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FROM THE EDITOR

Colleagues:

It is a great honor to have been selected (by default) to edit the official journal of the SWACJ. I would like to thank former editor Allan Patenaude, the associate editors, manuscript reviewers, and all other members of SWACJ who were instrumental in setting the SWJCJ on her maiden voyage. Because of their diligent efforts, taking over at the helm has been easy. The College of Juvenile Justice & Psychology here at Prairie View A&M University has further indulged me by providing support for a production editor who takes care of the tedious details.

While the journal was off to a slow start during its first two years, things picked up this year, as Allan predicted. Authors submitted 18 manuscripts for review during the past few months. Of these, you will find four diverse, high-quality articles published in this issue. Four others are undergoing review, and more are on the way. This means that the publication of Volume 2, Issue 2 is imminent, and will most likely be posted in November.

If you are interested in having a paper considered for the next issue, please send it in as soon as possible so that the review process can begin. If you are interested in reviewing a book for the journal, please contact the book review editor, Rocky Pilgrim, at Rocky@Pilgrimlaw.com. Wadsworth is still offering free review copies to our reviewers. Better yet, review a recent addition to your required classroom reading list.

If you have any comments or suggestions, please feel free to contact me at jon_sorensen@pvamu.edu. I look forward to working with you.

Jon Sorensen

The Role of Mental Disorder in Parolee Success

Marilyn D. McShane
Frank P. Williams III
Beth Pelz
University of Houston-Downtown

Traqina Quarles
Prairie View A&M University

Abstract

Parolee recidivism has, in one form or another, been thoroughly examined by academicians and virtually all departments of corrections. The same cannot be said, however, of recidivism studies of special groups. A recent article by Arthur Lurigio (2001) laments the "paucity of data on mentally ill parolees." General population recidivism studies of this special group are even rarer. This research analyzes the recidivism experiences of a randomly-sampled group of 3,126 parolees with a subset of 517 mentally-disordered parolees. Using layered bivariate analyses, binomial logistic regression, and ordinal regression, findings are reported on the relationship between mental disorder and both reincarceration and type of violations. Exogenous variables include gang membership, age at release on parole, age at first offense, type of commitment offense, number of prior arrests, prior parole violations, and drug use arrest. Some evidence suggests that mental disorder may be weakly related to technical parole violations and not at all to new offenses. While retaining a small but significant and independent relationship with recidivism, mental disorder failed to improve baseline models for predicting parole success.

INTRODUCTION

Criminal justice experts have long recognized that good health, the ability to work, and a positive self-image are critical aspects of any rehabilitation effort. It is quite common among criminal offender populations to find that poor socio-economic backgrounds—and the related conditions of drug and alcohol abuse, health problems and lack of access to mental health services—yield physical and psychological disabilities that deteriorate over time. Often, it is irrational behavior itself that draws police attention and brings the mentally disordered into the criminal justice system (Lurigio & Swartz, 2000; Lurigio, 2001). Thus, poor mental health tends to be common among offenders, and involvement with the criminal justice system itself tends to exacerbate mental problems.

When mental health experts discuss such problems, they assume the following traditional concepts of diagnoses are present: differentiation among types of disorders, DSM classifications, and detailed clinical charts. Unfortunately, data from criminal justice populations typically contain the barest essence of these staples. It is not uncommon to find records containing vague references to past "mental problems," assessments from generic "counselors," and notes from legal proceedings indicating a court-ordered examination with only the most superficial language.

In short, the information available to those who supervise offenders in the community frequently provides little more than mental health classifications ranging from no disorders (or at least no reported disorders), through the probable existence of some indeterminate disorder, to a record of medication or institutionalization for mental disorder. For this reason, we advisedly use the term "mental disorder" in this discussion to represent a range of mental disorders and mental illnesses from minor to major. Similarly, it should be understood that this is the type of generic information on which community supervision decisions are primarily based. This noted, mental health problem in the offender population becomes important in both prevalence and quality of information.

Depending on the level of seriousness and disability, experts estimate that approximately 10 to 20 percent of inmates have mental disorders, ranging from a type of personality disorder to a condition requiring a protective environment, treatment and medication. A 1999 BJS report indicated that 16 percent of prisoner/probationers reported either a mental health condition or admission to a mental health facility.

A report in Britain found that young offenders were three times more likely than those in the general population to have mental health problems (Davies, 2002). The most common diagnoses for this group were emotional, conduct and attention deficit disorders. We note, however, that these diagnoses were based on those offenders who received professional care and/or came to the attention of mental health professionals.

Officials estimate that approximately 600,000 offenders are released from secure facilities each year, an average of 1,600 per day (Petersilia, 2001). With close to 20 percent of

the offender population suffering some type of diagnosable (but likely undiagnosed) mental health problem, the risks for recidivism are potentially enhanced.

Developing effective services or treatment plans for mentally-disordered offenders is complicated by the frequency of overlapping life problems, including substance abuse and histories of violence and victimization. It is often difficult to tell which conditions, if any, related to mental disorder are the highest risk factors for recidivism. Homelessness and the inability to maintain employment may trigger technical revocations, while the failure to take medications and disputes with family members may also pressure significant others to call parole officers and file reports.

In a study comparing homeless and non-homeless jailed offenders, DeLisi (2000) found that the homeless were more likely to have more extensive criminal histories, more prior arrests, and arrests for nuisance offenses. The first two of these variables are commonly found in parole classification and risk instruments, but the third, nuisance arrests, is not (see McShane and Williams, 1997, for a thorough discussion of these instruments and the variables commonly associated with recidivism risk).

In regard to substance abuse, a study of 956 youths by Arseneault, Moffitt, Caspi and Taylor (2002) found that offenders with alcohol and marijuana dependence and schizophrenia-spectrum disorders reported higher levels of violence against co-residents and non-household members, as well as robbery and gang fights. Those with schizophrenia-spectrum disorders had the highest rates of household victimization.

Other research indicates high correlations between some types of mental disorder and substance abuse addiction, which in itself is highly correlated with crime (Draine & Solomon, 2000) but not necessarily correlated with recidivism for new crimes. Because mental disorders are treatable, one would anticipate that a relationship between mental disorder and crime and/or recidivism—even without considering co-occurring problems — would elicit the attention of parole authorities.

In spite of this evidence, current parole strategies with the mentally disordered seem to focus primarily on keeping clients on medication schedules and having reliable collateral contacts inform supervisors of developing problems. The surveillance modality commonly used for regular parolees is not substantially modified for the mentally-disordered parolee population, if for no other reason than the change over the past 30 years has been away from a treatment modality.

Fortunately, a more informed approach has been slowly developing. For instance, Colorado's dual-diagnosis program allows officials to provide specialized programming for mentally disordered offenders with substance abuse problems. The format involves slower-paced treatment that incorporates a balanced approach to the self-management of the symptoms of both (Stahl and West, 2001). Similarly, Texas officials try to involve community mental health workers in release planning prior to the transition of prisoners. Service providers in the

community are also given advanced case planning information so that valuable linkages are developed to provide continuity of care (Ortiz, 2000).

At the same time that some evidence indicates the value of therapeutic care, Arthur Lurigio (2001) correctly laments the "paucity of data" regarding recidivism of mentally-disordered parolees. There are few studies that focus directly on mentally-disordered parolees and their recidivism risk, perhaps because of the quality of "mental health" data noted earlier.

Another problem is that while the psychological literature on the subject is extensive, the research tends to use parolees in treatment and thus can be considered to have biased samples. As an example, one such study (Draine & Solomon, 2000) uses objective and subjective quality of life measures to predict levels of depression that were subsequently indicative of degrees of social integration and recidivism risk. Unfortunately, the Draine and Solomon study looked at the characteristics of those entering community supervision units expressly designed to handle psychiatric caseloads. In this regard, the study fails to inform us of risk levels under the more general practice of parole. It is apparent that any new information about the relationship between mental health problems and outcomes for general parole populations might be useful both for prediction and supervision. It also may be useful in planning the most effective case management components.

In addition to the literature on mental disorder and parole outcome, a brief discussion of parole classification and recidivism literature would be helpful. Because of the large number of studies in this area, we refer readers to major reviews of this work, (Andrews, et al., 1990; Gendreau, 1996; Gendreau & Andrews, 1990; McShane & Williams, 1997; Petersilia, 2003) and the National Institute of Justice report on recidivism of prisoners released in 1994 (Langan & Levin, 2002).

Many individual studies, however, suffer from poorly-measured variables and/or poor sampling techniques. Where special categories of offenders/offenses are concerned, the sample sizes are often too small to support conclusions, or the samples were drawn from convenience populations without regard to representativeness. In general, regardless of predictors used, typical actuarial classification instruments tend to produce between 6 percent and 20 percent explained variance—an amount that does not reflect confidence in the ability to identify recidivists.

Another problem is that recidivism rates vary from location to location. This variance is frequently attributed to regional or local differences in offenders, but there is another explanation. Parole departments and even local units frequently have different policies on how and when parolees are revoked. Thus, recidivism becomes a product of offender behavior, environmental and background factors, and organizational concerns and policies. The later are difficult to locate in data and may never be appropriately measured.

There also is reason to believe that recidivism should be minimally differentiated by the commission of a new offense or by technical revocation. Similarly, variation in type and

seriousness of reoffense is important to understanding recidivism because of concerns about the danger of reoffending. Again, much of the research makes no such distinctions. Thus, one must be very careful in drawing conclusions about the effect of different characteristics on recidivism.

Regardless of these issues, four factors are most commonly found in recidivism studies and in classification and risk instruments. These factors include number of prior arrests, age at first arrest, age at release, and prior parole violations (thus, prior incarcerations). Indeed, these four variables, out of a compilation of over 50 variables, were found to be the major contributors[1] to prediction of parolee success in the risk instrument developed from the data (Williams and Dolny, 1998) we will use in this analysis. Thus, mental disorder, while frequently discussed as a factor in recidivism, has not yet been incorporated in the actuarial risk instruments normally used in parole classification, though it has found a home in intensive non-actuarial instruments such as the Level of Supervision Index (Andrews & Robinson, 1984; Bonta & Motiuk, 1985). Potential reasons for this lack of inclusion in actuarial instruments include poor information on mental health and relatively small proportions of parolees who are officially identified or classified with such problems.

To this end, we propose to examine a parolee sample to answer questions about the relationship between mental disorder and parole outcome. For example, we do not yet know whether a pre-existing mental disorder is an independent actuarial factor serving to increase parolee risk, either in terms of reincarceration or dangerousness. In addition, the typical recidivism measure, success/failure, can be examined with these data and then reconstituted as a more sensitive four-category measure with type of parole violation. The analyses to follow investigate the conditional relationships between mental disorder, parolee characteristics, reincarceration and the form of violation while on parole. Specifically, we examine the following issues:

1.   Does mental disorder affect parolee success?
    a.   Does evidence of mental disorder affect parolee reincarceration or type of violation?
    b.   Is degree of mental disorder important to parolee reincarceration or type of violation?

2.   Do other parolee characteristics obviate any relationship between mental disorder and reincarceration or type of violation?

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[1] Gang membership was also a significant prediction variable, but could not be used because of an overlap with state laws mandating the highest level of parole supervision for gang members. In addition, both race and gender are significantly associated with recidivism. Neither are included in classification instruments for obvious reasons.

RESEARCH DESIGN

The Sample

The data were derived from a secondary analysis of a large data file created from a random sample of the parole files of a western state (see Williams & Dolny, 1998).The population for the study was all parolees who had completed their terms of parole or who had been terminated on parole during the period from October to December, 1997.[2] The intention was to develop a sample size of 3,500 total cases, primarily because it was understood that some of the case files would have insufficient information, and others would be deportation cases with no recidivism information. Three strata of parolees (females, sex-offenders, and gang members) were oversampled to achieve approximately 500 cases each, with around 2,000 cases for the general population, which was deemed a sufficient sample size for analytical purposes.

To develop the sample, a disproportionate stratified (systematic) random sample from each of the parole units was drawn. The parole director mandated that each parole unit save all paper files for cases closed during the sampling period. The contents of these files were normally destroyed as parolees finished their terms of parole. Each parolee file contained an institutional identifier from which the units (last) digit was used to create a systematic random sample (two random digits from 0 to 9 were drawn with expectation of a 20 percent sample). Each of four parole regions sampled cases from different random numbers drawn to represent the last digit (0–9) of a parolee's institutional number. In addition, the four strata were sampled with different sets of random numbers. Within a region, each parole unit selected cases with the same last-digit institutional numbers. After cases were selected, the closed files were forwarded to one of two locations for coding.

As expected, the sampling process contained cases that were not useful. Deportation cases (212) and parolees with multiple terms[3] (503) were removed from the sample. Immediate absconders (136) further reduced the number of cases with available recidivism and post-release data, and an additional group of cases (70) did not have information on all variables. In short, of the 3,332 parolees in the original data (4,047 less 503 duplicate parolee files with multiple terms and 212 deportees with no opportunity to recidivate), we lost 206 to immediate absconding and missing information, for a total of 3,126 parolees in the final analysis. Of this number, 517 parolees could be defined as having at least some history of mental disorder, and 2,609 parolees

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[2] Eight units had either too few dead files within this period or had misplaced the notice to save files. In these instances, closed case files were used from January and/or February, 1998.

[3] The cases with multiple term parolees were reduced to the chronologically first case per parolee. Because one of the original purposes behind the data collection was to examine recidivism relative to case supervision, every case handled by a parole agent was important. Multiple cases meant multiple supervising parole agents. For our purposes here, multiple cases meant that a single parolee is influencing the data more than others and the interest is in parolees who recidivate, not the number of recidivating cases.

who had no such history. The data analyzed here were weighted to produce the correct population proportions of the oversampled strata.[4]

A final observation on the sample is relevant. This particular state embraces a mandatory parole process. Because of the emphasis on surveillance rather than treatment, parole services suffer. Mental disorder, then, is less likely to be treated while the parolee is under parole supervision than in other jurisdictions with a service emphasis. This should not be interpreted to mean that there is no treatment available, as the parole agency both refers parolees and has its own outpatient counseling center. While this might suggest that results have limited generalizability, it is commonly accepted statement that parole supervision practices over the past 30 years have moved toward a conservative, law-enforcement-oriented approach. Thus, this state's approach to parole supervision is likely to be close to the norm. If mental disorder is important to predicting recidivism, then it would constitute a partial argument that such parole practices need to be modified to include a more service-oriented approach.

The Data Collection Instrument

The items in the data collection instrument were constructed from multiple sources. First, predictive variables located in the state's earlier study were incorporated. Second, items identified from various research findings throughout the United States and Canada over the past 20 years were used (see McShane & Williams, 1997). Third, items suggested through interviews with parole agents and parole administrators were included. Lastly, the project staff at parole headquarters suggested possible items. All items were incorporated into a data collection instrument and approaches to their measurement were refined over a period of six months. Of the original set of items, a majority were eliminated for one or more of the following reasons: they were not applicable to the state's parole practices, the information necessary to code the item was unreliable and/or frequently unavailable, or there was a general lack of information on which to base decisions for coding items of that type.

Coders were all senior parole agents/supervisors with years of experience in reading parolee files. Each coder underwent one week of training on the data collection instrument. After eliminating a large number of variables for the reasons above, a final cut took place in the training session for coders.

As part of the training, coders were asked to examine all items for potential unreliability and unavailability in the closed case files. At that point, several closed case files were examined, and all items on the instrument were reviewed one-by-one. This process led to the discarding of

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[4] The demographics of the sample closely matched those of the parole population with the exception of the oversampled strata. Even those strata were within 10 percent of their actual population proportion but were initially oversampled to insure their presence as a group of interest. Weighting was done, not for purposes of modifying a non-representative sample or mismatched demographics, but to eliminate the disproportionate effect of the oversampled strata. The sample was weighted with two rationales in mind: to maintain the ability to discuss the entire sample as representative of the population and to maintain the original sample size so that degrees of freedom did not vary from the original sample. Without this, estimates of population parameters and probability would have been in error. We also note that error induced by using the unweighted sample would be relatively small as all analyses of the data have produced similar results (for instance, the Nagelkerke r-squares for the first binary model have a difference of only .011).

several more items, including two significant variables identified by a previous study. As a result, more variables were subsequently collected in a separate search of automated databases. The final instrument was then created in a dynamic process that involved parole agents, project staff, research staff, and parole administrators.

A test of coding reliability yielded an overall reliability score of .96. In addition, at the end of the three months of coding, all coders were debriefed and coding decisions were discussed. Any divergences were either incorporated into the definitions of the variables or, where possible, recoded to meet the original coding requirements.

Variables were selected from the data according to the following rationales. Five of those developed for the original classification instrument were used: age at release on parole, age at first arrest, number of prior arrests, prior parole violations, and gang affiliation. In addition, we include a variable deemed to be important by the literature, prior drug use. The generalized measure of the commitment offense is also used, assuming that a dichotomy of generic minor and serious offenses may be associated with mental disorder and recidivism. Two versions of the dependent variable, recidivism, were used in an effort to better capture reoffending and differentiate between types of recidivism, as suggested in the literature review.

Variables

The variables used in the analysis were operationalized as follows:

Mentally disordered parolee: Defined in two ways: (1) two-category variable—no history of mental disorder or history of mental disorder; (2) three-category variable—no evidence of mental disorder, some evidence of mental disorder, or medicated and/or institutionalized for mental disorder.[5]

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[5] We recognize this is not a perfect measure of mental disorder. Evidence of mental disorder in the parolee's files is not conclusive, and except for the ability to determine whether the parolee was medicated or institutionalized, cannot accurately represent the degree of mental disorder. However, on the gross level of "severity" the question is whether the error in using the three categories exceeds the value gained by establishing order. We argue that simple evidence that a parolee has undergone counseling or had psychological tests resulting in a finding of abnormality is qualitatively different from evidence of medication or institutionalization *as a result of a mental disorder diagnosis*. In short, an informed clinician made the determination of severity for us. Thus, it is not the most severe category that is really in question, it is the range of mental disorder represented by the middle category—"some mental disorder." In most cases, such evidence was derived from institutional diagnostic results, and unless severe, was likely to remain outside the purview of clinicians. We also acknowledge the non-mentally-disordered category may indeed contain parolees with undiagnosed mental disorder or with mental disorder for which there is no evidence in the files. The problem is similar to the criminological issue of "secret deviance" (Becker, 1963) represented in those who do not report criminality or are not represented in the Uniform Crime Reports. Here, however, we note that as opposed to the issue of secret deviance, institutional diagnostic tests are given to all inmates, and the residual of secret mental disorder is therefore substantially reduced. Better measures of mental disorder are needed, but none were available for this study, which is why we construct the gross severity measure we use here rather than a more sensitive one. The fact is that the separation of the inclusive mental disorder category into two categories is an improvement.

***Success on parole*:** Defined in two ways: (1) no reincarceration or reincarceration[6]; (2) level of violation (see below).

***Violation*:** Four categories of parole outcome during the first year: (1) nonviolators—defined as no documented violations; (2) technical violators—defined as violations of conditions of parole where no new offense is involved; (3) non-serious new offense violators—defined as non-violent offenses, while on parole, which the Board of Parole Terms classifies as Type I or Type II violations (less than maximum reincarceration time); (4) serious or violent new offense violators—defined as serious or violent offenses, while on parole, which the Board of Parole Terms classifies as Type III violations (maximum reincarceration time) and violent offenses including murder-manslaughter, battery-assault, weapons charges, and some miscellaneous violations such as arson and kidnapping.[7]

***Parolee characteristics*:** Age at release on parole (25–30, and all other ages)[8], age at first arrest (under 18, 18–25, and over 25), number of prior arrests (0–3, 4–14, over 15), prior parole violations (new release, previous violator), gang affiliation (listed as "validated" gang members by the Department of Corrections or designated "significant history of gang involvement" by experienced parole agents), and prior drug use arrests (excluding the commitment offense—no arrests, any arrests).[9]

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[6] The dichotomous measure of success, incarceration or no incarceration, is used because of its clarity. Other definitions of success rely on interpretations of type of failure by multiple parties: the individual parole agent, the parole supervisor, the regional administrators, and the Board of Parole Terms. No single entity maintains a uniform definition of success. We also recognize that such a measure is rather insensitive in part because of these other potential definitions. That is one reason the second measure, type of violation, is added to the analysis.

[7] This measure may be construed as having order in the categories of violations. In each instance, the following category is considered more serious by the Board than the preceding ones. Thus, we use this variable as a rudimentary measure of the severity level of reoffending.

[8] These age of release categories were derived from the final classification model presented to the state. For other variables also used in the final classification model (prior arrests, age at first arrest, prior parole violations), the same is true—all categories are as developed for the final classification model.

[9] Drug use arrests reflects a previous record of arrest (not the commitment offense) for a drug use or possession offense. It excludes alcohol-related arrests and offenders who were arrested for selling drugs unless there was independent evidence that they actually engaged in drug use. We also note that drug problems are potentially a condition treated concurrently with mental disorders, with only the latter recorded as the type of treatment. This is particularly the case for "counseling" notations. As a result, our history of mental disorder variable is likely to have drug usage buried within it and the two are not fully independent. Nonetheless, there are enough separate indicators of drug use and mental disorder to believe that the two are not synonymous. Where analyses include drug use, however, the relationship between drugs and mental disorder should be treated with caution. Because drug use offenses are included in the commitment offense, this same issue applies to that variable.

***Commitment offense*:** The commitment offense of the parolee, categorized as non-serious and non-violent felonies (e.g., alcohol, drugs, property and other miscellaneous felonies that do not fall under the state penal code categories of serious and/or violent offenses) and serious and violent felonies (felonies expressly defined under the state penal code as serious and/or violent offenses).[10]

ANALYSIS

Preliminary Results

Cross tabulation analyses were conducted to get a feel for the data and any basic relationships. The simple no history/history mental disorder dichotomy produces no significant relationship with success (no reincarceration) while on parole, though the percentage of failures was slightly higher for those with any history of mental disorder (57.4 percent, compared to 56.0 percent for those with no history).

Elaborating the dependent variable, types of parole violation (no violations, technical violations, non-serious new offenses, and serious and/or violent offenses) were used as a measure of success. When compared to the mental disorder dichotomy, significant differences (p < .001) between the two groups were found in the commission of technical violations and new non-serious crimes. Parolees with a history of mental disorder have 1.7 times greater odds of committing technical violations than those without such history. Conversely, the odds that "normal" parolees will commit new, non-serious crimes while on parole are 1.3 times greater than parolees with a history of mental disorder. In this context, mentally-disordered parolees exhibit potentially greater supervision problems, yet appear to represent a lower criminal risk to the public.

When mental disorder was treated as the three-category variable (none, some history, medicated/institutionalized) against the success dichotomy, the results fall just short of significance (p = .055). It appears that parolees with some history of mental disorder (hereafter referred to as "LMD" for "Less-Mentally-Disordered") may be different from those with evidence of more serious mental problems (hereafter referred to as "MMD" for "More-Mentally-Disordered"). A separate comparison of only these two levels with parole reincarceration found this to be a correct interpretation (Fisher's Exact Test p = .027). It seems that MMD parolees are more likely to fail than the LMD group. The odds ratio estimates indicate that the odds of MMD parolees failing on parole are 1.25 times that of LMD parolees.

The final preliminary test examines the potential relationship between the three-category mental disorder variable and the four-category types of violation variable. As the dichotomous

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[10] The critical component in defining these offense categories is their location under the state statutes. In using this approach, we bypass the difficulties involved in setting up an arbitrary classification of commitment offenses. Thus, a non-serious and non-violent offense is a felony that did not fall under the state's classification of "serious" or "violent" offenses. None of the non-serious/non-violent offenses are misdemeanors. Similarly, a serious and/or violent offense is a felony falling under those statutory categories. As a reviewer has observed, the commitment offense variable is a combination of offense type and seriousness of offense. We use the seriousness component in the final, ordinal-based, analysis.

tests suggested, both mentally-disordered groups are less likely to engage in non-serious crime and more likely to produce technical violations. The likelihood ratio chi-square is significant (p < .001) and there is an inverse relationship between seriousness of mental disorder and seriousness of parole violation (Somer's d = -.088).[11]

There is also a small but significant difference between the types of violations of LMD and MMD parolees. The LMD group odds are about 6 percent lower for any form of violation or the commission of a new crime. Further, it appears that MMD parolees are more likely to be a supervision problem, but less likely to commit a new crime than non-mentally-disordered parolees. From these results, we also conclude that analyses based on the use of more sensitive measures for both mental disorder and success are worthwhile. We continue with this approach on a multivariate level and add other variables that might affect the basic relationship.

Multivariate Analyses

Two types of multivariate analysis are conducted here, both of which use forms of logistic regression. First, we treat the dependent variable as a dichotomy (success/failure) and conduct a binary logistic regression (BLR) with the five factors. Second, we make the assumption that types of parole violation can be interpreted as an ordinal variable and perform ordinal logistic regression (OLR).

An alternative to the BLR equation, multinomial logistic regression, was attempted with the three-category dependent variable, but the complete set of predictor variables resulted in at least one parameter estimate tending toward infinity and an unreliable outcome. Therefore, we report only the binary and ordinal results.

Binary Logistic Regression (BLR) Results

The BLR question is twofold, asking (1) whether mental disorder, after controlling for the joint effect of other variables, has an independent effect on recidivism, and (2) what effect, if any, the individual variables have on recidivism. We test this by examining three models, one without and two with the mental disorder variable. In BLR, the model fitting probability is interpreted much the same way as an F-test in multiple regressions, for example, the ability of the full independent variable model to exceed a "no independent variable" intercept model. If the

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[11] This test assumes that both variables can be construed to represent an ordered continuum. As we shall see later in the ordinal regression analyses, that assumption may be problematic.

probability value is significant,[12] the Nagelkerke R^2 can be interpreted much as a typical R^2 in OLS regression.[13]

The first model, without the mental disorder variables, results in an R^2 of .15, which can be viewed as a moderate level of explained variation in success/failure. Of the seven predictor variables, only seriousness of commitment offense and prior drug arrests are not significant. The best predictor is having more than 15 previous arrests, with prior parole violations a close second. Exp(b) represents the relative risk ratio, compared to the constant for the variable. With a risk ratio of .399, having more than 15 previous arrests decreases the odds of success by 61 percent. Similarly, other significant variables (with ratios below 1.0) decrease the odds of success from 60 percent to 35 percent. One variable, age at release, demonstrates that any group other than 25 to 30 year olds increases the odds of success by 30 percent. These results are then used to establish a baseline model to which the effects of the mental illness variables can be compared.

Variables and Categories	B	Exp (b)	Prob
Table 1. **Binary Logistic Regression with Seven Factors and Parole Success Dichotomy.**			
Model 1 – Without Mental Disorders			
Gang member	-.486	.615	.001
Violent or serious commitment offense	-.061	.941	.527
Age at release on parole	.265	1.304	.004
Prior parole violations	-.914	.401	.001
Age at first arrest			.001
under 18	-.696	.499	.001
18 to 25	-.436	.647	.001
Prior arrests			.001
4 to 14 arrests	-.728	.483	.001
15+ arrests	-.919	.399	.001
Drug use arrests	.019	1.019	.824
Intercept	.853	2.347	.001
Nagelkerke R-Sq. = .150			.001
Model 2 – Mental Disorder Dichotomy			
Gang member	-.564	.569	.001
Violent or serious commitment offense	-.103	.902	.321
Age at release on parole	.240	1.272	.020
Prior parole violations	-.916	.400	.001

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[12] An alpha of .05 was used in order to designate statistical significance.

[13] The frequently-used Cox and Snell psuedo R-square statistic under certain conditions fails to reach the maximum value of 1. This property makes comparison of R values difficult. The Nagelkerke modification allows the full range of 0 to 1, thus that measure is preferred here. In relation to the suitability of the Nagelkerke statistic for the binary logistic results, the recidivism/no recidivism dichotomy is at 56.3% and 43.7%, respectively—well within the boundaries of the typical 80/20 critical error region of binary assumptions and not far from the 50/50 split which maximizes the variance. In addition, we adjusted the cutoff point for the equation to reflect the 56% category, rather than the default 50%. Comparison of Naglekerke r-squares across the binary models is also appropriate, given that the dependent variables are identical. In the later case of a comparison between the binary and multinomial Naglekerke r-squares, we do not make that comparison directly and merely observe the general amount of variance explained by the models.

Table 1. Binary Logistic Regression with Seven Factors and Parole Success Dichotomy.			
Variables and Categories	**B**	**Exp (b)**	**Prob**
Age at first arrest			.002
under 18	-.515	.597	.087
18 to 25	-.324	.723	.001
Prior arrests			.001
4 to 14 arrests	-.647	.524	.001
15+ arrests	-.761	.467	.001
Drug use arrests	-.045	.946	.647
Mental disorder	-.252	.777	.036
Intercept	.905	2.471	.001
Nagelkerke R-Sq. = .136			.001
Model 3 — Mental Disorder Trichotomy			
Gang member	-.562	.570	.001
Violent or serious commitment offense	-.117	.890	.270
Age at release on parole	.245	1.277	.018
Prior parole violations	-.914	.401	.001
Age at first arrest			.002
under 18	-.515	.598	.001
18 to 25	-.322	.724	.007
Prior arrests			.001
4 to 14 arrests	-.639	.528	.001
15+ arrests	-.750	.472	.001
Drug use arrests	-.046	.955	.634
Mental disorder			.062
Some evidence of mental disorder	-.140	.869	.333
Medication and/or institution	-.417	.659	.026
Intercept	.896	2.450	.001
Nagelkerke R-Sq. = .137			.001

See endnote 13 for comparison groups for age of first arrest and prior arrests. Exp(b) = relative risk ratio; probability is rounded at 3 digits.

The second model, using mental disorder as a dichotomy, has six significantly contributing variables/categories, including mental disorder. Gang membership is the largest contributor to explaining success, followed by those aged 25 to 30 at the time of release on parole. Mental disorder is significantly related to an increase in recidivism, with an increase of 23 percent in the odds of failing on parole. However, all other significant variables/categories range from comparative success/failure odds of 27 percent to 60 percent; thus, mental disorder is the least important of the predictors. Further, the Nagelkerke R^2 of .136 is lower than that of the original model. At the binary level, including mental disorder in the equation does not enhance the ability to predict success on parole.

The third model, using mental disorder as a trichotomy (no mental disorder, some evidence, and medication and/or institutionalization), adds the MMD category to the list of significant contributors found in the first model. Otherwise, the list of significant variables remains the same as the baseline model. With only the MMD category significant, it appears that the elaboration of the mental disorder variable has some value in determining the true

relationship between mental disorder and parole success. MMD parolees are significantly less likely to succeed by a 34 percent decrease in odds when compared to "normal" parolees.

Having some evidence of mental disorder, on the other hand, is not a significant predictor of parole recidivism. However, as with model two, the inclusion of mental disorder does not result in an increase in recidivism predictability (Nagelkerke R^2 of .137, versus the original of .15). Nonetheless, the information gained by treating the mental disorder variable as a trichotomy (and perhaps a range of seriousness in mental disorder) is suggestive. The same possibility exists for the dependent variable, so we add a measure of type of offense as well as a measure of seriousness. We now proceed to a form of analysis capable of incorporating seriousness of parole violation.

Ordinal Logistic Regression Results

The final analysis uses the assumed order present in the dependent variable and reports an OLR examination of the variable contributions (see Table 2). The first model, without mental disorder in the equation, is significant, but of relatively low predictive strength (Nagelkerke R^2 = .075).[14] The significant variables constitute all but drug use arrests and categories exhibit a directional relationship to increasing seriousness, as expected.

Gang members, violent and serious offenses, age at release on parole, previous parole violators, first arrest at a young age, and high numbers of prior arrests are all related to increasing violation seriousness. In short, the previously-identified classification variables hold up across a seriousness of violation analysis. The question now is whether mental disorder contributes any independent effect to the equation.

The second model, with mental disorder included, is essentially unchanged from the first (R^2 = .074). While statistically significant, the amount of explained variance remains weak. The individual parameter estimates show that the results are relatively consistent across the two models, with the exception of a non-significant relationship for age at release on parole. The introduction of the three-category mental disorder variable does not contribute to an increase in the comparative model fit. The variable does, however, demonstrate a relationship in which LMD parolees are related to less serious violations.

In comparison to the BLR results, an ordered assumption in the analysis produces smaller amounts of explained variance, thus suggesting that a directional (or seriousness) effect is less important than the between categories (or type of violation) effect. Given the fact that the new offense groups are categorized by the Board of Parole Terms' version of the importance of the offense, we assume that the same problems exist as those involved in determining seriousness

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[14] The explained variance in ordinal logistic regression is actually the covariation of the log-odds.

from statutory categories. From this, we then deem it likely that the BLR results are the more credible of the two.[15]

Table 2. Ordinal Logistic Results for Models Predicting Violators.				
Model and Variable	**Model Fit**		**Estimate**	**Prob**
	R²	**Prob**		
Model 1 – Without Mental Disorder	.075	.001		
Threshold Serious and/or violent new offense			-1.423	.001
Nonserious & nonviolent new offense			.893	.001
Technical violation			2.018	.001
Gang member			.386	.001
Violent or serious commitment offense			.155	.057
Age at release on parole			.169	.031
Prior parole violations			.468	.001
Age at first arrest under 18			-.544	.001
18 to 25			-.495	.001
Prior arrests over 14			.713	.001
4 to 14			.227	.009
Drug use arrests			-.052	.476
Model 2 – With Mental disorder	.074	.001		
Threshold Serious and/or violent new offense			-1.411	.001
Nonserious & nonviolent new offense			.872	.001
Technical violation			2.044	.001
Gang member			.329	.002
Violent or serious commitment offense			.235	.010
Age at release on parole			.105	.236
Prior parole violations			.485	.001
Age at first arrest under 18			-.531	.001
18 to 25			-.488	.001
Model 2 – With Mental disorder	.074	.001		
Prior arrests 0 to 3			.662	.001
4 to 14			.251	.012
Drug use arrests			-.052	.534
Mental disorder Medication and /or institutionalization			.142	.363
Some evidence of mental disorder			.323	.009

R² = Nagelkerke Psuedo R². Contrast groups are: dependent variable (parole violation) = no violations; mental disorder = no evidence of mental disorder; gang member = gang membership; violent or serious commitment offense = serious & violent offense; age at release = 25 to 30; prior parole violations = parole violations; age at first arrest = over 25; prior arrests = over 15; drug use arrests = no drug use arrests.

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[15] We conducted an alternative analysis by incorporating the recidivism variable as a length of time to failure. A full-model OLS regression analysis (using number of days on parole as the dependent variable) yields an equivalent R-square (.127) to those reported in the logistic regressions. Finally, a Cox Regression Survival Analysis found little difference in the survival functions of the three mental disorder categories. Thus, time to failure does not appear to materially affect the results. It is suggestive, however, that the survival function plots showed MMD parolees consistently failing a little earlier than the other two groups. As noted earlier, there are problems in accurately identifying degree of mental disorder, but the firmest category is the MMD group. Future analyses, with more sensitive mental disorder data, should examine this possibility.

CONCLUSIONS

Even though it is reasonable to assume that lower levels of mental health functioning are related to success while on parole, knowledge on the subject is primarily derived from client-based samples. This study examines the effect of mental disorder on parole success using both reincarceration and violation types as measures of success in a general parole population. In addition, the study maximizes the ability to discern differences in mental disorder from parole records by incorporating a three-category measure.

One point is clear from the sum of the analyses: parolees with any evidence of mental disorder do not fare significantly worse than parolees without such evidence. Mentally-disordered parolees do not return to incarceration at a meaningfully greater rate, nor do they appear to commit more new offenses. This holds true even when controlling for prior drug use arrests, gang affiliation, type of commitment offense, prior parole violations, age at release on parole, age at first arrest and number of prior arrests.

However, changing the definition of recidivism to the presence and type of parole violation, rather than reincarceration, results in a caveat: as a collective, mentally-disordered parolees commit greater numbers of technical violations. While an interesting finding at the bivariate level, this does not necessarily mean that mentally-disordered parolees are more prone to problems while on parole. These results could be associated with greater surveillance by parole agents or greater information provided through their participation in treatment programs.[16] We do not have the ability with these data to determine the reason. On the other hand, the general category of mentally-disordered parolees seems to commit fewer violations for new crimes. Thus, there are no collective differences across all violation types.

There are also indicators that the degree of mental disorder is important. Parolees with a history of medication and/or institutionalization for their mental health problems (those we referred to as the MMD group) are more likely to fail on parole. Our estimate is that odds of failure are about 1.25 times that of parolees with less substantial histories of mental problems (the LMD group). As with the evidence discussed above on generic mental disorder, this failure is more likely to be in the form of a technical violation than a new offense.

In a multivariate framework with other variables, mental disorder as a dichotomy is independently significant but does not improve on a baseline model predicting success on parole. When the mental disorder category is divided into the two categories of LMD and MMD parolees, the latter category is a statistically significant, but not very meaningful, independent predictor of reincarceration. And again, there is no improvement over the baseline model without the mental disorder variable.

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[16] An examination of the number of collateral contacts made by parole agents lends some support to this interpretation, but hardly definitive support. The number of collateral contacts for both categories of mentally-disordered parolees is double that for "normal" parolees. Because these contacts are expressly for the purposes of gaining information on the parolee, they are associated with an increase in technical violations (but not strongly so).

In sum, while mentally-disordered parolees violate their parole at about the same rate as those without a record of mental disorder, their failures tend toward technical violations rather than new crimes. The distinction between the violation rates of parolees with some history and a more serious history of mental-illness is perhaps suggestive, but without a substantial effect on aggregate violation rates. Therefore, at least in terms of the approach taken here, degree of mental disorder is not a particularly useful indicator of subsequent parole experience. An overall lack of improvement in levels of explained variation in the multivariate models does not justify public (or agency) concern over mentally-disordered parolees. Rather than a negative finding, this would seem to be worth knowing—in the aggregate, mentally-disordered offenders do not seem to create a greater public danger or an increased number of new crimes subsequent to their release on parole.

For knowledge on this subject to progress, researchers need to be able to identify the degree of mental disorder among parolees, document the history of that illness, differentiate rationales for technical violations, and separate the potential effects of interacting variables. There are few, if any, existing datasets with such information, and if they do exist, they are likely to be selective populations found in certain treatment modalities that will tell us little about the general issue. Because collection of such data is unlikely to occur by accident, understanding the mental disorder/crime nexus will require a major research project. Fortunately, contemporary correctional philosophy seems to be returning, at least minimally, to a concern for rehabilitation and treatment, a necessary condition for such investigations.

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BIOGRAPHICAL SKETCHES

Frank P. Williams III is a Professor of Criminal Justice and Director of the Security Management Program, University of Houston-Downtown. He is also a Professor Emeritus at California State University, San Bernardino. Dr. Williams received his Ph.D. in Criminology from Florida State University. Some of his recent publications and interests lie in parole practices, criminological theory, and concern about crime.

Marilyn D. McShane is a Professor of Criminal Justice and Director of the Institute of Community Justice, University of Houston-Downtown. She received her Ph.D. in Criminal Justice from Sam Houston State University. Recent publications and interests lie in the area of criminological theory, criminal justice management, and historical penology.

Beth Pelz is Dean of the College of Public Service and an Associate Professor of Criminal Justice at the University of Houston-Downtown. She received her Ph.D. in Criminal Justice from Sam Houston State University. Recent publications and interests lie in the area of prison gangs, juvenile disabilities and delinquency, and correctional treatment.

Traqina Quarles, a doctoral student at Prairie View A&M University, is currently working on a tobacco research grant. Her research interest includes corrections and reintegration.

Unofficial Use of Problem-Oriented Policing:
An Analysis at the Department and Individual Officer Level

Lorie Rubenser, Ph.D.*
Sul Ross State University

Abstract

This research explores the use of the Problem-Oriented Policing (POP) model within a municipal police department at two levels: the department and the individual officer. At the departmental level, the focus is on the use of POP techniques in the development of a special unit - the Nuisance Task Force. At the officer level, the focus shifts to demonstrate ways the actual work conforms to the POP model. Interviews, observations, and official police documents indicate that it is not necessary to officially recognize the use of POP to apply its principles. Results find that the POP model is not just widely applicable, but may be widely used in an unofficial and commonsensical manner.

INTRODUCTION

The concept of Problem-Oriented Policing (POP) holds that effective police attention to small disorder problems can stop the process of neighborhood deterioration and prevent serious crime from developing (Goldstein, 1979; Wilson and Kelling, 1982). Abandoned or illegally parked vehicles are a common problem that experts believe contributes to neighborhood deterioration, and ultimately leads to high crime rates (Wilson and Kelling, 1982). In 1995, the Omaha Police Department (OPD) received 7,775 calls concerning dead storage, abandoned, or illegally parked vehicles to its 911 system, representing 3.31 percent of all 911 calls (Omaha Police Department, 1998). Additionally, the Mayor's Hotline received approximately 1,000 calls per month regarding this issue.[1]

This study examines the development and functionality of the Nuisance Task Force (NTF), the police unit assigned to handle these complaints. The study also attempts to generate knowledge about the general applicability of the POP model. Additionally, this case study explores the possibility that a police department uses the POP model without acknowledging that it has done so.

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[1] No reliable data for this year exists, only the estimates of employees of the hotline.

PROBLEM-ORIENTED POLICING

The OPD claims not to practice POP. However, analysis of the NTF demonstrates the ways in which the unit's existence and work follows the POP model. The following sections discuss the POP model to provide an understanding of the ways in which the behavior of the NTF conforms to this model.

The idea of POP first appeared in 1979 in Herman Goldstein's article "Improving Policing: A Problem-Oriented Approach". Goldstein asserted that previous police reforms focused on internal factors that led to greater professionalism, instead of the outcomes or impacts of police actions. This "means over ends" focus led to reforms, such as increased education levels for officers, but ignored such things as changing the level of disorder in a community.

Goldstein's suggestions for ways to adjust the focus of reform to the ends of policing became the basis for POP. His suggestions focus around four key steps: 1) identify specific problems, 2) explore each problem in detail, 3) develop a response for each problem, 4) analyze the effectiveness of the response to the problem (1979). These four steps are often referred to as the SARA model (Stickels, 1999). They include scanning, analysis, response, and assessment, are and explained as follows:

1. **Scanning** is what Goldstein (1979) referred to as identification of problems. This preliminary step involves breaking problems down into small groups of like incidents, such as purse snatchings from elderly women at a particular bus stop in the evening. The breakdown of problems into smaller categories allows the identification of patterns and allows the police to create a proactive response, rather than continuing the futile reactive chase from one incident to the next (Goldstein, 1979; Goldstein, 1990; Spelman and Eck, 1987a; 1987b; 1987c).

2. **Analysis**, or exploring incidents in detail, allows for further examination of the patterns that emerged in the first step. This stage allows officers to collect as much information as possible to better understand the nature of the problem. The information collected in this step is much more varied and detailed that what is traditionally collected. Additionally, police are expected to collect information from a greater variety of sources, such as other city agencies, businesses, property owners, residents, and community organizations (Goldstein, 1979; Goldstein, 1990; Spelman and Eck, 1987a; 1987b; 1987c).

3. **Response** is the step in which the police seek the active involvement of individuals outside of the police organization. By reaching out to other resources, the police expand both their range of services and their options for solving problems. For many problems, another city agency needs to take action. This step culminates with the implementation of the planned response (Goldstein, 1979; Goldstein, 1990; Spelman and Eck, 1987a; 1987b; 1987c).

4. In **Assessment**, or analysis of effectiveness, officers evaluate the outcomes of the responses they developed and implemented in step three. Analyzing the impact moves the focus of police investigation from the means to the ends of their work. Here, the police employ new,

untraditional methods of analysis. Measures such as number of complaints, number of like incidents, and severity of incidents, indicate less pronounced changes in the problem.

If the response has led to a reduction in the severity of the offense or the number of like offenses, the response is considered a success. The problem may remain, but the police were effective in reducing it. However, if assessment reveals that the response has had no impact or a negative impact, it is necessary to restart the process to develop a more effective response (Goldstein, 1979; Goldstein, 1990; Spelman and Eck, 1987a; 1987b; 1987c).

Thus, POP is meant to be a set of steps that any police officer can use and apply to any problem. Many of the responses used in POP are only used once. Hence, even if analysis reveals that the response was successful, the same response may not work for similar problems or in other police departments (Goldstein, 1979; Goldstein, 1990; Spelman and Eck, 1987a; 1987b; 1987c).

Implementation of Problem-Oriented Policing

Several police departments across the country, including the department in Newport News, Virginia, have already employed the POP model. Officers in Newport News identified more than two dozen specific problems they wished to address. These problems ranged from robberies by downtown prostitutes, to burglaries in a specific apartment complex, to thefts from vehicles parked at a manufacturing plant (Spelman and Eck, 1987a; 1987b; 1987c; Goldstein, 1990).

Among the information gathering techniques used by the officers in step two of the POP model were surveys and interviews with residents and business owners in the affected areas. The officers used these surveys to confirm the presence and scope of the problem, as well as to provide detail about the incidents related to the problem. The officers also interviewed offenders in an attempt to determine the reasons behind the crimes. Based on the information gathered in step two, the officers developed a response to each crime problem. These responses included the coordination of responses by other municipal agencies and organizing community members so they might participate in protecting themselves. You can see this range of responses especially clearly in the handling of burglaries from an apartment complex. (Spelman and Eck, 1987a; 1987b; 1987c).

Surveys of the apartment residents revealed concern not only for the burglaries that were occurring, but also for the deteriorating condition of the building and surrounding area. Interviews with other municipal agencies revealed that the fire department, the public works department, and the department of codes also had concerns regarding the physical condition of the building. The officer in charge of this project coordinated the responses of city agencies and organized the tenants in cleaning up the building and surrounding area. Long-term plans include assisting the residents in relocating, and then demolishing the building. In the mean time, however, analysis indicates a 35 percent drop in the burglary rate. (Spelman and Eck, 1987a; 1987b; 1987c).

In San Diego, the police department identified addresses that were the source of multiple complaints about drug-related problems. Although the department dispatched a special team of officers to the area in a selective enforcement sweep, the massive number of arrests did not abate the

problem. Attempts to contact owners and managers were undertaken to enlist cooperation and gather information about the nature of the problem at each address. While the typical police response to these problems included the execution of search warrants for drugs and guns, a number of nontraditional approaches were undertaken that included tenant evictions from apartments, removal of a pay telephone used by drug dealers, and the hiring of security guards by building owners. At least one property was foreclosed. At another location, officers agreed to help clean and repair the house if the owner evicted the persons causing problems. Additionally, the police issued a restraining order against those who were evicted (BJA, 1993).

Police in Gainesville, Florida used the POP model to deal with a series of convenience store robberies. Stores that had been robbed had several common characteristics. Most had windows covered by advertisements, inadequate lighting in parking lots, large sums of money in registers, and only one employee at night. The police addressed these issues through promotion of a city ordinance, similar to other successful ordinances in other Florida communities. Although fought by storeowners, city council passed the ordinance. A year later, convenience store robberies were down 65 percent overall and 75 percent at night (Spelman and Eck, 1989).

New York City uses POP as a part of its overall patrol strategy. In 1984, the police department instituted the Community Patrol Officer Program (CPOP) that put officers into communities where they would get to know the residents and their problems and work toward solutions. Many of the problems brought to their attention dealt with order maintenance issues rather than crimes (Farrell, 1991). CPOP officers (CPOs) engaged in a problem solving strategy that fits the POP model, even though they were not explicitly using POP. What they did, however, involved identifying problems through a more thorough collection of information, followed by planning and carrying through actions designed to remedy these problems (Weisburd and McElroy, 1991).

One specific problem involved drug dealers in a public park. Arrests were ineffective, in part because they pulled CPOs off their beat, leaving them without enough time to simply maintain a presence in the park. After researching the issue, the officer enlisted the aid of residents whose apartments overlooked the park. When these residents saw a dealer stash drugs in the park, they would call the CPO, who confiscated the drugs. Rather than being off the street for hours with an arrest, the CPO could voucher these drugs into the department within 20 minutes. Drug dealers began experiencing supply problems and moved away from the park (crime displacement) or held their drugs, making arrests more productive. After one month, drug activity in the park was eliminated (Spelman and Eck, 1989).

As the New York example demonstrates, police do not always explicitly use the POP model, even though it fits the pattern of problem solving behavior in various departments. This may be an indication that many more officers and even entire departments are engaging in POP without acknowledging the model.

Unofficial Implementation of POP in Omaha

History of the Unit.

Originally, two workers from the city impound lot were assigned to handle all vehicle complaints in the city. These workers divided the city into two sections, and the police department and the Mayor's Hotline referred all vehicle complaints to these two people. Upon the discovery that these employees were not effective in addressing this problem, the impound supervisor wrote their jobs out of the annual budget, and their positions were eliminated.

This job elimination forced the police to handle all vehicle complaints. The department divided the calls into the four precinct divisions and forwarded the calls to the precinct captains for distribution to their patrol officers. The officers had to address these calls in addition to their normal workload. It quickly became apparent that the officers did not have adequate time to respond to the volume of vehicle complaints.

In 1995, OPD began to discuss ways to solve this problem. The deputy chief in charge of the Uniform Patrol Bureau began conducting research concerning the scope of the problem, and in January of 1997, the department created the Nuisance Task Force (NTF). This task force was designed as a six-month project to address complaints to the Mayor's Hotline concerning illegally parked, abandoned, or otherwise illegal vehicles within the Omaha city limits.

The task force was devoted to towing cars, which freed regular patrol officers from waiting for tow trucks. The task force was to conduct a door-to-door sweep of the city, handling all violations. The OPD believed that the city would no longer need the NTF after this sweep. Each of the four precinct captains donated two officers to the new unit. In addition, the city enlisted Mayor's Hotline and city tow lot facility personnel to engage in a cooperative effort.

The NTF was unable to handle the backlog and conduct the sweep through the city within the six-month period. In fact, due to the continuous volume of complaints, the department never implemented the original plan, which called for the task force to rotate through each precinct one at a time[2]. Instead, in February of 1998, Omaha made the NTF a permanent part of the OPD.

METHODOLOGY

Data Collection

In the present research, several types of data were collected relating to OPD's use of the POP model in creating the NTF and the NTF's continuing use of the POP model in its daily work. As Babbie (2003) indicates, use of several different methods allows the researcher to take advantage of each method's strengths while overcoming its weaknesses. This technique provides the research with increased validity by providing the ability to double check the results acquired through each measure against those of other measures.

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[2] Approximately 1,000 complaints per month.

This is particularly important where qualitative measures are used, as they are here. The validity of observations like those used here is often questioned due to the potential for researcher bias to affect results (Babbie, 2003). This problem is overcome here by combining these observations with quantitative measures.

Two different sets of data are utilized in this study. The first deals with the history of the unit and its implementation. This information is gathered through interviews with current and former unit personnel and with personnel from other city agencies. The second data set deals with the activity of the unit, as measured through observations, interviews, and official records. These data sets are described in detail in the sections that follow.

UNIT ACTIVITIES

A description of the unit itself and its internal workings was the first step in the research process. This was accomplished through an examination of official documents related to the unit, the collection of quantitative data concerning unit's workload, and through interviews and direct observations of the unit in operation.

Unit Work Load

Data were collected on the number of complaints received about vehicles and the number of tows completed by the unit officers during the two-month period of January and February of 1999. This information has been disaggregated by precinct areas to determine patterns of complaints throughout the city.

These data come from the unit officers' daily reports, which is the only source in which the work is broken down into categories useful for this study. The reports contain information on addresses, complaint type, and disposition of the complaint.

One of the problems with using this data source is that the officers may either lie or file incomplete reports, which causes the data to misrepresent the situation. This problem is minimized in several ways. The first is through review of records. If a report is incomplete, the sergeant may return it to the officer for completion. The other officers also provide an accuracy check, as they often work together and occasionally follow-up on each other's initial work. If the reports are inaccurate or incomplete, it is impossible for another officer to effectively complete the task. While this check is not explicitly discussed, it operates informally to promote accurate and complete reporting. Often this check occurs at role call, where one officer may ask another about a case. If that officer did not file accurate or complete records, he/she must rely on memory to discuss the case. Lies would become complicated, and incompleteness would make an officer look sloppy. Thus, it is in the officer's best interest to file accurate and complete reports.

The nature of the work provides further pressure for accuracy. The work of the unit is the result of a complaint. If this complaint is ignored, it may be repeated. In addition, the owner of the complaint vehicle may protest the actions of the officer. In most cases, these types of complaints

result from a misunderstanding of the law, rather than the actions of an officer. Accurate reports strengthen the officer's case if questions over conduct arise.

Quantitative data were also collected from the tow lot facility. These data revealed the percentage of vehicles towed to the facility as a result of action by the unit's officers. The data also allowed for a check on the reliability of the officer's daily reports concerning towing activity.

Observations

At least one ride-along was conducted with each officer in the unit. Additional ride-alongs were conducted so that a sample could be collected for each day of the week. Approximately 200 hours of observations were undertaken. The purpose of the observations was to determine officer's activities, as well as how they conducted these activities.

UNIT OFFICERS

The unit is currently composed of seven sworn line officers, one sergeant, one lieutenant, and one secretary. The officers work only day shift, and at least one officer is on duty every day. Officers on the task force are not required to respond to radio calls and are not confined to any city beats. The officers operate anywhere in the city where there is a complaint.

Interviews were conducted with every officer in the unit, as well as with the sergeant and lieutenant. The original interviews with each officer were conducted at the same time as the first ride-along with that officer. Follow up questions were handled during later rides.

These interviews followed a semi-structured format, with each officer asked the same questions, as well as individualized questions as appropriate. Officer perceptions of the job and the other officers in the unit, officer and unit history, and thought processes or methodology for handling the work were addressed through a series of questions asked during the interview phase of the research. These questions were designed to assess individual officer use of the POP model, as well as perceptions of the unit and its functioning.

Incorporating the interviews with the ride-alongs served two purposes. The first purpose was to save time. The officers did not use work or after hours time for the interviews, but could continue their daily routine with minimum disruption. The second purpose was to allow the interviewer/observer the opportunity to tailor the interview to the work experiences of the officer. The interviewer could add questions to capture nuances of the job that became apparent during the course of the observation period. This process follows the suggestion of Mastrofski and Parks (1990), that researchers conducting observational studies ask questions immediately after the actions that are witnessed, rather than trying to recall the incident for later interview purposes. This keeps the situation fresh in the minds of both the observer and the observed.

ANALYSIS

The observations revealed what the officers do and how they do it. By combining these observations with the interviews, common meanings were developed concerning the work, thereby adding validity to the observations.

The quantitative data supplements the observational data and reveals just how much work the officers do. This was made possible by breaking down the categories of work the officers perform, and then measuring the percent or number of cases the officers handle that fall into each of these categories.

The interviews with the officers and the outsiders also reveal the history of the unit. This history demonstrates the implementation process and illustrates how the unit conforms to the POP model.

ACTIVITIES OF THE NUISANCE TASK FORCE UNIT

Workload Data

Two months of data were collected concerning the activity of the NTF from officers' daily reports. These reports list the addresses of the complaint vehicles and the associated action taken by the officers. These data provide the geographical distribution of the calls handled by the task force officers. Due to the small number of calls occurring in some areas, the data have been disaggregated into the four primary precincts of the city, rather than by beat. The four precincts are labeled Northwest, Northeast, Southwest, and Southeast, and can be located by dividing the city into quadrants using Dodge Street and 72nd Street.

All cases handled by NTF officers during January of 1999 occurred in two precincts - Southeast and Northeast. However, this finding does not indicate there were no cases in the other two precincts. Examining the daily report sheets makes it apparent that no officers worked in the two other precincts during this month.

The February data reveals that cases were handled in all four precincts. However, the majority of cases continued to occur in the Southeast and Northeast precincts. This can be interpreted several ways. As the officers have freedom to decide where they work each day, it might appear that the officers ignored the missing two precincts in January. However, when the data are combined with the observations of the officers, it becomes apparent that this pattern reflects the distribution of calls for service.

Additional evidence supporting this pattern of usage can be seen when looking at the pattern of 911 calls for other police business. When 911 calls are broken down into precincts, as has occurred to the task force cases, the Southeast and Northeast precincts emerge as the heaviest police users (Omaha Police Department, 1998).

An important point to note is the task force does not appear to handle its entire workload. The Mayor's Hotline staff forwards roughly 1,000 calls to the unit each month. In January, the unit handled about half of these calls, while in February the unit handled almost two-thirds of these calls.

Tow Lot Data

An additional source of quantitative data that is used to address the issue of workload comes from the tow lot. Personnel from this agency keep records about the total number of vehicles towed to their facility by officers from the OPD. This data can be broken down into categories that indicate the percent of this total attributable to NTF officers.

The police department towed 305 vehicles to the tow lot during January, and 371 during February, for a total of 676. Officers from the NTF were responsible for 42 percent of the January tows and 54 percent of the February tows. (n=128 and n=200, respectively) Hence, the NTF is responsible for a significant portion of the OPD's total towing activity.

The NTF tows the following types of vehicles: unregistered, motor vehicle litter, dead storage, nuisance, and abandoned. The largest category during both months was unregistered vehicles, which are subject to immediate tow.

Observational Data

The following section summarizes the observations into a description of the typical behaviors that occur during a NTF workday. This summary is followed by specific examples, which demonstrate the variety of cases the officers are called upon to handle.

Daily Routine.

When the officers arrive at work each day, they select the area of the city they wish to work in and take the appropriate section of complaints. Then they organize the complaints according to the route they plan to take for the day. Many of the officers have a specific section of the city where they prefer to work. There are enough officers whose preferences differ so the entire city is covered without assigning areas.

Weekdays begin with roll call at 7:00 a.m. NTF roll call is an informal event. The officers simply gather around a table to discuss the events that will occur that day. The sergeant does not always attend role call. When he is present, he often asks officers what they know about a specific problem, or he may ask an officer to check into a problem. Many requests come from people who called the sergeant to complain about an action that was taken or one that they feel should have been taken. The sergeant phrases these problem inquiries as requests that officers could theoretically refuse. The sergeant also gives complaints to the officer who prefers to work that section of the city.

Roll call is also a time when the officers can coordinate a joint effort for complaints that may require more than one tow, or an area of the city where they wish to clean up several addresses at

once. At this time, officers also seek advice on how to handle a situation. Occasionally, one officer handles a complaint that a different officer previously handled. Roll call provides an opportunity to discuss this situation as well.

If the sergeant is not present for roll call, the officers will discuss among themselves their plans for the day. There is not generally an assertion of seniority in the unit. The officer that provides guidance may not be the senior officer. Officers pose questions to the group, and answers come from the officer who has the most knowledge of the particular problem. The officers thus continue to follow the POP model on an individual basis while planning their daily activities.

Once on the street, the officers proceed to their first selected address. At this point, each day begins to take on a unique character. Even though the officers theoretically do the same thing every day, each day presents its own unique pattern. The following sections lay out the range of possible activities the officers face. It is important to recognize that not all scenarios present themselves to all officers every time they go onto the street. Some days only present one or two scenarios, while other days offer a greater variety.

If officers arrive at the address of a new complaint and find the vehicle to be in violation of either the city municipal code or state statutes, the officers may choose from several different options, depending on the nature of the violation. The most common action is placing a sticker on the vehicle that indicates the violation and the date that the officer will make a follow-up check.

If at the time of the original investigation the officer finds an unlicensed vehicle parked on public or private property, the officer can immediately tow the vehicle. This includes vehicles with either missing or expired license plates. There is no requirement that the officer issue a warning to the owner. However, the officer can issue a warning indicating that the car must be moved within ten days or it will be towed. The officers are entrusted to use their discretion on this issue. There is no formal demand from the sergeant that the officers tow every offending vehicle. In many cases, the officer's actions depend upon the circumstances of the situation. Factors that influence the officer's decision include presence and demeanor of the owner, condition of the vehicle (tires up, running), and location of the vehicle (blocking street or sidewalk access).

If vehicle owners are present, most officers are willing to work with them. This can include informing the owners of the law and giving them a warning rather than towing the vehicle. However, consistent with the research on demeanor (Black, 1980; Klinger, 1994; Klinger, 1996), the willingness of the officer to work with the vehicle owner depends in large part on the attitude displayed toward the officer. If the owner is respectful and shows a willingness to comply with the officer's request to license or move the vehicle, the officer will usually issue a warning. However, if the owner is hostile or rude to the officer, the officer will likely immediately tow the vehicle.

If the vehicle creates a potential hazard, such as to children who play near it, officers are more likely to tow the vehicle. The same is true of vehicles that are blocking access or vision for other drivers. Conversely, if the vehicle is in proper working condition, the officer may either allow

the owner to move the vehicle or promise to get proper license plates before the ten-day warning period expires.

If the vehicle lacks proper license plates but is on private property, the officer will place a tow notice sticker and a Notice of Nuisance form on the vehicle that indicates the violation and the period in which the owner must bring the vehicle up to code. Additionally, the forms indicate whom owners can contact if they have questions or wish to appeal the citation.

The situation may also depend upon the attitude of the officers. If officers are having a bad day or have decided that they will tow all improperly licensed vehicles, there is often nothing the owner can say to stop the tow. Conversely, if the officers are having a good day or simply do not want to take the time to tow, the vehicle may just receive a warning sticker.

Two additional factors affect the decision to tow - when in their shift an officer encounters a violation, and whether the officer has previously been at the address. These factors affect the decisions made for all types of violations, but are particularly salient where an immediate tow is a possibility. It typically takes from 15 to 30 minutes for a tow truck to arrive. If officers have plans for lunch, need to use a restroom, or are close to ending their shift, they may not wish to wait to complete the job. In this example, they will issue the warning sticker and return later. When time is not a factor, officers use down time to complete paperwork, conduct work-related or personal business via cell phone, or just rest.

For addresses where the officer has responded to complaints before, officers are often less willing to give breaks. Repeated calls about the same addresses, and sometimes the same vehicle, indicate a pattern of refusal to comply. Officers do not believe excuses and promises of vehicle owners at these addresses, and are more likely to tow vehicles.

Another common violation encountered by task force officers is dead storage or abandoned vehicles. These vehicles on public property are parked for prolonged periods and never moved. The vehicle may or may not run. As indicated in city ordinances, vehicles cannot remain continually parked in the same spot on public property for more than 48 hours. Owners must move the vehicle at least one mile every two days. Officers place a tow notice sticker and copies of the Notice of Nuisance form on these vehicles, giving the owner ten days to move it. Additionally, officers place chalk marks on the tires and record vehicle mileage. These tactics enable officers to determine the movement of vehicles.

Cases of motor vehicle litter, as well as vehicles that are not licensed in Douglas County but are owned by someone living in the county, are treated in the same way. Wrecked and inoperative vehicles are considered motor vehicle litter. License plates from the wrong county or state are subject to wheel tax and thus to tow if the vehicle does not display proper plates or a wheel tax tag.

In all cases in which officers place a tow notice sticker on a vehicle, the officers can tow the vehicle after ten days if the owner does not correct the violation. While this is the ideal, it is more common for officers to return to the address of the violation from a week to a month after the ten

days have expired. This lapse is the result of officer work schedules and caseload. There is simply not time to return to every vehicle within ten days. Additionally, officers attempt to conduct their own follow-ups, as they are the most familiar with specific problems. The rotating shift officers work, in which they have different days off each week, often means that officers are off duty on the scheduled follow-up day.

Officers are also free to issue notices for problem vehicles for which they do not have a complaint. Several officers indicated they do this in situations where they are handling a complaint at one address, and the next address is also in violation. This is an attempt to appear fair rather than seeming to target a specific person.

The ability of officers to tow vehicles still in violation after the ten-day waiting period does not necessarily mean that vehicles are towed. Many of the factors affecting this decision were discussed above in the context of unlicensed vehicles.

An additional factor that affects decisions for dead storage and motor vehicle litter cases is the progress an individual has made toward compliance. If the individual had several vehicles in violation when the original investigation was made, but now has only one or two vehicles in violation, the officer may give this person a few extra days to finish cleaning things up.

If the officer decides to tow the vehicle, he/she remains on the scene until the tow truck collects the vehicle. This enables the officer to ensure that the tow truck driver takes the right vehicle, and ensures that the owner or some other person does not appear on the scene and create a confrontation with the tow truck driver.

Regular patrol officers may also begin the process by tagging a vehicle when complaints come directly to them. The case is then forwarded to the task force. The goal is for all vehicle complaints to come through the Mayor's Hotline.

Specific Cases.

One specific case that stands out involves an interaction between a task force officer and the owner of a vehicle that was being towed. The officer had previously placed a tow notice sticker on the vehicle because of a complaint that the vehicle did not run and had been parked in the same spot for several weeks. The officer followed up and found that the vehicle in the same condition. As a tow truck was hooking up the vehicle, the vehicle owner approached the officer. The owner explained that the vehicle was being repaired and that he would move it into the garage if the officer would not tow it. The tow truck was already on the scene, however, and the officer explained that it was too late. The vehicle was towed and the owner returned to his home after thanking the officer for the attention.

This case is typical of those observed during the study. Officers frequently interact with citizens in this fashion. Only one case during the observation period saw hostile behavior displayed

by a vehicle owner. In general, vehicle owners are respectful, even if officers are not cooperating with their requests.

At the case where hostile behavior was observed, the officer was working with the City Zoning Inspector. Two cars and a truck were to be towed. The City Zoning Inspector ordered the tows to bring the owner into compliance with a variety of zoning ordinances. The City Zoning Inspector was taking pictures of the vehicles and the yard for evidence of the violations. The picture taking appeared to anger the vehicle owner, as he screamed obscenities and gestured toward the City Zoning Inspector.

The City Zoning Inspector then requested that the task force officer arrest this individual for violating city ordinances concerning litter and parking. A back-up officer was called to the scene in case the individual refused to sign the arrest form and had to be taken into custody. The Humane Society was also called to deal with the two large dogs that were keeping the tow truck operators from safely reaching the vehicles[3].

Ultimately, another individual arrived and convinced the hostile person to sign the arrest form. The second individual informed the officer that the hostile person had a mental illness and had stopped taking medication. The vehicles were towed and everyone departed the scene peacefully.

The two cases discussed above illustrate the types of treatment that may confront officers. In addition, several cases were observed where the apparent owner of the offending vehicle was unable to speak English. In all cases, officers resolved the issue peacefully. Sometimes a mixture of languages and gestures helped, and in some cases, the officer provided material concerning the problem written in Spanish.[4]

The City Parks Division maintains a Weeds and Litter Unit that often works with task force officers. In some cases, officers cannot tow a vehicle until the Weeds and Litter Unit removes items from a yard. Similarly, the Weeds and Litter Unit sometimes cannot clean a yard until the task force removes problem vehicles.

Some cases provided moments of entertainment for both the officer and the observer. One case involved two large work trucks parked on opposite sides of the street. The officer was checking these vehicles to determine if they exceeded the width limits for parking on a public street. When the officer approached the vehicles to check the VIN numbers, they discovered that both trucks had purple bowling balls on their front seats. As one officer said, despite the fact that the work seems repetitive, the job always provides something different.

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[3] This is standard procedure for all cases where animals are loose or restrained in close proximity to vehicles that are to be towed.

[4] One of the officers of the unit took the initiative to have the Spanish language forms made up and approved for usage.

Commentary.

Any time a researcher engages in observation, there is a chance that the observed party will alter his/her behavior. This chance is particularly acute in a study such as this one, where the subjects have been explicitly informed that their behavior is being observed.

There are several reasons to conclude that the behavior of the NTF officers did not change significantly while they were under observation. The first deals with the amount of time spent in the observation phase of this study. Over 200 hours of observations were completed. Six of the seven officers were accompanied for at least two full shifts. The amount of time the researcher was able to spend with the officers allowed a comfort zone to develop. The officers understood the purpose of the research, and the researcher understood the purpose of the officer's behaviors.

Combining the interviews with the observation phase contributed significantly to the development of this comfort zone. Any questions on the part of any of the participants were answered during these interviews. Observations thereafter were accompanied by informal, friendly conversation, and there was never a feeling of suspicion or hostility. In fact, more than one officer expressed excitement at being the subject of a research study.

The second and perhaps best reason for concluding that the observed behaviors did not change significantly due to the presence of the researcher is the range of observed behaviors. Beginning with roll calls in the morning, no effort was made to formalize these situations. There were jokes, stories and other friendly exchanges. Roll call did not always begin on time, and some days lasted over an hour, even though the actual substantive content would have taken only 10 or 15 minutes. There was never an attitude of needing to hurry things along so the officer could get to the street. In fact, after roll call, almost all of the officers would stop for a cup of coffee or soda before beginning their day. These stops usually lasted no more than ten minutes, but were indicative of the lack of rush the officers felt in beginning work.

Other behaviors also gave the impression that the officers were not trying to hide anything about the real process. The officers who did not stop for coffee would stop later in the morning for a bagel and soda. The officers would then attempt to find a place to park that was hidden from plain view. These officers would often read the paper or a magazine while taking this break.

All officers would eventually take a lunch break. Some officers were more conscientious about how long this break took. Several officers took at least the entire hour, while others were more lax about timing this break. Some officers ate in a restaurant, while others got the food to go and ate in the car or at a substation break room. On more than one occasion, the researcher was taken to a private home for lunch.

Most of the officers either would run personal errands while working, or would spend large amounts of time on cellular phones dealing with personal business. The researcher was taken on unexpected stops to personal homes, dentist offices, stores, and other errands. Officers who had phone calls to make or other personal business they did not wish to conduct in the presence of the

researcher would return to headquarters early in the shift. For shifts that ended at 5:00 pm, the officers all returned between 4:30 pm and 5:00 pm to complete paperwork, but it was not abnormal for officers to return as early as 3:30 pm with no intention of returning to the streets for the remainder of the shift.

Officers also tried to time their work so that they were not engaged in towing a vehicle or another time consuming task close to the end of the shift. More than once, officers finished work but did not return to the station because of the early hour. These officers found a place to park and do paperwork or even drove around aimlessly.

When asked about these time-wasting behaviors, all of the officers expressed the feeling that they need not hide things from the researcher. Several even pointed out the need for flexibility in their day in order not to burn out from running to and from cases. They noted that if they did spend every minute of their shift engaged in productive work, they would be busier than most patrol officers would and would quickly tire.

UNIT OFFICER INTERVIEWS

All of the officers in the NTF were subject to loosely structured interviews during the first ride-along. Many of the officers were asked supplemental questions during subsequent ride-alongs. Several questions dealt with the officer's perceptions of the work itself. For example, could they make a difference, were they appreciated, etc. Overall, the officers felt that they could make a difference. Many felt that they could make a difference for the person who had complained, while others felt this difference went further by influencing the entire area from which they removed the offending vehicles.

Most officers believe that the problem of junk vehicles will never disappear, as there are more junk vehicles than there are officers to attend to them. One officer even speculated that there are three vehicles that no one has complained about for every one that someone has called about. At the most, the officers hope to reduce the size of the problem and get people to stop storing junk vehicles on or near their property.

Several officers indicated that there were certain reoffenders, even though the officer had visited the address more than once. Some people appeared to perform auto rebuild work in their yards. Officers would remove multiple vehicles and months later returned and removed more vehicles. These people the officers believe they cannot reach.

One officer said that the job concerned changing people's behavior rather than their attitudes, since some people will never change. Others changed only after the officer removed vehicles on several occasions. These people probably thought the officer was wrong, but they eventually complied to avoid the hassle.

Two officers mentioned the Broken Windows Theory and Community-Oriented Policing when discussing their work. These officers indicated that while the department did not recognize

their work as POP, they thought of it in those terms. These officers indicated that they felt their work held meaning for the community, because it dealt with the things the community thought were important. They noted that although one junk vehicle in a neighborhood may not seem like a big problem, when it is in your neighborhood, it is a big deal. These officers also indicated that they saw the problem of junk vehicles as the beginning of the cycle described in Broken Windows. These vehicles are a sign that the people of the neighborhood do not care what happens there. If the officers come into the neighborhood and remove these vehicles, the quality of life improves.

SUMMARY OF FINDINGS

The data in this study indicates that the Omaha Police Department Nuisance Task Force fits the POP model. The implementation process that was undertaken to deal with the problem of junk vehicles clearly shows how this model fits the reality. It also shows how the implementation process was not a smooth one, but rather had a series of stages, as summarized in the following section.

Implementation of Problem-Oriented Policing

The Department Level.

As stated earlier, it appears that the OPD and entire city government used the POP model to implement their solution to the problem of junk vehicles in Omaha. Through interviews with current and former command staff officers who were or are involved with the NTF, it becomes clear that the POP model has gone through several cycles to arrive at the current solution. This section relies on these interviews to lay out the cycles of the model.

The four steps of the POP model include scanning, assessment, response, and analysis. The original scanning stage was accomplished by a combination of actors including the police and the mayor's staff. When the mayor took office, he instituted a hotline for community members to call about problems they encountered with city services. Junk vehicles were one of the problems that the hotline handled.

At the assessment stage, it was determined that there were enough calls about junk vehicles to justify expending resources on the issue. The response that was developed and implemented called for two employees from the city tow lot facility to handle these calls. However, analysis revealed that these individuals were not effective in dealing with this problem.

The model began again with the idea that there was a big problem with junk vehicles, and the current solution did not work. Additionally, the positions that were responsible for dealing with the problem were eliminated, thereby eliminating the current solution. At this point, assessment indicated that dealing with the problem through the tow lot facility was not possible. The number of calls to the Mayor's Hotline concerning this issue increased. The police were determined to be the best persons for this job.

The response that the OPD implemented called for the routing all 911 and Mayor's Hotline calls concerning this issue to one of the four precinct captains, who would then assign a patrol officer to address the complaints. Analysis again indicated that this response was not effective. The patrol officers did not have time to deal with the volume of calls about junk vehicles if they were to deal with all of their regular duties.

The cycle began again for the third time. At this point, the precinct captains and several sergeants looked into possible solutions. Their response was to create the NTF by having each precinct captain donate two officers to the new unit. Analysis of this response indicates that it worked, even though the problem still exists.

The Officer Level.

Each workday presents a different picture for the unit officers. Armed with complaint information, the officers begin their own POP process. In step one, officers scan the problem by sorting complaints and grouping them into the day's workload. The officers select an area of the city and a particular set of complaints that form a route to follow.

In the assessment step (step 2), officers gather information from their own experience and that of their colleagues. They gather additional information once on the scene. Is the vehicle still in violation? Have improvements been made? Is the owner present and cooperative? The answers lead to step three, where a response is made. Officers can warn the owner, place a Tow Notice sticker on the vehicle, tow the vehicle, etc.

The fourth step (assessment) may blend with the first step in the next round of the POP model. Officers may see continued problems from the same address or vehicle owner and determine that their response did not work. A more aggressive response may be necessary. Officers may also see compliance in the form of no future complaints or increased efforts toward compliance.

FINAL THOUGHTS

The continuing need for the NTF should not be taken as an indication of its failure or the failure of the POP model. The nature and scope of the problem is simply not amenable to a quick fix. This is not unique to this problem. The POP model often produces solutions to problems that are long term in nature (BJA, 1993).

As stated earlier, neither the OPD nor its officers officially claim to be using the POP model, although several of the officers see their work fitting within a Community-Oriented Policing philosophy, which is often closely related to POP. When examined closely, however, both the formation of the unit and the actual work of the officers in the unit fit within the POP model. This indicates that it is not necessary to officially acknowledge the model to make use of it. Therefore, it appears that the POP model is not just widely applicable, but may be widely used in an unofficial and commonsensical manner at both the departmental and individual level.

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BIOGRAPHICAL SKETCH

Dr. Rubenser is currently Assistant Professor of Criminal Justice and Graduate Coordinator for the Criminal Justice Department. She holds a Ph.D. in Criminal Justice from the University of Nebraska, Omaha; M.S. in Justice Studies from Arizona State University; B.A. in Law and Justice from Central Washington University, and A.A. in Administration of Justice from Bellevue Community College. Her research interests include policing issues and minority issues in criminal justice.

Dr. Rubenser currently serves as the Secretary/Treasurer of the Texas Association of Criminal Justice Educators. She is also Co-Editor of the Police Forum publication of the Academy of Criminal Justice Sciences Police Section

Levels of Academic Achievement and Further Delinquency Among Detained Youth

Deyanira Zamora, M.S.
Harris County Community Supervision and Corrections Department

Abstract

Several theoretical models emphasize the relationship between educational achievement and delinquency. Overall, this literature assumes that the relationship not only exists for the initiation of delinquency, but also for continued delinquency. This study examines the latter aspect of this presumed relationship using juvenile males in detention placement in Harris County, Texas. Two measures of educational achievement, reading and mathematics scores, are derived from a standard assessment instrument. Retrospective delinquency measures include number of referrals to detention, number of detention placements, and seriousness of placement offense. The findings suggest that academic achievement is not related to involvement in continued delinquency.

INTRODUCTION

A relationship between academic achievement and delinquent behavior has been proposed by various hypothetical and theoretical approaches in the literature. Indeed, this relationship is a mainstay of most theories of delinquency, either explicitly or implicitly. At the same time, these theories do not always clearly indicate what is meant by educational achievement and vary in their approach. For instance, is educational achievement the attainment of a diploma, the number of years of schooling, or absence of a learning disability? A brief examination of four general perspectives on this relationship follows.

The susceptibility hypothesis explains delinquent behavior as the result of neurological and intellectual differences in personality attributes in juveniles with learning disabilities. These differences may lead to an increased susceptibility to engage in defiant, aggressive and antisocial behavior or delinquent conduct (Lane, 1980; Broder, et al., 1981; Keilitz & Dunivant, 1986; Larson, 1988; Brier, 1989; Malmgren, et al., 1999).

The school failure hypothesis suggests that the failure experienced in school by juveniles with learning disabilities is the first of many negative experiences that will result in delinquency because of the development of a negative self-image (Keilitz & Dunivant, 1986; Brier, 1989;

Malmgren, et al., 1999). However, for this hypothesis to be true, it is assumed that academic failure is preceded by juvenile delinquency.

The differential treatment hypothesis explores the nature of the inconsistent treatment of learning disabled juveniles in the juvenile justice system. This hypothesis holds that, though learning disabled juveniles commit the same types of crimes at the same rates as non-learning disabled juveniles, the learning disabled juveniles are more likely to get caught and are at greater risk of being adjudicated (Malmgren, et al., 1999; Keilitz & Dunivant, 1986; Lane, 1980; Larson, 1988; Brier, 1989).

Finally, an explicit learning disability hypothesis has been advanced, though a causal relationship between learning problems and delinquent behavior has not been conclusively established. Several studies have found that negative attitudes toward school by juveniles experiencing school failure would often result in an increased disposition to engage in delinquent behavior as irregular school attendance and negative peer relationships would likely develop (Brier, 1995; Archwamety & Katsiyannis, 2000; Beebe & Mueller, 1993). Lack of educational achievement is not only associated with initial involvement in delinquent behavior, but it also plays a role in the ongoing criminal activity of those who experience learning difficulties. Rates of recidivism also seem to be positively associated with underachievement (Bachara & Zaba, 1978; Archwamety & Katsiyannis, 2000).

THEORETICAL APPLICATIONS OF THE RELATIONSHIP BETWEEN EDUCATION & DELINQUENCY

An early study focusing on academic achievement and delinquency (Comptroller General, 1977), found that one-fourth of juveniles are affected by a learning disability. The learning-disabled juvenile population, because of academic failure, often developed a negative self-image, and misbehavior became the way to deal with the disappointment and disapproval. Other more recent studies continue to find the same trends among juvenile delinquent populations. Beebe & Mueller (1993) found that 95 percent and 98 percent of the sample under investigation were functioning below grade level in reading and math subjects, respectively.

In another study, Brier (1995) found that a difficult temperament contributed to the susceptibility of a juvenile to become engaged in delinquent behavior. Juveniles who experience problems are often characterized as having difficulty focusing attention. They are easily distracted and are often restless. The juvenile cannot sit through an entire class period without attracting negative attention and will probably demonstrate poor achievement. These are the same characteristics identified by the Susceptibility Hypothesis as forming the relationship between low levels of academic attainment and involvement in delinquency.

A study completed in 1981 by Broder, et al., found partial support for the Differential Treatment Hypothesis. The rate of adjudication in a learning-disabled group was more than twice that of the non-learning disabled group. However, in examining the rate of self-reported

delinquency, it was determined that the learning-disabled group reported less involvement in delinquent behavior than the non-learning disabled group. This finding is not consistent with the assumption of the Differential Treatment Hypothesis, which proposes that both learning disabled and non-learning disabled juveniles engage in similar amounts of delinquency.

Keilitz & Dunivant (1986) also found partial support for the Differential Treatment Hypothesis. As in the Broder, et al. study (1981), a 220 percent increase in risk of being adjudicated was apparent in the juveniles who were learning disabled when compared to non-learning disabled juveniles, supporting the assumptions of the Differential Treatment Hypothesis. Keilitz & Dunivant (1986), on the other hand, found that learning disabled juveniles in their sample self-reported an average of 81 more delinquent acts than non-learning disabled juveniles.

Overall, there is a consistent suggestion, both theoretically and empirically, that some form of educational achievement is related to delinquency, yet clarification is still needed. Learning disability itself is not a measure of educational achievement, so we discard that approach in favor of operationalizations that incorporate assessments of the juvenile's level of educational functioning. Because there are standardized measures of educational achievement, it makes sense to use one of these instruments in assessing this presumed relationship. Further, many of these tests differentiate between reading and mathematical achievement, a subtlety not yet examined in this literature. Finally, while the basic relationship between educational achievement and delinquency is a standard assumption, there is also the suggestion that achievement should differentiate those who are already delinquent, either in quantity or severity offense.

To examine these issues, an elaborated test of the achievement-delinquency relationship is needed. We propose a test of the relationship between both reading and mathematical achievement and delinquency, with delinquency defined by quantity, severity and punitive reaction.

METHODOLOGY

The sample is comprised of 327 male juvenile delinquents ages 10 to 17 from varying ethnic and socio-economic backgrounds in the custody of the Harris County (Texas) Juvenile Probation Department. Of these, 317 were available with information for all variables used in this study. All boys were adjudicated to a Harris County juvenile detention facility from October 2002 to October 2003. Although the racial breakdown of juveniles in the detention center varies daily, the average percentages are: 21 percent White, 33 percent Black, 44 percent Hispanic and 2 percent other (Harris County Daily Report). The educational grade level also varies; however most juveniles in placement are in the 8th and 9th grade levels in school.

A juvenile incarcerated within a Harris County juvenile detention center can accurately be characterized as a minority male between the ages 14 to 16 years living in a low income, single-parent family home as a result of divorce. Although the juvenile is most likely to be classified as a student in the 7th through the 10th grade who is taking regular education classes in

a regular educational setting, the likelihood that he is achieving at a level below that is quite high. Some 16 percent of the juveniles were diagnosed as learning-disabled. Common to this sample are juveniles who have been referred to the authorities on at least two or three occasions; however, this is likely to be their first placement. They are more prone to have committed a misdemeanor property crime that is considered by county officials to be a of medium severity level. For most, their first placement is also their last, as almost 90 percent of the juveniles are returned to their communities with no further placements. Delinquents that are more serious are likely to be placed with the Texas Youth Commission and thus are missing from this sample.

Variables in the Study

The educational variables include: (1) the grade level of the juvenile, and (2) the level at which the juvenile is functioning in reading and math subjects, as determined by the *Kaufman Test of Educational Achievement* (KTEA), both at the time of enrollment into the detention center as well as prior to release. Achievement level is described as the educational ability and attainment level of the juvenile. Underachievement is typically defined as performing at least two grade levels below the typical ability of most juveniles according to age.

Staff provided reports of the monthly KTEA for a one-year period from October 2002 to October 2003. The reports included (1) the juvenile's current grade level, (2) date pre-test was taken by the juvenile, (3) pre-test scores for both math and reading levels, (4) date post-test was taken by the juvenile, and (5) post-test scores for both math and reading levels.

The sample of juveniles ranged from 4th to 12th grade. A little more than one-third (35.5 percent) of the sample was classified as a freshman in high school (9th grade level). Those in the 7th, 8th and 10th grades comprised the majority (51.1 percent) of the sample. Upon entry into the county justice system, the youths were administered math and reading tests. Low achievement scores dominated the sample, with slightly less than half placing at the elementary reading level (44 percent) and elementary math level (48 percent). Although the majority (86.6 percent) of the sample was found to consist of 7th to 10th graders, only one-quarter of students tested achieved math and reading scores at middle and high school levels. Final scores continued to indicate low achievement in math and reading; however, a slight improvement in achievement is visible for both scores. The middle and high school achievement scores seem to be consistent.

Because the KTEA scores are only available during placement, the achievement levels of the juveniles at the time of their offenses are unknown. However, analyses indicate the retrospective achievement data are stable over the one-year period in placement, given a year increase in both age and schooling. These entry achievement scores are used to minimize the retrospective period.

The delinquency information included: (1) the severity of the offense committed, as ordered by eight statutory subcategories of status, misdemeanor, and felony offenses; (2) the number of previous referrals to the juvenile justice department upon entry to placement during the study period; and (3) the number of times placement was administered as punishment to the

juvenile by the juvenile courts. Additional information on race/ethnicity (white, minority), age (year of birth) and family income level (to nearest $1,000) was also gathered and will be used as control variables.

HYPOTHESES AND ANALYSIS

The basic hypothesis is that a negative relationship will be found between the juvenile's academic level and the degree of his involvement in delinquency. Academic level will be measured for both reading and mathematical functioning. Involvement in delinquency is measured with three variables: total number of referrals to detention, total number of placements, and severity level of the offense. Two versions of this hypothesis will be examined with a version for each of the three delinquency variables.

1) Decreased levels of academic achievement in reading will result in increased levels of involvement in delinquency (number of referrals to detention, number of placements, and severity of placement offense).

2) Decreased levels of academic achievement in math will result in increased levels of involvement in delinquency.

Bivariate Analyses

The first step was to examine the bivariate relationship between the achievement variables (reading scores and math scores) and the delinquency variables (total number of referrals to detention, total number of placements and severity level of the offense). A relationship was found for two of the delinquency variables (referrals and placements) when the reading scores were used as the achievement variable. Additionally, a relationship was found for one of the delinquency variables (referrals) when the math scores were used as the achievement variable (Table 1).

Table 1. Bivariate relationships between academic achievement & juvenile delinquency.				
		Total Number of Referrals to Detention	**Total Number of Placements**	**Severity Level of Offense**
Reading Score	**R**	-.150	-123	.039
	Probability	.008	.029	.486
	N	317	317	317
Math Score	**R**	-.167	.071	.059
	Probability	.003	.209	.298
	N	317	317	317

Both of the Pearson r values for reading were statistically significant and negative, as was the value for math. Nonetheless, these relationships were weak, explaining only 2.2 percent, 1.5 percent, and 2.8 percent of their respective variances. The lack of a relationship between both

reading and math scores and offense severity[1], and between math scores and placements, is problematic for the hypotheses.[2]

One possible explanation for these results is a connection between the number of referrals and placements and age or race/ethnicity. Those who are older and of minority status may have higher numbers of referrals and placements. At the same time, they may also have higher achievement scores relative to younger delinquents. Thus, the true relationship between academic achievement and our delinquency variables may be suppressed. To examine this possibility, a multivariate analysis was conducted.

Multivariate Analyses

Using OLS multiple regressions, we initially regressed the two significantly-related delinquency variables (number of referrals and placements) on the control variables (age, minority race/ethnic status, and family income), and then added reading and math achievement scores to the controls as second models. The first set of models examined relationships with the number of referrals to detention (Table 2).

The model without reading scores resulted in only one significant predictor, the minority race/ethnic status variable, of referrals. That variable contributed virtually all of the 11 percent of explained variance. The other model, with reading scores included, failed to improve on the results of the first model. The addition of reading achievement scores did not further differentiate between juveniles with more or less referrals. The second set of models regressed the number of detention placements on the control variables and reading scores. As before, the first model used only the control variables. Family income was the only significant predictor of placements, although minority status was almost significant, accounting for almost 8 percent of the variance in placements. When reading scores were added in the second model, the results remained essentially the same. Reading achievement scores, then, did not contribute to a prediction of either the number of referrals or placements.[3]

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1 The eight-category seriousness variable may be a questionable choice as a dependent variable for Pearson's r. A check to determine whether results would vary due of the ordinal nature of the seriousness variable was made by running an ordinal regression. Neither the reading nor the math achievement scores were statistically significant.
2 Alternative analyses were performed by grouping the reading and math scores into low, medium and high categories and collapsing both number of referrals and placements into four categories. The resulting Somer's d values and their associated probabilities replicated the original Pearson's r results.
3 The third variable, severity level of placement offense, was not statistically significant in any of the bivariate analyses. Because a three-category dependent variable cannot be used in OLS regression, no further analysis was attempted.

Table 2.				
OLS regressions of delinquency measures on control variables & reading scores.				
Model & Variable	**Model R^2**	**Partial r**	**Beta**	**Prob**
Referrals to Detention				
Model 1 Without Reading Scores	.113			.001
Minority		.265	0.269	.001
Age		-.101	-0.098	.105
Family Income		-.095	-0.094	.130
Model 2 With Reading Scores	.113			.001
Minority		.250	0.267	.001
Age		-.097	-0.097	.122
Family Income		-.092	-0.093	.144
Reading Scores		-.006	-0.007	.920
Detention Placements				
Model 1 Without Reading Scores	.078			.001
Minority		.100	0.110	.079
Age		-.072	-0.071	.251
Family Income		-.198	-0.205	.001
Model 2 With Reading Scores	.078			.001
Minority		.104	0.110	.098
Age		-.070	-0.070	.268
Family Income		-.194	-0.204	.002
Reading Scores		-.001	-0.001	.988

The second set of models examined the ability of mathematics achievement scores to predict referrals and placements (Table 3).

Model & Variable	Model R^2	Partial r	Beta	Prob
Table 3. **OLS regressions of delinquency measures on control variables and math scores.**				
Referrals to Detention				
Model 1 Without Math Scores	.113			0.001
Minority		0.265	0.269	0.001
Age		-0.101	-0.098	0.105
Family Income		-0.095	-0.094	0.130
Model 2 With Math Scores	.116			0.001
Minority		0.249	0.257	0.001
Age		-0.089	-0.088	0.155
Family Income		-0.080	-0.082	0.202
Reading Scores		-0.054	-0.056	0.390
Detention Placements				
Model 1 Without Math Scores	.078			0.001
Minority		0.110	0.110	0.079
Age		-0.072	-0.071	0.251
Family Income		-0.198	-0.205	0.001
Model 2 With Math Scores	.080			0.001
Minority		0.188	0.121	0.060
Age		-0.080	-0.080	0.201
Family Income		-0.204	-0.216	0.001
Reading Scores		0.049	0.052	0.431

As before, the first model incorporated only control variables, and the second adds math scores. For referrals, only minority race/ethnic status significantly contributed to the model, accounting for 11.3 percent of the variance. With the addition of math scores to the second model, the explained variance increased slightly, to 11.6 percent, but math scores were not a

significant predictor. The regression models for placements virtually duplicated those for referrals, with family income as the only significant contributor, followed by minority status as almost significant (accounting for approximately 8 percent of the variance across both models). Math scores, as with reading scores, failed to contribute to the prediction of detention placements. Both of the hypotheses are rejected.

CONCLUSIONS

Evidence of a relationship between academic achievement and delinquency is pervasive and assumed by many theoretical positions. This evidence, however, is based on research showing that low academic achievement contributes to the initiation of delinquent behavior, not necessarily the continuation and seriousness of that behavior. The contribution of this research is to examine the latter. Using a standard measure of academic achievement, the *Kaufman Test of Educational Achievement*, the analyses ask about the effect of both reading and mathematics achievement levels on further delinquency among those who have initiated delinquent behavior. This research further differentiates itself by defining delinquency in three ways: referrals to detention, placements in detention and the severity of placement offense.

Elementary analyses found, as predicted, evidence of a relationship between academic achievement and juvenile delinquency. This evidence, however, was not substantial. Of six possible tests, only three were statistically significant. Two of those were between reading achievement and both number of referrals and placements. The remaining relationship appeared between math achievement and number of referrals. Severity of the placement offense was not related to either form of educational achievement. To complicate matters, none of the three significant bivariate relationships were very strong, with all explaining less than 3 percent of the variance in delinquency.

Given that only half of these tests found, at best, what can be described as a very weak relationship — hardly what was anticipated given the strong statements in the literature — there was the likelihood that other variables traditionally related to both education and delinquency may further reduce that relationship. Analyses controlling for race/ethnicity, age, and family income resulted in the elimination of any independent contribution by either reading or math achievement scores and verified that supposition. In short, there was no evidence that educational achievement is a predictor of continued delinquency that would result in referral to or placement in detention, or the seriousness of delinquent acts, among those who are already delinquent.

On the other hand, it might be argued that these findings provide at least superficial support for the theoretical models discussed earlier. All of these models suggest that low educational achievement leads to delinquency. Because more than a majority of detained delinquents in this sample had initial scores already low in both reading and math achievement, the educational achievement variance was clearly restricted and a further effect might be truncated. In this sense, all models are at least partially correct in that the direction of their assumed relationship between educational achievement and delinquency was supported.

Nonetheless, this apparent support is questionable insofar as the models rely on the presence of learning disabilities to generate the population from which this sample was drawn.

Because only 16 percent of sampled juveniles were diagnosed with such problems, it appears that learning disability is not a prevalent feature of the sample. Moreover, learning disabilities do not assist in discriminating future delinquency among this sample, a fact gleaned from follow-up analyses including that variable in the previous models.

These results, while certainly having limitations, call into question assumptions about the relevance of educational achievement as a way to differentiate further delinquent behavior among those who are already delinquent. It may be that educational achievement is best construed as an important factor in the initiation of delinquent behavior.

Though these data are derived from a localized sample of juveniles in detention placement, they do not appear to be unique. The geographic location is one of the largest urban areas in the United States, the juveniles in placement are primarily middle-range offenders, and the juveniles in the sample are typical of the placement population. Perhaps the most critical limitation of this study is found in its retrospective measures of delinquency in comparison to the educational achievement measures. However, because the achievement measures demonstrated stability across the one-year period of detention, there is reason to believe they can also be seen as stable indicators during the retrospective period of delinquent behavior. Clearly, more research is crucial to this issue, but these findings minimally indicate a need for both a non-retrospective study and clearer delineation of the education/delinquency relationship.

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BIOGRAPHICAL SKETCH

Deyanira Zamora received a Bachelor of Science in Criminal Justice from the University of Houston – Downtown in May of 1999. While completing her Master of Science degree requirements in the fall of 2003, Deyanira was invited to be a part of a panel discussion and presented her paper entitled "Older Offenders in Prison Policy" at the annual meeting of the Southwestern Association of Criminal Justice. In the spring of 2004, she met all requirements for completion of the Master of Science degree. After six years of working with juvenile offenders, Deyanira now works in a specialized unit with the county's Community Supervision & Corrections Department as an Officer in the Sex Offender Unit.

Statistical Significance Testing: The Bootstrapping Method and an Application to Self-Control Theory

George E. Higgins
University of Louisville

ABSTRACT

The present study discusses two problems with statistical significance testing (i.e., tautology and violation of statistical assumptions) that require supplemental analysis. The bootstrap method is presented as a form of internal replication to learn about the consistency of and augment the findings from statistical significance tests in many criminal justice and criminology research findings. The bootstrap method is demonstrated by applying the method to an empirical test of self-control theory. The empirical test shows support for self-control theory and that the bootstrap method provides evidence that these findings will replicate across several different samples.

INTRODUCTION

In criminology and criminal justice, quantitative methods are the major basis from which cumulative knowledge and understanding is developed. In fact, a recent study by Tewksbury, DeMichele, and Miller (Forthcoming) demonstrated that only a small percentage of studies use methods other than quantitative methods. A brief recap of the logic of most quantitative methods suggests that a hypothesis is stated *a priori*; then sample data are collected using operational definitions; and statistics are performed that provide results. The results are deemed suitable if we find statistical significance and we are able to reject the null hypothesis. The repetition of this process provides cumulative knowledge and understanding of phenomenon in criminal justice and criminology. However, research in education, psychology, and criminal justice/criminology have shown that statistical significance testing has at least two potential flaws--tautology and biased estimates based on violations of assumptions.

The purpose of this paper is three-fold. First, this paper will provide an illustration of the problems of statistical significance testing. Second, the paper will present the bootstrap methodology as a possible remedy for this problem and demonstrate that findings replicate in studies. Third, the paper will provide an illustration of how the bootstrap method works by examining Gottfredson and Hirschi's (1990) *General Theory of Crime*, now known as self-control theory.

To accomplish these purposes, the paper presents the problems with statistical significance testing. Next, the bootstrap methodology is presented as a possible alternative to augment statistical significance tests. Following this presentation, the bootstrap methodology is applied to Gottfredson and Hirschi's (1990) self-control theory using a nonrandom sample of undergraduate students.

This paper is important for several reasons. First, the paper illuminates problems that are inherent to most criminal justice and criminology research that researchers need to consider when conducting research. Second, the paper presents a remedy for this problem--the bootstrap method. Third, the paper uniquely contributes to the self-control theory literature by demonstrating the utility of the bootstrap method.

STATISTICAL SIGNIFICANCE TESTING

Statistical significance testing is important in developing the accumulation of knowledge in criminal justice and criminology. Tewksbury et al. (in-press) reviewed the six most popular journals in criminology and criminal justice and found that relatively few articles were written using qualitative methods, and that the journals were dominated by quantitative methods that rely on statistical significance testing.

At its core, statistical significance testing is a procedure for determining the likelihood of a result assuming the null hypothesis to be true. More concretely, commonly used statistical significance tests (e.g., *t*-ratios and regression analysis) are procedures for determining the likelihood of a result (this likelihood is usually some pre-set level referred to as alpha) assuming that the null hypothesis is true (usually the null hypothesis of no effect is tested) given a random sample and a sample size of *n* (Carver 1978). This form of statistical significance testing is routine in criminal justice and criminology.

While this form of statistical significance testing is routine in criminal justice and criminology, it has potential problems that need to be addressed. In education, psychological and criminological literature, a lively debate has taken place for years about the problems associated with statistical significance testing (see Thompson, 1987 for a partial review of this debate). For instance, a special edition of the *Journal of Experimental Education* (Thompson 1993) illustrated and discussed the problems with statistical significance testing. Additionally, Maltz (1993) argued that while hypothesis testing is a mainstay in criminology, this testing has deficiencies. The deficiencies have resulted in debates that center around two primary issues.

The first issue with statistical significance testing is that it may be tautological. Thompson (1987) argued that examining null hypotheses of no difference is a fruitless endeavor because virtually all null hypotheses may be rejected at some sample size. Meehl (1978) also stated, "As I believe is generally recognized by statisticians today and by thoughtful social scientists, the null hypothesis, taken literally, is always false" (p. 822). Thus, the null hypothesis will almost always be false given a large enough sample size.

Researchers in criminal justice and criminology (criminologists) are aware of this issue. For example, most careful criminologists take the time to perform power analyses before they conduct their research. That is, criminologists that perform power analysis before undertaking their research are determining the correct sample size to reject their null hypothesis creating the possibility of a tautology. The possible tautology is created because almost all statistical significance tests rely on the sample size in their formulas.

For example, the t-ratio in multiple regression (known as regression hence forward) determines statistical significance of an individual unstandardized slope, but the t-ratio formula uses the unstandardized slope and the standard error (Lewis-Beck, 1980). While the sample size is not readily apparent in this formula, a close inspection of the formula for the standard error shows that sample size is clearly necessary. Thus, Thompson's (1992) argument becomes relevant:

> *Statistical significance testing can involve a tautological logic in which tired researchers, having collected data from hundreds of subjects, then conduct a statistical test to evaluate whether there were a lot of subjects. However, the researchers already know the answer to this test because they collected the data and know they are tired. This tautology has created considerable damage regarding the accumulation of knowledge (p. 436).*

Therefore, criminologists are aware that the rejection of a null hypothesis is determined by sample size. However, it is not clear that criminologists understand that these efforts are tautological in nature. This does not mean that criminologists should not be careful and perform power analyses, but criminologists should acknowledge the flaws with this logic.

The second issue with statistical significance testing involves the possibility of inescapable dilemmas for criminologists (Thompson 1995). That is, criminologists will find themselves in research situations that require that they violate the assumptions of their statistics. For example, regression is clearly a very important statistic for criminal justice and criminology. Like many other statistical techniques, the statistical significance portions of regression rely on important assumptions (Lewis-Beck 1980; Blalock 1979).

As mentioned before, the determination of an individual unstandardized slope in regression relies heavily on a sample size. Further, regression requires that criminologists meet at least three other assumptions. One assumption is that all of the operational definitions represent the measures without error. Another assumption is that the errors are homogeneous. Finally, the errors of the independent measures are normally distributed. Maltz (1993) argued that in many studies, the assumptions of regression are rarely met. Fan and Jacoby (1995) argued that a violation of these regression assumptions is very likely, and that the simultaneous violation of these assumptions may make the regression results impossible to interpret. Given the possible tautology and assumption violations of statistical significance testing, augmenting or supplemental alternatives are necessary for criminal justice and criminology research.

ALTERNATIVES TO STATISTICAL SIGNIFICANCE TESTING

Throughout the literature, several methods have been developed as alternatives of or augmentations of statistical significance testing (see Thompson 1995 for a brief review of these methods). This paper focuses on the augmentations of statistical significance testing. These augmentations (i.e., additions to statistical significance testing) are designed to provide researchers with some idea of how well their statistical significance test findings will replicate. Replicability analyses are attempts to view data from different perspectives to understand if noteworthy effects will consistently occur under specific conditions (Thompson 1994). This is an important issue because no one study will provide replicability information (Blalock 1979) that is necessary for the accumulation of knowledge (Thompson 1987, 1995).

Two augmentations are the cross-validation and the jackknife methods. Cross-validation involves researchers developing arbitrary splits of their sample and then performing analysis on the various splits of the data (Bernstein and Nunnally 1994) and comparing the splits. The problem with this method is that criminologists are likely to develop different splits for the same data providing different results.

The jackknife method uses an entire sample but drops individuals from the sample and then performs the analysis based on the remaining cases. The problem with the jackknife method is the computational intensive development of psuedovalues that are difficult to compute and that hold assumptions that are often untenable (see Efron and Tibshirani 1993 for a discussion of psuedovalues). While, these two methods provide augmentations to statistical significance testing, the cross-validation method and the jackknife method have problems that preclude their use.

Alternately, the bootstrap method provides a user-friendly alternative to the cross-validation and the jackknife methods (Stine 1990). The bootstrap method is conceptually easy to grasp when considered in a series of steps (Efron 1979; Efron 1985; Efron and Tibshirani 1993; Mooney and Duval 1993; Chernick 1999).[1] First, the bootstrap method copies the original dataset into a "mega" file. Second, the bootstrap method draws a sample with replacement from the mega file. Third, for the sample that was drawn, the bootstrap method calculates and stores the results (the results can be of any statistic that the criminologist desires). Fourth, the bootstrap method repeats this process a desired number of times, usually in the thousands. Fifth, the stored results are averaged, standard errors are calculated, and confidence intervals are computed for the averages and for interpretation.

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[1]The bootstrap begins with an original sample taken from the population, then calculates sample statistics. Next, the bootstrap copies the original sample several times to create a pseudopopulation. The bootstrap uses the empirical density function (EDF) (see Efron and Tibshirani,, 1993). From the pseudopopulation, the bootstrap draws several samples with replacement (Efron and Tibshirani, 1993). The bootstrap's strength is its ability to develop a sample that is the same size of the original sample that may include an observation several times while omitting other observations. Random sampling with replacement provides different samples from the original sample. As the bootstrap draws the samples with replacement, it calculates statistics for each sample. The bootstrap stores these statistics creating a distribution of them for further analysis. Once the bootstrap finishes, criminologists can analyze the mean, standard error, confidence intervals, and histograms for evidence of replication.

The real strength of the bootstrap method is sampling with replacement (Efron 1985; Efron and Tibshirani 1993; Mooney and Duval 1993). This method does not delete individuals as occurs in the jackknife method, or develop awkward splits as occurs in the cross-validation method. Instead, sampling with replacement makes use of the complete sample and provides several different configurations of the sample.

The bootstrap does not rely on a theoretical sampling distribution (i.e., central limits theorem that requires large samples) as in statistical significance testing. Rather, the constant resampling with replacement allows the bootstrap method to develop an empirical distribution for a given sample statistic that provides the framework for computing the averages, standard errors, and confidence intervals (Efron 1979; Efron and Tibshirani 1993). Because the sampling or resampling in the bootstrap method takes place with replacement, the combinations of samples are limitless and are driven by random number generators from Monte Carlo.

Because the bootstrap method relies on Monte Carlo random numbers generators to draw the samples, specific software is necessary in some cases. At least one commercial software package--STATA 8.0--allows for easy use of the bootstrap method (Fan 2003). Hence, the bootstrap method is applicable to almost all criminal justice and criminology research situations. To demonstrate the bootstrap method's applicability to criminal justice and criminology, the present study now applies it to an empirical test of Gottfredson and Hirschi's (1990) self-control theory.

GOTTFREDSON AND HIRSCHI'S SELF-CONTROL THEORY

Before the bootstrap method can be applied to Gottfredson and Hirschi's (1990) self-control theory, it is important to outline the theory. Empirical literature will then be presented that shows support for the theory and highlights the use of statistical significance testing and the lack of replication methods.

Gottfredson and Hirschi (1990) assume that individuals choose the behavior that they wish to perform rationally. That is, individuals will weigh the potential pleasure of performing a behavior against the potential pain of the behavior. When a behavior is judged to be more pleasurable than painful, an individual is likely to perform the behavior.

One behavior that may be judged more pleasurable than painful is crime. Crime is an act of force or fraud that an individual pursues to satisfy their interests (Gottfredson and Hirschi 1990). In Gottfredson and Hirschi's (1990) view, all crimes share the following common characteristics: short-lived, immediately gratifying, simple, easy, and exciting. Importantly, crime does not require any special motivation, but does require a decision that the behavior will provide more pleasure than pain. Central to this decision is low self-control.

Low self-control is an individual's persistent inability to resist a temptation when an opportunity (i.e., access) for the temptation presents itself (Gottfredson and Hirschi, 1990). Individuals with low self-control share the same characteristics: impulsive and insensitive;

attracted to easy and simple tasks, risks, and physical activities; averse to long-term planning. These characteristics influence an individual's ability to accurately calculate the differences between the potential pleasure and pain of an act. Gottfredson and Hirschi (1990) state:

> *The dimensions of self-control are ... factors affecting calculation of the consequences of one's acts. The impulsive or short-sighted person fails to consider the negative or painful consequences of his acts; the insensitive person has fewer negative consequences to consider; the less intelligent person also has fewer consequences to consider (i.e., has less to lose) (1990:95).*

In other words, individuals with low self-control are likely to commit crime because they inaccurately perceive the act as immediately beneficial for them and forsake the potential long-term consequences of the act for themselves and others.

Gottfredson and Hirschi (1990) argue that individuals with low self-control are the products of poor or ineffective parenting early in life (before eight years old). For proper and effective parenting to take place, parents must develop an emotional bond with their child. When an emotional bond is present, parents are likely to monitor their child to gather behavioral information. The behavioral information is then analyzed for deviant behavior. When the behavior is deemed deviant, parents noncorporally discipline their child. When this process does not take place or is ineffective, parents are likely to instill low self-control making their child more susceptible to criminal behavior (Gottfredson and Hirschi 1990).

A substantial body of literature has accumulated examining Gottfredson and Hirschi's (1990) theory. Most of the literature shows that low self-control has a link with several deviant behaviors including alcohol and drug use (Gibbs and Giever 1995; Arneklev, Grasmick, Tittle and Bursik 1993; Forde and Kennedy 1997; Winfree and Bernat 1998), skipping class (Gibbs, Giever and Martin 1998), physical aggression (Avakame, 1998), academic dishonesty (Tibbetts and Myers 1999; Gibbs and Giever 1995; Bichler-Robertson, Potack and Tibbetts 2003; Cochran, Wood, Sellers, Wilkerson and Chamlin 1998), traffic violations (Keane, Maxim and Teevan 1993; Piquero and Tibbetts 1996; Tibbetts 1997), bullying (Unnever and Conner 2003), and shoplifting (Piquero and Tibbetts 1996; Tibbetts 1997). Although these studies show that low self-control has a link with deviant behaviors, most of the studies use statistical significance testing.

Attempting to avoid the problem of statistical significance testing, Pratt and Cullen (2000) performed a meta-analysis that showed that self-control had a moderate link with overall measures of crime and deviance. In addition, they showed that opportunity did not significantly condition the link between self-control and deviance, but was a significant independent predictor of crime and deviance. They also found that deviant peer association was an important control measure when testing self-control theory. However, the meta-analysis relied on effects (i.e., regression coefficients) that were developed using statistical significance testing. In other words, in an attempt to bring the large body of knowledge about self-control theory together, Pratt and Cullen (2000) restricted themselves to possibly tautological coefficients that demonstrated that the samples for the studies were large and not necessarily replicable and probably violated many of the assumptions of their test statistic.

Within the self-control theory empirical literature, several criminologists have claimed to have replicated their findings. For instance, Gibbs and Giever (1995) showed that low self-control had a link with alcohol use and class cutting and claimed this showed the findings replicate. Others have claimed to have replicated findings in a manner similar to Gibbs and Giever (1995) by using separate behaviors to replicate their findings (Nagin and Paternoster 1993; Piquero and Tibbetts 1996; Tibbetts 1997; Tibbetts and Myers 1999). While these findings substantiate the generality of low self-control, they do not necessarily demonstrate that their findings replicate. In essence, the findings demonstrate that they these studies had large sample sizes. That is, these studies relied on the possibly tautological statistical significance testing.

Piquero, Gibson and Tibbetts (2001) use a technique where they split their sample based on the sex of the individual. They found the same results for males and females. Their claim is that these findings indicate replication. On the contrary, these findings are arbitrary because a researcher with the same data may split the sample a different way and arrive at different findings. In other words, this study uses the cross-validation method of replication, and they relied on statistical significance testing without augmenting their results with any other form of replication.

Paternoster and Brame (2000) examined their self-control theory results using the cost effective Monte Carlo method of replication, a relative of the bootstrap method. In this approach, Paternoster and Brame (2000) estimated a model that mimicked their original Cambridge data. For the Monte Carlo study, they developed a psuedopopulation model that contained their estimates. Next, they tested two hypotheses by determining the parameter and standard error bias if the link between low self-control and delinquency was equal to 0 and was not equal to 0. Their findings replicated their original results. This study is close to the bootstrap method; however, Monte Carlo simulations are difficult to develop and perform in comparison to the bootstrap method.

On the other hand, Winfree and Bernat (1998) showed that low self-control had a desirable effect on drug use in two cities. This form of replication is important because Winfree and Bernat (1998) use different samples to determine whether their findings replicate, which is a form of external replication. While external replication is outstanding, it can be costly. Additionally, they relied on statistical significance testing for the replication. Therefore, a gap is present in the literature concerning whether the bootstrap method can replicate the results in a self-control theory study and augment the reliance on statistical significance testing.

THE PRESENT STUDY

The present study contributes to the literature by applying the bootstrap method to an empirical test of self-control theory. This application is important for several reasons. First, this application shows that the bootstrap method can be applied to criminological theory testing situations and is versatile enough to be applied to almost any criminal justice and criminology

research situation. Second, this is the first test to use the bootstrap method in an empirical test of self-control theory providing unique findings to this literature.

Method

To make the contributions that this article promises, a specific set of methods are necessary. This section presents the procedures and sampling, and measures for this study. The methods are similar to ones used in previous self-control theory tests (see Pratt and Cullen 2000 for a review of these methods).

Procedures and Sampling

In the spring 2003 semester, the researcher gave a self-report survey to college students enrolled in ten courses at a college in the eastern United States. Five of these courses were open to all majors and five were open only to criminal justice majors. In the courses used, the professor agreed to allow the study to take place during class. The students present the day of survey administration took part in the study. In the classroom, the researcher told the students that their decision to take part in the study was voluntary and all responses were anonymous and confidential. After the researcher explained the rights as respondents and gave the respondents a letter stating these rights and procedures to 312 potential respondents, five students refused to take part in the study. After deletion for missing data removed five additional respondents for incomplete surveys, 302 completed surveys remained.

The sample contained 55.4 percent (*n*=167) females and 44.6 percent (*n*=135) males with ages between 18 and 31 (*M*=23.43 s.d.=5.54). The sample was predominately white (78.4 percent). The college's total student body was 58 percent female and 42 percent male and the average age was 26. The racial composition of the population was 84.7 percent white. Overall, the sample was younger than the college's total study body, contained more males, and had more nonwhites.

The fact that this sample does not result in a random sample is not a problem for testing Gottfredson and Hirschi's (1990) theory. Specifically, Gottfredson and Hirschi (1990) argued their theory in relative terms so that the links between their hypothesized measures should occur no matter the group being studied. Others that have tested self-control theory would agree with this assertion (Gibbs and Giever 1995; Nagin and Paternoster 1993; Piquero and Tibbetts 1996).

Measures

The measures of the study were important to test self-control theory. The students responded to measures of self-control, deviance, opportunity, and deviant peer association (see Appendix A for the measures).

Deviance. The deviance measure is a composite of ten items: stealing something worth $10 or less, stealing something worth more than $50, use of marijuana, use of cocaine, cheated

on exams, hitting someone on purpose, destroying someone else's property on purpose, used other illegal drugs (e.g., PCP, LSD, or Heroin), driving while intoxicated, and had four or more drinks in a row on a single night in the last two weeks. The students responded to the items using a five-point scale (1 = never, 2 = once, 3 = twice, 4 = three times, 5 = four or more times). The scale represented the summed scores of all items. A principal components factor analysis showed the measure was one-dimensional and internal consistency for the scale was suitable (.81).

Self-control. This study employed the Grasmick, Tittle, Bursik, and Arneklev (1993) self-control scale because it is the most popular attitude measure of self-control (see Pratt and Cullen 2000; Delisi et al. 2003; Unnever, Cullen and Pratt 2003). The scale included 24 items intended to measure the six dimensions of low self-control. Students responded to the items by circling the Likert-type response categories (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree). The items of the scale formed a composite score of self-control by summing the 24 items. Higher scores on this scale suggested lower self-control. The scale had good internal consistency (.89); and similar to other studies, the scale formed a unitary measure using principal components factor analysis.[2]

Opportunity. The opportunity measures used the same substantive information as the deviance items. That is, the opportunity measure is a composite of ten items including the likelihood of getting substances including alcohol, beer, wine, marijuana, and cocaine; the ease in driving while drunk; hitting someone; and destroying property. All the opportunity items had the same Likert-type response categories (1 = very difficult, 2 = difficult, 3= easy, 4= very easy). Higher scores on the scale suggest more opportunity for deviance. Cronbach's alpha for the opportunity measure was suitable (.80), and the findings from the principal components factor analysis suggested the measure was one-dimensional.[3]

Deviant peer association. The deviant peer association measure is a composite of ten items that ask the students how many of their friends have stolen something worth $10 or less, stolen something worth more than $50, used marijuana, used cocaine, cheated on exams, hit someone on purpose, destroyed someone else's property on purpose, used other illegal drugs (e.g., PCP, LSD, or Heroin), driven while intoxicated in the past year, and how many of their friends had 4 or more drinks in a row on a single night in the last two weeks. The students provided this information from five answer choices (1 = none of my friends, 2 = one of my friends, 3 = two of my friends, 4 = three of my friends, 5 = four or more of my friends). Higher

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[2]Some may argue that some of the items for the deviance measure represent minor forms. According to Gottfredson and Hirschi (1990), crime and similar acts (e.g., deviance) have two things in common: similar characteristics and low self-control.

[3]Some will question the validity and reliability of the Grasmick et al. scale to measure self-control, arguing the scale does not have any of these qualities (see Longshore, Turner, and Stein, 1996; Piquero, MacIntosh, and Hickman, 2000; DeLisi, Hochstetler, and Murphy, 2003; Higgins, 2002). However, several studies have shown the scale to be a valid and a reliable measure of self-control (Nagin and Paternoster, 1993; Piquero and Tibbetts, 1996; Piquero and Rosay, 1998; Piquero, Gibson, and Tibbetts, 2002).

scores on the scale represented more associations with deviant peers. The scale was one-dimensional and had high internal consistency (.92).[4]

   Interaction term. Because Gottfredson and Hirschi (1990) argued that an individual with low self-control is unable to resist a temptation when an opportunity presents itself, an interaction term between low self-control and opportunity is necessary. To create this interaction term, low self-control and opportunity were mean centered (see Aiken and West 1991 for rationale). Then low self-control and opportunity were multiplied to develop the interaction term.

Results

   Table 1 presents the means, standard deviations, and bivariate correlations between the dependent measures (i.e., deviance) and the independent measures (i.e., self-control, opportunity, an interaction term [self-control X opportunity], deviant peers, and gender). The findings show suitable links of the measures, especially with self- control and deviance (.42) and deviant peer association and deviance (.59). Second, the link between the interaction term and deviance is not significant and weak (.11), signaling problems with the interaction term. In addition, the largest correlation is (.59). This suggests that multicollinearity is not present in these data (see Lewis-Beck, 1980 for standards using correlations to interpret multicollinearity).

	Mean	S.D.	1	2	3	4	5	6
Table 1. **Sample descriptive statistics and Bivariate Correlations of measures (*n* = 302).**								
Deviance	17.13	.374	1.00					
Self-Control	50.69	12.68	.42*	1.00				
Opportunity	29.62	5.53	.23*	.16*	1.00			
Interaction**	975.60	400.11	.11	.03	.10	1.00		
Deviant Peers	25.78	.668	.59*	.44	.14*	.06	1.00	
Gender	1.55	.50	.18*	.25*	.15*	.06	.27*	1.00
* p < .05 *** Interaction term was mean centered.*								

   One purpose of this study is to examine self-control theory while controlling for opportunity, self-control x opportunity, deviant peers, and gender. The data in Table 2 show that self-control has a statistically significant impact on deviance (b = .106, p=.000, B=.211). Also, opportunity (b = .161, p = .008, B = .134) and deviant peer association have significant effects

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[4]The opportunity measure captures the ease and simplicity of the acts in congruence, with defining opportunity for this study. In addition, measuring opportunity this way is similar to studies that use this population.

on deviance (b = .265, p = .000, B = .467).[5] The interaction term and the gender do not have statistically significant effects on deviance (b = .007, p = .078, B = .087).[6]

	b	p	Beta	95% Confidence Interval		
				Lower	Upper	VIF
Self-Control	.106	.000	.211	.051	.161	1.303
Opportunity	.106	.008	.134	.043	.280	1.057
Interaction	.007	.078	.087	-.001	.016	1.020
Deviant Peers	.265	.000	.467	.204	.326	1.287
Gender	.024	.971	.002	-1.300	1.349	1.114
R^2	.405					

Table 2.
Linear Regression Analysis of Self-Control Theory (n = 302).

Note. VIF = variance inflationary factor coefficient.

Another purpose of this study was to apply the bootstrap method to examine the replicability of the findings because of the use of statistical significance testing (see Appendix B for programming syntax to perform this bootstrap).[7] Before the bootstrap results are presented, it is important to understand why the number of bootstrap samples was chosen and which test statistics were chosen to be replicated. Chernick (1999) suggested that a large number of samples (n = 1000) are necessary for proper use of the bootstrap method. Similar to previous self-control theory studies, the relative impact of the measures and the model-explained variance are important. That is, the beta coefficients of the measures on deviance are important because the beta coefficients place all of the measures on a common metric. The r-square value for the

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[5]This measure may not accurately capture the full range of differential association measures (see Tittle, Burk, and Jackson, 1986; Mazerolle, Burton, Cullen, Evans, and Payne, 2000). However, research on differential association contains several studies that use similar measures to these (see Akers, Krohn, Lanza-Kaduce, and Radosevich, 1979; Krohn, Skinner, Massey, and Akers, 1985; Winfree, Griffiths, and Sellers, 1989; Reed and Rose, 1998; Skinner and Fream, 1997; Akers and Lee, 1999). This measure is similar to other studies that use deviant peer association as a control measure in self-control theory (see Evans et al., 1997; Winfree and Bernat, 1998; Burton et al., 1998).

[6]Multicollinearity is not a problem for this model. The variance inflationary factor (VIF) is a method to detect multicollinearity (see Freund and Wilson, 1998). Table 2 provides the VIF's that do not come close to 10 suggesting little collinearity exists between the variables.

[7]Specifically, if the means from the bootstrap estimates are similar to the original statistics with small standard errors, then we have evidence the findings replicate over many different samples. In addition, a histogram can show to distribution of the statistics. The bootstrap then calculates 95 percent confidence intervals to find out if the test statistics are statistically significant. Mooney and Duval (1993) presented two methods that are suitable for bootstrapping regression. They suggested that researchers could bootstrap the entire data set or just the observed errors of a regression coefficient. When the independent variables' values are as random as the responses Mooney and Duval (1993) suggested when this occurs, bootstrapping cases is the most suitable method, which is what the current study used.

model indicates explained variance. Thus, the beta weight and the r-squared were used as the test statistic for the bootstrap method to replicate.

The data from Table 3 shows that across 1000 different samples, the mean beta coefficients and the mean r-square values for all the measures are similar to the original ones. This shows that the original findings from Table 2 replicate across different samples. In addition, the standard errors are not very large, providing more evidence that the findings replicate across 1000 resamples. Further, the confidence intervals suggest the coefficients are statistically significant.

Table 3. Bootstrap Estimates					
				95% Confidence Interval	
	Estimates	**Bias**	**Standard Error**	**Lower**	**Upper**
Self-Control	.206	.001	.058	.092	.321
Opportunity	.135	.002	.056	.025	.247
Interaction	.087	.007	.094	-.098	.272
Deviant	.472	-.000	.071	.332	.612
Gender	.003	.001	.092	-.178	.186
R^2	.405	.014	.055	.297	.512

Discussion

This study began with three purposes. First, the study was to present the problems with statistical significance testing. Second, the study was to present the bootstrap method as a possible augmentation to statistical significance testing. Third, the study was to illustrate the bootstrap method in an empirical test of Gottfredson and Hirschi's self-control theory.

Statistical significance testing is a staple in criminal justice and criminology. That is, studies that use this method dominate criminologists' knowledge bases (Tewksbury et al. Forthcoming). Statistical significance testing is reliant on sample size and test assumptions (Thompson 1987; Fan and Jacoby 1995). The reliance on sample size suggests that statistical significance testing only provides an assessment of the sample size. Simply put, statistical significance testing may be a tautological endeavor that is unable to provide replicable results alone (Thompson 1987). Further, tests of statistical significance such as regression have important assumptions that are almost routinely violated, which impedes the ability of criminologists to make sound inferences (Thompson 1992; Fan and Jacoby 1995). Therefore, statistical significance testing alone may be an impoverished method of developing an accumulation of knowledge in need of augmentation.

To augment statistical significance testing, cross-validation and jackknife methods have been developed, but they are hampered with substantial limits that preclude their widespread use (Thompson 1987, 1992). The bootstrap method is a reasonable but underused alternative to augment statistical significance testing in criminal justice and criminology. Specifically, the bootstrap method does not utilize awkward splits of the data like the cross-validation method, and does not rely on complicated internal calculations of pseudo values as in the jackknife method to determine replication (Thompson 1994).

The bootstrap method allows criminologists to examine the replicability of their findings by using varying configurations of their original data because it samples with replacement (Mooney and Duval 1993). After sampling with replacement, the bootstrap method allows criminologists to examine an average, standard error and confidence interval of virtually any test statistic to determine replicability of their findings (Efron 1979). Importantly, the bootstrap is a general method that can be used in almost any criminal justice and criminology research situation that can augment statistical significance testing and improve the accumulation of knowledge in these fields.

This study applies the bootstrap method to an empirical test of Gottfredson and Hirschi's self-control theory to demonstrate the methods utility. Self-control theory was tested using a nonrandom sample of college students. The findings from this study support Gottfredson and Hirschi's (1990) contention that low self-control will have a link with deviance.

The findings also support previous research that deviant peer association will have a link with deviance when low self-control is in the empirical model (Pratt and Cullen 2000; Evans et al. 1997). This suggests that low self-control is not the only cause of deviance. This finding is contrary to the assumption that Gottfredson and Hirschi (1990) make that low self-control is the single cause of deviance (see Pratt and Cullen 2000 and Winfree and Bernat 1998 for discussions of this issue).

Evans et al. (1997) comments that the link between low self-control and deviant peer association is complex. With this in mind, some research has focused on developing interactions between low self-control and deviant peer association (see Gibson and Wright 2001 for details of this research). While an interaction between low self-control and deviant peer association is not hypothesized by Gottfredson and Hirschi (1990), the findings here, combined with the suggestions from Evans et al. (1997), suggest that examining the interaction term may provide substantial advances in our understanding of self-control theory.

The findings show that opportunity has an additive link with deviance rather than a link with deviance when interacted with low self-control. This finding can be partially explained in the disparate measures of opportunity that are often used. That is, finding a problem with the interaction term is a consistent issue in the self-control theory literature and may be attributed to the different measures of opportunity that are used (Pratt and Cullen 2000).

While these substantive findings are important for self-control theory, the empirical test was used as an example of applying the bootstrap method. This application was necessary because the empirical test of self-control theory used on statistical significance testing has been discussed as being problematic.

To apply the bootstrap method, the original findings from the empirical test were replicated 1000 times. Specifically, the beta coefficients and r-squared values were examined using the bootstrap method. The findings from the bootstrap method show that the average beta coefficients and r-squared values were very similar to the original findings suggesting that the findings were replicated. In this context, the bootstrap method provides an opportunity to view data to find noteworthy effects that will replicate. As a word of caution, the bootstrap method is only as good as the data it is given to work with. That is, the bootstrap method provides important views of data in different ways, but it cannot make data more than they are or magically take researchers beyond the limits of their data.

In this vein, the limits of the present study are important to consider. First, the sample used for this study was non-random and comprised of predominately white college students. While it may be argued that this will hinder the ability to generalize the results, an important argument to remember is that Gottfredson and Hirschi (1990) stated their theory in relative terms. That is, no matter the group being studied, Gottfredson and Hirschi (1990) argue that their theory will be substantiated.

Second, the study used the problematic Grasmick et al. (1993) scale. However, some recently have shown that this scale does have value (Nagin and Paternoster 1993; Piquero and Tibbetts 1996; Piquero and Rosay 1998; Piquero, Gibson and Tibbetts 2002).

Third, the bootstrap method generates internal replications (i.e., it only uses the data presented) rather than an external replication method (i.e., additional samples with the same measures). External replications are always better than internal replications because we are able to capture differences in situations and individuals. Also, internal replications have the tendency to provide inflated replication estimates (Thompson 1984) suggesting that external replications are better. However, external replications may cause a substantial drain on resources or may be impractical. Thompson (1994) states, "it is always better to have an empirical overestimate of result replicability than to have only a dogmatic attachment to a mere presumption that sample results [are consistent]" (p.171).

Despite the limits, the present study outlines how statistical significance is problematic (i.e., tautological and involves violation of statistical assumptions). The present study outlines an alternative (i.e., the bootstrap method) that can augment statistical significance testing to help determine the replicability of the results. Finally, the study shows that the bootstrap method can be applied to criminological theory testing and may be used in almost any criminal justice and criminology research setting.

Within this application, the study shows that low self-control, opportunity, and deviant peer association, have links with deviance. While additional studies that use national random samples and external replicability would be optimal, the present study demonstrates that the bootstrap method can be used to replicate criminal justice and criminology studies that rely on statistical significance testing.

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APPENDIX A

Individual Items Measuring Deviance Scale

1. How many times, in the last year, have you taken little things (worth less than $10) that did not belong to you?
2. How many times, in the last year, have you taken things of large value (worth over $50) that did not belong to you?
3. How many times, in the last year, have you use marijuana?
4. How many times, in the last year, have you used cocaine?
5. How many times, in the last year, have you used notes, books, or looked at someone else's paper during an exam when it was not allowed?
6. How many times, in the last year, have you beaten up on someone or hurt anybody on purpose?
7. How many times, in the last year, have you destroyed someone else's property on purpose?
8. How many times, in the last year, have you used other illegal drugs (e.g., PCP, LSD, Heroin)?
9. How many times, in the last year, have you driven an automobile (car, truck, SUV or ATV) while you were intoxicated?
10. How many times, in the last **two weeks**, have you had 4 or more drinks in a row? (A drink means any of the following: a 12-once can or bottle of bear, a 4-ounce glass of wine, a 12-ounce bottle or can of wine cooler, a shot of liquor straight or in a mixed drink).

Cronbach's Alpha = .81

Individual Items Measuring Opportunity Scale

In the last two weeks:

1. how easy was it for you to obtain alcohol?
2. how easy was it for you to obtain beer?
3. how easy was it for you to obtain wine?
4. how easy was it for you to obtain hard liquor?

In the last year:

1. how easy was it for you to take things that do not belong to you?
2. how easy was it for you to damage property that does not belong to you?
3. how easy was it for you to drive while intoxicated?
4. how easy was if for you to hit someone?
5. how easy was it for you to obtain marijuana?
6. how easy was it for you to obtain cocaine?

Cronbach's Alpha = .80

Individual Items Measuring Deviant Peer Association Scale

How many of your friends have performed or been involved in the following acts in the last year?

1. Taken little things (worth less than $10) that did not belong to you?
2. Taken things of large value (worth over $50) that did not belong to you?
3. Used marijuana?
4. Used cocaine?
5. Used notes, books, or looked at someone else's paper during an exam when it was not allowed?
6. Beaten up on someone or hurt anybody on purpose?
7. Destroyed someone else's property on purpose?
8. Used other illegal drugs (e.g., PCP, LSD, Heroin)?
9. Driven an automobile (car, truck, SUV or ATV) while you were intoxicated?
10. Had 4 or more drinks in a row? (A drink means any of the following: a 12-once can or bottle of bear, a 4-ounce glass of wine, a 12-ounce bottle or can of wine cooler, a shot of liquor straight or in a mixed drink).

Cronbach's Alpha = .92

APPENDIX B

The bootstrap procedure in STATA Intercooled 8.0 in its basic form allows criminologists to determine the replication of slope coefficients. However, with a small amount of programming, criminologists can bootstrap the beta coefficients and r-square. The program used in this study followed these steps:

The **first** step is to clear the memory of the program: clear

The **second** step is to tell the program to use the data that you want: sysuse filename

The **third** step is to develop a regression in the memory of the program: regress deviance self-control opportunity interact deviant peers gender

The **fourth** step is to standardize the measures using the regression information in the program: egen stdeviance = std(deviance), egen stself-control = std(self-control), egen stopportuntity = std(opportunity), stdinteract = std(interact), stddeviant peers = std(deviant peers), stdgender = std(gender)

The **fifth** step is to develop a second regression in the program's memory. However, this one will contain the standardized coefficients: regress stddeviance stdself-control stdopportunity stdinteract stddeviant peers stdgender

The **sixth** step is to develop the bootstrap that produces the replications of the beta coefficients and r-square with the confidence intervals for each measure: bootstrap "regress stddeviance stdself-control stdopportunity stdinteract stddeviant peers stdgender"R2=e(r2)_b, reps(2) saving(bs) replace

The **seventh** step is to develop histograms of the significant beta coefficients with a normal distribution curve: histogram stdself-control normal

These steps will produce proper information that can provide some indication of replication of findings from studies.

BIOGRAPHICAL SKETCH

George E. Higgins is assistant professor in the Department of Justice Administration at the University of Louisville. He received is Ph.D. in Criminology from Indiana University of Pennsylvania in 2001. His most recent research appears in Criminal Justice and Behavior, Journal of Crime and Justice, Deviant Behavior, Criminal Justice Studies, College Student Journal, and Western Criminology Review. His current research focuses on testing general crime theories and quantitative methods.

Prostitution, Trafficking, and Traumatic Stress
By Melissa Farley (Ed.).
(Binghamton, NY: Haworth, 2003. pp. xxii, 361)

Edward J. Schauer
Prairie View A&M University

Written and gathered from the perspective that women and girls are the victims, this volume brings fresh insight into the discussion of prostitution and sex trafficking (P/T). The author's intent is to help the reader understand the realities of P/T, and to explain the logistics of victim rescue. The included articles concentrate on treatment and service to the women and girls who are able to find a way to escape P/T.

Including preface and introduction, the 18 articles presented combine to call into question the conventional wisdom upon the following subjects:

- Sex trafficking is qualitatively different than prostitution.
- Legalizing prostitution will result in both decreasing the harm of prostitution and lowering the rate of international sex trafficking.
- Most women in prostitution have freely chosen that life and remain in it willingly.
- Street prostitution is the most dangerous type.
- Male prostitution is different than female prostitution.
- Prostitution is a "normal" profession for women from certain socio-economic segments of the world's population.

New evidence is presented on the universality of techniques used to control women and children, as well as the extreme psychological trauma most women suffer under P/T. Furthermore, many insights are offered to guide the helping professions in P/T victim treatment and service.

In the preface, the editor presents an interesting overview of the issues appearing in the articles that follow. The editor places special emphasis upon the harm that P/T causes to women and children, the economic motivations of certain interests to prevent harm, and victims' needs for help to escape, sanctuary, support, job training, medical and psychological treatment, and other services. In the preface and in other articles in the book, the experiences of individual women are told just often enough to illustrate the information presented and to keep the reader's attention.

In the introduction, Judith Herman discusses psychiatric clinical observations on the techniques of control and domination, the extreme mental trauma suffered by victims, and the tendency of these traumatized women to hesitate to volunteer information to therapists. In the next article, Christine Stark and Carol Hodgson explain the similarities in the techniques used in wife battering and those used by the perpetrators of P/T.

Farley and colleagues explain their research in interviewing women involved in P/T in nine countries. They show that experiential evidence fails to support conventional conclusions. Incredibly high numbers of their subjects met clinical criteria for Posttraumatic Stress Disorder. Next, Michelle Anderson illustrates differential decision making among appellate courts in rape cases where women in prostitution were the victims.

And while most of the other articles are supported by research and sound logic, the article, "Gay Male Pornography's 'Actors': When 'Fantasy' Isn't" (p., 93), by Christopher Kendall and Rus Funk, is an opinion desperately searching for support. It follows the logic, "Feminist scholars have amassed data supporting the following conclusions for women. The same conclusion must therefore be true for gay males."

In "Prostitution Online" (p., 115), Donna M. Hughes explains that global communications have allowed the consumers of sex services more privacy and less isolation while leaving the victims more exposed and possibly more open to harm. Wendy Freed then summarizes her findings from interviews of women and girls in prostitution in Cambodia. Her tentative conclusions correlate closely with the literature relating to brothel prostitution in Southeast Asia.

Ugarte, Zarate, and Farley then explain the difficulties in providing resources and services to insure the safety and give immigrant protection to children trafficked across the U.S./Mexican border. Next, Dorchen Leidholdt develops a strong logical argument that sex trafficking consists of the same substance as prostitution. She concludes that trafficking is international or transnational prostitution, and that prostitution may be defined as domestic trafficking.

Arising from her research with prostitutes in Phoenix, Arizona, Lisa Kramer follows with suggestions to help substance abuse counselors, therapists, and social workers as they provide treatment and services. In summarizing literature on dissociative disorders, Ross, Farley, and Schwartz conclude that dissociation is common among women working in all facets of the sex industry. Vednita Carter, on the other hand, argues the existence of a historical link between prostitution and traditional American slavery as it affects the self determination of African-American women.

A second scientifically weak article in this volume is authored by Ulla-Carin Hedlin and Sven Axel Mansson. Their conclusion, which offers little that can be applied to the lives of other women in P/T, is that women have a chance to successfully escape P/T if they have loving, caring, supportive families.

Jannit Rabinovitch describes "PEERS," a Canadian organization developed and managed by survivors of prostitution. PEERS is shown to have a high success rate in helping women successfully escape prostitution. Next, Shoaling, Burris, Johnson, Bird, and Melbye describe "SAGE," a P/T survivor-run organization based upon a peer leadership model which also has a demonstrated success record.

In the seventeenth document, Margaret Baldwin explains the techniques of helping women from P/T apply for and receive assistance from public agencies. The final document, written by Janice G. Raymond, consists of a ten-point argument against the legalization of prostitution; and a legal response to the demand for prostitution.

Viewed in its entirety, this work is thought-provoking, well-documented, and well-written. Sixteen of the articles display logical consistency, research support, and are valuable additions to the scientific literature. Two are not of the same substance, thus the reason for their inclusion is a mystery.

Initially, the criminal justice scholar may question the decided bias of the editor and authors; however, the contemporary sex trafficking and prostitution literature is characterized by an unyielding polarity over the attached issues. With this understanding it must be determined that Melissa Farley, and the included authors, have presented a valuable, timely addition to the scientific literature.

BIOGRAPHICAL SKETCH

Edward J. Schauer was instrumental in the recent development of the Texas Juvenile Crime Prevention Center, the College of Juvenile Justice and Psychology, and the first doctoral program in juvenile justice, all at Prairie View A&M University. His research interests lie in the areas of sex trafficking and prostitution. He received his Ph.D. from Sam Houston State University.