

IMPLEMENTATION AND EFFECTS  
OF GRADUATED SANCTIONS FOR JUVENILE OFFENDERS

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## ABSTRACT

Valerie Cooley: Implementation and Effects  
of Graduated Sanctions for Juvenile Offenders  
(Under the guidance of Dennis K. Orthner, Ph.D.)

Graduated sanctions are a key feature of state juvenile justice policy. Federal funding to states is contingent upon use of graduated sanctions for juveniles. Every state has adopted aspects of graduated sanctions models, yet limited information exists regarding the implementation or effectiveness of graduated sanctions as a policy intervention. Nationally, approximately 90% of delinquent youth are supervised within their local communities, so a system of graduated sanctions depends upon local efforts to develop and sustain community-based sanctions.

North Carolina is one of many states that enacted juvenile justice reforms based upon a graduated sanctions model. Using data from 93 counties, this study examined the implementation of community-based sanctions and the effects of sanctions continuums on county-level juvenile crime rates and custody rates. The implementation analysis showed implementation variability. Most counties did not implement a full continuum of sanctions as idealized by the state model. Counties with fewer financial resources had lower implementation levels, but regression analysis revealed that political factors had the greatest effect on implementation.

Counties were classified according to the overall level of sanctions. A county-level longitudinal database was then constructed using data from 1990 to 2006 to include years before and after reform was enacted. Variability in local sanctions continuums was used to

examine the effects of community-based sanctions on policy outcomes. Selection effects were controlled using fixed effects models and propensity score matching.

Greater availability of sanctions in local communities reduced juvenile crime. Community-based residential services had the strongest effect, reducing the crime rate by 7 youth per 1,000. Secure custody rates dropped by half following juvenile justice reform. Prior to reform, counties with fewer sanctions alternatives had higher custody rates despite lower crime rates.. Legislative mandates restricted the use of secure custody to the most serious offenders. The decrease in custody rates for low implementation counties following reform may represent a forced departure from the practice of using secure custody for lack of sanctions alternatives. Results of the study lend support to recent state policy efforts to strengthen community-based sanctions and create smaller, community-based residential programs in lieu of large secure facilities.

To the men in my life.

In memory of my Dad, whose love gave me the courage to believe I could do anything.

My husband, whose unconditional love gives me courage to admit I cannot do everything.

My sons, my little men, whose love and trust motivate me to choose what matters.

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TABLE OF CONTENTS

LIST OF TABLES.....viii

LIST OF FIGURES.....ix

ABBREVIATIONS.....x

Chapter

I. INTRODUCTION.....1

    Accountability in Juvenile Justice.....2

    Federal Support for Graduated Sanctions.....4

    References.....8

II. IMPLEMENTATION OF COMMUNITY-BASED SANCTIONS.....11

    Sanctions Policy in Juvenile Justice.....12

    Policy Implementation.....16

    Data and Model Specification.....22

    Methodology.....27

    Results.....29

    Discussion and Conclusions.....35

    References.....41

III. COMMUNITY-BASED SANCTIONS AND JUVENILE CRIME.....50

    Juvenile Crime and Sanctions for Delinquency.....51

    Evaluations of Graduated Sanctions.....55

    Research Questions and Design.....59

Data.....	60
Methodology.....	65
Results.....	68
Discussion and Policy Implications.....	72
References.....	77
IV. COMMUNITY-BASED SANCTIONS OR SECURE CUSTODY .....	90
Punishment for Juvenile Offenders.....	91
Federal and State Sanctions Policy.....	93
Alternative Explanations for Punishment.....	94
Research Design and Methodology.....	98
Results.....	105
Discussion and Policy Implications.....	111
References.....	118
V. SUMMARY AND CONCLUSIONS.....	130
Study Limitations.....	130
Lessons Learned and Policy Implications.....	133
References.....	138
APPENDICES.....	139

## LIST OF TABLES

### Table

2.1	Description of sanctions implementation by socioeconomic indicators.....	46
2.2	Sample descriptive statistics.....	47
2.3	OLS regression results predicting implementation score.....	48
2.4	Logistic regression results predicting availability of sanctions components.....	49
3.1	Description of county sanction continuums.....	83
3.2	Descriptive statistics before and after juvenile justice reform.....	84
3.3	Mean differences in counties by sanctions comprehensiveness in the pre-reform period.....	85
3.4	Regression analysis results predicting county-level juvenile crime rates.....	86
3.5	Estimated effects of individual sanctions components on county-level juvenile crime rates.....	87
4.1	Descriptive statistics by geographic region.....	123
4.2	Mean scores from pre-reform time period by implementation category.....	124
4.3	Logit model results for predicting selection into high implementation group..	125
4.4	Correlation coefficients for crime variables and variables associated with minority percent.....	126
4.5	Regression analysis predicting county-level secure custody rates.....	127



## LIST OF FIGURES

### Figure

3.1	National and state juvenile crime trends.....	89
4.1	National juvenile custody rate trends by race.....	128
4.2	Juvenile custody rate trends in North Carolina.....	129

## ABBREVIATIONS

FBI	Federal Bureau of Investigation
JCPC	Juvenile crime prevention council
NC DJJDP	North Carolina Department of Juvenile Justice and Delinquency Prevention
OJJDP	Office of Juvenile Justice and Delinquency Prevention

## CHAPTER 1

### INTRODUCTION

Historically, juvenile justice policy in the United States has reflected a debate between two seemingly contradictory strategies for addressing juvenile crime. Policy has alternately emphasized either punitive sanctions to deter crime or rehabilitative approaches to encourage behavioral change (Bernard, 1992). State legislation of juvenile justice policy during the 1990s was dominated by a punitive framework (Butts & Mears, 2001; Jensen & Howard, 1998), largely in response to rising juvenile crime rates. The shift was evident in more referrals for formal court processes compared to dismissals, increased use of secure custody, and an escalation in the use of determinate sentencing tools (Griffin, Torbet, & Szymanski, 1998). Determinate sentencing tools structure decision-making processes about sanctions for juveniles by providing guidelines or mandates, usually based upon offense severity and risk factors for recidivism, that govern the decision regarding punishment. Such schemes are intended to reduce bias in sentencing (Sarri et al., 2001), but they may also pose obstacles for individualized treatment of offenders, a key feature of the juvenile justice system historically. State adoption of determinate sentencing for juveniles reflects the practice of the adult system. Most prominently, the scope of laws that transfer youth from juvenile court to adult court expanded, subjecting them to formal criminal court proceedings (Griffin et al., 1998; Puzzanchera, 2003).

Despite the legislative policy shift toward punitive strategies in the 1990s, some researchers and juvenile justice professionals continued to argue for the appropriateness and effectiveness of a rehabilitative emphasis in juvenile justice. Scott and Grisso (1998) and others (Grisso & Schwartz, 2000; Steinberg & Haskins, 2008) have emphasized developmental differences between adults and juveniles in decision-making capacity, suggesting that the use of similar punitive policies is inappropriate. Intervention research has challenged the pervading belief that no interventions effectively reduce delinquency (Howell, 2003). Reviews of juvenile justice evaluations have identified many effective interventions based upon rehabilitative premises (Herrenkohl, Chung, & Catalano, 2004; Lipsey, 1999; Lipsey & Wilson, 1998; Loeber & Farrington, 1998). Meta-analyses of program evaluations have found that rehabilitative programs can effectively reduce juvenile crime, especially when multiple services are provided in a noninstitutional setting over an extended period of time (Lipsey, 1992; Lipsey & Wilson, 1993).

In addition, one study showed that public support for legislation emphasizing punitive approaches for juveniles was based upon misinformation and faulty assumptions (Schiraldi & Soler, 1998). A more recent study indicated that the general public favors rehabilitative as opposed to punitive strategies to address juvenile delinquency (Krisberg & Marchionne, 2007).

### Accountability in Juvenile Justice

In the midst of ongoing debate about the two seemingly contradictory goals of punishment and rehabilitation, a recent theoretical framework for juvenile justice known as balanced and restorative justice has emerged. Balanced and restorative justice offers the hope of reconciliation between punitive and rehabilitative efforts to address juvenile crime.

The framework emphasizes the notion of accountability as a central tenet in justice policy (Bazemore & Clinton, 1997; Bazemore, Umbreit, Klein, Maloney, & Pranis, 1997).

Accountability has been defined as the assurance of consequences for admitted or adjudicated offenses that prompts juveniles to take responsibility for the delinquent act (Griffin, 1999). Some critics argue that accountability has simply become a euphemism for a punitive model of juvenile justice (Howell, 2003). Proponents suggest, however, that it incorporates rehabilitative goals of competency development (Beyer, 2003; Matese, 1997) and reintegration with the community (Bazemore & Clinton, 1997; Bazemore et al., 1997) so that youth can become productive members of society. In practice, accountability may be manifested in punitive approaches that emphasize consequences, but theoretically the concept holds the promise of merging two contrasting philosophies of juvenile justice. Within the framework of accountability, the use of immediate consequences may serve to incapacitate offenders who pose a risk to safety, deter further crime, increase awareness of the effects of one's actions, and teach pro-social beliefs and skills (Griffin, 1999; Matese, 1997).

Accountability is the underlying concept in the appropriations act that initiated the Juvenile Accountability Incentive Block Grants program to provide federal funding to states utilizing graduated sanctions in juvenile justice (Omnibus Crime Control and Safe Schools Act, 1998). Federal legislation has adopted the language of accountability as a policy goal and as an intermediary step to facilitate reductions in juvenile crime (Consequences for Juvenile Offenders Act, 2002; Juvenile Crime Control Act, 1997; Twenty-first Century Justice Appropriations Act, 2002). A federal administrative strategy to address juvenile

crime emphasizes both accountability, associated with immediate consequences for delinquent acts, and rehabilitation (Wilson & Howell, 1993).

#### Federal Support for Graduated Sanctions

In 1998, the federal government provided 250 million dollars in block grants to states who adopted accountability-based programs as a part of the juvenile justice system (Parent & Barnett, 2003). Subsequent legislation continued to provide funding for states, though the allocation decreased in later years (Beyer, 2003). A central tenet of the block grant legislation was state use of graduated sanctions to increase accountability of juvenile offenders. Adoption of graduated sanctions was one of four federal requirements states had to meet to be eligible for funding. The legislation defined graduated sanctions as a systematic range of sanctions, available to an offender for every offense committed, in which sanctions become progressively more severe with each subsequent offense. Though the block grants could be used by states for a variety of funding priorities, almost three quarters of the funding was spent on developing or strengthening systems of graduated sanctions (Parent & Barnett, 2002).

Graduated sanctions were emphasized in another key piece of federal juvenile justice legislation. The Juvenile Justice and Delinquency Prevention Act of 2002 promoted the use of graduated sanctions as a strategy to reduce juvenile crime. Title II, governing juvenile justice programs, and Title V, for local delinquency prevention programs, of the Act allocated federal funds for state juvenile justice systems. These funding blocks provided the largest allocation of federal funding to state juvenile justice systems in recent years (L. Warner, personal communication, July 18, 2007). Overall federal spending on juvenile

justice has declined, so it is significant that the largest blocks of remaining federal funds specifically promote the use of graduated sanctions.

The federal administration endorsed graduated sanctions as a key feature of an effective crime reduction strategy referred to as the Comprehensive Strategy for serious, violent, and chronic offenders (Wilson & Howell, 1993). Subsequently, the *Guide for Implementing the Comprehensive Strategy* was developed to encourage and strengthen implementation efforts by states and local municipalities (Howell, 1995). Two key components provide the foundation of the Comprehensive Strategy. The first is a network of prevention and early intervention programs to prevent delinquency. The other is a system of graduated sanctions, including rehabilitative treatment services, in order to halt the progression of offending behavior.

The Office of Juvenile Justice and Delinquency Prevention (OJJDP) provided funding to three initial pilot sites in 1996 to implement graduated sanctions as a part of the Comprehensive Strategy (Coolbaugh & Hansel, 2000). Since that time, six states were selected as demonstration states and received intensive training and technical assistance for implementation (Matese & Tuell, 1998). The Juvenile Sanctions Center (2005) has also supported state and local adoption of graduated sanctions. Fifteen demonstration sites have implemented and evaluated systems of graduated sanctions in order to determine effective policies and practices. Several states have followed the blueprint of the Comprehensive Strategy in order to develop a continuum of graduated sanctions (Howell, 2003; Mondoro, Wight, & Tuell, 2001).

Systems of graduated sanctions have always been an aspect of the juvenile justice system, but in a somewhat rudimentary and unstructured format (Howell, 1995). Federal

funding did not initiate this trend, but the federal financial incentives and administrative initiatives seem to have strengthened and institutionalized a trend already begun by states. Initial applications for Juvenile Accountability Incentive Block Grants indicated that 77% of states already met the eligibility requirement for graduated sanctions. Those that did not meet the criterion submitted a detailed plan to indicate changes to bring the state juvenile justice system into compliance (Parent & Barnett, 2003). Every state has applied for and received funds from this program in every year it has continued (Development Services Group, 2002), indicating widespread adoption of graduated sanctions across states.

Federal legislative and administrative initiatives emphasize the use of graduated sanctions as a key strategy for addressing juvenile crime. Federal funding for juvenile justice promotes the utilization and every state has adopted some type of system of graduated sanctions. This strategy is the predominant and underlying model for juvenile justice policy development. Despite the prevalence, definitive conclusions about the effect of graduated sanctions as a systemic intervention have not been reached (Wiebush, 2002).

This evaluation seeks to contribute to the existing literature and inform ongoing policy development efforts by providing empirical evidence regarding the implementation and effects of graduated sanctions in one state. Using county-level data from North Carolina, the study examined the implementation of juvenile justice reform legislation that mandated the creation of county-based Juvenile Crime Prevention Councils (JCPCs) responsible for the development of community-based sanctions. Reports from 93 of 100 counties provided information about the available and partially available services in county-based sanctions continuums that span multiple program types and supervisory levels. Once counties were classified according to implementation level, information available to the public from the



North Carolina State Data Center was used to create a longitudinal database to examine the effects of community-based sanctions on both juvenile crime rates and juvenile custody rates.

The analysis was divided into three parts. Chapter 2 describes the implementation analysis using cross-sectional data from the time period following the passage of juvenile justice reform. In addition to the identification of county-level variability in community-based sanctions, the chapter also includes results of regression analysis used to predict differences in implementation. Chapter 3 reports the results of longitudinal analysis examining the effect of community-based sanctions on county-level juvenile crime rates while controlling for alternative explanations of crime. Chapter 4 provides the results of a similar evaluation examining effects on juvenile custody rates. Though both analyses utilized similar data for explanatory variables, different techniques were used to control for selection bias. Each chapter provides some discussion of the analytical findings, but the final chapter offers a summary of the three analyses with a discussion of both study limitations and policy implications.

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## CHAPTER 2

### IMPLEMENTATION OF COMMUNITY-BASED SANCTIONS

Since the mid-1990s, the federal government has financially and administratively supported state adoption and development of graduated sanctions for juvenile offenders. All states utilize graduated sanctions for juveniles, including a comprehensive array of community-based sanctions and services available for juvenile offenders who demonstrate various levels of risk and need. Only those juveniles with the most serious offenses, who pose the highest risk of re-offending, are sentenced to secure facilities typically managed by the state. Most juveniles are placed in their communities and are subject to mandated sanctions and services provided by local government and social service agencies. Local communities, therefore, have significant responsibility for developing and implementing graduated sanctions for juveniles.

This study evaluated the implementation of community-based sanctions in 93 North Carolina counties. State legislation mandated the development of local sanctions continuums for juvenile offenders. An implementation evaluation of a policy helps assess the degree of convergence between intended services, often outlined by the state, and actual service provision dependent upon local government. Attention to implementation also provides insight about variability across program sites and helps inform an impact evaluation (Rossi, Lipsey, & Freeman, 2004). Following a brief description of the federal policy context, this chapter describes juvenile justice reform efforts in North Carolina, focusing on the state-local partnership that supports the development of community-based sanctions. The purpose of

this study was to compare local implementation of sanctions with state-level legislative and administrative expectations regarding the law and to describe implementation variability across counties. Using Matland's (1995) ambiguity-conflict model of policy implementation as a framework, the evaluation also identified factors affecting implementation at the local level.

## Sanctions Policy in Juvenile Justice

### *Federal Support for Graduated Sanctions*

Legislatively, the federal government strengthened the state adoption and development of graduated sanctions for juveniles through financial incentives from the Juvenile Accountability Incentive Block Grant program (Omnibus Crime Control and Safe Schools Act, 1998; Parent & Barnett, 2003; Twenty-first Century Justice Appropriations Act, 2002). Administratively, the federal OJJDP endorsed the use of graduated sanctions as a key feature in an overall juvenile crime reduction strategy referred to as the Comprehensive Strategy for serious, chronic, and violent juveniles (Wilson & Howell, 1993). In federal legislative and administrative documents, graduated sanctions are described as an array of sanctions, available for every offense, that are sure, immediate, consistent, individualized, and community-based. Sanctions should escalate with subsequent and more serious offenses (Howell, 1995; Twenty-first Century Justice Appropriations Act, 2002).

All states have accessed federal funds and established some form of graduated sanctions systems (Parent & Barnett, 2003). Conceptual models of graduated sanctions emphasize a comprehensive array of sanctions across multiple levels of supervision as one key component (Howell, 1995; Wiebush, 2002). Several states have followed the blueprint of the Comprehensive Strategy in order to develop sanctions continuums (Coolbaugh &

Hansel, 2000; Howell, 2003; Matese & Tuell, 1998; Mondoro, Wight, & Tuell, 2001). State and local cooperation are important to ensure such comprehensiveness. In order to more carefully examine the role of local communities, it is helpful to focus on juvenile sanctions policy in one state.

#### *North Carolina's Juvenile Justice Reform Act of 1998*

Similar to efforts in many states, North Carolina passed comprehensive juvenile justice reform in the late 1990s (Juvenile Justice Reform Act, 1998; Mason, 1999). The newly created North Carolina Department of Juvenile Justice and Delinquency Prevention (NC DJJDP) assumed responsibility for several substantial changes that took effect in July of 1999. Guided in part by the Comprehensive Strategy (Howell, 1995) and a graduated sanctions model developed by the Juvenile Sanctions Center (Wiebush, 2002), North Carolina reforms contained three graduated sanctions policy components—a decision-making structure, information management, and a comprehensive array of services and sanctions. The implementation of the components relies on efforts by both the state and local government.

The new juvenile code included a disposition level matrix to guide the court in making disposition decisions about level of supervision based upon severity of current offense and risk of re-offending. The use of validated risk and needs assessment tools were introduced to gather information and support decisions about specific sanctions or services within a supervisory level. The assessments include questions about known risk factors for recidivism such as offense history, school behavior, peer involvement, substance use, and parental supervision. Needs assessments ask additional questions about mental health and family issues. The use of a dispositional grid and assessment tools are typical of sentencing

guidelines reforms in many states (Mears, 2002). The mechanisms aid consistency in sentencing statewide while providing the opportunity to individualize particular sanctions and services for youth. Though the information is gathered by court counselors employed by the NC DJJDP, actual sanctions decisions are made by district judges elected in non-partisan elections every four years.

The grid and the assessments underlie the decision-making component of graduated sanctions. The NC DJJDP also developed and manages a statewide information system on juvenile offenders to fulfill the second component of graduated sanctions policy. The third component involves the development and oversight of an array of community-based services and sanctions.

The Juvenile Justice Reform Act mandated the creation of local JCPCs in every county in North Carolina to assume responsibility for community-based sanctions. Legislation and subsequent administrative directives specified the composition of the council to include representatives from the juvenile courts, local law enforcement, human service providers, parents, and youth in each community (Juvenile Justice Reform Act of 1998; North Carolina Department of Juvenile Justice and Delinquency Prevention [NC DJJDP], 2006). Each council is expected to meet regularly, assess the needs of the youth in the county, identify gaps in services, and provide a continuum of community-based services and sanctions at the local level in each county. Council members receive aggregated information from the state about the risk levels and needs of youth in their particular county to help prioritize program needs and apply for available state funding. JCPC consultants employed directly by the state juvenile justice agency oversee the assessment and service planning process. Each consultant is responsible for specific counties within a geographic region.



The ideal continuum of sanctions and services spans multiple service program types and various supervisory levels for local youth. Some programs are available for all youth in the community and others are targeted to at-risk or court-involved youth. The funding sources for the programs are varied and may include state sources, private donations, and local school budgets. Program areas include restorative services, such as restitution and community service. Clinical and assessment services are provided by multiple private agencies to address mental health, substance abuse, and family therapy needs. Structured activities may include a wide range of programs such as volunteer or non-profit organizations like Boy Scouts and Girl Scouts, faith-based programs, mentoring, or sports activities. Community structured-day programs are typically either alternative schools or day reporting centers that provide supervision specifically for court-involved youth. Residential programs include a few NC DJJDP programs specifically for juvenile offenders and private programs that also serve youth referred by families or other state agencies.

The state is responsible for providing secure custody facilities for the highest level of supervision in the continuum of sanctions. In North Carolina, only 14% of adjudicated youth in the 2005-2006 fiscal year were confined to a secure facility at disposition. The majority of delinquent youth in the state, as is true nationally, are served by community-based sanctions. Youth in secure facilities are returned to the community at release, so community services are also needed for them. In order to receive any state funding for sanctions continuums through the NC DJJDP, the councils must document compliance with all state requirements in the form of an annual report. Local counties have significant administrative and fiscal responsibility for the development and implementation of community-based sanctions in the state juvenile justice system.

## Policy Implementation

### *Policy Implementation in Criminal and Juvenile Justice*

In the past, the federal government showed concern about implementation of justice policy following a large influx of money into criminal justice policy innovations in the 1970s (Ellickson & Petersilia, 1983). Disillusioned with seemingly ineffective innovations, policy makers wanted to examine ways to ensure successful implementation. Criminology scholars also recognized the importance of implementation to identify the actual workings of proposed programs and policies, produce information about challenges to policy reform, and to correctly interpret evaluation results (Krisberg, 1980). Since that time, scholars have examined implementation of law-enforcement strategies to address gangs (Winfrey, Lynskey & Maupin, 1999), hate crime legislation (Haider-Markel, 2002), drug policy in California (Percival, 2004), and major crime reduction legislation in England and Wales (Maguire, 2004). Multiple factors were identified that influence implementation of criminal justice legislation including political climate, conflicting policy goals, multi-actor collaboration, tractability of the problem, funding, staff training, organizational capacity, and timeframes.

Studies specific to the juvenile justice system have also focused on implementation. Holsinger and Latessa (1999) identified the levels in a state sanctions continuum and predictors of disposition decision-making. The Criminal Justice Policy Council (2001) in Texas evaluated the implementation of juvenile justice reform legislation and provided information on the number of probation departments utilizing the sanctions continuum as a guide to sentencing. These descriptive studies did not identify predictors of implementation. Evaluations of juvenile detention intake practices in Florida (Bazemore, 1993), intensive aftercare probation programs (Goodstein & Sontheimer, 1997), and violence prevention

programs (Goei, Meyer, & Roberto, 2003; Mihalic & Irwin, 2003) all indicated that implementation did not always occur as planned or expected. These studies demonstrated the wide range of factors that may influence implementation including multi-actor cooperation, leadership and staff capacity, ideological norms of the implementers, staff continuity, and community support.

Implementation evaluations may stand alone to help ensure the quality of programs and policies, but attention to implementation is also important as an adjunct to impact or outcome evaluations (Rossi et al., 2004). Without full implementation, it is impossible to make definitive decisions about policy effectiveness (Corbett & Lennon, 2003). A past study of an adolescent drug use intervention showed that levels of implementation affected youth outcomes (Pentz et al., 1990). More recently, Mears and Kelly (2002) found that recidivism outcomes for juveniles were more related to the implementation variability across sites than individual characteristics of the offenders. Burke and Pennell (2001) studied the implementation of the sanctions component of the Breaking Cycles program in San Diego and identified specific program components that contributed to its effectiveness. Criminologists have called for more attention to implementation in evaluations (Mears & Kelly, 2002). Lemley (2001) particularly recommended the use of a policy implementation framework in implementation studies.

#### *Literature on Policy Implementation*

Implementation evaluations of juvenile justice policy can make beneficial use of the broader literature on policy implementation. Policy scholars have reviewed the policy implementation literature of the last few decades and support the continued importance of implementation research (Matland, 1995; Palumbo & Calista, 1990; Saetren, 2005). An

unresolved disconnect between policy intentions and policy implementation remains, which may be increasingly important to understand given the policy shift to the states (O'Toole, 2000). The broader literature on governance (Lynn, Heinrich, & Hill, 2001) incorporates aspects of implementation research and is enlivening its study (Hill & Hupe, 2002). These reviews acknowledge the contribution of both "top-down" theories that emphasize characteristics of policy design and bureaucrat compliance and "bottom-up" theories that emphasize the important role of local discretion by policy implementers. Such acceptance, however, further adds to the excessive number of variables that have been found to influence policy implementation, making it difficult to study empirically.

Efforts at synthesis provide theoretical frameworks in which to analyze policy implementation by suggesting groupings of variables expected to influence implementation. Winter (1990) suggested examining variables associated with phases or levels of policy development which he describes as characteristics of the policy formation process, organizational and interorganizational behavior, street-level behavior, and the response of the policy target group as well as societal changes that may affect the target group. Goggin, Bowman, Lester, and O'Toole (1990) focused specifically on communication patterns between levels of government and organizational capacity that entails resources, degree of fragmentation, and training. The governance literature also supports the use of multilevel theoretical models that include characteristics of the broader environment, clients, the key intervention, organizational structures, and key leaders or managers (Heinrich, Hill, & Lynn, 2004).

Although these frameworks are helpful, challenges still arise in trying to incorporate so many different variables in an empirical analysis. Small sample sizes preclude the use of

every variable that may possibly affect implementation (O'Toole, 2000). Many policy scholars agree, however, that implementation research needs to move toward theory validation using empirical methods (Goggin et al., 1990; Heinrich et al., 2004; Saetren, 2005). The conflict-ambiguity model of policy implementation (Matland, 1995) narrows the range of possible influences by suggesting that certain variables are most important within specific policy contexts.

#### *The Ambiguity-Conflict Model of Policy Implementation*

Matland (1995) proposed a method for choosing which sets of variables are most applicable to specific policy situations based upon characteristics of ambiguity and conflict. Policy ambiguity relates to the clarity of either the policy goals or means for achieving the goal. Policy conflict characterizes the level of congruence among the various participants involved in policy implementation regarding both policy goals and means. Based upon these two characteristics, Matland proposed four classifications of policy situations. Different sets of variables are expected to influence implementation within each category. Low policy ambiguity and low conflict reflect an administrative implementation model, which is largely dependent upon available local resources including funding and staffing. Political implementation occurs in situations in which policy goals are clear, but the various actors prioritize contrasting goals or disagree about means for achieving them. Given the low ambiguity but high conflict in such situations, those with political power and leadership authority are likely to determine implementation outcomes. Experimental implementation typically occurs in situations with high policy ambiguity but low policy conflict. Such implementation is determined by the norms of local actors and available financial resources and usually results in high variability between sites. Finally, symbolic implementation

occurs with high policy ambiguity and conflict. Local coalition strength is expected to determine implementation outcomes.

The ambiguity-conflict model has been used to examine policy implementation in areas of welfare policy, old growth forest management, and concurrency planning in Florida growth management policies. The qualitative case study of forest management in Montana illustrated a political paradigm (Mortimer & McLeod, 2006). The authors characterized the policy situation as such because of the two clearly defined but contrasting goals of harvesting versus preservation of the forests. They examined administrative documents describing programs, court decisions, and administrative regulations and concluded that political strength had the greatest influence on implementation. Chapin's (2007) study of 66 local governments in Florida showed the extreme implementation variability expected in an experimental model of policy implementation. A generally supportive political climate suggested low conflict, and local discretion for determining level-of-service standards and timing of implementation aligned with a characteristic of high ambiguity. Using information from county websites, municipal reports, and interviews with planning department staff, Chapin found that local actors determined policy implementation. The welfare study is a cross-state comparison using 44 states as the units of analysis; its results do not support expected predictors of implementation, which the authors attribute to the lack of certain variables in the analysis (Jennings, Jr. & Ewart, 2000). The ambiguity-conflict model also provides a helpful framework to empirically examine implementation of community-based sanctions for juveniles.

### *Policy Implementation in North Carolina*

The relationship between the state and local implementers in North Carolina seems to align with Matland's (1995) administrative model of policy implementation. One central agency, the NC DJJDP, oversees the implementation of juvenile justice policy with clear legislative mandates and administrative policies that govern specific policy outputs as well as roles and responsibilities of those involved in implementation (Juvenile Justice Reform Act, 1998; Mason, 1999; NC DJJDP, 2006). Agency staff have shown a high compliance rate in all three components of graduated sanctions policy. In decision-making, for example, only 2% of youth involved in the state juvenile justice system in the years 2004-2005 were not assessed for risk of recidivism and needs.

The NC DJJDP also oversees the activities of the county-based JCPCs that are given the specific responsibility for ensuring a locally-based continuum of services and sanctions. In order for counties to obtain funding from the state, the local councils must comply with specific procedures regarding composition of the council, frequency of meetings, assessment process, and reporting documents (NC DJJDP, 2006). All councils filed the necessary reports and received funding from the state. Although council members are not necessarily employees of the state juvenile justice agency, consultants employed by the state oversee all council activities. Centralized authority, clear procedures, and high compliance within the North Carolina system suggest characteristics of low ambiguity as well as low policy conflict that constitute an administrative model of policy implementation (Matland, 1995). As such, it was expected that local resources would have the greatest effect on county-level implementation outputs. Since staffing patterns and training are related to funding, this analysis assessed the effect of local financial resources on implementation.

The state-local partnership in juvenile justice is organized such that local JCPCs have discretion to determine the most pressing needs of the county and adapt community sanctions accordingly. Such discretion adds an element of policy ambiguity that may result in more variability between counties, as expected in an experimental paradigm of policy implementation. In such a case, local resources would be expected to affect outcomes as similar to an administrative paradigm. In addition, however, the belief systems of staff members might also influence implementation outcomes in an experimental policy situation. Despite high compliance with NC DJJDP mandates, the local councils are comprised of varied actors from different agencies. Conflict may arise around the specific decisions regarding the programs that constitute the sanctions continuum. An element of conflict may reflect Matland's political model of implementation (1995), so it was important to consider political affiliation of leaders and the community in the analysis.

#### Data and Model Specification

Using cross-sectional county-level data from North Carolina, this study examined the variability of community-based sanctions continuums mandated by state juvenile justice reform. Overall implementation levels and specific sanctions components were described and compared to a state-level model for the sanctions continuum. The study also identified local factors that affected implementation, giving particular attention to local financial resources.

#### *Data and Sample*

Each of 100 counties in North Carolina has a JCPC that is required to conduct an assessment of available services within the county in a process entitled Continuum Building.<sup>1</sup>

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<sup>1</sup> Two counties share one JCPC, so there are only 99 JCPCs in the state. The council produces a report for each county it supervises, and this study used the county as the unit of analysis.



A JCPC consultant, employed by the NC DJJDP, oversees the assessment process in several counties within a given region. A standardized annual report is produced by each council as the final result of the assessment process. Assessment reports are available to the public and were obtained from the JCPC consultants. Assessment reports for the planning years 2006-2007 and 2007-2008, which represent the state of services at of the end of 2005 and 2006 respectively, constituted the basis of the administrative data used in the implementation analysis. These years were chosen due to the availability of data and to allow for a five-year period following the adoption of the Juvenile Justice Reform Act to give sufficient time for full implementation.

The annual report provides information on all services available for juvenile offenders in the county across multiple levels of supervision. In addition, each program is rated in regard to the availability and accessibility of services in the community. Appendix A contains an example report. This information was quantified to develop measures of implementation for use in data analysis. Of 100 counties in the state, 93 provided assessment reports. The remaining seven counties, from one of four geographic regions, did not provide reports despite repeated requests, due in part to a vacant JCPC consultant position. In general, the seven counties are smaller and less densely populated than the average county. The sample of 93 counties, therefore, has higher means for these variables than the full sample of 100 counties would have had if implementation data were available. The missing counties had a lower delinquency rate in 2004. Slight differences exist in other demographic characteristics. Appendix B lists the means for various socio-demographic variables for the sample, seven missing counties, and all counties in the state. Study findings should only be tentatively generalized to the entire state.

A database was developed with additional county-level demographic, economic, and political variables. All data are available to the public through the North Carolina State Data Center, which compiles information from various state and federal agencies.

### *Implementation Measures*

The key outcome variable is a measure of overall implementation of the continuum of services and sanctions expected in each county. Administrative data were converted into quantitative scores of implementation that reflect the comprehensiveness or completeness of the local continuum of sanctions. Administrative reports describe services in six different program categories across five levels of supervision for offenders. Two of the program types, assessment services and clinical services, were collapsed resulting in five program types which include structured activities, restorative services, clinical services, structured community day programs, and residential programs. The first level of supervision, prevention services for at-risk youth, is not considered in this analysis as the focus of the evaluation is graduated sanctions for juvenile offenders. In addition, the fourth level of supervision, secure confinement, is the responsibility of the state and is not considered in this analysis. The three remaining levels represent immediate sanctions, intermediate sanctions, and aftercare services provided upon release from residential facilities. Restorative services are not typically provided post-release, so the measurement of the completeness of the continuum is based upon fourteen components of the continuum that represent the expected five program types across three different levels of supervision excepting post-release restorative services.

An overall implementation measure was created based on the sum of scores that designate whether particular services are fully available, partially available, or not available

in the county. In addition, indicators of full availability of services are used for each of the five program types in order to assess variability in specific components of juvenile sanctions policy. The first column of Table 2.1 shows the descriptive statistics for the implementation measures.

### *Explanatory Variables and Statistical Model*

Based upon Matland's model of policy implementation (1995), the implementation outcome was regressed on variables representing local financial resources and additional control variables. All explanatory variables were for the year prior to the implementation year. Counties with fewer financial resources were expected to have lower implementation levels. Key explanatory variables included county revenue per capita, state funding designated for local sanctions continuums per youth, per capita income as an overall measure of county wealth, and population density to test whether rural counties have greater difficulty with implementation (Mears, 1998). Rural counties were assumed to have access to fewer financial and in-kind resources. Local school expenditures per pupil were used as a measure of local resources designated specifically for the youth population. Finally, the state assesses the economic strength of a county and determines the required percent match in funding that each county must provide to obtain state funding for JCPCs. The highest required match is 30% and indicates greater economic strength. The lowest required match is 10% and indicates the least amount of local resources. Indicators of the match requirement were included as measures of overall economic strength. Due to the lack of organizational level data about the JCPCs, this study will focus on the financial resources in each county. Other measures of local resources, such as staffing capacity and training levels, are assumed to correspond to available funding levels.

Other juvenile justice evaluations have found that the ideological positions of key leaders (Bazemore, 1993; Goodstein & Sontheimer, 1997; Terry-McElrath & McBride, 2004) and community support for interventions (Mihalic & Irwin, 2003) may affect implementation. Past studies of crime policy have shown that Republicans, as compared to Democrats, tend to favor more punitive policies such as secure custody (Smith, 2004; Yates & Fording, 2005). In order to control for the level of support from the community and juvenile justice leaders, the percent of registered voters who are Democratic and an indicator of whether or not the District Attorney is Democratic were included in the model. Counties with a Democratic majority of voters and a Democratic District Attorney may be more likely to support community-based sanctions and have higher implementation.

Bottom-up policy formation involves local implementers who exercise discretion and alter policy to fit local needs (Brodkin, 1990; Palumbo & Calista, 1990). In order to assess whether counties with higher levels of implementation are responding to the needs of local youth, the percentages of system-involved youth in each county with high and medium needs and high and medium risk of recidivism were included. The state provides this information to counties for deliberate consideration in developing the sanctions continuum. The delinquency rate was also included to see if implementation of sanctions is a response to crime. The percentage of the county population between 10 and 17 was included as counties with a smaller youth population may not be expected to have as many services targeted toward youth. Attitudes about crime and strategies for crime control sometimes vary based upon geographic region (Jacobs & Carmichael, 2001; Krisberg, Litsky, & Schwartz, 1984; Mears, 2006), so indicators for three of the four regions in the state were included in the analysis. Table 2.2 lists the descriptive statistics for all variables.

## Methodology

Descriptive analysis was used initially to examine means and standard deviations of implementation scores across all counties. Counties were then classified into categories of high and low resources based upon their position above or below the median score on three socioeconomic measures. In addition, groups were developed based upon the state designation for the mandated match for state funds to JCPCs. Population density was used separately to designate the counties as high or low density. Bivariate analysis provided an initial assessment of whether or not financial resources affected implementation of community-based sanctions. To assess differences in specific policy components, proportion tests were conducted to compare the groups in terms of full availability of specific services such as residential or clinical programs.

Several preliminary steps were taken to specify the ordinary least squares (OLS) regression models used to identify predictors of implementation level. Due to the likelihood of correlation within the groupings of explanatory variables, particularly the local resources measures of interest, initial analysis included Pearson correlations between explanatory variables and calculation of variability inflation factors (VIFs). Per capita income, in particular, showed strong correlations with local school expenditures ( $r = .63$ ) and population density ( $r = .70$ ). Though the VIF was not over 7, it was distinctly higher than the other variables which can suggest a problematic relationship between it and the other explanatory variables. Its inclusion in preliminary models also reduced the goodness of fit of the model while adding very little additional explanation for variability. It was not a statistically significant predictor of implementation. Various transformations of the variable did not improve the models. Various indices were developed to incorporate all the socioeconomic

variables into one measure, but they did not improve the models. In addition, though correlated, many of the socioeconomic variables measure different aspects of county resources. The state's designation of the proportional match expected from the counties for the JCPCs is based upon multiple economic indicators and can represent an overall measure of economic strength. The final analysis, therefore, excluded per capita income from the statistical models. Percent of youth with high and medium risk of recidivism and high and medium needs were also highly correlated ( $r = .6$ ), but did not have VIFs of concern. The inclusion of both variables did not negatively affect the model fit or statistical significance of either variable in the models. Given the direct mandate to use the information in planning, it seemed important to include both variables as controls.

The implementation data were gathered from two separate years. An indicator variable was used to control for the effect of a greater time lag on the data collected for the 2007-2008 implementation year. It was not statistically significant in any model, so for simplicity the estimated coefficient is not reported. The 93 counties in the sample are nested within 37 judicial districts, and autocorrelation likely exists between counties within one district. The cluster sizes vary, including some districts comprised of only one county. Clustered robust standard errors were used to adjust the correlation matrices in order to ensure accurate standard errors. Though multilevel models could also be used to address clustering effects, the relatively small number of clusters and the focus of the research guided the decision to use the more simple option of clustered robust standard errors. Robust standard errors also corrected heteroskedasticity. The groupings of variables were introduced into the regression in a stepwise fashion.

In addition to the OLS regression models used to examine predictors of the extent of implementation, logistic regression was also used to analyze effects on implementation of particular continuum components. The dichotomous indicators of full availability for each of the five different program types were used as the outcome variables in subsequent models. Control variables were the same. The lag variable and clustered robust standard errors were used as in the OLS models.

## Results

Descriptive analysis showed that counties did not implement the full continuum of community-based sanctions. Table 2.1 shows the mean scores on implementation measures for the full sample. The mean on a scale from 0, for no services at all, to 28, for full availability of all programs at all levels, was 18. Only one county had a perfect score with full implementation of all continuum components. No others had full availability of services across even one supervisory level. Variability did exist in the availability of services by program type. Restorative services, which most commonly include teen court and restitution, were the most available services as 75% of counties had sufficient services for all youth. Assessment reports indicated that most of the restorative programs were funded by the state, so the additional support may explain the prevalence of the programs. Only 16% of counties had full availability of residential programs.

### *Bivariate Analysis*

Table 2.1 shows the mean implementation scores for the total sample and according to groups classified according to financial resources and population density. In general, more densely populated counties and counties with greater financial resources had higher overall implementation scores, though the mean differences were not statistically significant. The

counties required to make only a 10% match of state funds, indicating fewer economic resources, had a lower mean implementation score than either of the other two groups.

The effects of population density or financial resources were not consistent when examining the availability of specific sanctions components. These comparisons are also shown in Table 2.1. Availability of structured activities did not vary much between counties. Most counties had multiple and diverse programs within this category, but the relatively low proportion of fully available services indicates they were insufficient for the needs of local youth or difficult to access. A smaller proportion of highly densely populated counties had full availability of restorative services as compared to the low density group. The small number of counties without restorative services and the small sample of high density counties may help explain the seeming contradiction. The few counties without full availability in the high population density group tended to have a high number of services in that program category, but they were not all fully available. More densely populated counties had greater availability of both clinical and residential services. The difference between population density groups in available residential programs was statistically significant. Similarly, the counties with higher financial resources also had significantly greater availability of residential programs. Such programs are the most costly component of the sanctions continuum, so variation in local financial resources may have the greatest impact on residential programs.

### *OLS Regression Results*

Table 2.3 shows the results for the first and subsequent regression models. A significance level of  $p < .10$  was included because of the small sample size and the reduction in degrees of freedom due to the clustered robust estimation. The initial model, using only



the financial resource variables to predict implementation level, indicated that only state funding for JCPCs had a statistically significant effect on implementation, but the effect was in the opposite direction than expected. The effect was not substantively large. The mean amount of JCPC funding per youth was 35 dollars with a standard deviation of 16. A 32 dollar per youth increase in funding, the difference between a county one standard deviation below and one above the mean, would decrease the implementation score by 1. The change in score represents the loss of a partially available program or decreased availability of a program that had been fully available. The indicator for counties with only a 10% match requirement was negative and significant at the  $p=.12$  level, giving weak support to the notion that counties with fewer resources have lower implementation levels. Population density had a positive effect on implementation at the  $p = .11$  level; a result indicating that less densely populated counties may have access to fewer resources. The F statistic was significant for the overall model, but only 11% of the variability was explained. The low  $R^2$  suggested that other factors were important to explain differences in implementation.

When the discretionary variables were introduced into the second model, as shown in Table 2.3, the model fit improved and additional variability was explained. Population density became a significant and positive predictor of implementation. Similar to results of the bivariate analysis, more densely populated counties had higher implementation levels. The effect of JCPC funding remained negative and significant with a slightly larger magnitude. The only discretionary variable that had an effect was the proportion of youth with high and medium risk of recidivism, but the sign was in the opposite direction of the expected relationship. As the proportion of youth at risk of recidivism increased, the level of implementation decreased, but the change in the youth population had to be large for a

substantive effect. A county with 20% more of the youth population at high or medium risk would have an estimated decrease of 1.2 points on the implementation score. A lack of services could conceivably contribute to increased risk factors, but the risk data are from the year prior to implementation. Other factors, especially unobservable influences such as attitudes about crime and crime control, could influence both. A punitive stance toward juvenile justice may favor the use of secure custody rather than community-based services, especially in an area with a high proportion of youth at high risk of recidivism.

The political variables had the biggest impact on implementation as seen in the third model of Table 2.3. The overall model fit improved and explained an additional 10% of variability. A Democratic District Attorney, a key leader in the local juvenile justice system, increased the implementation score by 3.5 points as compared to a Republican. This result reflected the findings of studies that have shown Republicans tend to take a more punitive stance toward crime and may not be as supportive of community-based sanctions. The relationship between JCPC funding and implementation level remained the same.

Finally, the last model in Table 2.3 included dummy indicators for geographic areas of the state. The variables served as controls for omitted or unobserved variables; attitudes about crime, for example, may differ by region (Mears, 2006; Terry-McElrath & McBride, 2004). Though none of the regional indicators had a significant effect on implementation, their inclusion explained an additional 20% of the variability in implementation score. In the full model, JCPC funding and proportion of youth with a high or medium risk of recidivism had negative and significant effects on implementation. Again, in order to see a substantive difference in implementation outcomes, the changes in population or funding would have to be large. Population density had a positive effect on overall implementation. More youth

with high and medium needs had a positive and significant effect on implementation, possibly reflecting the bottom-up argument that local implementers use discretion based upon local needs. Slightly more than a 30% change in the youth population would be necessary to see a 1 point change in the sanctions continuum. The effect of a Democratic District Attorney increased in magnitude. Counties with Democratic leadership in the local juvenile justice system had, on average, an increase of 4.5 in the implementation score compared to counties with a Republican District Attorney. Substantively, this reflects a difference of two fully available sanctions components such as clinical services and residential programs. .

### *Interaction Effects*

Some additional analyses explored the possibility of interaction effects on overall implementation levels. Specifically, interactions were included to test whether the influence of the Democratic District Attorney differed according to county characteristics. A leader favorable toward the rehabilitative approach of community-based sanctions would likely have an even greater effect in counties with the resources to support the approach or in counties with the greatest needs. Interactions with financial resource variables were not significant. Inclusion of interactions between Democratic District Attorney and the youth risk and need variables, however, affected the results. For example, the model that included the interaction of youth proportion at high and medium risk and Democratic District Attorney rendered the risk variable insignificant but the interaction was significant and negative. The inclusion of the interaction also increased the positive effect of the District Attorney on implementation by 6 points, an increase that represents the addition of three fully available sanctions components. Youth at highest risk of recidivism pose the greatest threat to public

safety and ideological responses may vary the most with this population of offenders. Those are also the youth most likely to be removed from the community. By specifically controlling for the interaction of the District Attorney and the proportion of youth at high and medium risk, the influence of a supportive leader may be even greater for the majority of youth who are served in the community.

Regional interactions were introduced specifically with the discretionary variables related to local youth including youth crime rate and proportion of youth with high and medium risk and needs. Such variables helped to assess whether regional differences represented attitudes regarding responses to juvenile delinquency and at-risk youth. The introduction of the interactions did not affect many models. The interaction of the west indicator and risk variable, however, was statistically significant and positive. The magnitude of the negative risk coefficient that was found in all models was decreased specifically for the western region.

### *Logistic Regression*

The logistic regression models showed some support for the effect of political variables. Table 2.4 lists the models predicting likelihood of available sanctions components. The residential programs component was excluded from the table because the model only explained 17% of variability and was only statistically significant at the  $p < .05$  level. No variables were statistically significant predictors of available residential services. Since only 16% of counties have fully available residential services, this policy component had the least variability. In general, the models predicting availability of a particular sanctions component did not explain as much of the variability as the models predicting overall sanctions implementation.

The first model in Table 2.4 indicates that counties with a Democratic District Attorney and located in the eastern region are much more likely to have fully available structured activities. In addition, an increase of 1% in the proportion of high and medium risk offenders decreases the likelihood of fully available services by 9%. Except for the regional effect, this parallels the findings for overall implementation. Counties in the east are more likely and counties in the central region are less likely to have fully available restorative services as shown in the second model. The few counties with multiple restorative programs that are not fully available are mostly found in the central region and may help explain this finding. Both clinical services and community structured day programs were much more likely, 15 and 28 times more likely respectively, to be fully available in counties with a Democratic District Attorney.

When the models were run including the overall implementation score, it was a significant predictor in all models except clinical services and other variables became insignificant. Variables used in this analysis to explain policy implementation may have a greater effect on overall implementation than the more specific planning involving different policy components. Other factors not included in this analysis, such as organizational characteristics of the JCPCs or specific attitudes of personnel, may have a greater influence on particular implementation choices.

### Discussion and Conclusions

Despite clear legislation and a centralized Department of Juvenile Justice and Delinquency Prevention in North Carolina, the implementation of community-based sanctions for juveniles does not coincide with the idealized continuum of sanctions developed by the state. This study of policy implementation confirmed other findings that

implementation of state policy does not always conform to expectations and is not uniform across local units of government (Bazemore, 1993; Goodstein & Sontheimer, 1997).

Considerable variability existed in both the overall extent of implementation and the particular components of sanctions components. This finding is significant in and of itself as a reminder that policy implementation is an important aspect of policy-making. The state should continue to provide support to local communities to address gaps in services.

#### *Local Discretion in Implementation*

The variability in sanctions did not seem to be the result of discretionary choices by local councils to meet the particular needs of local youth. Sanctions were not more extensive in counties with more youth or higher juvenile crime rates. Proportion of youth at risk of recidivism did have a relationship with implementation level, but not in the hypothesized direction. Though risk and needs data were explicitly provided for county consideration in the development of a sanctions continuum, higher levels of risk did not predict more services. In fact, a 10% decrease in the proportion of youth with a high or medium risk of recidivism increased the implementation score by a little more than half a point. Given the high variability between counties in the proportion of high risk youth, this is an important finding. Initially, it might seem that a higher level of services decreased risk of recidivism, but the risk data were for the year prior to implementation. If the overall availability of services in the sanctions continuum does not change over time, it is possible that lack of sanctions and services contributed to increased risk. Implementation evaluations using longitudinal data would help to clarify this relationship, but it raises concern that implementation challenges may contribute to increased juvenile crime. Another possible explanation is that counties with a higher proportion of youth at risk of recidivism are more likely to depend on secure

custody to address juvenile crime and not rely on community-based options. Either explanation underscores the importance of state efforts to support the development and implementation of community-based sanctions.

### *Political Factors in Implementation*

The conflict-ambiguity model of policy implementation (Matland, 1995) is a helpful paradigm for identifying the most likely factors to influence policy implementation. The prediction that local resources would have the greatest effect on implementation of community-based sanctions was only weakly supported, and political influences showed the greatest effect. The policy situation may be more correctly classified as a political or experimental model. A model of political implementation arises in situations of high conflict and low ambiguity. Despite one centralized authoritative agency and high levels of compliance within the NC DJJDP, crime in general is a politically contentious issue and may arouse conflict. The conflict may be related to differences among local actors involved in the decision-making process rather than the state-local relationship. On the other hand, the discretion granted to local councils contributes to a policy situation of high ambiguity. In such a case, local resources and normative beliefs of implementers influence implementation.

Though political party affiliation is a broad categorization for an ideological belief system, the large positive effect of a Democratic District Attorney suggests the important role of ideology and normative belief in the implementation of crime policy. Though Democratic voters had an influence on implementation in one model, the persistent effect of a Democratic District Attorney in all models in the analysis seems to support the key role of local leaders in particular. Other studies of juvenile justice programs have found that normative beliefs of both implementers and the community affect implementation outcomes

(Goei et al., 2003; Mihalic & Irwin, 2003; Terry-McElrath & McBride, 2004). Democratic leadership increased the likelihood of residential and clinical services but not restorative services. Such differences may reflect preferences for specific strategies to address juvenile crime. Regional effects on the availability of particular sanctions components may also reflect attitudinal differences about appropriate responses to juvenile crime, and the findings lend tentative support to the idea that normative belief may influence implementation outcomes. Other studies have shown Republicans tend to take a more punitive strategy toward crime (Smith, 2004; Yates & Fearing, 2005). This study provides additional support by showing that Democratic leaders support rehabilitative, community-based sanctions options for juveniles.

Further research assessing attitudes and beliefs of key juvenile justice leaders and members of the JCPCs would help illuminate whether normative beliefs are the mechanisms through which political affiliation and regional effects influence implementation outcomes. North Carolina has committed itself to using evidence-based practice within the juvenile justice system. Validated risk and needs assessment tools, for example, are used to guide dispositional decision-making and service planning. A research-based policy framework provides a point of reference to examine and discuss normative beliefs about effective juvenile justice practice. Building consensus about appropriate strategies to address juvenile crime among council members, state juvenile justice staff, and the general public may help reduce conflict and improve the implementation of community-based sanctions in the state.

#### *Economic Resources and Implementation*

Political affiliation is related to many socioeconomic factors regarding class and race (Hutchings & Valentino, 2004), so local resources may have affected outcomes indirectly



through political orientation of a community. Additional models tested the mediating effects of socioeconomic variables and found that neither per capita income, child poverty, unemployment, nor welfare population were significant or altered the significance and magnitude of the political variables. Additionally, demographic variables including median age and minority proportion did not mediate the effects of the political variables. Bivariate analysis indicated a difference in implementation based upon county-level resources. Although political variables had a substantively larger effect on implementation, multivariate analysis showed some of the resource variables did affect implementation.

State funding for JCPCs had a negative effect on overall implementation levels. The data for JCPC funding were from the year prior to implementation data, but if implementation is static over time the relationship may be explained by greater funding going to counties who do not have existing services and sanctions. Funding was specifically requested for targeted programs for the following year, so it seems more likely that funding affected implementation. Greater state dollars may reduce incentives to provide local investment in sanctions. Counties considered to have the greatest economic disadvantage were only required to produce a 10% match to state funding. Those counties were less likely than the others to have full availability of community day programs. Alternative schools are one of the programs within that category and these programs would require local support and financial commitment. On the other hand, the counties with a 10% match were more likely to have restorative services which were typically funded by the state.

Increased population density did increase the level of implementation, so the study findings coincided with other research demonstrating that rural counties had lower levels of implementation (Mears, 1998). Less densely populated counties tended to have fewer

sanctions options, so it may be helpful to examine whether or not some funds should be targeted specifically to rural areas. One limitation of this study is that it assumed an underlying relationship between funding and other resource variables such as staff training and organizational capacity. Other more precise measures of resources may yield different results.

The influence of financial resources on implementation is unclear. To understand the relationship between state funding and local sanctions implementation, more specific information about funding is needed. The formulas governing disbursement of funds from the state to the local level and the decision-making process regarding local distribution to particular programs may help illuminate the relationship. Graduated sanctions models emphasize a wide spectrum of programs spanning multiple supervisory levels which may decrease the number of youth served by each program. Such a strategy can be more costly. Regardless of the specific relationship between local resources and implementation, the state should facilitate consideration of efficiency in local service delivery. Collaboration across counties or across agencies within a county, for example, may allow for a greater variety of programs at a lower cost. Joint administration with multiple sites for program delivery may be another way to improve economies of scale. Such strategies allow for multiple programs while promoting cost savings to ensure a sustainable commitment to community-based sanctions for juvenile offenders.

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Table 2.1 Description of sanctions implementation by socioeconomic indicators

Implementation variables	Total (n=93)	Population density <sup>a</sup>		Financial resources <sup>b</sup>		Match requirement for state funding <sup>c</sup>		
		High (n=13)	Low (n=80)	High (n=43)	Low (n=50)	30% (n=29)	20% (n=33)	10% (n=31)
Level of implementation								
Overall implementation score	18.10	18.92	17.96	18.48	17.97	18.03	18.73	17.48
Full implementation score	5.43	6.00	5.34	5.74	5.33	5.28	5.61	5.39
Fully available sanctions components								
Structured activities	0.38	0.39	0.38	0.30	0.40	0.38	0.39	0.35
Restorative services	0.75	0.46 **	0.80	0.65	0.79	0.72	0.70	0.84
Community structured day programs	0.26	0.23	0.26	0.26	0.26	0.14	0.40	0.23
Clinical services	0.20	0.31	0.19	0.22	0.20	0.14	0.24	0.23
Residential programs	0.16	0.39 *	0.13	0.30 *	0.11	0.24	0.18	0.06

<sup>a</sup>Counties with a population density over 300 are classified as high

<sup>b</sup>Counties above the median on three funding measures are classified as high

<sup>c</sup>Higher match requirement indicates greater SES resources according to state determination

\*\*p<.01 \*p<.05



Table 2.2 Sample descriptive statistics

Variables (n=93)	Mean	SD
County revenue per capita (in thousands)	1.22	0.42
State funding for JCPCs per county youth	35.33	16.69
Local school expenditure per pupil (in thousands)	1.46	0.50
Indicator of counties with 30% match for JCPC dollars	0.31	0.47
Indicator of counties with 10% match for JCPC dollars	0.33	0.47
Per capita income (in thousands)	25.78	4.14
Population density	178.97	227.40
Percent of system-involved youth with high/med risk	50.05	13.94
Percent of system-involved youth with high/med needs	55.36	17.40
Delinquency rate	35.85	12.63
Youth proportion of population	10.69	1.10
Counties with Democratic District Attorney	0.75	0.43
Democratic proportion of registered voters	52.18	15.67
Counties in a family court jurisdiction	0.15	0.36
Public safety expenditures per capita	191.39	93.49

Table 2.3 OLS regression results predicting implementation score

Explanatory variables (n=93)	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
County revenue per capita (thousands)	1.15	1.33	0.58	1.25	1.14	1.14	0.27	0.73
State funding for JCPCs per county youth	-0.03 †	0.02	-0.04 †	0.02	-0.03	0.02	-0.06 *	0.03
Local school expenditure/pupil (thousands)	-1.66	1.08	-1.18	1.13	-1.01	1.30	-1.08	0.83
Indicator of counties with 30% match	-1.24	0.95	-1.23	0.94	-1.13	0.82	-0.51	0.77
Indicator of counties with 10% match	-1.10	0.69	-1.03	0.81	-0.90	0.91	-0.87	0.84
Population density	0.31	0.19	0.32 †	0.17	0.25	0.18	0.30 †	0.18
Percent of youth with high/medium risk			-0.06 †	0.04	-0.07 *	0.03	-0.07 **	0.03
Percent of youth with high/medium needs			0.03	0.02	0.03	0.02	0.03 †	0.02
Delinquency rate			0.03	0.03	0.02	0.03	0.00	0.03
Youth proportion of population			0.18	0.51	0.54	0.58	0.72	0.45
Counties with Democratic District Attorney					3.50 *	1.40	4.56 ***	1.20
Democratic proportion of registered voters					-0.07	0.05	-0.04	0.04
East							1.74	1.91
West							1.69	1.51
Central							-2.83	1.93
F statistic	2.91 *		3.84 **		4.51 ***		11.81 ***	
R <sup>2</sup>	0.11		0.16		0.26		0.47	

Note. Though not reported, all models included an indicator variable signifying implementation data were from 2007-2008, indicating an additional year lag after implementation

Note. All models were estimated using clustered robust standard errors

†p<.10 \* p<.05 \*\*p<.01 \*\*\*p<.001

Table 2.4 Logistic regression results predicting availability of sanctions components

Explanatory variables (n=93)	Structured activities		Restorative programs		Day programs		Clinical services	
	B	SE	B	SE	B	SE	B	SE
County revenue per capita (thousands)	0.22	0.88	1.56	1.66	0.04	0.58	0.75	0.81
State funding for JCPCs per county youth	-0.01	0.02	-0.03	0.04	-0.04	0.03	-0.02	0.02
Local school expenditure/pupil (thousands)	-1.53	1.02	-0.71	0.96	-0.27	0.93	0.90	1.39
Indicator of counties with 30% match	0.94	0.84	1.52	1.43	-1.54 †	0.89	-3.08	1.91
Indicator of counties with 10% match	-0.49	0.72	1.91 *	0.80	-1.14 †	0.69	1.19	1.15
Population density	0.18	0.12	-0.23	0.21	-0.07	0.16	0.14	0.12
Percent of youth with high/medium risk	-0.09 *	0.03	-0.01	0.03	-0.03	0.02	-0.04	0.03
Percent of youth with high/medium needs	0.05	0.03	0.01	0.02	0.01	0.01	-0.01	0.03
Delinquency rate	0.01	0.02	-0.02	0.03	0.00	0.02	-0.01	0.03
Youth proportion of population	0.23	0.42	0.33	0.40	0.62	0.52	-0.03	0.43
Counties with Democratic District Attorney	2.40 **	0.92	-0.59	1.17	3.35 *	1.42	2.89 **	1.12
Democratic proportion of registered voters	-0.03	0.03	0.00	0.03	-0.04	0.05	-0.11 *	0.04
East	3.07 **	1.20	2.77 †	1.58	0.96	1.87	0.84	1.30
West	1.38	0.89	1.59	1.51	0.74	1.99	-0.71	1.45
Central	0.22	1.16	-2.85 †	1.6	-1.12	1.87	-0.51	1.50
Wald Chi square	64.07 ***		37.09 **		41.91 ***		42.51 ***	
Pseudo R <sup>2</sup>	0.27		0.37		0.24		0.31	

Note. Though not reported, all models included an indicator variable signifying implementation data were from 2007-2008, indicating an additional year lag after implementation

Note. All models were estimated using clustered robust standard errors

†p<.10 \* p<.05 \*\*p<.01 \*\*\*p<.001

## CHAPTER 3

### COMMUNITY-BASED SANCTIONS AND JUVENILE CRIME

Though juvenile crime rates have been declining for a decade, a considerable proportion of American youth are still involved in delinquent activity. Policymakers and practitioners in juvenile justice are continually seeking effective policies to prevent delinquency and reduce recidivism among juvenile offenders. Since the 1990s, the use of community-based sanctions as a part of comprehensive crime control strategies has become a commonly adopted policy in state juvenile justice systems. While a rudimentary system of graduated sanctions, including community-based programs, has always existed in juvenile justice systems, limited attention has been given to the systematic and precise utilization of sanctions (Howell, 1995). Despite federal support and widespread adoption by states, insufficient information exists about the effectiveness of community-based sanctions as an element of juvenile justice policy intended to reduce juvenile crime (Wiebush, 2002). The lack of empirical knowledge regarding the effectiveness of community sanctions is an obstacle to ensuring optimal state-level juvenile justice policies.

North Carolina is one of many states that enacted juvenile justice reforms, including the adoption of community-based sanctions, during the 1990s. The Juvenile Justice Reform Act of 1998 mandated changes that specifically govern the development of community-based continuums of services and sanctions in local areas. Approximately 14% of juvenile offenders in the state are disposed to secure custody, so the majority of youth are served by

community programs. Following a brief description of national and state-level policy regarding community-based sanctions, this study uses county-level longitudinal data to examine the effect of sanctions legislation on the juvenile crime rate in North Carolina.

### Juvenile Crime and Sanctions for Delinquency

#### *Juvenile Crime Trends*

Juvenile crime rates have declined since the mid 1990s. Property crime dropped by half from 1994 to 2006. The juvenile violent crime rate dropped 49% from 1994 to 2004 with moderate increases in the two subsequent years (Snyder, 2008). Despite the decline, legislators and the general public are still concerned about the level of delinquency. The Juvenile Justice and Delinquency Prevention Act of 2002 begins with the finding that, despite a declining trend in the juvenile violent crime rate, both the national level and rate of offending by juveniles is too high. A recent report released by the National Council on Crime and Delinquency states that 90% of the voting public agrees that juvenile crime is still a serious problem (Krisberg & Marchionna, 2007).

Self-report data from a national sample of high school students in 2007 revealed that 35.5% of American youth indicated involvement in a physical fight that year. Among high school students, 19.7% reported any marijuana use and 44.7% reported alcohol use within the last month (Center for Disease Control and Prevention, 2008). In 2006, 17% of arrests for violent offenses and 26% of arrests for property offenses involved youth under the age of 18. An estimated 2.2 million youth were arrested that year (Snyder, 2008) While the decline in juvenile crime rates is encouraging, delinquency remains a widespread and serious social problem.

Shifts in the demographics of the juvenile offender population have also aroused concern among policymakers, researchers, and practitioners in juvenile justice. The proportion of juveniles involved in the justice system who are female has increased (Siegel & Williams, 2003; Williams, Ayers, Van Dorn, & Arthur, 2004). In 1990, 19.5% of delinquency cases involved females as compared to 27.4% in 2005 (Sickmund, Sladky & Kang, 2008). Specifically, female arrest rates for simple assault, larceny, vandalism, and weapons possession have increased over time despite declines in the overall juvenile crime rate for those offenses (Williams et al., 2004; Zahn, Hawkins, Chiancone, & Whitworth, 2008). In addition, the proportion of young offenders involved in the justice system has garnered attention. The peak age of onset for delinquency has decreased from past years (Williams et al., 2004). Children who engage in delinquent behavior at an early age are at greater risk of becoming chronic or serious offenders than youth with a later onset of delinquent behavior (Loeber & Farrington, 1998; Loeber, Farrington, & Petechuk, 2003). Racial disparities in juvenile arrests and confinement persist and raise concerns about possible bias and inequity. Though African-Americans constituted 17% of the overall youth population in 2006, the racial sub-group was involved in 51% of all juvenile arrests for violent crimes and 31% of juvenile arrests for property crimes (Snyder, 2008).

Juvenile delinquency often has long-term effects that also concern policymakers. Youth in the juvenile justice system are more likely than youth in the general population to be from poor families and have health and mental health problems. They have higher rates of school non-completion and unemployment than youth in general (Foster & Gifford, 2004), which may contribute to continued cycles of poverty. Delinquent youth have a higher chance of developing anti-social associations as adults, which contributes both directly and indirectly

to increased risk of crime as adults (Simons, Stewart, Gordon, Conger, & Elder, 2002). Involvement in the juvenile justice system may negatively affect the transition to adulthood and increases the likelihood of continued social problems (Furstenberg, Rumbaut, & Setterson, 2004; Hogan & Astone, 1986; Krohn, Lizotte, & Perez, 1997; Mouw, 2004). The increased likelihood of negative consequences in adulthood adds weight to concerns about the current level of delinquent behavior in our country.

The large number of youth involved in delinquent behavior, the changing demographics of the delinquent population, persistent racial disparities, and the long-term consequences of delinquent behavior warrant diligent efforts to improve policies to reduce juvenile crime. A policy trend beginning in the 1990s emphasizes state adoption of graduated sanctions in juvenile justice systems. Administrative efforts have relied upon a theoretical framework rooted in developmental theories of delinquency in order to develop models of graduated sanctions (Wilson & Howell, 1993). Policy evaluations, however, have provided limited empirical information about the impact of graduated sanctions as a state policy intervention.

#### *Community-Based Sanctions as Policy*

Federal legislative and administrative initiatives define graduated sanctions as an array of sanctions, available for every offense, that are sure, immediate, individualized, and community-based. Sanctions escalate with subsequent and more serious offenses (Consequences for Offenders Act, 2002; Wilson & Howell, 1993). The administrative model of graduated sanctions emphasizes the importance of a wide array of punitive sanctions and treatment options which span escalating levels of structure and supervision necessary to provide individualized services to juvenile offenders (Howell, 1995). Nationwide in 2005,

only 11% of juveniles with delinquency petitions were placed into residential facilities (Sickmund et al., 2008). Because most youth remain in local communities for supervision, community-based sanctions function as a key component within graduated sanctions policy.

Legislatively, the federal government has strengthened the state adoption and development of graduated sanctions through financial incentives to states that implement such a policy for juveniles (Griffin, 1999; Parent & Barnett, 2003). Eligibility for funds is based upon specific federal conditions, including the development and implementation of a system of graduated sanctions. Every state has applied for and received funds from the federal Juvenile Accountability Block Grant program in every year since it began in 1998 (Development Services Group, 2002). The extent of financial awards indicates that all states have adopted a system of graduated sanctions. Although block grant funds could be used by states for a variety of funding priorities, an implementation evaluation indicated that almost three quarters of the funding had been spent on developing or strengthening systems of graduated sanctions (Parent & Barnett, 2002).

Administratively, the federal government endorsed the use of graduated sanctions as a key feature in an overall juvenile crime reduction strategy called the Comprehensive Strategy for serious, chronic, and violent juveniles (Wilson & Howell, 1993). Federally funded pilot sites in various states and counties have followed the model of graduated sanctions from the Comprehensive Strategy (Coolbaugh & Hansel, 2000; Juvenile Sanctions Center, 2005; Matese & Tuell, 1998). The model emphasizes three policy components. One relates to decision-making, another to information management, and the third to the broad array of sanctions and treatment options that include community-based programs (Howell, 1995; Wiebush, 2002). This study specifically examined the sanctions continuum



component of graduated sanctions in one state. Several states, including North Carolina, have followed the blueprint of the Comprehensive Strategy in order to develop a continuum of graduated sanctions (Howell, 2003; Mondoro, Wight, & Tuell, 2001).

Federal administrative and legislative efforts that support graduated sanctions are intended to increase juvenile accountability, defined as the assurance of consequences for delinquent acts, which facilitates a decline in delinquent behavior. Legislation governing the Juvenile Accountability Block Grant program indicates that the purpose of the funding is to help states address juvenile crime (Consequences for Offenders Act, 2002). The Comprehensive Strategy clearly identifies juvenile accountability as an expected benefit of graduated sanctions, and further specifies that accountability for juveniles is expected to decrease the likelihood of further or more serious crime (Howell, 1995). The use of graduated sanctions as policy may serve multiple goals, but reduction in juvenile crime is emphasized as a primary policy outcome. Despite federal support and widespread adoption by states, limited information exists about the effectiveness of graduated sanctions to reduce juvenile crime (Wiebush, 2002).

### Evaluations of Graduated Sanctions

#### *Evaluations of Effective Programs*

During the initial development process of the Comprehensive Strategy, researchers at the National Council on Crime and Delinquency conducted a thorough review of effective graduated sanctions programs. They were able to identify numerous programs that showed a decrease in future arrests or delinquent complaints for youth in the intervention groups as compared to youth in the control groups (Howell, Krisberg, Hawkins, & Wilson, 1995). Examples of effective programs included structured intensive day treatment, home-based

monitoring and multiple-service programs, diversion with one-on-one behavioral interventions, multi-systemic therapy, and intensive supervision with case management and monitoring. Insights from the exhaustive review of individual studies, coupled with meta-analyses (Garrett, 1985; Lipsey & Wilson, 1993; Lipsey, 1992), identified general and consistent characteristics of effective programs. Programs that demonstrated a decline in delinquent behavior tended to include multiple services, involved frequent contact over a long duration of time, operated outside the formal juvenile justice system, and focused on youth strengths rather than deficiencies.

Other reviews have also identified effective programs to slow or stop the progression of offending behavior. Increasingly, research is supporting the use of rehabilitative programs to effectively halt the progression of delinquent behavior. Skills-focused programs such as anger management and social competence programs or gang resistance trainings have reduced further offending (Altschuler & Armstrong, 1984; Herrenkohl, Chung, & Catalano, 2004; Lipsey, 1999; Lipsey & Wilson, 1998; Loeber & Farrington, 1998). Research has provided information about the effectiveness of particular programs within a given sanction level and offered guidance about specific programs that should constitute a continuum of services. Program evaluations have not, however, examined the effects of graduated sanctions as a system or policy intervention.

#### *Evaluations of Sanctions Continuums and Collaborative Interventions*

Before the formalized use of graduated sanctions as policy began with the Comprehensive Strategy, some past evaluations examined the effects of sanctions continuums. The focus was on the array of services provided, rather than one particular program. Studies of states which have emphasized community-based services rather than

institutional correctional interventions may also provide insight into the effects of community-based sanctions. Howell (1995, 2003) provides a review of these studies. For example, studies of Massachusetts and Utah before and after de-institutionalization showed that youth involved in the system after the shift toward community-based alternatives had lower recidivism rates (Coates, Miller, & Ohlin, 1978) and showed declines in the incidence and severity of delinquent behavior (Krisberg, Austin, Joe, & Steele, 1988; Krisberg, Austin, & Steele; 1989). Burke and Pennell (2001) studied the effects of the graduated sanctions component of the Breaking Cycles program in San Diego by comparing a random sample of cases served by traditional probation prior to the onset of the program with a sample of cases served by the Breaking Cycles program. They found that the intervention group was less likely to be referred or adjudicated for federal offenses than the comparison group.

Other studies of the use of sanctions continuums in the Midwest (Holsinger & Latessa, 1999) and Texas (Criminal Justice Policy Council, 2001) were descriptive and did not examine the effect of sanctions on juvenile crime. More recently, an evaluation of the Repeat Offender Prevention Program in Los Angeles compared outcomes of juveniles randomly assigned to either regular probation or an intervention group involved in an inter-agency collaborative program with access to a comprehensive array of community-based services (Zhang & Zhang, 2005). Of the 327 who started the study, 106 youth in the intervention group and 98 on regular probation successfully completed the program. The offenders in the intervention group received more services than those on regular probation and showed improved educational outcomes including more days in attendance, more classes passed, and higher grade point averages. Youth in the intervention group were less likely to have a new offense in the first six months, but no effect persisted after that time period. A

California study of all 58 counties in the state evaluated the effects of grant funding for community-based collaborative programs in juvenile justice on various juvenile crime indices (Worrall, 2004). Grants were competitively awarded based on counties' collaborative plans to address juvenile crime, so selection bias was likely. A fixed effects regression model, using longitudinal data from 1990 to 2001, was used to help address selection bias arising from unobserved variables that may have influenced the likelihood of a financial award and influenced the outcome variables. No overall reductions in juvenile crime resulted from funding, but some of the 14 funded counties experienced decreases in crime rates. The study did not examine the effect of specific sanctions or programs but utilized funding levels as an overall measure of collaborative programming efforts.

Several studies of graduated sanctions have been conducted in relation to drug testing. Two different studies of almost 2,000 young parolees from the California Youth Authority examined the impact of drug testing coupled with graduated sanctions. The offenders were randomly assigned to different levels of supervision. One study showed no difference in future arrests for youth subject to different frequencies of drug testing (Haapanen & Britton, 2002). Despite a spectrum of escalating sanctions for violations, the implementation evaluation suggested that most sanctions for a failed test were not varied and most offenders simply continued on probation. The lack of effect on re-arrests may be due to a failure to actually implement graduated sanctions. A second evaluation using the same cohort showed that those offenders assigned to greater drug testing coupled with graduated sanctions were less likely to be unemployed than those who were tested less often (Kilmer, 2008). Randomized experiments assigning adult offenders to drug testing with or without graduated sanctions have shown reductions in drug use (Harrell & Roman, 2001), self-

reported re-offending, and official re-arrests (Mitchell & Harrell, 2006) for offenders subject to a combination of graduated sanctions and drug testing.

Numerous reviews and meta-analyses of juvenile justice program evaluations guided the development of graduated sanctions models in juvenile justice. Fewer empirical studies have been conducted on the effects of graduated sanctions policy. Most of the research has involved program-level evaluations rather than examining the impact of graduated sanctions as a policy-level intervention. Some studies focused on a very specific subpopulation of offenders or local counties. Comprehensive Strategy evaluations like the study of the Breaking Cycles program may have examined multiple components of graduated sanctions policy simultaneously and obscured the effect of sanctions continuums. Given the widespread use of graduated sanctions as state policy, it is important to build on prior research to refine and improve the use of graduated sanctions as a strategy to reduce juvenile crime. This evaluation contributes to the existing literature by providing a county-level policy outcome evaluation that focuses specifically on the sanctions continuum component of graduated sanctions. The study may also provide insight more broadly into the impact of collaborative efforts in juvenile justice, an area lacking much empirical study (Worrall, 2004).

### Research Questions and Design

Two characteristics of sanctions continuums seem especially important to facilitate behavioral change in juvenile offenders. Though graduated sanctions reflect both federal and state policy initiatives, most juveniles are served within the local community. Nationally, approximately 11% of youth are placed in secure or residential facilities and the rest are supervised at home (Sickmund et al., 2008). Elmore (1980) has stressed the importance of

conducting outcome evaluations at the point where policy implementation actually addresses the behavior targeted for intervention. The availability of sanctions and services *within the local community* is an important policy characteristic.

In addition, many of the descriptive characteristics of graduated sanctions rely upon an assumption of comprehensiveness in the array of services. It is impossible to intervene with immediate sanctions, for example, if they are not accessible. Individualized case plans are hindered by a limited scope of available programs. Gaps in services may preclude the effective triggering of rehabilitative processes to facilitate behavioral change, so the *comprehensiveness* of the sanctions continuum is another important policy characteristic. Using North Carolina as a case study, this evaluation used the variability across counties to assess juvenile justice reform legislation mandating community-based sanctions. Specifically, the effect of the overall comprehensiveness of sanctions on county-level juvenile crime rates was estimated. In addition, this study assessed the relative effects of particular components of the sanctions continuum on crime rates.

## Data

### *Implementation Data and Sample*

County-based JCPCs are responsible for the sanctions continuum provided to juveniles in each North Carolina county. Annually, each JCPC is required to conduct an assessment of available services within the county and provide a standardized annual report. A JCPC consultant, employed by the North Carolina Department of Juvenile Justice and Prevention, oversees the assessment process in each county. The assessment reports from 93 counties from the planning years 2005-2006 and 2006-2007 constituted the basis of the data used to construct measures of continuum comprehensiveness and examine the effects of

policy at variable levels of implementation post-reform. These years were chosen due to the availability of reliable data and to allow for a five-year period following the adoption of the Juvenile Justice Reform Act to facilitate full implementation. The reports are available to the public and were acquired from the JCPC consultants.

Though there are 100 counties in North Carolina, data were only obtained from 93 counties. The seven remaining counties were the responsibility of one JCPC consultant, but the position was vacant and repeated requests for information from the regional office were unsuccessful. Omitted counties are adjacent to one another and located in a specific geographical region outside a major metropolitan area. The sample, therefore, does not accurately reflect the state as a whole. The evaluation provides a clear description of what has actually happened following juvenile justice reform in most of the state and offers useful information to state legislators and juvenile justice professionals. Generalizations to the whole state and other states should be cautiously considered.

Once the policy intervention variables were constructed, a panel was developed using data for the outcome and control variables from the years 1990 through 2006 to allow sufficient time before and after the reform legislation passed in 1998 and was enacted in 1999. The outcome variable was the county-level juvenile arrest rate. County arrest counts were obtained from the North Carolina Department of Justice through the North Carolina State Data Center. Additional economic and demographic data used as control variables are available to the public from several federal and state agencies through the North Carolina State Data Center. The longitudinal data from 17 time periods and 93 counties yielded a total sample of 1,581 observations.

### *Policy Intervention and Outcome Variables*

The JCPC reports provided information on all services available for juvenile offenders in the county as compared to a model continuum of five program types (structured activities, restorative programs, community day programming, clinical and assessment services, and residential programs) across multiple supervisory levels. In addition, each program was rated in regard to its availability and accessibility in the community. Measurement of the comprehensiveness of the continuum was based upon an additive sum of fourteen cells of the continuum that represent the five program types across three different levels of supervision (immediate, intermediate, and post-release) except post-release restorative programs. For an overall comprehensiveness score, each sanctions component was scored as a 2 for fully available, 1 for partially available, or 0 for not available; the index ranged from 0 for no services at all to 28 for fully available services in all program types at all supervisory levels. An increase of 1 in the index suggested that a county had an additional sanctions component or had made an existing partially available service fully available. In addition, indicator variables were utilized to represent whether each of the five program types within the sanctions continuum was fully available in the county or not. An additive sum of these component indicators represented an overall measure of fully available services. Table 3.1 lists the descriptive statistics for the sample of 93 North Carolina counties on various measures of sanctions comprehensiveness.

The sanctions comprehensiveness score devised from the JCPC reports was used as the policy intervention variable in this evaluation. Sanctions component indicator variables were used for additional analyses. An indicator variable was used to represent the period of time following the passage of reform legislation that mandated the creation of county JCPCs



to develop and oversee sanctions continuums. The interaction between the time variable and the policy variable isolated the effect of increased comprehensiveness in the sanctions continuum following reform. The interaction of the program indicator variables with the time variable represented the average treatment effect of that particular component of the sanctions continuum.

The county-level juvenile crime rate was the key outcome variable. The total number of juvenile arrests (arrest of anyone age 17 and under) was divided by the number of youth age 10 to 17 in the county and multiplied by 1,000 to construct a juvenile crime rate measure. An alternative measure was utilized in some statistical models. Youth in North Carolina fall under the jurisdiction of the adult court when they turn 16, so the initial measure may have included criminal activity committed by youth not subject to juvenile justice interventions. Conversely, some older youth could have been exposed to community-based sanctions earlier in their criminal career. Some have an extended commitment to the custody of the juvenile justice department and may be subject to juvenile sanctions up to the age of 21. Given the difficulty of distinguishing the actual group exposed to the policy intervention, two measures were used in the analysis. The first crime rate was based upon arrests and population of youth under 18. The second juvenile crime measure was discounted by the proportion of the youth population aged 16 or 17 for each county in a given year.

For both juvenile crime measures, 28 observations were recoded after information about reporting coverage, overall trend, and general level of crime was verified in the Easy access to juvenile FBI arrest statistics dataset provided by the OJJDP (Puzzanchera, Adams, Snyder, & Kang, 2007). Using the North Carolina data, recoding was based upon the within-county mean for the two time periods closest to the recoded observation. The indicator

variable signifying that an observation included a recoded measure was not significant in any analyses. Analysis using listwise deletion of the observations that were recoded did not yield different results in terms of significance, direction, or magnitude of coefficients. Five remaining observations were missing data about juvenile arrests, so those observations were excluded from analysis. The state juvenile crime trend corresponds to the national decline in juvenile crime over time as shown in Figure 3.1. State data indicated that the average juvenile arrest rate prior to 1999 was 50 arrests per 1,000 youth as compared to 47 in the post-reform period. The difference was not statistically significant.

#### *Alternative Explanations for Juvenile Crime*

This evaluation was based upon a multivariate regression model that examined the effect of sanctions comprehensiveness on juvenile crime rates over time. In order to isolate the effect of the policy intervention, it was important to control for other possible influences on the juvenile crime rate. Economic theory of crime predicts that personal propensities, the return on illegal activities, and the return on legal activities affect criminal behavior (Becker, 1968; Levitt, 1998). Unemployment rates, poverty rates, and a measure of urban or rural setting have been used to control for returns on legitimate activities (Gius, 1999). This study included the annual unemployment rate, per capita income, and population density as measures. Social disorganization theory also purports that unemployment and poverty may increase crime and additionally includes residential instability as a contextual risk factor that increases the likelihood of crime (Shaw & McKay, 1969; Veysey & Messner, 1999; Vowell & Howell, 1998). Accordingly, the percentage of owner-occupied homes in the county was included.

Justice policy initiatives intended to address juvenile crime rates needed to be considered. North Carolina has instituted family courts as a way to coordinate individualized services to juveniles and families involved in delinquency or other child-related court matters. Several judicial districts have adopted this model over the time period of the study. The model included an indicator of whether or not a county falls within a family court jurisdiction<sup>2</sup> and public safety expenditures per capita as a measure of law enforcement activity. Minority proportion and adolescent proportion in each county were used as demographic controls, a common practice in economic models that have used age or race as proxies for various propensities or tastes (Guis, 1999; Levitt, 1998). Finally, in order to control for omitted or unobservable factors that may affect criminal behavior, the overall county crime rate was included (Levitt, 1998). Annual total arrests were divided by the annual county population and multiplied by 1,000. As with the juvenile crime measure, some overall crime rate variables were recoded using similar methods. Nine observations were missing data for overall crime rate. Due to the missing data in both juvenile and overall crime rates, the analytical sample was comprised of 1,572 observations. Table 3.2 lists means and standard deviations for all variables in the analytical sample in both the pre and post reform periods.

### Methodology

Several methodological challenges arose in this evaluation. A key issue in this analysis was the likely presence of selection bias. Since randomization is difficult in juvenile justice intervention evaluations (Zhang & Zhang, 2005), quasi-experimental designs are often used that may include the potential for selection bias (Harrell & Mitchell, 2006; Papachristos,

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<sup>2</sup> This information was not obtained from the North Carolina State Data Center but directly from the website of the North Carolina Administration of the Courts at <http://www.nccourts.org/Citizens/CPrograms/Family/Default.asp>

Mearns, & Fagan, 2007). Such bias occurs when determinants of the key explanatory factor are also affecting the outcome variable (Vella, 1998). In this evaluation, the county JCPCs have discretion and responsibility to develop the sanctions continuums, so the comprehensiveness level of sanctions is endogenous. Policy implementation literature suggests that local economic resources are likely to affect the extent of implementation (Corbett & Lennon, 2003; Matland, 1995). Risk and resilience research and social disorganization theory indicate that neighborhood poverty is a risk factor for delinquency (Hawkins et al., 1998; Herrenkohl et al., 2004; Williams et al., 2004; Veysey & Messner, 1999; Vowell & Howell, 1998). County-level socioeconomic indicators were likely to influence both the policy intervention variable and outcome variable.

Using data from the pre-reform period only, bivariate analysis revealed differences between counties that had higher and lower degrees of comprehensiveness. In particular, the counties with the most comprehensiveness in sanctions had higher juvenile crime and overall crime rates. In addition, counties with the highest degree of comprehensiveness were the most densely populated. Table 3.3 lists the county-level comparative descriptive statistics for the pre-reform period according to the degree of comprehensiveness in the sanctions continuum. The comprehensiveness score was most highly correlated with the crime variables and population density and had Pearson correlation coefficients of .15 with juvenile crime, .08 with overall crime, and .20 with population density. When the comprehensiveness score was regressed on the other factors, both overall and juvenile crime rates had a significant effect on the comprehensiveness score. Inclusion of county fixed effects, however, rendered all of the other variables statistically insignificant. Attention to selection effects was clearly important.

Careful model specification, including control variables for observed factors that may affect the relationship between the outcome and the explanatory variable, can address potential selection bias (Mitchell & Harrell, 2006; Vella, 1998). The inclusion of variables guided by both economic and social disorganization theory helped to control the effects of socioeconomic factors that may influence both policy endogeneity and juvenile crime. The primary concern, however, was that unobserved factors affected both the predictor and outcome variables (Frees, 2004; Vella, 1998). Attitudes toward crime, for example, could have affected both justice policy implementation and delinquency rates in the present study.

Many extensions of Heckman's strategy to model the selection mechanism and correct standard errors have been applied to various model types (Heckman & Navarro-Lozano, 2004; Heckman, Tobia, & Vytacil, 2003; Heckman & Vytacil, 1998; Woolridge, 1995). The juvenile crime rate is a continuous variable, so an instrumental variables approach would be appropriate in this study. Attempts to model the selection effect using socioeconomic variables as instruments resulted in very poor models. Though the Wald chi squares were statistically significant, less than 2% of the variability in sanctions comprehensiveness scores was explained. Given the challenges of adequately modeling a selection effect, this analysis relied upon the use of county-level fixed effects to capture unobserved variables that may have influenced both policy choice and juvenile crime (Hedeker & Gibbons, 2006). An F test for joint significance showed that the county indicator variables did significantly contribute to the effect on the juvenile crime rate. In addition, the overall crime rate served as a proxy for unobserved factors such as attitudes about crime that may have affected the explanatory variables and the outcome variable, inducing selection bias.

Crime data tend to have a strong serial trend so models were run using two different strategies to address serial correlation. Indicator variables to signify the year were used in some analyses and a time trend variable and its square were included in other models (Singer & Willett, 2003; Woolridge, 2003). An F test for joint significance showed that the time indicators were jointly significant. In all models, the time trend variables were statistically significant. A square of the time trend variable was used as the effect of the trend decreased over the years. For simplicity, estimates are only reported for models using the time trend variables. Panel data typically involve autocorrelation of variables within a given unit over time which leads to inaccurate estimates of standard errors. Clustered robust standard errors were used to adjust the correlation matrices in order to ensure accurate standard errors and strengthen inference.

## Results

### *Effects of Comprehensive Sanctions Continuums*

Analysis proceeded initially with the overall sanctions comprehensiveness measure as the only policy intervention variable. Table 3.4 lists the results of the first model. When other influences were controlled, a greater degree of comprehensiveness in the sanctions continuum did decrease the juvenile arrest rate. During the post-reform period, the addition of one fully available sanctions component (an increase of 2 points) in the continuum decreased the arrest rate by 1.5 juveniles out of 1,000 youth in the county population. The statistically significant and positive coefficient for continuum comprehensiveness revealed a .5 difference in juvenile crime rate between high and low implementation counties in the pre-reform period, an indication of potential selection bias. The only factors that were not statistically significant were the unemployment rate and the minority proportion of the

county population. Most of the coefficients were in the expected direction, though an increase in per capita income showed an increase in juvenile crime. Notably, counties in a district with a family court had lower crime rates by 10 juvenile arrests per 1,000 youth in the population.

The next model in Table 3.4 included the time trend variables. The primary treatment effect of the sanctions continuum remained statistically significant with little change in the magnitude of the effect. Per capita income was no longer significant which suggests that its effect was due in part to its serial pattern. Inclusion of county-level fixed effects in the third model rendered the pre-reform difference in continuum comprehensiveness insignificant, so the fixed effects may have effectively captured some of the unobservable differences that contributed to both implementation level and juvenile crime. The interaction term for sanctions comprehensiveness post-reform remained statistically significant, but the magnitude decreased slightly. Several control variables became insignificant. Family courts and the adult crime rate continued to show an influence on juvenile crime rates, though the magnitude of each effect decreased with the inclusion of county-level fixed effects. The overall model explained approximately 16% more of the variability in sanctions comprehensiveness than models without the fixed effects. The inclusion of fixed effects showed that either omitted or unobserved variables, such as attitudes about crime, seemed to have an effect on crime rates. The adult crime rate was also included as a proxy to capture unobserved variables that may have induced selection bias. When the model was run without that variable, the pre-reform difference in implementation was greater than with the inclusion of the adult crime rate. In addition, the adult crime rate variable accounted for 5% of the variability in crime rates, giving further indication that unobservable differences may be

influencing both implementation levels and crime rates. The fixed effects model and the adult crime rate as a proxy for unobservable factors controlled for the problem of policy endogeneity, thus giving greater confidence in the estimated effect of sanctions comprehensiveness. Estimation using clustered robust standard errors changed the significance level of the overall treatment effect to  $p = .17$  and the family court to  $p = .10$ , but the overall crime rate, which captured unobserved variables such as attitudes about crime, remained significant. These results are reported in the fourth model of Table 3.4.

The reported estimates are based upon models which utilized the juvenile crime measure for the 18 and under population. Analyses using the discounted measure that excluded 16 and 17 year olds yielded similar results in terms of the significance and direction of effects. Compared to the results listed in model 3 of Table 3.4, only the pre-reform difference in comprehensiveness level was no longer significant. Table 3.3 shows the differences in crime levels pre-reform according to comprehensiveness level, and it seems possible that the differences were due in part to the criminal activity of the older youth population. The magnitude of the effects for sanctions comprehensiveness post-reform, owner-occupied proportion of homes, overall crime rate, and family court all decreased. Because family courts only serve youth up to age 15, the decreased coefficient reflects a more accurate estimate of the effect on the population most likely subject to the intervention. Similarly, if the sanctions continuums primarily serve the youth population under 16 due to the age limit of juvenile court jurisdiction, the estimated effect would be smaller than the effect using the total youth population.



### *Effects of Sanctions Components*

In order to examine the particular effects of sanctions components, models were then tested that each included one policy component indicator both with and without the overall comprehensiveness measure as shown in Table 3.5. The interactions of the component indicators with the post reform indicator showed the average treatment effects of the sanctions components in the post-reform period. All reported results in Table 3.5 refer to this interaction term though the component indicators were included in the models as well as all of the control variables and time trend variables. Component indicators are time invariant, so they would be perfectly correlated with county fixed-effects. As such, county indicators were not included in any of the analyses that involved the sanctions components, so effects of potential selection bias may not have been adequately controlled.

Availability of residential services clearly had the greatest impact on juvenile crime. Only 16% of counties had sufficient residential programs to meet the needs of county youth. Community-based residential programs included a mix of specialized foster care, emergency shelters, multipurpose group homes, programs specific for juvenile offenders, and a limited number of residential mental health programs. The residential services indicator was the only component variable that had a statistically significant effect on juvenile crime and reduced juvenile crime by about 7 youth per 1,000. When overall sanctions comprehensiveness was included, the effect of residential services was reduced to 5 juvenile arrests per 1,000 at the  $p = .06$  level. The effect of the overall comprehensiveness score was also reduced (compared to the models in Table 3.4 with no component indicators) and became statistically significant only at  $p = .11$ .

The final two models of Table 3.5 list the results for the models run with all sanctions component indicators. Residential services had the only statistically significant effect on juvenile crime. The effect persisted using clustered robust standard errors. Availability of residential services partially mediated the effect of overall comprehensiveness in sanctions. Other sanctions components seemed to have an effect largely through their contribution to overall comprehensiveness in sanctions. In the models with only one sanctions component indicator, the coefficients were decreased when overall comprehensiveness was included in the models.

Though not reported in Table 3.5, the effect of other control variables remained basically the same in the models including sanctions components indicators. Without the inclusion of the overall comprehensiveness level, all of the variables except per capita income had a statistically significant effect on juvenile crime. In each of the models with the overall comprehensiveness variable, most of the control variables lost significance except for family court, population density, the overall crime rate, and the time trend variables. In the final model of Table 3.5 with all policy variables included, family courts decreased the crime rate while an increase in population density and overall crime increased the juvenile crime rate.

## Discussion and Policy Implications

### *Limitations of the Study*

Attention to policy implementation was an underlying foundation of this study. The nature of the policy variables posed both strengths and weaknesses. The key policy variables reflected differential implementation of community-based sanctions. Such variability provided an opportunity to study the effects of various levels and components of the policy

intervention when a comparison group without community-sanctions was not available. Detailed information about county-level sanctions continuums also facilitated the identification of particular components of policy that had the greatest effect. The variability, however, reflected county discretionary choices and introduced complications of selection bias. In policy research, a tension exists between dealing with the endogeneity of policy choice and assumptions of uniformity in policy implementation. Inclusion of socioeconomic factors expected to influence both policy choice and juvenile crime rates, the use of county fixed-effects, and an overall crime rate variable as a proxy for unobserved factors that affect crime helped to address potential selection bias in this study. These strategies did not change the direction or statistical significance of the sanctions comprehensiveness effect. Other methods to address endogeneity may yield different results.

Challenges and benefits of using longitudinal data were also present in this study. Controlling for differences between counties before juvenile justice reform gave greater confidence in the differences post-reform. A greater time span increased the number of observations for analysis but introduced complications of both trending variables and autocorrelation within counties. Inclusion of time trend variables in this analysis did not change the effects of the policy variables. Clustered robust standard errors to account for the autocorrelation of observations within one county changed the statistical significance of overall comprehensiveness to  $p = .17$  in the models without any policy components. Using the same approach, the effect of residential services in the full model with all variables was statistically significant at the  $p = .12$  level and  $p < .05$  when overall sanctions was excluded. An increase of observations in the sample with additional years or the remaining seven counties could induce a statistically significant effect.

The methodological challenges largely affected the estimation of standard errors and reduced confidence in inference. Though the total population of counties was not used in this analysis and limits generalization, the sample included the large majority of the state. The number of counties and corresponding observations represents a departure from case studies that examine just a few counties at a time. As an evaluation of effects of North Carolina legislation in 93 counties, the study clearly showed that reform efforts governing the development of sanctions continuums helped to reduce juvenile arrests rates in most of the state. The study results provide empirical support for recent juvenile justice initiatives. Lessons for North Carolina may offer more tentative principles to other states.

#### *Policy Implications*

The results from this study seem to indicate that a wide variety of available programs that constitute a larger sanctions continuum does help reduce juvenile crime rates. Meta-analyses of other juvenile justice evaluations have shown that interventions with multiple services, offered outside of the formal justice system and based on individual strengths and weakness of offenders, effectively decrease juvenile crime (Garrett, 1985; Lipsey, 1992; Lipsey & Wilson, 1993). Graduated sanctions policy that guides and promotes adequate provision of multiple services in the local community aligns with these principles of effective intervention. Overall comprehensiveness of the sanctions continuum, as compared to most of the individual sanctions components, had a greater effect on juvenile crime. This finding suggests that the availability of a variety of services is perhaps as important as any one particular component. Prior research has emphasized the importance of interventions that recognize and adapt to individual strengths and weaknesses of juvenile offenders (Lipsey &

Wilson, 1998). A limited range of sanctions precludes individualized service planning for youth.

The North Carolina legislature recently required a continuation review to determine whether or not to continue funding the JCPCs. Other mechanisms are possible to coordinate and provide services, but the county-based councils represent an effective collaborative strategy to develop a sanctions continuum that relies upon multiple agencies. This research supports the decision of the legislature to continue funding the JCPCs in order to strengthen community-based sanctions as a key strategy in juvenile justice policy. This study did not attempt to explain why or how comprehensiveness affects behavioral change. It seems likely that comprehensive sanctions alone cannot bring about a decrease in crime but provides a foundation to facilitate such change. The process that matches individual needs and appropriate services depends upon the availability of such services. The significant, substantive, and negative effect of family courts, which are designed to improve collaboration of services and individualized treatment-planning for juveniles, on juvenile crime rates suggests that the service-planning process may be a key mechanism to match needs and services. The collaborative function of the JCPCs can similarly help with both the provision and matching of services. Further research into the relationships between dispositional decision-making for juveniles and the availability of services may strengthen our understanding of how sanctions continuums address juvenile crime.

Community-based residential services clearly constitute an important component of graduated sanctions policy. The effect of available residential services remained strong even when controlling for the overall level of sanctions. Two counties with the same overall level of services that differed only in the availability of residential services had a difference of

about 7 juvenile arrests per 1,000 in the county. The average county youth population in this study was a little more than 8,000, so the average county with fully available residential services could see a large drop in the juvenile crime rate. The large, more densely populated counties may especially benefit from ensuring adequate availability of community-based residential programs. Such programs cost more than other community-based programs, so it may be important to specifically examine the cost-effectiveness of residential programs as compared to other options. The findings from this study, however, provide empirical support for the state's recent initiative to deinstitutionalize the state Youth Development Centers (North Carolina's secure custody option for juvenile offenders) and develop smaller community-based residential programs. Such a diversion of funding may provide benefits in terms of decreased juvenile crime without a large increase in costs.

Similar to many other states, North Carolina has pursued juvenile justice reforms that emphasize the use of community-based sanctions. This study validates those efforts by showing that comprehensive continuums of sanctions in local communities do reduce juvenile crime. Residential services, in particular, seem to have a strong effect. Continued research can further inform policy choices by examining the cost-effectiveness of various sanctions components and the mechanisms used to match community sanctions to the needs of individual juvenile offenders. Findings from this study, however, support state efforts to develop and utilize community-based sanctions as a key strategy to address juvenile crime.

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Table 3.1 Description of county sanctions continuums

Variables (n=93 counties)	Mean
Degree of comprehensiveness (means)	
<i>Overall comprehensiveness score (0-28)</i>	18.10
<i>Full availability of sanctions components (0-14)</i>	5.43
Indicators of full availability (proportions)	
<i>Structured activities</i>	0.38
<i>Restorative services</i>	0.75
<i>Community day programs</i>	0.26
<i>Clinical services</i>	0.20
<i>Residential programs</i>	0.16

Table 3.2 Descriptive statistics before and after juvenile justice reform

Variables	Pre-reform (n=929)		Post-reform (n= 643)		Total (n=1572)	
	Mean	SD	Mean	SD	Mean	SD
Juvenile arrest rate per 1,000 youth	50.10	34.92	47.30	31.01	49.00	33.40
Overall arrest rate per 1,000 people	59.84	30.05	54.07	28.13	57.48	29.40
Per capita income (in thousands)	19.01	4.01	24.77	5.01	21.36	5.28
Population density	153.53	183.21	178.08	223.95	163.57	201.17
Annual unemployment rate	5.50	2.56	5.95	2.12	5.68	2.40
Proportion of homes owner-occupied	62.32	8.11	62.68	7.71	62.47	7.95
Minority proportion of population	24.36	17.46	24.60	17.76	24.46	17.58
Youth proportion of population	10.60	1.08	10.69	1.08	10.64	1.08
Family court (indicator variable)	0.01		0.11		0.05	
Public safety expenditures per capita	105.23	56.59	166.64	70.10	130.39	69.37

Table 3.3 Mean differences in counties by sanctions comprehensiveness in the pre-reform period

Variables	Sanctions comprehensiveness score			
	Very low (<15)	Low (15-18)	High (19-21)	Very high (>21)
	n=150	n=288	n=300	n=190
Juvenile arrest rate	45.99	46.13	50.14	59.27
Overall arrest rate	59.62	59.44	57.35	64.52
Per capita income (in thousands)	19.2	18.75	18.96	19.31
Unemployment	4.82	5.65	5.79	5.34
Population density	130.74	131.94	145.64	216.38
Owner-occupied homes	62.81	63.1	62.31	60.76
Youth proportion	10.23	10.65	10.67	10.71
Minority proportion	29.07	23	22.27	25.99
Public safety dollars	112.49	100.56	102.62	110.64

Table 3.4 Regression analysis results predicting county-level juvenile crime rates

Variables (n=1572)	Model 1		Model 2		Model 3 <sup>a</sup>		Model 4 <sup>a,b</sup>	
	B	SE	B	SE	B	SE	B	SE
Continuum comprehensiveness	0.52 **	0.18	0.41	0.17	-0.82	2.08	-0.82 *	0.28
Post reform indicator	9.29	5.10	7.54	4.99	5.40	3.42	5.41	7.79
Comprehensiveness post reform	-0.75 ***	0.22	-0.72 **	0.26	-0.60 **	0.18	-0.60	0.43
Per capita income	0.79 ***	0.16	-0.09	0.21	-0.47	0.33	-0.47	0.56
Unemployment	-0.4	0.24	-0.63 **	0.24	-0.29	0.22	-0.29	0.34
Population density	0.02 ***	0.00	0.03 ***	0	-0.02	0.01	-0.02	0.03
Owner-occupied homes	-0.25 **	0.07	-0.29 ***	0.07	0.98 **	0.31	0.98	0.62
Youth proportion	2.28 **	0.71	2.83 ***	0.7	0.84	0.74	0.84	1.55
Minority proportion	-0.04	0.04	-0.11 **	0.04	0.16	0.19	0.16	0.32
Family court	-10.53 ***	2.28	-11.15 ***	2.24	-6.89 ***	1.91	-6.89	4.16
Public safety dollars	0.04 ***	0.01	0.03 **	0.01	0.00	0.01	0.00	0.02
Overall crime rate	0.85 ***	0.00	0.87 ***	0.02	0.67 ***	0.03	0.67 ***	0.06
Time trend			4.20 ***	0.42	4.57 ***	0.37	4.57 ***	0.61
Time trend squared			-0.17 ***	0.02	-0.17 ***	0.02	-0.17 ***	0.02
R-squared	0.70		0.72		0.88		0.88	

<sup>a</sup>Though not reported, models included county fixed effects

<sup>b</sup> Model estimated using clustered robust standard errors

\*\*\*p < .001 \*\*p < .01 \*p < .05



Table 3.5 Estimated effects of individual sanctions components on county-level juvenile crime rates

	Model 1	Model 2	Model 3 <sup>a</sup>	Model 4	Model 5	Model 6 <sup>a</sup>	Model 7	Model 8	Model 9 <sup>a</sup>
	B	B	B	B	B	B	B	B	B
	SE	SE	SE	SE	SE	SE	SE	SE	SE
Continuum comprehensiveness		0.53 **	0.53		0.67 ***	0.67		0.38	0.38
		0.20	0.61		0.19	0.47		0.21	0.62
Post reform indicator	-4.33 **	6.46	6.46	-4.82 *	7.52 **	7.52	-4.62 *	7.40	7.40
	1.55	5.30	8.12	2.25	4.98	7.83	1.52	5.64	9.73
Comprehensiveness post reform		-0.63 *	-0.63		-0.79 **	-0.79 *		-0.71 *	
		0.30	0.47			0.40		0.32	
Full availability of sanctions components post-reform (interaction term)									
Structured activities	-3.59	-1.45	-1.45						
	1.93	2.18	2.81						
Restorative programs				-0.96	1.59	1.59			
				2.15	2.35	3.06			
Community day programs							-3.34	-0.14	-0.14
							2.10	2.56	3.53
Clinical services									
Residential programs									

Note. Though not reported, all models were estimated using all control variables, the time trend variables, and the corresponding component indicator for the reported sanctions component interaction term

<sup>a</sup>Estimated with clustered robust standard errors

\*\*\*p < .001 \*\*p < .01 \*p < .05

Table 3.5 (continued)

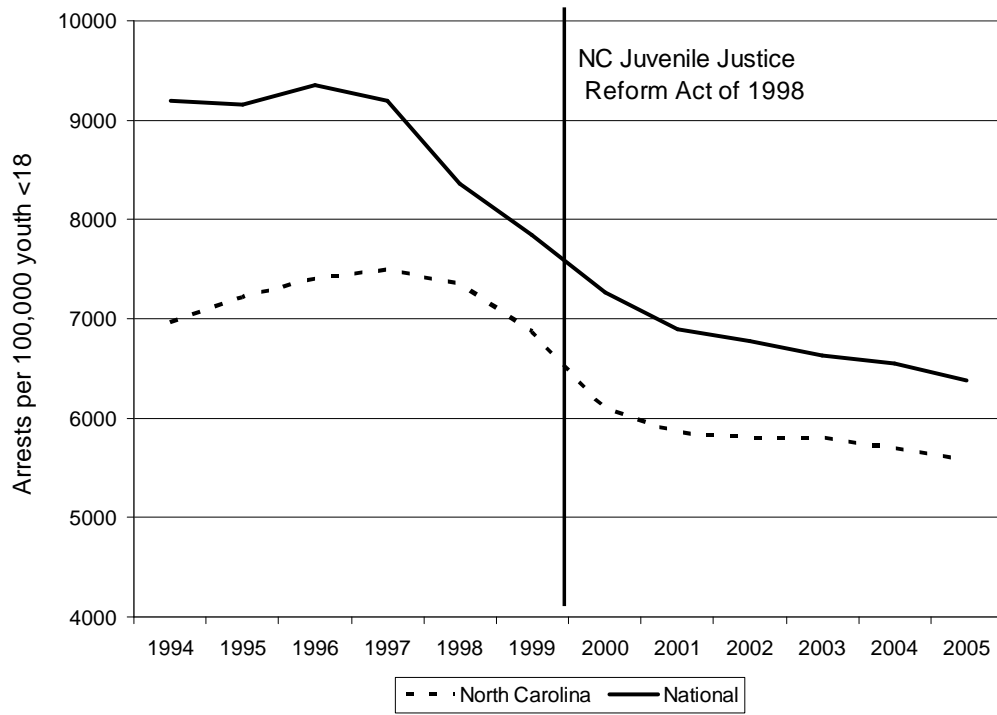
	<u>Model 10</u>	<u>Model 11</u>	<u>Model 12<sup>a</sup></u>	<u>Model 13</u>	<u>Model 14</u>	<u>Model 15<sup>a</sup></u>	<u>Model 16</u>	<u>Model 17</u>
	B	B	B	B	B	B	B	B
	SE	SE	SE	SE	SE	SE	SE	SE
Continuum comprehensiveness		0.39 *			0.36	0.36		0.85 **
		0.18	0.53		0.19	0.58		0.31
Post reform indicator	-5.13 ***	7.28	7.28	-4.64 **	3.66	3.66	-3.48	-2.13
	1.47	5.02	7.89	1.44	5.40	7.79	2.31	7.04
Comprehensiveness post reform		-0.69 **	-0.69		-0.47	-0.47		-0.08
		0.27	0.44		0.30	0.44		0.47
Full availability of sanctions components post-reform (interaction term)								
Structured activities							-2.35	-2.18
							2.05	2.22
Restorative programs							0.89	0.87
							2.21	2.40
Community day programs							-2.59	-2.29
							2.16	2.79
Clinical services	-2.29	-1.17	-1.17				-2.54	-2.44
	2.31	2.35	2.92				2.37	2.48
Residential programs				-7.28 **	-5.24	-5.24	-7.22 **	-6.78 *
				2.50	2.80	3.31	2.54	3.03

Note. Though not reported, all models were estimated using all control variables, the time trend variables, and the corresponding component indicator for the reported sanctions component interaction term

<sup>a</sup>Estimated with clustered robust standard errors

\*\*\*p < .001 \*\*p < .01 \*p < .05

Figure 3.1 National and state juvenile crime trends



## CHAPTER 4

### COMMUNITY-BASED SANCTIONS OR SECURE CUSTODY

Custody rates for juveniles increased throughout the early 1990s and have begun to decline in the last decade. Concerns about the cost, cost-effectiveness, and racial disparity in the use of secure custody for juveniles arose in response to the rising trend. Such issues have likely contributed to the consideration of sanctions alternatives. The use of graduated sanctions as a commonly adopted policy in state juvenile justice systems may have helped decrease custody rates. Federal legislation defines graduated sanctions as a wide array of escalating sanctions for juveniles that are expected to be based in local communities whenever public safety is not compromised. Such community-based alternatives provide greater dispositional options and help ensure that secure custody is used only in cases involving the most serious offenses.

This study examined the effect of available community-based sanctions on county-level juvenile custody rates in one state. North Carolina passed juvenile justice legislation formalizing the use of community-based sanctions in 1998. One of the explicit goals of the policy was to reduce reliance on secure custody for juveniles. In order to isolate the effect of the policy reform, other influences on custody rates need consideration. This chapter provides a brief review of the literature concerning determinants of punishment policy. Given concerns about racial disparities in the use of secure custody, theories about punishment that consider race are emphasized. Multivariate regression analysis with a

county-level longitudinal dataset was used to examine the effect of the legislation on juvenile custody rates while controlling for alternative explanations for punishment practices.

### Punishment for Juvenile Offenders

#### *National Juvenile Custody Rates*

The late 1980s ushered in a punitive cycle of juvenile justice and the use of secure custody as a sanction for delinquency increased. Once juveniles had been adjudicated delinquent in court, there was an increase in the use of confinement in a secure or residential facility as compared to other disposition options. The proportion of adjudicated juveniles placed in custody increased from 10.8% in 1991 to 12.9% in 2000 and then began to decline to 11.1% in 2004 (Stahl, Finnegan, & Kang, 2007). Day counts of youth in residential placement also showed a high point in the use of secure custody in the late 1990s. The number dropped from a rate of 356 juveniles in custody per 100,000 youth in the population in 1997 to a rate of 295 in 2006 (Sickmund, Sladky, & Kang, 2008).

#### *Effectiveness and cost-effectiveness of secure custody in reducing juvenile crime*

According to the economic model of crime (Becker, 1968; Levitt, 1998), harsher punishments or greater probability of apprehension and punishment will deter criminal behavior because of the increased cost associated with criminal choices. Secure custody, a harsh punishment as compared to other sanctions options, should theoretically deter delinquent behavior among youth. Findings from deterrence studies in juvenile justice, however, are mixed. Some studies have shown that increased use of secure custody decreased crime (Levitt, 1998) and some did not (Guis, 1999; Schneider & Ervin, 1990; Steinberg & Haskins, 2008). A recent study of New York City youth compared offenders

disposed to secure custody to those subject to community-based sanctions and showed that secure custody actually increased the likelihood of recidivism (Noe, 2008).

In addition to questions about effectiveness, policy professionals and researchers have also been concerned about the cost of juvenile incarceration which is significantly higher than other community-based alternatives (Austin, Johnson, & Weitzer, 2005). Cost-benefit analysis studies have indicated that reliance on incarceration and harsh sentencing is not a cost-effective alternative compared to other strategies for juvenile crime control and reduction (Fass & Pi, 2002; Greenwood, Model, Rydell, & Chiesa, 1996; Roberts & Camasso, 1991; Robertson, Grimes, & Rogers, 2001). Recent studies suggest that the general public also places more value on rehabilitative spending for juveniles than the costs of more punitive options like secure custody (Krisberg & Machionna, 2007; Nagin, Piquero, Scott, & Steinberg, 2006).

#### *Racial Disparity in Secure Custody*

Racial disparity exists at all levels in the juvenile justice system, including secure custody rates. Although custody rates for all youth populations have declined in recent years, minorities consistently have a higher rate of out-of-home placement than whites or the total adjudicated population. Figure 4.1 shows the national trend over time and compares the overall rate to subgroups based on race or ethnicity. The 2005 national rate of out-of-home placement per 100 adjudicated juveniles was 22.5 for all youth, but 20.7 for white youth, 25.4 for black youth, and 31.0 for American Indian or Alaskan Native youth (Puzzanchera & Adams, 2008). Census counts of youth in residential placement on a given day show a more striking racial disparity. In particular, the number of black juveniles in residential placement on a given day in 2006 was 767 per 100,000 youth compared to a rate of 170 for white youth

(Sickmund et al., 2008). Multiple concerns including cost, effectiveness, and racial disparity may have prompted policy efforts to reduce reliance upon secure custody for juveniles.

## Federal and State Sanctions Policy

### *Federal Graduated Sanctions Policy*

The recent trend of decreasing secure custody rates corresponds to federal and state efforts to support alternative sanctions policy in juvenile justice (Austin et al., 2005; Coolbaugh & Hansel, 2000; Howell, 2003; Matese & Tuell, 1999; Mondoro, Wight, & Tuell, 2001; Wiebush, 2002). Beginning in 1998, federal funding for state juvenile justice systems has been contingent upon the use of graduated sanctions (Development Services Group, 2002; Griffin, 1999; Parent & Barnett, 2003). Legislative and administrative documents define graduated sanctions as an array of sanctions, available for every offense, that are sure, immediate, individualized, and that escalate with subsequent and more serious offenses. In addition, the definition specifically emphasizes the use of community-based sanctions when appropriate and safe (Consequences for Juvenile Offenders Act, 2002; Howell, 1995).

### *Community-Based Sanctions in North Carolina*

In order to specifically identify the effect of available community-based sanctions on secure custody rates, it may be helpful to focus on juvenile justice reform in one state. North Carolina is one of many states which enacted juvenile justice reforms, including the adoption of graduated sanctions, during the 1990s. Given a strong system of county government and mandated local responsibility for the establishment of alternative sanctions for juveniles, North Carolina provides an opportunity to utilize variability in local continuums of sanctions to evaluate state policy outcomes. North Carolina's Juvenile Justice Reform Act of 1998 established multiple reforms that took effect in July of 1999, including the creation of the

state Department of Juvenile Justice and Delinquency Prevention (Mason, 1999). Similar to legislative efforts in most states (Mears, 2002), reforms included the introduction of risk and needs assessment tools and a disposition grid to guide juvenile sentencing decisions. In addition, state law mandated the creation of county-based JCPCs to provide a continuum of community-based services and sanctions at the local level. Counties partner with the state to ensure a wide array of available sanctions options. As in many other states, the sanctions continuum component of the reform is guided in part by the OJJDP's Comprehensive Strategy for chronic, serious, and violent offenders (Wilson & Howell, 1993).

State legislative reforms included multiple policy goals, including the development of “noninstitutional dispositional alternatives that will protect the community *and the juvenile*” (Juvenile Justice Reform Act, 1998, emphasis added). The law acknowledged the need for protection of juveniles, which reasonably encompasses the appropriate and fair use of secure custody. The availability of a community-based continuum of services, as well as a dispositional matrix to guide decision-making, was expected to ensure juvenile offenders would receive appropriate sanctions and only those with the most severe offenses and offense histories would be sentenced to secure custody. If community-based sanctions are viewed as an alternative to secure custody, then a higher level of available options should decrease juvenile secure custody rates.

#### Alternative Explanations for Punishment

##### *Studies of Adult Incarceration Rates*

To assess the effects of the reform legislation on custody rates, it is important to consider alternative explanations for variation in utilization of secure custody. Studies of state-level incarceration rates for adults have examined effects of crime levels, political



influences, regional differences, economic conditions, and demographic variations in subgroups that may be perceived as a threat to social order (Greenberg & West, 2001; Jacobs & Carmichael, 2001; Smith, 2004; Yates & Fording, 2005). Two studies employed a random effects statistical model using state-level pooled cross-sectional data across three time periods. Jacobs and Carmichael (2001) found that the strength of the Republican Party had the largest positive effect on incarceration rates. Proportion of blacks in the state population also had a positive effect on incarceration. Greenberg and West (2001) conducted a similar study and found that higher violent crime rates increased incarceration rates, as did unemployment and proportion of the population that is black. Smith's study (2004) used annual state-level data from 1980 to 1995 with panel-corrected standard errors and found no significant effects for the crime rate. The black proportion of the population was a positive and significant predictor of incarceration rates, and higher percentages of Democratic partisanship decreased incarceration rates. A state-level evaluation of the effect of sentencing guidelines on incarceration rates used many of the above variables as controls (Nicholson-Crotty & Meier, 2003). The proportion of the population that was black and the crime rate both had statistically significant positive effects on incarceration rates.

#### *Juveniles, Punishment, and Race*

Many of the studies of adult incarceration rates found that the minority proportion of the population had an effect on punishment outcomes. Fewer studies have directly examined determinants of custody rates for juveniles. The overrepresentation of minority juvenile populations in secure custody, however, raises particular concern about the possible effects of racial bias in juvenile dispositions. Though explanations for racial disparity may vary, literature reviews of past studies in juvenile justice have supported the notion that minority

youth in the juvenile justice system may be subject to different sentencing outcomes based upon race (Bishop & Frazier, 1996; Engen, Steen, & Bridges, 2002; Lieber, 2002; Pope, Lovell, & Hsia, 2002).

The symbolic threat framework posits that areas with higher proportions of groups perceived as a threat to social order will make greater use of formal social control mechanisms such as secure custody (Hawkins, 1987; Quinney, 1970; Sampson & Laub, 1993; Smith, 2004; Tittle & Curran, 1988). Some scholars have attributed the creation of the juvenile justice system as a whole to the desire to control specific groups in the population considered to be dangerous or threatening—young urban immigrants in particular (Platt, 1977; Sutton, 1990). Recent decades have seen a resurgence of concern about subgroups in the population perceived as dangerous (Garland, 2001; Rose, 2002).

Some studies in juvenile justice have directly assessed whether professionals perceive offenders differently based upon their race, lending support to the symbolic threat framework. Probation officers may view black youth as more likely to recidivate than white youth because they link criminal behavior to internal personality traits that may not be amenable to treatment (Bridges & Steen, 1998). Juvenile justice personnel have expressed beliefs about racial differences in terms of delinquency involvement and cooperation during the court process (Lieber & Jamieson, 1995; Lieber & Stairs, 1999). In a study with over 5,000 randomly selected delinquency cases from three jurisdictions in Iowa, African-American youth from the jurisdiction whose staff held the strongest beliefs in racial differences pertaining to criminal behavior and attitudes were more likely than whites to be referred for formal court processing at intake (Lieber & Stairs, 1999).

Building upon assumptions of the symbolic threat framework, studies in juvenile justice have assessed the effect of race on decision-making outcomes for juveniles. Lieber and Mack (2003) examined whether race, gender, or household composition affected decision-making at multiple levels of the juvenile justice system. The individual-level study used a random sample of 6,993 youth from four Iowa counties, including a disproportionate sampling of African Americans, over a decade-long time span beginning in 1981. Analysis was conducted using a multivariate logistic regression model, controlling for selection bias using a hazard rate calculated in a two-stage model. The study found that African-Americans were more likely than whites to be referred to formal court proceedings at intake. Effect of race was not significant at the decision-making point regarding disposition to secure custody versus other options. Noting discrepancies in juvenile custody rates across states, Mears (2006) used a cross-sectional design to examine different explanations, including those based upon tenets of symbolic threat, for variation in state-level custody rates for juveniles. Alternative explanations included the use of juvenile incarceration as a response to legitimate concerns about juvenile crime, a reflection of prevalent adult policies, or regional differences in the cultural acceptance of punitive policies. In models including all control variables, results showed that juvenile property crime, adult violent crime and incarceration rates, and regional indicators had the strongest effects on juvenile incarceration.

### *Geography and Juvenile Justice*

Some scholars have argued that the sense of symbolic threat, and corresponding patterns of differential treatment, may vary based upon urbanization and geographic region (Hawkins, 1987; Lieber & Stairs, 1999). Other cultural or ideological attitudes about crime and institutional responses to crime are likely to vary by region (Jacobs & Carmichael, 2001;

Mears, 2006). Feld (1991) has argued that the formality of urban courts tends to result in more severe sentences for juveniles. An older study of the juvenile justice system showed evidence of differences in youth confinement across states and regions (Krisberg, Litsky, & Schwartz, 1984). Both the adult criminal justice system (Mauer & King, 2007) and the juvenile justice system (Mears, 2006) show considerable variation in incarceration rates across states and regions, so possible influences on custody rates related to geography and urbanization should be considered.

### Research Design and Methodology

Using county-level longitudinal data, this study examined the effects of juvenile justice reform, and community-based sanctions in particular, on secure custody rates over time and across sites. Multivariate regression analysis was used to control for alternative explanations for variability in custody rates. Counties were classified in terms of the comprehensiveness of implementation in the local continuum of services. Counties with a high level of implementation served as the intervention group and those with low levels of implementation served as a comparison group in a quasi-experimental research design. Propensity scores were used to match counties, create a smaller sample of matched pairs, and control for the possible effects of selection bias.

### *Data*

Each county in North Carolina has a JCPC comprised of representatives from the juvenile courts, local law enforcement, human service providers, parents, and local youth that is responsible for the continuum of services provided to juveniles in the county. Annually, each JCPC is required to conduct an assessment of available services within the county and provide a standardized report describing existing services within six program types

(structured activities, restorative services, day programming, clinical assessment and services, and residential programs) and across multiple levels of supervision. The assessment reports for 93 of 100 counties from the planning years 2005-2006 and 2006-2007 constituted the basis of the data used to construct a measure of sanctions continuum implementation, classify counties in terms of high or low levels of implementation, and determine comparison groups. These years were chosen due to the availability of reliable data and to allow for a five-year period following the adoption of the Juvenile Justice Reform Act to allow for full implementation.

The measure of the comprehensiveness of continuum implementation in each county was based upon an additive sum of scores for each program type in each of three different levels of supervision (immediate sanctions, intermediate sanctions, post-release services to transition from secure custody) which are available to system-involved youth. According to the total implementation score, counties were classified as high or low implementers. For the purpose of this analysis, high implementation indicated that a county had 75% or more of suggested services fully available to youth. Other classification schemes were tested, but this categorization was chosen for its substantive interpretability and the goodness-of-fit of the logit models used to predict selection into the high implementation group. Nineteen of the 93 counties comprised the high implementation group. The indicator of high implementation served as the key explanatory variable in the policy evaluation.

The outcome variable was the county-level juvenile custody rate. The rate was the number of county youth admitted to one of the state-run secure Youth Development Centers (YDCs) per 10,000 youth aged 10-15 in the county for a given year. North Carolina's upper age limit for juvenile jurisdiction is 15, so all youth age 16 and higher would be processed in

adult court and not subject to secure custody in the YDCs. The data are available to the public from the North Carolina State Data Center, and the original source is the North Carolina Department of Juvenile Justice and Delinquency Prevention. Longitudinal data from the years 1990 to 2006 were used to measure custody rates before and after the adoption of the Juvenile Justice Reform Act of 1998. The total sample included 1,581 observations from 93 counties over 17 years. Additional longitudinal demographic, economic, and political data used as control variables are also available to the public from multiple state agencies through the State Data Center. Table 4.1 contains descriptive statistics for all variables.

*Statistical Model and Explanatory Variables*

This study used a difference-in-difference (DD) statistical model to examine effects of juvenile justice reform, including mandated community-based sanctions continuums, in North Carolina. A DD model simultaneously controlled for changes across time (before and after the policy was adopted) and between different types of counties to isolate the average treatment effect. The basic model can be represented by the equation:

$$\text{CustodyRate}_{ct} = \alpha + \beta_1 \text{CBS}_c + \beta_2 \text{P}_t + \beta_3 (\text{CBS}_c * \text{P}_t) + \beta_4 \text{C}_{ct} + \beta_5 \text{X}_{ct} + \beta_6 \text{Z}_c + \beta_7 \text{T}_t + u_c + e_{ct}$$

The outcome variable was the county-level juvenile custody rate. The key explanatory variable in the analysis,  $\text{CBS}_c$ , was an indicator variable that represented county membership in a particular comparison group based upon the degree of implementation of community-based sanctions. It took on a value of 1 if the county had a high level of implementation of the sanctions continuum and 0 if it did not.  $\text{P}_t$  represents an indicator variable for the time period before or after the juvenile justice policy reforms were adopted. The post-reform period was coded as 1. The interaction term between the group indicator and time indicator

isolated the effect of the policy and controlled for the effects of time and existing differences between groups.

Multiple measures of crime ( $C_{ct}$ ) were also included in the model to control for the possibility that increased custody rates reflected an institutional response to increased delinquent activity. In addition to the overall juvenile arrest rate, the juvenile violent crime rate was included in some analyses because secure custody is most often used in cases involving serious crimes. County-level juvenile arrest data specifically for violent crime were not available for the entire time period. As a proxy, the overall violent crime rate was discounted by the proportion of all criminal arrests involving youth ages 10-17 in each county for a given year. Because juveniles tend to commit violent crime at a lower rate than other crimes, the measure probably overestimated the level of juvenile violent crime. If the use of secure custody is a response to fear of crime, rather than actual crime by juveniles, it seems plausible that the overall violent crime rate would also affect custody rates because most violent crime is committed by adults. The measure utilized represents a level of violent crime that likely falls between the actual levels of juvenile and overall violent crime. The greater prevalence of adult crime as compared to juvenile crime may influence perceptions about criminal behavior and influence juvenile punishment practices, so the overall crime rate was also included in some models. Each of these three crime measures had observations with missing data, so the total analytical sample included 1,557 observations.

$X_{ct}$  represents a vector of time-varying controls for each county including demographic, political, and socioeconomic characteristics. The proportions of the county population that were adolescent, minority, and receiving welfare and percentage of families headed by female householders were included in the analysis, reflecting the practice in other

studies to consider the effect of group size for subpopulations that may be perceived as a threat to social order (Mears, 2006; Nicholson-Crotty & Meier, 2003; Smith, 2004). The models also utilized percent change in a five year-period for minority and youth populations. Per capita income, unemployment rate, population density, percent change in county population, and Democratic proportion of voters were included as controls.

Per capita expenditures for public safety and human services and an indicator variable to represent whether or not a county was within a jurisdiction with a family court were used as variables. Family courts have been introduced in different counties at various points over the time period in order to promote coordination of cases involving juveniles. These variables helped control for the influence of other policy changes in the state.

$Z_c$  represents the time-invariant indicator variables for geographic regions in the state that controlled for unobserved cultural or ideological differences in attitudes about crime. Three indicator variables were included to represent the eastern portion of the state, the central region including the capital county, and the far western region. The largest city in the state is in the reference region, labeled Piedmont. Table 4.1 provides descriptive statistics for the total analytical sample and by region. The most notable differences were the low crime and custody rates in the western region. Apart from the west, the reference region had the lowest incarceration rate despite the highest crime rate. Other large differences across regions were evident in population density and minority percent. The smaller number of observations in the Piedmont was due to the seven counties in that region without sanctions data.

Interactions were tested to further isolate particular subgroups that may be subject to the highest use of secure custody and to examine regional effects. The model included



county-level random effects to account for the autocorrelation within counties over time. A random effects model allows the inclusion of time invariant variables in the analysis (Fitzmaurice, Laird, & Ware, 2004). A time trend variable and its square ( $T_t$ ) were included as a strategy to control for the serial correlation often found in crime data (Singer & Willett, 2003; Woolridge, 2003).

### *Propensity Score Matching*

The construction of comparison groups based upon varying levels of implementation was a key feature of this statistical model. Because the county-based JCPCs have discretion in developing the sanctions continuum, it was important to control for effects of self selection into high or low implementation groups (Berk, 2003). Local characteristics which affect custody rates were also likely to influence the degree of implementation of community-based sanctions. Using data from the pre-reform period of time, Table 4.2 shows the mean differences between high and low implementation counties in the analytical sample. Notably, the high implementation counties had higher crime rates, were more densely populated, and had a higher proportion of counties from the East region. These differences were all statistically significant. Many of these factors were probably also related to secure custody rates.

Other evaluations of criminal and juvenile justice initiatives have used propensity scores to address selection bias (Papachristos, Meares, & Fagan, 2007; Noe, 2008). Propensity scores were used to match each of the 19 counties in the high implementation group to one nearest neighbor in the low implementation group. Initial steps to assess the degree of common support between the two groups revealed two outliers in the high implementation group unlikely to find a match in the comparison group. See Appendix C for

the descriptive statistics of the log odds ratios for the two different groups. These two counties were excluded from the matching procedure, resulting in a matched pairs sample of 34 counties. Both probit and logit models were used to predict propensity scores. The logit model selected to match counties had the best overall model fit and is described in Table 4.3.

Once the matches were determined, a balancing test was conducted to ensure that the two groups showed no statistical differences in mean propensity scores and mean values of the covariates within quartiles constructed from propensity scores (Handa & Maluccio, 2008). Appendix D lists the mean differences in covariates and propensity scores by quartile. No statistical differences were found, likely due to the small number of counties in each group. The highest quartile only had one low implementation group in it, precluding the possibility of tests of significant differences. Because the high implementation counties with the highest propensity scores were unlikely to have good matches, three more counties were dropped and the matching procedure was repeated. The Chi square for the logit model predicting selection into high implementation was no longer statistically significant at the  $p < .05$  level and the proportion of explained variability dropped by 10%. In light of concerns about model fit and sample size, the three counties were retained and utilized in the matching procedure and final sample. Due to this limitation, matches for some of the counties were not optimal and selection bias may not have been adequately addressed.

The sample of 34 counties over 17 years, less the observations with missing crime data, yielded a total of 571 observations in the analytical sample. The matching procedure reduced the differences between groups in the pre-reform period as shown in Table 4.2. In particular, the large difference in population density decreased from 77.32 to 14.62 and was no longer statistically significant. The low implementation group included 28% of

counties from the central region as compared to 5% in the high group. The difference was eliminated in matching and both groups had 6% of counties from that region. Proportional differences in the other regions also improved or remained the same. The difference in the percent change in minority population was no longer statistically significant, changing from 8.31% in high implementation counties and 11.38% in low implementation counties to approximately 8% for both groups.

In contrast, the difference in minority proportion of the population did increase slightly, from 26% and 24% for high and low implementation groups respectively to 27% and 23%, and became statistically significant. Notably, differences remained in crime rates. The overall juvenile crime rate difference increased from slightly below 11 to slightly above 11, though its statistical significance decreased. The difference in juvenile violent crime decreased from 16.75 to 9.32, but the overall crime rate difference increased from about 5.03 to 7.27. Efforts to address selection bias did reduce some of the differences between the groups, but did not eliminate them. Specifically, the persistent overall difference in the juvenile crime rate may represent a factor that likely influences both implementation and custody rates.

## Results

### *Juvenile Justice Reform and Custody Rates*

Figure 4.2 illustrates a clear drop in the state custody rates over time and lists the mean custody rate for each time period. There was a statistically significant difference ( $p < .001$ ) in the mean custody rate for the pre and post-reform periods. On average, 7 less youth per 10,000 in the population were placed in secure custody following juvenile justice reforms. The drop represents about a 50% decrease. Both groups of counties saw a 7 point

decrease in custody rates; high implementation from 14.7 to 7.5 and low implementation from 15.3 to 8.1. Despite higher crime levels, the mean custody rate for the high implementation group was lower than the low implementation group in both time periods. The difference, however, was not statistically significant. Lack of available community-based sanctions alternatives may be associated with the use of secure custody in cases that would not otherwise warrant such a punitive response. The significant decrease in custody rates following juvenile justice reform is obvious in Figure 4.2, but the effect of available sanctions alternatives is not clear.

Positive relationships existed between custody rates and many of the variables used to examine alternative explanations for utilization of secure custody. Table 4.4 lists the Pearson correlation coefficients for the variables with the strongest associations with custody rates. The crime measures all had the largest correlation coefficients, and the overall juvenile crime rate ( $r = .39$ ) was larger than the juvenile violent crime rate ( $r = .31$ ), perhaps due to the imprecision of the violent crime measure. Among the socioeconomic variables associated with the idea of symbolic threat, welfare proportion had the strongest association with custody rates ( $r = .37$ ) and then minority proportion ( $r = .30$ ). Many of the other socioeconomic variables had high correlations with minority proportion, so they may explain some of the relationship between minority percentage and custody rates. In particular, the very high correlation between minority percentage and proportion of families headed by females ( $r = .82$ ) precluded the use of both simultaneously in the analytical models.

#### *Multivariate Analysis*

The initial regression model shown in Table 4.5 used the entire analytical sample. Due to the high correlations between groupings of explanatory variables (shown in Table 4.4)

the initial model used minority proportion without measures of female-headed homes, youth, or welfare percentages. Overall juvenile crime rate was used initially because of its stronger relationship with custody rates as compared to juvenile violent crime. Democratic proportion of voters was strongly correlated to minority percent ( $r=.78$ ) so it was excluded in the initial model. Figure 2.2 illustrates a non-linear trend in custody rates following reform, with the largest decrease in custody rates immediately following reform. Although the legislation was passed in 1998, reforms were implemented beginning July 1, 1999. Custody rates represent numbers for the calendar year, so the full impact of legislative changes would not be evident until 2000. An indicator of the immediate post-reform years of 2000 and 2001 and its interaction with the post-reform and high implementation group indicators were included in the analysis and reported in the first model of Table 4.5.

The inclusion of the second post-reform time indicator decreased the coefficient of the post-reform indicator, but it remained statistically significant. The drop in custody rates in the years immediately following reform was larger than later years. The indicator for the high implementation group was negative and significant, reflecting an average difference of 3 fewer youth per 10,000 in custody. This finding reflects the lower custody rate for that group in the pre-reform period evident in Figure 4.2. The interaction terms were not significant, so initial analysis suggested no significant difference in the decrease of custody rates between groups following reform. This finding may reflect the seeming convergence of custody rates immediately following reform. Among the control variables, both minority percent and juvenile crime increased the custody rate. Counties in the eastern region also had an average of 6 more youth in custody even controlling for socioeconomic differences and crime rates. Increased unemployment, growth in the minority population, and counties in a

family court jurisdiction had negative effects on custody rates. The time trend variable and its square were significant in all models, but their effects are not reported in the table.

Subsequent analyses then examined whether any of the variables correlated with minority percent in the county population served to mediate the effect on custody rates. Neither youth proportion nor welfare proportion rendered minority proportion insignificant, and neither variable was significant when introduced into the models alone or with minority proportion. Inclusion of female-headed households, however, rendered the estimate for minority proportion statistically insignificant. An increase in the proportion of female-headed households also increased custody rates. All later models, therefore, used the household variable rather than minority percent. Democratic proportion was also introduced because the collinearity with minority percent was no longer problematic. Similar steps were used to specify which crime variables resulted in the best models. Each crime variable was statistically significant when introduced individually, but estimates for overall crime and then juvenile crime showed slightly larger effects on custody rates than juvenile violent crime. When all three measures were introduced simultaneously, only overall crime was statistically significant. Violent crime was not significant when paired with either of the other crime variables, but juvenile crime remained significant when introduced with overall crime. For simplicity, the remaining models shown in Table 4.5 include only the overall juvenile crime rate to control for the general level of delinquent activity. Separate analyses using the other crime variables also showed statistically significant positive effect on custody rates.

Inclusion of additional control variables in the second model of Table 4.5 did not vary the results for the policy variables. The treatment effects of the high implementation group in either post-reform period remained insignificant. Because the model controlled for the

high implementation group in the post-reform period, the statistically significant negative effects of the post-reform indicators show that the low implementation group decreased custody rates by approximately 3 youth per 10,000 in each time period following the juvenile justice legislation. Excepting omitted or unobserved historical changes, it seems likely that the decrease for the low implementation group is a result of the reforms. Strong regional effects remained. In addition to the large positive effect of the eastern region, counties in the central region also had higher custody rates by approximately 4 youth per 10,000. Estimated effects of unemployment, percent change in minority and county population, and eastern region changed slightly in magnitude but remained significant and negative. Family courts were no longer significant. Both welfare proportion and percent of families headed by a female had positive and statistically significant effects on custody rates, but increased Democratic proportion decreased custody rates.

### *Regional Interactions*

Ideological differences based on region or urbanization could influence custody rates either through beliefs about perceived threats or beliefs about appropriate responses to crime (Hawkins, 1987; Lieber & Stairs, 1999, Feld, 1991; Mears, 2006, Jacobs & Carmichael, 2001). To further delineate the regional effects, interaction terms were created between the regions and each of the crime variables and the socioeconomic variables associated with assumptions of symbolic threat, including female households, welfare proportion, and minority percent. To assess differences based on urbanization, similar interaction terms were created using population density and the other variables, but none of those interactions were statistically significant. The only regional interactions that had an effect on custody rates included the crime variables. These results are listed in model 3 of Table 4.5. Interactions

between the juvenile crime rate and the eastern and central indicators were positive and statistically significant, but the overall effect of crime became statistically insignificant as did the regional indicators. In the Eastern region, an increase of 10 in the juvenile crime rate increased the custody rate by almost 2 youth compared to the reference region. The average increase for custody rates in the central region was approximately 1 with a similar increase in juvenile crime. The regional effects may be related to a more punitive stance in response to juvenile crime rather than varying perceptions about groups that may be perceived as a symbolic threat. When the overall crime and juvenile violent crime measures were used in interactions, the results were similar in that the interactions with the central and eastern regions were positive and significant but the crime measure and the regional indicators became insignificant. Effects for the post-reform indicators and other control variables did not change in terms of direction or significance except for the high implementation indicator. High implementation counties no longer had a statistically significant effect on custody rates prior to reform, so the regional-crime interactions may explain some of the pre-reform differences in groups. Effects of control variables varied only slightly, but the negative effect of family courts was again statistically significant indicating that counties in a family court jurisdiction had about 2.5 less youth per 10,000 in secure custody compared to those counties with traditional court structures.

### *Selection Effects*

The statistically significant predictors positively related to the likelihood of selection into the high implementation group included youth proportion and growth in the youth population, a Democratic District Attorney, human service expenditures, and population density as shown in Table 4.3. Counties in the central region were less likely to have high



implementation of sanctions continuums. Analysis with the smaller matched pairs sample showed the effects of some variables remained unchanged even when controlling for some of the observed selection bias as shown in the last model in Table 4.5. A 10% increase in the proportion of families headed by a female increased the custody rate by 5 youth, but a 10% increase in county population decreased the custody rate by 3.6 youth. The regional effect for the east remained positive and significant, with 9 more youth in custody in that region, and family courts decreased custody rates by 5 youth. Welfare proportion and unemployment became insignificant. Finally, the post-reform indicator remained significant and negative suggesting a lingering effect of legislation reform for the low implementation groups. Despite efforts to control for selection bias and decrease differences in comparison groups, the significant and negative effect of the high implementation group variable indicated that the two groups had a difference of 4 youth in custody per 10,000 prior to reform. Though omitted or unobservable variables may explain the difference, it seems possible that counties without community-based sanctions alternatives used secure custody to address juvenile crime for lack of other options.

### Discussion and Policy Implications

This study has shown that juvenile custody rates in North Carolina decreased significantly following juvenile justice reform. The role of community-based sanctions in the decrease, however, was less clear. Methodological challenges in measurement and efforts to correct for selection bias possibly obscured the true effect of community-based sanctions. Future research may be able to provide more rigorous and more precise approaches to untangle such methodological difficulties and provide greater confidence in the results. This study, however, provides important insights into the overall effect of

juvenile justice reform on custody rates, the significance of policy implementation, and consideration of regional differences in policy implementation and outcomes.

### *Methodological Limitations*

The measurement of policy implementation may not have been sufficiently precise to reflect the available sanctions alternatives in the community. The indicator variable for group membership reflected a classification based upon the availability of at least 75% of all program types across supervision levels. Other thresholds or classification schemes may have produced different results. The underlying index for the classification scheme was also based upon a solely quantitative measure of implementation. If counties had few services, but they were very high quality, perhaps that would have a greater effect than having extensive services of lesser quality. In order to minimize such a problem, North Carolina has made strenuous efforts to ensure the adoption of effective programs within the sanctions continuum through the development of protocols for program selection based upon evidence-based principles (Lipsey, Howell, & Tidd, 2007), legislative standards for program requirements, and ongoing program review. In light of these efforts to ensure program quality, it seems reasonable to use a quantitative indicator as a first step in measuring implementation.

The classification of counties into high and low implementation groups indicated the underlying variability of local continuums of sanctions. In terms of research, county variability provided both an opportunity to study differential effects of sanctions continuums and raised challenges to precise estimation. Classification based upon implementation introduced endogeneity into the evaluation, but alternative strategies also have inherent challenges. Since juvenile justice systems vary so decidedly between states, it would be

difficult to identify comparison groups in a state-level evaluation. Local variation in implementation also reduces the usefulness of state-level comparisons that assume a degree of uniformity. Within a state, however, most comprehensive policy changes are mandated for all youth so assignment to different policy intervention groups is difficult apart from demonstration projects. Most evaluations using random assignment occur at the individual level studying a specific program in a few counties or courts, but this study sought to examine policy outcomes using a different unit of analysis. Future evaluations with a quasi-experimental design may be strengthened by using different techniques to control for selection bias. If propensity score matching is used, it may be necessary to impose stricter conditions of common support (Handa & Maluccio, 2008) despite the loss of observations for the sample. Despite the limitations, the use of variability in local implementation of community-based sanctions represents a helpful strategy to examine the effects of a widely-used juvenile justice policy. This study does provide information about effects of juvenile justice legislation in North Carolina and more general insights about regional influences and other determinants of punishment for juveniles.

#### *Effects of Juvenile Justice Reform Legislation*

Reform legislation in North Carolina specifically sought to decrease the use of secure custody for juvenile offenders. Figure 4.2 shows a decrease of 7 commitments to secure custody per 10,000 youth for both high and low implementation counties. This represents about a 50% reduction and can be considered a very strong success in terms of intended policy outcomes. Tenets of the North Carolina legislation (Juvenile Justice Reform Act, 1998) and other states' efforts (Austin et al., 2005) are based on the assumption that the availability of sanctions alternatives facilitates dispositions other than secure custody. All

counties had services for youth prior to the enactment of reform, but the legislation formalized and governed the development of community-based sanctions. Low implementation counties had higher custody rates in the pre-reform period despite lower crime rates, so it seems plausible that those counties utilized secure custody for juvenile offenders that might have been better served with other sanctions options if they had been available. Reform legislation included the mandated use of a risk assessment tool and a sentencing grid that restricted the use of secure custody to cases involving violent or serious crimes or offenders with a high risk of recidivism. The significant and negative post-reform effect for the low implementation counties may reflect the forced departure from a practice of utilizing secure custody for non-violent offenders when other options were not available. The possibility of other unobserved or omitted historical influences precludes definitive conclusions, but it seems likely that the large decrease in custody rates is related to the legislation. Effects of community-based sanctions in particular are less clear.

Despite tentative results of this study, community-based sanctions as a part of juvenile justice reform should not be abandoned as a feature of juvenile justice reform. Implementation of sanctions was variable across counties. Though counties were given discretion to develop sanctions, results showed that socioeconomic conditions contributed to selection into a high implementation group. If counties lacked resources and inappropriately used secure custody because of the deficiency, the restrictions placed on the use of secure custody make it even more important to provide support to counties to ensure a full continuum of community-based sanctions. Formulas used by the state to disburse juvenile justice funding to counties should be evaluated to ensure the counties with service gaps can receive designated help. Additionally, it may be possible to facilitate collaboration across

counties who face similar implementation challenges. Community-based sanctions also serve to meet other policy goals such as crime reduction. Since overall juvenile crime was a positive and significant predictor of custody rates, community-based sanctions may indirectly affect custody rates by lowering crime rates.

#### *Other Determinants of Punishment for Juveniles*

Other studies have found that the legitimate threat of crime prompts punitive responses such as the use of incarceration for adults or juveniles (Greenberg & West, 2001; Nicholson-Crotty & Meier, 2003). This study also confirmed that increased juvenile crime increased secure custody rates. The effect persisted in all models with additional control variables or using the matched pairs sample to address selection bias. Additional findings indicated, however, that the threat of perceived crime may have also influenced utilization of secure custody. A significant and positive effect of the adult crime rate, even when controlling for juvenile crime, suggests that the use of secure custody may represent a punitive response to the perceived threat of crime based upon a general awareness of crime. Regional effects may also be based upon different ideological frameworks about responses to crime (Jacobs & Carmichael, 2001; Lieber & Stairs, 1999; Mears, 2006). Given the inclusion of controls for socioeconomic differences between regions, it seems reasonable to purport that unobservable differences, such as attitudes about crime, constituted the basis of the regional effects. Additionally, the only regional interaction terms that had a positive and significant effect on custody rates were the regional-crime interactions. These variables do not directly measure attitudes about crime, but the findings warrant consideration of ideological differences and effects on institutional responses to delinquency. Professional development for juvenile justice personnel and dissemination of information to the public

regarding evidence-based practices and policies may help reduce regional effects based upon ideological differences regarding institutional responses to both perceived and legitimate threat.

Similar to other studies, this evaluation found that minority percentage did have a positive and statistically significant effect on custody rates (Greenberg & West, 2001; Jacobs & Carmichael, 2001; Mears, 2006; Nicholson-Crotty & Meier, 2003; Smith, 2004). The findings should be viewed differently for two reasons. Most of the other studies specifically used the proportion of the population that is black. The available county-level data for this study only disaggregated the population into minority and non-minority. Some studies have shown that the differential beliefs related to assumptions of symbolic threat are held about black youth in particular (Bridges & Steen, 1998; Lieber & Stairs, 1999). Secondly, the effect of minority percent is rendered insignificant with the inclusion of the proportion of families headed by a single female. Some scholars have recognized that stereotypes about single-parent homes may contribute to a sense of symbolic threat that influences punishment outcomes (Lieber & Mack, 2003; Mears, 2006). An equally plausible explanation, however, is that family structure may be related to other factors such as a general level of community disadvantage that contributes to lack of resources and greater use of secure custody. The positive and significant effect of household composition does not lend direct support to the symbolic threat framework, but it is an important finding that warrants consideration as a mediator of racial effects on punishment practices.

### *Conclusions*

The findings of this study lend empirical support for recent juvenile justice reform efforts in North Carolina and can be used to inform similar legislative endeavors elsewhere.

Custody rates decreased following reform. While other historical explanations are possible, it seems likely that the decrease is the result of the policy changes. Community-based sanctions should be considered one part of a larger policy that includes guidelines for decision-making. Development of sanctions continuums in the state and elsewhere should be guided by a clear understanding of the interplay of specific policy components. Decision-making guidelines may have restricted the use of secure custody that counties had previously utilized in lieu of available alternatives. Restricted use of secure custody makes community-based sanctions more important as a strategy to reduce crime.

Individualized planning for juvenile offenders is hindered without a comprehensive continuum of sanctions. Family courts were not a primary focus of this study, but the significant and negative effect of family courts on custody rates persisted in all models. Family courts have been instituted to coordinate services for court-involved youth and ensure appropriate provision of needed services based upon individual needs. The effect of family courts lends tentative support to the importance of individualized service planning that may depend upon community-based sanctions. Comprehensive continuums of sanctions, however, rely upon local resources and collaboration among agencies within a community and between local communities that differ from one another in socioeconomic and possibly ideological ways. As North Carolina and other states facilitate the development of community-based sanctions in local communities, planning efforts need to address implementation challenges, regional differences, and possible effects of ideology.

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Table 4.1 Descriptive statistics by geographic region

Variables	Total (n=1557)		East (n=538)		West (n=459)		Central(n=357)		Piedmont(n=203)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Custody rate	12.24	11.69	16.65	14.57	6.99	7.78	13.02	10.34	11.04	6.79
Juvenile crime rate	49.38	33.27	54.78	39.00	32.67	19.08	52.93	30.68	66.59	31.13
Juvenile violent crime rate	34.11	33.59	34.54	29.02	17.55	15.98	44.40	32.71	52.30	53.32
Overall crime rate	57.89	29.23	66.49	34.79	42.69	20.06	60.59	23.73	64.72	26.00
Minority proportion of population	24.57	17.55	35.71	14.53	7.20	6.82	34.89	13.95	16.16	9.29
Youth proportion of population	10.64	1.08	11.10	0.93	9.84	0.93	11.03	1.15	10.58	0.45
Workfirst proportion of population	3.73	3.17	5.02	3.70	2.23	1.70	4.45	3.35	2.46	1.59
Female-headed household % of families	20.34	6.04	23.15	6.45	16.20	3.39	22.95	5.11	17.68	4.39
Percent change in minority population	9.11	11.57	4.41	5.84	13.71	17.35	9.50	7.23	10.47	7.54
Percent change in county population	7.87	6.70	6.01	7.39	6.88	3.94	10.89	7.75	9.74	5.36
Per capita income (in thousands)	21.42	5.26	20.34	44.49	20.85	46.26	22.01	6.08	24.54	56.73
Unemployment	5.67	2.40	5.96	1.97	5.79	2.88	5.74	2.52	4.53	1.60
Population density	164.75	201.77	105.82	134.28	127.16	112.17	192.68	202.28	356.79	337.82
Family court	0.05		0.07		0.05		0.05		0.04	
Public safety dollars per capita	130.57	68.89	132.18	90.27	136.35	63.71	125.62	47.42	121.98	39.14
Human service dollars per capita	194.35	103.65	205.00	103.26	170.19	75.91	219.14	137.38	177.16	71.23

Table 4.2 Mean scores from pre-reform time period by implementation category

Variables	Total sample			Matched pairs sample		
	Total n=915	High n=191	Low n=724	Total n=340	High n=170	Low n=170
Juvenile crime rate per 1,000 youth	50.79	59.27 ***	48.55	52.47	58.08 **	46.87
Juvenile violent crime rate per 10,000 yout	35.40	48.65 **	31.90	34.78	39.44 **	30.12
Overall crime rate per 1,000 people	60.54	64.52 *	59.49	61.26	64.89 *	57.62
Minority proportion of population	24.56	25.99	24.18	24.97	26.76 *	23.18
Youth proportion of population	10.61	10.71	10.58	10.70	10.72	10.68
Workfirst proportion of population	5.29	5.33	5.28	5.41	5.48	5.33
Female-headed household % of families	18.66	18.36	18.74	19.00	18.76	19.24
Percent change in minority population	10.74	8.31 **	11.38	8.12	8.00	8.24
Percent change in county population	8.63	9.05	8.52	8.26	8.24	8.29
Per capita income (in thousands)	19.07	19.32	19.00	18.69	18.79	18.59
Unemployment	5.48	5.34	5.51	5.69	5.59	5.78
Population density	155.20	216.38 ***	139.06	165.02	172.33	157.72
Family court	0.01	0.01	0.02	0.02	0.00 *	0.04
Public safety dollars per capita	105.50	110.64	104.14	103.90	104.38	103.42
Human service dollars per capita	162.52	156.60	164.09	154.66	153.93	155.38
East	0.35	0.53 ***	0.30	0.47	0.53 *	0.41
West	0.29	0.21 **	0.32	0.29	0.24 *	0.35
Central	0.23	0.05 ***	0.28	0.06	0.06	0.06

\*\*\*p < .001 \*\*p < .01 \*p < .05 in two-tailed tests of significance

Table 4.3 Logit model results for selection into high implementation group

Variables (n=91)	Beta	SE
Juvenile arrest rate	-0.01	0.02
Minority proportion of population	-0.05	0.06
Youth proportion of population	2.36 *	0.97
Growth in youth population	0.41 **	0.14
Growth in county population	-0.24 †	0.14
Growth in minority population	-0.06	0.07
Proportion of families headed by single female	-0.12	0.14
Population density	0.91 †	0.48
Per capita income (in thousands)	-0.53	0.47
County revenue per 100 people	0.30	0.39
Human service funding per 100 people	1.57 *	0.80
Local school funding per 100 pupils	0.50	0.34
Public safety dollars per 100 people	1.86	0.00
East	-1.24	1.96
West	1.09	1.58
Central	-6.23 *	2.66
Democratic District Attorney	2.60 †	1.58
Proportion of voters registered as Democrats	0.03	0.05
LR Chi <sup>2</sup> = 37.32** Pseudo R <sup>2</sup> = .426		

Note. To represent baseline levels, variables are averages of 1990-1991 data

\*\*p < .01 \*p < .05 †p < .10

Table 4.4 Correlation coefficients for crime variables and variables associated with minority percent

	Juvenile custody rate	Juvenile crime	Juvenile violent crime	Overall crime rate	Minority percent	Female- headed household	Workfirst percent
Juvenile crime	0.39						
Juvenile violent crime	0.31	0.69					
Overall crime rate	0.40	0.79	0.44				
Minority percent	0.30	0.24	0.34	0.36			
Female-headed households	0.23	0.32	0.37	0.40	0.82		
Workfirst percent	0.37	0.19	0.22	0.32	0.57	0.33	
Youth percent	0.22	0.30	0.21	0.30	0.68	0.54	0.47



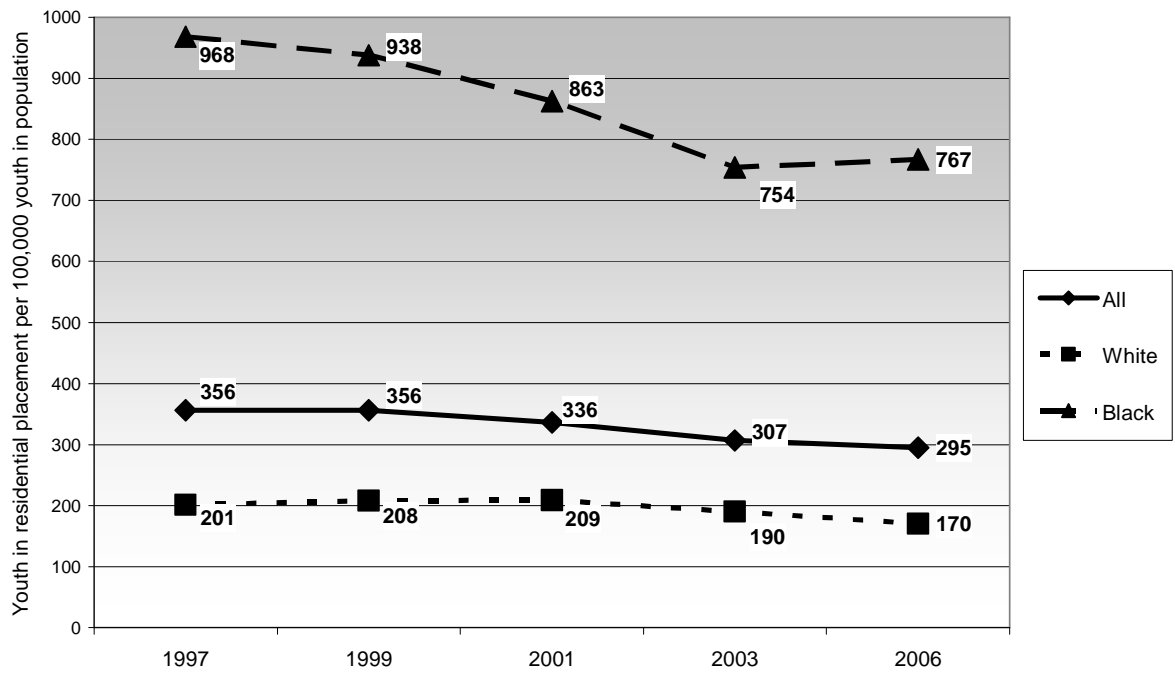
Table 4.5 Regression analysis predicting county-level juvenile custody rates

Variables	Full sample (n=1557)						Matched sample (n=571)	
	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
High implementation indicator	-3.07 *	1.28	-2.68 *	1.24	-1.76	1.24	-4.05 **	1.47
Post reform indicator	-2.23 **	0.81	-3.18 **	1.22	-2.91 *	1.21	-5.08 *	2.38
Immediate post reform indicator	-2.98 **	0.90	-2.85 **	0.91	-2.96 **	0.90	0.75	1.93
Post reform*High implementation indicator	1.06	1.24	1.15	1.23	0.33	1.23	0.47	1.89
Post reform*Immediate*High implementation	1.06	1.89	1.16	1.90	1.37	1.87	-1.13	2.76
Juvenile crime rate	0.08 ***	0.01	0.07 ***	0.01	-0.05	0.03	0.06	0.03
Minority proportion of population	0.09 *	0.04						
Youth proportion of population			0.17	0.41	0.16	0.40	-0.98	0.72
Female-headed households			0.33 **	0.11	0.33 **	0.11	0.47 *	0.20
Workfirst proportion of population			0.33 *	0.15	0.31 *	0.15	0.48	0.27
Percent change in county population	-0.15 *	0.07	-0.17 *	0.07	-0.16 *	0.07	-0.36 *	0.15
Percent change in minority population	-0.07 *	0.03	-0.09 **	0.03	-0.08 *	0.03	0.04	0.15
Percent change in youth population	-0.01	0.04	0.01	0.04	0.02	0.04	0.10	0.07
Democratic proportion of voters			-0.11 *	0.05	-0.06	0.05	-0.20 **	0.07
Per capita income (in thousands)	0.34 *	0.17	0.29	0.16	0.33 *	0.16	0.22	0.30
Population density	0.32	0.34	0.12	0.33	0.27	0.32	-0.52	0.59
Unemployment	-0.37 **	0.14	-0.44 **	0.15	-0.55 ***	0.15	-0.13	0.24
Eastern region	6.53 ***	1.790	7.13 ***	1.70	-4.70	2.74	9.09 ***	2.14
*juvenile crime					0.19 ***	0.04		
Central region	2.64	1.87	3.63 *	1.78	-4.61	2.85	0.51	3.53
*juvenile crime					0.12 **	0.04		
Western region	1.23	1.72	0.41	1.64	-3.51	2.65	-0.72	2.34
*juvenile crime					0.02	0.04		
Family court district	-2.62 *	1.24	-2.15	1.24	-2.56 *	1.23	-5.27 *	2.16
Public safety funding	-0.57	0.64	-0.61	0.63	-1.04	0.62	-1.31	1.05
Human services funding	0.01	0.36	0.14	0.36	-0.01	0.3600	1.30	0.68

Note. All analyses used random effects models that included a time trend variable and its square.

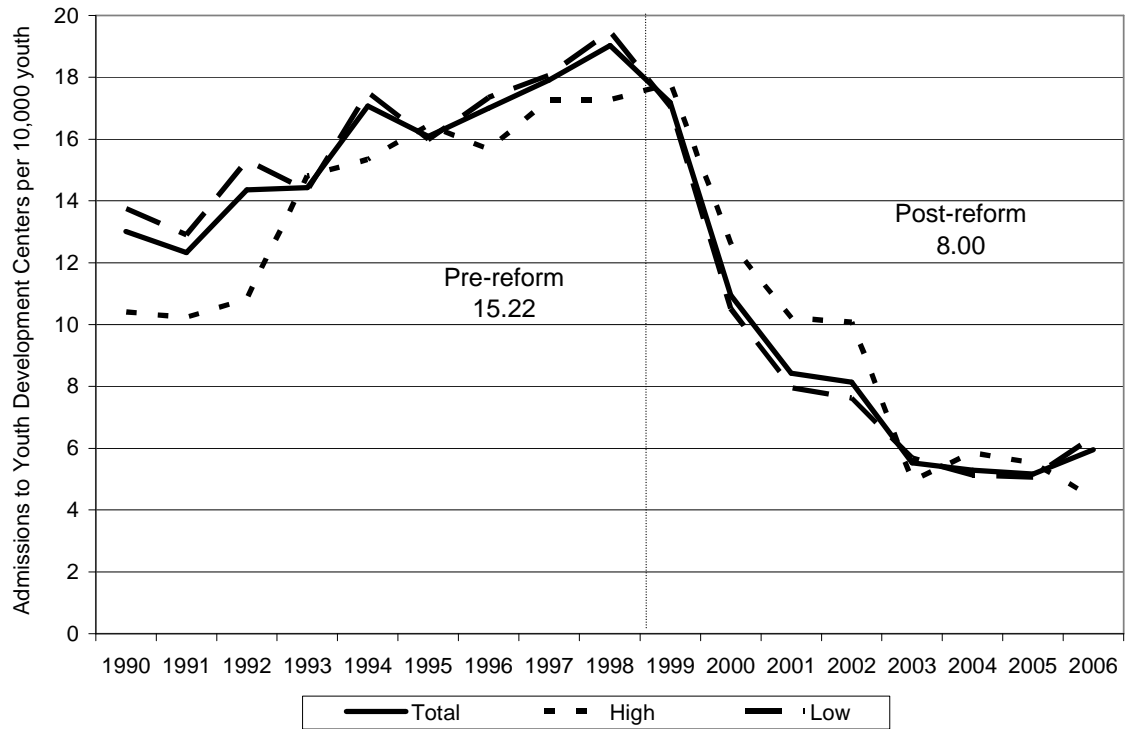
\*\*\*p<.001 \*\*p<.01 \*p<.05

Figure 4.1 National juvenile custody rates by race



Data Source: Sickmund, Melissa, Sladky, T.J., and Kang, Wei. (2008). Census of juveniles in residential placement databook.

Figure 4.2 Juvenile custody rate trends in North Carolina



## CHAPTER 5

### SUMMARY AND CONCLUSIONS

North Carolina legislation mandated policies to strengthen community-based sanctions as one key element in juvenile justice reform passed in 1998. This study has shown that reform initiatives helped to reduce delinquency and decrease reliance on secure custody for juveniles. Availability of a broad spectrum of sanctions and services within a county helped to reduce county-level crime rates. In particular, community-based residential programs had a large negative effect on both juvenile crime rates and secure custody rates. Limitations of the study warrant caution in drawing conclusions. Nonetheless, the results provide insight to improve continued policy development efforts that strengthen community-based sanctions for juveniles.

#### Study Limitations

##### *Data and Measurement Issues*

Many of the challenges inherent in this study are related to available data and measurement issues. Crime rates in this study were based upon official arrest statistics. The use of official crime data is considered problematic in part because such data tend to underestimate crime and combine both criminal activity and system responses to crime (MacDonald, 2002). North Carolina does have county-level delinquency rates available to the public from court records, but the data begin at the peak of the juvenile crime trend in 1994 and likely would not provide an adequate baseline to examine changes. In addition, court data also reflect differences in both delinquent behavior and system responses. Self-reported delinquency measures are not

available at the county level. These data limitations are common to all criminal justice researchers and should not prevent efforts to better understand and address delinquent behavior.

Use of individual level data may have allowed greater precision in measurement regarding delinquent activity, but the underlying research question in this study identified the county as the most appropriate unit of analysis. Individual behavioral change most likely occurs at the program level with specific services targeted to the needs and risk factors of individual youth. Evaluation of those specific programs should involve individual level outcomes. Provision of appropriate services depends upon individual information and the availability of many sanctions options. The comprehensiveness of a local sanctions continuum allows for individualized services to many delinquent youth. Development of community-based sanctions is a county-level policy intervention intended to facilitate a general reduction in juvenile crime through varying programs and sanctions. Despite the difficulties with an aggregate measure of crime using official data, county-level crime rates are appropriate measures given the particular focus of the policy intervention.

Data limitations specific to this study are perhaps more problematic. The lack of implementation data from seven counties prevented their inclusion in the study and limits generalization to the entire state. Located in one part of the state, the counties tend to be smaller and less densely populated than the remaining 93 counties. These differences may have affected the results. Because North Carolina has such an expansive system of county government, sufficient observations were still available for analysis and conclusions could be drawn about the vast majority of the state.

This study created quantitative measures of implementation to examine variability in sanctions across counties and then utilized the variability to examine the effects of sanctions on

policy outcomes. The strategy raised two primary issues, the measurement of implementation and the threat of selection bias inherent in using differential implementation to distinguish between counties in terms of the level of policy intervention. Many policy implementation studies are case studies that rely on qualitative methods to examine both the extent and predictors of implementation. Without a clear guide to develop a quantitative policy implementation measure, this study relied upon models in school-based intervention research (Dusenbury, Brannigan, Falco, & Hansen, 2003; Hahn, Noland, Ravens, & Christie, 2002; Orthner, Akos, Charles, & Cooley, 2005; Tappe, 1995, 1997). Many of the evaluations used additive indexes of intervention components, such as number of curriculum lessons taught, similar to the index of sanctions components used in this study. Though sanctions components were designated as not available, partially available, or fully available, no attempt was made to further distinguish services within a sanctions component. Quality of programs was not considered, apart from the state's ongoing efforts to ensure a minimum level of quality in program selection and retention.

The state can help improve future evaluations of community-based sanctions through efforts to develop valid and reliable measures of implementation of community-based sanctions. The Standardized Program Evaluation Protocol provides a process for rating the quality of programs utilized within local sanctions continuums (Lipsey, Howell, & Tidd, 2008). Continued use of this protocol can help improve implementation measures by incorporating aspects of both the quality and quantity of available programs to produce a more valid measure of implementation. In addition, training the JCPC consultants regarding the local services assessment process can help provide more reliable measures of implementation across counties. Consultants should utilize similar standards for consideration of what services fall within a given program category and what constitutes availability or accessibility of programs. The staff can

then facilitate the county-level decision-making processes to ensure each county is using similar rating criteria for the sanctions continuums. Consistency across counties will improve the reliability of implementation measures. The implementation measure should be improved, but the deliberate effort to measure and assess implementation variability represents progress beyond assumptions of uniformity in policy implementation.

### *Selection Bias*

The variability that enabled comparisons between counties also introduced selection bias into the outcome evaluations. Factors that influenced implementation also likely influenced crime rates and custody rates. Various strategies were employed to address selection bias, but future research can also improve on these efforts and clarify relationships between economic resources, crime, and system responses to crime.

### Lessons Learned and Policy Implications

Despite the limitations, the study provides support for recent policy initiatives and offers insight for continued policy development. North Carolina's efforts to improve the juvenile justice system through the strengthening of community-based sanctions has contributed to reductions in juvenile crime and reduced reliance on secure custody for juvenile offenders. The study confirms the recent legislative decision to continue funding the county-level Juvenile Crime Prevention Councils which coordinate the local sanctions continuums. The study also provides empirical support for the decision to create smaller community-based residential programs rather than continue to rely solely on the larger, state-run secure Youth Development Centers.

### *Attitudes and Beliefs and Policy Implementation*

Other findings offer insight about possible strategies for continued improvement of community-based sanctions. Lessons for North Carolina offer insights for other states seeking to strengthen community-based sanctions. The first and most obvious conclusion is that policy implementation matters. Implementation of sanctions differed across counties, both in the overall level of available sanctions and in the availability of particular types of programs. Such variability was not just related to deliberate discretionary choices based upon local needs.

Several findings suggested that attitudes about crime and crime control may contribute to differential implementation. The ideological stance, assessed by a broad measure of political party affiliation, of a key juvenile justice leader increased the level of overall implementation. A Democratic leader also increased the likelihood that specific sanctions components would be fully available, but not all of them. Regional effects contributed almost 20% of the explanation for variability in implementation. Given multiple control variables representing socioeconomic differences between counties and regions, it seems likely that unobserved factors, such as belief systems or norms, were captured by regional indicators. The custody rate study clearly showed that regions with the highest crime rates did not have correspondingly high incarceration rates, suggesting differential responses to crime based upon region. Additional omitted variables may explain the differences, but multiple variables controlled for the biggest observed differences between regions.

If attitudes or belief systems affect policy outcomes, it seems important to encourage greater consensus among juvenile justice professionals and the public regarding effective strategies for crime control. Staff trainings and technical assistance programs, across regions, provide opportunities to diffuse information about evidence-based practice to juvenile justice



professionals. Such situations may also provide opportunities to assess differential attitudes and engage in discussion to facilitate consensus. The state plan to build community-based residential facilities also provides opportunities to engage with the public in various local communities regarding the evidence base supporting the policy decisions.

### *Resources and Policy Implementation*

Though the evidence is not as conclusive, results of this analysis also suggested that funding and economic resources may contribute to low availability of community-based sanctions. Bivariate analysis showed that counties with fewer financial resources tended to have fewer sanctions alternatives. Other variables may mediate these effects. Many of the socioeconomic variables had insignificant effects on crime or custody rates when selection effects were controlled, suggesting a relationship between those variables and implementation. In multivariate analysis, state funding for JCPCs was associated with decreased implementation levels. More densely populated counties tended to have higher levels of implementation.

In order to better understand the relationship between state funding and local resources and implementation, it will be important to examine the funding stream for various local programs, the state funding formula to determine allocations to local communities, and the disbursement of state funding within a county. The existing process with three different levels of required matches for state funding acknowledge that counties have varying resources with which to respond to state mandates. The designations for match requirements should be updated. In addition, it may be helpful to establish smaller categories of funding designated for particular sanctions components or programs that are lacking. Particular challenges to implementation, such as transportation in less densely populated areas, could also be addressed through specific funding. Conflict within local counties for limited resources from the state may affect

implementation. State efforts to encourage innovative, evidence-based, collaborative programs may reduce reliance on state funding and build consensus within a local community.

### *Policy Components*

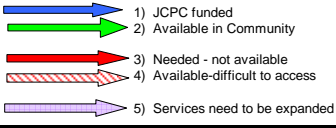
Finally, greater awareness of how the different components of juvenile justice reform work together may strengthen the juvenile justice system. The underlying strategy of graduated sanctions is to provide targeted sanctions and services to youth based upon individualized needs and risk of recidivism (Wilson & Howell, 1993). Individualized responses require both information specific to an offender and an array of sanctions alternatives. This study has focused on the latter. North Carolina assesses 98% of all delinquent youth using risk and needs assessment tools, and all local crime councils receive the aggregated information about youth in their local communities. The information alone is insufficient to ensure appropriate provision of services to individual youth. This study has shown that lower levels of available services do affect juvenile crime rates. The process of matching youth needs to available services is a necessary step toward crime reduction that involves the interplay of knowledge about youth and knowledge about community-based sanctions alternatives provided by a multitude of agencies. The Juvenile Crime Prevention Councils are one mechanism to facilitate the matching process. Though not the focus of this study, counties with family courts showed reductions in juvenile crime and secure custody rates. Family courts may represent another strategy to facilitate individualized service planning for delinquent youth. Greater understanding of organizational processes and the decision-making behavior of key actors will illuminate ways to facilitate not only the necessary provision of services but the matching of appropriate services to individual youth.

North Carolina serves as an example of a state utilizing evidence-based practice principles to strengthen the juvenile justice system. This study validates efforts to strengthen community-based sanctions in order to reduce juvenile crime. In addition, the shift toward smaller community-based residential programs holds promise for effectively addressing juvenile crime and reducing secure custody rates. Policy efforts will be strengthened by addressing attitudinal differences about appropriate system responses to delinquent youth. Re-examination of funding formulas and disbursement practices may help ensure sufficient resources to provide a wide array of sanctions options. Greater clarity about the process used to match individual youth with appropriate services and sanctions can help ensure the greatest likelihood of behavioral change. Recent increases in juvenile crime nationally and the prospect of further increases due to an economic recession underscore the importance of research to determine effective approaches to address delinquency. Effective crime control strategies rely upon the full implementation of community-based sanctions continuums.

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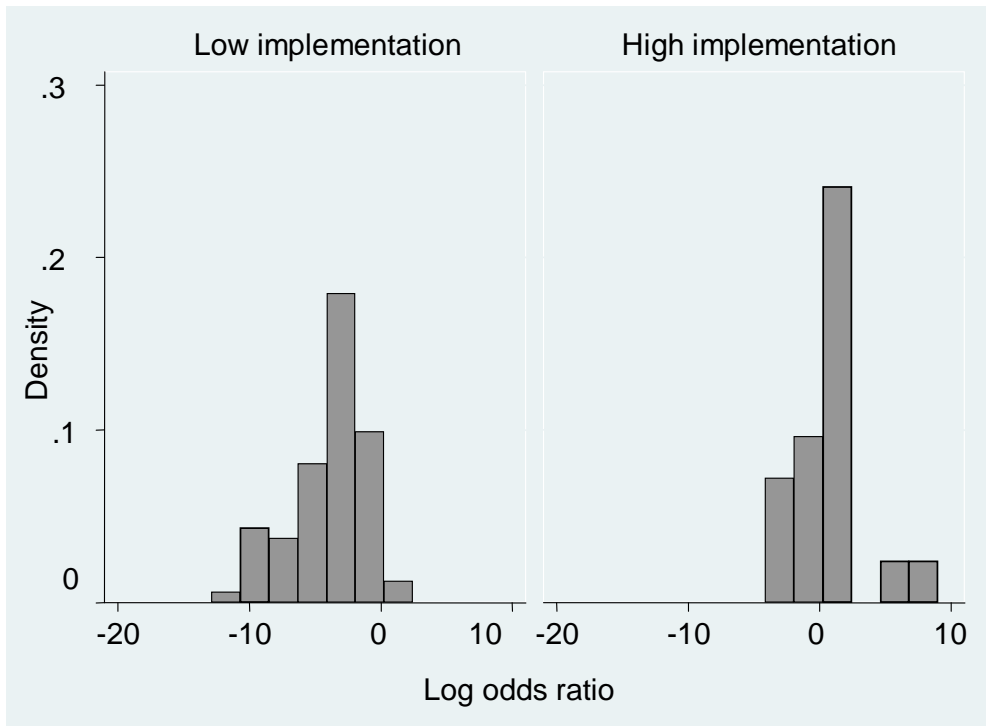
# Appendix A Sample JCPC Annual Report

Instructions: Adjust arrows to cover target populations								
		Comprehensive Strategy						
		Prevention			Graduated Sanctions			
		Target Populations						
Program Services & Structures Categories	Instructions: Adjust arrows to cover target populations	All Youth	Youth at Greatest Risk	Pre-Adjudicated Youth	Delinquent-Level I / Prot. Supervision	Delinquent-Level II Youth	Delinquent-Level III Youth	Post Release Youth
<b>Structured Activities</b>	One + One = Success							
	Resolve							
	Edgecombe Family Resource Center							
	4 H Activities							
	Town of Tarboro Recreation Program							
	Rocky Mount Parks and Recreation							
	Rocky Mount Family YMCA							
	Boys and Girls Club							
	MAPP							
	Governors One on One-Y Pals							
Children of Prisoners Enrichment								
Community Enrichment Organization								
<b>Restorative Services</b>	Impact Plus							
	Teen Court							
<b>Community Day Programming</b>	Mediation							
	Twin County Challenge							
<b>Assessment Services</b>	Private Providers							
	Psychological Evaluations							
<b>Clinical Treatment</b>	Preventive Services -DSS							
	Family Preservation - MHC							
<b>Residential</b>	Emergency Foster Care							
	Tri-County Residential Services							
	Private Pay Homes							
	Eckerd Youth Alternative							
	Level III Treatment Facilities							
Residential Substance Abuse-PORT								

Appendix B Mean differences between counties missing from sample, in sample, and total counties

	All (n=100)	Missing (n=7)	Sample (n=93)
Total population (in thousands)	85.39	74.68	86.19
Per capita income (in thousands)	25.58	25.36	25.83
Population density	175.20	125.06	179.11
Youth proportion of population	0.11	0.11	0.11
Minority proportion of population	0.24	0.23	0.26
Democratic proportion of registered voters	0.52	0.49	0.52
Delinquency rate 2004	35.60	31.70	35.80

Appendix C Diagnostics to assess common support for matching procedure



Summary statistics for log odds ratios

	Implementation group	
	High (n=19)	Low (n=74)
Minimum	-2.72	-12.85
25th percentile	-1.45	-5.27
Median	0.69	-3.43
75th percentile	1.77	-1.94
Maximum	6.81	0.78
Mean	0.70	-3.91
Standard Deviation	2.39	2.92

Appendix D Mean differences in matched pairs sample for implementation groups  
by quartiles based on propensity scores

Variables (n=34)	1st Quartile		2nd Quartile		3rd Quartile		4th Quartile	
	High (n=4)	Low (n=5)	High (n=2)	Low (n=6)	High (n=4)	Low (n=5)	High (n=7)	Low (n=1)
Juvenile arrest rate	36.50	38.20	41.00	47.80	41.50	45.20	62.43	26.00
Minority proportion of population	0.20	0.14	0.37	0.36	0.22	0.21	0.02	0.25
Youth proportion of population	0.11	0.10	0.12	0.12	0.11	0.11	0.10	0.09
Growth in youth population	-0.04	0.07	0.07	0.04	0.09	0.01	0.09	0.14
Growth in county population	0.07	0.10	0.10	0.08	0.09	0.09	0.09	0.13
Growth in minority population	0.11	0.08	0.09	0.11	0.10	0.09	0.05	0.11
Proportion of families headed by single female	0.17	0.16	0.22	0.24	0.22	0.18	0.17	0.13
Population density	137.55	159.68	94.59	115.68	232.60	185.12	154.61	460.75
Per capita income (in thousands)	15.22	16.92	15.25	14.87	14.49	14.53	16.04	14.55
County revenue per 100 people	4.96	6.32	5.43	4.56	5.44	6.39	8.45	7.22
Human service funding per 100 people	1.14	1.09	1.09	1.16	1.14	1.02	1.63	1.00
Local school funding per 100 pupils	7.81	9.87	6.54	7.32	7.35	7.83	10.86	8.72
Public safety dollars per 100 people	0.73	0.63	0.54	0.55	0.59	0.74	0.96	0.79
East	0.25	0.00	1.00	0.67	0.25	0.60	0.71	1.00
West	0.50	0.60	0.00	0.17	0.25	0.20	0.14	0.00
Central	0.00	0.20	0.00	0.00	0.25	0.00	0.00	1.00
Democratic District Attorney	0.75	0.40	1.00	0.83	0.75	1.00	1.00	1.00
Proportion of voters registered as Democrats	0.64	0.66	0.70	0.73	0.70	0.66	0.74	0.53
Propensity score	0.12	0.12	0.27	0.32	0.57	0.50	0.83	0.70

Note. To represent baseline levels, variables are averages of 1990-1991 data

Note. When possible, t-tests were conducted and no significant differences between means were found, perhaps due to small sample size