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### **Western Criminology Review**

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# Systematic Reviews and Meta-Analyses: Best Evidence on "What Works" for Criminal Justice Decision Makers\*

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Abstract. With the current emphasis on making "evidence-based policy," criminal justice policymakers today are under more pressure to use research in their decision making. Systematic reviews and meta-analyses can provide policymakers with reliable and comprehensive evidence about what works to reduce crime or improve justice. It is important that decision makers become more familiar with this method. In this article, we present a non-technical summary of systematic reviews. After discussing the need for different evidence to respond to different questions, we examine some of the challenges in locating "evidence." A common method for reviewing literature—the narrative or traditional synthesis—contains a number of methodological flaws that have contributed to the current emphasis on rigorous or systematic reviewing techniques. We consider two policy-relevant examples of systematic reviews addressing popular justice programs (Scared Straight and D.A.R.E.) and conclude with the argument that systematic reviews and meta-analyses offer the most useful information to decision makers who want to base their decisions on "what works" rather than ideology, tradition, politics, or anecdote.

**Keywords:** decision making; policy; evaluation; systematic review; meta-analysis

#### Introduction

Policy initiatives based on rigorous evidence are strongly encouraged within the field of crime prevention today (Coalition for Evidence-Based Policy, 2003). Determining what kinds of evidence should drive decision making about policing, courts, corrections, neighborhood prevention, and other domains for intervention is challenging. Evaluation studies come in all forms, vary on many dimensions, and sometimes conflict. It is tempting to pick out the study that seems most influential or important, and use that to guide decision making. A single experiment certainly can be influential, and may provide good answers to decision makers in the jurisdiction in which it was implemented. If widely publicized, the study may spur other researchers to conduct a new wave of theoretical and methodological studies. But it seems sensible that an evidence-based approach to what works in crime and justice should go beyond the selective consideration of one or a few influential studies.

Systematic reviews can greatly assist policymakers in

identifying effective programs and interventions and are considered an important tool among those who advocate evidence-based policy (Davies, 1999; Nutley, Davies, and Tilley, 2000). In systematic reviews, researchers attempt to gather relevant evaluative studies, critically appraise them, and come to judgments about what works using explicit, transparent, state-of-the-art methods. In contrast to traditional syntheses, a systematic review will include detail about each stage of the decision process, including the question that guided the review, the criteria for studies to be included, and the methods used to search for and screen evaluation reports. It will also detail how analyses were done and how conclusions were reached.

Systematic reviews have much to recommend them. Their foremost advantage is that when done well and with full integrity, they provide the most reliable and comprehensive statement about what works. Such a final statement, after sifting through the available research, may be "we know little or nothing—proceed with caution." This can guide funding agencies and researchers toward an agenda for a new generation of evaluation studies. This

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can also include feedback to funding agencies where additional process, implementation and theory-driven studies would be critical to implement.

Systematic reviews have other byproducts. By demonstrating irreconcilable conflicts, they go beyond the obvious "more research needed" to provide a specific research agenda. Because each primary study report is scrutinized, systematic reviews can underscore deficiencies in report writing and lead to better systems for collecting the data that is required by reviewers, including guidelines for editors to use before publishing original research. Reviews also ensure that relevant evaluations—which may have been ignored and long forgotten—are eternally used to respond to inquiries about what works. It is satisfying to investigators to find their study still considered twenty years or more after completion.

In his 1997 book, science writer Morton Hunt explained how the results from meta-analysis contradicted the conclusions drawn by earlier reviewers using traditional methods. For example, he wrote that quantitative estimates from meta-analyses of correctional treatment studies consistently show more positive effects for intervention on recidivism than earlier reviews. One of the reasons that meta-analyses came to different conclusions is that this method took into account the actual size of the effect reported in the study, rather than using statistical significance as the sole criterion for judging whether a program worked or not. In contrast to the pessimistic findings in earlier narrative reviews, such as those reported by Bailey (1966), Logan (1972) and Martinson (1974), meta-analyses across all areas of social, psychological and educational treatment have established that intervention generally has a small, positive—but non-trivial—effect on measured outcomes (Lipsey and Wilson, 1993). Palmer (1994) noted that meta-analyses of correctional interventions have helped to somewhat counter the prevailing pessimism generated by earlier reviews.

This article will present information about why we believe systematic reviews have a distinct advantage over other types of information for making policy decisions related to crime prevention. We begin by acknowledging the need of different evidence for different questions and address some of the challenges policymakers face when attempting to locate the evidence they need. We then propose systematic reviews as a solution to these challenges, discussing the various purposes and types of reviews, along with the limitations of each. Two relevant examples in criminal justice are presented. We conclude with a discussion of the benefits of using systematic reviews and meta-analyses in policymaking and lay

out an agenda on how these syntheses could become a centerpiece of evidence-based decision making in criminal justice.

#### **Different Evidence for Different Questions**

Policymakers need a wide range of information to inform their decision making. These needs require different types of scientific evidence (Boruch, 1997). To identify the scope and severity of a problem, for example, epidemiological data from sample surveys or trend data from official government statistics and reports (such as crime rates based on the Federal Bureau of Investigation's Crime in the United States: The Uniform Crime Reports) are available. These data respond to the question: "What is going on?" To obtain information on risk factors that lead some children to become criminals while others become law-abiding citizens, one would look to etiological studies (e.g., longitudinal studies that follow children to adulthood). These types of studies answer questions such as "how did this problem occur?" Determining "what works" to reduce crime, however, requires a different type of scientific evidence. In this case, data from outcome or summative evaluations, or those studies that have tested the impact of some intervention on an outcome measure of crime, are necessary. The question under consideration, then, drives the type of evidence required for an answer.

Evaluation studies have an advantage over drawing conclusions about whether a program works based on anecdotal evidence. 'Stories' are important, but they are prone to bias. It is rather easy, for example, to find a compelling story or anecdote to demonstrate that an intervention worked, or conversely, that it failed miserably. Personal experience with a program might also result in skewed views about what works. One of Rossi's (1987) lessons from his experience with program evaluation was that staff and clients invariably will love the program they are participating in. The objective data will not support their enthusiasm, and when the report is issued, the evaluator will not be invited to dinner! Evaluation studies, however, aim to reduce bias by systematically testing the effects of an intervention using social science methods. Thus, evaluation reports provide the evidence policymakers should seek when requiring information on the effectiveness of crime prevention and other justice programs.

#### **Challenges to Finding Evidence**

Although an evidence-based approach is strongly endorsed within the field of crime prevention today, sev-

eral challenges face the policymaker who desires to use evidence in decision making. Among these challenges are information overload, fragmentation of research across fields, difficulty of locating reports beyond those published in peer review journals, unevenness in methodological quality among studies, and selective use of evidence by advocacy groups.

Research, like other information, is now being disseminated through various outlets. The Internet and World Wide Web make a wide range of research information and reports from around the globe—some of it of questionable quality—available in seconds. Although the indisputable benefit of this progress is that more information is easily accessible to a broader audience, the negative impact is that too much information is produced for anyone to comprehend and stay abreast of. In addition to the challenges inherent in sifting through the enormous volume of information available, research relevant to criminology is often found in divergent fields. Besides criminological journals, periodicals in sociology, public health, psychology and education routinely publish studies relevant to criminal justice.

Yet, despite these technological advances and burgeoning publication sources, some evaluation reports remain difficult to find. A rather large number of evaluation studies are located in what Sechrest and his colleagues (1979) call the "fugitive literature" or in what Hopewell and colleagues (2006) refer to as the "grey literature." The term "fugitive literature" is especially appropriate to use in criminological circles because the documents are so difficult to identify and retrieve, much like criminals on the lam. Such studies, however, are part of the "evidence" to consider. Examples are governmental reports, doctoral dissertations and master's theses, conference papers, technical documents, studies done in foreign countries, and other literature that is not published in readily accessible sources. Lipsey (1992), in his review of delinquency prevention and treatment studies, found that approximately four of ten were reported outside of journals or academic presses.

Some may argue that unpublished studies are of lesser quality because they were not published in peer-reviewed scientific journals. Such an assertion, at the very least, ignores the high quality evaluations done by private research firms. For example, Greenberg and his colleagues (1999) reported that Abt Associates, a private research firm in Cambridge, Massachusetts, conducted over 25 percent of the randomized trials in social market effects (e.g., employment programs). Many of these were never published in journals, most likely due to the fact that evaluators in entities such as Abt Associates do not have

the organizational incentives to publish in peer-review journals as professors and university-based researchers do

Even if all evaluation reports were easily accessible, there is great variation in the type of design and quality of methods used. More often than not, the results across studies of the same intervention will differ, sometimes substantially so, and it is likely that some of that difference is due to methodological characteristics of the studies (Lipsey, 1992). DiIulio (1991) suggests that this methodological variation provides easy fodder for special interest groups and politicians to exploit; he contends that rigorous evaluations such as randomized experiments provide far less leeway and are not as easily exploited. This point dovetails with Hacsi's (2002) finding from case studies in educational evaluation research, in which proponents and opponents selectively used evidence, regardless of its quality, to support their presupposed positions on matters such as whether the federal government should support Head Start (preschool) or reductions in average class size.

Policy-relevant questions such as "what works to reduce crime in communities?" or "are there effective programs in reducing offender recidivism?" are not easily answered. The studies that bear on these questions are often scattered across different disciplines, are sometimes disseminated in obscure or inaccessible outlets, and can be of such questionable quality that interpretation is risky at best. Compounding these challenges, political and special interest groups selectively use evidence to promote a particular position. How then can policy and practice be informed by such a fragmented knowledge base, comprised of evaluative studies that range in quality? What study, or set of studies, if any at all, ought to be used to influence policy? What methods should be used to appraise and analyze a set of separate studies bearing on the same question? We believe that systematic reviews and metaanalyses provide policymakers with the best evidence, however imperfect, to guide their decision making.

#### **Sources and Presentation of Evaluation Studies**

Policymakers often obtain their information on what works from media outlets such as daily newspapers, weekly periodicals such as *Newsweek*, and television news shows such as *60 Minutes* (Weiss and Singer, 1988; Forsetlund and Bjorndahl, 2002). Media outlets typically report findings from a single study (the latest and, assumedly, the greatest). In reality, only a few of the presumably thousands of studies relevant to crime and justice conducted each year receive any media atten-

tion. Their notoriety may be due to a number of factors: a well-known investigator or research firm may have conducted the study, study results are controversial or go against conventional wisdom, powerful advocacy groups have seized the findings to advance their agenda, or the researchers have used a public relations approach to disseminate their work (Weiss and Singer, 1988). This study can then become the definitive work among the policy and practice community about "what works." A study reported in the news media and reaching a wide audience is more likely to change perceptions about the nature of the problem and the effectiveness of the intervention than is one reported in obscure scholarly journals reaching a narrow set of academicians (Weiss, Murphy-Graham, and Birkeland, 2005).

Regardless of whether a study is reported in the media or in a peer-reviewed journal, it may be possible that decision makers will have to act upon a single study because that is all the scientific evidence available. For example, many advocate quality preschool programs as a crime prevention strategy (Wilson and Hernnstein, 1986), but these recommendations are based primarily on the results of a single long-term evaluation that examined the effects of the Perry Preschool curriculum on the arrest records of the children who participated (Schweinhart, 1987). Following children from preschool for up to 25 years is an expensive proposition, and this is most likely the reason why only one study on the effects of quality preschool on crime has been reported.

Relying upon one or even a few studies *if others are available* is problematic. For example, if only one study (e.g., the Perry Preschool experiment) has been reported and we rely on it to make judgments about what works, we are relying on 100 percent of the available evaluation research. If five similar studies have been conducted, relying on only one study means that we draw on only 20 percent of the available evidence (Cook et al., 1992). Increase it to 20 relevant studies—and we would rely upon only 5 percent of the available evidence!

It is possible, however, that one study does represent the other studies quite well. Or, it may be that the one study is the very best of all those conducted. Studies in a particular area sometimes do converge, but in other cases, they conflict. A particular study, or even a few studies, may be unrepresentative of all the evidence. Any assertion that a study represents the 'norm' remains unsupported unless all relevant studies are examined.

Roberts (2000) underscores the importance of taking all studies into account in his review of medical evaluations of a blood plasma solution, known as human albumin, in treating the critically ill. He reviewed randomized trials

testing the effects of albumin on the subsequent mortality of patients. Some of the studies, particularly those that were publicized in the medical literature, showed that albumin was successful in reducing mortality among patients. But Roberts (2000) made a concerted effort to locate all of the relevant clinical trials, particularly those that never reached the journals. His review indicated that, on average, albumin increased the mortality of seriouslyill patients relative to doing nothing at all. He notes that British newspapers soon carried stories about his review, and estimated that the use of albumin cost 500 lives a year in the United Kingdom (Roberts, 2000). The pharmaceutical companies that manufactured albumin were unhappy, as the U.K. government soon issued guidelines against the treatment, leading to plummeting sales of albumin. Using only one or a few of those published studies might have led Roberts or anyone else to conclude that albumin was effective.

In criminal justice, Sherman and Berk (1984) conducted the seminal Minneapolis Domestic Violence Experiment, reporting that arresting misdemeanor domestic violence offenders was the most effective option for police, compared to the traditional strategies of separating the offender and victim for eight hours or attempting an informal mediation between the parties at the scene. If policymakers were to rely solely upon the Minneapolis study, many jurisdictions would continue to mandate arrest for police officers responding to misdemeanor (non-felony) domestic violence calls. In fact, the number of departments adopting such a policy after the Sherman and Berk (1984) report was staggering (Sherman and Cohn, 1989). There have now been five replications of the Minneapolis study and serious questions have been raised about whether arrest is an effective response to all misdemeanor domestic violence cases (Sherman 1992). To conclude that arrest "works" on the basis of the earlier Minneapolis experiment without taking into account the results of these subsequent replications seems misinformed.

Learning what works requires more than examining the isolated results of one or two evaluations. Lipsey (1997) noted that each evaluation study is part of a cumulative "brick-building" process in constructing knowledge about interventions and implementation. The only way this information can be mined is by identifying the accessible studies, analyzing them for what they tell us, and gleaning new discoveries from them. In short, this process is known as knowledge building or accumulation. But how do we accumulate knowledge from separate but similar studies? The method used to systematically examine separate but similar studies is the research review.

#### **Research Reviews**

Reviews typically summarize a number of different reports to draw conclusions (Khan et al., 2001). Of course, almost every individual report contains some type of review to frame the current study or argument. These literature reviews are typically rather brief, as they are not meant to be the focus of the report. Our definition of a research review is a report that goes beyond a cursory synthesis and focuses on the results of prior studies in order to draw conclusions from them.

We note that reviews may serve many different purposes. For example, researchers may conduct *critical reviews* in which they use a series of available empirical studies to highlight certain important issues upon which they would like to focus. Canadian researchers Ross and Price (1976) did exactly this in their review of research on behavioral modification programs. They covered a multitude of issues, including the lack of evidence on effectiveness, the type of clients who should be served, and how institutions were currently managing behavioral modification. In critical reviews, the research evidence is selectively used to highlight crucial issues.

Reviews can be written to provide state-of-the-art reports. In contrast to reviews in which critical issues are identified, state-of-the-art reviews often take the form of a discussion of recent studies in order to document advances made in dealing with a particular problem. Farrington (1994) provides an example of such a review in the area of early developmental and childhood prevention. He drew upon the findings of several recent evaluation studies to show that programs that featured components like visiting the homes of expectant mothers from impoverished areas can be beneficial. State-ofthe-art reviews can bring us up to speed on policy and practice innovations, and inform us about recent program victories or failures. The focus of this type of review is to illustrate what is possible, and what successes have been reported.

Comprehensive reviews cover a wide range of studies in order to address multiple, related issues. Textbooks for college studies often contain this type of review, skimming the most influential studies in a variety of areas but not delving into any one too deeply (Oxman and Guyatt, 1988). Some of the more influential reviews in criminology and justice are like this. For example, the University of Chicago publishes the annual volume, Crime and Justice: An Annual Review of Research. Although published by a different press, this series is very similar to the Annual Review publications in psychology, sociology, and public health (see www.annualreviews.org). In short,

each volume usually contains a series of comprehensive, multi-interest articles that summarize research to draw conclusions about a number of different issues. Rarely is the focus of those papers solely on the effectiveness of a particular intervention, or set of interventions.

Government task forces, or quasi-government bodies such as the National Academy of Sciences, often issue large, comprehensive syntheses on a wide range of interests. The goal of such reviews is to discuss pertinent policy, practice and research issues relevant to the topic, rather than summarily conclude what works. Effectiveness may be one of the score of issues addressed. Available studies are used to selectively highlight certain points. These reviews can be important. In the case of the National Academy of Sciences, they are approved by a panel of diverse members, including experts on opposing sides of issues (Weiss, personal communication). They sometimes represent a strong consensus statement, and politicians are comfortable using them for agenda setting. But since reports like those issued by National Academy panels cover lots of ground, they are not normally designed to provide a definitive answer about "what works." When they do include such material, just as textbooks, it is given only a very cursory treatment, sometimes relying on the most recent or well-known evaluation studies.

It is important for policymakers to identify the purpose of a review before using it as a source of information and decision making, as well as understand the types of research reviews commonly seen in the literature. Research reviews designed to find out "what works" generally are one of two types: traditional or systematic.

### The Traditional or Narrative Review of "What Works"

There is a half-century of history in criminology of trying to pull together scientific evidence from separate but similar studies into a single review (see Kirby, 1954, for an early example). The earliest reviews, though sometimes remarkable in their exhaustiveness, generally used narrative or qualitative methods in coming to conclusions. Reviewers often read studies and used some type of unknown and inexplicit process of reasoning (i.e., what Bushman and Wells [2001] called 'mental calculus') to determine what works or did not. This is not to say that the process was based on nefarious motives, ill will, or unscientific principles. Usually these reviewers made judgments on the basis of whether the study was believable according to methodological factors like internal validity.

Methods for analyzing separate but similar studies

have a century of application. It was not until the 1970s, however, that methods for conducting reviews were scrutinized the same way that methods for surveys and experiments have always been. This was ironic, as some of the most influential and widely-cited papers across fields were literature reviews (Chalmers, Hedges, and Cooper, 2002). But from this increased scrutiny, three major areas of criticism of the traditional or narrative review evolved.

One set of criticisms focused on the narrative review's *lack of explicitness*. Most reviews suffered from a lack of details about how the reviewer conducted the research. Information about why certain studies were included and others excluded was often missing. The report of the review often did not describe what searches were done in order to find evaluation studies. Reviewers sometimes provided more weight to a few studies over others, but did not provide the criteria for making such judgments. Ironically, these same reviewers rarely tolerated the same lack of explicitness in reports they included in their own reviews! In the end, the reader of most narrative reviews was forced to accept and trust the reviewer's expertise rather than put the conclusions to test.

Because of the lack of explicitness, it was difficult for the serious reader to determine how the reviewer reached conclusions about what works. This includes the criteria used to judge an intervention's success. Consider the debate over the conclusions in the Lipton, Martinson, and Wilks (1975) summary of over 200 correctional program evaluations, briskly reported first by Martinson (1974). Despite finding that nearly half of the evaluations reported in Martinson's paper had at least one statistically significant finding in favor of treatment, his overall conclusions were gloomy about the prospects of correctional intervention. The criterion for success was not readily known, but it must have been incredibly strict (Palmer, 1975).

A second set of criticisms focused on the *methods* used in the reviews. Most of the reviewers did not attempt to control for problems that could potentially bias their review toward one conclusion or another. At its worst, a reviewer advocating a position could selectively include only those studies favoring that viewpoint. For example, a reviewer in favor of strict gun control laws could ignore evaluations that report little effect for such laws. Far more likely than intentional distortion was how narrative reviewers failed to deal with *potential* biases. For example, some reviewers examining what works may rely on easy-to-get journal articles as the only source for reports of evaluations. But research in other fields suggests that relying on journal articles can bias the results

toward concluding that interventions are more effective than they really are (Berlin, Begg, and Lewis, 1989). This is because researchers in those fields were found to be more likely to submit their manuscripts to journals when they find a positive result—and more likely to bury the manuscript in their file drawer when they do not (Berlin et al., 1989).

Because the rules of scientific rigor and explicitness are not applied with equal force to the narrative review, the reviewer runs the risk of selectively including and excluding studies (Cooper, 1989; Wolf, 1986). Selection bias in literature reviews can lead to different published conclusions, as illustrated by the vast differences across sex offender treatment outcome studies:

Vernon Quinsey's (1984:101) conclusion in his review of recidivism studies of rapists applies to this broader review as well: 'The differences in recidivism across these studies are truly remarkable; clearly by selectively contemplating the various studies, one can conclude anything one wants' (Furby, Weinrott, and Blackshaw, 1989:22).

Another set of criticisms has to do with *practicality*. Traditional reviews have difficulty coping with the growth of research. Relying on available journals in a library or the papers collected in office files will no longer ensure coverage of the available studies. In the same way that it would be difficult to make sense of a large, growing and scattered collection of police reports or prison folders without orderly methods, it is also difficult to make sense of the burgeoning number of relevant evaluation studies without some systematic process for doing so.

Although narrative reviews of program evaluations can be influential (Martinson, 1974), they are considerably more difficult to conduct as the number of studies under review increases. Reaching conclusions from the results of multiple studies is risky when the populations, settings, study characteristics, and interventions vary widely across research reports (Wolf, 1986). It is difficult to examine interaction effects under such conditions without statistics. As Glass and his colleagues (1981) noted, accurately summarizing a considerable number of outcome studies is just as difficult without quantification as a large number of survey responses or case files. Cooper stressed the need for rigor to cope with the increased numbers of scientific studies (1989:145):<sup>2</sup>

Because of the growth in empirical research, the increased access to information, and the new tech-

niques for research synthesis, the conclusions of research reviews will become less and less trust-worthy unless something is done to systematize the process and make it more rigorous. Because of the increasing role that research reviews play in our definition of knowledge...adjustments in procedures are inevitable if social scientists hope to retain their claim to objectivity.

The narrative or traditional review, therefore, has a significant number of methodological limitations that compromise its ability to provide sound evidence to decision makers in criminal justice. The alternative method for synthesizing studies, now referred to as the systematic review, has its roots in the creation of quantitative reviewing or meta-analysis in the psychology and education fields in the 1970s.

#### A Brief History and Overview of Meta-Analysis

About the same time that the traditional review was coming under heavy criticism, the modern statistical foundation for quantitative reviewing was being developed (Glass, McGaw, and Smith, 1981; Hedges and Olkin, 1985). In 1976, Gene Glass coined the term metaanalysis to describe quantitative approaches to reviewing studies. He and Mary Lee Smith deserve much credit for popularizing this approach by applying this technique to research on the effects of psychotherapy (Smith and Glass, 1977) and class size (Glass and Smith, 1978). Glass (1976) popularized a standardized effect size measure for expressing the difference between experimental and control groups in standard deviation units. Using this numeric effect size as a dependent variable, Smith and Glass (1977) were able to quantify over 400 psychotherapy experiments. They concluded, in contradiction with some of the notable narrative reviews on the issue (Eysenck, 1961), that subjects exposed to psychotherapy experienced—on average—a strong, beneficial effect when compared to control group subjects.

Using the standardized effect size measure—or common metric—moved the emphasis of the review from statistical significance, which can be misleading, to the actual magnitude of effect the experimental treatment achieved. The common metric expresses the difference between the groups in a manner that is independent of statistical significance.

The Smith and Glass (1977) findings led to extensive use of meta-analysis in the fields of psychology and education. Its popularity soon spread to other fields, particularly medicine and business, with the technique receiving national press coverage (Mann, 1994; Strauss, 1991). Other researchers were simultaneously developing their own statistical approaches to synthesis (Hunter, Schmidt, and Jackson, 1982; Rosenthal, 1991; Hedges and Olkin, 1985).

Most meta-analyses of research on the effects of social or educational interventions follow a similar path. After identifying eligible studies, the researchers create a measure of "effect size" for each experimental versus control contrast of interest in the study. Most commonly, reviewers do this by standardizing the difference between scores of the experimental and control groups, placing outcomes that are conceptually similar but measured differently (such as rearrest or reconviction) on the same common scale or metric. Though these are different indices, they do measure a program's effect on some construct (e.g. "criminality"). These effect sizes are usually averaged across all similar studies to provide a summary of program impact. The effect sizes also represent the "dependent variable" in the meta-analysis, and more advanced syntheses explore the role of potential moderating variables, such as sample size or other characteristics on effect size. Many texts on meta-analysis have been produced over the past two decades and can be consulted for further details on the methods involved (Lipsey and Wilson, 2001; Cooper and Hedges, 1994; Hedges and Olkin, 1985).

#### The Lexicon of Research Reviews

Although there is some confusion about the term, meta-analysis involves the quantitative analysis of prior research results. Khan and his colleagues (2001) define meta-analysis as "the use of statistical techniques to combine the results of studies addressing the same question into a summary measure." The term "systematic review" became popular in the 1990s in medicine to overcome inadequacies in the term meta-analysis. First, researchers may sometimes have very good reasons for not using meta-analytic or quantitative methods to summarize studies. This does not mean that their reviews were unsystematic. For example, a reviewer may find that there are few studies meeting the eligibility criteria for inclusion into the review. Such was the case in a systematic review of treatment of sexual offenders reported by White and his colleagues (1999). They conducted a vigorous search and retrieval effort to locate randomized experiments testing interventions for that population. They located only three experiments that met their eligibility criteria, and attempted no quantitative synthesis. The review was systematically performed, and was important in pointing out that the evidence base in this area is scant, requiring vigorous investment in experiments. But it was not a meta-analysis.

Another shortcoming of the term meta-analysis is that it could include quantitative reviews that used inexplicit or biased methods. For example, a quantitative review that does not describe the search methods used would still be called a meta-analysis.

Using the term "systematic review" seems to get us out of some of those quandaries but may lead us into others. One general rule used to define a systematic review is that it will usually include a "methodology and results" section. But a review could use systematic methods to summarize evaluation studies, and then rely on "statistical significance" to make judgments about "what works." This definition would classify such a review as systematic even though there are empirical reasons undermining its conclusions. The definition of systematic review created by Khan and his colleagues at the NHS Centre for Reviews and Dissemination (2001:1) would also treat vote counting, a formerly popular method of summarizing studies within a review, in similar fashion:

A review of the evidence on a clear formulated question that uses systematic and explicit methods to identify, select and critically appraise relevant primary research, and to extract and analyze data from the studies included in the review.

Given the definitional problems, we prefer to think of systematic reviews as ranging on a continuum of quality. At one end, a systematic review may include a methods and results section with very brief details provided and rudimentary analysis. At the other end, the review may be written in very explicit fashion with state-of-the-art statistical techniques applied. The Cochrane Collaboration is an international organization specializing in such upperend systematic reviews, though most of their syntheses are relevant to health care issues (Chalmers and Altman, 1995). They have developed a list of steps in conducting systematic reviews at the upper end of this continuum:

- 1. The question guiding the work is explicit and can be answered by a systematic review;
- 2. The eligibility criteria for studies to be included is explicit;
- 3. The search methods are comprehensive and designed to reduce potential bias;
- 4. Each potentially eligible study is screened against the criteria with exclusions justified and recorded
- 5. The sample of eligible studies and the corresponding data set is the most complete possible;

- 6. If meta-analysis is possible, the methods are technically appropriate;
- 7. If statistical analyses are used to examine subgroup effects, they are technically appropriate; and
- 8. A structured and detailed report, explicitly reporting each stage of the review, is produced.

Systematic reviews, therefore, include reviews in which rigorous methods are employed regardless of whether meta-analysis is undertaken to summarize, analyze and combine study findings. When meta-analysis is used, however, estimates of the average impact across studies, as well as how much variation there is and why, can be provided. By using meta-analysis, we can generate clues as to why some programs are more effective in some settings and not others.

#### Criticism of Meta-Analyses and Systematic Reviews

Meta-analyses and systematic reviews are not without criticism. The most frequent criticism leveled is commonly referred to as the "apples and oranges" critique (Lipsey and Wilson, 2001). This criticism charges systematic reviews and meta-analyses for mixing vastly different studies together (e.g., by including heterogeneous study findings [Eysenck, 1994] or by including studies of differing methodological quality) to produce a single estimate of treatment effect. Gorman (1995) criticized a meta-analysis of eight outcome studies of Drug Abuse Resistance Education [D.A.R.E.] by claiming that the review team mixed together apples, oranges and a few poorly-done studies, or lemons! But some have argued that the apples and oranges criticism is not appropriate if the goal of the review is to broadly analyze "fruit" (Rosenthal and DiMatteo, 2001).

There have been a number of advances in methods to address the apples and oranges criticism, specifically regarding heterogeneity and methodological variability issues. Setting sensible eligibility criteria can reduce some of this variability before the sample of studies is collected and analysis begins. Moreover, reviewers now code the methodological, contextual, and treatment characteristics—often in excruciating detail—and explore how these variations impact estimates of treatment effect in the meta-analysis (Lipsey and Wilson, 2001). Another common method in meta-analysis is to conduct statistical tests of homogeneity to determine if the effect sizes obtained from the sample of studies is significantly different from what would be expected by chance or sampling error. If the "test of homogeneity" is significant, then the meta-analyst should assume that there are meaningful subgroups or moderating influences in the database of studies (Cooper and Hedges, 1994). It is now uncommon, because of these methods, to uncover meta-analyses that report only a single overall effect size to represent a heterogeneous sample of studies. Note that systematic reviews and meta-analyses attempt to address the apples and oranges criticism with explicit and transparent methods. Narrative and traditional reviews are also subject to the apples and oranges criticism but lack an arsenal of methods to respond to it.

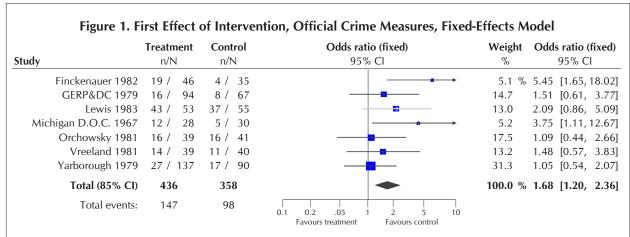
### An Example of a Systematic Review of a Single Program: Does 'Scared Straight' Work?

Petrosino and his colleagues (2003) reported on the effects of Scared Straight and other juvenile awareness programs. These "kids visit prisons" programs are meant to deter juvenile delinquents or children at risk by making them aware of the grim realities of prison life. Many of these programs feature a "rap session" in which prisoners brutally describe what institutional life is like, in an attempt to deter youngsters from committing crimes. Although researchers have long believed that this type of program was ineffective and possibly harmful, it has remained in use and has even experienced something of a revival in recent years. Although other reviewers had included Scared Straight as one of several programs included in their reviews, there was no existing systematic review focusing solely on evaluations of this program.

Petrosino and his colleagues (2003) conducted a rigorous search for randomized experiments that examined the effects of the Scared Straight program on subsequent measures of crime. Their methods included electronic searches of abstracting or bibliographic databases, contact with colleagues and research centers, visually examining the contents of bound criminological journals (i.e., "handsearch"), and tracking citations listed in existing reviews. Their techniques located nine randomized experiments reported between 1967 and 1992, including five unpublished studies. All of the experiments included a no-treatment control group, and seven of the nine reported data that could be statistically combined in the meta-analysis.

A common approach to analyzing data in meta-analysis is to use a forest plot of the odds ratio for each study. An odds ratio is simply the number of events (such as the number of juveniles failing or being arrested) divided by the number of "non-events" (number of juveniles succeeding or not being arrested). An odds ratio of "1.0" means that the program did not increase or decrease a juvenile being successful (not arrested). A 1.0 is a precise "no difference" effect, or effect of zero. Odds ratios above 1.0 mean that the program increased the failure rate; similarly, odds ratios below 1.0 mean the program was successful in reducing subsequent arrests.

Figure 1 presents the forest plot for the seven experimental studies of Scared Straight and other juvenile awareness programs. All seven report negative effects for the treatment group. In other words, children participating in the juvenile awareness program did worse than juveniles who did not. Petrosino et al. (2003) concluded that Scared Straight methods were not effective



Test for heterogeneity chi-square = 8.50 df = 6 p = 0.20  $l^2$  = 29.4% Test for overall effect z = 3.01 p = 0.003

Note: n=number of participants reoffending; N=number assigned to group; Cl=confidence interval; weight=amount of weight given to study in analysis; GERP&DC=Greater Egypt Regional Planning and Development Commission; D.O.C.=Department of Corrections.

Source: Petrosino, et al. (2003)

in deterring subsequent crime, and likely had a backfire or toxic effect on juveniles. What is remarkable is that a meta-analysis of nearly 400 experimental or well-controlled quasi-experimental evaluations of preventative or treatment interventions for juvenile delinquency showed that nearly two-thirds (64%) were positive in direction (Lipsey, 1992). The Scared Straight studies clearly go against the trend of most juvenile intervention showing positive effects. This meta-analysis underscored that presumably beneficial interventions can go against conventional wisdom and best intentions and have a negative impact on the very juveniles and citizens policymakers and practitioners desire to help.

### An Example of a Systematic Review Comparing One Program With Others: Does 'D.A.R.E.' Work?

One of the most popular school-based drug prevention programs in the world is Drug Abuse Resistance Education, or D.A.R.E. Initiated in 1983 as a joint project between the Los Angeles Police Department and Unified School District, the core program used uniformed police officers to deliver a 17-week curriculum (lasting one hour per week) to 5th and 6th grade students (i.e., 10-12 year olds). Several early evaluations were positive, and the program quickly expanded with federal funding throughout three-fourths of the nation's school districts (Rosenbaum and Hanson, 1998).

Given the federal investment in the program, it was only natural that decision makers would wish to know whether D.A.R.E. worked to reduce drug use and led to better attitudes toward the police. The National Institute of Justice issued a solicitation for an evaluation of the research on D.A.R.E., and after a peer review process, selected the Research Triangle Institute (RTI) in North Carolina to conduct the study (Ennett et al., 1994). RTI followed the tenets of systematically reviewing evidence. They were explicit in their procedures, used methods to reduce bias, and presented a detailed report outlining what they did and why they did it. Although there were many uncontrolled studies on D.A.R.E., their extensive searches turned up only eight evaluations that used either a randomized field trial or rigorous quasi-experimental procedures. They examined the outcomes of self-reported drug use, attitudes toward police, attitudes toward drugs and knowledge about drugs. For each of these measures, they created a standardized effect size expressing the difference between the experimental and control groups.

Their results showed that D.A.R.E. had positive impacts on knowledge, but the findings were less persuasive when it came to attitudes or behavior. Given that the

researchers at RTI used effect size rather than odds ratios, it was difficult to understand how D.A.R.E. was faring without a basis for comparison. They did not collect a sample of evaluations of other types of drug prevention programs to compare to D.A.R.E. To remedy this, they worked with Nancy Tobler, who had conducted several earlier meta-analyses of school-based drug prevention programs. Using the Tobler database, the RTI researchers identified programs delivered to 5th and 6th graders (like the core D.A.R.E. curriculum) and classified them as "interactive" or "non-interactive." Interactive programs were those that involved role-playing and modeling and did not rely on straight lectures providing information. Non-interactive programs involved little more than providing information to youngsters about the harm of drugs. Although the authors did not attempt to define how interactive D.A.R.E. was, the program was weighted toward the officer delivering a standardized curriculum in the classroom and likely fell somewhat in-between the interactive and non-interactive groupings.

The comparison data were telling. Although D.A.R.E. did better on some measures than "non-interactive" programs, the evidence showed that drug prevention defined as "interactive" was far more effective with 5th and 6th grade students than D.A.R.E. This was true across measures of attitude, knowledge and self-reported drug use. Even though self-reported drug use (which included to-bacco, alcohol and marijuana) were small for all groups, the positive impact for interactive programs was three times the size of D.A.R.E. Without this comparison data, it is unlikely that the review would have generated much controversy (Elliot, 1995). But given the results, some questioned whether the federal investment in D.A.R.E. was really worth it all, and whether these more effective alternatives should be supported.

### A Modest Agenda for Improving the Policy-Review Connection

What if a wide range of systematic reviews could be produced on a large scale, and made available in rapid fashion to decision makers in criminal justice? This electronic archive could provide a resource for federal, state, and local decision makers to access so they can determine "best evidence" on what works for a variety of interventions relevant to reducing crime and making the justice system fairer and more effective. Inspired by the success of the Cochrane Collaboration in health care (www.cochrane.org), the international Campbell Collaboration (www.campbellcollaboration.org) was inaugurated in 2000 to prepare, update and disseminate systematic

reviews in social science. The Campbell Collaboration (C2) initiated review groups to supervise work in three substantive areas: education, social welfare, and crime and justice.

The Campbell Crime and Justice Group (CCJG) now oversees a portfolio of over 40 titles. The Scared Straight example, mentioned earlier, was initiated as a pilot review for the C2 and is available online (Petrosino et al., 2003). Completed reviews also exist on the effects of boot camps (Wilson et al., 2005) and the effectiveness of counter-terrorism strategies (Lum et al., 2006). The pace of producing reviews has been somewhat unsteady, likely reflecting the difficulty in both the organization and the individual teams in obtaining funds to leverage time and resources toward the review. Nonetheless, with sufficient funds the CCJG archive (and C2 in general) should become an important source of rigorous evidence on the effects of criminological and justice interventions. Longterm investment in the C2 and CCJG is needed to expand the archive so that it contains a large number of reviews, each addressing particular policy or practice questions.

The CCJG is only one of many entities producing systematic reviews and meta-analyses like the aforementioned Scared Straight and D.A.R.E. examples. Petrosino (2000) located 205 systematic—or possibly systematic-reviews of research on the effects of interventions relevant to crime, drugs or alcohol. More recently, Petrosino (2005) found 50 meta-analyses in correctional intervention alone, and these were located without a comprehensive search. Rigorous syntheses likely number in the hundreds across areas relevant to crime and justice, and represent a form of "criminological intelligence" that has not been mined or exploited in any way. No organized collection of existing reviews currently is available, and interested users have to locate them as they would any other literature, through bibliographic database searches of Criminal Justice Abstracts and the National Criminal Justice Reference System (NCJRS) abstracts.

As a parallel resource to the CCJG reviews, we propose that an electronic archive be created that would provide short, structured abstracts of existing (already available) systematic reviews and meta-analyses. There is at least one important precedent for such a database. The Cochrane Collaboration's main product is an electronic publication known as the *Cochrane Library*. Though the main part of the Cochrane Library provides access to over 1,500 completed systematic reviews of research on the effects of health care interventions, the publication also makes available other relevant databases. For example, the UK-National Health Service Centre for Reviews and Dissemination at the University of York produces the

Database of Abstracts of Reviews of Effectiveness (www. york.ac.uk/inst/crd/darehp.htm). This Centre produces structured abstracts of reviews relevant to health care, and includes mostly non-Cochrane reviews (e.g., reviews from the British Medical Journal or Journal of American Medical Association). Subscribers to the Cochrane Library also get access to this database of structured abstracts to other reviews. Such a resource, as an ancillary to CCJG reviews, could cover a range of policy and practice questions and provide fertile ground for future research and directed funding.

#### Conclusion

Though careful studies on the use of systematic reviews in decision making have not been reported in academic journals, Weiss (1978) suggested over twenty years ago-before review methods were the object of considerable attention—that policymakers would find syntheses more compelling than single studies. This is because a good review would presumably reconcile different studies that are often used by competing sides in policy debates, at least where reconciliation of distinct studies is possible. A good review would also pull together the relevant information so that policymakers or their aides (or agency staff to whom they would delegate such responsibility) would not have to spend time tracking and synthesizing data. Such syntheses would be most important when decisions about appropriations were made, particularly when governments were looking for new programs or strategies to fund.

Nonetheless, we do not wish to overzealously sell evidence, and we recognize the constraints faced by the justice policymaker (Petrosino et al., 2001). Lipton (1992) underscored the multitude of inputs into any decision, including budgetary restrictions, constituent wishes, public opinion, and reappointment or reelection concerns. Research necessarily is but one input into that process, and Weiss (1998) argues that is as it should be in a democratic society. But research evidence can and should be an important consideration in policy and practice choices made by decision makers in criminal justice. Given the explicitness, comprehensiveness, and rigor of a systematic review and meta-analysis, they should be the starting point for considerations about "what the science says" about what to do to reduce crime and increase fairness in the criminal justice system.

#### **Endnotes**

1. Research also confirmed that studies in a review are part of a sampling distribution. As such, variation

- in studies can be due to sampling error as well as real distinctions between context, intervention delivery and other factors (Cooper and Hedges, 1994). Hedges and Olkin (1985) and others have shown how quantitative techniques can be used to determine how much variation across studies is likely due to sampling error and how much is likely due to subgroup differences. Narrative or traditional reviews do not use such techniques and run the risk of attributing differences that occur because of sampling error to conflict between studies (when they actually may be in convergence).
- 2. Although the number of evaluations and other research is cumulatively and annually increasing, the number done relative to the funds invested in programming is infinitesimal.

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# Gender Similarities and Differences in Correctional Staff Work Attitudes and Perceptions of the Work Environment\*

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**Abstract.** Over the last few decades, there has been a dramatic increase in the number of women entering the traditionally male-dominated field of corrections. During this time, researchers, using a variety of different methodological techniques, have attempted to disentangle the potential gender differences among correctional personnel. In building on this research, the following study surveyed correctional staff at a Midwestern high security state prison in the fall of 2000 in order to determine whether male and female correctional staff differed in their perceptions of the work environment, as well as their general attitudes toward their jobs. A total of 28 work environment indices were measured, including occupational attitudes not traditionally examined. Bivariate results indicated gender differences in perceptions of dangerousness, role ambiguity, role conflict, input into decision-making, job autonomy, supervision, punishment ideology, and job satisfaction; however, after controlling for age, race, education, position, tenure, and supervisory status, only dangerousness and job satisfaction remained statistically significant. The implications of these contemporary findings for correctional research and practice are also considered.

Keywords: corrections; prison staff; gender; occupational attitudes.

#### Introduction

The field of corrections has changed drastically in the past thirty years—sometimes for the better, sometimes not. Since the mid-seventies, there has been about a seven-fold increase in the number of people incarcerated (Schmalleger and Smykla, 2005). Litigation and legal interventions have increased as well. The growth and change in corrections has led to increased research. One area that has received increased scholarly attention has been the perceptions and behaviors of correctional staff. Working in corrections is a unique work experience. Prisons are not involved in processing or the production of inanimate objects, or providing services to willing customers. Instead, prisons deal with humans,

"processing and manipulating them" (Jayewardene and Jayasuriya, 1981:149). Correctional work is often hard and dangerous, and working in a correctional institution holds little prestige in society. At the same time, it is a rather routine, calm job punctuated with periods of crisis. This has lead to the realization that studying the perceptions and attitudes of correctional staff is critical.

One positive development in the field of corrections has been a more diverse workforce. Although the majority of correctional staff is white men, the last several decades has seen a dramatic increase in the number of female correctional staff working in men's prisons (Pollack, 2002). This has led to a growing trend to study whether men and women differ in their perceptions and attitudes of the work environment. Like other areas of criminal

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justice, this research developed primarily because males questioned whether females could handle the physical and emotional strains associated with corrections. Research has found that in some ways male and female correctional employees are similar to one another in their perceptions and attitudes, and in other ways are different. While there is a burgeoning body of literature that has examined the differences between male and female correctional staff, not all the salient dimensions of the work environment have been explored with contemporary personnel. Most studies have examined limited areas of the occupational environment for correctional officers only, and many are outdated, as female representation at the time of these prior studies was very small. The current study attempts to expand the literature by examining a very broad array of occupational perceptions and attitudes among all staff, as correctional members contribute to the work environment irrespective of their assignment. Overall, 28 different correctional staff work environment perceptions and attitudes were measured. Using both bivariate and multivariate analyses, gender differences were tested. Such an expansive study of male and female attitudes among all correctional personnel has not been part of traditional empirical inquiries.

#### Literature Review

Over the past thirty years, gender differences have been the focal point of social science studies more broadly, as well as within the major criminal justice institutions. As such, there has been a growth in the literature that explores potential differences among correctional staff. The impetus for such inquiries has stemmed from male resistance to female co-workers, and the assumption that women were not able to adapt to the strains of the occupation (Martin and Jurik, 1996). Two theoretical models have guided a majority of the research on assessing views, attitudes, and behaviors of female and male correctional staff. The first model is the "Importation-Differential Experiences Model" (Van Voorhis et al., 1991). The main premise of this model is that a wide array of demographic factors influences a person's perceptions, views, attitudes, and behaviors. Others have used this model to focus on a single demographic factor that takes precedence over all others. For example, the Gender Model postulates that men and women are socialized differently, and this results in different perceptions and attitudes (Jurik and Halemba, 1984). This leads men and women to differ in their levels of job satisfaction, organizational commitment, and perceptions of the organization.

The second model is referred to as the "Work

Role-Prisonization Model," where the correctional work environment helps shape employees' perceptions, views, attitudes, and behaviors, regardless of individual characteristics (Jurik and Halemba, 1984; Van Voorhis et al., 1991). Under the Work Role-Prisonization model, if opportunities are relatively equal, the work environment will transcend gender in terms of shaping correctional employees' perceptions and attitudes (Kanter, 1977a).

#### **Empirical Support for the Importation Model**

In support of the Importation model, research has noted that men are more likely to report seeking a career in corrections for a steady paying job and to secure and control inmates, while women are more likely to chose to work in corrections because they wish to help rehabilitate offenders and to work with others (Jurik, 1985a, 1985b; Jurik and Halemba, 1984; Walters, 1992). In addition, female correctional staff generally report greater support for affirmative action than do male staff (Stohr et al., 1998). This makes sense, considering that women had to fight for the right to work in corrections, particularly in male inmate facilities.

Many studies, especially qualitative studies, have found that women working in corrections confront tremendous obstacles. Female correctional staff often face discrimination and harassment (Carlson, Anson, and Thomas, 2003; Owen, 1988; Pogrebin and Poole, 1997). For example, Zimmer (1986) found that female correctional officers routinely experienced remarks about their appearance, sexual joking and teasing, false rumors about sexual involvement with inmates or other staff, obscene phone calls, and constant reminders of their "female" status. In other work, in-depth interviews with 108 Denverarea female jail officers revealed that sexism and sexual harassment were very common and had caused discomfort and pain for many of the women (Pogrebin and Poole, 1997). In other studies, it was found that women were far more likely to have been victims of sexual harassment from fellow male staff and superiors than were men (Beck and Stohr, 1991; Stohr et al., 1998).

Furthermore, female correctional workers may experience "tokenism," being the numerical minority as compared to men (Kanter, 1977b). Tokenism results in barriers being placed in front of minority employees so that they have difficulty in reaching equality in the organization (Zimmer, 1988). This is evident in the literature when male staff are asked about the ability of women to work in corrections, as they often believe that women are not as capable as men of working in corrections (Crouch, 1985; Hemmens et al., 2002; Jurik, 1985b,

1988; Owen, 1985; Pogrebin and Poole, 1997; Zimmer, 1986). Women, as minorities, may be more likely to receive inadequate training and support, and this in turn can lead to greater role ambiguity, role conflict, and stress (Van Voorhis et al., 1991). In addition, because they are not the numerical majority and do not hold as many positions of power, female correctional workers may feel that they have fewer promotional opportunities or that the current promotional procedures are unfair. Van Voorhis et al. (1991:475-476) argued, "access to equal employment is no guarantee that women and other minorities will receive fair access to the resources, informal networks, and other considerations needed to assure job satisfaction and evidence satisfactory performance and advancement potential." The works of Jurik (1988), Jurik and Halemba (1984), and Zimmer (1986, 1987) all suggest that women correctional employees perceive the work environment in a more negative light than do male correctional workers.

Another area of difference between male and female correctional workers is the level of reported job stress. In two studies of Southern correctional officers, it was found that female correctional workers reported higher levels of stress and tension than did their male counterparts (Cullen et al., 1985; Van Voorhis et al., 1991). A greater level of job stress among women was found even though female correctional officers perceived greater supervisory support than did men (Van Voorhis et al., 1991). Among federal correctional staff, it was found that women's stress levels were higher (Wright and Saylor, 1991). Lovrich and Stohr (1993), in their study of jail staff, also observed that female staff generally reported higher levels of job stress. These findings support the position that there is a gender difference in the work attitude of reported job stress. It is possible that this difference is due to the hostile work environment faced by many female staff.

Conversely, in a study of juvenile counselors in secure Canadian facilities, it was observed that women reported lower levels of stress than did their male counterparts (Pelletier, Coutu, and Lamonde, 1996). Similarly, among Maricopa County, Arizona, jail officers, a significant relationship was found between gender and job satisfaction; female staff generally reported higher levels of job satisfaction when compared to male officers (Griffin, 2001). Among federal correctional staff, it was found that white female officers were more satisfied with their jobs and perceived the quality supervision to be better than did their male counterparts (Britton, 1997). This suggests that even when faced with a hostile work environment, female correctional employees may take greater enjoyment in their jobs. Although contradictory, women may unfortunately expect the hostility, and assess the work environment only by its job-specific tasks.

There are other areas where female and male correctional workers may differ. In a study of Texas correctional staff, Crouch and Alpert (1982) observed that female staff were less punitive in their views toward inmates than were male staff, and this difference increased over time. Additionally, they found that male officers expressed a greater willingness to use aggressive methods in handling inmates. The opposite was found in a study of Northeastern correctional officers. In hypothetical situations, women were, on average, more aggressive in their responses than were men (Jenne and Kersting, 1996). In a study of staff at six jails, it was found that men had a higher perception of promotional opportunities than did women (Lovrich and Stohr, 1993). Additionally, female staff reported greater skill variety as compared to male staff (Lovrich and Stohr, 1993). Among juvenile counselors in secure Canadian facilities, it was observed that male counselors were more likely to report that supervision was task-oriented, while female counselors were more likely to report that supervision was controloriented (Pelletier et al., 1996). Thus, there is evidence (although the nature of the relationship is mixed) to support the postulation that men and women correctional staff perceive their work environment in different ways.

## **Empirical Support for the Work Role-Prisonization Model**

There is also empirical evidence which refutes the Importation model and supports the Work Role-Prisonization model. For instance, while some studies have found that job stress varies by gender, not all studies have observed such a relationship. Among correctional officers at three Midwestern prisons, no relationship between gender and job stress was found (Walters, 1992). Likewise, in a study of correctional officers at a Southwestern correctional facility, Triplett, Mullings, and Scarborough (1996) found no significant relationship between gender and job stress. Among correctional officers at a Kentucky medium security prison, while both experienced high levels of stress, there was no significant difference between male and female officers in their level of burnout (Hurst and Hurst, 1997). In a study of Pacific Northwest correctional officers, female and male staff had similar levels of burnout in terms of emotional exhaustion and personal accomplishment (Savicki, Cooley, and Gjesvold, 2003). Moreover, it was found that female and male respondents generally reported the same level of job stress. Finally, Dowden and Tellier (2004), in a meta-analysis, noted that gender only had a weak correlation with job stress for correctional staff.

In other work perceptions, female and male correctional staff appear to be similar as well. A number of studies have noted that female correctional workers do not differ in their level of job satisfaction when compared to their male counterparts (Blau, Light, and Chamlin, 1986; Cullen et al., 1985; Lovrich and Stohr, 1993; Van Voorhis et al., 1991; Walters, 1992; Wright and Saylor, 1991). In addition, Farkas (1999) found that inmate supervisory style did not vary much between male and female correctional officers at two medium-security correctional institutions. Wright and Saylor (1991) found no difference in perceived efficacy with inmates between female and male federal correctional staff. It has been reported that there was no difference between female and male jail officers in their preference of either security based training or service based training (Stohr, Lovrich, and Wood, 1996). In a study of staff at six jails, there was little difference between female and male staff in perceptions of quality of supervision, satisfaction with pay, feedback from the job, or job autonomy (Lovrich and Stohr, 1993). Additionally, there was no reported difference in level of commitment (Lovrich and Stohr, 1993). Among Pacific Northwest correctional officers, men and women did not differ in their perceptions of supervisors and were similar in their level of organizational commitment (Savicki et al., 2003). Further, there was no difference reported in male and female officers' perceptions on defining and responding to conflict situations (Hogan et al., 2004).

Overall, the research on gender differences in corrections, to date, is rather mixed. There is support that men and women differ in some areas, while in other areas, there appears to be no gender difference between correctional officers in their views and work attitudes. While the former is more in line with the Importation model, the latter findings are consistent with the Work Role-Prisonization model. Another reason for the divergent findings could also have to do with the type of methodology conducted or the particular correctional facilities studied. In a review of the literature, Britton (1997) concluded that qualitative studies generally found that gender was important in how correctional staff perceived their work environments, and quantitative studies generally found no differences. However, this is not always the case, as several quantitative studies have found differences. Moreover, even in the same study, differences are observed on some work environment areas but not others. For example, Van Voorhis et al. (1991) found support for both the Importation and Work Role-Prisonization models in their study of Southern correctional officers.

Mixed findings certainly call for further research in

this area. Moreover, the rising number of women joining (and rising up through) the ranks of corrections warrant additional empirical studies. In addition, rules regarding harassment (against women) have been established and enforced, and it is generally taken more seriously today than it was in the past both by those in charge and watchdog agencies. More importantly, much of the prior research has focused heavily on job stress and job satisfaction. The studies which have examined other areas have been limited in their scope by looking on average at six or less dimensions of the work environment. The work environment is very complex and there have been many areas that have not been researched.

#### The Work Environment

The work environment is the setting, both tangible and intangible, in which the employee carries out his or her job, and there are numerous dimensions of this environment (Cammann et al., 1983). Because the work environment areas are as diverse as they are numerous, it is helpful to break them into two general categories of organizational structure and job characteristics.1 Organizational structure refers to how an organization arranges, manages, and operates itself (Oldham and Hackman, 1981), and includes centralization, formalization, organizational justice, integration, and instrumental communication (Lincoln and Kalleberg, 1990). Job characteristics relate to a particular job that is being done by a person, and include job variety, skill variety, role conflict, role ambiguity, task significance, task identity, and supervision (Hackman and Lawler, 1971). Therefore, both organizational structure and job characteristics are multidimensional. In addition to perceptions of organizational structure and job characteristics, there are work attitudes in general. Work attitudes are psychological states of how an employee feels overall about his or her work experiences. There are several dimensions of work attitudes; the most frequently studied in criminal justice are job stress, job satisfaction, and organizational commitment. More specific correctional work attitudes include job involvement, moral commitment, continuance commitment, and punishment and rehabilitation views.

Rather than look at a few areas, the current study examines a much wider scope of the work environment than has been done in past research on gender differences in corrections. This study included 28 perceptions of both job and structural dimensions of the work environment, as well as work attitudes, among correctional personnel (i.e., not just officers). By examining so many areas of the work environment, a more comprehensive understanding

will be gained about how contemporary male and female correctional staff potentially differ in their perceptions and attitudes.

Given that women are represented in greater numbers at all positions and levels of corrections, compared to thirty years ago, we might expect fewer differences between male and female employees, as suggested by the Work Role-Prisonization Model. Moreover, the institution that was part of this study was led by a rather progressive female warden, who stressed a rehabilitative philosophy for the prison. This too might work to reduce the amount of gender differences, as the traditional thinking that females should not be part of the correctional culture might not survive in such a work environment. In all, we might expect in such a setting that the work environment itself will play a more prominent role in determining correctional staff attitudes over that of gender.

#### Methods

Survey Administration. In the fall of 2000, 420 staff at a Midwestern, high-security state prison were provided a survey asking about their perceptions of the prison work environment. The prison housed approximately 1,300 adult male inmates. Most of the inmates, who were serving long custodial sentences for drug and violent offenses, were classified at a medium- or maximum-security level. The prison had been in operation for several decades, employing about 450 staff at the time the survey was administered. Due to sick leave, temporary reassignment, annual leave, and so forth, approximately 420 staff members were available at the time of the survey. In a cover letter, the importance of the survey was explained, as was the fact that participation was strictly voluntary and all responses would be anonymous. The survey was distributed with the paychecks issued to all staff who were working at the prison during the week of the survey. A cash raffle, with several cash awards ranging from \$50 to \$100, was used to increase participation. In addition, one follow-up survey was conducted. A total of 272 useable surveys were returned, for a response rate of 64 percent.

Respondents. The respondents represented all areas of the correctional facility (e.g., correctional officers, case managers, medical staff, industry staff, food service workers, and so forth). In terms of position, 50 percent were correctional officers, 6 percent were unit management staff (i.e., counselors, case mangers, and unit managers), 5 percent worked in the business office, 4 percent worked in education, 3 percent worked in industry, 3 percent worked in the medical department, 3 percent were part of the administration, and 26 percent worked

in other areas. The respondents also represented various administrative levels of the correctional facility (i.e., line staff, supervisors, and managers). About 24 percent of the respondents supervised other staff at the prison. Women comprised 24 percent of the sample and men 76 percent. In terms of age, the mean age was 42.55 years, the median was 44, and the values ranged from 20 to 61 years of age, with a standard deviation of 8.32. With respect to tenure, the mean was 9.65 years at the prison, the median 9 years, and the values ranged from 0 to 26 years, with a standard deviation of 6.82. Turning next to highest educational level, about 10 percent indicated that they had a high school degree or GED, 50 percent some college but no degree, 20 percent an associate's degree, 16 percent a bachelor's degree, and 5 percent a graduate or professional degree. Approximately 83 percent of the respondents were white, 7 percent were black, 2 percent were Hispanic, 3 percent were Native American, and 5 percent were other. Overall, the respondents appeared to be representative of the staff at the prison. Of the total prison staff (approximately 450), about 77 percent were male, 86 percent were white, and 53 percent were correctional officers. Among the respondents, about 76 percent were male, 83 percent were white, and 50 percent were correctional officers. It appears that the respondents are similar to the overall staff at the prison. Thus, it should be that those who did not respond were due to random chance rather than a systematic reason. In this study, all the respondents were included. This was done to increase the group of respondents studied and to see if a different result would be found from past studies. Past studies have generally only examined correctional officers.

Work Environment Indices. The survey instrument was 16 pages long and included 176 questions. Of these questions, nearly 150 dealt with attitudes and perceptions of the work environment. These questions were used to form 28 indices measuring different dimensions of the prison work environment as well as general occupational attitudes. All of the indices used for later analyses were created by summing the responses of the specific items.

In terms of conceptual operationalizations, the *dangerousness* index measured perceived dangerousness of the job (Cullen et al., 1985). *Role ambiguity* is the uncertainty or a lack of information in carrying out the duties and responsibilities of a given job (Rizzo, House and Lirtzman, 1970). *Role conflict* occurs when behaviors for a given job or task are inconsistent with one another job or task (Rizzo et al., 1970). *Instrumental communication* is the "degree to which information about the job is formally transmitted by an organization to its members" (Agho, Mueller, and Price, 1993:1009). *Integration* is

the extent that an organization allows and stresses that different work groups work together with cooperation and coordination to accomplish the major tasks and goals of the organization, or, conversely, pits them against one another to compete for scarce resources (Mueller et al., 1994).

Input into decision-making means one is provided a voice in organizational decisions (Miller and Droge, 1986). Job autonomy is defined as the degree of freedom that employees have in making job-related decisions (Agho et al., 1993). The supervision index was designed to measure perceptions of quality, open, and supportive supervision. Job variety is simply the degree of variation in the job (Price and Mueller, 1986), as some jobs require role performance that is highly repetitive, while other jobs have a significant degree of variety in the required tasks and how they are performed (Mueller et al., 1994). The index of *feedback* measured the degree of worthwhile and timely feedback of job tasks and requirements that are provided to employees. The promotion index measured perceived opportunities for promotions that a staff member has with the employing organization (Curry et al., 1986).

Work-family conflict is "a form of inter-role conflict in which the role pressures from the work and family domains are mutually incompatible in some respect. That is, participation in the work (family) role is made more difficult by participation in the family (work) role" (Greenhaus and Beutell, 1985:77). The two major dimensions are work life interfering with family/home life and family/home life interfering with work (Netemeyer, Boles, and McMurrian, 1996). The work-on-family index measured the time conflict, strain, and harm to family and home life that can result from working in corrections. The family-on-work conflict index measured whether home and social life interfered with work.

Organizational justice deals with the degree of fairness found within an organization. The two major dimensions of organizational justice are distributive and procedural justice. *Distributive justice* is the perception of fairness in distribution and allocation of outcomes within an organization based upon inputs by an employee (Greenberg, 1987). *Procedural justice* is the perceptions of workers on fairness of the processes and procedures used to arrive at organizational outcomes (Greenberg, 1986).

While absenteeism is important to organizations, as it is an inevitable part of work, *how* employees view absenteeism is extremely important to organizations (VandenHeuvel and Wooden, 1995). *Absent views* measured a staff member's views toward the use of sick leave.

In addition, an *employee's view of sick leave usage* at the correctional facility and by *fellow staff* was measured. The *punishment* and *rehabilitation* views of respondents were also captured, as both are critical components of correctional personnel occupational worldviews.

In addition to perceptions and views of the work environment, nine additional indices were created and measured—all of which have been part of various prior correctional studies. *Job involvement* is a psychological identification with the importance of work (Kanungo, 1982). *Job stress* is generally defined in the correctional literature as a worker's feelings of job-related hardness, tension, anxiety, frustration, worry, and distress (Cullen et al., 1985; Van Voorhis et al., 1991). *Job satisfaction* is an emotional, affective response resulting from the extent a person derives pleasure from his or her job (Muchinsky, 1987).

Organizational commitment is the degree of commitment a person has for the employing organization and "not to the job, work group, or belief in the importance of work itself" (Lambert, Barton, and Hogan, 1999:100). In corrections there are generally two unique levels of commitment. One level of commitment is to the overall agency (i.e., Department of Corrections), and the other level is to the particular facility where the person works, both of which were measured in the current study. Organizational commitment has also been equated to investments an employee has with the organization (Becker, 1960). These investments can cause a worker to become bonded with the organization and have a desire to remain because the costs are too high, and is conceptualized here as continuance commitment. The moral commitment index measured the degree to which a person felt an obligation or duty to support and be loyal to the organization. An overall affective measure of organizational commitment was utilized, which comprises the core elements of loyalty to the organization, identification with the organization (i.e., pride in the organization and internalization of the goals of the organization), and involvement in the organization (i.e., personal effort made for the sake of the organization) (Mowday, Steers, and Porter, 1979).

Finally, *life satisfaction*, which is a person's general assessment of the overall quality of his or her life, was measured. With the exception of instrumental communication, all the items used to form the indices were answered on a five-point Likert type of response scale ranging from strongly disagree (coded 1) to strongly agree (coded 5). For instrumental communication, a five point response scale of 1 – not informed at all and 5 – very well informed was used. As previously indicated, all 28 indices were created by summing the responses to

each of the specific survey items.

Independent and Control Variables. Gender was measured as a dichotomous variable with women coded as 0 and men coded as 1. For the purposes of multi-variate analyses, age, race, educational level, position, tenure, and supervisory status were included in the study as control variables. Age was measured in continuous years. The measure of race was collapsed from an ordinal-level measure to a dichotomous-level measure of White or Nonwhite. The ordinal level of highest educational level was changed to a dichotomous variable representing whether the respondent did or did not have a college degree (i.e., associate, bachelor, or graduate). The position variable was coded as 0 – did not work in a custody position (i.e., correctional officer) and 1 - worked in a custody position. Tenure at the prison was measured in continuous years. Supervisory status measured whether the respondent supervised other staff (coded as 1) or did not (coded as 0).

#### **Results**

Brief descriptions, sources of individual survey items, and descriptive statistics for the 28 indices are presented in Table 1. There appears to be significant variation in each of the measures. Moreover, for each variable, the median and mean are similar, which indicates that the variables are normally distributed. Cronbach's alpha (Cronbach, 1951), a measure of internal reliability, is also reported in Table 1. Cronbach's alpha values of .60 or higher are generally viewed as acceptable (Gronlund, 1981). An examination of Table 1 reveals that all 28 indices have an alpha value equal to or greater than .60.

The independent *t*-test was used to examine whether there was a statistically significant difference between the views of female and male staff on the 28 work environment indices. The results are presented in Table 2. Across the 28 indices, there was a statistically significant difference between men and women on seven work environment measures. Men were more likely to feel that they worked a dangerous job than were women, and also reported higher levels of role ambiguity than did their female counterparts. On average, women were more likely to report having input into decision-making at the correctional facility, to perceive a higher level of job autonomy, and to perceive a higher level of quality, supportive supervision. In general, men held more punitive attitudes than women, while female employees reported a higher level of job satisfaction when compared to male workers.

Because there were more male respondents than fe-

male respondents, the non-parametric Two Independent Samples (using the Mann-Whitney statistic) and K-Independent Samples (using the Kruskal-Wallis statistic) tests were used. Both nonparametric tests found that there was a statistically significant difference between men and women on the same seven indices of dangerousness, role ambiguity, input into decision-making, job autonomy, supervision, punishment, and job satisfaction. In addition, both nonparametric tests indicated that there was a significant difference between male and female correctional staff in their perceptions of instrumental communication and integration. Women scored higher on both indices. While these two indices did not make the cut-point level of  $\underline{p} \le .05$  for the Independent *t*-test, the probability level for each was close. For the instrumental communication, the probability level for the *t*-value was p = .052, and for the integration index, the probability level for the t-value was p = .056.

In order to examine differences between women and men independent of the effects of age, race, educational level, position, tenure, and supervisory status, multivariate analysis using Ordinary Least Squares (OLS) regression was conducted. Twenty-eight OLS regression equations with each of the indices as the dependent variable were analyzed. Gender, age, race, educational level, position, tenure, and supervisory status were entered as the independent variables. The results are presented in Table 3. Because of the large number of dependent variables, a different regression results table was constructed than is typically reported. The dependent variables are reported in the far left column and the seven independent variables (i.e., the demographic measures) are reported in the top columns. Finally, R-squared, a measure of explained variance, is reported in the far right column.

An examination of Table 3 reveals that gender had only a significant impact on two of the twenty-four indices. Even after controlling for age, race, educational level, position, tenure, and supervisory status, women were less likely to feel that they worked in a dangerous job as compared to men. Additionally, female staff generally reported higher levels of job satisfaction than their male counterparts. For the other indices in which gender was observed to have significant effects in the bivariate tests, multi-variate analyses showed no significant difference. Moreover, position and supervisory status had the largest number of significant relationships with the indices. Both had statistically significant effects with 14 of the 28 work environment measures. Age had significant effects on six of the indices, and tenure had significant relationships with five of the indices. Respondent race had four significant associations. Finally, educational level had

	Table 1. Descriptive Information f	# of		Standard		Minimum	Maximum	
Index name	Description of index & item source		Mean	deviation	Median	value	value	Alpha
Dangerousness	Measures perceived dangerousness at work (Cullen et al., 1985)	4	13.58	3.54	14	4	20	.82
Role ambiguity	Measures degree of perceived role ambiguity (i.e., clarity of what is expected) (Ivancevich and Matteson, 1980)	4	8.67	2.41	8	4	18	.62
Role conflict	Measures the degree of perceived role conflict (i.e., degree of confusing and conflicting tasks/roles at work) (Ivancevich and Matteson, 1980; Triplett et al, 1996)	4	10.76	2.76	10	4	19	.70
Institutional communication	Measures instrumental communication (i.e, receiving timely and useful communication and information for the job) (Curry et al., 1986)	5	17.65	3.69	18	5	25	.85
Integration	Measures perceived degree of integration (i.e., cooperation and joint efforts) at work between different work groups (Miller and Droge, 1986).	5	13.44	3.04	14	5	22	.73
Input into decision-making	Measures amount of input allowed in decision-making (Curry et al., 1986)	5	14.08	4.12	14	5	25	.81
Job autonomy	Measures perceived degree of job autonomy (i.e., say in how job is done) (Curry et al., 1986)	2	6.50	1.80	7	2	10	.66
Supervision	Measures perception of supportive, quality supervision (Wright and Saylor, 1992)  Measures the degree of job variety (i.e., variety of job tasks)	3	9.51	2.79	10	3	15	.77
Job variety	Measures the degree of job variety (i.e., variety of job tasks) (Curry et al., 1986) Measures the timeliness and useful feedback a person	5	15.74	3.91	16	5	24	.76
Feedback	receives for his/her job (Wright and Saylor, 1992) Measures perceptions of future promotional opportunities	2	6.74	1.61	7	2	10	.64
Promotion	(Triplett et al., 1996).	3	8.74	3.03	9	3	15	.81
Work on family conflict	Measures the degree that work problems cause conflicts at home (Bacharach, Bamberger, and Conley, 1991; Bohen and Viveros-Long, 1981; Higgins and Duxbury, 1992)	9	21.74	5.41	21	10	37	.79
Family of work conflict	Measures the degree that family issues cause conflicts at work (Bacharach et al., 1991)	2	3.66	1.37	4	2	10	.77
Distributive justice	Measures perceived distributive justice (i.e., fairness of outcome) in terms of performance evaluation (Wright and Saylor, 1992)	2	7.22	1.73	8	3	15	.73
Procedural justice	Measures perceived procedural justice (i.e., the fairness of procedures) in terms of promotions (Wright and Saylor, 1992)	3	7.88	2.88	8	3	15	.84
Absent views	Measures views on use of sick leave (VandenHeuvel and Wooden, 1995)	2	6.21	2.00	6	2	10	.60
Views of absent staff	Measures the views of use of sick leave by fellow employees (Johns, 1994)	3	9.93	2.37	10	4	15	.81
Punishment	Measures attitude toward punishment of inmates (Cullen et al., 1989)	9	27.26	6.49	27	10	45	.84
Rehabilitation	Measures attitude towards treatment/rehabilitation of inmates (Cullen et al., 1989)	8	24.39	5.64	25	8	39	.84
Job involvement	Measures the degree of identification with a particular line of work or career (Lawler and Hall, 1970)	3	4.75	1.70	4	3	12	.74
Job stress	Measures perceived job stress (Crank et al.,1995)	4	10.51	3.26	10	4	20	.78
Job satisfaction	Global measure of overall job satisfaction (Brayfield and Rothe, 1951).	5	17.50	4.29	18	5	25	.89
Agency commitment	Measures commitment to the agency (i.e., the degree of commitment to the DOC) (Wright and Saylor, 1992)	4	13.18	2.69	14	5	20	.74
Institutional commitment	Measures commitment to the institution (i.e., the prison) (Wright and Saylor, 1992)	3	9.20	2.28	9	3	15	.67
Continuance commitment Moral	Measures view that the person must remain with the agency because has too much at stake (Jaros et al., 1993)  Measures the belief that must be loyal to an employer (Jaros et	3	10.73	2.56	11	3	15	.70
commitment Organizational	al., 1993)  Overall measure of affective organizational commitment	3	9.23	2.40	10	3	15	.65
commitment	(Mowday, Porter and Steers, 1982)	9	29.75	6.64	31	9	45	.88
Life satisfaction	Measures the degree satisfied with overall life (Quinn and Staines, 1979).	2	4.11	1.09	4	2	6	.87

Table 2. Independent *T*-test Results for the Differences Between Female and Male Correctional Staff in Their Perceptions of the Work Environment and Work Attitudes

(N = 272)

	Women		٨		
-		Standard		Standard	
Index Name	Mean	deviation	Mean	deviation	t-value
Dangerousness	12.11	4.04	14.06	3.24	-3.97 **
Role ambiguity	8.12	1.91	8.80	2.52	-1.98 *
Role conflict	10.25	2.62	10.87	2.74	-1.61
Instrumental communication	18.46	3.80	17.44	3.63	1.95 <sup>†</sup>
Integration	14.11	3.24	13.27	2.97	1.92 †
Input into decision-making	15.02	3.78	13.82	4.22	2.03 *
Job autonomy	6.91	1.69	6.39	1.81	2.04 *
Supervision	10.26	2.66	9.32	2.80	2.39 *
Job variety	16.34	4.17	15.53	3.84	1.45
Feedback	6.91	1.66	6.70	1.56	0.89
Promotion	9.33	2.96	8.60	3.01	1.69
Work on family conflict	20.69	5.23	22.02	5.28	-1.77
Family on work conflict	3.62	1.24	3.69	1.42	-0.39
Distributive justice	7.25	1.78	7.23	1.69	0.07
Procedural justice	8.20	2.88	7.80	2.88	0.98
Absent views	6.02	1.63	6.23	2.10	-0.75
Views of absent staff	9.97	2.42	9.92	2.38	0.14
Punishment	25.84	6.93	27.72	6.27	-2.03 *
Rehabilitation	25.40	5.82	24.14	5.42	1.60
Job involvement	4.77	1.63	4.77	1.74	0.01
Job stress	10.57	3.42	10.43	3.19	0.29
Job satisfaction	18.71	3.76	17.15	4.41	2.55 *
Agency commitment	13.31	2.65	13.21	2.64	0.26
Institutional commitment	8.75	2.38	9.38	2.25	-1.93
Continuance commitment	10.63	2.40	10.80	2.62	-0.45
Moral commitment	9.46	2.13	9.20	2.45	0.76
Organizational commitment	30.91	6.57	29.56	6.50	1.45
Life satisfaction	4.26	1.03	4.08	1.09	1.15
	*n<0.05 **n<		0.01		

only two significant impacts on the 28 work environment indices.<sup>2</sup>

#### Discussion

The aim of this study was to determine what, if any, differences there were between male and female correctional staff in their perceptions of the work environment. In bivariate tests, there were differences on seven to nine of the indices, depending on the whether the Independent *t*-test or non-parametric statistics were used. This suggests that there is some difference between men and women in their perceptions and attitudes, but the difference was limited. For 19 of the 21 indices, there were no

gender differences. This means that men and women are similar in their perceptions and attitudes in many of the areas of the work environment.

Moreover, almost all the significant bivariate relationships disappeared in the multi-variate analyses when *other* demographic characteristics were controlled. Only two of the indices maintained statistical significance when controls were introduced. More specifically, perceptions of dangerousness and job satisfaction differed between men and women. The finding that male correctional staff were more likely to feel that they worked at a dangerousness job is interesting, considering the picture of harassment and mistreat faced by many female correctional staff that has been noted by many past researchers. It could be

<sup>†</sup> Significant using the non-parametric of Two Independent Samples (using the Mann-Whitney statistic) and K-Independent Samples (using the Kruskal-Wallis statistic) tests but not for the Independent t-test.

Table 3. OLS Regression Results with the Standardized Regression Coefficient Reported **Educational** Supervisory  $\mathbb{R}^2$ Dependent variable Gender Age Race level **Position** Tenure status .17 \*\* -.02 -.14 \* -.10 .31 \*\* -.03 .01 .19 \*\* **Dangerousness** .08 \*\* Role ambiguity .03 -.12 .02 -.01 .17 \* -.16 \* .11 Role conflict .07 .08 -.13 \* -.02 .07 .09 -.11 .06 \* Instrumental communication -.11 -.05 .04 -.01 -.09 -.10 .04 .05 -.07 -.01 .06 -.09 -.12 .09 .07 \*\* Integration .11 -.25 \*\* -.06 -.12 .09 .05 -.09 .27 \*\* .21 \*\* Input into decision .18 \*\* -.20 \*\* .05 -.28 \*\* .19 \*\* Job autonomy -.04.03 -.10.13 \* -.10 -.39 \*\* .16 \*\* .23 \*\* -.02 Supervision -.08 .06 .02 .02 .06 -.16 \* -.25 \*\* .16 \* .14 \*\* Job variety -.03 .16 \*\* -.17 \* .06 \* Feedback -.03 -.08 -.03 .04 .04 -.20 \*\* -.19 \*\* .12 \*\* **Promotion** -.08 -.01 -.03 .04 .16 \* .32 \*\* .12 \*\* Work on family conflict .05 -.03 -.09 -.05 -.07 .05 .04 .07 .01 Family on work conflict .00 -.04 .06 .05 .00 Distributive justice .03 -.05 -.22 \*\* .02 .08 .07 \* .09 -.06 -.10 .08 .22 \*\* .08 \*\* **Procedural justice** -.05 -.06 -.07 -.12 -.19 \*\* -.20 \*\* .07 .15 \*\* Absent views .03 .14 \* -.11 -.05 -.14 \* .26 \*\* .10 \*\* -.02 -.13 \* -.04 -.06 .11 Views of absent staff -.22 \*\* .10 -.07 -.08 -.16 \* .16 \* .01 .19 \*\* **Punishment** .24 \*\* .00 .12 .15 \*\* Rehabilitation -.07 .12 .01 -.12 Job involvement .01 .05 -.04 -.01 -.06 -.12 .12 .04 -.03 Job stress -.02 .16 \* -.07 .02 .03 .01 .03 -.01 .12 \*\* -.13 .21 \*\*

Note. For a description of the indices (i.e., dependent variables), see Table 1. Gender was measured as 0 = female and 1 = male. Age was measured in continuous years. Race was measured as 0 = Nonwhite and 1 = White. Educational level was measured as 0 = no college degree and 1 = college degree. Tenure at the prison was measured in continuous years. Supervisory status was measured as 0 = non-supervisor and 1 = supervisor of other correctional staff. Position was measured as 0 = non-C.O. and 1 = C.O.

.03

.04

.07

.02

.12

.07

-.09

-.01

-.03

-.12

-.03

.02

.02

.13

-.11

-.05

.23 \*\*

.18 \*

-.17 \*

-.07

.01

\* <u>p</u> ≤ 0.05 \*\* <u>p</u> ≤ 0.01

that women feel that they are less likely to be assaulted by inmates. Two of the authors of the current study have prior correctional experience, and both witnessed an informal inmate code of chivalry. Male inmates who assaulted children or women were held in low regard by other inmates. In addition, many male inmates went out of their way to be around female staff and were generally more polite to female staff. The issue of whether or not a code of chivalry influences female staff perceptions of dangerousness has yet to be part of empirical studies of corrections. What is known is that women in this study felt that their jobs were not as dangerous compared to the male respondents. This is consistent with other research that found that female federal correctional staff perceived prisons to be safer than did male staff (Wright and Saylor, 1991).

-.15

-.01

.00

-.04

-.03

-.08

-.09

-.11

-.08

.03

.03

-.05

-.15 \*

lob satisfaction

Agency commitment

Moral commitment

Life satisfaction

Institutional commitment

Continuance commitment

Organizational commitment

Another possible explanation is that men help define

their own masculinity by their occupation. The underlying theme in corrections has been the accentuation of men's ability to control violent confrontations and using force. As Jurik and Martin (2001:265) argue:

-.09

.09

.04

-.04

-.16 \*

.09

.16 \*

.13 \*

.14 \*

.28 \*\*

.12

-.03

.05

.04

.05

.10 \*\*

.08 \*\*

.13 \*\*

The social control functions and perceived danger of police and corrections work have led to the association between competence in these jobs and culturally dominant notions of masculinity. Thus, the successful handling of danger and administering of social control offer specific men an opportunity to construct their masculinity in ways that conform to dominant social expectations.

Likewise, the literature suggests that men are more likely see a job as more dangerous than it really is, especially when compared to women (Britton, 2003).

The other index in which there was a significant gender difference in multi-variate analysis was job satisfaction. Overall, women liked their jobs more than their male counterparts. This appears to be a paradoxical finding in light that the literature reports that women experience greater obstacles and harassment in the correctional workplace than do men. It could be that female staff are more satisfied with their jobs because they are working in a non-traditional field. In non-correctional research, higher job satisfaction has been found for women working in non-traditional roles or fields (Kroes, 1983; O'Farrell and Harlan, 1982). As previously noted in the literature review, women are generally attracted to working in corrections because they are interested in rehabilitation and working with others. At the surveyed institution, the warden was a woman who strongly pushed rehabilitation programs. The warden also stressed fairness, professionalism, and performance. Based upon interviews with staff at the prison and outside the prison, the warden was well respected. Thus, female staff at this prison may be more satisfied in their jobs because of the tone of rehabilitation and fairness set by the warden at the prison. Moreover, there is a long and rich literature across many occupations which has found that women tend to be more satisfied with their jobs in general.

While there were two gender differences in the multivariate analyses, for the other 26 indices there were no differences. The bulk of the results strongly suggest that female and male correctional staff are more similar than dissimilar in their work perceptions and attitudes. This conclusion is supported by the works of Jurik and Britton. Jurik's (1985a) study of Western correctional officers concluded that work factors were more important than demographic characteristics. Likewise, Britton (1997) concluded that there is evidence that the correctional work environment is more important is shaping employees views and attitudes than are demographic characteristics, including that of gender. Thus, the results of this study mostly support the Work Role-Prisonization model rather than the Importation model. The institutional/socialization effect is also evident when only correctional officers (i.e., line staff) were studied. While not reported, similar results were observed. There was very little difference between male and female correctional officers in their perceptions of the work environment and in their job attitudes.

The literature contends that the organization has the power to shape and constrain worker behavior (Martin and Jurik, 1996). The nature of prison work, the potential for injury to both staff and inmates, and liability issues cause administrators to emphasize adherence to policies

and procedures. All workers are subject to disciplinary action for a violation of the rules. Further, extensive training is provided to ensure all workers respond in a similar manner. At the same time, most correctional facilities are unionized, which further requires all workers to be treated the same. These factors may neutralize the differences between men and women by pushing a "lock-step" mentality in all facets of the organization, where difference is not rewarded. Thus, both men and women may view the work environment in very similar terms.

The fact that men and women view the occupational world similarly also has implications for critics of women in corrections who suggest that they are unable to handle the various demands of the job. The findings of the current study dispel this myth by finding not only that women and men were more alike than different, but that women perceived the working environment to be less dangerous and were satisfied with their job than their male counterparts.

It is very important to point out that this study only examined differences in levels of perceptions and attitudes. It did not test to see if the different dimensions of the work environment affect men and women differently. For example, it could be that distributive justice is more important in shaping the job satisfaction of men, while procedural justice could be more important in shaping the organizational commitment of women. There is empirical evidence to suggest that while the perceptions of the work environment may be the same, female and male correctional staff respond differently to these work forces (Savicki et al., 2003; Walters, 1993). For example, it was found in a study of staff at a Southwestern correctional facility, that work-family conflict was an important contributor to job stress for female staff but not for male employees (Triplett, Mullings, and Scarborough, 1999). In their study of officers at a medium security Kentucky prison, Hurst and Hurst (1997:121) found that while both female and male staff reported similar levels of job stress, in comparison to males, it was more likely that female officers "processed stress by seeking social support, while male officers more frequently than female officers processed stress by planful problem solving." It is important that research be done to see if different dimensions of the work environment affect men and women differently. It is an area that needs further empirical attention.

Finally, this study is not without its limitations. First, the current research only involved one correctional facility, and one that was rather unique as it was lead by a female warden that stressed a rehabilitative philosophy. In this sense, the findings from this study might not generalize well to many "traditional" prisons operating today,

but as women rise through the correctional ranks and as philosophies differ, might serve as a possible benchmark for more contemporary studies of corrections. Future research would benefit from examining correctional settings that exhibit such diversity. The more institutions studied, the better, as cumulative research is how knowledge building occurs. In addition, future research may wish to over-sample female staff so more in-depth analyses can be conducted, such as the intersection of gender and race as was done by Britton (1997) or the interaction effects of gender and position as was done by Wright and Saylor (1991). This was not possible in this study because there were too few female respondents to allow for more complex analyses. While many areas of the work environment were measured, there are many other areas which were not. Future research should examine other components of the correctional environment that were not part of the current study (e.g., loyalty to occupational peers, perceptions of inmates, etc.) to see what, if any, gender differences exist. Future research may wish to increase the response rate. In this study the response rate was 64 percent, which may have been lowered because the length of the survey. While this response rate is acceptable, it is possible that those who did not respond had different perceptions of the work environment and/or job attitudes. Additionally, future research should obtain a larger number of respondents to see if gendered views differ by different types of positions.

In closing, this study found that women and men were more similar than dissimilar in their work perceptions and attitudes. In this sense, gender differences or unique inabilities to deal with correctional work by females was not noted. In fact, the opposite was true; the only differences that did emerge found that women viewed the occupational environment as less dangerous and were also more satisfied with their job.

#### **Endnotes**

- 1. The separation of the work environment into two categories is done to simplify the description of work environment as it is frequently done in the literature. It does not imply that no other dimensions of the work environment exist, such as the physical or the social dimensions.
- 2. While the VIF and Tolerance statistics did not indicate any collinearity or multi-collinearity problems, the personal characteristics do share some overlap with one another. For example, age and tenure are usually correlated with one another. In order to have higher tenure, one has to be older. The correlation was .40 between the

two. The correlations of the other characteristics with one another ranged from .01 to .33, which while suggesting some overlap, does not indicate a problem for the regression results. A reviewer suggested that instead of the continuous measures of age and tenure, categorical variables might result in different results. Dummy coded variables for those aged 35 to 45 and 46 and older were created, with the reference group being those 35 and younger. Likewise, two dummy coded variables were created for those with 6 to 12 years tenure and 13 or more years. The reference group was those with 5 or less years of tenure. The categorical (i.e., dummy coded) variables were used in place of the continuous measures of age and tenure in the regression equations. The new variables produced similar results in statistical significance for gender to those reported in Table 3. While not the focus of the study, there was some difference of the effects of age and tenure on some of the measures. The specific results are available upon request.

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# Testing the Cultural Invariance of Parenting and Self-Control as Predictors of American Indian Delinquency\*

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Abstract. We test the invariance of the "full model" of self-control using a sample of white and American Indian high school students. American Indians in our sample reported significantly lesser parenting, lower self-control, and higher levels of vandalism and personal offending, but not property offending. Race-specific regressions find that parenting significantly influenced self-control for white respondents only—not American Indians. Self-control significantly influenced all three forms of delinquency for each race. Parenting significantly predicted property offending and vandalism for each race, but failed to predict personal offending for either. Z-tests on the various influences revealed no significant differences by race, with the exception of the influence of parenting on vandalism. These findings provide support for the invariance of the full model of self-control but suggest that the influence of parenting on American Indian delinquency is somewhat different from whites. We also discuss our findings relative to the mediation effect of self-control on the parenting/delinquency relationship.

**Keywords:** American Indian; parenting; self-control; delinquency; invariance

#### Introduction

Gottfredson and Hirschi (1990) purport self-control as "A General Theory of Crime" due to the universal explanatory power of their theory. According to the authors, inadequate parenting results in low self-control (of offspring), which in turn leads to crime and analogous behaviors. What makes the theory "general" is that these influences are more or less invariant across samples (Tittle, Ward, and Grasmick, 2003). But while numerous studies using various samples and analytical techniques have supported the causal operation of the theory (Pratt and Cullen, 2000), relatively few have focused on the role of parenting within self-control theory. Even fewer explicitly test whether the influence of key variables is invariant across samples and sub-samples. We are not aware of any cross-sample invariance tests that include the influence of parenting as it applies to self-control theory.

We explore the invariance of the "full model" of

self-control by incorporating one of the most culturally distinct groups within U.S. borders: American Indians. Criminological literature depicts American Indians as among the most troubled, yet least studied groups in North America (Young, 1988). Furthermore, research typically fails to include a comparable group of whites, and testing standard criminological theories on American Indian crime and delinquency is virtually absent (Lester, 1999). Using subsamples of American Indian and white public high-school students, we test the cultural invariance of self-control as a dependent and independent variable, which includes invariance tests on the direct and indirect (via self-control) influence of parenting on delinquency. Following the method promoted by Paternoster et al. (1998), and used in previous invariance tests on selfcontrol (see Tittle et al., 2003; Vazsonyi and Crosswhite, 2004), we apply z-tests of significance to any differential influences by race. Our analyses provide a useful extension of previous invariance tests due to the cultural milieu of American Indians as well as our incorporation of the

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full model of self-control. Moreover, our research attends to the aforementioned empirical deficiencies related to American Indian delinquency.

#### **Self-Control**

Self-control is posited as "A General Theory of Crime" because it is derived from what Gottfredson and Hirschi (1990) believe is a constancy of criminality. This constancy is a hedonistic human nature based upon the self-interested pursuit of pleasure and avoidance of pain. Where individuals differ is in their ability to repress such impulses. Those less capable will tend toward immediate gratification, low frustration tolerance, self-centeredness, and risk taking, and they prefer physical over mental activities and simplistic rather than complex tasks. Individuals with low self-control are prone to crime because crime is simple, risky, self-centered and gratifying with little effort or delay.

Low self-control is the tendency for the above characteristics (dimensions) to "come together in the same person" (Gottfredson and Hirschi, 1990:91), producing a single, latent (unidimensional) trait that universally explains crime and analogous behavior. But while Gottfredson and Hirschi (1990) define low self-control as an individual propensity, the authors are clear that it is not a trait which drives individuals toward crime in the positivistic sense. Rather, the less self-control one has, the less he or she is able to judge the negative consequences of his or her hedonism; hence, such individuals are more prone to crime. And though some argue that the dimensions of self-control are incompatible as a single latent construct (Marcus, 2004), the application of self-control as a unidimensional trait is generally supported by the criminological community (Turner, Piquero, and Pratt, 2005), with the most popular measure of self-control being the Grasmick et al. (1993) scale.

# Self-Control as an Independent Variable

Most self-control research uses self-control as an independent variable; these studies have regularly found support for the variable. A meta-study on the theory (Pratt and Cullen, 2000) found that self-control generally predicts crime and analogous behavior regardless of sample and analytical technique. Cross-cultural support for self-control as a predictor of deviance has since been found using Canadian (Nakhaie, Silverman, and LaGrange, 2000), German (Marcus, 2003), and Spanish samples (Romero et al., 2003). Vazsonyi et al. (2001) found similarities in the influence of self-control on deviance in Hungary,

the Netherlands, Switzerland, and the U.S. Beyond the "West," Vazsonyi et al. (2004) found that self-control significantly influenced an array of delinquent behaviors among Japanese adolescents (but not male alcohol use), and low self-control actually decreased the likelihood of female alcohol use. Hwang and Akers (2003) found that self-control modestly influenced Korean substance use, though the effect was diminished when social learning variables were added to the model.

### Self-Control as a Dependent Variable

Gottfredson and Hirschi are certain that self-control develops "prior to the age of responsibility for crime" (1990:90), and therefore is the result of early child-rearing practices. Though the authors allow for innate differences, proper parenting is designated as the overriding source of self-control since it is "always possible whatever the configuration of individual traits" (1990:96). However, parenting can go wrong for any one of four reasons (Gottfredson and Hirschi,1990:98).

First, the parents may not care for the child (in which none of the other conditions would be met); second, the parents, even if they care, may not have the time or energy to monitor the child's behavior; third, the parents, even if they care and monitor, may not see anything wrong with the child's behavior; finally, even if everything else is in place, the parents may not have the inclination or the means to punish the child.

Though Gottfredson and Hirschi begin with affective attachment as the major determinant of parenting, it is the three elements of the parenting—monitoring the child's behavior; recognizing deviant behavior when it occurs; and punishing such behavior—that most directly influence self-control. Specific to monitoring, Gottfredson and Hirschi state, "the connection between social control and self-control could not be more direct than in the case of parental supervision of the child" (1990:99). The authors consider recognition the least researched of the three elements. They cite the well-documented role of consistency as key to proper punishment.

To a lesser extent, other familial variables are implicated as influences on self-control. These include the number of biological parents in the home, number of siblings, and mother working outside the home. The affective bond of biological parents increases the likelihood of proper parenting when compared to other caregivers. The more children one has the less time available for attending to each one. Gottfredson and Hirschi (1990) provide various reasons for why mothers working outside the home contribute to low-self control. Nevertheless,

they argue that adequate parenting can be achieved independent of these.

In spite of Gottfredson and Hirschi's (1990) urging that self-control be tested as both an independent and dependent variable, only a handful of studies include parental measures. Using an array of parenting variables, Feldman and Weinberger (1994), Gibbs, Giever, and Martin (1998), Hay (2001), Polakowski (1994), Pratt, Turner, and Piquero (2004), Unnever, Cullen, and Pratt (2003), and Turner et al. (2005) found that most of their selected measures acted as partial influences upon self-control1. Nonetheless, results are mixed and the magnitude of influence is not considered robust by all. For example, Cochran et al. (1998) found parental attachment to have a significant positive influence, but parental supervision did not. In an analysis by race, Pratt et al. (2004) found that parental supervision influenced self-control for both white and non-white respondents. Contrary to expectations, however, their monitoring/ discipline variable was positively associated with low self-control for each race. Though Hay found that his monitoring/discipline variables significantly influenced self-control, he considered the magnitude of influence "less than impressive" (2001:720). Wright and Beaver (2005) found their parenting variables to be inconsistently and weakly related to self-control in kindergarten and first grade, and that the influence of parenting depended on whether parents or teachers reported child self-control. They also determined that Ordinary Least Squares (OLS) regression overestimated the influence of parenting when considering genetic influences. Wright and Beaver suggest that extant research on parenting and self-control reveals a moderate relationship at best and that "there is reason to cast doubt over the validity of this body of research" (2005:1174).

# Self-Control as a Mediator

Whether the influence of parenting on delinquency is direct or indirect via self-control is unsettled. According to Pratt et al. (2004:220) "Gottfredson and Hirschi view parental socialization as a distal cause of criminal behavior in that its effect on crime operates solely through the development of self-control." Likewise, Unnever et al. argued that "when parental influence occurs, it is exerted though the narrow conduit of self-control" (2003:472). This point of view assumes that parenting is associated with crime and delinquency, but that self-control mediates the direct influence of parenting on delinquency; hence, the parenting influence is indirect via self-control. Such an interpretation, however, is based on the role of parent-

ing as the producer of a trait (self-control). Parenting can also limit delinquency by directly reducing opportunity (LaGrange and Silverman, 1999). A less supervised child with hedonistic tendencies (whatever the degree) is more likely to deviate. Though Gottfredson and Hirschi never openly specified the mediation aspect of self-control, they initially (Gottfredson and Hirschi, 1990) considered opportunity an important element of crime and later stated (Hirschi and Gottfredson, 1995) that self-control and opportunity are independent in their influence upon crime.

For studies that include the full model of self-control, in each instance parenting significantly influenced deviance when self-control was excluded from the analysis. However, results varied with the addition of self-control as a predictor. Hay (2001) and Unnever et al. (2003) found their parental variables retained a significant direct effect on delinquency when controlling for self-control. Polakowski (1994), Gibbs et al. (1998), and Feldman and Weinberger (1994) found that the association between parenting and deviance was mediated by self-control. That is, parenting indirectly influenced deviance via self-control. Pratt et al. (2004), Turner et al. (2005), and Wright and Beaver (2005) included parenting, but only self-control as the dependent variable. Whether parenting is a direct or indirect influence on crime and delinquency appears to be an unresolved issue of self-control theory.

# Invariance of Self-Control

Though a variety of methodologies have been applied to self-control theory, explicit tests on the invariance of self-control are rare. As noted by Tittle et al. (2003), if self-control is as universal as Gottfredson and Hirschi claim, the influence of key variables should vary little across (sub)samples. Vazsonyi and Crosswhite (2004) and Tittle et al. (2003) tested this hypothesis by employing the z-score method recommended by Paternoster et al. (1998). This method tests the equality of regression coefficients across samples. Using three self-control and four deviance measures, Tittle et al. (2003) compared the effects of self-control across gender and age. For each self-control/deviance combination tested, self-control significantly influenced deviance for both males and females, and z-scores indicated that the influence did not vary significantly by gender (with the exception of "variety" self-control on future crime/deviance). Among four age categories, self-control consistently failed to influence deviance for the oldest, and the magnitude of influence was always greatest for the youngest category. In the middle categories, significant influences existed for most self-control/deviance combinations. Z-scores

revealed that the influence of self-control differed significantly between the youngest and the oldest, and in many instances, influences also differed significantly from the youngest to the middle age categories. Using a sample of African American and Caucasian youth, Vazsonyi and Crosswhite (2004) compared the effects of self-control by gender and race on eight categories of deviance. With the exception of theft and assault, the influence of self-control on deviance did not differ significantly between male and female African American youth. When conducting gender specific analyses, for males, self-control significantly predicted all forms of deviance for both races; however, z-scores revealed that the influence on school misconduct differed significantly by race. For females, z-scores showed that the influence of self-control by race differed significantly for alcohol use, drug use, school misconduct, and total deviance (though self-control significantly influenced each of these deviance measures for both races). Moreover, self-control significantly predicted theft and assault for Caucasian but not African American females, yet z-scores revealed that the regression coefficients did not differ significantly by race. These studies cast at least some doubt on the invariance of self-control. Regardless, neither study tested the invariance of parenting as it applies to self-control theory.

# **American Indian Culture and Delinquency**

Despite a relative lack of inquiry, research finds that American Indians are one of the most deviant of all racial/ethnic groups in the United States. Official statistics have long reported American Indians as disproportionate offenders for most transgressions (Armstrong, Guilfoyle, and Melton, 1996; Greenfeld and Smith, 1999; Krisberg et al., 1987; Reasons, 1972; Stewart, 1964). This is especially true for juvenile crime rates (Andrews, 1999). Moreover, official rates of American Indian crime are excessive in spite of mass underreporting (Wakeling et al., 2001). Official statistics aside, self-report studies paint a similar picture. According to most, delinquency is higher for American Indians when compared to the general population (Donnermeyer et al., 1996; Forslund and Cranston, 1975; Lorch and Chien, 1988; Robbins and Alexander, 1985), though at least one study (Jensen, Stauss, and Harris, 1977) found similar rates of American Indian and Anglo delinquency. But as Lester (1999) notes, most studies fail to compare American Indian delinguency to a similarly-situated sample of whites.

Both official and self-report findings must be interpreted with caution due to the vast heterogeneity within Native America. There are more than 500 tribes, which

vary by region, reservation residence, and involvement in native culture (Beauvais, 1998). Moreover, two-thirds of the U.S. American Indian population resides on nonnative lands (Beauvais, 1998). In spite of such heterogeneity there appears to be a number of core cultural values salient to American Indian traditions, which stand in contrast to the surrounding Anglo culture (Nel, 1994). These include topics ranging from nature and reciprocity to time and space (Yates, 1987), integrated and united versus splintered and competing thought (DeFaveri, 1984), cooperative and group-oriented versus hierarchical and individualistic orientation (Swisher, 1990; Gilbert, Because of these differences, explanations of 2000). American Indian deviance entertain cultural issues not common to other U.S. racial/ethnic groups. Specifically, the American Indian/Anglo cultural divide is significant enough that the divide itself is implicated. It is believed that the differences generate conflict, marginality, and anomie, thus increasing the probability of deviance<sup>2</sup>.

Though cultural difference may be implicated, overall, there is nothing pointing to native traditions as problematic per se (Beauvais and LaBoueff, 1985). One exception may relate to parental practices. In a review of etiological research on American Indian substance use, Herring concludes that "a lack of clear-cut sanctions against substance use exists among Native American Indians" (1994:580). Herring (1994) cites several studies (Edwards and Edward, 1988; Schinke et al., 1988a; Schinke et al., 1988b) claiming that American Indians grow up in an environment where alcohol and substance use is not regarded as deviant but a sign of adulthood. Weibel-Orlando (1984) reported that about one third of participants in her study first drank with a close relative. But consistent with most research on American Indian crime and delinquency, these studies fail to include a comparable sample of whites. In fact, while Herring attributes American Indian substance use to parenting, he also states "the evidence indicates that many etiological influences are the same for Native American Indians as they are for other ethnic groups" (1994:579).

Even if substance use is less sanctioned, this may not be the case with other forms of delinquency. According to Silverman (1996), and Armstrong, Guilfoyle, and Melton (1996), the depiction of American Indians as disproportionately criminal or delinquent is largely the product of alcohol- and substance-related offenses. Substance use aside, few etiological studies include other forms of delinquency among American Indians. Regardless of theoretical claims, Ledlow (1992) concludes there is little empirical support for cultural arguments. There is presently no evidence that American Indians and whites differ

in interpersonal traits related to criminal behavior (Lester, 1999).

#### **Current Investigation**

The influence of self-control on crime and analogous behavior is well documented. The influence of parenting on self-control is inconsistent. Research on the mediating role of self-control on the parenting/crime relationship is mixed. Invariance tests are few, and those that exist fail to test the invariance of parenting as it relates to self-control theory.

Our goal is to explore the invariance of the full model of self-control using a sample of American Indian and white youth. We test the invariance of parenting as a predictor of self-control and the invariance of self-control as a predictor of delinquency. By extension, we test the invariance of the direct and indirect (via self-control) influence of parenting on delinquency. We do as previous self-control invariance studies have done and assume that our groups differ in some meaningful way. We emphasize cultural difference due to the cultural independence on which Gottfredson and Hirschi (1990) construct selfcontrol theory. As they state, the similarities in crime and criminality outweigh the differences and therefore "cultural variability is *not* important in the causation of crime, that we should look for constancy rather than variability in the definition and causes of crime, and that a single theory can encompass the reality of cross-cultural differences in crime rates" (1990:175). The literature on American Indian culture provides the foundation for which our particular assumption of group difference is

We address four primary research questions. 1) Do parenting, self-control, and delinquency differ between American Indians and whites? 2) Is the influence of parenting on self-control invariant? 3) Is influence of self-control on delinquency invariant? 4) Are the direct and indirect influences of parenting on delinquency invariant? Though secondary to our invariance tests, we use the last three questions to estimate self-control as a mediator of the parenting influence upon delinquency. We also address the issues of age and gender as they relate to self-control theory.

# **Data and Methodology**

The data for this study were gathered from six public high school districts in Oklahoma, a state well suited for such research since American Indians are the largest racial or ethnic minority. Schools from each of the five geographic regions of the state (central, northeast, southeast, northwest/panhandle, and southwest) were selected and include urban, rural, and mixed school districts. The original project from which these data are derived was a study of racial/ethnic differences in the prevalence, incidence, and etiology of delinquency, particularly American Indians. Consequently, special consideration was given to maximize the number of American Indian respondents and variation in tribal membership.

Anonymous questionnaires were administered by research staff and school officials to all students, attending grades 9 through 12, who were present the day of the survey. Participation was voluntary and written parental permission was required. Attrition due to voluntary participation, parental permission, and absenteeism reduced the proportion of completed questionnaires to approximately 43 percent of the total enrollment of the schools sampled. Though the response rate varied among participating schools, it proved to be similar to rates reported by other researchers who have adopted the requirements of voluntary participation and parental permission required by both school officials and the Institutional Review Board's (IRB) policy regarding protected groups in human subject research (Cochran et al., 2002). The percentage of American Indians in our sample was proportionate to the overall enrollment of the targeted schools (20.2) % versus 22.1%), though males were slightly underrepresented (44.4% versus 48.9%). After deleting other races, the sample included 1,122 white and 382 American Indian respondents.

Our analyses begin with mean comparisons by race of all variables. This is followed by a series of race-specific regressions. The first regression model tests the influence of parenting on self-control. The second model tests the direct influence of parenting on delinquency. The third model includes both parenting and self-control as predictors of delinquency. Using the method described by Paternoster et al. (1998), we then test whether any influences (regression coefficients) differ significantly by race. The familial variables number of parents, number of siblings, and mother working are also included in each regression (due to Gottfredson and Hirschi's hypotheses), though invariance tests are not applied to these variables. All regressions control for age and gender.

These models are also used to explore the mediating effect of self-control on the parenting/delinquency relationship. Judd and Kenny (1981) recommend three regression models for testing mediation: (1) Regressing the mediator on the independent variable; (2) regressing the dependent variable on the independent variable; (3) regressing the dependent variable on both the independent

dent variable and the mediating variable. Because our regression models parallel this methodology, we use them to estimate the mediation effect of self-control for both American Indians and whites. We consider the invariance test central to our analyses, with the mediating test as a secondary benefit.

#### Independent and Dependent Variables

Our familial variables include parenting, number of parents and number of siblings in the household, and the extent to which the mother works outside the home. Parenting is measured using three indicators that ask respondents to report the monitoring, recognizing, and punishing practices of their parents. Responses for each indicator range from 1 (strongly disagree) to 4 (strongly agree). The reliability of our parenting indicators (Table 1) is similar for American Indian (.69) and white (.61) respondents; hence, additive parenting scales are produced for each race. The parent and sibling variables come from a single question asking "How many of the following people live in the same household with you? Response options include: Father; Mother; How many brothers?; and How many sisters? Number of parents is coded 0, 1, or 2. Our coding does not distinguish whether a parent is mother or father, nor are we able to consider stepparents. Number of siblings is the sum of brothers and sisters. Mother working outside the home consists of four response options ranging from never (1) to most of time (4). Indicators and descriptive statistics are included in the Appendix.

We employ the Grasmick et al. (1993) self-control scale, which is comprised of six dimensions (immediate gratification, simplicity, risk-taking, physicality, anger, and self-centeredness) made up of four indicators each, for a total of 24 items. Each item includes Likert responses ranging from 1 (strongly disagree) to 4 (strongly agree). This scale is the most widely used measure of self-control and has been established as valid and reliable (Tittle et al., 2003); hence, it is a reasonable choice for our test of invariance. Table 1 reveals that the 24 items are internally consistent for American Indians ( $\alpha$  = .88), and whites ( $\alpha$  = .87). Removing any of the indicators reduces the respective Chronbach's alpha. We sum the 24 items to produce our self-control scales.

Delinquency includes three categories—personal offending, property offending, and vandalism—made of five indicators apiece (see Appendix). For each indicator, respondents are asked to report the number of times in the past year he or she has participated in a specific act. When scaled additively, each category of delinquency

Table 1. Reliability Analysis by Race on Parenting, Self-Control, and Delinquency

	America	n Indian	Wh	ite
	Ν	α	N	α
Parenting	378	.69	1,117	.61
Self-control	364	.88	1,058	.87
Personal offending	367	.69	1,090	.67
Property offending	362	.68	1,058	.71
Vandalism	368	.65	1,085	.61

revealed a considerable positive skew (personal = 5.13; property = 5.95; vandalism = 17.88). We transform the data by recoding indicator responses 0 (never) and 1 (one or more), then sum the indicators into their appropriate offense category. The transformation significantly reduces the skew of each scale (personal = 1.83; property = 1.58; vandalism = 1.96). According to Tabachnik and Fidell (1996), analyses involving such moderate skews of similar degree would not be significantly improved with further transformation. For American Indians and whites, reliability analysis (see Table 1) justifies the use of all indicators for personal offending ( $\alpha$  = .69; .67, respectively), property offending ( $\alpha$  = .68; .71, respectively), and vandalism ( $\alpha$  = 65; 61, respectively) additive scales.

#### Results

Table 2 reports the means and standard deviations of each variable by race. We include the demographic variables age and gender since they are the best known correlates of crime (Gottfredson and Hirschi, 1990). Gender is coded 0 (female) and 1 (male), and the distribution is fundamentally equal for each race. Forty-two percent of American Indians are male, 44 percent of whites are male. Age ranges from 15 to 21, and displays a fairly normal distribution for each race. Parenting ranges from 3 to 12; high scores signify better parenting. Self-control ranges from 24 to 96; high scores signify greater self-control. Though some prefer to code self-control so that high scores equal low self-control, we side with Tittle, Ward, and Grasmick (2004) who argue that such a procedure adds unnecessary interpretation difficulties. Finally, all delinquency categories range from 0 to 5; high scores signify more participation in delinquency.

The only means that do not differ significantly are gender and property offending. Among key variables, American Indians report less adequate parenting and low self-control compared to whites. American Indians also report higher levels of personal offending and vandalism. Though most mean differences by race are statisti-

Table 2. Descriptive Statistics by Race for Variables Included in the Analyses and T-Tests of Significance on Mean Scores

_	Aı	merican In	dian		White		
	Ν	Mean	SD	N	Mean	SD	Sig.
Age	381	17.22	1.12	1,119	17.09	1.03	.034
Gender	382	.42	.49	1,120	.44	.50	.334
Parents	380	1.53	.63	1,118	1.69	.55	.000
Siblings	381	1.46	1.35	1,118	1.19	1.17	.001
Mother working	382	3.12	1.20	1,122	2.95	1.28	.022
Parenting	378	10.12	1.97	1,11 <i>7</i>	10.46	1.65	.002
Self-control	364	61.25	12.32	1,058	63.79	11.87	.001
Personal offending	367	.86	1.24	1,090	.61	1.05	.000
Property offending	362	.97	1.28	1,058	.84	1.25	.104
Vandalism	368	.66	1.07	1,085	.52	.94	.027

cally significant, the magnitude of difference is generally slight.

Regression Analyses

Table 3 reports the race-specific, standardized OLS regression coefficients for self-control, personal offending, property offending, and vandalism as dependent variables. Self-control is the dependent variable in the

first column (model 1). Under each delinquency category are two models. The first (model 2) denotes the direct influence of parenting. The second (model 3) includes self-control with parenting as predictors of delinquency.

Beginning with model 1, the results are not encouraging for the theoretical assertions of self-control as a dependent variable. For white respondents, parenting is a significant but modest positive influence (.09) on self-control. As hypothesized, better parenting leads to

(Dependent	Variables = 1	Self-Control,	Personal Offe	ending, Prope	rty Offendin	g, and Vanda	alism)
	Self- control	Personal	offending	Property of	offending	Vand	alism
American Indian							
Age	.17 **	05	.00	06	.00	07	.01
Gender (male = 1)	10	.26 **	.23 **	.23 **	.18 **	.17 **	.11 *
Parents	02	03	04	09	10 *	.00	02
Siblings	03	.10	.10	.06	.04	03	04
Mother working	.00	05	06	.00	01	.02	.01
Parenting	.04	07	06	22 **	20 **	24 **	21 **
Self-control			31 **		38 **		38 **
R <sup>2</sup>	.036	.082	.174	.116	.250	.088	.214
N	358	361	345	357	341	363	348
White							
Age	.09 **	03	.01	05	.00	07 *	02
Gender (male = $1$ )	15 **	.23 **	.17 **	.26 **	.22 **	.19 **	.13 **
Parents	.01	03	02	07 *	07 *	02	.01
Siblings	.00	.09 **	.09 **	.09 **	.08 **	.07 *	.07 *
Mother working	03	.04	.04	.05	.04	.00	01
Parenting	.09 **	03	01	10 **	08 **	09 **	07 *
Self-control			36 **		33 **		35 **
R <sup>2</sup>	.037	.064	.189	.096	.204	.055	.166
N	1,047	1,078	1,025	1,046	991	1,072	1,018

self-control. However, parenting fails to significantly impact (.04) the self-control of American Indians. These findings suggest that poor parenting is not likely to be the dominant source of low self-control among our respondents, especially for American Indians. Furthermore, since parenting more or less fails to influence self-control, the likelihood of indirect parenting influences on delinquency is slim; hence, mediation is doubtful. The remaining familial variables also fail to influence self-control for each race.

Turning to delinquency as the dependent variable, when self-control is excluded (model 2), parenting significantly influences property offending and vandalism for both American Indians (-.22, -.24, respectively) and whites (-.10, -.09, respectively) in that better parenting decreases the likelihood of each. When self-control is added (model 3) the influence of parenting remains statistically significant for American Indian (-.20, -.21, respectively) and white (-.08, -.07, respectively) property offending and vandalism. Nevertheless, self-control significantly predicts each form of delinquency for American Indian (-.31, -.38, -.38) and white respondents (-.36, -.33, -.35), and the magnitude of influence is more robust than parenting. Moreover, when self-control is included as a predictor of delinquency, the explained variance of the model (3) is notably larger than that of the parenting model (2).

According to Baron and Kenny, mediation occurs if "a previously significant relation between the independent and dependent variables is no longer significant" (1986:1176) when the mediating variable is introduced to the model. When self-control is introduced, the influence of parenting on delinquency remains significant (and largely unchanged). This further suggests that the influence of parenting on delinquency is not mediated by self-control, implying that the effects of parenting are largely direct, not indirect via self-control. Parenting failed to significantly impact personal offending regardless of race or the inclusion of self-control.

Among the demographic influences, younger respondents of both groups are significantly more likely to report low self-control. This finding is in line with previous research on age and self-control (Tittle et al., 2003) and is theoretically consistent since Gottfredson and Hirschi (1990) allow for the possibility of improvement in self-control with age. Gender significantly influences white but not American Indian self-control. White females report higher self-control than white males. According to Tittle et al. (2003), females should report higher self-control since they are generally more supervised. Regardless, the explained variance of model

1 is less than 4 percent for each race, suggesting little influence among our predictors.

When testing these demographic influences on delinquency, with the exception of vandalism for whites, no significant age/delinquency coefficients exist. However, this significant age/vandalism coefficient is reduced to insignificance with the addition of self-control. Similar reductions in other age/delinquency coefficients appear when self-control is added to the model. Coupled with the significant influence of age on self-control, the influence of age on delinquency appears to occur through self-control. The overall lack of age influence, however, delimits this interpretation. As for gender, American Indian and white males are significantly more likely to report all forms of delinquency whether or not self-control is included in the model—an issue we return to in the discussion.

#### Tests of Significance by Race (Z-Scores)

The crux of our analyses is presented in Table 4, which reports the unstandardized regression coefficients and standard errors for our race-specific regressions. Applying the method outlined by Paternoster et al. (1998), we use these to calculate a z-score. This score verifies whether the differences in regression coefficients by race are statistically significant. We first test the invariance of parenting on self-control (model 1). We then test the invariance of the direct influence of parenting on delinquency (model 2). Finally, we test the invariance of parenting and self-control on each form of delinquency (model 3). We report the invariance tests on both the direct and indirect influences of parenting on delinquency for two reasons. First, we wish to address the overall lack of research on the etiology of American Indian delinquency, especially whether or not it differs from other groups. Secondly, previous research has implicated parenting as a disproportionate source of American Indian delinquency (Herring, 1994). Consequently, while the findings reported in Table 3 indicate a lack of mediation, both direct and indirect influences (on delinquency) are compared to check for the invariance of parenting as fully as possible. All coefficients reported in Table 4 are derived from the previous models (Table 3), which control for age, gender, number of parents and siblings, and mother working.

Beginning with model 1, although parenting is a significant influence upon white but not American Indian self-control, the difference by race is not statistically significant. This suggests that the influence of parenting on self-control is invariant, though we are guarded in this assessment due to the overall lack of influence. In a

Table 4. Unstandardized OLS Coefficients, Standard Errors, and Z-Scores

(Dependent Variables = Self-Control, Personal Offending, Property Offending, and Vandalism)

_	American Indian		White	e	
	В	SE	В	SE	z-Score
Self-control					
Parenting	.269	.334	.650 **	.222	.95
Personal offending					
Parenting (direct)	045	.033	021	.019	.75
Parenting	036	.032	007	.018	.91
Self-control	031 **	.005	032 **	.003	.17
Property offending					
Parenting (direct)	145 **	.033	076 **	.023	1.53
Parenting	132 **	.031	062 **	.022	1.56
Self-control	040 **	.005	035 **	.003	.83
Vandalism					
Parenting (direct)	130 **	.028	053 **	.017	2.41 *
Parenting	115 **	.027	037 **	.017	2.43 *
Self-control	032 **	.004	027 **	.002	1.12

Note: Coefficients control for age, gender, parents, sibling, and mother working.

\* = significant at  $\varrho$  < .05 \*\* = significant at  $\varrho$  < .01

similar vein, the influence of self-control on delinquency does not vary significantly by race. In combination, these findings support the invariance claims of self-control theory.

When comparing the influence of parenting on delinquency by race, the unstandardized regression coefficients are notably larger for American Indians (more than double in most instances). However, z-scores show that American Indian/white differences in the influence of parenting are statistically significant (p < .05) for vandalism only, whether or not self-control is included in the model. This suggests that parenting is a better predictor of American Indian vandalism compared to whites. In combination, our invariance tests suggest that the role of self-control is essentially similar for American Indians and whites, but the role of American Indian parenting on delinquency is slightly different, independent of self-control<sup>3</sup>.

#### **Discussion**

Our analyses yield five primary findings. 1) American Indians report poor parenting, low self-control, and higher levels of delinquency (personal offending and vandalism) relative to white respondents, though the differences are not dramatic. 2) Parenting is not a robust predictor of self-control for either group. 3) Self-control

is a fairly robust predictor of delinquency for both groups. 4) Parenting is a significant predictor of property offending and vandalism (but not personal offending) for both groups, independent of self-control. 5) Self-control influences are invariant by race, but parenting influences differ somewhat by race. Though not central to our analysis, we also discuss the mediation effect of self-control, as well as age and gender in relation to self-control theory.

Gottfredson and Hirschi (1990) insist that poor parenting is the primary source of low self-control, and that a handful of other familial variables are secondary influences. Controlling for age and gender, we find that parenting significantly influences the self-control of white but not American Indian respondents. However, zscores reveal that the difference by race is not statistically significant. While we interpret this finding as support for the invariance of parenting on self-control, the meager influence of parenting for both groups stands in contrast to theoretical expectations and most, but not all research on self-control as a dependent variable. Our findings side with others who question the influence of parenting on self-control (see Cochran et al., 1998; Wright and Beaver, 2005). All of our other familial variables fail to predict self-control.

Nevertheless, parenting significantly influences property offending and vandalism for both groups, and this influence is significant whether or not self-control is included in the model. However, invariance tests show that parenting is a significantly stronger predictor of American Indian vandalism compared to whites. For our particular sample and measures, it appears that American Indian parenting disproportionately contributes to vandalism when compared to white parenting. This does not imply that American Indian parenting is inadequate compared to whites (mean differences in parenting were slight, albeit significant), just that parenting is a more robust predictor.

As for self-control as a predictor of delinquency, our tests effectively support the invariance thesis. Self-control significantly predicted the likelihood of personal offending, property offending, and vandalism for both American Indian and white youth. In each instance, the influence of self-control is of decent magnitude and z-scores show that the influence does not differ significantly by race.

In combination, our regression findings also suggest that the influence of parenting on delinquency is not mediated by self-control for either race; hence, parenting is a direct influence on delinquency, not indirect via selfcontrol. With the exception of Hay (2001) and Unnever et al. (2003), this finding is also at odds with the majority of previous research on parenting and self-control. We are cautious with this interpretation, however, due to the wording of our items. Asking about the practices of parents when respondents were younger poses at least two problems. One, it is likely that respondents' parents are consistent over time and that those who were better supervised when younger are better supervised at the time of our study. This being the case, our parenting measures would influence opportunity (yet not the development of self-control as a trait). Two, our measures may be complicated by memory issues. Current parenting practices may influence the way our respondents recall previous parenting practices. For example, respondents with currently lax parents may believe their parents were always lax. The same is true for currently strict parents and the belief they were strict when the respondents were younger.

In addition to opportunity, we interpret our parenting-related findings with caution for other reasons. First, the lack of parental influence on self-control may reflect a weakness of our three-item parenting measure. Among those who found significant influence, Gibbs et al. (1998) used a 40-item monitoring/discipline measure. Hay (2001) employed four monitoring and four discipline measures, each asked separately for both mothers and fathers. Feldman and Weinberger (1994) addressed multiple dimensions that included attachment as well as consistency and severity of punishment measures. However, Unnever et al. (2003) and Turner et al. (2005)

used only four items, two for supervision and two for monitoring/discipline. Pratt et al. (2004) applied a two-item scale on lecturing and punishing. Polakowski (1994) also used only two items, one for supervision and one for consistency of punishment. In defense of our findings, Wright and Beaver (2005) also question the influence of parenting on crime, yet their parenting measures included a nine-item parental involvement scale, a nine-item parental withdrawal scale, a four-item parental affection scale, a three-item family rules scale, and a two-item physical punishment measure.

Another weakness of our parenting measure is that it does not capture the breadth and depth of potential cultural differences between American Indian and white parenting. Problematic as this may be, our measures are operationalized to address the issue of parenting as specified by Gottfredson and Hirschi (1990), and include a recognition measure in addition to monitoring and punishment. Among the aforementioned studies, only Cochran et al. (1998) included an explicit recognition measure, which was scaled with three other items: rule setting, monitoring, and punishment. Though Gibbs et al. (1998) and Hay (2001) argue that lacking a recognition measure is not overly problematic, Gottfredson and Hirschi (1990) state that this is the parenting item in most need of empirical research. Furthermore, both Cochran et al.'s (1998) and our findings question the influence of parenting on self-control.

Arguably the strongest support for our parenting measure is that it significantly influences delinquency (two of three forms), in the expected direction, independent of self-control, for both groups. Operational shortcomings aside, at a minimum our findings cast doubt on Gottfredson and Hirschi's claim that "differences in selfcontrol probably far outweigh differences in supervision in accounting for racial or ethnic variations" (1990:153) in crime. Given the limited and unsettled nature of existing parental measures, we agree with Pratt et al. (2004), Turner et al. (2005), and Wright and Beaver (2005) that the trend toward more research on self-control as a dependent variable is needed, especially in light of the weight Gottfredson and Hirschi (1990) attach to parenting as the overriding determinant. We view our analyses as an exploratory step, and hope our findings spur future research on the parenting invariance issue related to both self-control and American Indian delinquency.

Though not a focus of our study, we address the age and gender findings due to limited research on the topics. The effect of self-control on the age/crime association is largely indeterminable. Younger respondents reported lower self-control with our sample, which is theoretically

consistent, but age is largely unrelated to delinquency. We attribute the lack of age influence on delinquency to the limited age distribution of our sample. As for gender, it has been argued that if self-control is the robust predictor its authors claim it to be, it should significantly reduce the gender/crime association (Tittle et al., 2003). Previous research on gender and self-control is mixed. Burton et al. (1998), LaGrange and Silverman (1999), and Tittle et al. (2003) found at least some support for self-control as a mediator of the gender/crime association. Gibbs et al. (1998) found that the gender influence on crime had both a direct as well as an indirect effect via self-control. Our findings reflect the latter. When self-control is added to the model, gender remains a significant predictor of all forms of delinquency for both American Indian and white respondents. Regardless, self-control is the strongest predictor in this model, which, minimally, is not at odds with the theory.

We would be remiss not to address the assumption of cultural difference on which our invariance tests are based. We rely on extant literature to support the notion that American Indians are culturally distinct from their white counterpart. Hence, we assume cultural difference (as other tests of invariance have done) without any measures of such. Future research would be well served to include measures of the assumed differences.

Other caveats include our sample and the dimensionality of self-control. School-based self-report surveys are known to disproportionately exclude adolescents prone to delinquency (Tracy, Wolfgang, and Figlio, 1990). Students with low self-control are also less likely to complete the IRB requirements or the survey (Piquero, MacIntosh, and Hickman, 2000). Previous research has also questioned the use of the Grasmick et al. (1993) self-control scale as a unidimensional construct (Marcus, 2004). Nevertheless, the Grasmick et al. (1993) scale is known for its face validity, is the most widely tested measure of self-control, and has been supported as a significant predictor of a wide assortment of deviant behaviors. Because we are concerned with extending current tests on the invariance of self-control theory (which also applied the Grasmick et al. scale) to include the role of parenting, this scale is a logical choice.

We must also mention one particular aspect shared by virtually all of our American Indian respondents: only five reside on traditional native lands. This could be seen as a hindrance to our research, but we would argue against such a conclusion for several reasons. As cited earlier, American Indians are a vastly heterogeneous group and it would be erroneous to consider any sample as representative of the population as a whole. Secondly, two-thirds of the U.S. American Indian population does not reside on a reservation (Beauvais, 1998), and these are the American Indians largely ignored in self-report delinquency research (Lester, 1999). Furthermore, research has shown that non-reservation American Indians maintain distinct native practices that distinguish them from the Anglo world (Michel, 2002; Poupart, 2002). Finally, non-reservation American Indians have recently been cited as more at risk than their reservation counterpart (Grossman et al., 1994; Lewin, 2004). In light of these issues, one could argue our sample is preferred to a reservation sample. If nothing else, the use of non-reservation American Indians is a reasonable advancement of existing tests of significance on the invariance of self-control, and addresses the etiology of a relatively troubled group.

Our use of regression analysis for testing the mediating effect of self-control is potentially problematic. According to Baron and Kenny (1986) using multiple regression to estimate mediation requires two assumptions—one, that there be no measurement error in the mediator, and two, that the dependent variable not cause the mediator. A common method for dealing with these issues is the use of structural equation modeling (SEM). However, the mediation effect of self-control is a secondary concern in our analyses. Our primary goal is to test the invariance of parenting and self-control in relation to American Indian delinquency. Research focused on the mediation effect of self-control would benefit from the use of SEM.

Our analyses explore the invariance of the "full model" of self-control and we encourage more stringent tests, especially those which include invariance tests on non-parental predictors as recently explored by Unnever et al. (2003), Pratt et al. (2004), Turner et al. (2005) and Wright and Beaver (2005). Past research centered on self-control as an independent variable and now the focus has shifted to self-control as a dependent variable. We believe it is best to simultaneously test self-control as an independent and dependent variable. Such analyses should estimate the mediating effect of self-control by including the direct and indirect influences of parenting and other predictors (whatever they may be). Most of all, we encourage cross-sample invariance tests on each influence.

Finally, our tests attend to the much needed empirical research on the etiology of American Indian delinquency, on or off reservation. American Indians have been documented as "the most severely disadvantaged of any population within the U.S." (Yates, 1987:1135), yet the source of their illegal behavior remains relatively unstudied. Extant literature appears divided over whether or not the etiology of American Indian deviance is somehow dis-

tinct from standard criminological theories, and whether American Indian parenting is a culturally distinct source. For these reasons alone we consider this test of parenting and self-control an important step in understanding American Indian delinquency. For now, we accept self-control and parenting as predictors of American Indian delinquency (in a manner similar to white delinquency) and encourage further research comparing other theoretical perspectives, including those that more intricately address the role of culture.

#### **Endnotes**

- 1. Unnever et al. (2003), Pratt et al. (2004), Turner et al. (2005) and Wright and Beaver (2005) also found significant, non-parenting influences upon self-control.
- 2. The problem of American Indian cultural orientation includes numerous theoretical interpretations. Details can be found in LaFromboise, Coleman, and Gerton, 1993; and Morris, Crowley, and Morris, 2002.
- 3. Regression models excluding number of parents, siblings, and mother working were run but not reported. Excluding these variables did not appreciably alter the regression coefficents reported in Table 3. However, the parenting z-scores related to property offending (direct/indirect; 1.97/1.98) are significant ( $\underline{p} < .05$ ) when these variables are excluded.

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# **Appendix A. Descriptive Statistics**

Descriptive statistics reflect raw mean scores and standard deviations of indicators by race.

Risk taking   1   1   1   1   1   1   1   1   1	·	America	n Indican	Wł	iite
Risk lating         20         3         4         2.93         2.94         2.05         2.95		Mean	SD	Mean	SD
This is to test myself every now and then by doing something a little fash is a commenter of the fun of it. Commenters in dil exciting to do things for which I might get in touble. Commenters in dil exciting to do things for which I might get in touble. Commenters in dil exciting to do things for which I might get in touble. Commenters in the Excitement and adventure are more important to me than peace and security.    **Temperate thy ty a avoid projects that I know will be difficult.**   **Temperate thy ty a avoid projects that I know will be difficult.**   **Temperate thy ty a avoid projects that I know will be difficult.**   **Temperate thy ty a avoid projects that I know will be difficult.**   **Temperate thy ty a avoid projects that I know will be difficult.**   **Temperate thy ty a avoid projects that I know will be difficult.**   **Temperate thy ty a avoid projects that I know will be difficult.**   **Temperate thy ty a avoid projects that I know will be difficult.**   **Temperate thy ty a avoid projects that I know will be difficult.**   **Temperate thy ty a avoid projects that I know will be difficult.**   **Temperate the things that the avoid to bring me the most pleasure.**   **Temperate thy ty a avoid projects that I know will be difficult.**   **Temperate thy ty a avoid projects that I know will be difficult for me to take calmy be avoid the manage.**   **Temperate thy ty a avoid projects that I know will be difficult for other people.**   **Temperate thy ty a avoid project that service the project when they are having problems.**   **Temperate thy ty a avoid project that it means making things difficult for other people.**   **Temperate the project me that min.**   **Temperate the things that the content when I law is time and the project when I was a transpired to other people when they are having problems.**   **Temperate the things that the content when I law is time and the project that is the project when I was a transpired to the project when I was a transpired the project when I was a tra	Self-Control				
Sometimes find texticing to do things for which mode is sometimes find texticing to do things for which Imight get in trouble.   2,47   10,9   2,24   10,1	Risk taking				
Sometimes find it excitings to ob things for which I might get in trouble.	I like to test myself every now and then by doing something a little risky.	2.93	.94	2.96	.93
Excession and adventure are more important to me than peace and security.   Simplicity   Simpl	Sometimes I will take a risk just for the fun of it.	2.80	1.03	2.78	1.05
Excession and adventure are more important to me than peace and security.   Simplicity   Simpl	I sometimes find it exciting to do things for which I might get in trouble.	2.47	1.09	2.42	1.10
Integrating try to avoid projects that Iknow will be difficult.   2.55   3.95		2.29		2.14	1.00
Integrating try to avoid projects that Iknow will be difficult.   2.55   3.95	Simplicity				
When things get complicated, I tend to quit or withdraw.         2.08         3.98         1.99         2.21         1.90         1.09         2.19         2.10         2.10         2.10         2.00	· ·	2.55	.97	2.51	.99
The things in life that are easiest to do bring me the most pleasure.   1 dislike really hard tasks that stretch my abilities to the limit.   2 dislike really hard tasks that stretch my abilities to the limit.   2 dislike really hard tasks that stretch my abilities to the limit.   2 dislike really hard tasks that stretch my abilities to the limit.   2 dislike really hard tasks that stretch my abilities to the limit.   2 dislike really hard for me to talk calmly about it without getting upset.   2 dislike really angly, other people better shy away from me.   2 dislike really angly, other people better shy away from me.   2 dislike really angly, other people better shy away from me.   2 dislike really angly, other people better shy away from me.   2 dislike really angly, other people better shy away from me.   2 dislike really angly, other people better shy away from me.   2 dislike really angly, other people better shy away from me.   2 dislike really angly, other people went they are having problems.   1 dislike really angly, other people when they are having problems.   1 dislike really angly angly a dislike really angly angly a dislike really angly angly angly angly angly angly angly angly angly a dislike lift things of use people, it shelp problems from time.   2 dislike really angly angly angly angly angly angly a dislike really angly					.91
Anger					.96
Those my temper pretty easily.					.93
		2.13	1.00	2.03	.55
Often, when I'm anapy at people I feel more like hurting them than talking to them about why I am angry.         2.5         1.1         2.9         1.0           When I'm really angry, other people better stay away from me to talk calmly about it without getting upset.         2.5         1.1         2.0         1.0           Self-centre-Cinese         3.0         2.0         2.0           Self-centre-Cinese         3.0         2.2         9           I'm to very sympathetic to other people when they are having problems.         1.6         2.0         9         1.6         8.0         1.5         8.8         8.0         1.5         8.8         8.0         1.5         8.8         8.0         1.5         8.8         8.0         1.5         8.0         1.5         8.0         1.5         8.0         1.5         1.6         8.0         1.5         9.0         2.6         8.0         8.0         8.0         8.0         8.0         8.0         8.0         8.0         8.0         8.0         8.0         8.0         8.0         9.0         8.0         8.0         9.0         8.0         9.0         9.0         9.0         9.0         9.0         9.0         9.0         9.0         9.0         9.0         9.0         9.0         9.0		2.40	1 11	2.27	
When I'm really angry, other people better stay away from me.					
Self-centeredness					
Self-centeredness			1.12		1.07
The totolook out for myself first, even if it means making things difficult for other people.   2.38   1.00   2.29   3.9   I'm not very sympathetic to other people when they are having problems.   1.65   3.66   1.51   3.8   1.51   1.68   3.8   I'will try to get the things I want even when I know it's causing problems for other people.   1.87   3.9   3.9   1.79   3.8   I'will try to get the things I want even when I know it's causing problems for other people.   2.78   3.90   3.9   3.79   3.23   3.9   I'will had a choice, I would almost always rather do something physical that something mental.   2.78   3.90   2.65   3.23   3.9   3.97   2.95   3.23   3.9   I almost always feel better when I am on the move than when I am sitting.   3.10   3.03   3.97   2.95   3.29   3.9   I seem to have more energy and a greater need for activity than most other people my age.   2.76   3.89   2.65   3.90   2.65   3.90   Immediate gratification   1.98   9.98   1.76   9.90   Immediate gratification   1.98   9.98   1.76   9.90   I don't devote much thought and effort to preparing for the future.   2.51   1.01   2.44   1.00   I'm more concerned with what happens to me in the short run than in the long run.   2.30   1.06   2.04   3.90   I'm more concerned with what happens to me in the short run than in the future.   2.50   3.90   2.41   3.90   I'm more concerned with what happens to me in the short run than in the future.   2.50   3.90   2.41   3.90   I'm more concerned with what happens to me in the short run than in the future.   3.31   8.8   3.52   3.50   I'm more concerned with what happens to me in the short run than in the future.   3.31   8.8   3.52   3.50   I'm more concerned with what happens to me in the short run than in the future.   3.31   3.8   8.2   3.52   3.90   I'm more concerned with what happens to me in the short run than in the future.   3.31   3.8   8.2   3.52   3.90   I'm more concerned with what happens to me in the short run than in the future.   3.31   3.8   8.2   3.52   3.90   I'm more concerned with what	When I have a serious disagreement, it's usually hard for me to talk calmly about it without getting upset.	2.84	1.10	2.75	1.06
Irm not very sympathetic to other people when they are having problems.   1.65   3.66   1.51   3.81   3.81   3.87   3.97   3.68   3.81   3.8	Self-centeredness				
If things I do upset people, it's their problem not mine.         1.87         9.7         1.68         8.           I will try to get the things I want even when I know it's causing problems for other people.         1.90         9.3         1.79         8.           Physicality         That A a choice, I would almost always rather do something physical that something mental.         2.78         9.6         2.68         1.0           I almost always feel better when I am on the move than when I am sitting.         3.03         9.7         2.25         1.99           I like to get out and do things more than I like to read or contemplate ideas.         3.19         9.7         3.23         9.           I seem to have more energy and a greater need for activity than most other people my age.         2.76         3.89         1.66         9.           I florit devote much thought and effort to preparing for the future.         1.98         .98         1.76         9.           I often do whatever brings me pleasure here and now, even at the cost of some distant goal.         2.51         1.01         2.44         1.00           I'm more concerned with what happens to me in the short run than in the future.         2.52         2.90         2.41         1.90           Acetala supervision.         2.52         2.95         2.64         1.90           Acetala supervision. <td>I try to look out for myself first, even if it means making things difficult for other people.</td> <td>2.38</td> <td>1.00</td> <td>2.29</td> <td>.94</td>	I try to look out for myself first, even if it means making things difficult for other people.	2.38	1.00	2.29	.94
Name   Physicality   Physicality   Physicality   Physicality   Physicality   Physicality   Physicality   Physicality   If I had a choice, I would almost always rather do something physical that something mental.   2.78   3.60   2.68   1.79   2.95   1.99   1.18   2.75   2.95   1.99   1.18   2.75   2.9	I'm not very sympathetic to other people when they are having problems.	1.65	.86	1.51	.81
Physicality   1	If things I do upset people, it's their problem not mine.	1.87	.97	1.68	.85
If I had a choice, I would almost always rather do something physical that something mental.       2.78       .96       2.68       1.0         I almost always feel better when I am on the move than when I am sitting.       3.03       3.97       2.95       3.93         I like to get out and do things more than I like to read or contemplate ideas.       3.19       3.97       3.23       3.9         I seem to have more energy and a greater need for activity than most other people my age.       1.96       3.98       1.76       9.9         I don't devote much thought and effort to preparing for the future.       1.98       1.98       1.76       9.9         I don't devote much thought and effort to preparing for the future.       1.98       1.98       1.76       9.9         I don't devote much thought and effort to preparing for the future.       1.98       1.98       1.76       9.9         I don't devote much thought and effort to preparing for the future.       1.98       1.98       1.76       9.9         I don't devote much thought and effort to preparing for the future.       1.98       1.98       1.76       9.9         I fled no whatever brings me pleasure here and now, even at the cost of some distant goal.       1.88       1.76       9.9       2.41       9.9         I much prefer doing things that man the than the future.       1.98       1.88 <td>I will try to get the things I want even when I know it's causing problems for other people.</td> <td>1.90</td> <td>.93</td> <td>1.79</td> <td>.84</td>	I will try to get the things I want even when I know it's causing problems for other people.	1.90	.93	1.79	.84
If I had a choice, I would almost always rather do something physical that something mental.       2.78       .96       2.68       1.0         I almost always feel better when I am on the move than when I am sitting.       3.03       3.97       2.95       3.93         I like to get out and do things more than I like to read or contemplate ideas.       3.19       3.97       3.23       3.9         I seem to have more energy and a greater need for activity than most other people my age.       1.96       3.98       1.76       9.9         I don't devote much thought and effort to preparing for the future.       1.98       1.98       1.76       9.9         I don't devote much thought and effort to preparing for the future.       1.98       1.98       1.76       9.9         I don't devote much thought and effort to preparing for the future.       1.98       1.98       1.76       9.9         I don't devote much thought and effort to preparing for the future.       1.98       1.98       1.76       9.9         I don't devote much thought and effort to preparing for the future.       1.98       1.98       1.76       9.9         I fled no whatever brings me pleasure here and now, even at the cost of some distant goal.       1.88       1.76       9.9       2.41       9.9         I much prefer doing things that man the than the future.       1.98       1.88 <td>Physicality</td> <td></td> <td></td> <td></td> <td></td>	Physicality				
I almost always feel better when I am on the move than when I am sitting.   3.03   9.7   2.95   9.91   1.11   1.		2.78	.96	2.68	1.03
Hike to get out and do things more than I like to read or contemplate ideas.   3.19   3.29   3.23   3.9   3.26					.98
Seem to have more energy and a greater need for activity than most other people my age.   2,66   2,89   2,65   2,99   2,66   2,99   2,66   2,90   2,66   2,90   2,66   2,90   2,67   2	, ·				.91
Internet   Internet	· ·				.91
I don't devote much thought and effort to preparing for the future.					
Infine   I		1 02	0.8	1 76	90
I'm more concerned with what happens to me in the short run than in the long run.         2.30         1.06         2.04         99           I much prefer doing things that pay off right away rather than in the future.         2.52         99         2.41         99           Parental supervision         3.31         8.88         3.42         7.7           Recognize: Generally, when I was younger my parents/guardians kept a pretty close eye on me.         3.31         8.82         3.52         66           Punish: Generally, when I was younger my parents/guardians recognized when I had done something wrong.         3.44         8.1         3.52         7.7           Wother working         3.12         1.20         2.95         1.26           Did your mother have a paid job when you were growing up?         3.12         1.20         2.95         1.26           Interpersonal offending         Hit an instructor or supervisor.         2.5         3.23         0.99         8.           Gotten into a serious fight at work or school.         6.1         1.56         4.41         1.2           Taken part in a fight where a group of your friends were against another group.         8.8         2.59         4.5         1.3           Used a gun or knife or some other weapon to get something from someone else.         2.1         7.7         1.2					
Trunch prefer doing things that pay off right away rather than in the future.					
######################################					
Monitor: Generally, when I was younger my parents/guardians kept a pretty close eye on me.         3.31         .88         3.42         7.73           Recognize: Generally, when I was younger my parents/guardians recognized when I had done something wrong.         3.36         .82         3.52         .66           Punish: Generally, when I was younger my parents/guardians punished me when they knew I had done something wrong.         3.44         .81         3.52         .66           Wother working         Did your mother have a paid job when you were growing up?         3.12         1.20         2.95         1.21           Interpersonal offending         Hit an instructor or supervisor.         .25         3.23         .09         .8           Gotten into a serious fight at work or school.         .61         1.56         .41         1.22           Taken part in a fight where a group of your friends were against another group.         .88         2.59         .45         1.3           Hurt someone badly enough to need medical attention.         .49         1.97         .46         3.3           Used a gun or knife or some other weapon to get something from someone else.         .21         .77         .12         .77           Property offending         Stolen something from someone worth more than \$50.         .42         .271         .39         3.5<		2.32	.99	2.41	.90
Recognize: Generally, when I was younger my parents/guardians recognized when I had done something wrong.       3.38       .82       3.52       .66         Punish: Generally, when I was younger my parents/guardians punished me when they knew I had done something wrong.       3.44       .81       3.52       .77         Wother working       The parents of the missing the many parents/guardians punished me when they knew I had done something wrong.       3.12       1.20       2.95       1.21         Did your mother have a paid job when you were growing up?       The parents of the missing them to a serious fight at work or school.       2.5       3.23       .09       .8         Gotten into a serious fight at work or school.       .61       1.56       .41       1.22         Taken part in a fight where a group of your friends were against another group.       .88       2.59       .45       1.3         Hurt someone badly enough to need medical attention.       .49       1.97       .46       3.1         Used a gun or knife or some other weapon to get something from someone else.       .21       .77       .76       .77         Property offending       Stolen something from someone worth less than \$50.       .11       .45       .50       .10       .44         Stolen something from					
Punish: Generally, when I was younger my parents/guardians punished me when they knew I had done something wrong.       3.44       8.81       3.52       7.74         Adother working         Did your mother have a paid job when you were growing up?       3.12       1.20       2.95       1.26         Interpersonal offending         Hit an instructor or supervisor.       25       3.23       .09       .8         Gotten into a serious fight at work or school.       .61       1.56       .41       1.2         Taken part in a fight where a group of your friends were against another group.       .88       2.59       .45       1.3         Hurt someone badly enough to need medical attention.       .49       1.97       .46       3.1         Used a gun or knife or some other weapon to get something from someone else.       .21       .77       .12       .77         Porperty offending       Stolen something from someone worth less than \$50.       1.10       4.51       1.00       4.4         Stolen something from someone worth more than \$50.       .42       2.71       .39       3.5         Stolen something from a store without paying for it.       .1.45       5.07       1.08       4.3         Taken a car without permission for a joyride.       .67       3.62					.77
Mother working         Did your mother have a paid job when you were growing up?       3.12       1.20       2.95       1.26         Interpersonal offending         Hit an instructor or supervisor.       .25       3.23       .09       .8         Gotten into a serious fight at work or school.       .61       1.56       .41       1.2         Taken part in a fight where a group of your friends were against another group.       .88       2.59       .45       1.3         Hurt someone badly enough to need medical attention.       .49       1.97       .46       3.1         Used a gun or knife or some other weapon to get something from someone else.       .21       .77       .12       .77         Property offending       Property offending         Stolen something from someone worth less than \$50.       1.10       4.51       1.00       4.44         Stolen something from someone worth more than \$50.       .42       2.71       .39       3.5         Shoplifted something from a store without paying for it.       1.45       5.07       1.08       4.3         Taken a car without permission for a joyride.       1.32       5.75       5.3       1.7         Stolen something from a car.       .67       3.6       2.9       .5 </td <td></td> <td></td> <td></td> <td></td> <td>.68</td>					.68
Did your mother have a paid job when you were growing up?       3.12       1.20       2.95       1.26         Interpersonal offending         Hit an instructor or supervisor.       .25       3.23       .09       .86         Gotten into a serious fight at work or school.       .61       1.56       .41       1.22         Taken part in a fight where a group of your friends were against another group.       .88       2.59       .45       1.3         Hurt someone badly enough to need medical attention.       .49       1.97       .46       3.1         Used a gun or knife or some other weapon to get something from someone else.       .21       .77       .12       .77         Property offending  .	Punish: Generally, when I was younger my parents/guardians punished me when they knew I had done something wrong.	3.44	.81	3.52	.74
Interpersonal offending         Hit an instructor or supervisor.       .25       3.23       .09       .8         Gotten into a serious fight at work or school.       .61       1.56       .41       1.2         Taken part in a fight where a group of your friends were against another group.       .88       2.59       .45       1.3         Hurt someone badly enough to need medical attention.       .49       1.97       .46       3.1         Used a gun or knife or some other weapon to get something from someone else.       .21       .77       .12       .77         Property offending       Stolen something from someone worth less than \$50.       1.10       4.51       1.00       4.44         Stolen something from someone worth more than \$50.       .42       2.71       .39       3.5         Shoplifted something from a store without paying for it.       1.45       5.07       1.08       4.3         Taken a car without permission for a joyride.       1.32       5.75       5.3       1.7         Stolen something from a car.       .82       4.36       5.3       2.4         Vandalism       Damaged a car on purpose.       .82       4.36       .53       2.4         Gone into or broken into a house or building when you weren't supposed to.       <	Mother working				
Hit an instructor or supervisor.       .25       3.23       .09       .80         Gotten into a serious fight at work or school.       .61       1.56       .41       1.22         Taken part in a fight where a group of your friends were against another group.       .88       2.59       .45       1.3         Hurt someone badly enough to need medical attention.       .91       1.97       .46       3.13         Used a gun or knife or some other weapon to get something from someone else.       .91       .77       .12       .77         Property offending       Stolen something from someone worth less than \$50.       1.10       4.51       1.00       4.44         Stolen something from someone worth more than \$50.       .42       2.71       .39       3.53         Shoplifted something from a store without paying for it.       1.15       5.07       1.08       4.33         Taken a car without permission for a joyride.       1.32       5.75       5.3       1.7         Stolen something from a car.       .6       3.62       4.0       2.0         Vandalism       Damaged a car on purpose.       .82       4.36       .53       2.4         Gone into or broken into a house or building when you weren't supposed to.       .86       2.95       3.4       1.1 </td <td>Did your mother have a paid job when you were growing up?</td> <td>3.12</td> <td>1.20</td> <td>2.95</td> <td>1.28</td>	Did your mother have a paid job when you were growing up?	3.12	1.20	2.95	1.28
Gotten into a serious fight at work or school.       .61       1.56       .41       1.22         Taken part in a fight where a group of your friends were against another group.       .88       2.59       .45       1.33         Hurt someone badly enough to need medical attention.       .49       1.97       .46       3.13         Used a gun or knife or some other weapon to get something from someone else.       .21       .77       .12       .77         Property offending       Stolen something from someone worth less than \$50.       1.10       4.51       1.00       4.44         Stolen something from someone worth more than \$50.       .42       2.71       .39       3.5         Shoplifted something from a store without paying for it.       1.45       5.07       1.08       4.3         Taken a car without permission for a joyride.       1.32       5.75       5.3       1.7         Stolen something from a car.       .67       3.62       4.0       2.0         Vandalism       Damaged a car on purpose.       .82       4.36       .53       2.4         Gone into or broken into a house or building when you weren't supposed to.       .56       2.95       .34       1.3         Set fire to someone else's stuff/property.       .89       4.09       .67	Interpersonal offending				
Taken part in a fight where a group of your friends were against another group.       .88       2.59       .45       1.3-1.3-1.3-1.3-1.3-1.3-1.3-1.3-1.3-1.3-	Hit an instructor or supervisor.	.25	3.23	.09	.83
Taken part in a fight where a group of your friends were against another group.       .88       2.59       .45       1.3-1.3-1.3-1.3-1.3-1.3-1.3-1.3-1.3-1.3-	Gotten into a serious fight at work or school.	.61	1.56	.41	1.23
Hurt someone badly enough to need medical attention.       .49       1.97       .46       3.12         Used a gun or knife or some other weapon to get something from someone else.       .21       .77       .12       .77         Property offending       Stolen something from someone worth less than \$50.       1.10       4.51       1.00       4.44         Stolen something from someone worth more than \$50.       .42       2.71       .39       3.5         Shoplifted something from a store without paying for it.       1.45       5.07       1.08       4.3         Taken a car without permission for a joyride.       1.32       5.75       5.3       1.7         Stolen something from a car.       .60       3.62       .40       2.00         Vandalism       Damaged a car on purpose.       .82       4.36       5.3       2.4         Gone into or broken into a house or building when you weren't supposed to.       .56       2.95       .34       1.3         Set fire to someone else's stuff/property.       .36       3.82       .13       1.1         Damaged school property on purpose.       .89       4.09       .67       4.20	· · · · · · · · · · · · · · · · · · ·	.88		.45	1.34
Used a gun or knife or some other weapon to get something from someone else.       .21       .77       .12       .77         Property offending       .27       .28       .77       .29       .77         Stolen something from someone worth less than \$50.       1.10       4.51       1.00       4.44         Stolen something from someone worth more than \$50.       42       2.71       .39       3.55         Shoplifted something from a store without paying for it.       1.45       5.07       1.08       4.3         Taken a car without permission for a joyride.       1.32       5.75       5.3       1.7         Stolen something from a car.       .67       3.62       .40       2.09         Vandalism       .82       4.36       .53       2.4         Damaged a car on purpose.       .82       4.36       .53       2.4         Set fire to someone else's stuff/property.       .66       2.95       .34       1.3         Damaged school property on purpose.       .89       4.09       .67       4.20					3.17
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# Disorganization Precursors, the Family and Crime: A Multi-Year Analysis of Canadian Municipalities

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Abstract. Based on a macro-sociological adaptation of Shaw and McKay's (1942) social disorganization theory, this study examined the role of family disorganization as a mediator of the effects of poverty, mobility and ethnic heterogeneity on crime. Canadian municipal data in 1991, 1996 and 2001 were examined. The results revealed that poverty and mobility had negative effects on the family. Also, mobility and ethnicity had strong direct effects on crime, and poverty had a considerable indirect effect through family disorganization. These findings provided some support to Shaw and McKay's theory. The causal link between poverty, family disorganization and crime underscores the importance of providing community supports to the family, especially programs targeting families in poverty, and strong and cohesive family units, in turn, may help to buffer the negative impact of poverty on the community.

**Keywords:** social disorganization theory; family disorganization; poverty; mobility

# Introduction

This study examines crime rates in Canadian municipalities using a macro-sociological adaptation of Shaw and McKay's (1942) social disorganization theory. Here, the theoretical model poses poverty, ethnic heterogeneity and mobility as the precursors of social disorganization whose effects on crime are partially mediated by familyrelated factors including the rates of married population, divorced population and single-parent families. causal link through the family-related factors helps to establish social disorganization as an explanation of the effects of its precursors on crime. While this macro-sociological adaptation is a departure from Shaw and McKay's neighborhood-level ecological analysis, it captures the basic premise of social disorganization theory in terms of the relationship between structural factors of integration and the community's ability to control crime.

# **Social Disorganization Theory**

The Precursors of Social Disorganization

Shaw and McKay's (1942) social disorganization theory proposes that poverty, ethnic minority population, and declining population are predictive of high rates of crime in urban areas. These three habitat factors contribute to a social and cultural environment that weakens the community's ability to control crime (Kornhauser, 1978; Smith and Jarjoura, 1988). Poverty depletes the community's resources and its ability to monitor and

control criminal activities. Moreover, poverty, often as a result of unemployment or underemployment, causes difficulties for members in the community to meet their basic needs and thus increases the likelihood of some members using crime as a means to meet those needs.

With a high proportion of ethnic minority population, residents in the community are less likely to develop strong social networks due to the differences in their cultural backgrounds and language barriers (Osgood and Chambers, 2000). Without strong social networks, the community is less able to supervise its youths (Osgood and Chambers, 2000; Sampson, 1987b; Veysey and Messner, 1999) and effectively control crime and deviance (Smith and Jarjoura, 1988). It is also possible that there may be tension and conflict between the different groups (Flippen, 2001), thus leading to an increase in interpersonal violence (Green, Strolovitch, and Wong, 1998).

In depopulating city cores and communities, the young, skilled, productive, and middle-class members are leaving for jobs in more prosperous places or for better neighborhoods (Massey, 1996; Wilson, 1987). To that extent, the reduction in human and capital resources may cause disorganization which, in turn, reduces the ability of the community to control crime.

A few recent adaptations of social disorganization theory have modified two of the three predictors. Heterogeneity of ethnic or racial groups is often used in place of the proportion of ethnic minorities. Thus, it is the differences among the ethnic groups rather than the mere presence of ethnic minorities in the community *per* 

se that explain the difficulty in forming social networks (Warner and Pierce, 1993).

Another modification of the theory uses the geographical mobility of the population as a substitute for population decline (Smith and Jarjoura, 1989; Warner and Pierce, 1993). The premise of using population mobility as an explanation of crime is that mobility causes instability in social relationships and the social structure which, in turn, weakens the community's ability to control crime. Presumably, the concept takes into consideration of three categories of migration, that is, moving from one address to another within the same community, moving into the community from another, and moving out of the community. However, due to limitations in data availability, most studies of social disorganization capture only the first two categories of migration and ignore the migration out of the community (Osgood and Chambers, 2000; Sampson, 1985; Smith and Jarjoura, 1988; Smith and Jarjoura, 1989; Warner and Pierce, 1993). Using this common yet peculiar measure of mobility, an expanding suburban community would be considered more mobile than a depopulating city core.

Family Disorganization as a Measure of Social Organization

Bursik (1988) remarked that Shaw and McKay (1942) did not separate the outcome of social disorganization from disorganization itself. That is, while crime, signs of incivility, and other social problems are the outcomes of social disorganization, they themselves could be used as indicators or measures of disorganization also. We may also add here that Shaw and McKay (1942) did not distinguish the measures of social disorganization from those of the precursors. At any rate, they did not provide concrete measures of social disorganization. Therefore, subsequent studies of social disorganization theory have to construct measures of the concept based on one's understanding and interpretation of the term "social disorganization" and the availability of data.

At the macro-sociological level, recent studies have used the divorce rate and percent single-parent families or percent female-headed households as measures of social disorganization (Bachman, 1991; Cubbin, Pickle, and Fingerhut, 2000; Figueira-McDonough, 1995; Gottfredson, McNeil, and Gottfredson, 1991; Hirschfield and Bowers, 1997; Osgood and Chambers, 2000; Sampson and Groves, 1989; Smith and Jarjoura, 1989; Veysey and Messner, 1999; Warner and Pierce, 1993). At the individual level, comparable measures include whether the parents are divorced and whether the child

is living with both parents as opposed to other arrangements (Smith and Jarjoura, 1989; Yang and Hoffmann, 1998). Oftentimes the interpretation of the variables is based on the traditional point of view, with marriage and the two-parent family being the norm, and divorce and the single-parent family being the indicators of family disorganization.

In this study, we focus on family disorganization with the understanding that there are other indicators of social disorganization. Among these interrelated and sometimes overlapping indicators are two important categories developed by Sampson and his associates: collective efficacy in terms of informal control and social cohesion (Sampson, Raudenbush, and Earls, 1997; Browning, 2002; Browning, Feinberg, and Dietz, 2004), and community organization/disorganization in terms of local friendship networks, unsupervised peer groups and organizational participation (Sampson and Groves, 1989; Sun, Triplett, and Gainey, 2004; Veysey and Messner, 1999). Other organization/disorganization indicators include participation in employment and home ownership (Figueira-McDonough, 1995), political and organizational participation (Flippen, 2001), social capital (Saegert, Winkel, and Swartz, 2002) and organized social control (Hirschfield and Bowers, 1997).

Family Disorganization as a Mediating Factor

Poverty and Family Disorganization. Sampson (1987b) notes that previous research often failed to find a direct relationship between structural economic factors on crime. However, he suggests that the relationship may be indirect through family disruption, especially in the case of African Americans. That is, unemployment and economic deprivation in the African-American communities increase the likelihood of female-headed households. Female-headed households, in turn, contribute to the increase in crime and delinquency due to lower levels of formal and informal social control. Although Sampson's (1987b) focus is on African-American communities, the explanation is applicable to other communities.

One of the reasons for the high number of female-headed households in African-American communities is the high number of men without employment (Sampson, 1987b; Wilson, 1987). Unemployed men are less able to support a family financially or engage in a marital or conjugal relationship. In other words, high male unemployment rates mean fewer marriageable males and more unwed mothers and female-headed families. In addition, unemployment and economic deprivation also contribute to divorce and separation. Other consequences of the

economic marginalization of African-American men may include out-of-wedlock childbearing, delay of marriage, and poor work and family roles (Massey and Sibuya, 1995; Shihadeh and Steffensmeier, 1994).

According to Sampson (1987b), female-headed households reduce the support for and participation in community organizations which, in turn, reduce the strength of the community's formal social control. In terms of informal social control, family disruption causes juvenile delinquency at both the family and neighborhood levels. At the family level, homes with only one parent are less able to effectively monitor, supervise and control the children, compared to homes with two parents. At the neighborhood level, compared to single-parent families, two-parent families provide more effective supervision and guardianship of the neighbors' children, especially the control of peer group activities that often lead to the involvements in gangs and delinquency. In addition, Shihadeh and Steffensmeier (1994) suggest that the weaker kinship ties and relative social isolation of single mothers also contribute to less effective informal control at both the family and neighborhood levels.

Mobility and Family Disorganization. To some extent, family disorganization mediates the effect of mobility on crime. A high degree of population mobility may adversely affect the stability of friendship and kinship ties (Sampson, 1987c). A mobile population is less favorable for the formation and maintenance of relationships, including marital and conjugal relationships (see, for example, Glenn and Shelton, 1985; Myers, 2000; Shelton, 1987; South and Lloyd, 1995; Trovato, 1986). People who have to move for employment, education, and other reasons have a greater chance of separation from their spouse or family on a temporary or even long-term basis. The weak friendship and kinship ties in a mobile population also reduce the social and financial supports for families, leading to a higher probability of divorce or separation. Moving into a new and unfamiliar environment requires the family and its members to make adjustments and may cause them stress (e.g., the loss of income; see Jacobsen and Levin, 1997). Thus, it is reasonable to expect that mobility may increase the likelihood of family disorganization.

Heterogeneity and Family Disorganization. Studies have found associations between racial or ethnic minority groups and female-headed households (Sampson, 1987b; Shihadeh and Steffensmeier, 1994; Stokes and Chevan, 1996), marriage (South and Crowder, 2000), divorce (Breault and Kposowa, 1987) and teenage pregnancy (Langille, Flowerdew, and Andreou, 2004; Seltzer, 2000; Singh, Darroch, and Frost, 2001). However, they tend

to focus on the racial or ethnic status of the individual or the proportion of the minority population rather than heterogeneity. Few studies have offered the explanation of or research evidence on the relationship between racial heterogeneity and family disruption.

To be sure, racial heterogeneity increases the likelihood of interracial marriage, especially for the members of racial minority groups (Blau, Blum, and Schwartz, 1982). There is some research evidence that interracial marriages may be less satisfactory, especially for the wife (Fu, Tora, and Kendall, 2001) and more likely to result in divorce, possibly due to the status gap between the couple (Fu, 2006; Ho and Johnson, 1990). However, interracial marriages account for only about 5 percent of all married couples in the United States (Lee and Edmonston, 2005) and about 3 percent in Canada (Canada and the World Backgrounder, 2004), thus limiting the viability of interracial marriages as an explanation.

Perhaps a more viable explanation is organizational fragmentation. Heterogeneity, combined with a certain degree of segregation or fragmentation between the different groups, may deplete the social capital, reduce political participation, and weaken the ability of the community to organize itself (Costa and Kahn, 2003; Rotolo, 2000). As a result of weaker organization, the community is less able to provide supports and services to the family, causing it more difficult for its members to form or maintain the family.

While one may be inclined to extend the preceding argument and suggest that heterogeneity should reduce friendship ties, kinship ties, and interpersonal networking, just as it does community organization, it is not clear if that is actually the case. Gatherings of friends and relatives, frequent interactions and intimate communications do not require the mobilization of a large number of people or resources in the community. Also, even in a racially-homogeneous community, friendship choices and kinship ties are already segregated by education, occupation, income, religion, language, political preference, and other characteristics. Moreover, even if heterogeneity does reduce the number of interracial or inter-ethnic ties, those who are affected may turn to their own racial or ethnic group, relatives and family members for support, thus strengthening the intra-racial ties and the family (see McPherson, Smith-Lovin, and Brashears, 2006 for a discussion of heterogeneity and social ties).

Another viable explanation is cultural fragmentation. Different racial or ethnic groups may have different beliefs, values, ideals and practices regarding marriage and the family (McLoyd et al., 2000). Racial or ethnic heterogeneity, combined with cultural differences and

even conflicts, may weaken the community's consensus, especially regarding the traditional family. With the fragmentation of family norms and practices, the less traditional expressions or practices such as premarital sexual activity, teenage pregnancy, divorce and single-parenthood may be more tolerated or accepted, thus increasing the likelihood of family disruption.

In short, organizational and cultural fragmentations are proposed here as the explanations of the effects of racial or ethnic heterogeneity on family disruption.

# Research on Disorganization Precursors, the Family, and Crime

Disorganization Precursors and the Family

Poverty and the Family. Research studies have found considerable associations between family disruption and the direct and proxy measures of poverty. Figueira-McDonough (1995) studied census tract data in Phoenix, Arizona and observed that the percentage of female-headed families had a strong association with poverty. Using city-level data specifically for the black population, Shihadeh and Steffensmeier (1994) found that income inequality, the ratio of employed males per 100 females and welfare payment had significant effects on the percentage of female-headed households. Based on mixed-level data, Stokes and Chevan (1996) observed that low individual educational attainment and neighborhood unemployment increased the likelihood of female-headed families.

Studies have also found connections between poverty and teenage pregnancy (Berry et al., 2000; Khalili, 2005), socioeconomic status and teenage pregnancy (Corcoran, Franklin, and Bennett, 2000; Singh et al., 2001), poverty and marriage (Sullivan, 1993), neighborhood disadvantage and family formation and transitions (South and Crowder, 1999; South and Crowder, 2000; Crowder and Teachman, 2004), unemployment and divorce (Breault and Kposowa, 1987), and socioeconomic status and divorce (Hewitt, Baxter, and Western, 2005). These studies offered some support to the notion that poverty causes family disruption and, particularly, single-parenthood.

Mobility and the Family. Shelton (1987) examined data from the General Social Survey and found that the city mobility rate increased the likelihood of divorce or legal separation (see also, Glenn and Shelton, 1985). Trovato (1986) analyzed Canadian provincial data between 1971 and 1979 and found a positive association between the divorce rate and the rate of inter-provincial migration. South and Lloyd (1995) used mixed-level

analysis and reported a positive effect of county mobility rate on the individual's marital dissolution. In a study of marital stability in Finland, Finnäs (2001) reported that urban-to-rural migration increased the individual's likelihood of divorce.

Using data from the Study of Marital Instability over the Life Course, Myers (2000) examined the number of times a person moved between 1980 and 1992 and the person's marital outcomes in terms of staying single, cohabitation, and marriage. He found that frequent movers were more likely to cohabitate than to marry, perhaps due to lower levels of parental supervision, support, and related reasons. Data from the Panel Study of Income Dynamics showed that the number of times a woman moved during her adolescent years contributed to teen pregnancy (Crowder and Teachman, 2004) and premarital first births (Sucoff and Upchurch, 1998). To that extent, these studies supported the notion that mobility increases instability and uncertainty, reduces a person's social ties and support, and has adverse effects on marriage and the family.

Migrants who moved from a region with a low level of family disruption to a high-disruption region may also suffer from an increased likelihood of family disruption due to assimilation. For example, Tolnay and Crowder (1999) studied black children aged 0-14 who moved to northern cities from the south. They found that the longer these young migrants lived in the north, the more their families resembled their northern-born counterparts in terms of not having a father in the same home. To that extent, these south-to-north migrant families suffered from the "negative assimilation" of the northern pattern of family disruption.

Heterogeneity and the Family. Using a number of survey data sets in the United States spanning from the 1950s to the 1990s, Costa and Kahn (2003) found that birthplace fragmentation and to a lesser extent racial fragmentation reduced the level of volunteering in the population. Birthplace fragmentation also reduced organization membership. However, both racial and birthplace fragmentations did not have any significant effect on the amount of time visiting friends or at parties. Comparing results from the General Social Survey in the United States between 1985 and 2004, McPherson et al. (2005) noted that racial heterogeneity had increased over the years. During the same period, while non-kin ties through voluntary associations and neighborhoods had decreased over the years, the connections to spouses and parents had increased over the years. Results from these studies supported the contention that heterogeneity affects community organizational involvement but not necessarily interpersonal ties.

Phillips and Sweeney (2005) analyzed data from the 1995 National Survey of Family Growth and found that the rate of marital disruption was lowest for foreign-born Mexican Americans and highest for non-Hispanic Blacks and native-born Mexican Americans. In a survey of over 1,200 women in the Netherlands, Kalmijn, De Graaf, and Poortman (2004) showed that the belief in traditional versus emancipation values had a rather strong effect on the woman's risk of divorce and separation. While these two studies did not examine the link between heterogeneity, family norms and practices and family disruption, they offered some support to the possibility of such a connection.

# Poverty and Crime

Massey (1996) noted that recent changes in technology and the economy in many countries had increased the concentration of poverty in urban areas and among racial minority groups. The concentration of poverty led to the increase in crime and violence. Based on data from U.S. and Ohio cities, Ackerman (1998) found that economic marginalization contributed to high rates of violence and property offenses. Comparing the U.S. and Canada, Ouimet (1999) noted that most of the serious offenses in the U.S. were found in large cities, perhaps due to the concentration of poverty in the population or ghettos. In contrast, the absence of clear-cut ghettos in Canadian cities contributed to a safer environment there.

Several studies reported a positive relationship between poverty and homicide. An analysis of Native American homicide by Bachman (1991) revealed that at the county level, economic deprivation had a positive effect on the homicide rate. Kposowa, Breault, and Harrison (1995) reported a positive effect of poverty on the homicide rate, based on U.S. county-level. Similarly, Lee, Maume, and Ousey's (2003) analysis of countylevel data revealed that both socioeconomic disadvantage and concentration of poverty caused higher levels of homicide in metropolitan areas. In nonmetropolitan or rural areas, while the problem of poverty concentration may be less serious, socioeconomic disadvantage was still an important criminogenic factor, especially where there were significant losses of population (Barnett and Mencken, 2002). In their examination of city homicide rates, Haynie and Armstrong (2006) found that a composite measure of socioeconomic disadvantage predicted race-, gender- and relation-specific rates of homicide.

A number of studies found a positive relationship between poverty and other crimes. Smith and Jarjoura (1988) reported that the effect of poverty on violent crime was significant in neighborhoods with high levels of mobility, and its effect on burglary was mediated by the percentage of single-parent households. In a study of British communities, Sampson and Groves (1989) demonstrated that a higher percentage of the population with low socioeconomic status contributed to an increase in vandalism. Warner and Pierce (1993) examined calls to the police in sixty Boston neighborhoods and found that poverty had positive effects on assault, robbery and burglary. After examining crime rates in U.S. central cities, Oh (2005) found that the increase in the poverty rate between 1980 and 1990 had a positive effect on rape and larceny.

On the other hand, a few studies showed that poverty did not have a significant direct effect on crime or certain offenses, especially when some mediating or moderating variables were included in the analysis. Using city drug arrest rates, Mosher (2001) reported that race-specific measures of economic deprivation failed to predict the trafficking arrest rate. Oh (2005) reported that the increase in the poverty rate did not affect the rates of homicide, aggravated assault, robbery, burglary, and auto theft. Using county-level data, Lanier and Huff-Corzine (2006) found that poverty did not have any significant effect on the American Indian homicide rate.

Moreover, contrary to social disorganization theory, other studies reported a connection between crime and high socioeconomic status. Smith and Jarjoura (1989), for example, found that higher income households were more likely to be burglarized. Sampson and Groves (1989) reported that communities with a higher percentage of high SES population tended to have higher rates of burglary. Based on neighborhood data from seven U.S. cities, Sun et al. (2004) reported positive effects of SES on robbery and assault victimization. Osgood and Chambers (2000) reported that rural areas with higher rates of poverty population had lower rates of sexual assault and physical assault, perhaps due to the outward migration of men from relatively poor rural communities to other communities and metropolitan areas. Dobrin, Lee, and Price (2005) examined a sample of homicide victims and non-victims from Prince George's County, Maryland and found that the census-block poverty rate reduced the individual's homicide victimization.

In short, findings from research studies suggested that there was some relationship between poverty and crime. However, the direction of the relationship depended on the type of offense and other factors, thus suggesting that poverty alone was not a sufficient explanatory factor.

# Mobility and Crime

Research studies found that the relationship between mobility and crime varied from community-to-community and from study-to-study. Some studies found that mobility increased crime. Using data on inter-provincial mobility, Hartnagel (1997) identified a strong and positive correlation between mobility and violent and property crime rates. Perhaps mobility was a destabilizing factor leading to a weaker structure of social control. Similarly, Osgood and Chamber (2000) observed that residential mobility in rural areas increased assaults. Sun et al. (2004) found that mobility had direct positive effects on robbery and assault.

Other studies revealed that the relationship between mobility and crime depended on other factors. Smith and Jarjoura (1989) found that mobility in the neighborhood at the aggregate level increased household burglary victimization whereas the relationship at the individual household level was not significant. In a similar study (Smith and Jarjoura, 1988), they reported that mobility increased violent crime rates in poorer neighborhoods but not in more affluent ones. Haynie and Armstrong (2006) reported that city residential mobility rate predicted African-American women's rates of intimate and family homicide but not the men's rates, thus demonstrating that the effect depended on gender, race and the victim-of-fender relationship.

Still a number of studies revealed that mobility did not increase crime. Sampson and Groves' (1989) study showed that residential stability did not affect violence and property victimization. Buckner, Bassuk, and Weinreb (1999) studied the effect of homelessness on children's behavior. They reported that the number of times children had moved did not predict behavior problems, suggesting that mobility *per se* was not an important factor. Browning (2002) observed that residential stability in the neighborhood did not have any significant effect on female victimization of intimate partner homicide (see also, Browning et al. 2004). Lanier and Huff-Corzine (2006) reported that the county-level mobility rate did not have any significant effect on the American Indian homicide rate.

Contradicting social disorganization theory in their findings, a few studies showed that mobility reduced crime. Warner and Pierce (1993) found that residential mobility reduced robbery and assault. Similarly, a negative correlation between residential mobility and homicide was reported by Sampson et al. (1997). Sun et al. (2004) reported the finding of negative effects of residential mobility on robbery and assault victimization

through local friendship networks.

Given the above, one may conclude that mobility alone may not be a consistent predictor of crime. Perhaps the effect of mobility on crime has to be examined along with the other precursors of social disorganization.

# Heterogeneity and Crime

The observed relationship between heterogeneity and crime varied from study to study. Sampson and Groves (1989) found that ethnic heterogeneity had considerable effects on robbery and burglary victimizations. Smith and Jarjoura (1989) reported a positive relationship between burglary victimization and racial heterogeneity. Green et al. (1998) revealed that racially motivated crimes against minorities were most frequent in the predominantly white areas where there had been an in-migration of minorities. Osgood and Chambers (2000) observed that ethnic heterogeneity (i.e., whites and nonwhites) in rural communities increased youth violence, including robbery, weapons offenses and simple assault. Lanier and Huff-Corzine (2006) observed a positive effect of ethnic heterogeneity on the American Indian homicide rate. A number of other studies also reported a positive effect of ethnic heterogeneity on crime (see, for example, Hirschfield and Bowers, 1997; Sampson et al., 1997; Sun et al., 2004).

However, a few studies found that the causal link between heterogeneity and crime was weak or dependent on other factors. Sampson and Groves (1989) reported that the effects of ethnic heterogeneity on personal violence, theft and vandalism were weak. Smith and Jarjoura (1989) found that racial heterogeneity was not a significant predictor of violent crime rates. Browning (2002) observed that immigrant concentration in the neighborhood did not have any significant effect on female victimization of intimate partner homicide. In addition, there was also the possibility that the effect of heterogeneity may depend on the level of poverty (Warner and Pierce, 1993).

In short, research studies have revealed that the effects of poverty, mobility and heterogeneity on crime varied in different studies. Perhaps individually, each of these social habitat factors is not necessarily a sufficient explanation of crime. This supports the use of them together as explanatory factors.

# Single-Parenthood

Studies have shown a positive relationship between single-parenthood and criminal victimization. Based on the British Crime Survey, Sampson (1987a) found that single-adult households had more burglary victimization, compared to households with two adults. Moreover, households located in neighborhoods with a concentration of single-adult households also experienced more burglary victimization. Smith and Jarjoura (1989) reported a causal link between burglary victimization and single-parent households in both individual-level and neighborhood-level analyses. In another analysis, they remarked that single-parenthood explained the effects of poverty and racial heterogeneity on crime (Smith and Jarjoura, 1988). Sampson and Groves (1989) reported that at the neighborhood level, the proportion of divorced and separated adults and the percentage of single-parent households predicted violent and property crime victimizations. Focusing on uxoricide in Canada, Wilson, Daly, and Wright (1993) observed that the rate of victimization was significantly higher for female-headed families.

Similarly, a few studies found a positive relationship between single-parenthood and criminal offending. Based on a sample of 156 U.S. cities, Sampson (1987b) found that the percentage of female-headed black households had a significant effect on the black robbery rate. Messner and Sampson (1991) examined race-specific offending rates for robbery and homicide in U.S. cities and observed a positive relationship between the percentage of female-headed households and crime for both black and white offending rates. Warner and Pierce (1993) observed that the neighborhood percentage of female-headed households was positively related to calls to the police for robbery and burglary. Shihadeh and Steffensmeier (1994) reported a positive effect of female-headed households on adult homicide rate in the black population. Ackerman (1998) found a strong, positive correlation between female-headed households and crime. Almgren et al. (1998) analyzed homicide rates in 75 communities in Chicago and found that communities with higher percentages of female-headed households also had higher homicide rates. A study by Cubbin et al. (2000), based on an examination of county-level data, demonstrated that homicide rates were predicted by the percentage of female-headed households. Lanier and Huff-Corzine (2006) observed a positive effect of female-headed households on the American Indian homicide rate.

There are also reports of a positive correlation between single-parenthood and youth crime and other deviances. Shihadeh and Steffensmeier (1994) observed that cities with higher rates of female-headed black families also had higher levels of black juvenile homicide and robbery. Osgood and Chambers (2000) found that female-headed households caused youth violence, perhaps due to weaker parental control and adult control of children in com-

munities where there were fewer male parents. Kierkus and Baer (2002) reported a connection between family disruption and delinquency, causally linked by parental attachment. Indeed, the link between family disruption and the diminished capacity of the community in supervising its youths had been reported in a number of studies (Sampson and Groves, 1989; Veysey and Messner, 1999). Also, children from single-parent households tended to have lower academic achievement (Bankston and Caldas, 1998), perhaps due to disadvantages in resources (Jang, 1997).

#### Theoretical Model

The theoretical model here poses the precursors of social disorganization, namely poverty, mobility and heterogeneity as antecedent variables, and family disorganization as an intermediate variable. Based on Shaw and McKay's (1942) social disorganization theory, it is hypothesized that the precursors have both direct and indirect effects on crime. Regarding the indirect effects, the precursors have adverse effects on the family, and family disorganization, in turn, increases the level of crime in the community. The causal link is based on the notion that the precursors constitute an environment or habitat that is unfavorable to the formation and maintenance of the family. As a social institution and a social group, the family serves to regulate and control the behavior of its members. When the family experiences difficulties or is in transition, such as in the case of single-parent families or divorce, it becomes less effective in its social control function. As a result, the level of crime increases in a community where there is a substantial proportion of families experiencing difficulties or in transition.

Three family-related variables will be considered in this study, including the percentage of population married, percent population divorced, and percent single-parent families. While research has shown that there is a strong connection between percent single-parent families and the crime rate, the strong correlation between single-parenthood and poverty makes it difficult to differentiate the effects of these two variables on crime. Therefore, incorporating the other two indicators of family structure may help to differentiate the effects in question.

#### Methodology

The Data

Each year, the Canadian Center for Justice Statistics (CCJS) conducts a Uniform Crime Report (UCR) Survey and publishes municipal-level data on crime rates and

police resources. The UCR data file was merged with selected municipal-level census data from the 1991 and 2001 Census and the 1996 bi-Census. Data for 540 Canadian municipalities in 1991, 526 in 1996, and 520 in 2001 were available for analysis. The number of municipalities varied over the years due to the amalgamation of municipalities, especially in Ontario and Quebec, missing census information (e.g., mismatches between the data files due to the use of different municipality names or different definitions of municipal boundaries), missing data from police services that did not participate in the UCR survey, the merging of police services, and new police services (e.g., aboriginal tribal police services) in recent years.

Based on the UCR, in 1991 there were approximately 2.85 million reported Criminal Code Offenses (excluding traffic offenses); the corresponding numbers for 1996 and 2001 were approximately 2.64 million and 2.41 million (Canadian Center for Justice Statistics, 2002). From the 540 municipalities in the 1991 sample, there were a total of 2.37 million reported offenses, or about 83 percent of the total of 2.85 million offenses reported nationally. The corresponding percentages for 1996 and 2001 were 77 percent and 85 percent. Therefore, the samples were reasonably representative of the actual numbers of reported incidents in the respective years.

# The Variables

Information on the crime rates was compiled from Statistics Canada's electronic data files on criminal offenses (2004b) and an annual publication, entitled *Crime and Police Resources in Canadian Municipalities*, based on data collected from the Police Administration Annual

Survey and the UCR Survey conducted by the CCJS (see, for example, Canadian Center for Justice Statistics, 2002). The reported rates were based on the number of incidents reported to the police per 100,000 population. Three aggregated rates – violent crime rate, property crime rate, and total crime rate – were used in this study. The total crime rate was measured as the number of Criminal Code offenses, excluding traffic offenses, per every 100,000 population. Based on municipal-level data, the total crime rate showed a declining trend from an average of 11,399.4 offenses per 100,000 population in 1991 to 9,118.5 in 2001 (see Table 1).

About one of every ten Criminal Code offenses was a violent offense (see Table 1). In Canada, the major offense categories of violent crime were homicide, robbery, abduction, assault, and sexual assault. Each major category of violent offenses was subdivided into codespecific categories. For example, assault was subdivided into three levels: assault (level one), assault with weapon causing bodily harm (level two), and aggravated assault (level three). A similar classification applied to sexual assault. Level one assault accounted for over half of the violent offenses (62% in 2001; results not shown in tables). The next three most common categories were assault with a weapon (14%), robbery (9%), and level-one sexual assault (8%). Aggravated assault (1%), homicide (0.2%), abduction (0.2%), sexual assault with weapon (0.1%), and aggravated sexual assault (0.05%) made up only a fraction of all violent offenses (all the percentages were based on 2001 data; results not shown in tables).

Property offenses accounted for about half of the total crime rate (see Table 1). In Canada, the major categories of property crime included theft under \$5,000 (39% in 2001; results not shown in tables), breaking and entering

Table 1. Mean Values o	of the Se	lect	ed Varial	ble	Table 1. Mean Values of the Selected Variables												
	1991		1996		2001												
Population size	38,533.7		38,628.9		43,225.8												
Log. of population size (LNPOP)	9.2		9.2		9.3												
Population density	664.4		652.9		511.3												
Log. of population density (LNPDN)	6.0		6.0		5.5												
Percent Native population (NATIVE)	1.3	%	2.5	%	3.8	9											
Percent low income families (LOWINC)	12.0	%	14.0	%	10.7	%											
Moved in the last year (MOBIL)	15.5	%	16.0	%	14.7	%											
Ethnic heterogeneity (ETHHTG)	0.60		0.69		0.67												
Percent population married (MARRD)	55.1	%	51.4	%	50.4	%											
Percent population divorced (DIVRC)	5.8	%	7.3	%	7.9	%											
Percent single-parent families (SGLPA)	12.9	%	14.2	%	14.8	%											
Total crime rate (CRIME)	11,399.4		9,599.8		9,118.5												
Violent crime rate (VIOLN)	1,206.8		1,030.4		1,114.7												
Property crime rate (PRPTY)	8,195.3		5,107.3		4,061.1												
Number of cases	540		526		520												

(17%), motor-vehicle theft (10%), frauds (7%), theft over \$5,000 (1%), and possession of stolen goods (2%).

Population size was based on the census enumeration of the number of persons in the municipality. The average population size of the municipalities for the various years was approximately 40,000 (see Table 1). Population density was measured as the number of persons per square-kilometer. Both population size and population density were transformed by a logarithmic function to avoid outlier problems. Percent Native population was measured as the percentage of persons identified as having aboriginal origins. The proportion in 1991 was 1.3 percent, compared to 2.5 percent and 3.8 percent in the subsequent bi-census and census (see Table 1). The unusual extent of increase in the Native population was partly due to a higher birth rate, the natural increase over the years, and a number of other factors.<sup>2</sup>

Poverty was measured as the percentage of low-income families in the municipality (Warner and Pierce, 1993; Osgood and Chambers, 2000). The definition of low income was based on Statistics Canada's low-income cut-offs.<sup>3</sup> The average percentage of low-income families for the municipalities decreased between 1991 and 2001, from 12.0 to 10.7 percent (see Table 1). The reduction in low-income families reflected the improved Canadian economy since the mid-1990s (Statistics Canada, 2006).

Mobility was measured as the percentage of "movers" or persons one year of age or older in the municipality who had lived at a different address one year earlier. The definition included people who had moved within the municipality or from outside the municipality. The average percentage of movers in the municipalities in 1991 was 15.5 percent, compared to 16.0 percent in 1996, and 14.7 percent in 2001.

Year -1991	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. LNPOP	.30	07	.19	.27	.00	27	.42	.23
2. LNPDEN		07	.17	.24	.12	26	.26	.30
3. NATIVE			.21	.33	.18	13	01	.20
4. LOWINC				.13	14	58	.30	.61
5. MOBIL					.32	1 <i>7</i>	.34	.20
6. ETHHTG						.39	32	14
7. MARRD							63	79
8. DIVRC								.47
9. SGLPA								
Year - 1996	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. LNPOP	.32	08	.24	.31	.30	24	.37	.28
2. LNPDEN		07	.21	.27	.19	12	.16	.26
3. NATIVE			.08	.33	.08	01	11	.16
4. LOWINC				.16	.04	62	.42	.71
5. MOBIL					.16	07	.21	.20
6. ETHHTG						.15	12	.05
7. MARRD							69	70
8. DIVRC 9. SGLPA								.53
Year - 2001	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. LNPOP	.28	22	.17	.10	.23	19	.26	.21
2. LNPDEN		02	.25	.37	.15	29	.23	.40
3. NATIVE			.25	.35	.17	01	1 <i>7</i>	.31
4. LOWINC				.22	.02	51	.26	.71
5. MOBIL					.15	24	.12	.39
6. ETHHTG						.38	36	02
7. MARRD							73	64
8. DIVRC 9. SGLPA								.44

Ethnic heterogeneity was a composite variable based on multiple categories of ethnic identity (Statistics Canada, 2003b).4 The data used here were collected from Statistics Canada's (2004b) E-Stat tables of population profiles.<sup>5</sup> Blau's (1977) index was used here to measure the degree of ethnic heterogeneity. The index was constructed as  $(1 - \sum p_i^2)$ , where  $p_i$  represents the proportion of an ethnic group relative to the population.<sup>6</sup> Blau's index has been used as a measure of ethnic or racial heterogeneity in related studies (see, for example, Hirschfield and Bowers, 1997; Osgood and Chambers, 2000; Sampson and Groves, 1989; Smith and Jarjoura, 1988; Smith and Jarjoura, 1989; Sun et al., 2004; Veysey and Messner, 1999; Warner and Pierce, 1993). The heterogeneity index had a value of 0.60 in 1991, compared to 0.69 for 1996, and 0.67 for 2001.7

Percent population married referred to the percentage of persons aged 15 or over who were identified as legally married in the current year. For the municipalities, the average percent population married showed a declining trend between 1991 and 2001, from 55.1 percent to 50.4 percent (see Table 1). Percent population divorced referred to the percentage of persons aged 15 or over identified as divorced in the current year. The average percentage of divorced population for the municipalities increased from 5.8 percent in 1991 to 7.9 percent in 2001. The average percentage of single-parent families also increased over the years from 12.9 percent in 1991 to 14.8 percent in 2001. The statistics were consistent with the notion that the family institution has been undergoing quite significant changes in recent years, with a decrease in the number of traditional families (Milan, 2000).

The bivariate correlations of the precursors and the family and control variables are presented in Table 2. Strong correlations were observed between low income and the family variables. For example, in 1991 the cor-

relation between low income and percent population married was -.58 and that between low income and single-parent families was .61. The correlations between percent married and the other two family variables were -.63 and -.79, respectively. Similarly strong correlations of these variables were observed for 1996 and 2001. These high correlations would call for the examination of possible collinearity-related problems in subsequent analyses.

#### Results

Effects of Disorganization Precursors on the Family

In examining the effects of the precursors of social disorganization on the family, the family variables were regressed on the precursors, controlling for population size, population density, and percent native population. Results of the regression analysis are presented in Table 3. Population size and population density had significant negative effects on marriage and were associated with higher levels of divorce and single-parenthood. For example, for the 2001 data, the standardized coefficients for population size were -.16, .25, and -.11, and those for population density were -.15, .13, and .19, demonstrating that urbanized municipalities tended to show higher levels of family disorganization.

Of the three precursors, low income had the most consistent effect on the family variables. In 2001, for example, low income was associated with a lower proportion of married population, and higher proportions of divorced population and single-parent families (with  $\hat{\beta}$ s of -.43, .20, and .58, respectively). The observed effects were strong and consistent for the three data periods (see Table 3).

In 1991, mobility had a strong effect on divorce and some negative effect on marriage (with  $\hat{\beta}$ s of .38 and

_		1991			1996			2001	
Regressors	MARRD	DIVRC	SGLPA	MARRD	DIVRC	SGLPA	MARRD	DIVRC	SGLPA
Population size	14 ***	.27 ***	.12 ***	17 ***	.30 ***	.11 **	16 ***	.25 ***	.11 ***
Population density	16 ***	.12 ***	.17 ***	.01	01	.10 **	15 ***	.13 **	.19 ***
% population Native	08 **	06	.09 **	.00	14 ***	.13 ***	.03	13 **	.16 ***
% low income families	45 ***	.12 ***	.61 ***	60 ***	.35 **	.65 ***	43 ***	.20 ***	.58 ***
Mobility	11 **	.38 ***	.02	.04	.15 **	.00	16 ***	.12 **	.15 ***
Ethnic heterogeneity	.36 ***	42 ***	05	.21 ***	23 **	04	.47 ***	44 ***	14 ***
N	540	540	540	526	526	526	520	520	520
$R^{2}$	.52	.45	.53	.44	.33	.54	.51	.34	.62
	Note	: MARRD =	% population	married; DIVR	C = % popu	lation divorce	d;		

-.11). It had a moderate effect on divorce in 1996 (i.e., .15) and statistically significant effects on all three family variables in 2001 (-.16, .12, and .15, respectively). To that extent, a high level of mobility had adverse effects on marital relationships.

Unlike low income and mobility, ethnic heterogeneity was associated with a *higher* proportion of marriage and *lower* levels of divorce and single-parenthood. In 2001, for example, ethnic heterogeneity had a positive effect on marriage, and negative effects on divorce and single-parenthood ( $\hat{\beta}$ s were .47, -.44 and -.14, respectively). Perhaps this finding in part reflected the traditional values and practices of certain ethnic groups with respect to the salience of marriage and the family.

The magnitudes of the effects of the disorganization precursors on the family variables varied across the three data periods. The effect of low income on marriage was much stronger in 1996 than the other periods (i.e., -.60 compared to -.45 and -.43). Similarly, the effect of low income on divorce was also stronger in 1996 (i.e., .35 compared to .12 and .20). Given the recessive economy in Canada in the early- and mid-1990s (Statistics Canada, 2006), perhaps financial factors played a more critical role in family matters during that period of hardship. Persons with low incomes who were not certain about their job security and prospect might refrain from getting married, and low-income couples might experience more financial stress and difficulties, thus leading to a higher likelihood of divorce. These results demonstrated that the effects of the precursors on the family probably depended on the larger societal trend and context.

In short, of the three precursors of social disorganization, low income had strong effects on the family, and mobility had some considerable effects, thus lending support to the proposed theoretical model. On the other hand, the effects of ethnic heterogeneity on the family variables showed that it might not be a precursor of family disorganization.

The Effects of Disorganization Precursors and the Family on Crime

The high correlations between low income and the family factors suggested the possibility of collinearity-related problems. Collinearity diagnostics of the regression estimates were performed using the condition index and the variance inflation factors (VIF) (Belsley, Kuh, and Welsch, 1980). The results showed some collinearity but the regression estimates were still reasonably robust.<sup>8</sup>

The effect coefficients of the disorganization precursors and the family and control variables on crime were presented in Table 4. Judging by the size of the effect coefficients, percent Native population had the largest effect on the crime rates, with effect magnitudes of up to .41, .52, and .32 for the total, violent and property rates, respectively. These coefficients reflected the disadvantaged conditions of Native people in Canada. In comparison, the effects of population size and density were relatively small.

Low income did not have any significant direct effect on crime. For example, the 2001 effect coefficient on the total crime rate was merely .03. Thus, municipalities with a relatively high proportion of poverty families did not necessarily have higher crime rates, suggesting that poverty *per se* was not a direct contributing factor of crime.

Both mobility and ethnic heterogeneity had consistent and substantial direct effects on crime. In 2001, the

_		1991			1996		2001			
Regressors	CRIME	VIOLN	PRPTY	CRIME	VIOLN	PRPTY	CRIME	VIOLN	PRPTY	
Population size	10 **	10 ***	03	14 ***	17 ***	.02	14 ***	16 ***	03	
Population density	.02	02	.04	.05	03	.10 **	07	15 ***	01	
% population Native	.41 ***	.52 ***	.32 ***	.38 ***	.44 ***	.27 ***	.41 ***	.43 ***	.25 **	
% low income families	.01	.01	.00	08	.01	08	.03	.06	.09	
Mobility	.26 ***	.17 ***	.28 ***	.37 ***	.29 ***	.33 ***	.30 ***	.20 ***	.36 **	
Ethnic heterogeneity	.36 ***	.33 ***	.35 ***	.18 ***	.17 ***	.20 ***	.21 ***	.18 ***	.28 **	
% population married	10 *	08	14 *	03	.06	11 *	08	10	15 **	
% population divorced	.12 ***	.07	.19 ***	04	09 **	.05	02	08	.09	
% single-parent families	.19 ***	.22 ***	.12 *	.32 ***	.38 ***	.15 ***	.17 ***	.23 ***	.02	
N	540	540	540	526	526	526	520	520	520	
$R^{2}$	.67	.69	.61	.56	.59	.44	.59	.57	.48	

p < .05; p < .01; p < .001.

effect coefficients of mobility and ethnic heterogeneity on the total crime rate were .30 and .21, respectively. The corresponding coefficients in 1991 were .26 and .36. Moreover, the effects of mobility and ethnic heterogeneity were significant for both violent and property crimes. The effect coefficients of mobility on violent crime ranged between .17 and .29 for the various years, whereas those on property crime were between .28 and .36. The effect coefficients of ethnic heterogeneity on violent crime were between .17 and .33, and those on property crime were between .20 and .35, for the various years.

Compared to the disorganization precursors, the family variables had weaker effects on crime. Marriage had a relative weak effect on property crime (with  $\hat{\beta}$ s between -.11 and -.15), and it did not have any significant effect on violent crime. The effect of divorce was inconsistent over the years. It had a positive effect on property crime in 1991 ( $\hat{\beta} = .19$ ), a negative effect on violent crime in 1996 ( $\hat{\beta} = -.09$ ), and no significant effect on either in 2001. Single-parenthood was the only family variable that had a considerable effect on crime. In 2001, the effect coefficient of single-parenthood on violent crime was .23, compared to .02 on property crime. The respective coefficients were .38 and .15 in 1996 and .22 and .12 in 1991. Given the recessive economy in the early- and mid-1990s, the much stronger effect of single-parenthood in 1996 seemed to suggest that the disadvantaged conditions of single-parents were more aggravating in economic hardship, thus resulting in a higher level of criminal involvement.

In summation, the results showed that high levels of mobility, ethnic heterogeneity and single-parenthood were associated with higher crime rates at the municipal level, thus lending some support to the social disorganization perspective. However, the direct effects of low income, marriage and divorce on crime were inconsistent or weak.

# The Effects on Specific Violent and Property Offenses

Table 5 presents the regression of specific violent and property offenses on the disorganization precursors and family variables. Based on the coefficients and  $R^2$ s, it is rather obvious that the effects of the predictors varied for the different offenses. The disorganization precursors were stronger predictors for theft under \$5,000, level-one assault, and frauds than for the other offenses (the partial  $R^2$ s in 2001 for the three offenses were .21, .07, and .09, respectively; see Table 5). The family variables were stronger predictors for breaking and entering, robbery, and theft over \$5,000 than for the other offenses (the par-

tial  $R^2$ s in 2001 were .09, .06, and .07). In comparison, the precursors and family variables were weak predictors for homicide, levels two and three assault and sexual assault (the partial  $R^2$ s in 2001 were .01, .02, and .01). Thus, the overall pattern showed that the disorganization precursors and the family variables were stronger predictors for certain offenses.

There were a number of unexpected results related to divorce and single-parent families. Contrary to expectation, percent population divorced was associated with lower levels of frauds and level-one sexual assault. For example, the effect coefficients related to frauds were -.27 in 1991 and 1996, and -.15 in 2001. Also, percent single-parent families was associated with lower levels of breaking and entering and theft over \$1,000 in 1991 ( $\hat{\beta}$ s of -.25 and -.28), and lower levels of robbery in both 1991 and 1996 ( $\hat{\beta}$ s of -.18 and -.11; see Table 5).

The rather wide range of the magnitudes of the coefficients and explained variances ( $R^2$ ), and the unexpected results suggested that while the structural and family variables were relative effective in dealing with crime in general, they were not adequate for some of the specific offenses, particular low-frequency violent offenses such as homicide and aggravated and weapon-related sexual assaults. More sophisticated model specifications would be required to adequately explain these offenses.

# Family Disorganization as an Intermediate Factor

The indirect effects of the disorganization precursors on the total crime rate through the family variables were examined using path analysis (see Table 6). The magnitude of a causal path was calculated by multiplying the standardized coefficients involved in the causal link (Duncan, 1975). For example, the indirect effect of low income on the 1991 total crime rate through marriage was calculated by multiplying the standardized effect of low income on marriage presented in Table 3 and the standardized effect of marriage on the total crime rate presented in Table 4 (i.e., indirect effect = -.45 \* -.10 = .045). The indirect effect of low income through the three family variables was calculated by summing all the causal paths involving the family variables (Duncan, 1975). For example, the indirect paths of low income through divorce, marriage and single-parenthood were .045, .014, and .116, respectively. Therefore, the combined indirect effect of low income was .175 ( $\cong$  .18), or the sum of the indirect paths.

The indirect effects of percent low income on the total crime rate through the family variables for 1991, 1996, and 2001 were .18, .21, and .13, respectively (see

Table 6). The effect coefficients were positive and rather substantial, suggesting that the higher the percentage of low-income families in the municipality, the higher was the total crime rate. Moreover, much of the indirect effect was mediated by single-parenthood (i.e., .116, .208, and

.099 for the various years). To that extent, the finding lent much support to the notion that family disorganization explains the effect of poverty on crime.

In relation to mobility and ethnic heterogeneity, the family variables mediated only a small portion of the ef-

Regressors	HOMI	RBRY	SX2&3	SX1	AS2&3	AS1	B&E	GTHF	THFT	FRD
1991										
Log. population	07	.44 ***	05	16 ***	.07	12 ***	.14 ***	.15 ***	.03	30 **
Log. population density	11 *	.10 **	.06	10 *	.01	06	12 ***	10 *	.02	.09
% Native	.13 **	.12 ***	.41 ***	.20 ***	.59 ***	.40 ***	.34 ***	.18 ***	.18 ***	03
% low income families	.09	.11 *	.10	.03	.04	07	.18 ***	.07	03	09
Mobility	.00	09 *	.01	.26 ***	.01	.19 ***	.04	.06	.37 ***	.34 **
Ethnic heterogeneity	.21 ***	.12 **	.06	.27 ***	.28 ***	.37 ***	.22 ***	.29 ***	.32 ***	.23 *
% population married	07	32 ***	.01	.00	18 **	13 *	27 ***	25 ***	15 **	29 *
% population divorced	.22 ***	.22 ***	.11	13 *	01	.02	.43 ***	.40 ***	.11 *	27 *
% single-parent families	05	18 **	01	.26 ***	02	.29 ***	25 ***	28 ***	.17 **	.10
$R^2$	.10	.51	.22	.37	.50	.61	.49	.33	.58	.30
Partial R <sup>2</sup> (precursors)	.03	.01	.01	.13	.05	.16	.05	.07	.23	.16
Partial R <sup>2</sup> (family var.)	.03	.08	.01	.03	.01	.08	.14	.12	.06	.06
1996										
Log. population	.07	.37 ***	15 **	21 ***	.04	18 ***	.18 ***	29 ***	.01	32 *
Log. population density	13 **	.15 ***	.03	05	.00	04	06	02	.09 *	.10 *
% Native	.18 ***	.25 ***	.24 ***	.31 ***	.50 ***	.49 ***	.37 ***	.24 ***	.26 ***	.04
% low income families	12	.15 ***	.02	03	03	05	.10	10	09	05
Mobility	.06	.03	.06	.18 ***	.14 ***	.30 ***	.05	.13 **	.40 ***	.23 *
Ethnic heterogeneity	.04	.19 ***	.03	.12 **	.12 **	.13 ***	.14 ***	.11 *	.16 ***	.11 *
% population married	01	14 *	02	.08	06	.09	08	14	05	07
% population divorced	.24 ***	.19 ***	.06	17 **	05	06	.31 ***	07	.01	27 *
% single-parent families	.04	11 *	01	.37 ***	.17 **	.38 ***	05	.02	.21 ***	.19 *
$R^2$	.11	.53	.09	.34	.42	.62	.39	.18	.47	.20
Partial R <sup>2</sup> (precursors)	.01	.04	.01	.04	.03	.08	.02	.02	.14	.05
Partial R <sup>2</sup> (family var.)	.05	.05	.01	.06	.01	.06	.07	.00	.03	.05
2001										
Log. population	.02	.39 ***	12 *	19 ***	02	16 ***	.04	30 ***	01	23 *
Log. population density	.02	.09 *	.00	22 ***	17 ***	14 ***	20 ***	09	.02	.07
% Native	.26 ***	.27 ***	.17 **	.28 ***	.48 ***	.42 ***	.39 ***	.12 ***	.13 ***	03
% low income families	.14 *	.14 **	06	.02	.02	.03	.12 *	03	08	01
Mobility	05	.05	14 **	.22 ***	.14 ***	.27 ***	.15 ***	07	.47 ***	.24 *
Ethnic heterogeneity	.08	.21 ***	.08	.18 ***	.14 ***	.15 ***	.23 ***	.18 ***	.23 ***	.25 *
% population married	.03	14 *	06	01	18 **	03	11	30 ***	08	15 *
% population divorced	.12	.22 ***	06	10	12 *	07	.31 ***	.12	01	15 *
% single-parent families	12	04	.10	.31 ***	.15 **	.29 ***	.00	10	.22 ***	.24 *
$R^2$	.07	.53	.12	.45	.48	.62	.42	.15	.52	.28
Partial R <sup>2</sup> (precursors)	.02	.04	.02	.06	.03	.07	.06	.02	.21	.09
Partial R <sup>2</sup> (family var.)	.01	.06	.01	.03	.02	.03	.09	.07	.03	.03

Notes: Rates of specific offenses: HOMI = Homicide; RBRY = Robbery; SX2&3 = Sexual Assault Levels Two and Three; SX1 = Sexual Assault Level One; AS2&3 = Assault Levels Two and Three; AS1 = Assault Level One; B&E = Breaking and Entering; GTHF = Theft Over \$5,000 (in 1991, "Over \$1,000"); THFT = Theft Under \$5,000 (in 1991, "Under \$1,000"); FRD = Frauds. Only standardized coefficients are presented.

 $*\underline{p}$  < .05;  $**\underline{p}$  < .01;  $***\underline{p}$  < .001.

Table 6. Direct and Indirect Effects of the Disorganization Precursors on the Total Crime Rate through the Family Variables

		Direct	Indirect	Indire	ct effect tl	nrough
	Year	effect	total	MARRD	DIVRC	SGLPA
% low income families	1991	.01	.18	.045	.014	.116
	1996	08	.21	.018	014	.208
	2001	.03	.13	.034	004	.099
Mobility	1991	.26	.06	.011	.046	.004
	1996	.37	01	001	006	.000
	2001	.30	.04	.013	002	.026
Ethnic heterogeneity	1991	.36	10	036	050	010
	1996	.18	01	006	.009	013
	2001	.21	05	038	.009	024

Notes: Family variables: MARRD = Percent Population Married; DIVRC = Percent Population Divorced; SGLPA = Percent Single-Parent Families. Only standardized coefficients are presented.

fects of these two disorganization precursors on the total crime rate. The indirect effects of mobility on the total crime rate ranged between -0.1 and .06, and those related to ethnic heterogeneity ranged between -0.01 and -.10.

In short, the observed effect coefficients showed that the family, particularly single-parenthood, was an important mediating factor for the effect of poverty on crime, but much less so for the effects of mobility and ethnic heterogeneity.

# Discussion

Using Canadian municipal-level data in 1991, 1996, and 2001, this study examined the direct effects of the precursors of social disorganization on crime and their indirect effects through three family-related factors. The findings revealed that much of the effect of poverty on crime was mediated by the family-related factors. In contrast, the effects of mobility and ethnic heterogeneity on crime were mainly direct. With respect to the effects of the family-related factors on crime, percent single-parent families showed the strongest effect.

Findings from this study support Shaw and McKay's (1942) formulation of social disorganization theory to the extent that mobility and ethnic heterogeneity are strong predictors of crime, and poverty also causes crime indirectly through its effect on the family. The results have shown that poverty, mobility and ethnic heterogeneity are important predictors of crime.

As an institution, the family is not independent of the social and economic conditions of society. As the findings have revealed, marriage, divorce and single-parenthood are influenced, in the respective order of importance, by poverty, ethnic heterogeneity, and mobility. At the aggregate level, poverty is unfavorable to marriage and contributes to higher levels of divorce and singleparenthood, especially during a recessive economy. This finding underscores the importance of financial as well as other community supports to the family.

Like poverty, a high level of mobility in the community reduces the probability of marriage and increases that of divorce. A highly mobile population is not a favorable factor for building or maintaining a family. Mobility weakens social networking and support. The loss of social support from relatives and friends, and the demand for adjusting to a new job or a new environment may put strains on the family.

Ethnic heterogeneity does not cause family disorganization. On the contrary, as the findings have revealed, ethnically-heterogeneous communities also tend to have a higher percentage of married population and a lower percentage of divorced population. Perhaps much of the support for the family is derived from kinship or friendship groups, which in most cases are composed of members of the same ethnic group. A few families of the same ethnic origin can effectively provide social support for one another. It is also possible that given the lack of extensive social networking, the family has become even more important among ethnic minorities, especially among recent immigrants, thus helping to reinforce marriage and prevent divorce. In short, the findings suggest that ethnic heterogeneity strengthens rather than weakens the traditional family.

In sum, results from this study have confirmed the importance of mobility and ethnic heterogeneity as predictors of crime. Poverty has some indirect effect on crime through family disorganization. Poverty and ethnic heterogeneity also have considerable effects on the family at the aggregate level. In comparison, the effects of mobility on the family variables are relatively weaker. The findings lend considerable support to Shaw and McKay's (1942) social disorganization theory in terms of the strong correlations between the disorganization precursors and crime. The reformulation of their theory, in terms of drawing the causal link between the disorganization precursors and crime through family disorganization, receives some support.

The results have established that family disorganization is critical as a mediator of the effect of poverty on crime. This particular finding accentuates the role of the family as an intervening variable. In terms of policy implications, the finding implies that in communities with high poverty rates, the family is at risk of being negatively impacted. Thus, it is critical that there are programs in place in these communities to support the family, especially programs targeting families in poverty. Strong and cohesive family units, in turn, help to buffer the negative impact of poverty on the community. Future research should continue to examine the roles of family disorganization and other types of social disorganization in understanding the dynamics of poverty, mobility, heterogeneity, and other structural factors.

# **Endnotes**

- 1. In 1991, the classification criterion for the two theft categories was set at \$1,000. It was changed to \$5,000 beginning in 1994.
- 2. In 1991, respondents were asked to identify their ancestry, and they were told to report as many origins as applicable, resulting in a considerable proportion of persons with multiple origins. The calculation of the percentage of aboriginal population for 1991 excluded aboriginal persons who had multiple ethnic origins since the Census reports aggregated all persons with multiple origins into one category. Beginning in 1996 (Statistics Canada, 1998), a more direct question of ethnic identity was used: "Is this person an Aboriginal person, that is, North American, Indian, Métis or Inuit (Eskimo)?" The new aboriginal identity question included both persons of single aboriginal origins and persons of aboriginal and other origins. Therefore, the drastic increase in the proportion of aboriginal population was partly due to the addition of this identity question. Other reasons included the positive trends in ethnic awareness, political movements, and fewer incompletely enumerated aboriginal

- reserves (Statistics Canada, 2003a). Still another reason for the increase had to do with the use of municipal-level data and the increase in aboriginal police services in recent years due to the First Nations Policing Policy Agreements beginning in 1991. Since municipal crime rates were based on the reports by police services, the increase in aboriginal police services resulted in the inclusion of more municipalities with high concentration of aboriginal population in the 1996 and 2001 samples. The 1991 sample contained 13 communities with 10 percent or more of the population in the community reportedly aboriginal. The number increased to 29 communities in the 1996 sample and 54 in the 2001 sample.
- 3. The 1992 family expenditure data collected by Statistics Canada showed that Canadian families spent an average of 44 percent of their after-tax incomes on basic necessities including food, clothing, and shelter. The Low Income Cutoffs (LICOs) were then set at twentypercent points above the population average. That is, the LICOs were defined as families with spending of 64 percent or more of their after-tax income on basic necessities, with adjustment made for seven different sizes of families and five urbanization categories (Paquet, 2002). For example, in 1992, the LICO for a family of four living in an urban area of 500,000 population or more was \$25,694 (in Canadian dollars) after tax, compared to \$19,472 for a family of the same size living in rural areas (Paquet, 2002). The Consumer Price Index (CPI) was used to make adjustments to the LICOs for the years prior to 1992 and the subsequent years. The CPI indexes for 1991, 1996, and 2001 were set at 98.5, 105.9, and 116.4, compared to the standard CPI index of 100 in 1992. For example, using the CPI, the LICO for a family of four living in an urban area of 500,000 population or more was \$29,908 or 116.4 percent of the corresponding figure in 1992 (Statistics Canada, 2004a).
- 4. In 1991, the Census questionnaire provided 15 mark-in categories and two write-in categories of ethnic origin. Respondents selected from the mark-in categories and were allowed to write in up to two additional categories of ethnic origin. In 1996, a completely openended format was used with four write-in spaces and respondents were allowed to write in up to six categories of ethnic origin. Twenty-four examples of ethnic origin were given, including "Canadian" as one of the new categories. The Census questionnaire item for ethnicity in 2001 was similar to that in 1996 with a few changes. In 2001, there were twenty-five examples of ethnic origin listed with the question, 21 of which were based on the

most frequent response categories in 1996. The example "North American Indian" was replaced by "Métis" and "Inuit," and four new categories including Vietnamese, Lebanese, Chilean and Somali were added to the list of examples.

- 5. In 1991, the Census profile of municipalities published 32 "single-response" categories of ethnic origin, one "other single-responses" category and one "multiple-responses" category. In 1996, the profile contained 100 published ethnic categories, with three response types for each category (i.e., total-, single-, and multiple-responses). In 2001, 208 ethnic categories were used in coding (see Statistics Canada, 2003b, Appendix C), but only 61 of the categories were published in the E-Stat profile, with three response types for each category.
- 6. The index has a minimum value of 0 when 100 percent of the population belongs to the same ethnic (i.e.,  $p_i = 1.0$ ). The maximum value of the index approaches 1.0 when each ethnic group in the population accounts for only a very small proportion of the population. For example, if four ethnic groups are equal in number and each represents 25 percent of the population, the index has a value of 0.75. It means that there is a 75 percent chance that two randomly selected individuals in the population will be members of different ethnic categories.
- 7. To make the index comparable between the different census years, only the single-response categories plus one multiple-response category were used in the construction of the index. One of the reasons for the increase in the heterogeneity index from 1991 to 1996 was the increase in the number of categories published by Statistics Canada.
- 8. According to Belsley et al. (1980), a condition index between 30 and 100 represents a moderate but tolerable degree of collinearity effect. In the regression analyses, the condition indexes were about 89, 73, and 65 for the various years. The VIFs for low income and divorce had values of approximately 2.0 for the various years, suggesting that their associated standard errors were only slightly inflated. The VIFs for single-parenthood were between 2.9 and 3.6 and those for marriage were between 3.2 and 4.1. These VIFs were still below the critical VIF value of 10 (Belsley et al., 1980). Therefore, one may conclude from these results that the effect of collinearity, if any, was within the acceptable level.

9. Upon the suggestion of one of the reviewers of the manuscript, I tested whether population size (under 100,000 versus 100,000 and over) would modify the effects of the variables on the crime rates. The interactive terms of population size (0 and 1) and the precursor and family variables were added to the original model. The variables were centered to minimize collinearity-related problems (see Aiken and West, 1991). Out of a total of 54 interactive terms (i.e., 6 precursor and family variables \* 3 years \* 3 crime rates), only six were statistically significant. The significant interactive effect coefficients were associated with single-parenthood (with  $\hat{\beta}$ s of -.14 and -.17), ethnic heterogeneity (-.11 and -.14), low income (.14), and mobility (.07).

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# An Ecological Assessment of Property and Violent Crime Rates Across a Latino Urban Landscape: The Role of Social Disorganization and Institutional Anomie Theory<sup>1</sup>

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**Abstract.** The present research put forth an integrated theoretical framework aimed at providing a more holistic community-level approach explaining crime across a heavily populated Latino city. Guided by social disorganization and institutional anomie theory, this study used several data sources and OLS regression techniques to examine the impact of social disorganization, economic and noneconomic institutional characteristics on rates of property and violent crime across 1,016 census block groups in San Antonio, Texas. While several findings emerged, interactions between alcohol density and concentrated disadvantage were significant and positively associated with property and violent crime. Interactions between welfare generosity and concentrated disadvantage were significant and negatively associated with the outcomes.

**Keywords:** social disorganization; institutional anomie; Latinos; crime; interaction terms; census block groups

#### Introduction

For more than half a century, research in the ecological tradition has been dominated by social disorganization theory (Shaw and McKay, 1942). This theory posits that adverse community characteristics such as poverty undermine levels of informal social control, which, in turn, fosters crime in urban settings (Sampson and Groves, 1989). While social disorganization scholars are credited with explaining why crime occurs across different aggregates, a common limitation is that most studies have been conducted in settings absent large Latino populations.

Still working in the ecological tradition, a small number of social scientists have recently enlisted institutional anomie theory to study economic (e.g., Gini index) and noneconomic (e.g., participation in religious engagements) institutional effects on crime (e.g., Maume and Lee, 2003). Developed by Messner and Rosenfeld (1994), institutional anomie claims that community-based economic institutions elevate normlessness (i.e.,

anomie) which produces higher rates of criminal activity; however, noneconomic institutions hold the capacity to buffer anomic-fueled economic effects on crime. While this theory is able to adjust for a wider array of institutions, the drawback is that studies are conducted at a relatively high level of aggregation (e.g., nations, states, counties), which limits consideration of community-level attributes.

Despite these shortcomings, the role of social disorganization and institutional anomie are salient when placed in the context of the systemic network thesis. According to Bursik and Grasmick (1993; see also Kasarda and Janowitz, 1974; Kornhauser, 1978), all kinds of community and institutional components are part and parcel of the private, parochial, and public systemic network that represents different levels of social control. The systemic model posits that a broad range of community and institutional characteristics affect crime indirectly through their effect on informal social control. To further illustrate this point, Wilson's (1987) seminal work depicted how macro-structural antecedents (e.g.,

deindustrialization) impacted the larger institutional fabric of the community—fewer supportive institutions such as churches and family stores—which further influenced localized social pathologies (e.g., female-headed households, unemployment, criminals) that undermined the development of community oversight. Peterson, Krivo, and Harris (2000) argued that impoverished communities also experience difficulty attracting and maintaining institutions that impede criminal behavior. The decline of supportive institutions may consequently attract unconventional crime-inducing institutions, such as bars, due to little business competition and low rents (Chung and Myers, 1999; Lee, 1998).

While the ecological-crime causal relationships is difficult to simplify, the current integrated theoretical framework aimed to provide a more informed understanding of the wide range of community demographics and institutions that act independently and interdependently (via interaction terms) to influence crime. Guided by social disorganization and institutional anomie theory, this study examined the impact of social disorganization (concentrated disadvantage), as well as economic (pawnshops/music CD-exchange stores, alcohol outlets) and noneconomic (welfare generosity, church membership rate, Latino culture, voter turnout rate) institutional characteristics on rates of property and violent crime across census block groups in San Antonio, Texas.

San Antonio was selected as the study site based on the general omission of Latinos in the criminological literature, its large Latino population, and the manner in which this population is related to some of the institutions of interest. The city has a 58 percent Latino population, yet this ethnic group is predominantly of Mexican origin, native-born, disadvantaged, and less educated. In terms of additional Latino specific demographics, Latinos account for 23 percent of those living in poverty (city 16%), 18 percent of female-headed households (city 15%), 8 percent on public assistance (city 9%), and 8 percent with a bachelors degree or higher (city 13%). These figures indicate that Latino communities are more disadvantaged than the rest of the city. By all accounts, San Antonio is an acculturated city. The 2000 U.S. Census revealed that only 5 percent of the Latino population is foreign-born, and 15 percent reported speaking English less than very well. Despite such acculturation, the Latino population shows patterns of ethnic enclaves. According to Allen and Turner (2005), 78 percent of Latino population is residentially concentrated, but not shaped by immigration when compared to other urban areas (e.g., Houston and Los Angeles) with modest to large numbers of Latinos.

Latino demographic characteristics may shape sur-

rounding economic and noneconomic institutions. For example, over 871,000 individuals registered to vote during the 2000 Presidential election and approximately 48 percent participated. However, Spanish surnames accounted for twenty-three percent of the voter turnout. One plausible explanation for the low ethnic turnout is the poor and less educated population. Although San Antonio's legacy is rooted in Catholicism, the Glenmary Research Center and San Antonio Catholic Archdioceses show that from 1990 to 2000 Catholic congregations decreased by 32 percent. Hunt (2000) reported that the Catholic Church is losing Latinos to other religions. In 2003 the city also experienced a reduction in Section 8 housing vouchers which caters to a large Latino population. The San Antonio Housing Authority (SAHA) currently has over 11,000 residents receiving aid, with a waiting list surpassing 5,000. While it appears that institutional features of San Antonio likely to help Latinos are declining (or are weak), other institutions adversely influencing Latinos have increased. For instance, the city's business/assumed names records revealed that 44 new pawnshops were established between 1999 and 2003, and alcohol serving institutions continue to grow. Similar to other large urban cities, much of the institutions considered to undermine pro-social values of restraint and conformity are located in and around Latino communities. In the end, San Antonio is distinctive from other large urban cities due to its large, disadvantaged, working, poor, native-born, Mexican-American communities that tend to be residentially concentrated in areas with declining political, religious, and welfare institutions and increasing crime-inducing institutions.

Overall, the unique research setting of San Antonio provided a rare exposé into community and institutional arrangements of a predominantly Mexican-American Latino urban landscape. Given the rapid growth of this ethnic group, it is plausible that other urban cities will increasingly come to resemble San Antonio (Guzman, 2001). Such locales are likely to be associated with unique Latino experiences, as well as various structural constraints that have plagued this ethnic group. This study follows Martinez's (2002) pioneering research, advocating for criminology that examines the Latino experience with the goal of moving beyond the White/Black urban crime focus.

### **Literature Review**

The literature review is divided into three subsections. The review begins with social disorganization, followed by a discussion on institutional anomie and various competing noneconomic and economic institutional dimensions. The final subsection provides an overview of institutional anomie's moderating concept and existing empirical studies.

#### Social Disorganization

In their classic work, Shaw and McKay (1942) reported that socially disorganized urban communities characterized by residential mobility, ethnic heterogeneity, and low socioeconomic status were associated with crime. Over the years, theoretical adjustments have been articulated and elaborate poverty measures were developed to better understand the changing social ecology of crime across urban settings (see, Duncan and Aber, 1997). For example, Sampson, Raudenbush, and Earls (1997; see also Morenoff, Sampson, and Raudenbush, 2001; Sampson and Raudenbush, 1999; Sampson, Morenoff, and Earls, 1999) found that high levels of concentrated disadvantage, immigrant concentration, and residential instability were positively related to violence at the census tract level. Collective efficacy was also reported to attenuate the effects of concentrated disadvantage and residential instability on violence. In related studies estimating the influence of social disorganization predictors on rates of burglary, researchers found similar direct and mediating results (Lynch and Cantor, 1992; Miethe and McDowall, 1993; Rountree, Land, and Miethe, 1994; Sampson and Groves, 1989; Smith and Jarjoura, 1989).

Another social disorganization condition that has been extensively studied is population turnover (e.g., Browning, Feinburg, and Dietz, 2004; Morenoff et al., 2001). Consistent with Wilson's (1987) conception of social isolation effect, areas with depleted populations may experience higher crime rates due to: (a) an exodus of the upper and middle class and (b) citizens who lack resources to move choose not to participate in regulating community behavior. Morenoff et al. (2001) found a significant negative association between population density and homicide across Chicago census tracts. Based on Wilson's conception of social isolation, Morenoff et al. (2001:539) contend that a negative association is more applicable at the community-level, whereas a positive association is expected at the city-level. Browning et al. (2004) and Morenoff and Sampson (1997) also discovered similar inverse relationships. Furthermore, disorganized communities may attract negative, unconventional institutions, such as alcohol outlets. Kornhauser (1978:79) emphasized the need to focus on the larger institutional characteristics of communities as a way to more effectively realize community normative order. Others have

recently endorsed this line of inquiry (Hunter, 1985; Peterson et al., 2000; Wilson, 1987).

Institutional Anomie and Competing Noneconomic and Economic Institutions

By shifting focus to the institutional arrangement of communities, integrating institutional anomie into the current theoretical argument is applicable. Messner and Rosenfeld (1994) revised Merton's (1938) anomie perspective by shifting the foci to noneconomic institutions. This shift provided the essence of their perspective; namely, that Merton did not (a) account for anomie generated by a heavy reliance on economic institutional opportunities and (b) consider noneconomic institutions as a way to reduce anomie and crime. Scholars argue that institutional anomie is suitable to explain macrolevel rates of violent and property crime (Messner and Rosenfeld, 1994:68; see also Messner and Rosenfeld, 2001:42; Savolainen, 2000).<sup>2</sup> At the center of institutional anomie are two competing dimensions -- noneconomic and economic institutions -- assumed to influence the regulatory capacity of communities.

On one hand, noneconomic religious, political, welfare, and Latino cultural institutions are considered convention-inducing agents that foster mechanisms of community social control and invoke conformity. Researchers, for example, have posited that the social ecology of religious institutions is important in establishing cultural norms, values of conformity, moral communities, and communal goals (Messner and Rosenfeld, 1997:74; Bainbridge, 1989; Bursik and Grasmick, 1993; Stark, 1996:164; Stark, Bainbridge, and Crutchfield, 1983; Warner, 1993). An additional source of noneconomic institutional social control is the local political landscape. Putnam (2000) has identified voting as a key component of political social capital. More recently, Rosenfeld, Messner, and Baumer (2001; see also Messner, Baumer, and Rosenfeld, 2004) noted that social capital can be theoretically linked with crime by drawing on institutional anomie's heritage, because communities characterized by higher levels of political participation can influence the strength of community normative order.

While measures of poverty or some derivation thereof (e.g., concentrated disadvantage) have long been associated with crime, some researchers posit that welfare institutions can reduce crime by wealth redistribution (Benoit and Osborne, 1995; Eaton and White, 1991). More specifically, Zhang (1997) examined the effect of cash and in-kind welfare programs on criminal behavior based on the theoretical notion that programs can reduce

crime. He reported that public housing programs had a significantly negative effect on property crime when compared to Medicaid and school lunch programs. Goering and Feins (2003) and Sampson, Morenoff, and Raudenbush (2005) have recently advocated the use of housing vouchers to aid the poor in securing residence in middle class neighborhoods as a way of reducing crime in impoverished areas.

In his pioneering community-level analysis on Latino homicides across five U.S. cities, Martinez (2002:134) concluded that Latino immigrant communities create a buffer zone against crime by exhibiting higher levels of social (e.g., families, friends, church) and economic (e.g., work and schools) institutional integration. This study extends a similar argument: communities that preserve the Latino culture in terms of Spanish language will also buffer against crime. The Latino culture is commonly conceptualized as the process whereby change (e.g., language, behavior, norms) occurs among immigrant populations (e.g., Latinos) due to exposure to and interaction with a cultural system (e.g., American) that is different from the culture of origin (Anderson and Rodriguez, 1984; Rogler, Cortes, and Malgady, 1991). Just as "immigration reinforces the cultural attributes of Latinos by intensifying the use of Spanish" (Martinez, 2002:39), Spanish speaking Latinos are more likely to reside among immigrants, because embedded in language is knowledge of customs, accesses to cultural groups, and its respective artifacts (Vega and Gil, 1998:128). Therefore, Latino communities characterized by a dominance of the English language are likely to be associated with crime, because native cultural attributes (e.g., Spanish language) are replaced by norms associated with the "American Dream" of material wealth. With this said, only one study has investigated acculturation as a contextual characteristic of communities. Using U.S. Census data, Finch et al. (2000) operationalized aspects of acculturation as household linguistic isolation and found that higher levels of community acculturation had a direct relationship with the prevalence of substance abuse among pregnant Latinas.3

On the other hand, economic institutions, such as bars, are likely to obstruct the development of community normative order. For example, Peterson et al. (2000) relied upon physical street addresses of select unconventional institutions to investigate whether local institutions matter for controlling neighborhood violence and found that bars, economic deprivation, and residential instability contributed to an increase in violent crime across census tracts. Interestingly, they also reported that the presence of recreation centers reduced violent crime

in most economically disadvantaged neighborhoods. Alaniz, Cartmill, and Parker (1998; see also Roncek and Bell, 1981; Roncek and Maier, 1991; Roncek and Pravatiner, 1989; Quimet, 2000) conducted a similar study at the block group level across three California communities and reported that violence was a function of alcohol availability and percent divorced. Although an understudied topic, researchers have empirically shown that pawnshop institutions also influence crime (Wright and Decker, 1993; Fass and Francis, 2004). Glover and Larubbia (1996) posited that pawnshops are counter-productive toward establishing normative order because they attract "easy money" criminals.

Institutional Anomie's Moderating Concept and Existing Empirical Studies

Institutional anomie theory claims that the various types of competing institutional dimensions matter most when examined in tandem. In other words, it is the interaction among economic and noneconomic institutions that produces the driving institutional balance of power concept characterized by Messner and Rosenfeld (2001:68). Thus, institutional anomie is considered a moderating theory of crime studies (Maume and Lee, 2003).<sup>4</sup> Institutional anomie's unique contribution, then, is that it emphasizes "the relative strength [interaction] between [economic and noneconomic] institutions in terms of the social structure" (Savolainen, 2000:1002; see also Bernburg, 2002:731; Messner and Rosenfeld, 1997:1408). Put differently, an expansion of economic opportunities is likely to reduce rates of crime only when coupled with a strengthening of noneconomic institutions (Messner and Rosenfeld, 2001:101; see also 1994:68-90).

Institutional anomie has remained understudied when compared to other ecological theories; but recent empirical tests have emerged. Chamlin and Cochran (1995) showed the effects of economic deprivation on property crime were significantly lower across states with higher levels of church membership and percent voting while the effects of economic deprivation on property crimes were significantly higher across states with elevated levels of divorced families. Savolainen (2000) reported nations with generous welfare programs experienced reduced negative effects of economic inequality (Gini coefficient) on homicides. Maume and Lee (2003) estimated the influence of economic pressures (Gini coefficient) and five noneconomic institutions (political voter turnout, familial divorce rate, educational expenditure, civically engaged religious denominations, and welfare expenditure) and

found that the interaction between welfare expenditure and Gini was the only term to significantly moderate the effect of Gini on homicides across 454 counties.<sup>5</sup>

In summary, the literature indicated that diverse types of crime across various geographical aggregates can be explained using social disorganization *and* institutional anomie theory. The theoretical difference is one mainly of emphasis -- the former aims at explaining direct and mediating influences while the latter aims at explaining moderating influences. With this said, whether the community and institutional fabric of San Antonio influences crime remains an open empirical question.

#### **Research Objectives**

The present research put forth an integrated theoretical framework aimed at providing a more holistic community-level approach explaining crime across a heavily populated Latino city. Toward this end, social disorganization and institutional anomie should be viewed as supplementary, rather than competing, theoretical frameworks. Three research objectives sought to (1) determine direct social disorganization effects on the outcomes, (2) better understand the effects of various institutional characteristics on crime, and (3) discover whether the effect of concentrated disadvantage on crime depends on the level of economic and noneconomic institutions. To accomplish these objectives, several contextual multivariate models were estimated, because community institutions will vary with respect to their ability to impose values of restraint and control (Messner and Rosenfeld, 2001:79).

#### **Data and Variables**

Several independent data sources were culled to construct the data file: (1) 2000 Census Bureau, (2) Texas Alcohol Beverage Commission (TABC), (3) San Antonio Police Department (SAPD), (4) Bexar County Elections Department, (5) San Antonio Housing Authority (SAHA), (6) San Antonio Catholic Archdiocese, and (7) other public information. The following subsections highlight these data sources, along with the collection and measurement procedures.

The first source of data was the 2000 Census Bureau. This source was used to carry out two broad functions. The first function was to identify the unit of analysis -- San Antonio's 1,016 census block groups (BGs). Smaller geographic aggregates, such as BGs, may yield greater effects due to distinct homogeneous communities (McNulty and Holloway, 2000; Peterson et al., 2000; Simcha-Fagan and Schwartz, 1986; Quimet, 2000;

Warner, 2003; Wooldredge, 2002). As described in the variable section below, the second function was to use the Census Summary Tape File 3 (STF 3) to help identify an array of community and institutional items at the BG level.

The second data source was the Texas Alcohol Beverage Commission (TABC). Consistent with prior research that collected alcohol outlet data (Alaniz et al., 1998; Gyimah-Brempong, 2001; Nielsen and Martinez, 2003; Peterson et al., 2000), the current study secured a list of over 1,400 "on-site" alcohol serving institutions (e.g., restaurants, bars, pubs, clubs) from 2001-2002. The TABC provides information to the public via the Internet in a downloadable version. The data included each institution's physical street address. This made it possible to geocode each institution within San Antonio.

Third, the San Antonio Police Department (SAPD) provided official violent (e.g., robbery) and property (e.g., residential burglary) crime incident records for calendar years 2001-2003. At least three years of crime data is considered adequate to avoid annual fluctuations and increase the likelihood of having sufficient incidents to calculate reliable rates (Messner and Golden, 1992; Peterson et al., 2000; Sampson, 1985, 1987). The SAPD data included attributes of the criminal event, such as date, time, incident address, and incident type. The address where the incident occurred was geocoded to its respective BG. The SAPD also provided physical locations of pawnshop and music CD-exchange stores. According to SAPD, there were 96 pawnshops and 30 music CDexchange stores. To ensure data quality, information was crosschecked using the Bexar County public records and yellow page directory.

The fourth data source was election voter turnout information obtained from Bexar County Elections Department. This department collects vital information, such as the physical street addresses of those who voted in a particular election. During the 2000 Presidential election, over 415,000 votes were cast by residents of San Antonio.

The fifth data source consisted of 2000-2003 San Antonio Housing Authority (SAHA) Section 8 housing voucher information. These data provided the physical address of the Section 8 home where the client resided and the amount of the monetary stipend the renter received to help pay for housing. From 2000-2003, SAHA provided monetary voucher assistance to over 11,500 clients.

The sixth data source was 2002 church location and membership information. Using the Internet, Bexar County public records, San Antonio Catholic Archdiocese official records, and yellow page directory, church loca-

tions and membership information was collected. Once a church was identified, church staff were contacted and asked to provide the physical street address and number of church members per congregation. San Antonio has over 650 Catholic, Lutheran, Baptist, Presbyterian, Episcopal, and Christian churches serving over 500,000 adherents.

All data were geocoded to their respective BGs, producing an analysis file of 1,016 BGs. Population sizes for the BGs ranged from 226 to 4,292 individuals, with a mean population of approximately 1,400.

# Dependent Variables

Two general categories of crime rates were specified as the dependent variables. *Violent crime rate* was operationalized as the three-year (2001-2003) average of homicide, rape, robbery, and assault (simple and aggravated) in each BG per 1,000 residents. *Property crime rate* was measured as the three-year (2001-2003) average of serious property crime (auto theft and residential/vehicular burglary) in each BG per 1,000 residents. To reduce skewness and induce homogeneity in error variance, violent and property crime rates were transformed to natural logarithms.

# Social Disorganization and Economic Institutional Independent Variables

Social disorganization and economic institutional predictors were assumed to obstruct the development of community normative order. Concentrated disadvantage was operationalized as a weighted factor regression score (eigenvalue = 2.85, factor loadings > .8) that included the following 2000 Census items: percent poverty, percent unemployment, percent female-headed household with children, percent Latino, and to a lesser extent, percent Black. San Antonio is 58 percent Latino with a relatively small African-American (6%) population. Concentrated disadvantage represented economically disadvantaged BGs to which Latinos and single parent families were concentrated. Percent units vacant represents the proportion of untended housing units within each BG. Percent male 15-29 years of age was operationalized using 2000 census data. These three variables were hypothesized to be positively associated with violent and property crime outcomes. The final social disorganization determinant, population change, was measured as the natural logged 2000 BG population subtracted from 1990 BG population.<sup>6</sup> It was hypothesized that a decrease in population would be associated with an increase in violent and property crime rates, thus, a negative association was

expected.

The following variables represented economic institutional predictors. Monetary aggravators were dummy coded and measured as: 1 = one or more pawnshop or music CD-exchange establishment in BG, 0 = nopawnshop or music CD-exchange establishment in BG. This study extended the pawnshop argument to include music CD-exchange stores. Music CD-exchange stores trade and/or purchase merchandise (tapes, records, CDs) from customers. These institutions are counterproductive because they attract "easy money" criminals that reflect American culture's reliance on unconventional opportunities (i.e., the commission of crime) to acquire materialistic goals (Glover and Larubia, 1996; Chamlin and Cochran, 1995). Alcohol density was operationalized as the number of alcohol establishments licensed for onsite consumption (e.g., bars, taverns, pubs, restaurants) in each BG per 1,000 residents. It was hypothesized that monetary aggravators and alcohol density would be positively associated with violent and property crime rates.

#### Noneconomic Institutional Independent Variables

The next set of variables represented noneconomic institutions that were assumed to invoke values of restraint and reinforce norms of conformity.7 Welfare generosity was measured as the total Section 8 housing dollar voucher amounts per unit in BG. Church membership rate was operationalized as the number of registered church members in each BG per 1,000 residents. To capture the unique experiences that Latino communities face, the level of Spanish/English language usage was gauged in terms of retaining or losing cultural traditions as a group. Knowledge of the Spanish language is positively related to integration with the traditional Latino culture (Buriel, Calzada, and Vasquez, 1982), whereas Portes and Rumbaut (1990) consider English language acquisition a fundamental process of becoming Americanized.8 Latino culture was operationalized as the percentage of BG households linguistically isolated from the English language as reflected in 2000 Census data. The aim was to capture the level of households that speak Spanish and have difficulty speaking English. BG households characterized by higher levels of linguistic isolation from the English language (i.e., more Spanish speaking Latino households) were expected to be negatively associated with crime. Finally, voter turnout rate was measured as the number of voters that participated in the 2000 Presidential election in each BG per 1,000 residents.

Based on these noneconomic institutional variables, the following hypotheses were specified. First, welfare generosity, church membership rate, Latino culture, and voter turnout rate were expected to be negatively associated with the outcomes. Second, it was hypothesized that welfare generosity, church membership rate, Latino culture, and voter turnout rate would influence the impact of social disorganization and economic institutional independent predictors on the outcomes. Lastly, and consistent with the moderating focal point of institutional anomie research, it was anticipated that all noneconomic and concentrated disadvantage interaction terms (e.g., welfare generosity \* concentrated disadvantage) would be negatively associated with the outcomes. In keeping with the institutional anomie spirit, it was hypothesized that both economic and concentrated disadvantage interaction terms (e.g., alcohol density\* concentrated disadvantage) would be positively associated with the outcomes. Descriptive statistics for all variables are shown in Table 1. Appendix A provides a variable summary description along with the hypothesized relationships.

#### **Analytical Strategy and Findings**

Three analytical strategies were employed. First, bivariate correlations were estimated to: (a) determine the preliminary relationships among the independent and dependent variables, (b) gain a better understanding between the theoretical social disorganization, economic, and noneconomic independent relationships, and (c) address issues concerning multicollinearity. Next, Ordinary Least Squares (OLS) regression was used to estimate several multivariate models. In the process, diagnostic procedures were performed to further investigate multicollinearity, and tests for spatial autocorrelation were conducted.

Due to the spatial nature of the data, contemporary

researchers advocate for the assessment of spatial autocorrelation (Alaniz et al., 1998; Kubrin and Weitzer, 2003a; Messner et al., 2001; Nielsen and Martinez, 2003). Using GeoDa software (Anselin, 2004), Moran's I was used to help detect whether spatial autocorrelation was present. "Moran's I is a cross-product coefficient similar to a Pearson's correlation coefficient and is bounded by 1 and -1" (Kubrin and Weitzer, 2003b:166). When Moran's *I* is significantly positive, positive spatial autocorrelation is present. No evidence was found to indicate that property (Moran's I = .12;  $\underline{p} > .19$ ) and violent (Moran's I = .10;  $\underline{p}$ >.11) crime rate in a given BG was spatially dependent on adjacent BGs. Consistent with Reisig et al. (2004:262) Moran's I was also used to investigate whether the social disorganization, economic and noneconomic independent variables yielded any significant spill-over effect across BGs. While none of the independent variables achieved statistical significance, the largest Moran's I coefficient was observed for concentrated disadvantage (.18), followed by alcohol density (.15), and voter turnout rate (-.12). Hence, no evidence of spill-over was detected.

Table 1 presents the bivariate correlations. Many of the hypothesized relationships between the independent and dependent variables were significant and in the expected direction. The general pattern of findings indicated that as social disorganization and other economic institutional characteristics increased, violent and property crime rates also increased. In contrast, as noneconomic social control institutions increased, violent and property crime rates decreased. In terms of relative magnitude, concentrated disadvantage yielded the strongest correlation for violent crime rate, followed by alcohol density, percent units vacant, population change, monetary aggravators, and voter turnout rate. As for property crime rate, the observed correlations were strongest for alcohol density,

Table 1. Descriptive Statistics and Bivariate Correlations													
	(N = 1,016)												
	X <sub>2</sub>	$X_3$	X <sub>4</sub>	$X_5$	X <sub>6</sub>	<b>X</b> <sub>7</sub>	X <sub>8</sub>	X <sub>9</sub>	X <sub>10</sub>	Υ	Z	Mean	SD
X <sub>1</sub> Concentrated disadvantage <sup>a</sup>	.12 **	.13 **	09 **	.04 **	.07 *	20 **	06	.45 **	30	.48 **	.24 **	0.00	1.00
X <sub>2</sub> Percent units vacant		.09 **	06	.00	.03	01	.10 **	.08 *	08 *	.30 **	.24 **	6.67	8.09
X <sub>3</sub> Percent male 15-29 yrs. of age			.00	.11 **	09 **	.06	04	.11 **	23 **	.07 *	.03	10.79	5.35
X <sub>4</sub> Population change <sup>D</sup>				06	10 **	.02	.05	15 **	.09 **	23 **	24 **	1.42	2.88
X <sub>5</sub> Monetary aggravators					.02	.09 **	.07 *	.04	04	.20 **	.22 **	0.51	0.30
X <sub>6</sub> Alcohol density						03	.06	.03	19 **	.41 **	.44 **	3.41	10.07
X <sub>7</sub> Welfare generosity							02	.05	09 **	09 *	08 *	4777.28	9197.33
X <sub>8</sub> Church membership rate								.04	.04	06	14 *	35.09	45.50
X <sub>9</sub> Latino culture									17 **	10 *	09 *	15.56	10.36
X <sub>10</sub> Voter turnout rate										15 **	10 *	426.79	555.23
Y Violent crime rate <sup>b</sup>											.53 **	1.70	0.78
Z Property crime rate <sup>b</sup>												3.94	1.23
a Weighted factor score													
b Natural log													
* <u>p</u> < .05													
** <u>p</u> < .01													

concentrated disadvantage, percent units vacant, population change, monetary aggravators, and church membership rate. Concentrated disadvantage was positively associated with monetary aggravators and alcohol density but negatively associated with welfare generosity, church membership rate, and voter turnout rate. The observed relationship for Latino culture showed that higher levels of Spanish-speaking communities were disadvantaged with low voter turnout rates. Overall, results indicated that multicollinearity was not a problem; Pearson correlation values did not exceed .70.

Multivariate OLS Regression Results – Property Crime Rate

When using small aggregates, Land, McCall, and Cohen (1990) argued researchers need to carefully control for model specification and multicollinearity. The large number of units of analysis (i.e., 1,016 census BGs) created a large sample of aggregates, which in turn allowed more macro-level predictors to be modeled (Wooldredge, 2002). As a result, a total of 9 models were estimated. Models 1 through 3 were additive, whereas 4 through 9 were multiplicative. According to Chamlin and Cochran (1995), additive models have little bearing on the evaluation of institutional anomie theory due to its moderating principles. Instead, such an approach "serves as a baseline for the determination of the contribution of the joint influence [interaction] of economic conditions and measures of noneconomic institutions on crime" (Chamlin and Cochran, 1995:421). The potential for collinearity was investigated further using OLS regression diagnostics. Results (not shown) provided additional support that multicollinearity was not a problem. None of the Variance Inflation Factors (VIF) exceeded 4.0.

Table 2 presents OLS regression models for property crime rate. Model 1 examined whether social disorganization positively affected property crime rate. Consistent with the social disorganization hypotheses, concentrated disadvantage (.20) and percent units vacant (.20) were significantly and positively associated with the outcome; population change (-.21) showed a significant inverse relationship. Model 1 accounted for 14 percent of the explained variation. In Model 2, two economic institutional variables were included in the equation. The logic was that an increase in unconventional institutions may directly influence crime and further undermine levels of social control. The findings indicated that alcohol density (.43), concentrated disadvantage (.22), monetary aggravators (.20), percent units vacant (.19), and a decrease in population (-.16) increased property crime rates across BGs. The significant and positive association for alcohol density and monetary aggravators support the economic institutional hypotheses. The explained variation for Model 2 (36%) was more than double the explained variation in Model 1 (14%).

Model 3 examined whether an increase in norm inducing noneconomic institutions: (a) were negatively associated with property crime and (b) influenced the impact of social disorganization and economic institutional conditions on the outcome. Welfare generosity (-.09), church membership rate (-.07), and Latino culture (-.09) were significantly and negatively associated with property crime. While voter turnout rate (-.02) failed to achieve statistical significance, its hypothesized association was confirmed. Next, the social disorganization and economic institutional predictors were assessed to detect attenuation in the model. For example, the coefficient for concentrated disadvantage was reduced from .22 in Model 2 to .12 in Model 3. Moreover, with the exception of alcohol density, a slight reduction was observed across the social disorganization and economic coefficients. While the findings suggest theoretically that various supportive and convention inducing institutions may help relieve resource deficient communities in ways that reduce crime, interpretation of the results from a purely statistical perspective remains inconclusive since such decline in magnitude of coefficients was not investigated statistically. Nonetheless, the noneconomic institutional hypotheses were partially supported.

In Models 4-9, estimating procedures allowed the researchers to integrate both theoretical approaches by examining whether: (a) interactions between concentrated disadvantage and other crime prone economic institutional predictors were positively associated with property crime, and (b) the influence of concentrated disadvantage on the outcome was moderated by noneconomic institutions. One of the central debates among institutional anomie theorists (e.g., Maume and Lee, 2003:1155) is how to best measure economic institutions in a way that captures the institutional balance of power.<sup>10</sup> Researchers have remained committed to using variables such as poverty (a deprivation measure) and Gini coefficient (an inequality measure) to reflect the economy (Chamlin and Cochran, 1995; Maume and Lee, 2003; Savolainen, 2000).11 In doing so, scholars regularly calculate an interaction term that includes poverty/Gini and some other noneconomic institution. Rather than rely on a single measure that captures absolute poverty or its inequality continuum equivalent, the current research used concentrated disadvantage rooted in the social disorganization tradition. Justification for this approach is that (1) concentrated disadvantage is

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Variable	β	β	В	β	β	β	β	β	β
Concentrated disadvantage <sup>a</sup>	.20 ***	.22 ***	.12 ***	.13 ***	.15 ***	.15 ***	.12 ***	.18 ***	.13 **
	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)
	[.07]	[.07]	[.04]	[.05]	[.05]	[.05]	[.04]	[.07]	[.05]
Percent units vacant	.20 ***	.19 ***	.18 ***	.18 ***	.17 ***	.18 ***	.18 ***	.18 ***	.18 **
	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
	[.01]	[.01]	[.01]	[.01]	[.01]	[.01]	[.01]	[.01]	[.01]
Percent male 15-29 yrs. of age	01	.01	.00	.00	.02	01	.00	01	.00
	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
	[00]	[.00]	[.00]	[.00]	[.00]	[.00]	[.00]	[00]	[.00]
Population change <sup>b</sup>	21 ***	16 ***	15 ***	15 ***	14 ***	15 ***	15 ***	15 ***	15 **
	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
	[02]	[01]	[01]	[01]	[01]	[01]	[01]	[01]	[01]
Monetary aggravators	_	.20 ***	.18 ***	.19 ***	.17 ***	.18 ***	.18 ***	.18 ***	.18 **
		(.03)	(.03)	(.03)	(.03)	(.03)	(.03)	(.03)	(.03) **
		[.23]	[.21]	[.21]	[.20]	[.21]	[.21]	[.21]	[.21]
Alcohol density	_	.43 ***	.44 ***	.43 ***	.45 ***	.43 ***	.41 ***	.43 ***	.43 **
		(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
		[.00]	[.00]	[.00]	[.01]	[.00]	[.00]	[.00]	[.00]
Welfare generosity	_	_	09 *	09 *	09 *	10 *	09 *	09 *	09 *
			(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
			[.00]	[.00]	[.00]	[.00]	[.00]	[.00]	[.00]
Church membership rate	_	_	07 *	07 *	07 *	07 *	08 *	08 *	08 *
			(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
			[.00]	[.00]	[.00]	[.00]	[.00]	[.00]	[.00]
Latino culture	_	_	09 *	09 *	04	09 *	09 *	10 *	10 *
			(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
			[.00]	[.00]	[.01]	[.00]	[.00]	[.01]	[.00]
Voter turnout rate	_	_	02	02	04	02	02	01	04
			(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
			[.00]	[.00]	[.00]	[.00]	[.00]	[.00]	[.00]
Monetary aggravators * Con dis.	_	_	_	.10 *	_	_	_	_	_
				(.03)					
				[.11]					
Alcohol density * Con dis.	_	_	_	_	.19 ***	_	_	_	_
					(.00)				
					[00.]				
Welfare generosity * Con dis.	_	_	_	_	_	11 *	_	_	_
						(00.)			
Church membership * C						[.00]	00 *		
Church membership rate * Con dis	_	_	_	_	_	_	09 * (.00)	_	_
							(.00) [.00]		
Latino culturo * Con dis							[.00]	04	
Latino culture * Con dis.	_	_	_	_	_	_	_	04 (.00)	_
								(.00) [01]	
Voter turnout rate * Con dis.	_	_						[]	05
voter turnout rate Con uis.	_	_	_	_	_	_	_	_	(.00)
									[.00]
									[.00]
Constant	3.163 ***	3.126 ***	3.107 ***	3.111 ***	3.112 ***	3.108 ***	3.104 ***	3.102 ***	3.107 **
F-Statistic		95.56 ***							
R <sup>2</sup>	.14	.36	.38	.38	.41	.38	.38	.38	.38
<sup>a</sup> Weighted factor score									

considered a resource disadvantage measure that reflects an assortment of community factors (Land et al., 1990; Sampson and Jeglum-Bartusch, 1998), and (2) we seek to integrate two theoretical perspectives. We are unaware of existing studies that model concentrated disadvantage as an interaction term.

To avoid problems with multicollinearity, interaction terms were centered (Jaccard, Turrisi, and Wan, 1990). This practice is consistent with much of the institutional anomie research (e.g., Maume and Lee, 2003; Savolainen, 2000). The observed main effects across Models 4-9 showed little change, further suggesting no problems with multicollinearity. Model 4 specified an interaction term between monetary aggravators and concentrated disadvantage. This interaction term was significantly and positively associated (.06) with the outcome. Unsurprisingly, Model 5 indicated that the interaction between alcohol density and concentrated disadvantage was significant and positively associated (.19) with property crime rate. Thus far, BGs characterized by a combination of concentrated resource disadvantage, pawn shops/music CD-exchange stores, and alcohol density were directly associated with the outcome.

Models 6-9 estimated interaction terms among the noneconomic institutional characteristics (welfare generosity, church membership rate, Latino culture, voter turnout rate) and concentrated disadvantage. The findings showed that rates of property crime were significantly and inversely associated with BGs with higher levels of Section 8 welfare housing vouchers and church membership rate. While interaction terms for Latino culture (-.04) and voter turnout rate (-.05) failed to achieve significance, their hypothesized directional relationships were supported. Overall, two of the four noneconomic institutional interaction terms revealed evidence of moderating influences. In terms of explained variation,  $R^2$  for the multiplicative models were 38 percent and 41 percent respectively.

Multivariate OLS Regression Results – Violent Crime Rate

Table 3 presents OLS regression models for violent crime rate. Similar to the results in Table 2, many of the specified hypotheses were supported, with three of the four social disorganization predictors significantly associated with violent crime. Concentrated disadvantage yielded a much stronger positive (.44) correlation for violent crime, when compared to property crime in Table 2. The explained variation was a healthy 32 percent. In Model 2, monetary aggravators and alcohol density results also

mirrored those from Table 2. However, the coefficient for monetary aggravators (.16) in the violent crime model was weaker, when compared to the same model (.20) in the previous table. Perhaps pawnshops and music CD-exchange stores were positively associated more with property than violent crime. Nonetheless, the economic institutional hypotheses were confirmed to be positively associated with the outcome. More interestingly, Model 2 showed more than half (52%) of the variation in violent crime rate was explained.

When noneconomic institutional variables were entered in Model 3, welfare generosity (-.07), Latino culture (-.10), and voter turnout rate (-.08) were significant and negatively associated with violent crime. These findings are slightly different when compared to property crime Model 3 in Table 2. For example, church membership rate was unrelated to violent crime, but significantly and inversely associated to property crime. Furthermore, voter turnout rate was significant and inversely related to violent crime, but unrelated to property crime. Two possible explanations for such discrepancies were that some scholars posit violent crime should not be linked to dimensions of religion because of the impulsive and emotional nature of such crimes (Bainbridge, 1989; Stark, 1987); and communities characterized by higher levels of voters are less likely to tolerate violence, thereby taking an active and more collective role in expressing disapproval (Messner et al., 2004). After controlling for the noneconomic institutions, the observed coefficient for concentrated disadvantage (.40) showed a slight reduction. Model 3 partially supported the hypotheses for the noneconomic variables, explaining 54 percent of the variation in violent crime rate.

In Models 4-9 for violent crime, a different pattern of results emerged when compared to models for property crime in Table 2. Despite their directional accuracy, Models 4 and 7 indicated that a combination of monetary aggravators and concentrated disadvantage (.05) and church membership and concentrated disadvantage (-.09) were unrelated to violent crime. In Models 8 and 9, the combination of Latino culture and concentrated disadvantage (-.12) and voter turnout rate and concentrated disadvantage (-.10) were significant and negatively associated with violent crime; but in Table 2 these interaction terms were unrelated. In essence, BGs characterized by concentrated disadvantage and alcohol density experienced more violent crime; less violent crime was observed in BGs characterized by concentrated disadvantage, welfare generosity, households that speak Spanish and have difficulty with English, and higher voter turnout. The mixed results seen for Latino culture might suggest Latino

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Variable	β	β	В	β	β	β	β	β	β
Concentrated disadvantage <sup>a</sup>	.44 ***	.45 ***	.40 ***	.36 ***	.36 ***	.38 ***	.35 ***	.42 ***	.41 **
	-(.01)	(.00)	-(.01)	-(.01)	-(.01)	-(.01)	-(.01)	-(.01)	-(.01)
	[.13]	[.14]	[.10]	[.11]	[.11]	[.11]	[.11]	[.13]	[.12]
Percent units vacant	.23 ***	.22 ***	.21 ***	.21 ***	.20 ***	.21 ***	.20 ***	.20 ***	.21 **
	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
	[.01]	[.01]	[.01]	[.01]	[.01]	[.01]	[.01]	[.01]	[.01]
Percent male 15-29 yrs. of age	01	.01 (.00)	.00	.00	.01	.00	.01 (.00)	01 (.00)	01 (.00)
	(.00) [.00]	[.00]	[.00]	[.00]	(.00.) [.00.]	[.00]	[.00]	[.00]	[.00]
Population change <sup>b</sup>	18 ***	13 ***	11 ***	11 ***	11 ***	11 ***	11 ***	11 ***	12 **
r opulation change	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
	[01]	[01]	[01]	[01]	[01]	[01]	[01]	[01]	[01]
Monetary aggravators	_	.16 ***	.15 ***	.15 ***	.14 ***	.14 ***	.15 ***	.15	.15 **
		-(.02)	-(.02)	-(.02)	-(.02)	-(.02)	-(.02)	-(.02)	-(.02)
		[.16]	[.14]	[.15]	[.14]	[.14]	[.15]	[.15]	[.15]
Alcohol density	-	.42 ***	.45 ***	.44 ***	.45 ***	.44 ***	.40 ***	.44 ***	.42 **
		(00.)	(.00)	(.00.)	(.00)	(00.)	(.00.)	(.00)	(.00)
W 16 5		[.00]	[.00]	[.00]	[.01]	[.00]	[.00]	[.01]	[.01]
Welfare generosity	_	_	07 *	07 *	07 *	08 * (.00)	07 *	07 *	07 ** (.00)
			(.00) [.00]	(.00) [.00]	(.00) [.00]	[.00]	(.00) [.00]	(.00) [.00]	[.00]
Church membership rate	_	_	05	05	05	05	05	05	05
			(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
			[.00]	[.00]	[.00]	[.00]	[.00]	[.00]	[.00]
Latino culture	_	_	10 *	09 *	09 *	10 *	09 *	.11 *	10 *
			(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
			[.00]	[.00]	[.01]	[.00]	[.00]	[.01]	[.00]
Voter turnout rate	_	_	08 *	07 *	07 *	07 *	08 *	07 *	09 *
			(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
			[.00]	[.00]	[.00]	[.00]	[.00]	[.00]	[.00]
Monetary aggravators * Con dis.	_	_	_	.05				_	_
				-(.02) [.05]					
Alcohol density * Con dis.	_	_	_	_	.16 ***			_	_
Autonor density Con dist					(.00)				
					[.00]				
Welfare generosity * Con dis.	_	_	_	_	_	09 *		_	_
						(.00)			
						[.00]			
Church membership rate * Con dis	_	_	_	_	_	_	03	_	_
							(.00.)		
Latina cultura * C:-							[.00]	12 *	
Latino culture * Con dis.	_	_	_	_	_	_	_	12 * (.00)	_
								[01]	
Voter turnout rate * Con dis.	_	_	_	_	_	_	_	_	10 *
									(.00)
									[.00]
Constant		1.356 ***							
F-Statistic R <sup>2</sup>	.32	181.2 *** .52	.54	.54	.55	.54	.54	.55	.55
IX.	.34	.5∠	.54	.54	.JJ	.J <del>-1</del>	.54		.55
<sup>a</sup> Weighted factor score									
<sup>b</sup> Natural log.									

Spanish speaking households reflect immigrant communities that are capable of warding off violent crime, but not property crime. In fact, San Antonio ranks second behind San Diego with the lowest violent crime rate in the U.S. Thus, there is much more to be said and measured about the Latino experience, other than traditional measures such as ethnicity and race (Sampson et al., 2005). Overall, these findings suggest some moderating influence and partially support the directional accuracy of the interaction term hypotheses. The explained variation for Models 4-9 were 54 percent and 55 percent.

## Multivariate OLS Regression Results – Summary

In summary, OLS regression results showed five general patterns of findings. First, social disorganization determinants, especially concentrated disadvantage, behaved consistent with previous research. monetary aggravators and alcohol density appeared to make community matters worse by intensifying violent crime more than property crime. Third, noneconomic institutional characteristics seem to adequately relieve the adverse social disorganization and economic institutional influences on crime. Fourth, the interactions between concentrated disadvantage and several of the economic and noneconomic variables produced a mixed set of findings. Interactions between alcohol density and concentrated disadvantage, however, were significant and positively associated with both outcomes; interactions between welfare generosity and concentrated disadvantage were also significant and negatively associated with both outcomes. Fifth, the models revealed moderate to strong explained variation. Overall, the empirical evidence provides some merit to the proposed theoretical integration of social disorganization and institutional anomie, warranting further research.12

#### **Discussion and Conclusion**

The current study incorporated the theories of social disorganization and institutional anomie. The former was employed to tackle the demographic structure; the latter was enlisted to capture various types of institutions. Taking this approach remains attentive to the wide range of positive and negative community forces associated with crime and explores the conditional nature of crime. For example, the estimated interaction terms allowed the integration of both theories while testing whether substantive connections existed at the census block group level. Based on the findings, both theories can be viewed as supplementary in order to provide a more refined

picture that explains crime. The findings extend the understanding of these theories when conceptualized on a community continuum. At one end, more traditional demographic structures exist; at the opposite end, economic and noneconomic institutions are present. As researchers begin to identify and operationalize demographic and institutional forces more likely to be associated with crime, they can begin to assess the interdependent nature of these ecological characteristics. This process adds to the theoretical viability and utility of each.

The Latino culture findings showed a significant negative association for property and violent crime; but the concentrated disadvantage-Latino culture interaction term suggested a tolerance for property crime and not violent crime. These mixed results add to an ongoing debate whether the Latino experience, in its various forms, impedes or improves community crime. Researchers have posited two divergent perspectives. Sampson et al. (1997:920) reported that higher rates of immigration undermine the capacity of residents to realize common values and to achieve informal social control due to ethnic and linguistic heterogeneity in Chicago (see also Flippen, 2001:301). However, in a more recent study, Sampson et al. (2005) found that lower rates of violence among Latinos, compared to Whites and Blacks, were explained by immigrant concentration.

Martinez's (2002) work also cast doubt on the hypothesis that immigration is associated with crime. Immigration may affect poor Latino neighborhoods positively by helping revitalize areas, strengthening traditional social controls, and creating new community institutions (Elliot and Sims, 2001:344; Buriel et al., 1982), which in turn reduce the likelihood of crime. Scribner (1996) posits that immigrants are generally found to do as well and sometimes better than American citizens. Hagan and Palloni (1999:631) argue future research should focus on the culture and religion of Mexican communities in a manner that emphasizes "ways to preserve, protect, and promote the social and cultural capital that Mexican immigrants bring to their experience in the United States." This research sought to study the Latino experience with the goal of bringing Latinos to the criminological forefront and, in the process, move beyond the White/Black urban crime focus.

The implications of these findings are persuasive enough for rethinking how city officials should plan, implement, and coordinate economic and noneconomic development activities. On one hand, this study identified types of criminogenic economic institutions that officials might regulate more closely. For example, the fact that monetary aggravators and alcohol density were positively

associated with violent and property crime signals the need for regulation of such institutions through zoning. On the other hand, the study also identified noneconomic crime stabilizing mechanisms of social control in which officials might further invest or re-invest. Zoning and land use decisions are likely to have salient consequences (Bursik and Grasmick, 1993:53-55). Land use variables have been found to be an important correlate of crime (e.g., Peterson et al., 2000; Smith, Frazee, and Davison, 2000). By zoning, the goal is to improve the economic, social, cultural, and political efficacy among residents for the purpose of establishing community normative order. According to Kubrin and Weitzer (2003a:385), it "is axiomatic that the priorities and decisions of municipal government officials and business interest can have major effects on a neighborhood's quality of life and that neighborhoods vary in their capacity to secure valued city services, but we are only beginning to understand how this influences crime." Few studies have examined how external political decision making influences crime (Stark, 1987; Stucky, 2003; Velez, 2001; Wilson, 1996).

With this said, however, there are three research limitations. The first limitation bears directly on the aforementioned policies. The cross sectional data preclude definitive statements about causal linkages between the independent measures and outcomes. For example, it is unclear whether crime attracts bars or vise versa. If crime is already present, zoning may not matter because bars are an extension of communities, not the cause. This analysis reinforces the notion that the community-crime path is far from unidirectional and suggests that a complex relationship exists. To better isolate causality, future studies may seek to utilize cross sectional data yet employ more sophisticated LISREL simultaneous equation strategies that specify recursive and nonrecursive models (Markowitz et al., 2001; see also Bellair, 2000). The second shortcoming was that the researchers were unable to measure key social disorganization mechanisms of social control, such as collective efficacy. Third, as mentioned earlier, we were unable to determine whether the reduction in magnitude of social disorganization and economic institutional coefficients in Models 3 for property and violent crime rate were statistically significant; which in turn, rendered the evidence inconclusive that mediation exists. Despite these drawbacks, this research has answered the call of previous scholarship (e.g., Morenoff et al., 2001) suggesting that future ecological studies examine more objective institutional measures similar to those used by Peterson et al. (2000). In so doing, we are optimistic that the greatest prospect for these ecological perspectives is their role and utility toward theoretical integration.

#### **Endnotes**

- The authors thank Richard Rosenfeld and anonymous reviewers for their helpful comments and suggestions
- 2. There is debate regarding the extent to which institutional anomie applies to violent or property crimes, or both.
- 3. Justification for this census item is that it "incorporates the level of English-language interaction for an entire household and subsumes important components of contextual census variables such as nativity and length of time in country" (Finch et al., 2000:429).
- They argue that it is inappropriate to focus exclusively on the direct relationship between economic and noneconomic structures and crime.
- 5. They also found that the economy (i.e., Gini coefficient of family inequality) was positively and significantly related to various homicide outcomes. Second, noneconomic familial divorce rate was positively and significantly related with homicide; voter turnout, civically engaged adherents, and welfare expenditure were negatively and significantly associated with homicides. In general, voter turnout was responsible for significantly attenuating the effect of economy on homicides. Magnitudes of the coefficients were largest for familial divorce rate, followed by voter turnout, civically engaged adherents, and welfare expenditure.
- 6. Population change represents the absolute increase or decrease in actual population. The variable can range from negative to positive infinity. The natural log can only be computed for positive integers. To account for this, computing the natural log of the absolute value normalized the variable. Once computed, the direction of the natural log value was changed to negative where a population decrease was experienced.
- 7. While "direct measures of the extent to which noneconomic institutions provide alternative definitions of self-worth that could serve as countervailing forces against the anomie produced by the unbridled pursuit of the American Dream are not available," the presumption here is that "certain structural arrangements [e.g., church membership] are more likely than others [e.g., pawn-shops/music CD-exchange stores] to promulgate non-materialistic values" (Chamlin and Cochran, 1995:417).

- 8. Prior research has estimated various aspects of the Latino culture as an intervening and moderating variable (Cuellar, Arnold, and Maldonado, 1995; Rogler et al., 1991:590).
- 9. The spatial weight matrix was based on rook contiguity. Rook is defined as two neighbors (e.g., census block groups) sharing a common boundary at the edge. Only those cells having a rook's contiguous relation were assigned a value of 1.
- 10. "For example, using macro-level data, how does one measure the dominance of the economy in the institutional balance of power, the effectiveness of noneconomic institutional controls, or anomie?" (Chamlin and Cochran, 1995:415).
- 11. Cochran et al. (1995) estimated poverty in their primary models, but also substituted poverty with the Gini coefficient to determine differential effects. The outcome yielded similar results. In contrast, Maume and Lee (2003) estimated the Gini coefficient in their original model, but then substituted the Gini coefficient with poverty. Maume and Lee (2003:1154) also reported that the results were "identical to the ones [with the Gini coefficient]." The lack of variation in results is perhaps due to the fact that such concepts are theoretically distinct, but may share similar qualities when operationalized.
- 12. As one reviewer suggested, results should be interpreted with caution since concentrated disadvantage: (1) includes outputs of the economy (poverty and unemployment) as well as family structure (female-headed households with children) and (2) incorporates Latino population which makes interpretation of the net effect of Latino culture less precise.

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Variable	+/-	Operational definition
Violent crime rate		Three year (2001-2003) average of homicide, rape, robbery, and assault (simple and aggravated) in each BG per 1,000 population. Natural logs were computed to normalize the distribution.
Property crime rate		Three year (2001-2003) average of serious property crime (auto theft, residential burglary, and vehicular burglary) in each BG per 1,000 population. Natural logs were computed to normalize the distribution.
Concentrated disadvantage	+	Weighted factor regression score that included the following 2000 Census items: percent poverty, percent unemployment, percent female-headed household with children, percent Latino, and to a lesser extent, percent Black.
Percent units vacant	+	Percent BG housing units vacant.
Percent males 15-29 years c	+	Percent BG population males between ages 15-29.
Population change	-	Natural logged 2000 BG population subtracted from 1990 BG population.
Monetary aggravators	+	<ul> <li>1 = One or more pawnshop or music CD-exchange store establishment in BG.</li> <li>0 = No pawnshop or music CD-exchange store establishment in BG.</li> </ul>
Alcohol density	+	Number of on-site (in-house) consumption alcohol establishments (e.g., bars, taverns, pubs, restaurants) in each BG per 1,000 population.
Welfare generosity	-	Total Section 8 housing dollar voucher amounts per unit in BG.
Church membership rate	-	Number of registered church members in each BG per 1,000 population.
Latino culture	-	Percent BG households linguistically isolated. The census defines "linguistically isolated" household as those in which no person 14 years old and over speaks only English and no person 14 years old and over who speaks a language other than English speaks English "Very well".
Voter turnout rate	_	Number of participated voters in each BG per 1,000 population.