface, with the on-diagonal bars rising higher than the off-diagonal bars. This shape illustrates the negative association between the two variables. Important for our analyses, though, each of the 16 cells in this figure contained a nontrivial number of study members. For example, among the 241 study members in the highest quartile of “self-perceived criminality,” 99 (41 percent) scored in the lowest quartile of “getting caught,” but still 74 (31 percent) study members scored in the high or highest quartile (40 and 34, respectively).

We redid Figure 1 using “social sanctions” instead of “getting caught,” and obtained nearly identical results, as shown in Figure 2. The study mem-

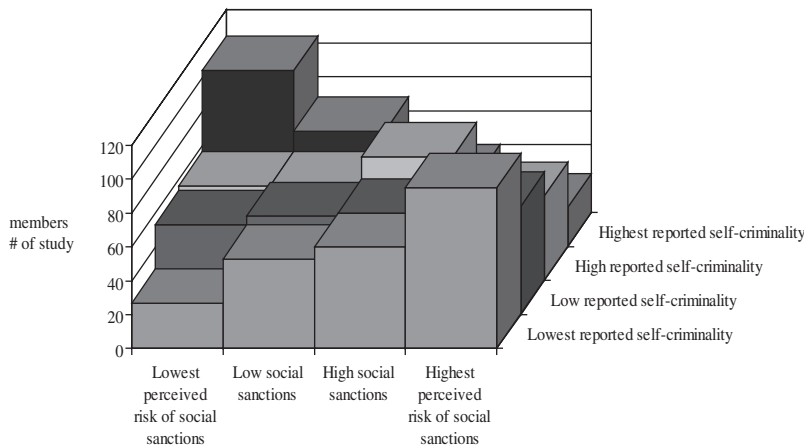


Figure 2: The Distribution of Perceived Risk of Social Sanctions by Reported Self-Criminality

bers with the highest self-perceived criminality perceived overall low social sanctions, yet a meaningful number of them perceived high sanctions.

Figures 1 and 2 demonstrate that some criminally prone study members viewed crime as risky or costly, and, conversely, some less-prone individuals did not. This allows us to meaningfully discuss the impact of deterrence perceptions at all levels of criminal propensity. It also provides some empirical support for the theoretical position that all persons consider the consequences of their behavior and that even those who are high in criminal propensity and impulsivity are capable of foresight. The differences between the impulsive and criminally prone and others, therefore, may be differences in degree.

Testing the Differential Effect of Deterrence Perceptions

We tested the differential effect of deterrence perceptions with a series of regression equations that contained interaction terms between deterrence perceptions and criminal propensity. In the first set of equations, presented in Table 1, we used OLS regression to regress the self-reported offending variety scale at age 26 on “getting caught” at ages 18 and 21 and each of the three criminal propensity variables.¹⁰ Table 1 has six columns with each column reporting a different regression equation. The first equation, in column 1, tests the main effects of “getting caught” and “childhood low self-control” on

TABLE 1: The Varying Effect of Perceived Risk of Getting Caught on the Variety of Criminal Behavior

Independent Variable	Dependent Variable = Variety of Self-Reported Offending at Age 26					
	(1)	(2)	(3)	(4)	(5)	(6)
Perceived risk of getting caught (ages 18 and 21)	-.650* (-6.20)	-.621* (-5.91)	-.545* (-5.38)	-.514* (-5.09)	-.219* (-2.24)	-.231* (-2.39)
Male	.903* (8.29)	.916* (8.43)	.762* (7.34)	.775* (7.50)	.726* (7.59)	.739* (7.80)
Social class	-.282* (-2.72)	-.266* (-2.57)	-.300* (-3.10)	-.281* (-2.91)	-.377* (-4.20)	-.359* (-4.03)
Childhood Low Self-Control	.335* (3.00)	.298* (2.67)				
Childhood Low Self-Control × Risk of Getting Caught		-.260* (-2.65)				
Adolescent low self-control			.995* (9.71)	.953* (9.27)		
Adolescent Low Self-Control × Risk of Getting Caught				-.307* (-3.34)		
Self-perceived criminality					1.490* (15.81)	1.403* (14.71)
Self-perceived Criminality × Risk of Getting Caught						-.354* (-4.48)
R ²	.178	.184	.245	.253	.346	.359

NOTE: Cells report unstandardized OLS regression coefficients (t-values in parentheses). N = 977.
*p < .05 (two-tailed tests).

“variety of criminal behavior at age 26,” and column 2 adds an interaction term created by multiplying together these two predictor variables. Columns 3 and 4 present the main and interaction effects for “getting caught” and “adolescent low self-control.” Columns 5 and 6 present the effects for “self-perceived criminality.” Each of these six equations controls for social class and gender.

As shown in columns 1, 3, and 5, the main effects of “getting caught” and of each of the three propensity variables were statistically significant and in the expected directions. The study members who anticipated getting caught also committed fewer crimes, and those with low self-control or high self-perceived criminality committed more crimes.

As shown in columns 2, 4, and 6, the interaction terms between “getting caught” and the three propensity variables were statistically significant and negative.¹¹ Their negative sign indicates that the deterrent effect “getting caught” (i.e., its negative effect) was *greatest* (i.e., even more negative) among study members low in self-control and high in self-perceived criminality. Because the variables used to create these interaction terms share the same metric, we can roughly compare the magnitude of these interaction coefficients, and the effect of the perceived risk of getting caught on crime interacted most strongly with self-perceived criminality, followed by adolescent and childhood low self-control ($b = -.354, -.307, \text{ and } -.260$, respectively).

In the second set of equations, presented in Table 2, we repeated the analyses of Table 1 using “social sanctions” at age 21 instead of “getting caught,” and we obtained nearly identical results. As shown in columns 1, 3, and 5, “social sanctions” and each of the three criminal propensity variables significantly predicted variety of self-reported offending as main effects. In columns 2, 4, and 6, the interaction terms between “social sanctions” and the three propensity variables were statistically significant and negative. As such, the deterrent effect of perceived social sanctions was strongest among the criminally prone study members. The effect of perceived social sanctions on crime interacted most strongly with childhood low self-control, followed by adolescent self-control and then self-perceived criminality ($b = -.292, -.225, \text{ and } -.209$, respectively).

To test the robustness of the analyses in Tables 1 and 2, we replicated them using several different model specifications: an OLS regression equation predicting offending at age 21 (instead of age 26), a tobit regression equation predicting offending at age 21, and a tobit regression equation predicting offending at age 26. We estimated tobit equations to allow for left-hand censoring due to the 18 percent of study members who reported “zero” crimes at age 26 (and 8 percent reporting zero at age 21; see Caspi et al. 1998 for a discussion of tobit equations).¹²

TABLE 2: The Varying Effect of Perceived Risk of Social Sanctions on the Variety of Criminal Behavior

Independent Variable	Dependent Variable = Variety of Self-Reported Offending at Age 26					
	(1)	(2)	(3)	(4)	(5)	(6)
Perceived risk of social sanctions (age 21)	-.810* (-8.06)	-.786* (-7.83)	-.611* (-6.13)	-.578* (-5.76)	-.341* (-3.53)	-.320* (-3.32)
Male	1.018* (9.90)	1.021* (9.96)	.877* (8.84)	.876* (8.85)	.758* (8.17)	.757* (8.17)
Social class	-.088 (-.85)	-.089 (-.86)	-.141 (-1.44)	-.146 (-1.49)	-.265* (-2.88)	-.251* (-2.73)
Childhood low self-control	.222* (1.99)	.203 (1.82)				
Childhood Low Self-Control × Risk of Social Sanctions		-.292* (-2.98)				
Adolescent low self-control			.886* (8.42)	.866* (8.22)		
Adolescent Low Self-Control × Risk of Social Sanctions						
Self-perceived criminality				-.225* (-2.51)		
Self-perceived Criminality × Risk of Social Sanctions					1.429* (14.67)	1.372* (13.79)
R ²	.192	.199	.247	.252	.337	.341

NOTE: Cells report unstandardized OLS regression coefficients (t-values in parentheses). N = 977.
*p < .05 (two-tailed tests).

In our replications of the “getting caught” analyses in Table 1, all three interaction terms were statistically significant and negative in each of the three replication analyses—OLS regression with age 21 crime, tobit regression with age 21 crime, and tobit regression with age 26 crime. In our replications of the “social sanctions” analyses in Table 2, all three interaction terms were significant and negative in the OLS and tobit equations with crime at age 21. In the third replication, however, using tobit regression and age-26 crime, all three interaction effects were negative but only the “childhood self-control” by “social sanctions” effect was statistically significant. In these replication analyses, then, 22 of 24 interaction effects were statistically significant in the expected direction.

In the third set of equations, presented in Table 3, we repeated the “getting caught” analyses in Table 1 but with a different dependent variable—the relative frequency of crime (logged), rather than its variety, and we again obtained similar, if not actually stronger, substantive findings. As shown in columns 1, 3, and 5, “getting caught” and each criminal propensity variable significantly predicted “relative frequency of self-reported offending” as main effects. In columns 2, 4, and 6, “getting caught” significantly and negatively interacted with each of the three propensity variables. The effect of “getting caught” on crime interacted most strongly with self-perceived criminality, followed by adolescent self-control and then childhood self-control ($b = -.049, -.035, \text{ and } -.020$, respectively).

We tested the robustness of the relative frequency analyses in Table 3 by replicating them with several different model specifications: a tobit regression; an OLS regression using “social sanctions” rather than “getting caught”; and a tobit regression using “social sanctions.” In each of these replications, all interaction terms between deterrence perceptions and criminal propensity were statistically significant and negative.

Illustrating the Differential Effect of Deterrence Perceptions

The regression equations presented test the statistical significance of perception-by-propensity interaction effects, but, frankly, they lack intuitive appeal. To convey more fully the strength and direction of these interaction effects, we now illustrate them with numerical and graphical methods.

Numerically, we illustrate the differential impact of deterrence perceptions as follows. In a regression equation $Y = B_1X_1 + B_2X_2 + B_3X_1 * X_2$, the coefficient B_2 represents the effect of X_2 on Y when X_1 is set at zero (Jaccard et al. 1990:26). To estimate the effects of X_2 at other levels of X_1 , one can simply recenter X_1 . We did this with “adolescent self-control.”¹³

We present our results in Table 4. This table reports the main effects of the two deterrence variables, “getting caught” and “social sanctions,” on self-

TABLE 3: The Varying Effect of Perceived Risk of Getting Caught on Relative Frequency of Criminal Behavior

Independent Variable	Dependent Variable = Relative Frequency of Self-Reported Offending at Age 26 (logged)					
	(1)	(2)	(3)	(4)	(5)	(6)
Perceived risk of getting caught (age 21)	-.054*	-.052*	-.046*	-.042*	-.025*	-.027*
Male	(3.63)	(3.75)	(3.10)	(3.29)	(3.14)	(3.44)
Social class	-.024*	-.023*	-.031*	-.029*	-.037*	-.034*
Childhood low self-control	(5.40)	(5.08)	(-3.80)	(-3.58)	(-4.69)	(-4.47)
Childhood Low Self-Control × Risk of Getting Caught		-.020*				
Adolescent low self-control			.080*	.075*		
Adolescent Low Self-Control × Risk of Getting Caught						
Self-perceived criminality				-.035*	.105*	.093*
Self-perceived Criminality × Risk of Getting Caught					(12.69)	(11.25)
R ²	.129	.135	.176	.193	.231	.270

NOTE: Cells report unstandardized OLS regression coefficients (t-values in parentheses). N = 977.
*p < .05 (two-tailed tests).

TABLE 4: The Effects of Deterrence Perceptions on Crime at Different Levels of Adolescent Low Self-Control

Crime-Cost Perception	The Effect of Each Deterrence Perception Assessed at:				
	Very Low Self-Control (90th percentile)	Low Self-Control (70th percentile)	Median Self-Control (50th percentile)	High Self-Control (30th percentile)	Very High Self-Control (10th percentile)
Risk of getting caught (ages 18 and 21)	-.865* -.256 (-6.22)	-.724* -.215 (-6.35)	-.552* -.164 (-5.48)	-.381* -.113 (-3.40)	-.127 -.038 (-.79)
Risk of social sanctions (age 21)	-.835* -.249 (-6.25)	-.731* -.218 (-6.62)	-.605* -.180 (-6.08)	-.480* -.143 (-4.27)	-.294 -.088 (-1.82)

NOTE: Cells report unstandardized OLS regression coefficients, with standardized coefficients in italics (*t*-values in parentheses). All equations control for gender and social class. Dependent variable = age 26 variety of criminal behavior. Data from the Dunedin Study. *N* = 977.

**p* < .05 (two-tailed tests).

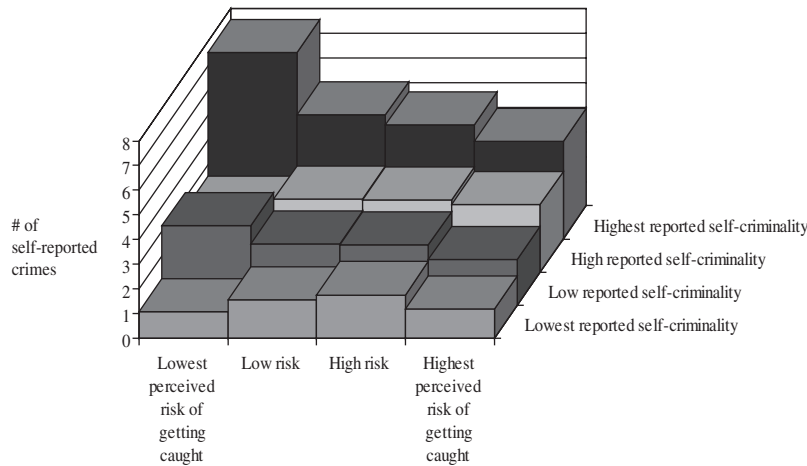


Figure 3: Self-Reported Offending by Perceived Risk of Getting Caught and Reported Self-Criminality

reported offending as assessed at five different levels of adolescent low self-control. (For clarity of presentation, we do not report the remaining coefficients in each equation, those of low self-control, the interaction terms, gender, and social class.) The first column of numbers reports the effect of each deterrence-perception variable on criminal behavior as estimated at a “very low” level of self-control. At this level, the effect of “getting caught” was $b = -.865$ (and standardized coefficient $\beta = -.256$), and the effect of “social sanctions” was $b = -.835$ ($\beta = -.249$), and both variables were statistically significant. At a “low” level of self-control, the effects of the deterrence perceptions remained negative and significant, but dropped in magnitude somewhat, at $b = -.724$ ($\beta = -.215$) and $b = -.731$ ($\beta = -.218$), and the variables remained significant at gradually smaller magnitudes through “high” self-control. At a “very high” level of self-control, however, a change occurred, for neither deterrence-perception variable was statistically significant ($b = -.127$ and $\beta = -.038$; $b = -.294$ and $\beta = -.088$). As such, the perception of crime as risky or as costly was estimated to have little effect on the criminal behavior of this subset of highly controlled study members.

Graphically, we illustrate these interaction effects by plotting the distribution of criminal behavior as a function of “getting caught” and “self-perceived criminality.” We present our results in Figure 3, which like Figure 1, has a horizontal axis that gives quartile groupings of “getting caught” at

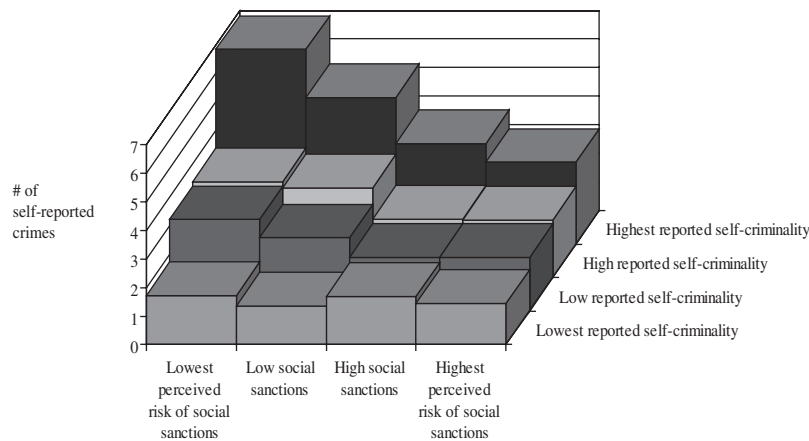


Figure 4: Self-Reported Offending by Perceived Risk of Social Sanctions and Reported Self-Criminality

ages 18 and 21 and “self-perceived criminality.” The Y-axis, however, now reports the average crime scores of the study members in that particular cell. For example, the bar in the front left of Figure 3 rises to slightly above “1,” indicating that the study members at the lowest levels of “getting caught” and “self-perceived criminality” averaged only 1.1 different crimes in the previous 12 months. In contrast, the bar in the back left of Figure 3 shows that the study members lowest in “getting caught” but highest in “self-perceived criminality” averaged 7.5 crimes.

Several patterns emerge in Figure 3. The bars in the back are overall higher than those in front, representing the main effect of self-perceived criminality. The bars on the left tend to be higher than those on the right, representing the main effect of the perceived risk of getting caught. In the back row, the bars change in height considerably when going from left to right—from 7.5 crimes to 3.9 crimes; whereas, in the front row, they change only from 1.2 to 1.1. This represents the interaction between the perceived risk of getting caught and self-perceived criminality in that the former decreases crime levels most strongly at high levels of the latter.

In Figure 3, we replicate Figure 4 with the variable “social sanctions,” and we got almost identical results. Self-perceived criminality again had a main effect from back to front, perceived social sanctions had a main effect from left to right, and the effect of perceived social sanctions varied strongly by levels of self-perceived criminality.

Figures 3 and 4 bear upon another explanation for the relationship between punishments and criminal propensity. Several studies have advanced the possibility of a curvilinear relationship between criminal propensity and deterrence, with threatened punishments having no effect on those either most likely or least likely to commit crime; instead, punishments affect only those in the middle—marginal offenders (Andenaes 1974; Nagin and Paternoster 1994; Pogarsky in press; Zimring and Hawkins 1968, 1973). Empirical evidence for this curvilinear relationship, however, has not been strong. Nagin and Paternoster (1994) found a monotonic relationship between deterrence and criminal propensity. Pogarsky (2002) found that incorrigible respondents responded less to punishments than did others, but it is not clear from the presented analyses that acute conformists were less deterred than marginal offenders. As shown in Figures 3 and 4, we found no evidence of a curvilinear relationship, for the respondents with the highest self-reported criminality (i.e., those in the back row), and not those with mid-levels of criminality (i.e., those in the middle two rows) showed the most responsiveness to social sanctions.

DISCUSSION

This article examined the relationship between criminal propensity, perceptions of the risks and costs of crime, and criminal behavior. We began by reviewing four theoretical perspectives on these relationships. A traditional deterrence perspective would hold that the threat of punishment equally affects all people, regardless of criminal inclination. Self-control theory would hold that threatened punishments have a greatly diminished effect on individuals with low levels of self-control. A third perspective drawn from various sources would hold that the threat of punishment would be most salient for, and thus have its greatest impact on, individuals most prone to crime. An implicit fourth perspective would hold that the effect of sanction threats is minimal both for those low in criminal propensity, whose criminal conduct is likely effectively inhibited by noninstrumental factors such as strong moral beliefs, and for those who are highest in criminal propensity, those who are exceptionally present oriented and impulsive and who, therefore, are incapable of much foresight.

We tested these competing perspectives using data from the Dunedin (New Zealand) study with which we regressed self-reported crime upon measures of criminal propensity, perceived costs of crime, and interaction terms between the two. Using various model specifications, we found consistent support for the third theoretical perspective, that viewing criminal behavior as costly and risky most deterred study members low in self-control

and high in self-perceived criminality. In fact, at sufficiently low levels of criminal propensity, these threatened punishments may have no deterrent effect at all. The latter results are consistent with a large body of research that shows that when other inhibitions are strong (such as those provided by one's moral beliefs), the deterrent effect of sanction threats are irrelevant.

Our findings differ from several recent studies of these issues, and we think that these differences might arise, in part, due to differences in research designs. Many previous studies have used self-reported intentions to commit crime as the outcome variable (Nagin and Paternoster 1994; Piquero and Pogarsky 2002; Pogarsky 2002). We have suggested that one manifestation of low self-control is a kind of boastful "trash talk" that takes the form of indicating that they would commit a crime even in face of risk (maybe *because of* the risk of sanction) in response to a hypothetical crime scenario while being more risk conscious when dealing with the commission of an actual crime. Our results also differ from those recently reported by Pogarsky (2002). He found that perceived sanction threats did not affect a would-be offender's self-reported intention to offend when they were classified as "incorrigible." There are design and sampling differences between Pogarsky's study and ours that may account for the divergent findings. Like Nagin and Paternoster (1994), Pogarsky (2002) employed a scenario design and his respondents were university students who by their decision to attend college have shown an obvious ability to delay present for future gratification. In addition, there is an important conceptual difference between the two studies. Our interest in this article has been on self-control and how it conditions the effect of sanction threats. Pogarsky's "incorrigible" offenders were not defined on the basis of their impulsivity or their present orientation. Incorrigible offenders were those who reported that there was a good chance that they would commit a criminal offense (drive while intoxicated) both when sanction threats were viable and when there was no chance that they would be apprehended. Incorrigible respondents, therefore, were no more likely to offend if they thought they could do so with impunity. It should not be surprising, therefore, that in the analysis reported by Pogarsky, sanction threats had no effect within this group. Furthermore, in terms of their impulsivity, Pogarsky reported that the mean level among the incorrigibles was no different from those deemed "deterable" and a group of nonoffenders ("chronic conformists"). On closer inspection, therefore, our finding that deterrence works best among those at high risk because of their level of self-reported criminal propensity and low self-control is not at odds with Pogarsky's findings, but they do raise important questions for future research.

Moreover, our finding that sanction threats inhibit the criminal activity of those most at risk of offending does square with other findings reported in the empirical literature. Both qualitative and quantitative research have found

that persistent criminal offenders do consider the risks involved when both committing specific crimes and in deciding to quit the crime “business” (Piquero and Rengert 1999; Rengert and Wasilchick 1985; Shover 1996; Wright and Decker 1994). In addition, experimental research by Block and Gerety (1995) has shown that the least conventional are more affected by some dimensions of punishment (variation in risk) than others (variations in its severity). Our finding that threatened social punishments most affected criminally prone individuals is also consistent with those in a previous study with these same data. In Wright et al. (2001), we found that social bonds, such as to work, family, education, and partners, influenced the criminal behavior of criminally prone individuals more than others less at risk for offending.

The conceptual model developed in this article has implications for both theory of and policy toward crime. For explanations of crime, our model contends that propensity theories such as those espoused by Wilson and Herrnstein (1985) and Gottfredson and Hirschi (1990) are not incompatible with the notion that offenders also react to the situational incentives and disincentives of their behavior. Such propensity theories need not and should not be taken to mean that those at high risk of criminal activity (because of the impulsivity) are incapable of foresight. Although they may, on average, be more present-oriented than most, all individuals discount future consequences to some extent, and all to some degree are responsive to situational contingencies. In fact, our findings suggest that for those most at risk of criminal conduct, such instrumental considerations may be the most influential factors in deciding both if and how to offend.

More generally, our hypotheses and findings point to a broad conceptual model of crime based on both social and psychological predictors. Collectively, these findings suggest a broad hypothesis for future study: *Many social processes bear upon criminal behavior, and whatever the nature of their effect, whether to increase or decrease criminal behavior, they have their greatest impact on individuals with personal characteristics, both psychological and biological in origin, that increase their proclivity to crime.*

This “interdependence” hypothesis suggests consistent shortcomings in current theories of crime. It implies that sociologically and economically based theories, such as social control, labeling, social disorganization, anomie, conflict, and Marxist theories, are misspecified on account of not explicating the variable impact of social processes as a function of individual propensities. It also implies that psychological and biological theories of crime, such as low self-control, personality, and some developmental theories, are misspecified due to not incorporating individuals’ differential response to their social environment. In sum, any explanation of crime must address both

the person and the person's social situation, and in this sense, the study of crime is intrinsically social-psychological.

For psychological explanations of crime, our model contends that propensity theories such as self-control theory (Gottfredson and Hirschi 1990) are incorrect in assuming that criminally prone individuals do not respond to the perceived risk of criminal sanctions; in fact, they should respond most strongly. This finding suggests a need to revisit, and perhaps reject, the assumption of social imperviousness that is central to self-control theory. For sociological explanations of crime, our model warns against assuming uniform responses to social controls of crime, for the impact of these controls can vary widely by individuals' preexisting characteristics. For public policy, our model gives optimism for policies that would deter criminal behavior by increasing its costs. These policies should have their greatest impact on those targeted by policy makers—potential criminals. Given that previous studies have commonly measured deterrence effects across the general population, thereby including many prosocial, less-responsive individuals, these studies may have underestimated the true deterrent effect of various policies among the criminally prone, and so deterrence policies actually might be more successful than currently thought.

NOTES

1. An implication of this is that because of their present-orientation, those prone to crime will be more responsive than others to immediate contingencies, such as the rewards, pleasures, and thrills of crime. We do not pursue this interesting angle in this article.

2. Silberman (1976:454) noted that “[f]or persons who are psychologically, culturally, or socially disposed to commit this type of [serious] crime, neither socialization nor the mere probability of getting caught is sufficient to deter them. The negative correlation between severity of punishment and crimes for such ‘serious’ offenses may be because individuals who otherwise would be inclined to engage in such behavior are in fact deterred by the threat of severe punishment.”

3. Another relevant study is Decker, Wright, and Logie (1993). They found that in response to posed hypothetical crime situations, a group of active residential burglars were more responsive to the possible costs of the risk of being arrested than a noncriminal group of controls. They noted, however, that not too much should be made of this fact because the noncriminal group was not likely to state that they would commit a burglary.

4. We thank Greg Pogarsky for bringing this observation to our attention.

5. We focus our discussion here on the risks and costs of crime, rather than its rewards, due to data limitations discussed below.

6. See Wright et al. (1999b, 2001) for more information about the construction and justification of these low self-control measures.

7. Several lines of theory are relevant here. In a symbolic interaction approach, young people who see themselves as bad kids, relative to others in their reference group, are more likely than others to commit delinquency (Bartusch and Matsueda 1996; Matsueda 1992). In the book, *Seductions of Crime*, Katz (1988) describes three components to criminal motivation, including

“unique ways of understanding how one is and will be seen by others” (p. 9). Similar emphases on self-perceptions of one’s own criminality are found in labeling theory (Becker 1963) and containment theory (Reckless, Dinitz, and Murray 1956). Silberman (1976) took criminal self-perceptions one step further and related them to differential reactions to deterrence messages. “The effect of labeling, the process by which punished individuals acquire deviant identities and consequently engage in ‘secondary deviations,’ may interact with the deterrent effect of the threat of punishment” (p. 443). Our use of the term *criminal propensity*, then, parallels psychological and medical studies’ referral to individuals as being “at risk” for a malady, and we view low self-control and self-reported criminality as two manifestations of a latent propensity of criminality.

8. We use self-control and self-perceived criminality to operationalize the concept of criminal propensity, but other constructs have been suggested too, such as impulsivity, discounting, and taste for risk. Previous studies have used these constructs interchangeably, but this similarity is an open question and perhaps differences in conceptualizing criminal propensity can account for differences in empirical studies of this question. We thank an anonymous reviewer for making this point to us.

9. For example, the front-left bar in Figure 1 rises to “35,” indicating that 35 study members scored in the lowest quartile of both “getting caught” and “self-perceived criminality.”

10. By measuring the independent variables at earlier waves than the dependent variable, we assume some level of stability in both risk perceptions and criminal propensity. Although previous studies have examined, and overall supported, the stability of self-control (e.g., Gottfredson and Hirschi 1990; Wright et al. 1999a), fewer have examined the stability of risk perceptions, and both remain important issues for future research.

11. In analyses not shown here, we entered all three interaction effects simultaneously, and they remained significant.

12. These and all results are available upon request from the authors.

13. For interpretative purposes, we recentered “adolescent self-control” five different times, at levels corresponding to the 90th percentile of study members’ scores of low self-control (i.e., “very low” self-control), the 70th percentile (“low” self-control), the 50th percentile (“average” self-control), the 30th percentile (“high” self-control), and the 10th percentile (“very high” self-control). We then reestimated the regression equations containing adolescent self-control interaction effects (i.e., column 4 of Tables 3 and 4) five separate times, each time using a different scaling of adolescent self-control. (Note: this recentering does not change the estimated coefficients for the interaction effects—only for the main effects of deterrence perceptions.) We report both unstandardized and standardized coefficients to facilitate comparison of effects across levels of low self-control.

REFERENCES

- Andenaes, Johannes. 1974. *Punishment and Deterrence*. Ann Arbor: University of Michigan Press.
- Bachman, Ronet, Raymond Paternoster, and Sally Ward. 1992. “The Rationality of Sexual Offending: Testing a Deterrence/Rational Choice Conception of Sexual Assault.” *Law and Society Review* 26:343-72.
- Bartusch, Dawn Jeglum and Ross L. Matsueda. 1996. “Gender, Reflected Appraisals, and Labeling: A Cross-Group Test of an Interactionist Theory of Delinquency.” *Social Forces* 75:145-77.
- Beccaria, Cesare. 1963. *On Crimes and Punishments*. Translated with an introduction by Henry Paolucci. New York: Macmillan.

- Becker, Gary S. 1968. "Crime and Punishment: An Economic Approach." *Journal of Political Economy* 76:169-217.
- Becker, Howard S. 1963. *Outsiders: Studies in the Sociology of Deviance*. New York: Free Press.
- Bennett, Trevor and Richard T. Wright. 1984. *Burglars on Burglary: Prevention and the Offender*. Hampshire, UK: Gower.
- Bentham, Jeremy. 1948. *An Introduction to the Principles of Morals and Legislation*. Edited with an introduction by Laurence J. Lafleur. New York: Hafner.
- Block, Michael K. and Vernon E. Gerety. 1995. "Some Experimental Evidence on Differences Between Student and Prisoner Reactions to Monetary Penalties and Risk." *Journal of Legal Studies* 24:123-38.
- Caspi, Avshalom, Bradley R. Entner Wright, Terrie E. Moffitt, and Phil A. Silva. 1998. "Early Failure in the Labor Market: Childhood and Adolescent Predictors of Unemployment in the Transition to Adulthood." *American Sociological Review* 63:424-51.
- Costello, Anthony, Craig Edelbrock, R. Kalas, Marie Kessler, and S. Klaric. 1982. *National Institute of Mental Health Diagnostic Interview Schedule for Children*. Rockville, MD: National Institute of Mental Health.
- Cromwell, Paul F., James N. Olson, and D'Ann Wester Avary. 1991. *Breaking and Entering: An Ethnographic Analysis of Burglary*. Newbury Park, CA: Sage.
- Cusson, Maurice and Pierre Pinsonneault. 1986. "The Decision to Give Up Crime." Pp. 72-82 in *The Reasoning Criminal: Rational Choice Perspectives of Offending*, edited by Derek B. Cornish and Ronald V. Clarke. New York: Springer-Verlag.
- Decker, Scott, Richard Wright, and Scott Logie. 1993. "Perceptual Deterrence among Active Residential Burglars: A Research Note." *Criminology* 31:135-47.
- Elliott, Delbert S. and David Huizinga. 1989. "Improving Self-Reported Measures of Delinquency." Pp. 155-86 in *Cross-National Research in Self-Reported Crime and Delinquency*, edited by Malcolm W. Klein. Dordrecht: Kluwer-Nijhoff.
- Elley, Warrick B. and James C. Irving. 1976. "Revised Socio-Economic Index for New Zealand." *New Zealand Journal of Educational Studies* 7:153-67.
- Etzioni, Amitai. 1988. *The Moral Dimension: Toward a New Economics*. New York: Free Press.
- Feeny, Floyd. 1986. "Robbers as Decision-Makers." Pp. 53-71 in *The Reasoning Criminal: Rational Choice Perspectives of Offending*, edited by Derek B. Cornish and Ronald V. Clarke. New York: Springer-Verlag.
- Fry, Margery. 1951. *Arms of the Law*. London: Victor Gollancz Ltd.
- Gottfredson, Michael R. and Travis Hirschi. 1990. *A General Theory of Crime*. Stanford, CA: Stanford University Press.
- Hirschi, Travis and Michael R. Gottfredson. 1995. "Control Theory and the Life-Course Perspective." *Studies on Crime and Crime-Prevention* (Swedish National Council for Crime Prevention) 4:131-42.
- Jaccard, James, Robert Turrissi, and Choi K. Wan. 1990. *Interaction Effects in Multiple Regression*. Newbury Park, CA: Sage.
- Junger-Tas, Josine, Gert-Jan Terlouw, and Malcolm W. Klein. 1994. *Delinquent Behavior Among Young People in the Western World*. Amsterdam: Kugler.
- Katz, Jack. 1988. *Seductions of Crime: Moral and Sensual Attractions of Doing Evil*. New York: Basic Books.
- Liska, Allen E. and Steven F. Messner. 1999. *Perspectives on Crime and Deviance*, 3rd ed. Upper Saddle River, NJ: Prentice Hall.
- Matsueda, Ross L. 1992. "Reflected Appraisals, Parental Labeling, and Delinquency: Specifying a Symbolic Interactionist Theory." *American Journal of Sociology* 97:1577-1611.
- McGee, Rob, Michael Feehan, Sheila M. Williams, and Jessie C. Anderson. 1992. "DSM-III Disorders from Age 11 to 15 years." *Journal of Abnormal Child Psychology* 13:337-52.

- Meisenhelder, Thomas N. 1977. "An Exploratory Study of Exiting from Criminal Careers." *Criminology* 15:319-34.
- Moffitt, Terrie E., Avshalom Caspi, Phil A. Silva, and Magda Stouthamer-Loeber. 1995. "Individual Differences in Personality and Intelligence Are Linked to Crime: Cross-Context Evidence from Nations, Neighborhoods, Genders, Races, and Age-Cohorts." Pp. 1-34 in *Current Perspectives on Aging and the Life Cycle, Volume 4, Delinquency and Disrepute in the Life Course: Contextual and Dynamic Analyses*, edited by John Hagan. Greenwich, CT: JAI.
- Nagin, Daniel S. and Greg Pogarsky. 2001. "Integrating Celerity, Impulsivity, and Extralegal Sanction Threats into a Model of General Deterrence: Theory and Evidence." *Criminology* 39:865-92.
- Nagin, Daniel S. and Raymond Paternoster. 1993. "Enduring Individual Differences and Rational Choice Theories of Crime." *Law & Society Review* 27:467-96.
- 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.
- Parsons, Talcott. 1937. *The Structure of Social Action*. New York: Free Press.
- 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.
- Piliavin, Irving, Rosemary Gartner, Craig Thornton, and Ross L. Matsueda. 1986. "Crime, Deterrence, and Rational Choice." *American Sociological Review* 51:101-19.
- Piquero, Alex R. and Greg Pogarsky. 2002. "Beyond Stafford and Warr's Reconceptualization of Deterrence: Personal and Vicarious Experiences, Impulsivity, and Offending Behavior." *Journal of Research in Crime and Delinquency* 39:153-86.
- Piquero, Alex R., Raymond Paternoster, P. Mazerolle, Robert Brame, and C. W. Dean. 1999. "Onset Age and Offense Specialization." *Journal of Research in Crime and Delinquency* 36:275-99.
- Piquero, Alex R. and George Rengert. 1999. "Studying Deterrence with Active Residential Burglars." *Justice Quarterly* 16:451-71.
- Pogarsky, Greg. 2002. "Identifying Deterrable Offenders: Implications for Deterrence Research." *Justice Quarterly* 19(3):431-452.
- Quay, Herb C. and D. R. Peterson. 1987. *Revised Behavioral Problem Checklist: Interim Manual*. Coral Gables, FL: University of Miami.
- Reckless, Walter, Simon Dinitz, and Ellen Murray. 1956. "Self-Concept as an Insulator against Delinquency." *American Sociological Review* 21:744-56.
- Rengert, George and John Wasilchick 1985. *Suburban Burglary: A Time and Place for Everything*. Springfield, IL: Charles C Thomas.
- Rutter, Michael, J. Tizard, and K. Whitmore. 1970. *Education, Health, and Behavior*. New York: Wiley.
- Shover, Neal. 1996. *Great Pretenders: Pursuits and Careers of Persistent Thieves*. Boulder, CO: Westview Press.
- Silberman, Matthew. 1976. "Toward a Theory of Criminal Deterrence." *American Sociological Review* 41:442-61.
- Silva, Phil A. and Warren R. Stanton. 1996. *From Child to Adult: The Dunedin Multidisciplinary Health and Development Study*. Auckland, New Zealand: Oxford University Press.
- Taylor, Ian, Paul Walton, and Jock Young. 1973. *The New Criminology*. New York: Harper and Row.
- Tellegen, Auke and Niels G. Waller. 1994. "Exploring Personality through Test Construction: Development of the Multidimensional Personality Questionnaire." Pp. 133-61 in *Personality*

- Measures: Development and Evaluation, Vol. 1*, edited by Steven R. Briggs and Jonathan M. Cheek. Greenwich, CT: JAI.
- Tittle, Charles R. 1977. "Sanction Fear and the Maintenance of Social Order." *Social Forces* 55:579-96.
- Tittle, Charles R. 1980. *Sanctions and Social Deviance: The Question of Deterrence*. New York: Praeger.
- Toby, Jackson. 1964. "Is Punishment Necessary?" *Journal of Criminal Law, Criminology, and Police Science* 55:332-37.
- Trasler, Gordon. 1993. "Conscience, Opportunity, Rational Choice, and Crime." Pp. 305-22 in *Routine Activity and Rational Choice, Advances in Criminological Theory, Volume 5*, edited by Ronald V. Clarke and Marcus Felson (Freda Adler and William Laufer, series editors). New Brunswick, NJ: Transaction Press.
- Van Dijk, Jan and Pat Mayhew. 1992. *Criminal Victimization in the Industrialized World*. The Hague, the Netherlands: Ministry of Justice.
- Walsh, Dermot. 1986. "Victim Selection Procedures among Economic Criminals: The Rational Choice Perspective." Pp. 39-52 in *The Reasoning Criminal: Rational Choice Perspectives of Offending*, edited by Derek B. Cornish and Ronald V. Clarke. New York: Springer-Verlag.
- West, W. Gordon. 1978. "The Short-Term Careers of Serious Thieves." *Canadian Journal of Criminology* 20:169-90.
- Wilkins, Leslie T. 1962. "Criminology: An Operational Research Approach." Pp. 305-332 in *Society: Problems and Methods of Study*, edited by A. T. Welford, Michael Argyle, D. V. Glass, and J. N. Morris. New York: Philosophical Library.
- Wilson, James Q. and Richard Herrnstein. 1985. *Crime and Human Nature*. New York: Simon & Schuster.
- Wright, Bradley R. E., Avshalom Caspi, Terrie E. Moffitt, and Phil A. Silva. 1999a. "Low Self-Control, Social Bonds, and Crime: Social Causation, Social Selection, or Both?" *Criminology* 37:479-514.
- Wright, Bradley R. E., Avshalom Caspi, Terrie E. Moffitt, Richard A. Miech and Phil A. Silva. 1999b. "Reconsidering the Relationship between SES and Delinquency: Causation but Not Correlation." *Criminology* 37:175-94.
- Wright, Bradley R. E., Avshalom Caspi, Terrie E. Moffitt, and Phil A. Silva. 2001. "The Effects of Social Ties on Crime Vary by Criminal Propensity: A Life-Course Model of Interdependence." *Criminology* 39:321-51.
- Wright, James D. and Peter H. Rossi. 1985. *Armed Criminals in America: A Survey of Incarcerated Felons, 1983*. Ann Arbor, MI: Inter-University Consortium for Political and Social Research.
- Wright, Richard T. and Scott H. Decker. 1994. *Burglars on the Job: Streetlife and Residential Break-ins*. Boston: Northeastern University Press.
- Zimring, Franklin E. and Gordon J. Hawkins. 1968. "Deterrence and Marginal Groups." *Journal of Research in Crime and Delinquency* 5:100-14.
- Zimring, Franklin E. and Gordon J. Hawkins. 1973. *Deterrence: The Legal Threat in Crime Control*. Chicago: University of Chicago Press.
- Zimring, Franklin E. and Gordon Hawkins. 1997. *Crime Is Not The Problem: Lethal Violence in America*. Oxford: Oxford University Press.

Bradley R. E. Wright is an assistant professor in the Department of Sociology at the University of Connecticut. His research focuses on the social psychology of crime and deviance.

Avshalom Caspi is a professor of personality and social psychology at the Institute of Psychiatry at King's College London, and professor of psychology at the University of Wisconsin. He research focuses on the measurement, development, and implications of personality differences across the life span. For his research, he received the Distinguished Scientific Award for Early Career Contribution to Psychology from the American Psychological Association (1995) and the John P. Hill Memorial Award for contributions to the understanding of adolescent development from the Society for Research on Adolescence (2002).

Terrie E. Moffitt researches the interplay between nature and nurture in the origins of problem behaviors, particularly antisocial behaviors. She directs the Environmental-Risk Longitudinal Twin Study ("E-risk") and is associate director of the Dunedin Multidisciplinary Health and Development Study in New Zealand, which is described in her 2001 book, Sex Differences in Antisocial Behaviour: Conduct Disorder, Delinquency and Violence in the Dunedin Study (Cambridge University Press).

Ray Paternoster is a professor in the Department of Criminology and Criminal Justice at the University of Maryland. He is interested in criminal offending over the life course, capital punishment, and quantitative methods in criminology.