

## **ABSTRACT**

Mason, Helen Marcinda. Multilevel Model of Racial Disparity in Traffic Enforcement. (Under the direction of Donald Tomaskovic-Devey and Matthew T. Zingraff).

Individual officer characteristics, attributes of the organization, and the racial threat thesis are all explored as possible contributors to the racial distribution of citations. Using Hierarchical Linear Modeling (HLM), the findings of the analyses suggest that less experienced officers and those officers working in patrol districts where members are more highly trained issue more African American citations than more experienced officers and officers working in patrol districts where members are less trained. The findings also indicate that the effect of length of service on the outcome measure varies by the officer's race. The racial threat analyses suggest that there is racial disparity in the issuance of citations and that the extent of the disparity steadily increases as the representation of African Americans in the driving population increases. The implications of this dissertation's findings for future research on the racial distribution of traffic enforcement outcomes are discussed.

**MULTILEVEL MODEL OF RACIAL DISPARITY IN TRAFFIC ENFORCEMENT**

by

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## **BIOGRAPHY**

On June 19, 1970, I was born in Fort Knox, Kentucky as the first of five children born to Tom and Sherry Mason. Soon thereafter my parents moved back to their hometown of Howe, Indiana. In the years to follow our family grew as Kasey, Niki, Bub, and Allison were all born. I graduated June 1991 from Davenport College in Grand Rapids, Michigan with a bachelor's degree in business management and marketing. In August of 1994, I enrolled in the graduate school at North Carolina State University. I received my Master of Science in June of 1998 and completed all of the requirements for a doctorate in Sociology in September of 2002.

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I also want to acknowledge the love and support of my family. My parents have made many sacrifices for my brother and sisters and me over the years. Because of their devotion to us we have been able to accomplish much more than we would have been able to otherwise. Their emphasis on working hard and not giving up provided me with the determination and discipline necessary to finish my dissertation. My brother, sisters, grandparents, aunts, and uncles have also been sources of support for me over the years, which I am grateful for.

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## TABLE OF CONTENTS

LIST OF TABLES .....	viii
LIST OF FIGURES .....	ix
1. INTRODUCTIONS .....	1
Limitations of DWB Research .....	5
Present Study .....	8
2. OFFICER ATTRIBUTES AND POLICE DISCRETION .....	12
Race .....	13
Experience .....	24
Training .....	27
Summary .....	30
3. ORGANIZATIONAL FACTORS AND POLICE DISCRETION .....	31
Supervision .....	34
Experience and Training Composition of the Organization .....	38
Racial Composition of the Organization .....	39
Summary .....	43
4. RACIAL THREAT AND POLICE DISCRETION .....	46
Summary .....	53
5. INDIVIDUAL AND ORGANIZATIONAL ANALYSIS: DATA, MEASURES, AND METHOD .....	56
Data and Sample .....	56
Measurement of Variables .....	57
Outcome Variable .....	57
Officer Attributes .....	61
Race .....	61
Experience .....	61
Training .....	62
Individual-level Interactions .....	63
Organizational Characteristics .....	64
Supervisory Intensity .....	65
Experience Composition of the Organization .....	67
Training Composition of the Organization .....	68
Racial Composition of the Organization .....	69
Cross-level Interactions .....	70
Individual-level Control Variables .....	71
Number of Whites Cited .....	71
Time of Day and Type of Highway .....	72
District-level Control Variable .....	73
Racial Composition of Drivers .....	73

Summary of Proposed Research Strategy .....	76
Specification and Method .....	76
Strategy for Analyses .....	77
6. INFLUENCE OF OFFICER AND DISTRICT PROCESSES .....	79
Results .....	79
Officer Processes .....	82
Individual-level Interaction Processes .....	84
Organizational Processes .....	87
Cross-level Interaction Processes .....	88
Summary of Findings .....	89
7. THE INFLUENCE OF RACIAL THREAT .....	91
Data and Sample .....	92
Measurement of Variables .....	92
Dependent Variable .....	92
Control Variables .....	93
Individual-level Variables .....	93
District-level Variables .....	93
Organizational Characteristics .....	93
Racial Threat .....	94
Method for the Racial Threat Analyses .....	94
Findings .....	95
Implications of Racial Threat for Individual and Organizational Analysis .....	104
8. IDENTIFICATION AND DESCRIPTION OF STATISTICAL OUTLIERS .....	107
Model Predicting Number of Citations Issued to African Americans .....	109
Individual-level Measures .....	110
District-level Measures .....	111
Statistical Outliers and Assigned Troop .....	112
Model Predicting Proportion of Citations Issued to African Americans .....	114
Individual-level Measures .....	115
District-level Measures .....	116
Statistical Outliers and Assigned Troop .....	117
Summary of Findings .....	120
9. DISCUSSION AND CONCLUSIONS .....	125
The Effect of Officer Characteristics on the Issuance of Citations to African Americans .....	126
The Effect of Organizational Characteristics on the Issuance of Citations to African Americans .....	137
The Effect of Racial Threat Processes on the Issuance of Citations to African Americans .....	144
Other Determinants of the Number of Citations Issued to African Americans .....	148

Overall Conclusions and Policy Implications .....	149
Policy Implications .....	151
10. NOTES .....	155
11. REFERENCES .....	159
12. APPENDICES .....	184
1. Results of Multilevel Equations: Officer and Organizational Predictors of the Number of African American Citations (Poisson Distribution) .....	185
2. Results of Multilevel Equations: Officer and Organizational Predictors of the Number of African American Citations (Natural Metric) .....	187
3. Results of Multilevel Equations Predicting the Total Number of White and African American Citations (OLS Results) .....	189
4. Results of Multilevel Equations Predicting the Total Number of White and African American Citations (HLM Results) .....	190
5. Predicted, No Racial Disparity, and Experience-Related Intensity of Policing Slopes of the Number of Citations Issued to African Americans .....	191
6. Results of Multilevel Model Predicting the Number of Citations Issued to African Americans .....	192
7. Mean Values on Control, Individual, and District Measures for Troopers with a Nonoutlier, Positive Outlier, or Negative Outlier Residual Score based on the Model Predicting the Number of Citations Issued to African Americans .....	193
8. Results of Multilevel Model Predicting the Proportion of Citations Issued to African Americans .....	194
9. Mean Values on Control, Individual, and District Measures for Troopers with a Nonoutlier, Positive Outlier, or Negative Outlier Residual Score based on the Model Predicting the Proportion of Citations Issued to African Americans .....	195

## LIST OF TABLES

Table 5.1	Description of Measures .....	58
Table 5.2	Description of Statistics for Variables Used in Analysis .....	59
Table 6.1	Results of Multilevel Equations: Officer and Organizational Predictors of the Number of African American Citations (LN) .....	81
Table 7.1	Results of Multilevel Equations: Officer, Organizational, and Racial Threat Predictors of the Number of African American Citations (LN) .....	96
Table 7.2	Results of Multilevel Equations: Officer, Organizational, and Racial Threat Predictors of the Proportion of Citations Issued to African Americans .....	101
Table 8.1	Mean Values of Control, Individual, and District Measures for Troopers with a Nonoutlier, Positive Outlier, or Negative Outlier Residual Score Based on the Model Predicting the Number of Citations Issued to African Americans .....	110
Table 8.2	Frequency of Nonoutliers, Positive Outliers, and Negative Outliers by Troop Based on the Model Predicting the Number of Citations Issued to African Americans .....	113
Table 8.3	Mean Values of Control, Individual, and District Measures for Troopers with a Nonoutlier, Positive Outlier, or Negative Outlier Residual Score Based on the Model Predicting the Proportion of Citations Issued to African Americans .....	116
Table 8.4	Frequency of Nonoutliers, Positive Outliers, and Negative Outliers by Troop Based on the Model Predicting the Proportion of Citations Issued to African Americans .....	119

## LIST OF FIGURES

Figure 4.1	The Hypothesized Linear and Nonlinear Forms of the Relationship Between Racial Composition of a District and the Number of Citations Issued to African Americans .....	47
Figure 6.1	Predicted Length of Service Slope for White and African American Officers .....	86
Figure 7.1	Predicted and No Racial Disparity Slopes of the Number of Citations Issued to African Americans .....	99
Figure 7.2	Predicted and No Racial Disparity Slopes of the Proportion of Citations Issued to African Americans .....	103
Figure 8.1	Histogram of Residual Scores Based on the Model Predicting the Number of Citations Issued to African Americans .....	109
Figure 8.2	Histogram of Residual Scores Based on the Model Predicting the Proportion of Citations Issued to African Americans .....	115

## CHAPTER 1

### INTRODUCTION

The phrase “Driving While Black” (DWB) suggests that African Americans are under police suspicion while driving on the road due to their skin color (Harris 1997).<sup>1</sup> Further, it is argued that the excessive police suspicion directed at African American motorists results in their disproportionate subjection to traffic stops, extensive questioning, ticketing, searches, and arrests. Discussions of DWB have called attention to racial profiling, pretextual stops, and the War on Drugs since it is these practices that are directly related to DWB.

Kennedy (1999) defines racial profiling as “using race as a factor in deciding whom to place under suspicion and/or surveillance . . . (It) occurs whenever police routinely use race as a negative signal that, along with an accumulation of other signals, causes an officer to react with suspicion” (p. 34). Some argue that the War on Drugs has encouraged racial profiling by law enforcement through the use of drug courier profiles, which list characteristics or behaviors that are thought to be associated with drug couriers (ACLU 1999; Kennedy 1999). Both the development and application of drug courier profiles have been criticized on the grounds that there tends to be an implicit or explicit racial component involved. Consequently, police officers utilizing drug courier profiles often consider the race of the motorist in determining suspicion (i.e., racial profiling).

The drug courier profile was introduced for use on our nation’s highways in the mid-1980s by the Drug Enforcement Agency (DEA) (ACLU 1999). A highway drug interdiction program known as “Operation Pipeline” was initiated to train patrol officers in the use of drug courier profiles and pretextual stops. The presumed benefit was an increase in the effectiveness of the Drug War.

Since the program started in 1986 over 27,000 police officers representing 48 states have been trained to use drug courier profiles that either implicitly or explicitly encourage the targeting of citizens using race and ethnicity, along with other factors, to apprehend drugs and drug traffickers (Allen-Bell 1997). It has been suggested that profiles, even if they do not explicitly refer to race or ethnicity, result in a greater suspicion of minority drivers due to the historical and contemporary connection between race and crime (Cole 1999). The following are examples of drug courier profiles used by police organizations (see Allen-Bell 1997:5):

- The Virginia State Police Department utilized a drug courier profile that attached suspicion to black and Latino males driving Florida rental cars northward.
- The Eagle County sheriff's office uses the following drug courier profile on Interstate 70 in Colorado: presence of fast-food wrappers strewn in the car, out-of-state license plates, and dark skin.
- Delaware's drug courier profile commonly used, targets young minority men driving late model cars and carrying pagers or wearing gold jewelry. The profile also considers the ages of the car and whether it is a rebuilt car with compartments; similarly, a profile was used to stop suspects based upon the fact that "they were three young black male occupants in an old vehicle".

As the above examples demonstrate, profiles are often "over-inclusive and overbroad" and their application can, and often do, result in innocent minority citizens being profiled as drug couriers (Allen-Bell 1997).

Once a motorist is racially profiled, police may perform a pretextual stop. Pretextual stops occur when police selectively enforce minor traffic violations against motorists who are viewed as suspicious by the officer for the purpose of conducting an investigation. For instance, an officer may suspect that a motorist is transporting drugs. The officer will wait for the motorist to commit a traffic violation and then will use that violation as a reason to pull the suspicious motorist over to conduct a field investigation. Thus, while the ultimate purpose for the traffic stop may be connected to the War on Drugs, the precipitating event is a minor traffic offense. To summarize, the use of racial profiles along with the practice of pretextual stops by police may subject African Americans to more vehicular stops, extensive questioning, ticketing, searches, and arrests than whites who are less likely to be associated with drug courier profiles.

The earliest examinations of the driving while black phenomenon suggest that African Americans are disproportionately subjected to pretextual stops, ticketing, and searches while traveling on highways. The Orlando Sentinel examined police activity on Interstate 95 in Volusia County, Florida to address the issue of whether police target racial and ethnic minority drivers. The newspaper obtained videotapes from the vehicles of the Florida highway patrol Selective Enforcement Team and reviewed 148 hours of videotape involving more than 1,000 police stops between 1989 and 1992. In addition, the newspaper observed drivers on Interstate 95 in Volusia County for five days in order to develop an estimate of the racial composition of drivers on this highway. They found that of the 1,120 vehicles counted around five percent of the drivers were dark skinned. In contrast, their review of the videotapes suggested that over 70 percent of the drivers stopped and over 80 percent of the drivers searched were African American or Hispanic. It

was further found that the stops of African American and Hispanic drivers on average lasted more than twice as long as the stops of white drivers (see Harris 1997).

Although the study was not a scientific one, similar studies have also found the overrepresentation of African Americans in traffic stops in other areas of the country. For example, Lamberth examined stops on the New Jersey Turnpike on randomly selected days during the years of 1988 and 1991 and found African Americans represented 35 percent of all stops and 73.2 percent of all arrests even though they constituted only 13.5 percent of the estimated drivers on the Turnpike (see Harris 1999). Lamberth also conducted a study of traffic stops conducted by Maryland State Police on Interstate 95 from Baltimore to the Delaware border during the timeframe of January 1995 to June 1996. It was found that patrol officers not only disproportionately stopped African American motorists but also targeted this racial group for searches (see Harris 1999). African Americans represented an estimated 16.9 percent of the drivers and 17.5 percent of traffic violators on Interstate 95 but constituted 72 percent of those searched. In contrast, whites made up less than 20 percent of all stops and searches.

Research conducted in the Midwest has similarly found evidence suggesting that police may target minority drivers. For example, a study conducted in Ohio found that African Americans were about twice as likely as non-African Americans to be ticketed in the cities of Akron, Dayton, Toledo, and in Franklin County, Ohio in the years of 1996 and 1997 (Harris 1999). Research conducted in Illinois and Colorado also suggested that the racial groups considered most associated with drug offenses—African Americans and Hispanics—were targeted by law enforcement (Harris 1997).

Studies of pretextual stops on inner city streets have similarly found evidence that police officers target racial minorities. The American Civil Liberties Union (ACLU) examined all stop reports filled out by officers of the Philadelphia Narcotics Unit and by Philadelphia police in four specific police districts (ACLU 1999). It was found that while African Americans made up around 42 percent of the population and whites constituted 54 percent of the population, 79 percent of the cars stopped had an African American driver, whereas only 14.1 percent of the stops had a white driver during the week of March 7, 1997. Another weekly time period was examined and racial disparity in police stops was similarly found.

To summarize, political activists argue that patrol officers often engage in racial profiling and pretextual stops in an attempt to further investigate drivers viewed as “suspicious”. Further, it is suggested that the War on Drugs has encouraged these practices. The above research suggests that a consequence of these policing practices is that African Americans may be targeted for traffic enforcement outcomes.

### **Limitations of DWB Research**

While the above studies suggest that African Americans are disproportionately subjected to traffic enforcement outcomes, they are not without several limitations. First, the findings discussed above should be taken with some caution since much of the earliest research was associated with either pending litigation alleging racial profiling or investigative reporting. Thus, findings and interpretations were not subject to rigorous scientific peer review. Second, DWB research is often based on a limited geographical area such as a single highway located in a state, part of the state, or even just a county in the state. This severely limits the generalizability of the findings to other

highways and other areas of the state in that such analyses ignore the potential role played by context and setting in understanding traffic stops and subsequent outcomes.

Another common problem with DWB research has been the difficulty in identifying adequate baseline measures. To determine whether there is racial disparity in traffic enforcement within a particular area, the racial distribution of drivers and driving behavior of the area should be considered. Often the racial distribution of the general population is used as the sole proxy for the racial breakdown of the actual drivers on the road. Here, census information is used to obtain the number of white and minority racial or ethnic group members in the population. This measure may seem desirable since it can be used to estimate the racial distribution of individuals in a certain geographical location and the estimate can be obtained with limited financial and time costs to the researcher. Despite these advantages, the resident population measure is problematic for several reasons.

For one, the measure does not take into account possible racial differences in access and use of an automobile (i.e., time spent driving or miles driven). There are reasons to believe that African Americans would be less likely to have access to and use of a vehicle due to racial differences in economic status. For instance, the US Department of Transportation Survey (1990) indicated that African American households were less likely to own a vehicle than white households (cited in Harris 1999).

Concerning the use of a vehicle, the findings from the North Carolina Highway Safety Study's survey of North Carolina residents suggests that African Americans may drive less than whites (Smith et al. 2002). Specifically, it was found that, on average, African American motorists

reported driving 3,000 fewer miles in the previous year than white motorists. Thus, there may be racial difference in exposure to police.

Another limitation associated with the use of the resident population measure is that it fails to consider possible racial differences in driving behavior. Some research suggests that there are not differences in the driving behavior of whites and African Americans. Lamberth conducted a rolling survey of drivers and driving behavior on the New Jersey Turnpike and along Interstate 95 between Baltimore and Delaware (discussed in Harris 1999). This method involves researchers driving along the highway at or slightly above the speed limit and recording characteristics of the drivers observed passing the research vehicle. This method suggested that there were no racial differences in the tendency to speed.

The North Carolina Highway Safety Study employed a similar method where researchers drove at the speed limit on 14 highway segments in North Carolina and recorded the demographic characteristics of the drivers that passed the research vehicle (Smith et al., 2002). Using this method, the researchers were able to estimate the racial distribution of speeders. Further, this research was also able to estimate how many miles over the speed limit motorists were driving, which allowed estimates of the racial distribution of those who speed excessively.<sup>2</sup> This research suggested that in 12 of the 14 segments African American drivers speed more than white drivers. Although the research examining racial differences in driving behavior has been quite limited it does suggest that it may be important to consider driving behavior when developing an adequate baseline measure of drivers.

Finally, the resident population measure fails to incorporate the racial makeup of nonresident drivers on the road. Take, for example, an area that is 90 percent white and 10 percent African

American (Area A). Using a resident population measure, it would be assumed that 10 percent of the drivers on the road are African American. But what if Area B, which is adjacent to Area A, is composed of 65 percent white residents and 35 percent African American residents. If residents in Area B drive in Area A, which is likely to be the case, then the resident driver measure would not accurately describe the racial distribution of motorists in Area A, which includes both resident and nonresident drivers. Thus, in this example, the resident driver measure would likely underestimate the percent of African Americans on the road.

A final limitation related to existing DWB research is that most of it has focused on describing the extent of racial disparity in traffic enforcement outcomes. Such research has been important since it has suggested that African Americans drivers are targeted by police and it is not limited to a particular area of the country. This research has called attention to the issue and encouraged other social researchers and police organizations to further investigate the social problem of DWB. However, by focusing on the racial distribution of such outcomes this research has neglected to examine the factors that may contribute to or reduce racial disparity in traffic enforcement (for exceptions see Meehan and Ponder, in press; North Carolina Highway Safety Study 2002).

### **Present Study**

This dissertation will attempt to address some of the methodological and analysis weaknesses of previous DWB research. First, I will examine the racial distribution of citations produced in the calendar year of 2000 by the North Carolina State Highway Patrol. DWB research has tended to focus on police stops and searches (for an exception see Harris 1999).

While these outcomes are important, other traffic enforcement outcomes that may be racially biased have been neglected such as ticketing practices. Racial disparity in the issuance of citations may have several negative repercussions for African American motorists. If African Americans are disproportionately subjected to traffic tickets compared to whites, their cumulative experiences with police may result in their having higher automobile insurance rates, being more likely to have a suspended license, and may even have consequences for employment since some employers refer to the traffic records of potential employees in making hiring decisions. These costs along with the emotional, financial and time burdens that may be disproportionately incurred by African American motorists suggest that ticketing is an area of law enforcement that should not be overlooked as a possible site of racial bias. Thus, this research will examine the generally overlooked traffic enforcement outcome of ticketing. In doing so, NCSHP citations produced on all highway types (i.e., Interstate, US and NC Highways, and Rural Roads) and in all counties in NC will be considered.

Finally, the purpose of this study is not just to identify the racial distribution of citations but to also understand what factors may be related to that racial distribution. As such, individual officer characteristics, attributes of the organization, and racial threat will all be explored as possible contributors to the racial distribution of citations. In doing so, I will utilize a baseline measure of “driver’s driving” which considers the racial makeup of both residents and nonresidents drivers in a locality (Smith et al. 2002). Further, using Hierarchical Linear Modeling (HLM), I will examine whether the relationship between officer characteristics and the racial distribution of citations may vary across district-level measures.

There are two points that should be kept in mind before moving on to the next chapter. First, research related to racial disparity in traffic enforcement is in the beginning stages. Research on other policing outcomes reveals a list of factors that have been found to be related to police decision-making (i.e., decision to arrest or use force). Since there is an absence of research examining traffic enforcement outcomes, I use the existing research related to other policing outcomes as a guide in determining the factors that may be related to the racial distribution of citations. However, it still remains to be determined whether the same factors related to these other policing outcomes are also related to the issuance of citations. Accordingly, this research is as much, if not more, exploratory as it is about hypothesis testing.

Second, it was noted above how political activists argue that racial profiling and pretextual stops encourage police to target African American motorists. These policing practices, it is said, are used to assist police in the apprehension of criminals and contraband. Thus, it would be expected that racial disparity in traffic enforcement outcomes would be highest among officers and within organizations actively involved in crime control. The North Carolina State Highway Patrol troopers examined in this dissertation primarily engage in traffic enforcement and accident investigation and are only rarely involved with crime control. Consequently, the North Carolina State Highway Patrol is an organizational setting where racial disparity, if it is found, should be relatively modest compared to police organizations that do engage in crime control, such as municipal police.

What follows is, first, a discussion of individual officer characteristics that may be important for the racial distribution of citations (Chapter 2). Next, factors of the police organizations will be highlighted (Chapter 3), followed by a discussion of the racial threat perspective that suggests that the racial composition of the district may impact the extent of racial disparity in ticketing (Chapter

4). The remaining chapters will discuss the sample and measures (Chapter 5), present the findings of the analyses (Chapters 6, 7, and 8), and provide overall conclusions and policy implications (Chapter 9).

## CHAPTER 2

### OFFICER ATTRIBUTES AND POLICE DISCRETION

One approach to explaining police behavior is an individual approach, which explains police discretion in terms of characteristics of the officer. Characteristics suggested in past research have ranged from personal attributes such as race, gender, and age, to the work-related factors of rank, tenure, and training (Charles 1981; Friedrich 1977; Hovarth 1987; Sherman 1973, 1975). In this chapter, the race, experience, and training of an officer will all be discussed as possible factors that may influence an officer's racial distribution of citations. Although the literature suggests that rank, gender, and age might also be important, methodological difficulties preclude the use of these variables in the present study.

Specifically, rank of the officer would be of little use to our understanding of citation activity since those ranked higher than 'trooper' in the North Carolina Highway Patrol rarely issue citations. Gender is excluded from the analyses that follow because women make up only two percent of the North Carolina State Highway Patrol and are not represented in many of the patrol districts. The extremely small number of women officers in the analysis would make any conclusions regarding the effect of gender on the outcome measure questionable.

Finally, there is a strong correlation between an officer's age and length of service. In fact, the bivariate correlation between the age and experience of North Carolina State Highway troopers was .908. The strong correlation between these two variables is not surprising since individuals tend to be in their middle 20's in age when they begin their service with the North Carolina State Highway Patrol. Thus, troopers with similar years of experience are in most cases around the same

age in years. Due to this high bivariate correlation, researchers sometimes choose to use age or years of experience in statistical models. Preliminary analyses suggested that age was not a significant predictor of the number of African American citations issued while experience was. In addition, age was a weaker predictor than experience of the total number of citations issued.<sup>3</sup> Consequently, this dissertation focuses on work experience instead of age, since experience seems to better explain the variance in the issuance of citations. The following theoretical discussion addresses how the officer characteristics used in this study might be related to the racial distribution of citations.

## **Race**

The race of the officer may be associated with racial bias in policing if officers have a propensity to discriminate against those motorists who are racially different. It may also occur if officers express favoritism toward those motorists who are racially similar. Given that the majority of police officers are white, the consequences of outgroup discrimination and ingroup favoritism will have more negative repercussions for African American than for white motorists.

Law enforcement targeting African American motorists may be motivated by racist attitudes of some police officers. Racist individuals may believe in the biological inferiority of African Americans compared to whites and generally would support formal patterns of social distance and segregation such as the Jim Crow system of legalized discrimination and segregation. This is often referred to as old-fashioned racism (McConahay 1986). Thus, white officers would be expected to be more likely to possess racist attitudes toward African Americans than African American officers

and exercise their police powers in ways that unfairly subject African Americans to traffic enforcement outcomes.

Because officers are not just police officers, but also members of their community, the racial attitudes of white officers may resemble those of the larger white community. If this were the case, results from attitude surveys of the general population would also indicate the attitudes of police officers. Recent national surveys suggest that some whites still exhibit old-fashioned racism but they compose only a small segment of the population. For instance, national surveys suggest a decline in overt racist attitudes prompting some scholars to argue that “old-fashioned” racism hardly exists in modern times (Davis and Smith 1994; Schuman et al. 1997:159). Still, surveys suggest that at least 10 to 15 percent of whites express the overt form of old-fashion racism. If the attitudes and behaviors of police officers resemble the larger white community then 10 to 15 percent of white officers may have a disposition to use their power and authority in ways that explicitly disadvantage or discriminate against African Americans.

It is also suggested that even if whites do not express an overt form of racism some may still express a more subtle and often unconscious form of racism—“new racism”. The main theories included under new racism are symbolic racism (Sears 1988), modern racism (McConahay 1986), laissez-faire racism (Bobo and Smith 1998), and aversive racism (Gaertner and Dovidio 1986). New racism theories suggest that it is essential that we consider how information is processed about others and ourselves if we are to comprehend subtle and unconscious forms of racism. As such, a discussion of social cognition research, which is interested in the ways that people make sense of themselves and others (Fiske and Taylor 1991), may be beneficial since it is believed that how we think about social stimuli impacts how we respond to those stimuli.

The social cognition perspective assumes that our minds are able to deal with only a certain amount of information at any one time (Fiske and Taylor 1991). Consequently, we create a more simple and manageable structure for new information by reducing that information into categories (Allport 1954; Bodenhausen and Wyer 1990). Research suggests that people may categorize themselves and others into groups automatically and unconsciously (Bower and Karlin 1974; McArthur and Baron 1983). Further, when encountering people we tend to use social categories that are immediately apparent, especially when we have little or no prior individuating information about people. Thus, people often categorize others and themselves on the basis of simple but highly visible characteristics such as race (Brewer 1988; Stangor et al. 1992).

Policing research suggests that police use categories, or typifications, especially when engaging in proactive policing (Skolnick 1966; Walker 2001). In such situations police are attempting to process large amounts of information in short time periods. A primary way one processes large amounts of information is to place it within categories. The categories police focus on are those that tend to be associated with crime and deviance, which may include the race of the motorist.

The discussion of categorization is relevant to racial bias in policing since there are emotional and cognitive influences of categorization. For instance, the categories we place people within influences our impressions of them and often our behavior toward them (Sagar and Schofield 1980). Due to the significance of the self in perceptions (Higgins and Bargh 1987), it is argued that through the use of categories (such as those based on race) we make a distinction between the group we are a part of—the ingroup—and other groups—outgroups. This is evident in our use of words like

“we” versus “they”. Thus, racial categorizations may encourage officers to view those of the same racial group as ingroup members and those from a different racial group as outsiders.

The tendency to make ingroup and outgroup distinctions has implication for racial bias in policing since there is nearly an automatic display of ingroup favoritism upon making the ingroup and outgroup distinction (Jones et al. 1981; McGarty and Penny 1988; Mullen and Hu 1989; Tajfel et al. 1971; Wilder 1981). For instance, people often favor ingroup members by being more positive and helpful with them than with outgroup members (Brewer and Brown 1998; Pettigrew 1979). Ingroup members are also favored in reward allocations (Tajfel et al. 1971) and in esteem (Rabbie 1982). In contrast, people are more likely to avoid or derogate outgroup members. Thus, officers may value and overall favor those belonging to their racial group. Officers may then be more likely to use a more prosocial behavior (i.e., be less aggressive) with those belonging to their racial group than outgroup members. This may have implications for racial differences in traffic enforcement outcomes.

Ingroup bias may also be found in attributions made about ingroup versus outgroup behavior. The strongest form of evaluative bias is represented by what Pettigrew (1979) referred to as “the ultimate attribution error” in causal attributions for socially desirable versus undesirable behaviors. Desirable behaviors tend to be attributed to internal, stable (personality) causes when involving ingroup members, whereas similar behaviors are more likely attributed to external or situational causes when involving outgroup members. Conversely, undesirable behaviors are more likely to be seen as internally caused when exhibited by outgroup members than by ingroup members. For instance, research finds that blame for an accident, or other negative outcomes, is more likely to be attributed to the personality of the driver when the driver was of a different

ethnicity, rather than the same ethnicity, as the research participant (Hewstone et al. 1983; Wang and McKillip 1978). According to Pettigrew (1979), “The ultimate attribution error will be greatest when the groups involved have histories of intense conflict and possess especially negative stereotypes of each other” (p. 469).

Accordingly, an officer may be more likely to attribute a traffic violation to internal, stable qualities (i.e., personality defects) of the motorist when committed by an outgroup member than when committed by someone who represents the officer’s racial group. Consequently, intergroup attribution bias may lead officers to be less likely to stop or severely sanction motorists who represent the same racial group as the officer since such traffic violation(s) are more likely to be attributed to situational causes. For offenders who are outgroup racial members, police may apply more severe penalties since they are more likely to view the behavior as reflecting a deficient personality.

When one racially categorizes a person, not only is intergroup bias initiated, but also schemas stored in the memory are invoked. Hinton (2000) defined schemas as “knowledge structures that organize our knowledge about an object, person, or event” (p. 179). Schemas influence the way we interpret and remember information, and they impact inferences made about people and events. The schema invoked as a result of racial categorization includes stereotypes that are associated with the racial category. Jones (1997) defines a stereotype as “a positive or negative set of beliefs held by an individual about the characteristics of a group of people” (p. 170). Stereotypes are more likely to be activated and impact thoughts when one is cognitively busy, making quick decisions, tired, or distracted. These factors may all be involved in policing and thus

would seem to make police officers especially prone to draw on stereotypes when processing information.

While all racial categories have accompanying stereotypes, the degree of negativity of these stereotypes will vary by racial group. The less powerful racial and ethnic groups, such as African Americans, have especially negative stereotypes associated with their group (i.e., lazy, violent, lack intelligence). In contrast, powerful racial groups, like whites, are more likely to be associated with positive stereotypes (i.e., hardworking, intelligent, disciplined) than less powerful racial groups.

The use of negative stereotypes associated with racial categories may become problematic in that they impact perception, memory, attributions, and behavior. Stereotypes are category-based expectations. Functioning as expectations, the activation of racial stereotypes contributes to people generating expectations of others' personality and behaviors before they say or do anything (Hinton 2000). These racial stereotype expectations will affect what we pay attention to and, consequently, what we later remember. Some refer to this as expectancy-based illusory correlation (Hamilton and Gifford 2000).

Illusory correlation refers to how people tend to overestimate a relationship between two variables or actually impose a relationship when none exists because the correlation between these variables is expected (Fiske and Taylor 1991; Hamilton and Rose 1980). Sagar and Schofield's (1980) research provides an example of expectancy-based illusory correlation. They found that pictures of ambiguously aggressive behaviors were interpreted as more hostile and threatening when performed by an African American stimulus figure than when the perpetrator was portrayed as white. As this research suggests, stereotypes impact how information is interpreted such that ambiguous information tends to be interpreted in ways that are consistent with existing stereotypes

(Sagar and Schofield 1980). Racial stereotype expectations led the participants to perceive the situation in a way that was congruent with their preexisting beliefs about African Americans as compared to whites. Research suggests that illusory correlation biases are especially likely to occur when individuals do not process information thoroughly (Stroessner and Plaks 1999).

With regard to traffic enforcement, activated racial stereotypes influence officers to make judgments regarding suspicion simply on the immediate observation of the motorist's race. These stereotypical expectations also may bias an officer's interpretations of the behavior observed. Ambiguous information that is encountered will often be interpreted and remembered in ways that are consistent with the stereotypes. The same behavior, then, may be viewed by police with different levels of suspicion depending on the race of the observed motorist. For example, an officer may interpret a white man driving a luxury car as a signal of class status while an African American man driving the same car may warrant suspicion.

Based on the above discussion of "old-fashioned" and new racism, white officers may be more likely than African American officers to discriminate against African American motorists due in part to racist attitudes, but more likely due to cognitive bias. Unfortunately, research examining the influence of racial attitudes and cognitive bias on traffic enforcement outcomes is absent from this literature. One of the few exceptions is Friedrich (1977) who examined 322 police-initiated traffic encounters. Friedrich's research found a relationship between the racial attitudes of white police officers and their behavior toward African American citizens. Specifically, white officers with less favorable attitudes toward African Americans were more likely to arrest and issue traffic tickets to African Americans than white officers with more favorable attitudes.

With regard to ingroup and outgroup bias, indirect evidence suggests that white officers may display cognitive bias toward African Americans due to their inability or unwillingness to identify with African Americans. For instance, white police are suggested to have less understanding and sensitivity to the history and culture of African Americans than are African American officers (Fyfe 1988; Kelly and Farber 1974; Kelly and West 1973; Regoli and Jeromes 1975). A possible consequence of this is that white officers may treat African Americans less favorably than African American officers. Based on this argument, it is hypothesized that white officers will be more likely to disproportionately ticket African Americans than will African American officers.

On the other hand, there might be reasons to suspect that an African American officer would act harsher toward African Americans than a white officer. There is good reason to suspect that African American officers have to deal with problems regarding their occupation that white officers fail to encounter. African American police may find themselves in a situation where they represent an organization that has historically contributed to the oppression of African Americans. Further, numerous allegations suggest that African Americans continue to be unfairly treated by police organizations throughout the country. They are racially profiled and disproportionately targeted for pretextual stops, ticketing, searches, arrests, and excessive use of force by police. Historical and present day law enforcement-community relations create a situation where many racial minorities question the fairness and legitimacy of policing. Representing an organization that has had antagonistic relations with racial minorities may be problematic for African American officers.

Further, the policing profession, generally, in many cases continues to be dominated by whites, both in leadership and membership. African Americans may feel vulnerable in their position

due to their subordinate racial status in a white-dominated organization. White officers' attitudes and behaviors toward new African American officers may, at least initially, reflect preexisting stereotypes they possess of African Americans. Consequently, African American officers may more often feel pressured to prove their competency and commitment to the organization than do white officers. One might suspect this is especially the case for African Americans early on in their careers. Research that suggests that African American officers are more productive than white officers may be a signal of such pressure. For instance, research has found that African American officers cite and arrest white and African American motorists more often than white officers (Bureau of Justice Statistics' 1999; Friedrich 1977).

The suggested organizational pressures uniquely experienced by African American officers may require African Americans to choose between their commitment to policing and their commitment to their racial group. Some research suggests that African American officers' loyalty to policing may overshadow their loyalty to their racial group in that African American police may be tougher on African American citizens than are white officers (Alex 1969; Bordua and Tifft 1971). It may be that the desire to prove their competency, to be accepted by white colleagues, and to be institutionally rewarded results in African American officers feeling obliged to conform to the expectations of the organization. Consequently, African American officers may cite more African Americans than white officers.

There might also be pressures that white officers experience that are not encountered by African American officers that would similarly result in African American officers issuing more tickets to African Americans than white officers. There has been considerable public and media scrutiny of the North Carolina State Highway Patrol over the last several years regarding troopers

targeting African American motorists. Whether or not claims of racial profiling are accurate, these conditions might impact the behavior of white officers toward racial and ethnic minority drivers. Specifically, it might encourage white officers, who are more likely to be accused of racial bias than African American officers, to be extremely cautious in their treatment of African Americans. They may avoid contact when possible and in cases where they do stop an African American driver they may be inclined to provide more leniency than they would for white drivers. This could be especially the case for less experienced officers for several reasons. They may feel less confident in their abilities, feel their actions are more scrutinized by supervisors, and may be more concerned about tainting their image by being associated with accusations of racial harassment than officers more settled in their careers.

Thus, there may be pressures unique to both African American and white officers that may result in African American officers issuing more citations than white officers to African Americans. Unfortunately, research examining the relationship between an officer's race and the racial distribution of ticketing are rare. In addition, examining the relationship between an officer's race and policing outcomes is somewhat difficult due to patrol assignments. African American officers are often assigned to police high-crime areas which also tend to be areas which have a relatively high minority concentration (Dulaney 1996; Peak 1997). The selective patrol assignments of African American officers may result in their practicing a more aggressive style of policing and having more exposure to African Americans. Thus, African American officers might be more likely to ticket African American motorists than are white officers due to their assignment to higher crime and more racially heterogeneous areas.

While the proceeding arguments suggest reasons for why and how officer's race may be related to police discretion, it may also be the case that African American and white officers do not vary in their treatment of African Americans. Indeed, individuals who select policing as a profession might share common beliefs and attitudes that overshadow the expected racial differences in the attitudes and behaviors of white compared to African American officers. Occupational socialization and adherence to the norms of the police subculture could also result in similarities in the behaviors of white and African American officers. This would explain the research that has found no difference in the policing behavior of white and African American officers (Friedrich 1980; Homant and Kennedy 1985; Smith and Klein 1983; Weitzer 2000; Worden 1989).

In the beginning of this section, it was suggested that the race of the officer might impact racial disparity in ticketing due to white officers being more likely to exhibit overt and subtle racism toward African American motorists than would African American officers. Based on this argument, one would hypothesize that white officers will be more likely than African American officers to ticket African American motorists. Still, African American officers may be more likely than white officers to ticket African American motorists due to organizational pressures experienced by African American officers and/or political and organizational pressures experienced by white officers. Patrol assignments of African American officers may also result in their ticketing African Americans more often than white officers. Finally, it may be the case that African American and white officers do not vary in their ticketing practices if similar personalities are attracted to the profession and/or organization factors equalize the behavior of white and African American officers. The analysis to follow will address these competing positions.

## **Experience**

Tenure may reduce racial disparity in policing. The more years of experience an officer has acquired the more professional the officer should be in carrying out the police role (Sheehan and Cordner 1989). Work experience should improve an officer's ability to respond quickly to difficult situations as the rules and procedures become more familiar (Unsinger and More 1990). Due to improved judgment, more experienced officers might be less inclined to allow external factors, such as race, to influence their use of police discretion. Research suggests that an officer's experience is associated with being less likely to have allegations of misconduct filed against them (Lersch and Mieczkowski 1996). Accordingly, I would expect more experienced officers, all else equal, to be less likely to ticket African American motorists than officers with fewer years of experience.

Experience may also be related to policing outcomes due to the nature of patrol assignments. Many departments operate under a seniority system where officers with more experience may be assigned to areas with lower overall activity and lower levels of crime than are less experienced officers. Consequently, less experienced officers may practice a more aggressive style of policing than more experienced officers. There is some research that suggests that less experienced officers are more likely to conduct traffic and pretextual stops, issue tickets, and make arrests in traffic encounters than more experienced officers (Friedrich 1977; Worden 1989). In addition, some research suggests that they are also more likely to use force on the job (Toch 1995).

Importantly, less active and lower crime areas also tend to be more racially homogeneous (i.e., whiter) than busier and higher crime areas. This may have consequences for the racial distribution of tickets if African Americans are more likely to drive in areas where the style of policing is more aggressive. According to this argument, less experienced officers may be more

likely to ticket African American drivers than more experienced officers due to their practicing a more aggressive style of policing in areas where African Americans may disproportionately drive.

While patrol assignments may encourage a more aggressive style of policing, it may also be the case that less experienced officers are more motivated to “produce” than are more experienced officers, regardless of the patrol assignments. This motivation may stem from more positive attitudes toward the job or from the desire of a more favorable assignment or shift. Officers with fewer years of experience may also be motivated by the future prospect of moving up in the ranks. Regardless of the reason, I suspect that organizational pressures to “produce” may be more consequential for the behavior of officers with less tenure. Thus, if a primary goal of the police organization is to remove drugs and weapons from the street, then less experienced officers may be more likely to target those groups believed to be most associated with such offenses, such as African Americans, than officers with more experience.

In contrast to the above discussion, work experience could arguably increase an officer’s propensity to engage in racial disparity. Niederhoffer (1967) suggested that an officer’s length of service might have negative consequences on their attitudes and behaviors in that length of service may result in more cynical attitudes and authoritative styles. Consequently, these negative attitudes and styles of behavior may translate into harsher treatment of citizens, especially those believed to be less law-abiding (Friedrich 1977).

Friedrich (1977) presented some support for this argument. Specifically, he found that satisfaction with the job steadily declined during 8 to 15 years of experience, but increased slightly afterwards and attitudes toward supervisors became increasingly negative across all years. These findings suggest that experience can create or harden negative attitudes. Further, Friedrich’s

research suggested that while more experienced officers treated nonoffenders more favorably, they tended to treat offenders more negatively than did less experienced officers. Conversely, less experienced officers were more likely to treat nonoffenders and offenders alike. Friedrich suggested that the increased cynicism that develops in officers as experience increases has consequences for the impact of the organization's norms on police behavior. More experienced, and consequently, more cynical officers, are less committed to organizational rules and practices. This permits them to follow their own predispositions, which may not coincide with the organizational norm of impartial behavior. Additional research has similarly suggested that more experienced officers may be more likely to follow their own rules of conduct (Brown 1981; Muir 1977). Thus, more experienced officers might be friendlier with those motorists believed to be law-abiding and harsher toward those believed to be less law-abiding. Since race is associated with crime and deviance, if work experience operates in this way it may increase the propensity to treat African Americans more severely.

In this section, it has been argued that experience might be negatively associated with the number of citations issued to African Americans if more experience is related to increased professionalism or a less aggressive style of policing tied to patrol assignments or organizational pressures. Alternatively, experience might be positively associated with the number of citations issued to African Americans if an officer's attitudes and behavior toward the job, supervisors, and citizens most associated with criminality become more negative with experience.

## **Training**

Training might be related to racial bias in policing if it impacts an officer's standard of practice. Continuous training provides the opportunities to gain the necessary knowledge and skills to more effectively carry out the police role (Sheehan and Cordner 1989). For instance, officers become more familiar with the law as it relates to the extent of their police powers, including the civil rights of citizens, and it is believed that such knowledge will reduce the chances that an officer will violate the civil liberties of citizens (Unsinger and More 1990). There is some evidence that training programs can improve an officer's skills and knowledge related to traffic enforcement (Burns 1988; Studdard and Burns 1989).

Along with the acquisition of greater legal knowledge, the goals and the values of the organization become clearer and are more likely to be internalized by the officer through training (Unsinger and More 1990). Having an officer accept and actually believe in the values and goals of the organization is especially important given that officers conduct much of their work without direct supervision. Internalizing the goals and values of the organization allows the officer's conscious to help control his/her behavior when in the absence of direct supervision.

The policies and procedures of the agency may also become clearer to an officer due to training (Unsinger and More 1990). Specialized training exposes an officer to different situations and/or scenarios that may be encountered while on the job. Given the ambiguousness of the many policies and procedures, training helps provide a better understanding of when and how to use various police powers. Such exposure may increase an officer's ability to make quick decisions in difficult situations and to do so in a manner that is more consistent with the organization's goals and values (Unsinger and More 1990).

Officers who place more value in training, and therefore are probably more likely to willingly participate in advanced training, are less likely to allow their personal attitudes and experiences to impact their use of discretion than those who place less value in training (Breci and Simons 1987; Brown 1981). Thus, training may result in decision-making that is more impartial. Unfortunately, there is a lack of research that directly tests the relationship between an officer's training and racial distribution of tickets. There is, however, a survey of municipal police officers representing 151 policing organizations across the country that suggests that training may reduce police misconduct. Weisburd et al. (2000) found that most of the officers surveyed believed that training was an effective method for preventing the improper use of discretion. Accordingly, I suspect that those officers with more training would be less likely to disproportionately cite African Americans than officers with less training.

In contrast to the above argument, some research suggests that professional training may not necessarily reduce racial disparities. The focus of recruit and in-service training may actually encourage attitudes and behaviors that result in race-based policing. Recruit training often includes a disproportionate amount of time emphasizing the dangers of policing with minimal time spent on constitutional law and civil rights pertinent to the enforcement of law (Kappeler et al. 1998). Preoccupation with danger may encourage traits like suspiciousness, cynicism, hostility and fear in officers. Such training, then, may lead officers to focus their attention on selective behavior, attitudes, and appearances of marginal groups in society (Kappeler et al. 1998).

Some research supports the notion that police training may encourage police to have negative attitudes about African Americans. For example, over an 18-month period, Teahan (1975) examined the attitudes of 97 white police officers starting with the time they entered the

police academy. The research found that as training progressed officers became more hostile toward African Americans since the training encouraged police to view African Americans as criminal.

Based on the above discussion, one plausible hypothesis is that the knowledge and skills gained through training may serve to improve an officer's ability to carry out the police role (Block 1991; Bracey 1997; Little 1990). This is certainly the intent behind training. As such, officers with more training may be more likely to value ethical conduct and to possess more occupational knowledge and skills. Consequently, officers with more training may be less likely to engage in police misconduct, in general, and inappropriate uses of discretion, in particular (Bracey 1997; Brown 1981).

Alternatively, training may encourage officers to use race as an indicator of suspicion. Research suggests this may be the case with municipal police. The consequences of training for state police is more ambiguous. North Carolina State Highway Patrol troopers, compared to municipal police, are far more concerned with routine traffic enforcement rather than getting criminals and drugs off the streets. Consequently, much of the advanced training for regular road troopers is designed to increase proficiency in tasks related to traffic enforcement. The most frequent training sessions participated in by the North Carolina State Highway Patrol troopers include Intoxilyzer 5000 (85.5 percent), CPR training (83 percent), Certified Vascar and Radar Operator (64 percent), and Mobile Data Training (60.4 percent). Thus, one would suspect that the North Carolina State Highway Patrol's advanced training is not likely to encourage the use of race as an indicator of suspicion. Although less likely than investigative training, NCSHP officer training may still promote activities that result in some race based policing, which may then encourage

ingroup and outgroup differentiation and the activation of racial stereotypes by troopers.

Consequently, the cognitive errors associated with racial categorization may be committed (i.e., in-group favoritism, out-group discrimination, ultimate attribution error, illusory correlation). If this is the case, then those officers with more professional training may be more likely to act in ways that produce racially biased outcomes than their counterparts.

### **Summary**

In this section I have suggested that personal and work characteristics of the officer may be related to an officer's propensity to be racially biased in their use of discretion. As to the specific nature of the relationship between various individual characteristics and use of discretion, it is difficult to make strong predictions due to the lack of research on the ticketing behavior of police officers. The research that has been presented in this chapter is primarily based on municipal police rather than state law enforcement. This raises even more questions as to how individual characteristics of North Carolina State Highway troopers may impact their use of discretion. Thus, it should be noted that although hypotheses are offered, this research is also about pattern discovery. In the next chapter I discuss organizational factors that may be related to an officer's ticketing practices.

## CHAPTER 3

### ORGANIZATIONAL FACTORS AND POLICE DISCRETION

In organizational theory, the bureaucratic-rational model would take the position that an organization's structure has a tremendous impact on the action of its members (Weber 1946). This position argues that bureaucratic organizations are able to influence the decisions of individual members through supervision, indoctrination (recruitment, selection, training, and exhortation) of members, and through a system of reward and discipline (Mastroski 1987; Simon 1976). In sum, this position portrays bureaucratic organizations as systems of coordinated and controlled activity.

Certainly most police organizations would fit this description. In addition, they usually have a quasi-military character. For instance, police organizations have a defined division of labor where separate responsibilities tend to fall within a specific unit. Although the organizational arrangement varies across types of departments (i.e., federal, state, county, municipal), all police organizations have a relatively fixed and clearly defined division of labor. The North Carolina State Highway Patrol, for example, consists of six sections, each with distinct responsibilities. These sections include administrative services, communications and logistics, inspection and internal affairs, research and planning, training, and zone operations (i.e., the enforcement section).

In addition to division of labor, control in police organizations is hierarchically structured, often referred to as the chain of command. For instance, the order of rank for the NCSHP from the bottom up is trooper, sergeant, first sergeant, lieutenant, captain, major, and colonel. Orders and requests are expected to flow up or down through each level in the organizational hierarchy. In

addition, each member has one immediate superior to whom he or she must answer. As Wilson and McLaren (1977) noted:

Line command is simple in operation and involves no difficult relationship when channels of control are clearly established and understood; it consists of the superior officer directing the efforts of his immediate subordinates by written or verbal orders or instructions (p. 128)

Another characteristic of police organizations is a complex system of rules and regulations that are designed to control and guide the actions of officers. The development of operational manuals and handbooks contain regulations and procedures to guide conduct in most situations. Further, rookie training and advanced training acquired throughout an officer's career are vehicles for increasing an officer's awareness and understanding of the various rules and regulations. Ideally, the behavior of officers is predictable since they are manipulated by rules and regulations.

According to this classic bureaucratic and quasi-military depiction of police organizations, the structure of police organizations, along with their organizational policies and procedures, guide police officers use of discretion (Simon 1976; Weber 1946). This description of police organizations is fitting for the North Carolina State Highway Patrol, which is formally structured and based on a military model.

The values and goals of the organization will determine in a large part the extent to which the various organizational aspects will affect racial disparity in policing. A "professional" perspective toward policing suggests that police agencies should strive to be impartial in the enforcement of laws. Thus, the imposition of social control should reflect the behavior of offenders, not their social position.

In addition, proponents of the professional model of policing suggest that members of the police force should be nonpolitical, well recruited, well trained, well disciplined, and equipped with modern technology (Wilson and McLaren 1972). The professional model may be especially exhibited by state police agencies, which tend to possess the image of a “spit and polish” department. State law agencies are typically described as having more extensive recruitment, higher standards of academic qualifications, and more extensive in-service training than municipal police agencies. According to the professional model of police organizations, elements of the police organization should, ideally, reduce the racial disparity in ticketing. There was evidence in the North Carolina Traffic Study (2002) that racial disparity in traffic enforcement outcomes was lower in the North Carolina State Highway Patrol than it was for local North Carolina police forces.

Conflict theorists assume that society is composed of groups with opposing interests and unequal amounts of power. It is further argued that these opposing groups struggle for the limited amount of resources. Due to differing degrees of power, the dominant group is generally able to use their advantage to preserve and promote the power it holds as a group, which is detrimental to the less powerful group. Thus, it is often the groups with the most power that tend to have the greatest influence on police organizations (Chambliss 1966; Gurr 1980; Jacobs 1979; James 1988; Quinney 1969; Turk 1969). Police organizations, themselves dominated by whites, may be positioned to create policies and procedures that, consciously or unconsciously, reflect their racial groups interests without pressure from sources external to the organization.

Proponents of conflict theory may very well be correct in suggesting that some law enforcement policies and procedures result in policing that varies depending on the group, activity, and community being enforced. Police organizations, however, are not likely to routinely

discriminate against minorities, even if they, as individuals or the collective, are motivated to do so. Police organization, then, may unconsciously, and in some cases consciously, encourage racial discrimination in the enforcement of laws. For instance, Lundman's (1979) research suggested that the differential treatment of certain types of citizens in traffic enforcement resulted from organizational norms that supported such behavior. This suggests that elements of the organization, such as enforcement policies and procedures, supervision, and training might encourage race-based policing.

The above discussion suggests that police organizations may be effective in controlling and guiding police discretion. The professional model of policing suggests that policing is impartial and the imposition of social control reflects the behavior of offenders, not their social position. Consequently, elements of the organization should reduce racial disparity in policing. Still, organizations may knowingly or unknowingly encourage race-based policing. What follows is a discussion of organizational characteristics that might impact the racial distribution of citations. Supervision and the experience, training and racial composition of the organization will all be considered.

### **Supervision**

Supervision involves monitoring and evaluating the performance of officers and addressing officer misbehavior when it is detected. It also includes shaping the attitudes and behaviors of officers to reflect the goals and values of the organization (Goldstein 1977). Supervising patrol officers' behavior, however, may be difficult because much of their work occurs out on the street in the absence of direct supervision (Brown 1981; Manning 1977). The policing profession is

somewhat unique since those occupying the lowest rank, troopers, often experience the least direct supervision and thus the greatest amount of discretion due to the nature of their work. While there may be obstacles in directly supervising patrol officers, there are indirect means that supervisors may use. This is especially the case where the officer's work can be easily measured.

For example, troopers are required to record many of the actions they take with drivers. Thus, they fill out forms when they conduct traffic stops, searches, and arrests. They also fill out forms when they issue citations, written warnings, use force, and investigate accidents. Important to supervision, statistics may be compiled from these forms and supervisors are then able to review the statistics of those being supervised. These statistics provide supervisors information on an officer's work output, distribution of various impositions, and information on the characteristics of the drivers with whom an officer interacts. It is suggested that these indirect means of supervision are quite effective in controlling officer behavior (VanMaan 1983).

There is research that suggests that effective supervision by police organizations may have some impact on patrol officer behavior. For example, research on traffic enforcement suggests that organizational priorities regarding traffic enforcement along with the close monitoring and controlling of officer behavior impacts individual officer's productivity in issuing traffic tickets (Gardiner 1969; Wilson 1968). Similarly, Muir's (1977) research examined patrol officers' understanding of human kind and morality regarding the use of coercion and found that patrol sergeants were able to have a fundamental influence on officers' development of both understanding and morality, and therefore on their behavior. Similarly, research has found supervision to impact the decision to arrest, use force, and the number of citizen complaints filed (Crank 1990; Fyfe 1978; 1982; 1986, 1988; Meyer 1980; Sherman 1983; Slovak 1986).

Other studies suggest that supervision has little impact on officer behavior thus calling into question the ability of supervision to influence officers' discretion (Allen and Maxfield 1983; Brown 1981; Mastrofski et al., 1987). Brown (1981), for example, surveyed officers representing three California police departments (Redondo Beach, Inglewood, and LAPD) and found that 46 percent of the police officers in Rodondo Beach and 40 percent in Inglewood said that they would pursue a course of action even if a supervisor would disapprove.

With regard to racial bias in policing, research suggests that closely monitoring and evaluating officer behavior may also reduce racial disparity in policing. For instance, Wilson (1968) compared police departments that he termed "legalistic" with those he referred to as "watch style." In the legalistic departments, Wilson found that the activities of the patrol officers were closely monitored and evaluated. For example, the legalistic departments, which resembled the professional model of policing, tended to have an internal affairs section that investigated possible police misconduct, a research and planning section that gathered and analyzed data from police reports, and an inspection section that checked the performance of officers. Consequently, Wilson found that the legalistic departments were less likely to discriminate against minorities than watch style departments. This research indicates that in organizations where officers are more closely supervised, African Americans may be more fairly treated by officers than in organizations with less supervision. Similarly, a survey of municipal officers representing 113 police departments suggests that officers believe that supervisors are effective in influencing their behavior (Weisburg et al. 2000). For instance, close to 90 percent of the officers surveyed in this study agreed with the statement, "Good first-line supervisors can help prevent police from abusing their authority".

Collectively, the research examining supervision and police discretion has produced inconsistent findings. Further, the effect supervision may have on an officer's racial distribution of citations is especially unclear due to the limited research examining this relationship. In advance, it is difficult to suggest whether effective supervisions will increase or decrease racial bias in policing. In order for supervision to reduce racial disparity, the goals and values of the organization must support racial equality in policing. Unfortunately, policies and practices, ostensibly created to implement organizational goals and values, may themselves encourage racial bias. In organizations where such practices are encouraged, close supervision of officer behavior may encourage race-based policing.

Based on the above discussion, I hypothesize that those officers who work with more supervision will be less likely to disproportionately cite African American motorists than will officers who work in organizations with less supervision. This hypothesis reflects the professional model of policing by suggesting that effective supervision may ameliorate racial bias in policing. Further, the impact of supervision on police discretion may differ for white and African American officers. As suggested earlier, one might expect that white officers would harbor racist beliefs and/or cognitive biases toward African American motorists more often than African American officers. Consequently, the presence of supervision might reduce the targeting of African American motorists especially among white officers with the propensity to do so otherwise. An alternative hypothesis is that supervision may encourage racial disparity. This would be the case if organizational policies covertly or overtly support race-based policing or if high productivity goals encouraged aggressive policing strategies.

## **Experience and Training Composition of the Organization**

The experience and training composition of the organization is suggested to signify the organization's climate. One perspective suggests that the greater the experience and training of the organization's members the more "professional" the climate. In such organizations, there may be a general atmosphere where officers have more pride in their profession, which improves the overall morale of the organization (Unsinger and More 1990). It seems that officers in these organizations would behave in ways that maintain the integrity of themselves, the organization, and the profession.

In addition, officers in organizations where the average officer has more training or work experience would more likely be highly informed of laws related to the police role and the goals and policies of the organization (Unsinger and More 1990). As such, they may be less likely to carry out the police role in an irresponsible or unethical way. It seems that in these organizations the use of extralegal factors such as race would be less likely to occur (Bracey 1997; Brown 1981). It is also likely the case that in such organizations that there would be reduced civil liability and the community would have a more positive impression of the police organization than in less professional organizations (Unsinger and More 1990). Thus, an organization composed of more experienced and trained officers would more likely have officers who are more equitable in their application of the law.

While the above discussion suggests that having a workforce that is more experienced and trained will reduce racial bias in policing, it may actually have the opposite impact. For instance, to the extent that street experience increases an officers' cynicism regarding policing, and those they serve, organizations composed of more experienced officers may be more likely to have a work atmosphere where the level of performance is lower and the willingness to act in ways that

reinforces organizational goals and policies is hindered (Niederhoffer 1967; Regoli and Poole 1978). It seems that under such conditions the climate of an organization composed of a larger proportion of seasoned officers would more likely result in racial disparity in citations than an organization with a smaller proportion of experienced officers.

Having a workforce that is more trained may similarly increase racial disparity in policing. This would be the case if training reinforces attitudes and behaviors that encourage race-based policing practices. For example, an examination of the New Jersey State Police was conducted due to numerous allegations of targeting racial minorities for traffic stops and searches (Verniero and Zoubek 1999). One of the conclusions of the report was that the messages received through training encouraged officers to unduly focus on racial minorities.

To the extent that work experience and training is related to professionalism, I hypothesize that an officer located in police organizations where officers on average have more work experience or professional training would be less likely to show racially biased ticketing patterns than officers working in organizations where officers on average have less work experience or professional training. Still, if work experience and training encourages cynicism and race-based policing, officers might be expected to ticket African American motorists in organizations composed of more experienced and trained officers.

### **Racial Composition of Police Organization**

Historically, police recruitment has resulted in a police force composed of working class origin, white, male police officers that reproduced middle class values. Those who did not reflect

the middle-class lifestyle were often screened out through recruitment and selection practices including oral interviews, physical agility, and psychological tests (Kappeler et al. 1998).

The extent of racist beliefs and behavior in policing may at least partially reflect the racial makeup of police organizations, which tend to be white. For instance, Attorney General Drew S. noted:

Discriminatory employment practices are often closely related to discrimination in provision of public services. A police department that deliberately excludes minorities from employment is often accused of failing to provide adequate police services to minority communities and the community as a whole. (US Dept. of Justice 1979:1, cited in Stokes and Scott 1996, p. 32).

Increased recruitment of minority members has been suggested as a means to reduce negative attitudes and behaviors directed toward racial minority citizens, and consequently, diffuse tension, encourage cooperation, and bolster the image of the department with minority members (Kerner Commission 1968; Presidents Advisory Board 1998, p. 85; President's Commission on Law Enforcement and Administration of Justice 1967, p. 167). The push for minority recruitment is based partly on the belief that African American officers, compared to white officers, have a greater appreciation and understanding of the culture and societal problems of minority citizens and are less antagonistic to the public (Berg et al., 1986; Jenkins and Faison 1974).

Thus, the increased organizational representation of African Americans, relative to white officers, may impact the organizational culture such that racial prejudice and discriminatory practices are less likely. Specifically, it seems that such things as training, the reward and punishment

structure, and the police subculture may all be altered such that racial bias in policing is reduced when there is more racial diversity in the organization (Walker 1989). Indeed, organizational research suggests that groups composed of members from different racial backgrounds may be better able to develop unique solutions to problems due to the greater variety of perspectives and approaches provided than a group composed of racially homogeneous individuals (Hoffman 1979; Nemeth 1992).

Furthermore, greater racial diversity in the organization may result in training, generally, that is more racially sensitive. As mentioned in the previous chapter, police training may inadvertently encourage officers to view minority groups with undue suspicion. I suspect that in organizations where there is more racial diversity in the workforce that training would less likely associate race with suspicion and would more likely teach less threatening ways to communicate with minority members. It seems plausible that such training would encourage less hostile and, consequently, more effective interactions between officers and minority citizens (Barlow and Barlow 2000).

Having greater organizational representation of African American officers may also impact the reward and punishment structure in such a way that racial discrimination in policing would be less likely to occur. For punishment to be effective in impacting police discretion, supervisors must send the message that patrol officers will be recognized for appropriate behavior and held accountable for inappropriate behavior. Studies of police misconduct have found that often supervisors were aware of the deviant activities of patrol officers but chose to “look the other way” (Barlow and Barlow 2000). When supervisors accommodate racial misconduct it sends the message that the organization condones such practices. It is likely that officers would be held more accountable for racial misconduct in organizations with greater African American representation.

This may especially be the case if higher minority representation translates into more African American officers obtaining leadership positions.

Having more African American officers may also impact the police subculture that has historically tended to reinforce white, masculine, and middle-class standards. Historically, the presence of such a police subculture has had implications for racial discrimination. First, members of the subculture have tended to be authoritative, suspicious, and have negative racial attitudes (Skolnick 1966). These qualities often encourage the devaluing or at least the increased suspicion of African Americans by police. Second, the subculture demands secrecy and loyalty. These two norms encourage officers to protect each other from administrative and public scrutiny (Kappeler et al. 1998). Thus, officers who treat African Americans in an unfair or injurious way may not be held accountable which lowers the costs associated with police misconduct.

It seems that in organizations where there is more racial diversity officers engaging in racial misconduct would be less likely to be protected by peers. This might occur due to changes in the subculture's norms regarding what is professionally and morally acceptable when it comes to the treatment of racial minorities. When police violate such standards, the subculture may be less supportive and less secretive of practices that are of questionable legality, especially as it relates to race.

Research testing the impact of the racial composition of the organization on policing outcomes is limited. One exception is Cao and Huang (2000) who failed to find a relationship between the racial composition of the organization and the organization's rate of complaints filed. It remains unknown what impact racial composition may have on other policing outcomes, especially those measured at the individual-level.

Based on the above discussion, I suspect that in organizations with a higher representation of African Americans, the norms and values of the organization would be less likely to encourage or tolerate negative racial attitudes and behavior by officers. Thus, I hypothesize that officers in patrol districts with a higher proportion of African Americans would be less likely to be racially biased in ticketing than officers working in organizations with a lower percentage of African American officers.

In such organizations, both white and African American officers should ticket African American motorists less. Working in a more racially diverse organization, African American officers may feel less isolated and less pressured to resemble white officers and, consequently, will be less likely to ticket African American motorists. With regard to white officers, they will also be less likely to cite African Americans in a more racially diverse organization due to organizational changes, as discussed above, which would probably make race-based policing less likely.

### **Summary**

This section has suggested that organizational factors such as supervision and the experience, training, and racial composition of an organization might be related to the racial distribution of citations. The exploratory nature of this research should be noted since, as was the case for individual factors, there has been limited research examining the relationship among aspects of the organization and traffic enforcement, which makes developing hypotheses difficult. Further, the research that has been discussed has been based on examinations of municipal police while the current study addresses the discretionary behavior of state law enforcement. Consequently, it is difficult to predict the direction of the relationship between the various organizational factors and the

racial distribution of citations. There is reason, however, to suspect that the NCSHP may resemble the professional model of policing more than the conflict model.

For example, a study of the Riverside municipal police found that the racial distribution of citations varied across the traffic and patrol units due to differences in the mission, training, and deployment of the two units (Gaines 2002, Parker 2001). The initiative of traffic officers involved enforcing traffic laws and, consequently, the purpose for pulling over a car was generally to issue a citation. These officers tended to patrol areas where traffic accidents were more common and where citizens had issued complaints. Riverside patrol officers, on the other hand, were more concerned with getting criminals, drugs, and weapons off the street and tended to pull over cars for the purpose of conducting an investigation (i.e., pretextual stops). Accordingly, patrol officers were more likely to patrol during the times when and places where higher levels of crime and disorder were most likely. These were also the times when and places where racial minorities were disproportionately driving. This research found that differences in the initiatives, training, and deployment of these two units resulted in no racial disparity in the stops of traffic officers but considerable racial disparity in patrol officer stops.

The responsibilities and motivations of the troopers examined in this dissertation most resemble those of the traffic unit. Regular road troopers are concerned with traffic enforcement rather than apprehending criminals and drugs. Consequently, they engage in traffic stops for the purpose of enforcing traffic laws rather than conducting an investigation. It seems reasonable to suggest, then, that the organizational policies and procedures for these troopers would not generally lend themselves to disproportionate race based policing. This may not be the case for specialized units of the North Carolina State Highway Patrol that more closely resemble Riverside's patrol unit,

such as the drug interdiction unit. Although troopers in the drug interdiction unit engage in routine traffic stops, they are also concerned with the trafficking of drugs and other contraband. Thus, the drug interdiction unit, due to their mission, would be more likely expected to aggressively enforce traffic law with the extra responsibility to look for indicators of suspicious persons and activities. Differences in function, mission, and expectations, then, may partly account for apparent racial disparity in policing. Having discussed how the characteristics of the organization that police operate within may influence policing, I will now move on to a discussion of how racial threat may impact the discretion of police officers.

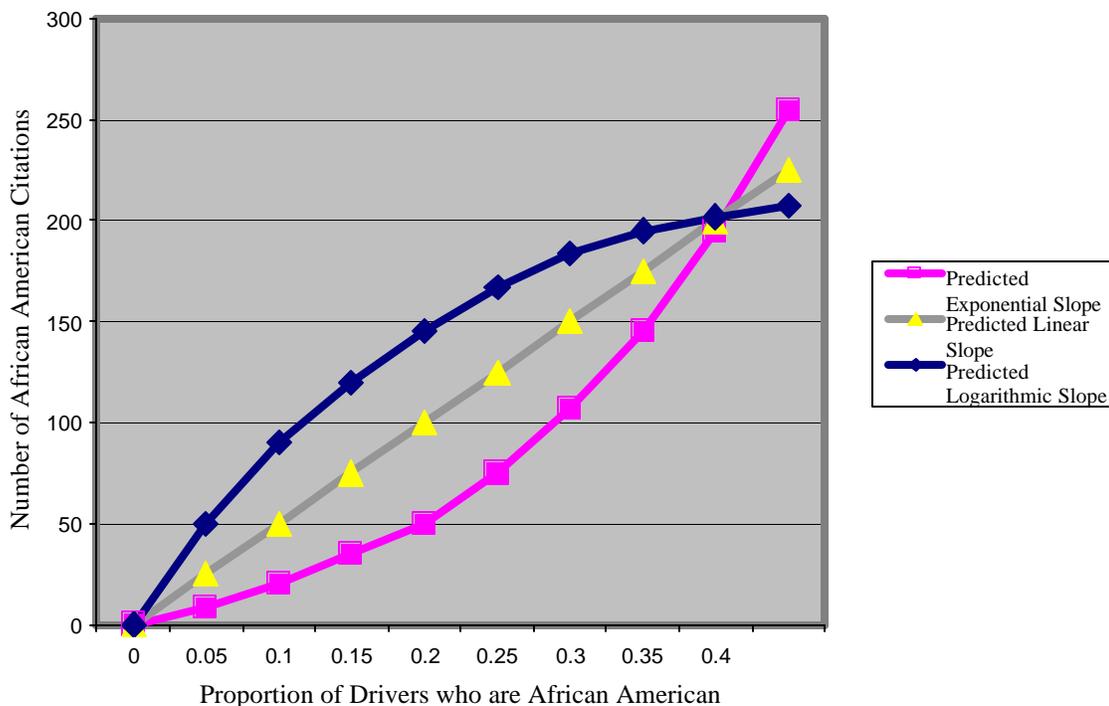
## CHAPTER 4

### RACIAL THREAT AND POLICE DISCRETION

Blalock's (1967) racial threat thesis suggests that the racial composition of an area may be related to that area's level of racial discrimination. He argued that majority group members are more likely to feel economically or politically threatened when the size of the subordinate group is relatively large. Intergroup conflict, prejudice, and discrimination directed at the subordinate group are argued to increase under conditions of perceived threat. Thus, Blalock suggested that the presence of African Americans in a geographical area would be positively related to that area's level of discrimination: the greater the proportion of African Americans, the greater the discrimination. Blalock's thesis has been used to explain the spatial variation in the relative economic, political, and social standing of racial and ethnic minorities in this country.

Blalock further refined his thesis by suggesting that the relationship between minority group presence and discrimination may be curvilinear (see Figure 4.1). The precise form of the relationship depends on the source of threat. When the discrimination is motivated by economic competition, Blalock suggested that there would be a positive, *decreasing* slope (i.e., logarithmic). That is, as percent African American increases, discrimination rises at an ever-decreasing rate. Specifically, Blalock reasoned that as the percent African Americans in the population increases, a decrease in the rate of increases in discrimination occurs because of the success of discrimination at lower levels.

**Figure 4.1. The Hypothesized Linear and Nonlinear Forms of the Relationship between Racial Composition of a District and the Number of Citations Issued to African Americans**



Therefore, to the extent that whites are successful in reducing the resources available to African Americans when their numbers are not large, there will be a reduction of instances of economic competition between whites and African Americans where larger numbers of African Americans are located. The motivation for whites to discriminate against African Americans (i.e., economic competition) is reduced and, consequently, additional discrimination will be produced at an ever-decreasing rate as the percent African American increases. Blalock stated:

Although intensity of competition is difficult to conceptualize and measure, one would expect the greatest *perceived* competition among near equals. . . Provided that discriminatory behavior actually results in handicaps for the minority, the larger the minority percentage the

greater is the average gap between the two groups, and less intense the average degree of perceived competition. (p. 148)

Still, the relationship between percent minority and discrimination should be positive with an *increasing* slope (i.e., exponential) when the discrimination is related to perceived political threat. The higher the proportion of African Americans in the population, the more likely African Americans will be able to politically mobilize. In turn, this creates a greater need for discrimination to ensure advantage. As Blalock (1967) noted:

. . . if whites are to maintain a constant power advantage over [African Americans], then the degree of their mobilization relative to that of [African Americans] must not only increase with percent [African American], *but it must also rise at an increasing rate.* (p. 153)

While Blalock's thesis has primarily been used in economic and political research, the idea of minority groups representing a threat has gradually been recast in terms of social control. This formulation suggests that as majority groups perceive increases in the relative size of the minority group as a threat to the existing distribution of economic and political resources, they intensify social control efforts, specifically directing them at the threatening population.

For instance, research suggests that the lynchings of southern African Americans were largely a response by some of the white community to the perceived economic and political threats of the African American population (Corzine et al. 1983; Corzine et al. 1988; Olzak 1990; Reed 1972; Tolnay et al. 1989). Similarly, it has been suggested that the creation of Jim Crow laws was a response to minority group threat. As Wilson (1978) argued:

The efforts of white workers to eliminate Black competition in the South generated an elaborate system of Jim Crow segregation that was reinforced by an ideology of biological racism (p. 14).

Thus, the perceived racial competition resulted in attempts by whites to informally, through lynchings, and formally, through Jim Crow laws, halt the perceived economic and political threat of African Americans. In doing so, whites maintained their economic and political advantage in Southern society.

There have been others who have demonstrated how in more modern times the white community has used formal social control as a means to control the perceived threat of African Americans. Research in this tradition has focused on the general threat that racially and culturally dissimilar groups pose to the existing political and social order. It is posited that increases in the relative size of the minority group may be related to increases in the *capacity* and *exercise* of social control. Much of this research has been at the aggregate-level and has focused on municipal areas during the time period of the 1960's through the early 1980's.

With regard to the *capacity* for social control, research does indeed suggest that increases in the presence of minority group members is positively related to police size and expenditures. For instance, Jackson and Carroll (1981) analyzed 90 non-Southern US cities and found that the size of the nonwhite population in 1961 had a positive influence on police expenditures in 1971, holding constant the crime rate, city revenue, and population size.<sup>4</sup> They reasoned that whites feared racial competition and the political mobilization of racial minorities during the Civil Rights' period because it threatened to change the role of the subordinate group in local politics. The white community

responded by putting pressure on the government and police organizations to control the threatening minority groups.

Similarly, Greenberg et al. (1985) found that an increase in the size of the minority population relative to the size of the white population was related to growth in police strength (i.e., size of police force), controlling for the violent and property crime rate, city revenue, and population size.<sup>5</sup> This was especially the case in the Southern cities. Interestingly, they found the effect of percent nonwhite on police employment to be present in the 1950-1960 and 1960-1970 time periods but not during the 1970-1980 time period. They suggested that Southern whites used crime control to preserve their privileged position in the face of challenge from the Civil Rights' movement and it was between 1950 and 1970 that race relations were extremely salient in the South.

Some of the research in this tradition has also explored Blalock's proposition that the relationship between minority group size and discrimination might be nonlinear. For instance, both Jackson and Carroll's (1981) and Greenberg et al.'s (1985) findings suggest that the relationship between the size of the minority group and the capacity for social control is positive with a decreasing slope at the highest levels of percent African American.<sup>6</sup> Thus, there appears to be a tipping point in the relationship between the size of the nonwhite population and police expenditures. These authors suggest that when African Americans are the majority in terms of the population size, they are able to achieve more political power. Consequently, they are in a better position to resist the discriminatory actions of whites (Blalock 1967; Jackson and Carroll 1981).

With regard to the *exercise* of social control, much of this research has focused on the relationship between minority presence and arrest, sentencing, or imprisonment outcomes. Research suggests that minority presence may indeed increase perceived general threat that subsequently may

increase the exercise of social control. Specifically, increases in the representation of minorities in the population has been found to be related to increases in arrest rates (Brown and Warren 1992; Liska 1985; McCarthy 1991), police homicide rates (Jacobs and O'Brian 1998), police processing of juvenile and adult cases (Dannefer and Schutt 1982), and imprisonment policies (Nagel 1982).

Research examining the *exercise* of social control has not tested for the possibility of a nonlinear relationship even though Blalock proposed that the relationship might be curvilinear. As noted above, research examining the *capacity* of social control suggests that the estimation of a nonlinear model provides a better fit to models predicting police expenditures. This may also be the case with the exercise of social control. If this is the case, models predicting measures related to the exercise of social control may be misspecified, which may impact the substantive conclusions.

To summarize, the above research notes how the perception that African Americans represent an economic or political threat to whites may result in the targeting of African Americans for informal and formal social control. Further, research examining the relationship between minority presence and the *capacity* for social control suggest that the relationship is nonlinear—positive with a decreasing slope. Research on the *exercise* of social control tends to estimate a linear relationship with the racial composition of an area but neglect to explore the form of that relationship.

The above conceptualization of racial threat focuses on the economic and political threat that the presence of racial minority group members may pose to majority group members. There is reason to suspect that racial minority group members may also symbolize a criminal threat to whites and legal authorities. There has been quite a bit of research which has supported the validity of culturally and racially dissimilar subordinate groups being viewed by whites and authorities as a criminal threat (Chiricos et al. 1997; Liska et al. 1981; Lizotte and Bordua 1980; Moeller 1989;

Skogan 1995; Swigert and Farrell 1976). For example, Swigert and Farrell (1976) reported that whites and legal authorities hold criminal stereotypes of nonwhites as dangerous. Reference to crime statistics, media portrayals of African Americans, and cognitive biases may all encourage such an association between African Americans and crime (Chambliss 1994; Cummings 1988; Takata and Levitz 1990).<sup>7</sup> Consequently, an increase in the percent of African Americans increases the perception of crime, which increases white's level of fear (Chiricos et al. 1997; Jackson 1989). The racial threat perspective suggests that whites may react to the perceived criminal threat of African Americans by pressuring legal authorities to control this criminally threatening population. In addition, legal authorities, such as the police, may be influenced by the representation of African Americans in the population, even without community pressure. Police may individually react to the presence of African Americans by increasing social control efforts directed at members of this perceived criminally threatening group.

Research supports the notion that minority presence may increase the perceptions of criminal threat, which in turn may impact social control efforts. Specifically, research suggests that perceptions of criminal threat are triggered by the visibility of minorities and that such perceptions may be related to police size (Chamlin 1989; Jacobs 1979; Liska et al. 1981), arrest rates (Liska and Chamlin 1984), and police homicide rates (Liska and Yu 1992). The relationship has also been found for other areas of crime control including juvenile sanctioning (Sampson and Laub 1993; Tittle and Curran 1988) and correction expenditures (Jacobs and Helms 1999).

One of the first studies considering the possible criminal threat posed by minorities and its relationship to social control was Liska et al. (1981). This study examined 109 cities from 1950 to 1970, in five-year intervals. It was found that, controlling for the crime rate, percent nonwhite had a

positive influence on police size, especially in the South, during the late 1960s and early 1970s.

Additional analysis suggested that the racial composition of the city influenced whites' fear to walk the streets at night. Similarly, Chamlin (1989) found a positive relationship between the change in percent black and police size during the 1972-1978 time period, independent of the crime rate, in the 109 US cities examined.

Tittle and Curran's (1988) research also found support for minority presence representing a criminal threat that consequently impacts social control. This study differs from the others discussed in that it focused on juvenile justice dispositions rather than policing. But like the other studies, the authors found that African American youth were more severely sanctioned when the community consisted of a higher percent of African Americans in the population than when the percent of the African American population was lower. The authors reasoned that the higher the visibility of African Americans in the population, the higher the awareness of racial stereotypes and associated symbolic threat. Where racial threat was high, legal authorities responded by more severely sanctioning those youth who belonged to the fear-provoking group (i.e., African Americans).

### **Summary**

The previous discussion describes how the presence of African Americans may be viewed as economically, politically, and criminally threatening to whites. Threatened groups may attempt to influence both the amount of informal and formal social control directed toward threatening populations. Even in the absence of direct community pressure police may individually implement methods to address the perceived threat of crime, some of which may have negative repercussions

for racial minorities. It is in either case that African Americans may be vulnerable to negative policing outcomes.

While the perceived economic and political threat of African Americans may motivate the targeting of this minority group for social control, it seems most probable that it is the criminal threat associated with African Americans that has the most consequences for social control in more recent times (Liska et al., 1981; Turk 1969). Plausibly, Anderson (1995) suggested that the image of the African American criminal has replaced the African American Civil Rights' protester as the symbol of racial threat.

There is reason to believe that the fear associated with the visibility of African Americans may impact traffic enforcement outcomes. This seems especially likely given societal concerns for violence and drugs, both of which tend to be associated with minorities and minority communities. These community crime concerns fuel the public perception of minority groups as criminally threatening (Anderson 1995; Liska et al. 1981; Thompson et al. 1992). Consequently, community pressure from dominant racial group members may result in legal authorities taking action to control threatening populations and activities such as violence and drugs. Further, legal authorities that similarly share cultural stereotypes associating African Americans with crime and deviance may implement policies and procedures that produce racially disparate traffic enforcement outcomes. Either of these situations may encourage the use of racial profiles, pretextual stops, and the over-deployment of officers to minority areas, relative to white communities. Research suggests that these organizational practices and policies tend to target African Americans for aggressive traffic enforcement efforts (ACLU 1999; Allen-Bell 1997; Black 1980; Brown 1981; Chambliss 1994; Gaines 2002; Harris 1997, 1999). Thus, I hypothesize that the higher the proportion of African

American motorists in the district, the more likely African American motorists will be subjected to traffic enforcement outcomes, such as citations.

Regarding the form of the relationship, there are theoretical reasons to suspect a nonlinear relationship between the racial composition of drivers and police discretion. Research suggests that the relationship between minority presence and social control (i.e., the capacity for social control) may be curvilinear—positive with a declining slope. It seems possible that once the size of the African American population reaches a certain level that racial disparity may decline.

For instance, Jackson and Carroll (1981) found that the relationship between percent nonwhite and police expenditures was positive when nonwhites were the numeric minority. However, as nonwhites began to approach 50 percent of the population, the slope began to decline. The authors suggested that the sheer number of African Americans became a political resource in that they were in a position to politically block further increases in discrimination that would normally occur with the increasing perceived threat associated with increases in minority group size. Others have similarly suggested that beyond a certain proportion privileged citizens and legal authorities may seek accommodation with minorities (Turk 1969; 1976). Accordingly, I suggest that the relationship between the relative size of the African American population and traffic enforcement may be nonlinear—positive with a declining slope. It should be noted that the racial threat thesis has not previously been applied to traffic enforcement outcomes; thus, the hypotheses suggested here are primarily based on the findings from other areas of policing. The analysis in Chapter 7 will attempt to discover whether the racial threat process operates in a similar manner with the racial distribution of citations as that suggested by research in other areas of policing.

**CHAPTER 5**  
**INDIVIDUAL AND ORGANIZATIONAL ANALYSIS**  
**DATA, MEASURES, AND METHOD**

**Data and Sample**

The data used for the following analysis include information gathered from the North Carolina State Highway Patrol citation data base, personnel roster data base, and demographic data on licensed drivers provided by the North Carolina Division of Motor Vehicles.<sup>8</sup> These data files reflect activity during the 2000 calendar year.

Citation data were gathered for officers who are white or African American, ranked as troopers, and are not assigned to a “special” unit. This analysis includes only officers who were classified as white or African American since the theoretical discussions in the previous chapters focus primary attention on white and African American officers. Ninety-eight percent of North Carolina State Highway Patrol officers are classified as white or African American.

Officers who issue citations on a regular basis tend to be regular road troopers. In general, as officers move up in the ranks they spend increasing amounts of time performing administrative duties and, consequently, spend less time patrolling traffic. For instance, troopers issued an average of 365 citations in 2000, compared to higher-ranking officers (i.e., sergeants, first sergeants, lieutenants, captains, and majors) who issued an average of 30 citations in 2000. It is even more uncommon for those ranked sergeant or higher to cite African Americans. For example, those officers ranked higher than a trooper issued, on average, only about seven African American

citations in 2000. Due to the infrequency at which those ranked higher than a trooper issue citations, the analysis includes only troopers.

Officers assigned to special units are also not included in the sample. This study requires the matching of officers to police districts and those assigned to special units such as the drug interdiction or motorcycle unit often patrol areas that cover more than one district. Hence, the nature of their assignments and resulting mobility makes it difficult to include them in a multi-level study.

Once the officers who are not white or African American, not regular road troopers, and those who are assigned to special units are removed, the sample consists of 1024 troopers, which reflect 91 percent of all North Carolina State Highway Patrol troopers (1,073). What follows is a discussion of the measurement of the concepts included in the analysis. At the end of the chapter the research strategy is summarized.

### **Measurement of Variables**

In this section I will outline how the concepts previously defined as relevant to this study will be measured. In addition, the descriptive statistics of the measures will also be discussed. Table 5.1 provides a summary of the measurement of the concepts and Table 5.2 lists the descriptive statistics for the measures.

#### Outcome Variable

The dependent variable for this analysis is the trooper's number of non-accident related citations issued to in-state African American drivers in 2000. While this count measure includes all

**Table 5.1. Description of Measures**

<b>Variable</b>	<b>Description</b>
<i>Dependent Variable</i>	
African American Citations	Natural log of the number of non-accident citations issued to in-state African American drivers.
<i>Officer Attributes</i>	
Race	Dummy variable where 1=White trooper and 0=African American trooper.
Experience	Number of years the trooper has been employed by the North Carolina State Highway Patrol.
Training	Number of in-service training sessions completed divided by length of service.
<i>Organization Variables</i>	
Supervisory Intensity	Number of Sgts. in the district divided by the total number of citations issued in the district in 2000.
Experience Composition of Organization	Sum of years of experience of all officers in the district divided by total number of officers in the district.
Training Composition of Organization	Sum of number of in-service training sessions completed by all officers in the district divided by the sum of years of experience of all officers in the district.
Racial Composition of Organization	Number of African American officers in the district divided by number of White and African American officers in the district.
<i>Control Variables</i>	
Proportion Interstate	Proportion of a trooper's citations that occurred on an Interstate in 2000.
Proportion US Highway	Proportion of a trooper's citations that occurred on a US Highway in 2000.
Proportion Rural Roads	Proportion of a trooper's citations that occurred on a Rural Road in 2000.
Proportion NC Highway	Proportion of a trooper's citations that occurred on a US Highway in 2000 (reference category).
Proportion Late Night/Early Morning Hours	Natural log of the proportion of a trooper's citations that occurred during late night/early morning hours (8 p.m.-7 a.m.) in 2000.
White Citations	Natural log of the number of non-accident citations an officer issued to in-state white drivers.
Racial Composition of Drivers in District	Sum of the number of resident drivers in district $i$ (where $i=1, 2, 3, 4 \dots 53$ ) who are African American and the number of nonresident drivers in district $i$ who are African American divided by the sum of number resident drivers in district $i$ (where $i=1, 2, 3, 4 \dots 53$ ) who are white and African American and the number of nonresident drivers in district $i$ who are white and African American.

**Table 5.2. Descriptive Statistics for Variables Used in Analysis**

	Mean	SD	Minimum	Maximum
<b>Dependent Variable</b>				
African American Citations	93.97	75.91	1	514
LN African American Citations	4.07	1.19	0	6.24
<b>Explanatory Variables</b>				
<i>Officer Attributes</i>				
Race	.85	.36	0	1
Length of Service	10.00	7.06	0	29
Training	5	2.52	0	12
Training (adjusted for yrs.exp.)	.61	.42	0	2
<i>Organization Characteristics</i>				
Supervisory Intensity (x 1000)	.35	.13	.15	.73
Experience Composition of Org.	12.15	2.21	7.08	17.68
Training Composition of Org.	.47	.10	.32	.76
Racial Composition of Org.	.15	.12	0	.43
<i>Control Variables</i>				
Proportion of Citations issued on the Interstate	.14	.21	0	.96
Proportion of Citations issued on US Highways	.38	.20	0	.95
Proportion of Citations issued on Rural Roads	.25	.14	0	.73
Proportion of Citations issued on NC Highways (reference category)	.23	.16	0	.86
Proportion of Citations issued during Late Night/Early Morning Hours	.25	.12	.02	.95
LN Proportion of Citations issued during Night Hours	-1.45	.43	-3.53	-.05
White Citations	271.14	149.83	2.0	1102.00
LN White Citations	5.43	.66	.69	7.00
Proportion of Drivers Driving in the District who are African American	.21	.12	.01	.47

Note. Individual-level N=1024; District-level N=53.

types of citations (i.e., speeding, nonspeeding moving violations, nonmoving violations), around half of the citations issued by the North Carolina State Highway Patrol are for speeding. Twenty-six percent of the total of white and African American citations were issued to African American drivers.

Citations that were issued to out-of-state drivers are excluded from the analysis since the baseline measure for the racial distribution of drivers in the district makes assumptions regarding North Carolina drivers only. In 2000, about 17 percent of citations issued by the North Carolina State Highway Patrol were to out-of-state drivers. Further, this analysis includes only citations issued in encounters where the officer most likely initiated the interaction. The theories discussed in the previous chapters relate to the individual and contextual influences on police decision-making and assume that police have quite a bit of discretion in deciding when to stop a motorist and, subsequently, issue a citation. Since this is not the case with accident-related encounters, only citations unrelated to an accident are included in the analysis.

Turning now to the descriptive statistics, the average number of African American citations issued by the troopers in this sample was 94 and ranged from one to 514. The distribution of this variable was highly skewed at the higher end of the distribution. Thus, in the analysis that follows, the number of African American citations is transformed using the natural log to adjust for the high skewness. Logging results in a distribution with a more normal curve. The mean of the transformed variable is 4.07 with a range of zero to 6.24.

## Officer Attributes

### *Race*

It is hypothesized that white officers might be more likely to cite African Americans due to racist attitudes or cognitive bias. An alternative hypothesis is that African American officers might be more likely to cite African Americans than white officers due to organizational pressures experienced by African American officers and/or organizational and political pressures experienced by white officers. Ideally, measures of the officers' attitudes toward African Americans and how officers process information when they encounter African Americans, including the influence of stereotypes, would be included. It would also be preferable to incorporate measures of the officers' perceptions of possible organizational or political pressures. Unfortunately, more direct measures of racial attitudes, cognitive processes, and perceptions of organizational and political pressures are not available. Following previous research, I use the officer's race as an indicator of such processes.

The race variable is measured using a dummy-coded variable, where troopers who are white are coded as one and African American troopers are coded as zero. As noted above, those officers who are not white or African American are omitted since this study is concerned with how discretion may vary among white and African American officers. Of the 1024 troopers included in the sample, 870 are white (85 percent) and 154 are African American (15 percent).

### *Experience*

It is hypothesized that the officer's length of service may be positively related to the issuance of citations to African Americans due to negative attitudes and behaviors increasing with tenure.

Alternatively, it is suggested that there may be a negative relationship between length of service and the outcome measure if professionalism increases or an aggressive style of policing decreases with work experience. It would be preferable to have measures of an officer's attitudes, skills, and knowledge related to various aspects of policing. Since these measures are not available, I follow the lead of previous research and use the officer's years of experience as an indicator of an officer's capabilities and attitudes toward police work.

An officer's length of service is operationalized straightforwardly as the number of years the officer has been with the North Carolina State Highway Patrol. The average number of years employed for North Carolina State Highway Patrol troopers who are included in the sample is 10 years. This variable has a range from less than one year to 29 years of service.

### *Training*

It is hypothesized that training may have a positive relationship with the issuance of African American citations if training promotes race-based policing. Alternatively, training may be negatively related to the number of citations issued to African Americans if training is associated with professionalism. An ideal measure of training would include such dimensions as the quantity, quality, and specific content of training. Such information, with the exception of quantity of training, is usually not available in studies using official data. Such is the case here. Similar to most of the research examining the impact of an officer's training, I use a measure that pertains to the amount of training.

The training measure is computed as the number of in-service training sessions an officer has participated in during his/her career divided by the number of years with the North Carolina State

Highway Patrol. By dividing training by the number of years of experience, the measure takes into account the opportunity an officer has had to attain advanced training. North Carolina State Highway Patrol in-service training includes such areas as accident investigation and reconstruction, CPR, emergency medical technician, criminal investigation, drug interdiction program, dealing with hazardous materials, motorcycle school, mobile data training, riot control, use of breathalyzer, intoxilyzer, radar, and vascar equipment. The average number of trainings complete by North Carolina State Highway Patrol troopers was five, with some officers having participated in none and others completing more than 12 training sessions. The five most frequent training sessions participated in by troopers include Intoxilyzer 5000 (85.5 percent), CPR training (83 percent), Certified Vascar and Radar Operator (64 percent), and Mobile Data Training (60.4 percent) and Riot Control (29.4 percent).

Examination of the distribution of the training measure used in the analysis suggested that there might be outliers that would have an undue influence in the analysis. Several possible solutions were explored including a natural log transformation, winsorizing the outliers (i.e., giving them a value at the high end of the distribution, but still within a normal distribution range) and deleting influential cases. Regardless of the method used the results were similar in the preliminary analysis. In the final analysis the winsorized version of the measure is employed. The training measure used in the analysis has a mean of .61 and ranges from zero to two.

### *Individual-Level Interactions*

This analysis also includes two interaction terms to see if the effects of length of service or training on the number of African American citations may vary by the race of the officer. I have

suggested that length of service and training may have a negative relationship with the outcome variable due to experience and training being related to an officer's degree of professionalism. Here, professionalism is argued to include being knowledgeable of the police role, aware of and respectful of citizen rights, able to competently handle difficult situations, and less likely to allow external factors to influence decision-making. Since whites may have a greater propensity to target African American motorists due to overt racism or cognitive bias, it seems that those officers who would most benefit from the positive effects of training and experience would be white officers.

Similarly, if additional years of service and training have an adverse effect on police discretion, it also seems as though such a relationship would be more consequential on the behavior of white officers. Officers may develop more negative views toward those viewed as most threatening to the social order and possibly toward the job itself as experience increases. Similarly, training may encourage the focus on selective behavior, attitudes and appearances of marginal groups (i.e., African Americans). If this is the case, it seems that the effects of experience and training would be most consequential for the behavior of white officers who are probably more likely to have preexisting biases toward African Americans that experience and training may further heighten.

### Organizational Characteristics

The North Carolina State Highway Patrol is divided into eight troops (A through H), which are then broken further down into 53 districts (A1, A2 . . . H6). In the more urban areas of the state, a single county might define a district's boundaries whereas in the rural areas a district may encompass two counties. Each district has its own station (i.e., administrative building) where a

trooper's immediate supervisor(s) is also located and where troopers report to during their shift, get their assignments, and turn in paperwork. In addition, it is within the district's boundaries that officers do the majority of their patrolling. Since a district defines the physical territory a trooper patrols, which officers the trooper regularly interacts with, and where most administrative duties are handled and immediate supervisors are located, an officer's organizational context is defined as a district. This analysis has 1024 troopers who are each represented in one of the 53 districts.

### *Supervisory Intensity*

A negative relationship between supervision and the number of citations issued to African Americans is hypothesized if the organization's climate reflects the professional model of policing where impartial behavior is expected and rewarded. In contrast, it is hypothesized that supervision will be positively related to the outcome measure if the organization's climate and supervisors encourage, perhaps inadvertently, race-based policing. Ideally, measures related to the quantity and quality of supervision, and the trooper's perception of the supervisor's priorities would be included in the analysis. Thus, the analysis would include such things as the average sergeant/trooper contacts during a shift, supervisory review (i.e., time spent reviewing reports and other means of monitoring officer behavior), and supervisors experience related to supervision. In addition, measures related to the accountability of behavior (supervisors use of rewards and punishments) and which behaviors are most rewarded or punished would also be included. These measures are not provided in the data used in this analysis.

The concept of supervision is operationalized in this dissertation as the number of sergeants assigned to a district divided by the total number of citations issued within that district in 2000.

Because the numerator (i.e., number of sergeants) will have a value much smaller than the denominator and will thus produce very small ratios (i.e., .0006), I have multiplied the result by 1000 to aid in the interpretation of this measure. This measure assumes that the higher the ratio of supervisors to the number of citations, the more time a supervisor has available to devote to closely monitoring, evaluating and responding to the behavior of troopers. This measure assumes that all supervisors are equivalent, and that the intensity of supervision is a function of workload.

Research suggests that those ranked immediately above patrol officers (i.e., sergeants) have the greatest impact on the decision-making of patrol officers (Rubinstein 1973; Van Maanen 1983). This is the case since it is sergeants that most closely monitor the activities of patrol officers and to whom patrol officers report to on a regular basis. There are several reasons why it is difficult for lieutenants, captains, and majors to directly supervise troopers.

For one, these highest-ranking officers are assigned to a troop rather than a district. As mentioned earlier, a troop may include up to eight districts. Consequently, a North Carolina State Highway Patrol troop may have anywhere from 130 to 216 troopers. In addition, these highest-ranking officers are assigned to administrative buildings that are separate from the district headquarters where troopers work. Thus, the highest-ranking officers are generally physically separated from troopers. For all of the above-mentioned reasons, lieutenants, captains, and majors are quite limited in their ability to directly impact the behavior of troopers. Thus, in this analysis, a trooper's supervisor is limited to those ranked as sergeants. A district generally has one to four sergeants. The number of troopers assigned to a district ranges from 10 to 42.

In the absence of direct measures for the quantity and quality of time a supervisor directs specifically toward monitoring and adjusting the behavior of troopers, I will use the number of

citations issued in the district in 2000 as the denominator in the supervision measure. This is suggested to be an indicator of the productivity of the officers in the district and, consequently, how much time sergeants may spend on more general administrative duties. The assumption is that the more time spent on administrative duties, the less time they will have available to devote to supervision.

Examination of the distribution of this variable indicated that there were a few districts with extremely high ratios, compared to the other districts that might have an undue influence on the regression results. In preliminary analyses I used the natural metric as well as the natural log and winsorized versions of the variable. Since the results were similar regardless of the version of the variable used, I chose to use the natural metric of the variable in the final analyses. The supervisory intensity measure has a mean of .35, with a range of .15 to .73.

### *Experience Composition of the Organization*

In Chapter 3 it was suggested that the average experience of members of the organization is an indicator of the organization's climate. For instance, the average experience of the police organization's members might be related to the degree of professionalism of the organization. To the extent that higher levels of organizational professionalism reduces racial disparity in enforcement, the higher the average experience of members, the less likely officers may be to disproportionately ticket African Americans. Alternatively, it may be that experience is related to negative attitudes and behaviors directed toward the job and citizens believed to be most associated with criminality. If this is the case, then it would be expected that the higher the average experience of the organization's members the more likely the work climate may encourage or at least tolerate race-

based policing. Officers working in such organizations may cite more African Americans than officers working in organizations where the members are less experience, on average. Based on the above hypotheses, measures of the organization's climate, especially as perceived by the troopers would be preferable. The official data used in this dissertation do not provide such measures. Consistent with previous research, a measure of the average experience of the organization is used.

To measure the experience composition of the organization, the sum of years of experience of all officers in the district is divided by the number of officers in the district. This measure has a mean of just over 12 years with a range of 7 to 18 years.

#### *Training Composition of the Organization*

It is hypothesized that to the extent training is associated with professionalism, officers working in an organization where members, on average, have more training the organization's climate would be less tolerant of officers carrying out the police role in an irresponsible or unethical way. Thus, officers would probably cite less African Americans in such organizations.

Alternatively, if training is associated with learning attitudes and behaviors that encourage race-based policing practices, then the higher the average training of the organization's members the more likely the organization's climate may be supportive of practices that result in the targeting of African American motorists. Thus, in such organizations officers are expected to cite more African Americans than those officers working in organizations where members are less trained, on average. It would be preferable to have measures regarding the organization's climate, including the content of training and how it is interpreted by the organization's members. Since these measures are not available, I use the quantity of training as an indicator of the organization's climate.

The average training of officers in a district is operationalized as the sum of number of in-service trainings completed by officers in the district divided by the sum of years of experience of officers in the district. The higher the value of the measure the more trained an organization's officers are, on average, compared to other districts. This measure has a mean of .47, with a range of .32 to .76.

### *Racial Composition of the Organization*

It is hypothesized that the representation of African Americans in the organization may be negatively related to the issuance of citations to African Americans due to the organization being more racially sensitive. It would be preferable to have measures related to the organization's climate such as the trooper's perceptions of supervisors' and peers' attitudes toward whites and African Americans. In addition, measures related to the frequency of negative racial behaviors such as the use of negative racial terms and jokes would be included. Since these measures are not available, I follow the lead of previous research and use a measure of the racial composition of the organization as an indicator of the racial climate of the organization

The racial composition of the organization is computed as the number of African American officers in the district divided by the total number of African American and white officers in the organization. The average proportion of officers who are African American across the districts is .15 and has a range from zero to .43. Examination of the distribution of this measure showed that it was slightly skewed to the right. In preliminary analysis, the natural metric, logged, and winsorized version of this variable were entered separately into the regression equation and the results were the

same regardless of what version was used. In the final analysis, I use the original version of the measure.

### *Cross-level Interactions*

This analysis will explore whether any of the individual-level officer measures (race, years of experience, and training) vary with any of the organization-level measures (supervisory intensity, experience, training, and racial composition). With regard to the officer's race, it seems that the effect of the organization variables on the outcome measure would be stronger for white than African American officers, assuming that white officers may have a higher propensity to target African Americans than do African American officers.

As noted earlier, it is not clear whether the officer's length of service or training will impact the number of citations issued to African Americans and, if either does have an influence, what the direction of the relationship might be. Similar problems exist for the organization-level variables. Little guidance is provided by prior research. It is hypothesized, though, that if the officer's experience and training are related to professionalism and if the experience and training composition of the organization is also related to a climate that does not encourage or tolerate the differential treatment of racial minorities, then officer's with more experience and training would issue the least number of citations to African Americans when working in organizations where members are more experienced and trained, on average. Alternatively, if an officer's experience and training is related to negative attitudes and behaviors and higher propensity to engage in race-based policing and if the organization's experience and training composition is related to a climate that is more tolerant of a racialized style of policing, then officers with more experience and training working in organizations

where members, on average, have more experience and training would cite more African Americans than officers with less experience and training who work in organizations where members have less experience and training, on average. Finally, hypotheses could also be developed suggesting the positive influences of experience and training at the individual-level and negative influences of experience and training at the organization-level (or vice versa) using the theoretical arguments suggested above.

### Individual-level Control Variables

#### *Number of Whites Cited*

If an officer is a higher producer of citations overall, that officer may cite a relatively high number of drivers across racial lines compared to other officers. Consequently, an officer may issue many tickets to African American motorists without being racially biased. The number of white citations issued by the officer is included in the analysis as a control for the quantity of citations issued by an officer.

This control variable is measured simply as the number of whites cited by an officer. Troopers in the sample cited an average of 271 white motorists, with some officers citing only two whites and others citing up to 1102 whites. As with the number of African American citations, this variable is highly skewed to the right of the distribution and examination of a scatterplot of the dependent variable and the number of whites cited suggests that the relationship is curvilinear. Thus, this variable was transformed by taking the natural log. The transformed variable has a mean of 5.43 and a range of .69 to 7.00.

### *Time of Day and Type of Highway*

It may be that the racial distribution of drivers varies somewhat by the time of the day and/or type of highway. For instance, the 1995 National Transportation Survey suggested that African Americans, compared to whites, disproportionately drive in the late evening and early morning hours (US Department of Transportation 1995). Similarly, a study in Riverside, CA found that minority drivers disproportionately drive at night and early morning in the locations throughout the city that they “spot checked” (Gaines 2002).<sup>9</sup> This finding may be explained by racial minority members being overrepresented in low-wage, service-type jobs which makes a work commute in the late evening and early morning hours more likely than many other jobs. Consequently, the proportion of an officer’s citations issued during evening hours may be related to the officer’s issuance of citations to African Americans.

The type of highway and officer patrols may also be related to the number of citations issued to African Americans. Indeed, findings from the North Carolina Highway Traffic Study suggested that the type of highway was associated with the ticketing of African Americans (Smith et al. 2002). For instance, regression results suggested that the proportion of citations issued on rural roads was negatively related to the issuance of African American citations. Thus, the higher the proportion of an officer’s citations occurring on the rural roads the fewer citations an officer may issue to African Americans.

Since the above discussion suggests that the number of citations issued to African Americans by an officer may partially reflect when and where the officers patrol, this analysis will include control variables related to the officer’s deployment. Thus, the proportion of a trooper’s citations issued during the late night and early morning hours (8:00 p.m. through 7:00 a.m.) and the

proportion of a trooper's citations that are issued on each of three highway types (Interstate, US highway, and rural roads) will be included in the analysis as control variables. The highway reference category is the proportion of citations issued on NC highways.

Both the proportion of an officer's citations issued on the Interstate and during night hours are skewed to the right. Examination of scatterplots and preliminary analysis utilizing the natural metric and the natural log of these variables suggested that the natural metric be used for the proportion of an officer's citation issued on the interstate and the natural log be used for the proportion of an officer's citations issued during night hours in the final analyses.<sup>10</sup> The average proportion of an officer's citations issued on the interstate is .14, on US highways is .38, on rural roads is .25, and during night hours is .25.

#### District-level Control Variable

##### *Racial Composition of Drivers*

A measure of the racial composition of motorists at risk of being subjected to traffic enforcement needs to be included in the analysis in order to better understand the issuance of citations to African Americans. Developing a baseline measure of race specific exposure for each officer is not easily accomplished. An ideal baseline measure would include a count of all drivers in a geographic area (the smaller the area the better) broken down by race, along with a description of each driver's traffic infractions during the time period under study. However, the time and resources required to obtain such data makes it virtually impossible for larger areas such as a state. More realistic measures include an estimate of the racial composition of the population within a

geographical area, an estimate of the racial composition of drivers in accidents, and an estimate of the racial composition of drivers driving in the district.

The racial composition of the population is fairly easy to acquire through a census of licensed drivers broken down by geographical areas. However, such a measure fails to consider racial differences in access and use of an automobile or racial differences in traffic law violations. In addition, it also does not take into account the racial composition of nonresident drivers that might travel through a given area (see Chapter 1 for a more complete critique of the resident population measure). While there are measurement errors, it does provide some indication of the possible racial distribution of drivers in a given area.

The second measure is a racial breakdown of accidents occurring across areas. Similar to the resident driver measure, it indicates the racial breakdown of drivers on the road. This measure might under- or overestimate the representation of African Americans on the road. The US Department of Transportation survey (1998) suggests that African Americans are less likely than other races to be involved in accidents. To the extent that the nationwide findings of this survey are generalizable to North Carolina it suggests that this measure may underestimate the proportion of drivers who are African American. In addition, since more than one policing agency may investigate accidents in a geographical area, the use of a single agency's accident data may underestimate the racial composition of drivers in some districts but not others. This would seem particularly problematic in more urban geographical areas since multiple police agencies investigating accidents is more likely. It should also be noted that since accidents are rare events, combining accident data across several years might be required to produce estimates for small geographical units.

Finally, there is the measure of the racial distribution of drivers driving, which is the measure used in this study (Smith et al. 2002). This measure is computed by using both data on licensed drivers and information from the citation data on the residence of drivers who have been cited. Since it uses license data instead of census information, it reflects the driving population instead of the general resident population. This makes this measure preferable to a resident population measure. In addition, as will be discussed next, the use of the citation data enables an estimate of the racial distribution of *nonresident* drivers to be included in the driver's driving measure. However, this measure, like the resident population measure, assumes that the driving behavior of white and African Americans is similar.

All three of the above measures were computed at the district-level and then compared. Preliminary bivariate analysis suggested that the measure of driver's driving was most highly correlated with the outcome measure of the number of African American citations. In addition, preliminary multivariate analyses confirmed that the driver's driving measure explained more of the variance in the outcome measure than the alternative two measures. Thus, the analysis that follows uses the driver's driving measure as an estimate of the racial baseline of drivers in the district.

The calculation of the estimate of proportion of the drivers driving who are African American for each district includes the racial distribution of *resident* licensed drivers in district  $i$  (where  $i=1, 2, 3, \dots, 53$ ), plus a consideration of the racial distribution of *nonresident* in-state drivers that drive in district  $i$ . The racial distribution of *resident* licensed drivers was acquired from North Carolina Department of Motor Vehicles. The computation of the racial distribution of *nonresident* in-state drivers who drive in district  $i$  involves taking into account the racial breakdown of nonresident in-state drivers who are cited in district  $i$ . The racial composition of the district is the

weighted sum of the racial composition of the home counties of the drivers cited. This number is then standardized to the state-level by multiplying it by 14.9, which is the individual risk of being cited in North Carolina (1 in 14.9 North Carolina drivers were cited by the North Carolina State Highway Patrol in 2000). The driver's driving computation is performed for each of the 53 districts. The average percent of drivers who are African American across the districts is 21.1 percent, with a range of .01 to .47.

## **Summary of Proposed Research Strategy**

### Specification and Method

Research on policing outcomes has typically been conducted at a single level (i.e., individual or organization-level). However, there is reason to believe that a single-level analysis may be inappropriate. Extant policing research suggests that the decision-making of police may be a product of both individual and contextual (i.e., organizational) factors. Inherently, such research requires the formulation and testing of hypotheses involving data from multiple levels. Recent developments in the statistical theory of hierarchical linear models (HLM) now provide appropriate tools for modeling within- and between-police organization processes (Bryk and Raudenbush 1992).

Multilevel modeling programs make three substantial improvements to the analysis of data with a nested structure. For one, these models avoid violating the assumption of independence of observations that traditional ordinary least squares analysis commits in analyzing hierarchical data since HLM estimations explicitly recognize the clustering of individuals within higher-level units, such as organizations. Next, hierarchical models are powerful in estimating cross-level effects, including

the effects of group characteristics on both the average level of outcomes within the group and on certain interesting structural relationships within groups. Third, hierarchical models can partition the variance between the levels. Due to HLM's superior ability to estimate nested models, it will be used to estimate the models in this dissertation.

### Strategy for Analyses

These data are analyzed within a two-level hierarchical linear modeling framework described by Bryk and Raudenbush (1992). In the next chapter, the direct influence of officer and district-level characteristics on the variation in the number of African American citations is explored. In addition to the direct effect of officer and district-level factors, interactions between officer attribute measures and interaction between officer attribute and organization characteristics are explored.

Specifically, the first equation estimates an intercept-only model, which investigates the variation of the outcome measure within and among districts. Next, the equation is extended to include the primary officer characteristics of race, length of service, and training, along with the control variables at the individual-level and the district-level control variable of the estimated racial composition of drivers driving in the district. The third equation includes all the measures in Equation 2 but adds individual-level interaction terms. Next, the district-level variables of supervisory intensity, and the experience, training, and racial composition of the organization are added in the fourth equation to determine whether organizational characteristics account for some of the variation in the number of African American citations an officer issues. Finally, it is investigated whether differences among officers in the number of citations issued to African Americans may also

result from interaction effects involving the organizational context and officer characteristics (i.e., do explanatory variables at the group level serve as moderators of individual-level relationships).

## CHAPTER 6

### THE INFLUENCE OF OFFICER AND DISTRICT PROCESSES

Previous research that has explored possible factors affecting police discretion has often focused on either individual or contextual (i.e., organization or community) predictors. Individual-level research suggests that certain characteristics of the officer may be important. While research has not been conclusive, officer attributes such as race, experience, and training have all been suggested as possible predictors of the decision to arrest, use force, and the number of citizen complaints filed against officers. Further, research focusing on organization or community factors also supports the importance of various organization and community characteristics for police discretion. Although extant research notes the relevance of both individual and contextual factors for police decision-making, there has been a lack of research that has simultaneously explored the impact of these two levels on an officer's use of discretion.

The data used in this project allow for the consideration of both individual and organization factors. The purpose of this chapter is to examine the impact of various officer and organization factors on the number of African American citations issued. Further, I will explore whether the organization variables that impact the outcome measure vary by an officer's characteristics. The use of multilevel data and HLM statistical software in this project will allow for the examination of such cross-level interactions.

#### **Results**

Table 6.1 displays a series of two-level models that regress the natural log of the number of African Americans cited in 2000 on the officer, organization, and control variables described in

Chapter 5. The models displayed in Table 6.1 were also conducted using a Poisson over-dispersed distribution and using the natural metric of the outcome variable. Examination of the HLM reliability estimates for the analyses performed using the natural log of the number of African American citations, the Poisson-over-dispersed distribution, and the natural metric of the number of African American citations suggested that the analysis using the natural log of the number of African American citations had the highest reliability (Bryk and Raudenbush 1992).<sup>11</sup> Consequently, this chapter discusses the results from the analyses using the natural log of the number of citations issued to African Americans. The results for the analyses using the Poisson over-dispersed distribution and the natural metric of the outcome measure are presented in Appendices 1 and 2.

The first step in an HLM model, before statistical controls are introduced, is to partition the total variability in each outcome into its within-district and between-district components. Equation 1 presents these results. First, the intercept coefficient of 4.06 suggests that the grand-mean number of African Americans cited is 57.97 [ $\exp(4.06)$ ]. Examination of the estimates of the variance components indicates that the estimated district-level variance is .996 and the estimated officer-level variance is .465. This indicates that approximately two-thirds of the variation in the number of citations issued to African Americans is at the district-level. Specifically, differences *across individuals* account for 32 percent of the variation in the number of African Americans cited [ $.465/ (.996 + .465)$ ] while 68 percent of the variation in the number of African American citations is accounted for by differences *between districts* [ $.996/ (.996 + .465)$ ].

**Table 6.1. Results of Multilevel Equations: Officer and Organizational Predictors of the Number of African American Citations (LN)**

	Equation 1	Equation 2	Equation 3	Equation 4
Constant	4.056** (.138)	4.117** (.063)	4.226** (.075)	4.113** (.059)
<b>Control Variables</b>				
<i>Individual-Level</i>				
Proportion Interstate		.513* (.234)	.529* (.235)	.492* (.231)
Proportion US Highways		.100 (.230)	.108 (.231)	.115 (.227)
Proportion Rural Roads		.013 (.283)	.019 (.281)	.001 (.278)
Proportion Night (LN)		.127* (.056)	.128* (.056)	.124* (.056)
# White Citations (LN)		.829** (.033)	.828** (.033)	.825** (.033)
<i>District-Level</i>				
Proportion of Drivers Driving in the District who are African American		8.241** (.672)	8.250** (.669)	7.776** (.584)
<b>Officer Variables</b>				
Race (white=1)		-.053 (.032)	-.181** (.065)	-.051 (.032)
Length of Service		-.006* (.002)	-.018** (.006)	-.006* (.002)
Training (adjusted for yrs. of exp.)		-.041 (.042)	-.040 (.041)	-.044 (.042)
<b>Interaction between Officer Variables</b>				
Race * Length of Service			.013* (.006)	
<b>Organization Variables</b>				
Supervisory Intensity (x 1,000)				-1.551* (.738)
Experience Composition of Org.				.048 (.044)
Training Composition of Org.				.749 (.675)
Racial Composition of Org.				.015 (.474)
<b>Variance Components</b>				
<i>District-level Variance Component</i>	.996	.171	.170	.154
Percent of District-level Variance Explained		(83%)	(83%)	(85%)
<i>Individual-level Variance Component</i>	.465	.192	.192	.192
Percent of Individual-level Variance Explained		(59%)	(59%)	(59%)
<b>Reliability</b>	.97	.94	.94	.94

Notes: All IV's, with the exception of the race dummy variable, are centered at their grand mean. Standard errors are in parenthesis. Analysis includes only officers ranked as troopers. N= 1024 troopers, 53 districts.

\*\*p<.01; \*p<.05 (two-tailed tests)

### Officer Processes

In the next step of the analysis, the extent to which variables measured at the officer-level account for intradistrict variation in the number of citations issued to African Americans (ln) is examined, holding constant the individual and district-level control variables. Preliminary estimations of the within-district model indicated that the slopes for officer's race, length of service, and training did not vary systematically across districts. Therefore, these parameters are "fixed" in the following analysis—that is, they are not allowed to vary across districts. Only the slope for the intercept has been specified to vary across the districts. To aid in the interpretation of the coefficients, all of the continuous explanatory variables are entered at their grand mean. Equation 2 presents these results.

The intercept value of 4.12 indicates that the average number of African American citations across the 53 districts when considering the officer and control variables is about 62. The officer's length of service is the only officer characteristic that is found to be significantly related to the number of citations issued to African Americans ( $p < .05$ ) and the direction of the coefficient suggests that this predictor is negatively related to the outcome variable.<sup>12</sup> Thus, less experienced officers cite more African Americans than officers with more experience. This finding is consistent with the idea that professionalism, including impartial behavior, is associated with experience. It is also supportive of the argument that less experienced officers practice a more aggressive style of policing, due to patrol assignments or perceived organizational pressure. Contrary to theoretical expectations, the officer's race and amount of training attained do not appear to be significant predictors of the number of African American citations issued by the officer.

The results also suggest that the proportion of an officer's citations issued on the interstate and during late night/early morning hours and the number of white citations issued (ln) are all

positively related to the number of African American citations issued ( $\ln$ ).<sup>13</sup> Thus, officers with a higher proportion of their citations occurring on the interstate and during the hours of 8 p.m. and 7 a.m. issue more citations to African Americans than those officers who issue a fewer proportion of their citations on the Interstate and during evening hours. These findings suggest that deployment measures are indeed related to the issuance of citations to African Americans. In addition, as the number of whites cited increases so does the number of African Americans cited.

The district-level control variable, the proportion of drivers in the district who are African American, is strongly, positively associated with the number of citations issued to African Americans. Officers who work in districts where African Americans represent a higher proportion of drivers cite more African Americans than officers working in districts where the proportion of drivers who are African Americans is smaller. This finding is as expected.

The variance components for Equation 2 suggest that the inclusion of these variables explains 59 percent  $((.465-.191)/.465)$  of the original *individual-level* variation in the number of African Americans cited and the district-level variable of the proportion of drivers who are African American accounts for 83 percent  $((.996-.170)/.996)$  of the original *between district* variation in the outcome variable. Thus, the racial composition of the drivers in the district explains almost all between district variations in the citations of African Americans. The model leaves about 40 percent of the individual-level variation unexplained.

### Individual-level Interaction Processes

Model 3 introduces the officer-level interaction term of race and length of service. The two interaction terms of race and training and length of service and training were also tested for their possible influence on the outcome measure but were found to be insignificant at the .05 level. Multicollinearity tests were conducted, including examination of the tolerance level and the variance inflation factor, to make sure that the insignificant finding for the two individual-level interaction terms was not a result of multicollinearity problems. The tests suggest that there may be some problems associated with multicollinearity when all three of the product terms are entered in the model simultaneously. Three models were estimated where each of the three individual-level product terms were separately entered. The results suggest that only race and experience interaction term was significant.<sup>14</sup> The insignificant interaction terms were dropped from the final equation.

As in Model 2, the individual-level control variables of the proportion of citations issued on the interstate and during late night/early morning hours, and the number of white citations issued are positively related to the number of African American citations issued. Similarly, the district-level control variable of the proportion of drivers in the district who are African American remains positively related to the number of African American citations issued. Further, there is little change in the size of the coefficients for these individual and district-level control variables.

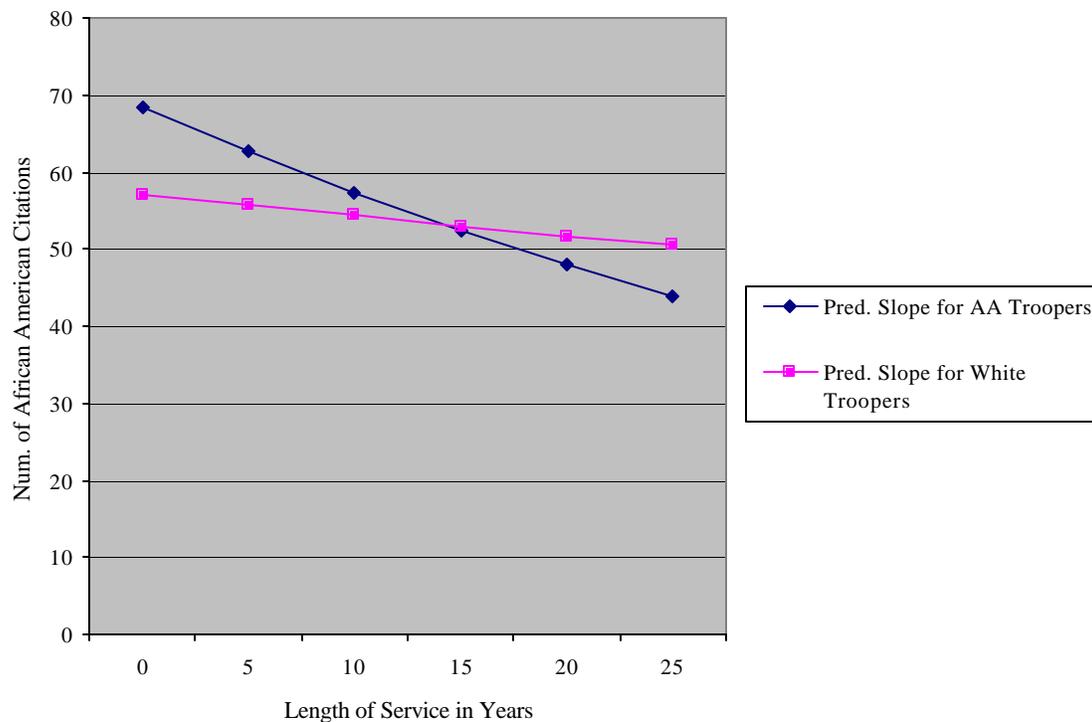
With regard to the individual-level interaction term of race and length of service, it is found to be positively and significantly related (i.e., .01,  $p < .05$ ) to the number of African Americans cited. To better understand the nonadditive relationship of race with the outcome variable across different years of experience, I have plotted slopes for white and African American officers. Thus, Figure 6.1 displays the predicted length of service slope for white and African American officers with

average characteristics. The predicted experience slope for African American officers with average characteristics equals  $-.018$  and for white officers the predicted slope equals  $-.005$ . Using the predicted experience slopes for white and African American officers and substituting different values for years of experience produces the slopes displayed in Figure 6.1.

Figure 6.1 illustrates that for both African American and white officers the number of citations issued to African Americans declines with experience. Looking at the differences in the white and African American experience slopes at different years of experience, it can be seen that when the years of experience is less than 15 years, African American officers cite more African Americans than white officers. However, after 15 years of experience, white officers cite more African Americans than African American officers. For instance, African Americans with less than one year of experience cited 68 African Americans, compared to white officers with the same years of experience who cited 57 African Americans. Thus, during their first year on the job, African American officers cited 16 percent more African Americans than do white officers.

Comparing white and African American officers with the sample's average number of years of experience (10 years), African American officers cited 57 African Americans while their counterpart, white officers, cited 54 African Americans. Thus, the difference between African American and white officers with 10 years of experience is around five percent. At 15 years of experience, the relationship is reversed to where white officers cited 53 African Americans, compared to African American officers cited 52 African Americans.

**Figure 6.1. Predicted Length of Service Slope for White and African American Officers.**



The gap between white and African American officers continues to widen over the remaining years. For instance, near the sample's maximum years of experience (i.e., 25 years), white officers cited around 50 African Americans while African American officers cited 44. Thus, white officers with 25 years of experience cited about 12 percent more African Americans than do their racial counterpart. To summarize, African American officers cite more African American drivers than white officers early in their careers but by 15 years of experience this relationship reverses to where white officers cite more African Americans.

### Organization Processes

Equation 4 of Table 6.1 adds the organization variables of supervisory intensity, and the experience, training, and racial composition of the organization to the model predicting the number of African Americans cited. Supervisory intensity is the only organization measure found to be associated with the number of citations issued to African American.<sup>15</sup> Specifically, the higher the supervisory intensity of an officer's organization, the fewer the number of African American citations issued ( $p < .05$ ). Thus, the results suggest that officers working in organizations where there is higher supervisory intensity issue less African American citations than those officers working in organizations with less supervisory intensity. Thus, it appears that supervision may be a resource for controlling officer's behavior. In addition, the finding that supervision reduces rather than increases the number of citations issued to African Americans indicates that organizational factors may reduce racial disparity in traffic enforcement. This is more consistent with the professional model than the conflict model of policing.

The findings in Equation 4 suggest that the experience, training, and racial composition of the organization are not associated with the number of African American citations issued.<sup>16</sup> Thus, characteristics of the workforce do not appear to be important predictors of the number of citations issued to African Americans. With the addition of the organization variables, there is little change in the direction or level of significance of the officer and control variables. The total between district variation in the number of African American citations is 85 percent with the inclusion of the district-level variables of the proportion of drivers who are African American and supervisory intensity.

### Cross-level Interaction Processes

In Chapter 2 it was suggested that the impact of the organization variables on the outcome variable may vary by officer characteristics, particularly by an officer's race. The equations estimated thus far have constrained the officer attributes to be equal across districts, and the effect of the organizational characteristics are invariant for white and African American officers with different levels of experience and training. To test whether the effect of the officer attributes on the number of citations issued to African Americans differs across the supervision, and experience, training and racial composition of the organization, cross-level interactions between officer attributes and organizational characteristics are included in the equation.

Examination of the coefficients for the cross-level interactions indicated that there were no major differences in the impact of an officer's race, experience, and training on the number of citations issued to African Americans for different organizational contexts. Since there may be problems associated with multicollinearity with the simultaneous inclusion of all the tested product terms, 12 models were estimated where each cross-level interaction term was separately entered. The findings of these models confirmed that none of the cross-level interaction terms were significant predictors of the outcome measure.<sup>17</sup> These findings imply that the determinants of the issuance of citations to African Americans are similar across different contexts. Thus, a context-specific equation does not significantly improve the ability to explain the number of citations issued to African Americans.

## **Summary of Findings**

The findings of this chapter suggest that individual and contextual level factors both help explain the number of African American citations issued. This analysis suggests that an officer's length of service, the proportion of citations they issue on the Interstate and during night hours, and the number of white citations issued all impact the officer's frequency of African American citations. Specifically, less experienced officers, officers who issue a greater proportion of their citations on the Interstate or during night hours, and officers who issue more white citations tend to issue more African American citations than their counterparts.

The analysis suggests that the effect of length of service on the outcome measure varies by the officer's race. For both white and African American officers the number of African American citations issued declines with years of experience. Interestingly, though, African American officers tend to issue more citations to African Americans than white officers in the early years of their career, but this relationship reverses in the later years. At 15 years of experience and greater, white officers issue more African American citations than their African American counterpart. The theoretical implications of this will be discussed in Chapter 9.

The analysis further established that district-level variables affect the number of citations issued to African American drivers in that supervisory intensity and the proportion of drivers in the district who are African American are found to be significant predictors of the outcome measure. Thus, officers who work in organizations where there is less supervision issue more African American citations than those who work in organizations with more supervision. Finally, officers who work in districts where there is a higher proportion of drivers who are African American cite

more African Americans than do officers working in districts where African Americans are less represented.

It was hypothesized that the experience, training, and racial composition of the organization would influence an officer's number of African American citations. None of these workforce characteristic measures appear to influence an officer's issuance of African American citations. Finally, this analysis examined whether the impact of the organization variables on the outcome measured varied by officer characteristics. The findings in this chapter do not provide support for cross-level interactions.

The findings presented in this chapter are both strong and interesting but the models estimated may be theoretically limited. For instance, to the extent that the racial threat process is relevant to an officer's issuance of African American citations, as suggested in Chapter 4, the equations estimated in this chapter may be misspecified. Chapter 7 will extend Equation 4 from this chapter by introducing the racial threat process to the models estimated.

## CHAPTER 7

### THE INFLUENCE OF RACIAL THREAT

Chapter 6 explored the relationship between officer attributes and organizational characteristics on the issuance of citations to African Americans. This chapter introduces racial threat as a possible predictor of an officer's issuance of African American citations. Chapter 4 discussed the limitations of previous research that has examined the impact of racial threat on policing outcomes. For one, much of the research examining the relationship has utilized aggregate data with cities as the unit of analysis. Consequently, how racial threat might impact individual-level and nonurban policing outcomes remains unanswered. Another limitation of previous research is that most of it, with the exception of that focusing on the capacity for social control, has failed to test for a nonlinear relationship between racial threat and police outcomes (for exceptions see Jackson and Carroll 1981; Greenberg et al., 1985).

This chapter is devoted to addressing these limitations. First, I will examine how the racial composition of the districts that troopers are assigned to may impact their issuance of African American citations. Thus, the analysis will consider the racial composition of both urban and nonurban districts across the state and its effect on a less serious, but more frequent, individual-level policing outcome of traffic enforcement. Further, I will investigate the form of the relationship between racial threat and the issuance of African American citations. Finally, I will discuss how the introduction of racial threat measures to the models predicting an officer's issuance of African American citations has implications for the findings and conclusions of Chapter 6.

## Data and Sample

The data and sample for this analysis are the same as that used in the multi-level analysis of individual and organizational factors and citations (see Chapter 5 for a more complete discussion). Thus, the data for this analysis are derived from three separate data files: North Carolina State Highway Patrol citation data collected during the year 2000, North Carolina State Highway Patrol roster file (2000), and demographic information of North Carolina licensed drivers in 2000 provided by the NC Department of Motor Vehicles. With regard to the sample, it includes African American and white troopers who issued at least one African American citation in 2000.

## Measurement of Variables

### Dependent Variable

Two separate analyses will be conducted. In the first one, the dependent variable is the trooper's *number* of non-accident related citations issued to in-state African American drivers in 2000. The average number of African American citations issued by the troopers in this sample was 94 and ranged from one to 514. The natural log of the variable is used since the distribution is skewed to the right. The mean of the transformed variable is 4.07 with a range of zero to 6.24. (Refer to the discussion in Chapter 5 for more detailed information about this measure). In the second analysis, the outcome measure is the *proportion* of an officer's nonaccident citations that were issued to in-state African American drivers. This measure has an average of .25 and ranges from zero to .72.

### Control Variables

The control variables used in the analyses in this chapter are the same as those used in the multi-level analysis in Chapter 6. Included are the proportion of an officer's citations that are issued on the Interstate, on US highways, and on rural roads. The highway reference category is the proportion of an officer's citations that are issued on NC highways. In addition, the proportion of citations issued during night hours and the number of nonaccident citations issued to in-state white drivers by the officer are also included as control variables.

### Individual-level Variables

As in the multi-level analysis of individual and organizational factors, the officer's race, length of service, and training are included. Race is a dummy variable (1=white), length of service is simply the number of years the officer has been employed by the North Carolina State Highway Patrol. Training is the number of in-service training sessions an officer has completed divided by the officer's length of service.

### District-level Variables

#### *Organizational Characteristics*

The organizational characteristics included in the following analyses include supervisory intensity, and the experience, training and racial composition of the workforce. The supervisory intensity measure is computed as the number of sergeants divided by the total number of citations produced. The experience composition of the workforce is computed by summing up the years of experience of the members of the district and dividing this value by the number of officers. The training composition measure reflects the sum of the members' in-service training sessions

participated in divided by the sum of experience of the organizations members. Finally, the racial composition of the organization is simply the number of African American officers located in the district divided by the total number of white and African American officers. Refer to Chapter 5 for a more complete discussion of the organizational measures.

### *Racial Threat*

The racial threat thesis suggests that the visibility of African Americans is what triggers the racial threat process. An estimate of the proportion of drivers in the district who are African American is included in the analyses of this chapter as a measure of the racial composition of the area. (See Chapter 5 for a discussion of how this measure is created).

In order to approximate the form of the relationship between the proportion of drivers who are African American and the number and proportion of citations issued to African American motorists, regression analyses are performed using transformed values of the proportion of drivers who are African American. Thus, the nonlinear racial threat model includes the proportion of drivers who are African American and its polynomial terms (i.e., proportion African American squared and proportion African American cubed). If these polynomial terms are found to be significant, it may suggest that the form of the relationship between the racial composition of drivers and the number or proportion of citations issued to African Americans is nonlinear.

### **Method for the Racial Threat Analyses**

The purpose of the following analyses is to ascertain how the visibility of African Americans in a district impacts the issuance of citations to African Americans. Using HLM, the *number* of African American citations ( $\ln$ ) is regressed on the individual, organizational, and control measures

discussed above. Next, whether the relationship between the number of citations issued to African American drivers and the proportion of the district's drivers who are African American is nonlinear is examined. Thus, the polynomial terms of the proportion of drivers in the district who are African American are added to the regression equation. Entering the linear and the quadratic and cubic terms of the proportion of drivers who are African American enables the exploration of whether the relationship between the racial composition of the district and the outcome measure is nonlinear. Since the dependent variable is logged, predicted values are plotted to examine the curve of the estimated line. In the next analysis, I estimate an equation where the outcome measure is the *proportion*, instead of the *number*, of an officer's citations issued to African American drivers. Measuring the dependent variable as a proportion instead of a number will allow another test for the form of the relationship between the racial composition of the district and the issuance of citations to African Americans.

## **Findings**

The results for the multi-level equations testing the racial threat thesis are presented in Table 7.1.<sup>18</sup> The individual and control variables discussed above are included in the estimated equations. In addition, all of the individual officer attribute and control measures are held constant by setting them equal to their grand mean, with exception of the race dummy variable and the racial threat measures.

The results that test for both a linear and nonlinear relationship between the racial composition of drivers and the *number* of African Americans cited are provided in Equations 1 and 2, respectively, in Table 7.1. Referring to Equation 1, the results suggest that the

**Table 7.1. Results of Multilevel Equations: Officer, Organizational, and Racial Threat Predictors of the Number of African American Citations (LN)**

	<b>Equation 1</b>	<b>Equation 2</b>
Constant	2.579** (.154)	1.263** (.244)
<b>Control Variables</b>		
Proportion Interstate	.509* (.23)	.455* (.213)
Proportion US Highways	.122 (.228)	.137 (.217)
Proportion Rural Roads	.005 (.276)	-.036 (.258)
Proportion Night (LN)	.126* (.056)	.118* (.055)
# White Citations (LN)	.824** (.033)	.821** (.034)
<b>Officer Variables</b>		
Race (white=1)	-.175** (.065)	-.179* (.082)
Length of Service	-.018** (.006)	-.019* (.007)
Training (adjusted for yrs. exp.)	-.044 (.042)	-.040 (.040)
<b>Interaction between Officer Variables</b>		
Race * Length of Service	.013* (.006)	.013* (.006)
<b>Organization Variables</b>		
Supervisory Intensity (x 1,000)	-1.537* (.735)	.019 (.337)
Experience Composition of Org.	.048 (.044)	.026 (.022)
Training Composition of Org.	.740 (.674)	1.101* (.411)
Racial Composition of Org.	.008 (.476)	.241 (.339)
<b>Racial Threat Variables</b>		
Proportion of Drivers Driving who are African American	7.798** (.583)	31.118** (3.811)
(Proportion of Drivers Driving who are African American) <sup>2</sup>		-86.025** (15.105)
(Proportion of Drivers Driving who are African American) <sup>3</sup>		87.702** (17.879)

Notes: All IV's, with the exception of the race dummy variable and the racial threat variables are centered at their grand mean. Standard errors are in parenthesis. Analysis includes only Troopers. N= 1024 troopers, 53 districts.

\*\*p<.01; \*p<.05 (two-tailed tests)

proportion of drivers in a district who are African American has a positive relationship with the number of African American citations issued. This is not surprising since this equation resembles the equation estimated in Chapter 6 (see Equation 4, Table 6.1).

Similar to the results reported in Table 6.1 in Chapter 6, the control variables of the proportion of citations issued on the Interstate, proportion of citations issued during late night/early morning hours and number of white citations issued ( $\ln$ ) are all significantly and positively related to the number of African American citations ( $\ln$ ). Similarly, the officer's length of service is found to be a significant predictor of the outcome variable and the direction of the relationship is negative.

Equation 2 in Table 7.1 presents the results of the analysis testing for the hypothesized nonlinear relationship between the racial composition of drivers and the number of African American citations issued. Examination of the control and officer variables shows that the direction and level of significance of the coefficients remain unchanged from Equation 1. As in Equation 1, the proportion of drivers who are African American is a significant predictor of the number of African American citations and this relationship is positive. More importantly, the quadratic and cubic terms of the proportion African American are significantly related to the outcome variable. These findings suggest that the relationship between the racial composition of drivers in a district and the number of African American citations is nonlinear.

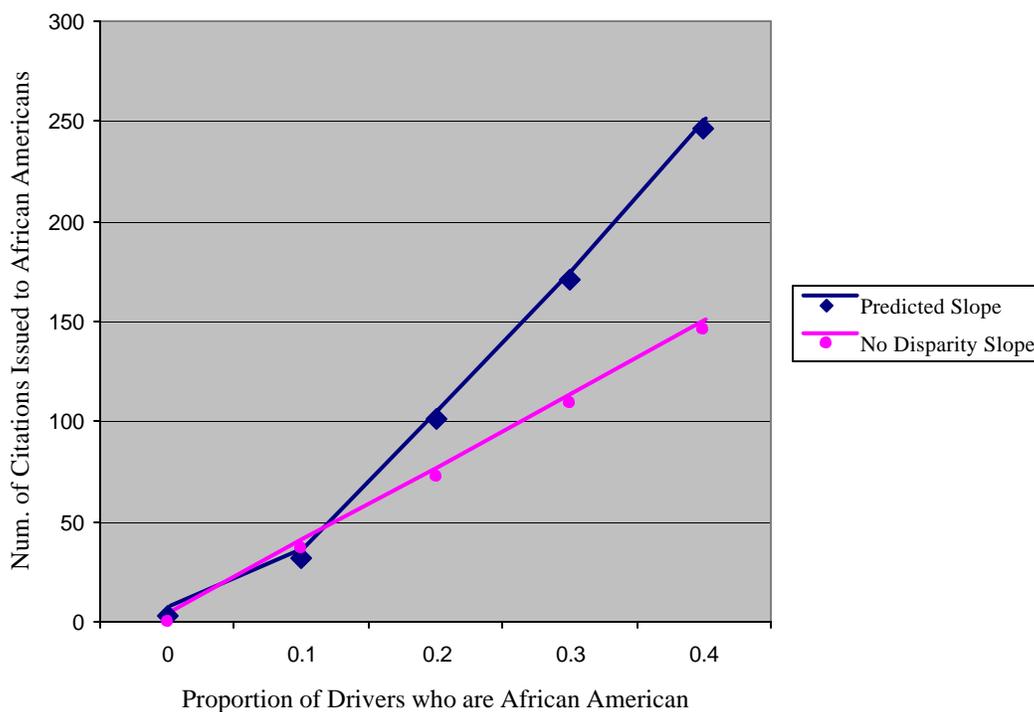
To determine whether the first or second equation is the best fitting model, I conducted an incremental F test. The R-square in the linear model is .78 and in the nonlinear model is .84. The results of the F test statistic suggest that adding the quadratic and cubic terms to the equation increases the predictive power of the racial threat model, which predicts the number of citations issued to African American drivers.

To illustrate the possible nonlinear relationship more clearly the expected relationship between the number of African American citations for the observed range of the racial composition of drivers in the sample is plotted in Figure 7.1. The predicted curve, which begins at the level of the constant term, reflects the coefficients for the linear and polynomial terms after the other variables in the equation (with the exception of the race dummy variable) are set equal to their grand means. For a comparison, I have included a slope that represents a situation where there is no disparity in the issuance of citations to African Americans. This no disparity slope is constructed by taking the mean number of citations issued to white and African Americans, which is 365, multiplied by the observed levels of proportion of drivers in the district who are African American. For instance, in a district where the proportion of drivers in the district who are African American is .1, officers would be expected to issue 36.5 citations to African Americans.

This approach to estimating a no disparity slope is simple but assumes that the level of activity (i.e., total number of citations issued) is unrelated to the racial composition of the district. To test this assumption, the total number of citations issued was regressed on the racial composition of the district controlling for proportion of citations issued on the highway types and during late night/early morning hours. Preliminary OLS multivariate regression results suggested that the total number of citations issued was related to the proportion of drivers in the district who are African American (Appendix 3). However, the effect of racial composition on level of activity disappeared once length of service was entered into the multivariate regression equation. This suggested that officers with less experience tend to be disproportionately located in areas with a higher concentration of minorities and due to their higher levels of productivity, these districts tend to have a higher number of total citations. In contrast, HLM results suggested that the racial composition of

the district was not a significant predictor of the total number of citations issued (Appendix 4). The HLM results did support the OLS findings of a length of service effect on the total number of citations issued. Appendix 5 presents the two slopes illustrated in Figure 7.1 in this chapter but also includes a slope that demonstrates how much of the difference in the predicted and no racial disparity slope is attributed to this experience related intensity of policing, as suggested by the OLS results.<sup>19</sup>

**Figure 7.1. Predicted and No Racial Disparity Slopes of the Number of Citations Issued to African Americans**



Referring to Figure 7.1, the results of the plotted predicted slope for the number of citations issued to African American drivers, based on Equation 2 in Table 7.1, suggests that the slope is

nearly linear. To the extent that there is a nonlinear relationship, it is in districts where the proportion of drivers who are African American is .1 or less. In such districts, the rate of increase at which the number of African Americans being cited is less than the rate of increase predicted in districts where the proportion of drivers who are African American is above .1. In districts where the proportion of drivers who are African American is above .1, the rate of increase in the number of citations issued to African American drivers remains fairly constant.

Comparison of the predicted slope and the no disparity slope suggests that as the level of proportion of drivers in the district who are African American increases so does the gap between the predicted and the no disparity slope. Thus, it appears that racial disparity in the issuance of citations to African Americans increases as African Americans represent a greater proportion of drivers. For instance, the difference between the predicted and the no disparity slope when the proportion of drivers who are African American is .2 is 42 African American citations. The difference increases to 76 when African Americans represent 30 percent of white and African American drivers and 114 when African Americans represent 40 percent of white and African American drivers. Thus, this analysis, which uses the *number* of citations issued to African American drivers as the outcome measure, suggests support for the racial threat thesis.

**Table 7.2. Results of Multilevel Equations: Officer, Organizational, and Racial Threat Predictors of the Proportion of Citations Issued to African Americans**

	Equation 1	Equation 2
Constant	.043** (.013)	.014 (.018)
<b>Control Variables</b>		
Proportion Interstate	.018 (.034)	.018 (.034)
Proportion US Highways	-.010 (.038)	-.008 (.038)
Proportion Rural Roads	-.036 (.039)	-.037 (.039)
Proportion Night	.117** (.039)	.116** (.039)
<b>Officer Variables</b>		
Race (white=1)	-.031* (.013)	-.031* (.013)
Length of Service	-.002 (.001)	-.002 (.001)
Training (adjusted for yrs. exp.)	-.0004 (.008)	-.0003 (.008)
<b>Interactions between Officer Variables</b>		
Race * Length of Service	.002* (.001)	.002* (.001)
<b>Organization Variables</b>		
Supervisory Intensity (x 1,000)	.027 (.037)	.057 (.038)
Experience Composition of Org.	.001 (.003)	.001 (.003)
Training Composition of Org.	.131* (.065)	.148* (.064)
Racial Composition of Org.	.054 (.052)	.053 (.055)
<b>Racial Threat Variables</b>		
Proportion of Drivers Driving who are African American	1.131** (.03)	1.718** (.315)
(Proportion of Drivers Driving who are African American) <sup>2</sup>		-2.487 (1.314)
(Proportion of Drivers Driving who are African American) <sup>3</sup>		2.993 (1.634)

Notes: All IV's, with the exception of the race dummy variable and the racial threat variables, are centered at their grand mean. Standard errors are in parenthesis. Analysis includes only Troopers. N= 1024 troopers, 53 districts.

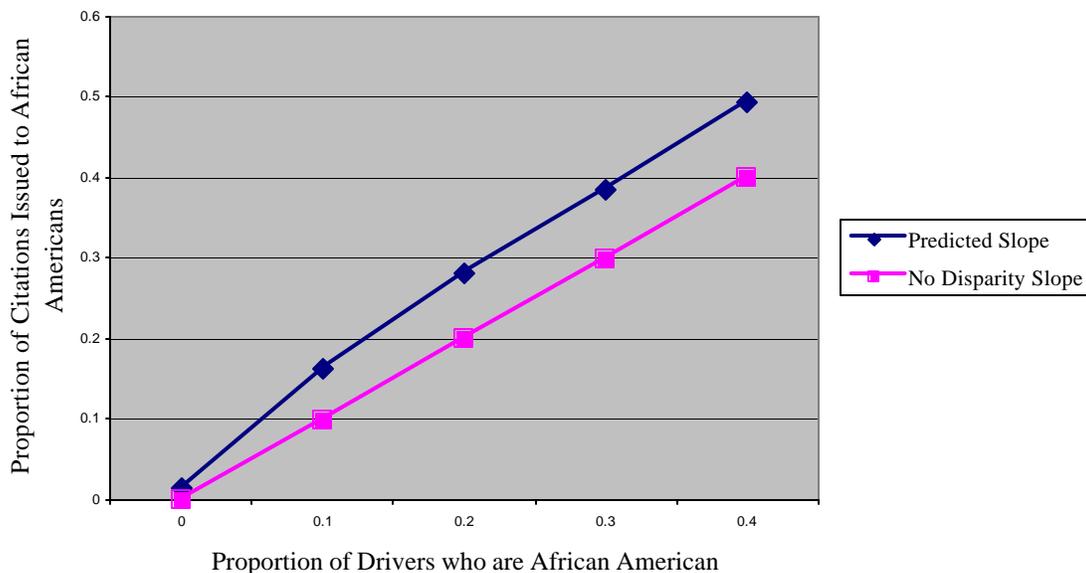
\*\*p<.01; \*p<.05 (two-tailed tests)

To further explore the possibility and extent of racial disparity in the issuance of citations, I estimate equations similar to those presented in Table 7.1, but instead use the *proportion* of citations issued to African American drivers as the outcome measure. The results of the estimated linear and nonlinear models testing the racial threat thesis are presented in Equations 1 and 2 in Table 7.2.

Referring to Equation 1, the results suggest that the proportion of drivers in the district who are African American is a significant predictor of the proportion of citations issued to African American drivers. Interestingly, the test for a nonlinear relationship in Equation 2, suggests that the relationship is not curvilinear. While the linear term of the proportion of drivers who are African American is significant, the quadratic and cubic terms are not. The linear equation better describes the form of the relationship between the proportion of drivers who are African American and the proportion of an officer's citations issued to African Americans. Figure 7.2 displays the predicted linear slope for the proportion of citations issued to African American drivers across the possible range of the proportion of drivers who are African American in the sample. To determine the amount of disparity, I've also plotted a slope that would resemble a situation where there is no racial disparity in the issuance of citations.

First, a comparison of the expected slope in Figure 7.2 to the expected slope in Figure 7.1 suggests that, at least above the .1 proportion of drivers who are African American, both slopes are effectively linear, suggesting a steady increase in both the number and proportion of citations issued to African Americans as the proportion of drivers who are African American increases.

**Figure 7.2. Predicted and No Racial Disparity Slopes of the Proportion of Citations Issued to African Americans**



As to the possible presence of racial disparity in the issuance of citations, the coefficient for the proportion of drivers who are African American in Equation 1, Table 7.2, is 1.13. Since the coefficient is above one, it suggests that some racial disparity in the issuance of citations exists. Specifically, as you go from 0 to 1 (a one unit increase), there is a 13 percent difference in the proportion of African Americans cited.

As to the extent of racial disparity, the difference between the expected slope and the no disparity slope reflects the extent of racial disparity in the issuance of citations at various levels of the racial composition of the district. The figure suggests that the difference between the two slopes steadily increases as the proportion of drivers in the district who are African American increases. For instance, the difference between the predicted and the no disparity slope when the proportion of drivers who are African American is .1 is .06. Thus, African Americans represent 6 percent

more of the drivers cited than would be expected given their representation in the driving population. The difference increases to 8 percent when African Americans represent 20 percent of white and African American drivers and 10 percent when African Americans represent 40 percent of white and African American drivers.

To summarize, the results suggest that there is racial disparity in the issuance of citations and the extent of the disparity steadily increases with increases in the proportion of drivers who are African American. Thus, there is more racial disparity at the higher levels of proportion of drivers who are African American than at the lower levels. This was found in the equation predicting the number of citations issued to African Americans and the equation predicting the proportion of citations issued to African Americans. These results are consistent with the hypothesis suggesting that the larger the relative size of the African American population of drivers, compared to whites, the greater the perceived threat and, consequently, the more social control efforts will be directed toward African Americans. Further, the results of this chapter fail to find strong support for a curvilinear relationship between the number or proportion of drivers who are African American and the proportion of citations issued to African Americans. This suggests that the rate of increase in the issuance of African American citations is fairly constant with increases in the proportion of drivers in the district who are African American.

### **Implications of Racial Threat for the Individual and Organizational Analysis**

The findings of this chapter suggest that a nonlinear racial threat model provides a better fit to the data than the models estimated in the previous chapter. This suggests that the models in Table 6.1 of Chapter 6 were misspecified. This may have implications for the findings and

conclusions drawn in Chapter 6. A comparison of the results from Table 6.1 in Chapter 6 to those presented in Table 7.1 in this Chapter indicates that this is partially the case. First, the findings presented in Table 7.1 suggest that findings regarding the individual-level measures in Chapter 6 remain the same. Experience, the race and experience product term, the proportion of citations issued on the interstate and during late night/early morning hours remain significant predictors of an officer's issuance of African American citations and the direction and level of significance of these predictors are also unchanged.

The findings of Equation 2, which is presented in Table 7.1 of this chapter, do challenge the findings and conclusions of district-level measures presented in Chapter 6. The findings of Equation 4 (Table 6.1, Chapter 6) suggested that supervisory intensity was a significant and negative predictor of an officer's number of citations issued to African Americans. It was also suggested by the findings that the experience, training, and racial composition of the workforce were not related to an officer's issuance of African American citations.

In contrast, the findings from Equation 2 (Table 7.1), which includes the three racial threat measures and appears to be a better fitting model, suggests that supervisory intensity is no longer a significant predictor of the number of citations issued to African Americans, which questions the conclusions drawn about the importance of supervision in reducing racial disparity in the issuance of citations. Further, the addition of the two nonlinear racial threat measures to the equation results in the training composition of the organization now being significantly and positively related to the number of citations issued to African Americans. The findings presented in Table 7.2 of this chapter also support the importance of the training composition of the organization on the issuance of citations to African Americans. Specifically, the training composition of the organization is also

found to be a significant predictor of the *proportion* of an officer's citations issued to African Americans. Thus, the findings of this chapter suggest that officers working in organizations with more highly trained officers issue more citations to African Americans than those officers working in organizations with less trained officers. This is an interesting finding and contrary to what would be expected by the professional model of policing. The substantive implications of this finding will be presented in the final chapter of this dissertation.

In the next chapter, I introduce a strategy for identify officers whose issuance of African American citations may be suspect. Once these outliers are identified, I then compare them to the officers whose number of citations to African Americans is within the "normal" range on various individual and district-level characteristics.

## CHAPTER 8

### IDENTIFICATION AND DESCRIPTION OF STATISTICAL OUTLIERS

This chapter focuses on the identification and description of those officers whose issuance of citations to African Americans is much higher or lower than their peers. In other words, these officers would be considered statistical outliers. Research suggests that a useful way to identify and reduce racial bias in organizational settings might be the development of a system that identifies the members of the organization whose behavior may be suspect and therefore would warrant further investigation (Bielby 2000; Walker nd). Police administrators may also want to develop a means to identify particular police units that may need to be investigated due to a relatively high presence of suspect officers. This chapter is devoted to presenting such a strategy for identifying such officers and police units. Further, this chapter evaluates the robustness of this method.

The method described in this chapter begins with the classification of officers into one of the three groups (i.e., nonoutliers, positive outliers, or negative outliers), which is accomplished through the estimation of a prediction model. The coefficients from the estimated model are then used to create a residual score for each trooper by calculating the difference between the number of citations actually issued to African Americans and the expected number of citations issued to African Americans as predicted by the model.

Troopers with residual scores that are more than two standard deviations *above* the mean (i.e., those who over cite African Americans relative to peers) are classified as positive outliers, also referred to as high-end officers, and troopers with residual scores more than two standard deviations *below* the mean (i.e., those who under cite African Americans relative to peers) as

negative outliers or low-end officers. Finally, troopers with residual scores *within* two standard deviations from the mean are categorized as nonoutliers. Once the three groups are defined, each group's mean value for various individual and district-level factors is compared with the other two groups.

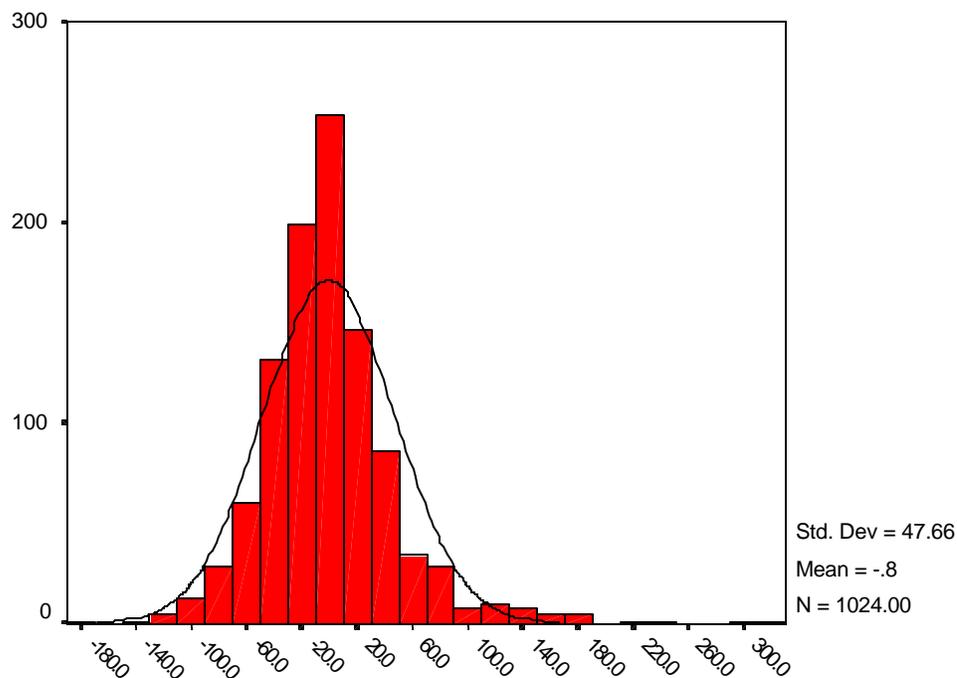
An officer's classification will be to some extent dependent on the model estimated. To determine how sensitive the findings are to the model being predicted, two different models will be estimated and the findings and implications of each model will be discussed. The first model estimates the expected *number* of citations issued to African Americans, controlling for the racial composition of the district, the proportion of an officer's citations issued on the various highway types, the proportion of an officer's citations issued during late night/early morning hours, and the number of white citations an officer issued. The alternative model estimates the predicted *proportion* of citations issued to African Americans and includes all of the same control variables with the exception of the number of citations issued to whites. Thus, both of these equations will take into account the individual and district-level control variables used in the analyses performed in Chapters 6 and 7.

The next section presents the results from the model predicting the number of citations issued to African Americans. This is followed by a discussion of the results from the alternative model predicting the proportion of citations issued to African Americans. The chapter concludes with a comparison of the findings from the two predicted models and the implications of the findings.

### Model Predicting the Number of Citations Issued to African Americans

The first model estimated is the expected *number* of citations issued to African Americans (see Appendix 6). The computed residual scores range from -171.04 to 326.36. A histogram displaying the distribution of trooper residual scores is displayed in Figure 8.1. The average residual score for the sample was  $-.83$  with a standard deviation of  $47.66$ . Consequently, high-end officers are those with a residual score of  $94.49$  or higher and low-end officers are those with a residual score of  $-96.49$  or lower. This model produces 36 high-end and 13 low-end officers.

**Figure 8.1. Histogram of Residual Scores Based on the Model Predicting the Number of Citations Issued to African Americans**



**Table 8.1. Mean Values on Control, Individual, and District Measures for Troopers with a Nonoutlier, Positive Outlier, or Negative Outlier Residual Score Based on the Model Predicting the Number of Citations Issued to African Americans.**

Mean Value of Measure	Nonoutliers	Positive Outliers	Negative Outliers
<i>Individual-Level Measures</i>			
Total Number of Citations Issued	355.27	594.69	467.69
Proportion of Citations Issued to African Americans	.24	.52	.26
Length of Service	10.17	5.25	10.54
<i>District-Level Measures</i>			
Proportion of Drivers Driving in the District who are African American	.21	.31	.33
Supervisory Intensity of District	.34	.28	.28
Experience Composition of Organization	11.94	10.84	11.79
Training Composition of Organization (x 100)	.48	.54	.42
Racial Composition of Organization	.15	.24	.25
N=	975	36	13

The following discussion provides a comparison of officers in the three categories on the individual and district-level measures previously discussed (see Chapter 5). Table 8.1 displays the mean value of the various measures for each of the three groups (i.e., nonoutliers, positive outliers, and negative outliers). For simplicity, the table presents only the individual and district-level factors found to have statistically significant differences across the groups. Appendix 7 provides the mean values for all of the factors considered regardless of their statistical significance.

#### Individual-level Measures

The results from the model predicting the number of citations issued to African Americans suggest that positive and negative outliers are more productive (in terms of the total number of

citations issued) than nonoutliers. Specifically, positive outliers issued about 595 citations and negative outliers issued around 468 citations during 2000, compared to nonoutliers who averaged about 355 citations. The officer's length of service is also found to be statistically different across the three groups. High-end officers are considerably less experienced than are nonoutlier or low-end officers. In fact, the sample of positive outliers has almost half the years of experience than the other two samples (5.52 years vs. 10.17 and 10.54 years, respectively). Thus, those officers who disproportionately issue citations to African Americans compared to their peers tend to be less experienced and more aggressive in their issuance of total citations.

#### Organization Measures

The findings from the model predicting the number of citations issued to African Americans suggest that positive and negative outliers work in districts where African Americans represent a higher proportion of the drivers than do nonoutliers. Specifically, positive and negative outliers work in districts where about 31 to 33 percent of the drivers are African American, while nonoutlier officers work in districts where about 21 percent of the drivers are African American.

Officers with residual scores that are within the normal range are found to be located in districts with a higher supervisory intensity than those officers who disproportionately over or under cite African Americans (.34 compared to .28 and .28, respectively). The results also suggest that positive outliers work in organizations where the average length of service is slightly lower than the other two groups. The average organization's experience for the sample of positive outliers is 10.84, while it is 11.94 for nonoutliers and 11.79 for negative outliers.

The average training of the organization's members is also found to be statistically significant. Positive outliers work in districts where officers are more trained, on average than the nonoutliers. Conversely, negative outliers work in organizations where officers are less trained, on average, than the nonoutliers. Finally, the districts that nonoutliers work in tend to have a smaller proportion of African American officers than do the districts of high-end and low-end troopers. While nonoutliers work in districts where African American officers represent about 15 percent of the officers, positive and negative outliers work in districts where African American officers represent 24 and 25 percent, respectively, of the officers.

To summarize, the results from this predicted model suggest that positive and negative outliers tend to work in districts where African Americans are more represented both as drivers and as officers. These two outlier groups also work in districts with less supervision. Further, positive outliers work in organizations where members have less experience and more training than the other two groups.

#### Statistical Outliers and Assigned Troop<sup>20</sup>

It may also be informative to determine the troops that the outliers are assigned to in order to determine if they are concentrated in particular areas of the state. Table 8.2 lists the troops and frequency of outliers in each location. As displayed, the troop most represented by high-end officers is Troop 1 and the troop most represented by low-end officers is Troop 8. Specifically, 13 of the 36 high-end officers (36 percent) are assigned to Troop 1, and 5 of the 13 low-end officers (39 percent) are located in Troop 8. Interestingly, in both of these Troops the outlier's counterpart is not represented (i.e., there are no low-end officers in Troop 1 and no high-end officers in Troop

8). Similar to Troop 1, Troop 5 consists of high-end outliers but no low-end outliers. Both high-end and low-end officers are located in Troops 2, 3, and 4 and there are no outliers located in either Troop 6 or Troop 7. Thus, with the exception of Troops 1, 5, and 8, there are not considerable differences between troops in their distribution of positive and negative outliers.

**Table 8.2. Frequency of Nonoutliers, Positive Outliers, and Negative Outliers by Troop Based on the Model Predicting the Number of Citations Issued to African Americans.**

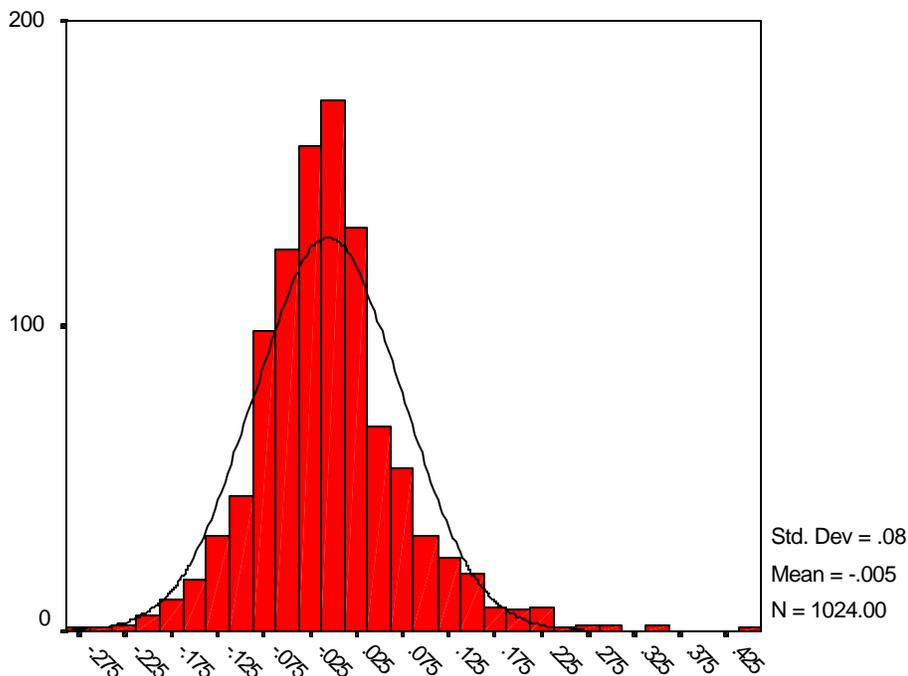
	Positive Outliers	Negative Outliers
Troop 1	13 (36%)	0 (0%)
Troop 2	12 (33%)	3 (23%)
Troop 3	6 (17%)	4 (31%)
Troop 4	3 (8%)	1 (8%)
Troop 5	2 (6%)	0 (0%)
Troop 6	0 (0%)	0 (0%)
Troop 7	0 (0%)	0 (0%)
Troop 8	0 (0%)	5 (39%)
Total	36 (100%)	13 (100%)

Finally, it may be that positive and negative outliers vary in regard to whether the district is urban or not. It may be that African Americans are disproportionately represented in urban areas of the state. If this is the case, officers patrolling highways near urban areas may cite more African Americans than those officers working nonurban areas of the state. For this analysis, the districts with a relatively high population size compared to other districts are classified as “urban”. Thus, the urban districts include those districts where Durham, Fayetteville, Greensboro, Mecklenburg, Raleigh, Wilmington, and Winston-Salem are located. Thirty-three percent of high-end officers and 31 percent of low-end officers are located in urban districts. Thus, there does not appear to be much difference between high-end and low-end officers when it comes to assignment to an urban district.

### **Model Predicting the Proportion of Citations Issued to African Americans**

An alternative model is now estimated in order to ascertain how sensitive the preceding categorization of officers is to the model being estimated. This model estimates the expected *proportion* of citations issued to African Americans (see Appendix 8). Figure 8.2 displays the distribution of the residual scores in a histogram. The residual scores produced from this prediction model have a range of  $-.28$  to  $.44$ . The mean value of the residual scores is  $-.005$  with a standard deviation of  $.08$ . Those officers with residual scores ranging from  $-.165$  to  $.155$  (i.e., within two standard deviations from the mean) are classified as nonoutliers. Officers with residual scores above  $.155$  are positive outliers and those officers with residual scores below  $-.165$  are negative outliers. This method produces 37 positive outliers and 17 negative outliers.

**Figure 8.2. Histogram of Residual Scores Based on the Model Predicting Proportion of Citations Issued to African Americans.**



Each group's mean value on various individual and district-level measures is presented in Table 8.3. Only those measures having a statistically significant difference across the groups are displayed. Each group's mean values for all of the factors considered regardless of their statistical significance are displayed in Appendix 9.

### Individual-level Measures

The findings of this predicted model suggest only one individual-level measure varied significantly across the three groups. Negative outliers issue a higher proportion of their total citations on rural roads than the other two groups. Thirty-three percent of the low-end officers' citations were produced on rural roads compared to twenty-five and twenty-six

**Table 8.3. Mean Values on Control, Individual, and District Measures for Troopers with a Nonoutlier, Positive Outlier, or Negative Outlier Residual Score Based on the Model Predicting the Proportion of Citations Issued to African Americans.**

Mean Value of Measure	Nonoutliers	Positive Outliers	Negative Outliers
<i>Individual-Level Measures</i>			
Proportion of Citations Issued on Rural Roads	.25	.26	.33
<i>District-Level Measures</i>			
Proportion of Drivers Driving in the District who are African American	.21	.24	.32
Training Composition of Organization (x 100)	.48	.51	.44
Racial Composition of Organization	.15	.19	.23
N=	970	37	17

percent of nonoutliers and positive outliers, respectively. The total number of citations issued and the officer's length of service, which were significantly different across the three group in the previous model, were not found to be significantly different in this model.

#### District-level Measures

The results from the model predicting the proportion of citations issued to African Americans suggest that both positive and negative outliers are located in districts where the proportion of drivers who are African Americans is higher than that for nonoutliers. This is similar to the findings in the previous model. However, this model suggests more distance between positive and negative outliers in the mean value for this measure than the previous model estimated. Here the

proportion of drivers who are African American is .24 for positive outliers and .32 for negative outliers compared to .31 and .33 for positive and negative outliers, respectively, in the previous model.

Similar to the previous model, the results here suggest that positive outliers tend to work in organizations where officers are more trained, on average, than the other two groups. The average of this measure for positive outliers is .51 compared to .48 for nonoutliers and .44 for negative outliers. Officers in the two outlier groups are also located in organizations with more African American representation than are nonoutlier officers. This is especially the case for negative outliers. The average proportion of African Americans in the organization is .23 for negative outliers, .19 for positive outliers and .15 for nonoutliers. Neither supervisory intensity nor the experience composition of the organization is found to be significant in this model although they were in the previous model.

#### Statistical Outliers and Assigned Troop

The results from this model suggest that positive outliers are most represented in Troop 1 and negative outliers are most represented in Troop 8. This was also the case in the previous model. Here, 16 of the 37 (43 percent) positive outliers are represented in Troop 1 and 5 of the 17 (29 percent) negative outliers are located in Troop 8. The results from this model are also similar to those of the previous model in that in both Troop 1 and Troop 8 the outlier's counterpart is not represented.

High-end officers are more likely to be located in Troops 1 and 5 than low-end officers (See Table 8.4). In fact, 43.2 percent of high-end officers and no low-end officers are located in

Troop 1. Nearly 30 percent of the positive outliers are located in Troop 5 but 12 percent of low-end officers are also located in this troop. Although the general conclusions regarding the representation of positive outliers in Troops 1 and 5 are similar across the two models, there is some difference between the actual percentages of outliers represented in the troops. For instance, 36 percent of positive outliers are located in Troop 1 according to the first model while the second model suggests that 43.2 percent of positive outliers are located in this troop. Further, both models suggest that positive outliers are more likely to be represented in Troop 5 than negative outliers, but 30 percent of positive outliers are located in this troop according to the second prediction model while 5.6 percent of this group is located in Troop 5 based on the first prediction model.

Low-end officers are most likely to be represented in Troops 3 and 8 (23.5 percent and 29.4 percent, respectively) while only 2.7 percent of high-end officers are located in Troop 3 and none are located in Troop 8. These findings are similar to those from the first model. However, the results of the second model suggest that 23.5 percent of negative outliers and 3 percent of positive outliers are located in Troop 3, while the results of the first model suggest that 31 percent of negative outliers and 17 percent positive outliers are located in Troop 3. For Troop 8, the first model suggested that 39 percent of the negative outliers are represented here and 29 percent of negative outliers are represented in this troop based on the results of the second model. Both models do suggest that positive outliers are not present in Troop 8.

Low-end and high-end officers are quite similar in their representation in Troops 2 and 4. The first model, however, suggests that a larger proportion of outliers are located in Troop 2 and a smaller proportion of outliers are located in Troop 4. For instance, the first model suggests that 33 percent of positive outliers and 23 percent of negative outliers are

**Table 8.4. Frequency of Nonoutliers, Positive Outliers, and Negative Outliers by Troop Based on the Model Predicting the Proportion of Citations Issued to African Americans.**

	Positive Outliers	Negative Outliers
Troop 1	16 (43.2%)	0 (0%)
Troop 2	4 (10.8%)	3 (17.6%)
Troop 3	1 (2.7%)	4 (23.5%)
Troop 4	4 (10.5%)	3 (17.6%)
Troop 5	11 (29.7%)	2 (11.8%)
Troop 6	0 (0%)	0 (0%)
Troop 7	1 (2.7%)	0 (0%)
Troop 8	0 (0%)	5 (29.4%)
Total	37 (100%)	17 (100%)

located in Troop 2 and the second model suggests 11 percent of positive outliers and 18 percent of negative outliers are located in this troop. For Troop 4, the first model suggests that eight percent of the positive and the negative outliers are located in this troop and the second model suggests that 11 percent of the positive outliers and 18 percent of negative outliers are located in this troop.

Finally, neither outlier group is located in Troops 6 and only one positive outlier is located in Troop 7. The results for these two troops are similar to the results from the model predicting the number of citations issued to African Americans. Thus, this discussion suggests that the general conclusions regarding outliers' representation in the eight troops are similar across the two models

but there is some difference between the two models in the actual representation of outliers in the troops.

The results from the previous model suggested that about 33 percent of high-end officers are located in “urban” districts and 31 percent of low-end officers are located in such districts. The results from this model suggest that about 22 percent of high-end officers are assigned to urban districts and nearly half (47 percent) of low-end officers are assigned to urban districts. Thus, this model suggests less representation of positive outliers and more representation of negative outliers in urban districts than suggested by the previous model.

### **Summary of Findings**

In this section positive and negative outliers have been identified and compared to those officers with residual scores within a predicted normal range. As noted, positive outliers are those who disproportionately over cite African Americans and negative outliers are those who disproportionately under cite African Americans, compared to their peers. The conclusions drawn from using a procedure such as the one suggested in this chapter for identifying outliers have been found to vary depending on the model estimated.

For instance, the first model predicted the *number* of citations issued to African Americans. From the results of this model 36 officers were classified as positive outliers and 13 officers were classified as negative outliers. The second model, which predicted the *proportion* of citations issued to African Americans, suggested that there were 37 positive outliers and 17 negative outliers.

Further examination of each officer’s classification between the two models suggests that 42 percent of the officers (15 out of the 36) classified as positive outliers from the results of the first

model are consistently classified as positive outliers from the results of the second model. Further, 46 percent of the officers (6 out of the 13) classified as negative outliers from the first model are consistently classified as negative outliers in the results from the second model. Finally, 97 percent of the officers (942 out of the 975) classified as nonoutliers in the first model remain classified as nonoutliers in the second model.

The finding that less than half of the positive outliers were the same officers under the two model specifications suggests that this methodology is far from perfect. On the other hand, if error in the model was purely random there would be little or no overlap across the model specification. The best that can be said is that outlier analyses suggest the presence of officers who might merit supervisory scrutiny but are in no way identified as biased officers.

The differences in the classification of officers between the two models are reflected in the discussion of the descriptives of the groups. This is illustrated in the discussion of the individual-level measures. The findings from the first model suggest that the groups significantly vary on their total number of citations issued and the officer's years of experience. The results from the second model, do not suggest that the three groups vary significantly in the total number of citations issued or the officer's years of experience but the findings do suggest that the groups vary on the proportion of citations issued on rural roads.

The individual-level implications drawn from the first model suggests that those who over cite African Americans relative to their peers are more aggressive in their issuance of total citations and are less experienced. Thus, police organizations may want to explore what it is about being aggressive in the issuance of total citations and being less experienced that results in the association with disproportionately ticketing African Americans. Additional supervision and training may be

necessary for those with less experience. This may be especially the case for inexperienced officers who are aggressive in their ticketing behavior.

Referring to the district-level measures, the findings from the first model suggest that the groups significantly vary in the racial composition of drivers, supervision, and the experience, training, and racial composition of the organization. The findings from the second model similarly suggest that the groups significantly vary in the racial composition of drivers and the training and racial composition of the organization. However, supervision and the experience composition of the organization are not found to significantly vary in the results from the second model.

The combined results from the two models suggest that lower levels of supervision may be associated with both the disproportionate under and over citing of African Americans. Increased supervision may bring these outliers closer to the norm in their issuance of citations. Further, several of the workforce characteristics (i.e., experience, training, and racial composition of the organization) seem to be also associated with the over and under citing of African Americans. This suggests that there may be something about the climate of police organizations that encourages or discourages the over and under citing of African Americans. This may be especially the case for those officers who are relatively inexperienced and aggressive in their issuance of citations.

Finally, both models suggest that officers who over and under cite African Americans are located in districts where African Americans are more represented than those officers who cite African Americans within the normal range. The results from the first model suggest that the average proportion of drivers in the district who are African American for positive outliers is .31 and for negative outliers it is .33, compared to .21 for nonoutliers. The results from the model predicting the *proportion* of citations issued to African Americans suggests that the average proportion of drivers

in the district who are African American for positive outliers is .24 and for negative outliers is .32, compared to .21 for nonoutliers. For both predicted models, the group with the highest average representation of African American drivers is the negative outliers. Police organizations may want to determine whether this is a reflection of the racial composition of drivers in the specific area patrolled within the district, the behavior of the officers (i.e., avoidance of African American drivers), or officers responding to (unwritten) organizational directives.

The conclusions concerning the representation of outliers in the various troops are very similar between the two models. Positive outliers are disproportionately represented in Troops 1 and 5 while negative outliers are disproportionately represented in Troops 3 and 8. The results from both of the predicted models also suggest that both outlier groups are represented similarly in Troops 2 and 4, and neither is located in Troop 6. It appears that the procedures used in this chapter are somewhat less sensitive between the two models in describing the officers in terms of their representation in troops than in describing officers in terms of their representation in the various individual and district-level measures.

The models were not as consistent in suggesting the representation of the two groups in urban areas. The results from the first model suggested that positive and negative outliers were somewhat equally represented in urban districts (33 percent and 31 percent respectively). The results from the second model suggested that 22 percent of positive outliers are located in urban districts and 47 percent of negative outliers are located in such districts. This suggests that as the area of consideration becomes smaller (i.e., examining a group's representation in *troops* vs. examining a group's representation in urban *districts*) that the results become more sensitive to the predicted model estimated.

To summarize, this chapter presents a method for identifying officers whose behavior may be suspect, compared to their peers. These officers are then able to be described in terms of various individual and district-level measures and their representation in the various troops and in urban districts, compared to their peers. Police organizations might use this information, combined with other tools available such as citizen complaints filed, peer evaluations, and performance reviews to further investigate identified officers. Early identification and subsequent investigation of such officers enables police organizations an opportunity to address the behavior of officers before it has negative implications for the organization and the citizens of the state.

## CHAPTER 9

### DISCUSSION AND CONCLUSIONS

This final chapter is devoted to a discussion of the substantive implications of the findings from the previous analysis chapters. Before possible conclusions are discussed, it is important to note the limitations of this research. First, this study only examined the state highway patrol organization of a single state; consequently, broad inferences about police behavior should not be drawn. Second, it is possible that the models did not capture sufficiently the process. Research related to possible racial disparity in traffic enforcement is just in the beginning stages. As such, this dissertation is quite exploratory since there is an absence of extant literature indicating measures related to traffic enforcement outcomes by state law enforcement. Important measures not yet identified in this line of research may have been overlooked in this analysis. Furthermore, the use of official data necessarily limits the range and depth at which this research is able to fully capture important aspects of the decision making process at the heart of racial profiling research. Research of this sort would benefit from directly incorporating measures of the officer's attitudes regarding racial minorities, the job, and the organization. Organization-level measures related to the enforcement strategies and priorities, the racial climate, and the nature of the police subculture would also provide an organizational framework for the analyses or stand alone as sources of racial disparity in traffic enforcement outcomes. And certainly, incorporating direct measures of situational-level factors such as the motorist's driving behavior and demeanor toward the officer would help us to better interpret the observed levels of racial disparity. Nevertheless, compared to previous studies the preceding analyses provide a strong set of potential explanatory variables.

This chapter will proceed as follows. A discussion of the findings and substantive implications of officer attributes, organizational characteristics, and racial threat on the issuance of citations to African will be presented first. This discussion will be followed by the overall conclusions and policy implications drawn from this research. The conclusions and implications are based on the models estimating the natural log of the number of citations issued rather than the natural metric or the Poisson estimates of the number of citations issued to African Americans. The equations estimated using the natural log of the number of African American citations produced higher reliability estimates and had lower deviance scores, which suggests a better fit to the data, than the other two options.

### **The Effect of Officer Characteristics on the Issuance of Citations to African Americans**

This dissertation examined the effect of an officer's race, experience, and training on the issuance of citations to African Americans. The findings of Chapters 6 and 7 suggest that the only personal attribute found to be directly related to the officer's number of citations issued to African Americans was length of service. This measure was also found to be associated with those classified as positive outliers, who tend to have half the experience, on average, than nonoutliers and negative outliers. Thus, the findings in Chapters 6, 7, and 8 suggest that officers who issue more citations to African Americans and who excessively cite African Americans tend to be less experienced, on average, than those officers who issue fewer citations to African Americans and who do not excessively cite African Americans.

It was hypothesized that the relationship between experience and the outcome measure would be positive if experience was associated with the development of negative attitudes and

behaviors (Neiderhoffer 1967; Brown 1981; Muir 1977). On the other hand, to the extent that experience is positively related to professionalism or negatively related to an aggressive style of policing, a negative relationship between experience and the issuance of citations to African Americans was expected (Sheehan and Cordner 1989; Unsinger and More 1990). The findings presented in Table 6.1 in Chapter 6 and Table 7.1 in Chapter 7 suggest a negative relationship, which is supportive of the idea that experience is related to the development of skills and knowledge that improve an officer's ability to make impartial decisions. Such a finding is also suggestive of experience being associated with an officer's style of behavior. It is difficult to ascertain the exact mechanisms that produce the experience effect due to the absence of measures related to the process. However, a plausible suggestion will be provided.

Without completely ruling out the professionalism argument, the research indirectly seems to be more supportive of the aggressive style of policing argument. A model was estimated predicting the total number of citations issued and the findings suggested that length of service was also strong predictor of an officer's total number of citations (Appendices 3 and 4). Thus, less experienced officers not only issue more citations to African Americans but also more total citations than more experienced officers. It is plausible to suggest that professionalism might be related to higher levels of impartial behavior, but it is difficult to imagine that professionalism would be related to lower levels of absolute productivity. Rather, it seems the opposite would be expected. It appears, then, that this research may be more supportive of the style of policing argument.

There are two explanations offered for why experience may be related to an officer's aggressiveness in ticketing, especially tickets issued to African Americans. The first possible explanation is that less experienced officers may be more impacted by perceived organizational

pressures or are just more motivated to produce in order to enhance their future career prospects than more experienced officers. Officers in the earlier years of their careers may be more motivated by institutional rewards and the perceived need to prove their competency to supervisors and peers. Research does suggest that less experienced officers who are seeking institutional rewards may target those groups where the returns are expected to be the greatest (i.e., African Americans) (Meehan and Ponder in press). Thus, less experienced officers who tend to be more aggressive in their style of policing may be especially aggressive with African Americans.

This more aggressive style of policing by less experienced officers may make cognitive bias mechanisms stronger. Less experienced officers, who tend to be more active in their issuance of citations than more experienced officers, may experience more time pressures on decision-making. If so, they may be more likely to process information in a way that forces them to be efficient in evaluating all that is observed (Allport 1954; Bodenhausen and Wyer 1990). As discussed in Chapter 2, a primary way that this is accomplished is by placing information into categories, which are often based on visible characteristics such as race (Brewer 1988; Stangor et al. 1992). These categories trigger stereotypes (Hinton 2000) and to the extent that *racial* stereotypes are evoked, less experienced officers may be more likely than more experienced officers to subject African American motorists to traffic enforcement outcomes.

The second explanation as to why experience may be related to a more aggressive style of policing pertains to differences in patrol assignments. Less experienced officers may be assigned to busier areas or highways, which may have a higher representation of African Americans than the patrol assignments of more experienced officers. Deployment-type variables of highway type, time of day, and the proportion of drivers driving in a district who are African American were added to

the models estimated in this dissertation as controls for possible patrol assignment differences. It would be premature, however, to rule out patrol assignment as a possible explanation for the relationship between experience and the issuance of citations to African Americans since the deployment measures included in this analysis are limited and, consequently, there is a possibility that there may be measurement error in the variables included. Future research needs to address more fully the mechanisms by which an officer's experience is related to their ticketing behavior.

A final comment needs to be made before discussing the findings for the officer attributes of race and training. Due to methodological problems associated with including both experience and age in the models estimated, I chose to use experience instead of age. However, I did estimate the models discussed in this dissertation with age instead of experience and the results suggested that age was not significantly related to the number of citations issued to African Americans.

Theoretically, age would be expected to be positively associated with the issuance of African Americans if racial attitudes are more conservative in older officers than younger officers. It should also be noted that age could be hypothesized to be negatively related to the number of African American citations issued because of the possible assignment of older officers to less busy highways within the patrol district. Because it is likely that African Americans are disproportionately found on busier highways (Smith et al. 2002), age of the officer would be negatively associated with the number of citations issued to African Americans (see discussion below).

Although not significant, it was found that the age coefficient was negative, which suggests that age may indeed be associated with patrol assignments. Police organizations may reward older officers with patrol assignments that are in less active areas of the district, which may also be areas with less African American representation in the driving population. They may also be held to more

relaxed standards (i.e., not expected to be as productive) due to their age. Thus, similar to experience, age may be related to patrol assignments. To the extent that this is the case, the stronger effect of experience suggests that it is an officer's experience more so than their age that enables them to acquire less active assignments or to be less aggressive in their enforcement of traffic laws. Future research will hopefully determine whether experience remains more important than age in other police organizations and with other policing outcomes or whether this finding is unique to the North Carolina State Highway Patrol.

The findings suggested that an officer's race and training are not significantly related to an officer's issuance of citations to African Americans. It was hypothesized that in-service training programs would be positively related to the number of citations issued to African Americans to the extent that training encouraged a racialized style of policing (Kappeler et al. 1998; Teahan 1975). Alternatively, it was suggested that the relationship between an officer's training and issuance of African American citations would be negative if a higher level of training was related to a more professional style of behavior (i.e., impartiality) (Burns 1988; Sheehan Cordner 1989; Studdard and Burns 1989; Unsinger and More 1990). Neither of these hypotheses was supported in this research. Of course, if both processes occur they may simply have canceled each other out in the empirical estimates.

The insignificant effect found here for officer's training on the ticketing of African Americans does not rule out the possible importance of training in shaping the behavior of patrol officers as it relates to the racial distribution of citations issued. Remember that the training measure used in this dissertation was based solely on the quantity of in-service training. While the amount of training is an important dimension, it is likely the case that the quality and content of training is at least as

important. Future research must attempt to develop alternative, and if possible, multiple indicators of training to more completely understand the possible influence of training on policing outcomes.

The race of the officer was also found to have an insignificant direct effect on the number of citations issued to African Americans. Initially this finding seemed to suggest that African American and white officers did not vary in their issuance of citations to African Americans. This substantively suggested that occupational socialization and adherence to the norms of the police subculture may result in similarities in the behaviors of white and African American officers or that individuals who select policing as a profession might share common beliefs and attitudes that overshadow the expected racial differences in the attitudes and behaviors of white compared to African American officers. Most research would stop here. A benefit of this research was that it also examined individual-level interaction effects. In doing so, race was found to have a conditional effect on the issuance of African American citations, varying by length of service.

Specifically, the findings from Chapter 6 suggested that, for both races of troopers, the number of citations issued to African Americans tends to decline with years of experience. Further, the findings indicated that African American officers cite more African Americans relative to white officers in the earlier years while white officers cite more African Americans relative to African American officers in the later years. This finding was unexpected and explains why the race of the officer was not found to have a direct effect on the number of citations issued by African Americans. This finding has substantial ramifications for the substantive conclusions drawn in this dissertation regarding the relationship between an officer's race and the issuance of citations to African Americans. Accordingly, this may have serious implications for the conclusions of previous research

that has overwhelmingly neglected to explore the possible conditional influence of an officer's race on individual-level policing outcomes.

It was hypothesized that the effect of length of service on the outcome measure would be more important for white officers than African American officers. This hypothesis reflected the idea that white officers would have a higher propensity to target African Americans for traffic enforcement due to more negative racial attitudes or cognitive bias toward African Americans. Consequently, it was suggested that if length of service increases the number of citations issued to African Americans due to increased negative attitudes and behavior, then the effects of length of service on the outcome measure would be more pronounced for white officers who already may have a higher propensity to target African Americans. Conversely, if length of service is associated with a reduction in the number of citations issued to African Americans due to the association of experience with professionalism, the benefits of a higher standard of work should be especially beneficial to white officers. The finding of a steeper slope for African American officers than for white officers challenges both of these straight-forward hypotheses.

There are plausible explanations for this finding. One explanation pertains to the possible impact of organizational pressures on the issuance of African American citations. First, both white and African American officers in the early years of their careers may be more motivated to produce, than more experienced officers, due to perceived organizational pressures to prove their competency and, for some, to be institutionally rewarded, as discussed above. However, there could also be pressures that are unique to each race that results in African American officers having a more dramatic reduction in their issuance of African American citations over the years than do white officers.

It was suggested in Chapter 2 that African American officers might feel vulnerable due to their subordinate racial status in a white-dominated organization. They, consequently, may not only feel the need to prove their competency in policing but also their loyalty to the policing profession, especially during the earlier years of their career. This pressure may result in a more aggressive style of policing, especially with African American motorists.

More experienced African American officers may feel less pressure to prove their work capabilities and loyalties to the organization or to themselves than those with less experience. This reduced perceived pressure could result in a decline in the overall number of citations issued. A less aggressive style of policing would also likely be reflected in a reduced number of citations issued to African Americans, especially if they no longer feel the need to prove their loyalty to the organization.

White officers in the earlier years of their careers may also experience pressure related to their job that impacts their ticketing of African Americans. For instance, there has been quite a bit of public scrutiny directed toward the behavior of the North Carolina State Highway Patrol over the last couple of years by the community and the media (especially local newspapers) regarding the possibility of troopers targeting African American drivers. Since accusations of race-based policing are generally directed at dominant group members, white officers may feel especially vulnerable and, consequently, cautious with African American drivers. They may even avoid or be lenient with African Americans. This may be especially the case for less experienced white officers who may feel that they are already under more scrutiny than more experienced officers simply due to supervisors keeping a closer eye on less experienced officers. In addition, officers in the earlier

years of their career may feel they have more to lose if accused of racial bias than officers in the later years of their career.

Later in their careers, white officers may feel their experience and track record of success provide them some protection from the scrutiny of supervisors. It may also be the case that these more experienced officers have a more established work style that results in their being less impacted by racial politics. The literature does provide some support for more experienced officers having a more individualized style of policing that is influenced less by external pressures (Brown 1981; Muir 1977).

Thus, both white and African American officers with less experience may practice a more aggressive style of policing due to perceived (or real) organizational pressures than more experienced officers who may be more comfortable in their positions and, consequently, exert less effort in their policing role. White officers early in their careers may feel more vulnerable to accusations of racial bias than their racial counterpart and, therefore, may be more likely to avoid or let African Americans off the hook (i.e., not issue a citation) than less experienced African American officers. In contrast, less experienced African American officers, who may feel the need to prove their loyalty, may be particularly aggressive toward African American drivers.

As white and African American officers progress in their careers they may become more secure in their position and are less likely to be motivated by the need to prove themselves. Consequently, they may practice a less aggressive style of policing, which results in fewer African American citations for all officers. The slope, however, may be steeper for African American officers since not only do they practice a less aggressive style of policing, which itself would likely reduce the overall number of citations, including African American citations, but they also may feel

less motivated to prove their loyalty to peers, supervisors, and themselves, which would have an additional effect of reducing the number of African American citations.

White officers would also practice a less aggressive style of policing which would also reduce the number of African American citations over the years but this effect would be somewhat offset by white officers being less likely to avoid or be lenient with African Americans later in their careers. Thus, the number of African American citations would reduce over the years but at a slower rate than for African American officers due to this counteracting process.

The second possible explanation for the finding of African American officers citing more African Americans than white officers early in their careers and white officers citing more African Americans than African American officers in the later years of their careers pertains to the possible effects of patrol assignments. The literature suggests that less experienced officers may be assigned to the busiest patrol areas. These are often areas that have more minority drivers. While both less experienced white and African American officers may be assigned to busier, minority concentrated areas, African American officers might be especially so. Policing literature suggests that in efforts to minimize minority citizen and police conflict and improve minority citizen and police relations, police organizations may strategically assign African American officers to minority areas (Dulaney 1996; Peak 1997). Ideally, such efforts will reduce allegations of racial bias made by minority citizens. To the extent that the North Carolina State Highway Patrol employs a similar strategy, both white and African American officers with less experience may be assigned to busier areas and areas with a relatively high representation of African Americans, but African American officers may be in the areas with the highest concentration of minorities.

As white and African American officers progress in their careers they would then be reassigned to less busy and, potentially, whiter areas. The difference in minority representation in patrol areas in the early years to the later years may be greater for African American officers since they may be assigned to more concentrated minority areas early in their careers than white officers with similar experience. However, in the later years, officers, regardless of their race, may be rewarded with a less active and, consequently, whiter patrol assignment. If this is the case, African American officers with 15 years of experience and greater may be assigned to areas resembling the areas assigned to white officers with 15 plus years of experience. While white officers may be similarly assigned to less active areas later in their careers, the contrast in the racial composition of drivers may not be as great for white officers as it is for African American officers. This may explain why the years of experience slope is not as dramatic for white officers as for African American officers.

The analysis did control for the racial composition of drivers in the district. The inclusion of this control variable would seem to suggest that the interaction effect of race and length of service on the outcome measure is not about differences in the racial composition of patrol areas. Because the measure used reflects the average racial composition for the district, this district level measure is limited in that it fails to account for differences in the racial distribution of drivers that may exist within areas of the district. Thus, there would be measurement error to the extent that such variations in the racial distribution of drivers exists within the areas of the district. It is also important to note that without an organizational study over time on officer transfers and reassignments it is impossible to determine what patterns may exist.

### **The Effect of Organizational Characteristics on the Issuance of Citations to African Americans**

Findings for the organizational variables in Chapter 6 revealed that supervisory intensity was the only characteristic that influenced the number of citations issued to African Americans. This conclusion was later modified by the findings of the racial threat analysis presented in Chapter 7. Specifically, the analysis presented in Table 7.1 in Chapter 7 suggested that the addition of the quadratic and cubic terms of the proportion of drivers in the district who are African American provided a better fit to the data than the models estimated in Chapter 6, which only included the natural metric of the proportion of drivers who are African American. This finding indicated that the models in Chapter 6 were misspecified, which may have implications for the findings and conclusions of Chapter 6. Comparison of the findings in Equation 4 of Table 6.1 (Chapter 6) with those in Equation 2 of Table 7.1 (Chapter 7) suggested that this was partially the case.

Specifically, the results of Equation 2 in Table 7.1 (Chapter 7) indicated that supervision was no longer a significant predictor of the number of citations issued to African Americans. The findings also suggested that the training composition of the workforce was now relevant to an officer's issuance of African American citations. The training composition of the patrol unit was also found to be related to an officer's *proportion* of citations issued to African American citations (Table 7.2, Chapter 7), providing further support for the importance of the training composition of the patrol unit in this dissertation.

It was hypothesized that to the extent training was associated with professionalism, officers working in a patrol district where members, on average, had more training the organization's climate would be more reflective of responsible enforcement. Alternatively, if training was associated with the development or hardening of attitudes and behaviors that encourage race-based policing

practices, then the higher the average training of the organization's members would reflect greater targeting of African American motorists. Thus, in such organizations officers would be expected to cite more African Americans than those officers working in organizations where members were less trained, on average.

The finding in Chapter 7 that the training composition of the patrol unit was *positively* related to an officer's issuance of citations provides some support for the alternative (second) hypothesis presented above. This argument seems to be further supported by the results of the statistical outlier analysis presented in Chapter 8. Specifically, the statistical outlier analysis suggested that the training composition of the patrol district was positively associated with being a positive outlier and negatively associated with being a negative outlier. The results of both Chapters 7 and 8 suggest that training is not important at the individual-level, but is significant at the patrol district-level. These findings support the idea that there is something about the training level of the organization, separate from the training of the officer, which impacts an officer's issuance of citations to African Americans. The training composition of the work force may indeed impact the organizational climate and this impact appears to increase the number of citations issued to African Americans. This findings is counter to what would be expected based on the professional model of policing.

Although the findings in Chapter 7 challenged the relevance of supervision on an officer's issuance of citations, the statistical outlier analysis in Chapter 8 did provide support for the benefits of supervision in reducing aberrant behavior. It was suggested in Chapter 3 that an organization has the ability to control the behavior of police officers through effective supervision (Gardiner 1969; VanMaan 1983; Wilson 1968). It was further hypothesized that to the extent that the organization

reflected a professional model of policing, where organizational norms encourage impartiality in the enforcement of laws, that increased supervision would reduce the number of citations issued to African Americans (Wilson and McLaren 1972). On the other hand, if the organization's norms encourage a racialized style of policing, either intentionally or unintentionally, then higher levels of supervision may be associated with an increase in the number of citations issued to African Americans (Chambliss 1966, 1994; Mann 1975; Turk 1969).

The results of the model predicting the number of citations issued to African Americans (Table 8.1, Chapter 8) suggested that officers who disproportionately over and under cite African Americans, relative to those officers who cited African Americans within a normal range, are located in organizations with less supervision, as measured here. Thus, this analysis indicates that supervision may not only be beneficial for those officers who are overzealous in their ticketing of African Americans, but also for those who appear to refrain from ticketing African Americans. These findings reinforce scholars' and police professionals' long-held view that developing effective methods of supervision must be a priority for police departments as they attempt to control nonconforming behavior.

Future research should further explore this relationship and in doing so better describe the supervisory styles and methods that are most effective in controlling the behavior of patrol officers. In addition, future research should also examine long-term patterns of supervision and the structural, environmental, and political factors affecting these patterns. Some type of modified ethnographic research design would be beneficial since it would allow the collection of detailed information about the actual patterns.

The findings of Chapters 6 and 7 indicated that the experience composition of the patrol unit was not a significant predictor of an officer's number of African American citations issued. It was hypothesized that a work force consisting of more experienced members would help to promote an organizational climate that would be less supportive or tolerant of racial misconduct. Alternatively, it was suggested that experience might be related to negative attitudes and behaviors directed toward the job and citizens believed to be most associated with criminality. If this was the case, then it was expected that the higher the average experience of the organization's members the more likely the work climate would encourage or at least tolerate race-based policing. Officers working in such organizations would cite more African Americans than officers working in organizations where the members were less experienced, on average.

While the analyses in Chapters 6 and 7 failed to provide support for either a positive or negative impact of experience of the patrol unit on the issuance of citations to African Americans, the statistical outlier analysis suggested that this workforce composition measure was important. For instance, the findings of the model estimating the number of citations issued to African Americans suggested that positive outliers, compared to nonoutliers and negative outliers, were located in patrol districts where the work force was slightly less experienced. This finding may indicate that patrol districts with a less experienced work force may produce a climate where practices believed to produce results, such as race-based policing, are more tolerated. This may encourage some officers in these districts to excessively ticket African Americans.

The finding in Chapter 8 that the experience composition of the workforce is important is supported by previous research. For example, Cao and Huang (2000) found that the average age of city police departments was significantly related to citizen's complaints against police. Police

departments with older average ages, and hence with more average work experience, tended to have lower citizens' complaint rates. The finding of this dissertation suggests that the experience composition of the workforce is an important factor, at least as it pertains to the disproportionate issuance of African American citations. Thus, research may benefit from exploring the consequences of work force composition on a variety of policing outcomes in various types of police agencies.

The racial composition of the organization was also found to be significantly related to outliers in both of the models estimated in Chapter 8. Those officers who under and over cite African Americans, compared to nonoutliers, were found to be located in patrol districts where African Americans represented a greater portion of the work force. The finding that those who under cite African Americans tend to be in patrol districts with higher levels of African American representation in the organization is consistent with the hypothesis that increased African American presence in the organization produces a climate that is less supportive or tolerant of a racialized style of policing. Still, high-end ticketing occurs also in these same district types.

It is interesting that, to the extent that a greater African American representation in the organization encourages more equal enforcement, both positive and negative outliers are represented here. It should be noted that positive and negative outliers were also more likely to be in districts with a higher concentration of African American drivers than nonoutliers, which is also puzzling. It is quite possible that this finding is due to measurement error in the estimated racial composition of drivers, which may be more extreme in those districts with higher levels, than lower levels, of African American representation in the driving population. Sampling and measurement error both increase as binomial distributions approach .5 as they do for high proportion of African

Americans. Since the proportion of drivers driving in a district who are African American is significantly and positively associated with the racial composition of the organizations (.61) in a bivariate correlation, this may explain the association of negative and positive outliers to the racial composition of officers in the patrol district.

As discussed earlier, the estimate of the racial composition of drivers reflects the average for the district. It is likely to be the case that districts with higher levels of African American concentration in the driving population have more variability in the racial composition of drivers across the district. Consequently, the models predicting the estimated number and proportion of African American citations in Chapter 8, which controlled for the racial composition of drivers, may be more likely to produce outliers in these districts. This explanation is merely a speculation, although it is based on very conventional sampling theory. It is also possible that what are identified here as outliers result from an important unknown in this research—the behavior of drivers that results in enforcement action.

The development of a better baseline measure of the racial composition of drivers at a smaller level than the district would provide more insight into this possible problem. Such research would, ideally, be able to develop theoretical expectations and explanations for the impact of the racial composition of the organization on an officer's issuance of African American citations and possibly other policing outcomes. On the other hand, if error in the estimates of baseline effects is merely a reflection of sampling error increasing as the population approaches a .5 binomial distribution, the use of smaller geographic units for baseline estimates will also have relatively high error variance. Still, these results suggest that positive and negative statistical outliers tend to be represented in districts with a higher level of African American representation in both the patrol

district and in the driving population. Future research will hopefully more completely address some of the possible methodological shortcomings of this dissertation and in doing so substantiate or challenge the findings of this research.

Finally, this analysis considered whether the organizational effects on the outcome variable varied by officer characteristics of race, experience, or training (Chapter 6). The equation estimating the natural log of the number of citations issued to African Americans failed to find any of the cross-level interaction terms to be significant. It should be noted, however, that two statistically significant cross-level effects were found in both the models estimated with the Poisson distribution and the natural metric of the number of citations issued to African Americans (See Appendices 1 and 2). One of these was common to both estimates. Both the equation estimated with the Poisson distribution and the equation estimated with the natural metric of the number of citations issued to African Americans found significant a negative cross-level interaction between an officer's experience and the training composition of the organization. This finding is not explored further since the more credible model (i.e., the model estimated with the natural log of the number of citations issued to African Americans) failed to find support for this cross-level effect nor was there a theoretical prediction for such a result. On the other hand, if future research suggests an explanation and/or replicates the finding this result may turn out to be important.

Future research examining traffic enforcement outcomes, other policing outcomes, and other police agencies should examine cross-level effects. This is the case because the predominance of single-level analyses in policing research have prohibited this more inclusive analyses in past research. The simultaneous exploration of individual and contextual level factors impacting policing outcomes would best address the complexities of police decision-making.

### **The Effect of Racial Threat Processes on the Issuance of Citations to African Americans**

Blalock posited that the presence of African Americans in a geographical area would be positively related to that area's level of discrimination. This might be the case, according to Blalock, because majority group members are more likely to feel economically or politically threatened when the size of the minority population is relatively large. More recently, it has been suggested that the presence of African Americans poses a criminal threat to whites and legal authorities (Chiricos et al. 1997; Liska et al. 1981; Lizotte and Bordua 1980; Swigert and Farrell 1976), which in turn increases the amount of social control directed at African Americans (Liska et al. 1981; Liska and Yu 1992; Sampson and Laub 1993; Tittle and Curran 1988).

Accordingly, it was hypothesized that the proportion of African Americans in the driving population would be positively related to racial disparity in the issuance of citations. It was also suggested that the form of the relationship between the size of the African American population and the issuance of citations to African Americans might be nonlinear—increasing at a decreasing rate. This prediction was based on the argument that as African Americans reach a certain proportion of the population they may become politically influential (at least in democracies) and, consequently, are in a position to politically block further increases in discrimination (Jackson and Carroll 1981). Privileged citizens and legal authorities may also seek accommodation with African Americans once they reach a certain proportion of the population (Turk 1969; 1976).

Two equations were estimated in Chapter 7 to examine the relationship between racial threat and the racial disparity in the issuance of citations. The first predicted the number of citations issued to African Americans and the second predicted the proportion of citations issued to African Americans. The results of both of these models are supportive of racial threat thesis. While in

general African Americans are cited at a rate higher than would be expected given their representation in the population, the difference between the predicted and expected slope (i.e., no racial bias), which represent the number (or proportion) of citations issued to African Americans, widens as the proportion of drivers in the district who are African American increases. Further, the findings suggest that the basic relationship is nearly linear rather than curvilinear. These results should be taken with some caution.

While the results suggest that there is racial disparity in the issuance of citations, the results also suggest that this disparity is relatively modest. This is not surprising given that the North Carolina State Highway Patrol focuses on traffic enforcement and not on crime control. A second reason to cautiously interpret the findings is that the estimate for the racial composition of drivers used in this dissertation may under or overestimate the representation of African Americans in the district. If this is the case, then the suggested extent of disparity may actually be higher or lower than indicated in Chapter 7. The estimate of the proportion of drivers driving in the district who are African American rests on the assumption that there is behavior similarity between white and African American drivers. This may not be the case. A survey of North Carolina residents found statistically significant differences in the number of miles driven in the last week and across the last year between white and African American drivers (Smith et al. 2002). White drivers reported driving an average of 3,000 miles more than African American drivers. To the extent that these results accurately describe the driving behavior of North Carolina residents, the racial composition of drivers measure used in this dissertation may underestimate the racial disparity in the issuance of citations. On the other hand, an observational study on North Carolina highway segments suggests that the estimate of the racial composition of drivers used in this dissertation might overestimate the

amount of racial disparity in the issuance of citations (Smith et al. 2002). Although statistically significant results were not produced on 12 of the 14 highway segments, the results from the observational study indicated that African American motorists were more likely to speed than white drivers.

The above suggests that the racial composition of drivers used in this dissertation might underestimate or overestimate the representation of African Americans drivers. To the extent that the presence of measurement error associated with African American drivers driving less miles than whites and the presence of measurement error related to African American drivers driving faster than whites actually exists and are relatively equal, these racial differences in driving behavior would not have serious implications for the estimate of the racial composition of drivers in the district utilized in this dissertation. This would suggest that the existence and extent of racial disparity in the issuance of citations discussed in Chapter 7 might be fairly accurate. The possible limitations of the racial composition of drivers measure used in this dissertation should be kept in mind since it does potentially have ramifications for the findings and conclusions of this dissertation, especially those discussed in Chapter 7. Let me now turn to the theoretical implications of the racial threat findings.

The hypothesis as related to the racial disparity in the issuance and citations (discussed in Chapter 7) more likely reflects the response of whites and legal authorities to the perceived criminal threat of African Americans, rather than to perceived political or economic threat, as originally theorized by Blalock. Reference to crime statistics, media portrayals of African Americans, and cognitive biases all perpetuate the stereotypes of African Americans as being more aggressive, possessing less personal control, and being more criminally inclined (Chambliss 1994; Cummings 1988; Takata and Levitz 1990). Such stereotypes often impact the beliefs and behaviors of whites

and legal authorities toward African Americans (Chiricos et al. 1997; Hinton 2000; Liska et al. 1981). Thus, it seems reasonable to suggest that as the visibility of African Americans increases so does the suspicion and police attention directed toward African Americans. This interpretation is supported by the finding of this dissertation that racial disparity in the issuance of citations to African Americans increases as the representation of African Americans in the driving population increases.

An alternative explanation for these findings is that patrol intensity may vary by the racial composition of the area, which may account at least partially for the racial disparity in the issuance of citations. This argument suggests that police treat African American and white motorists similarly but since they more actively issue citations in districts with a higher concentration of African Americans, more African American drivers are stopped and cited. Research does provide support for police activity being more aggressive in areas with a higher rather than a lower concentration of African Americans (Groves 1968; Krivo and Peterson 1996; Peeples and Loeber 1994; Smith 1986; Smith and Visser 1981; Smith et al. 1984).

To test this alternative explanation, the total number of citations issued was regressed on the racial composition of the district controlling for proportion of citations issued on the highway types and during late night/early morning hours (Appendices 3 and 4). OLS multivariate regression results suggested that the total number of citations issued was related to the proportion of drivers in the district who were African American, which is indicative of the intensity of policing argument. However, the effect of racial composition on level of activity disappeared once length of service was entered into the multivariate regression equation. This finding suggests that officers with less experience tend to be disproportionately located in areas with a higher concentration of minorities and due to their higher levels of productivity, these districts tend to have a higher number of total

citations. These OLS findings indicate that a small portion of the racial disparity in the issuance of citations is accounted for by this experience related intensity of policing (Appendix 5). This intensity of policing finding should be taken with caution since the same model that was estimated in OLS was also estimated in HLM and the results did not support the intensity of policing argument.

### **Other Determinants of the Number of Citations Issued to African Americans**

Policing research suggests that policing outcomes vary by patrol assignment (Smith 1986; Smith et al. 1984; Smith et al. 2002; Worden 1989). The results of this dissertation suggested that the higher the proportion of an officer's citations issued on an Interstate, the higher the number of citations issued to African Americans. A positive relationship was also found between the proportion of an officer's citations issued during late night and early morning hours and the number of citations issued to African Americans. Research does suggest that these findings may at least be partially due to African American drivers disproportionately driving on the interstate and during night hours (Smith et al. 2002). It may also be the case that policing practices vary across types of highways and times of the day, which may have partially produced these findings. This dissertation is merely able to suggest such an explanation since the data used here provide no direct evidence that it is the behavior of police that varies across highway types or time of day.

Although deployment-type measures were not the focus of this research and therefore not fully theoretically developed, future research may want to explore the relevance of such mechanisms. This is especially important since research suggests that they impact traffic enforcement outcomes (Gaines 2002; Smith et al. 2002; Worden 1989). For instance, the findings in Chapter 7 suggest that officers police may more aggressively in parts of the state with a large African American

driving population. Consequently, models predicting traffic enforcement outcomes may be misspecified if pertinent deployment controls are not included.

### **Overall Conclusions and Policy Implications**

Policing research has traditionally focused on the more serious law enforcement practices, such as the decision to arrest or use force. Instead, DWB research suggests that for a more complete examination of police-citizen encounters one should address the less serious, but more frequent outcomes related to traffic enforcement. The purpose of this dissertation was to add to this slowly developing line research that is still in its infancy.

As one might expect in a developing body of research, much of the earliest work tended to be largely descriptive and not attentive to the conceptual and methodological complexities of the issue. For example, most research makes little attempt to statistically examine factors that may encourage or reduce racial disparity in traffic enforcement outcomes (for exceptions see Meehan and Ponder, in press; Smith et al. 2002). In addition, policing research generally suggests that individual, situational, and contextual (organization and community) factors may all have an influence on an officer's use of discretion. Although this is conventional knowledge, policing research has tended to limit analyses to either individual *or* contextual-level factors. The data used in this dissertation enabled the development of both individual and contextual-level measures. In addition, the use of HLM made it possible to conduct a multilevel analysis without violating the assumptions related to traditional OLS regression analysis. Thus, a major contribution of this dissertation has been the examination of multi-level factors related to the issuance of African American citations.

The analysis of officer and organizational processes and the analysis of statistical outliers both suggested the importance of individual and contextual-level factors in the distribution of African American citations. Thus, while police bring with them to the job personal attributes that are related to their exercise of discretion, they do not work in a vacuum—the organizational context of policing is also relevant to their performance. The analysis examining the impact of racial threat on the issuance of African American citations also calls attention to the relevance of the community context by suggesting that the racial characteristic of the community in which police operate is related to an officer's issuance of African American citations. The findings of this dissertation, overall, suggest that a multi-level approach to examining policing outcomes is warranted and future research would benefit from further exploring the multi-level nature of police decision-making.

A strength of this dissertation and its analyses is its examination of trooper activity on all highway types and all 100 counties in North Carolina. The findings indicated that African Americans are disproportionately issued citations. Further, this dissertation has demonstrated that the extent of racial disparity in the issuance of citations increases as the representation of African Americans in the driving population increases, as measured here. Although the findings here are generalizable beyond a single highway or single urban area, the findings are still limited to North Carolina and to the North Carolina State Highway Patrol. The replication of research similar to that conducted here will help determine whether the findings here are applicable to other state highway patrol agencies or whether they are distinct to the North Carolina State Highway Patrol.

This dissertation has addressed one of the most basic yet difficult issues underlying the DWB phenomenon—the importance of a valid baseline measure of the racial composition of drivers. The most common and time and cost effective estimate is a resident population measure.

Somewhat better estimates could be gained by standardizing citations to the driving age population or registered licensed drivers. Still, these measures have several limitations including their failure to take into account racial differences in the access and use of a vehicle, differences in driving behavior, and the racial distribution of nonresident drivers. This dissertation used a measure that estimates the racial composition of driver's driving (Smith et al. 2002). It is preferable to other measures in that it uses the drivers' license population rather than the general population and it incorporates the racial composition of both resident and nonresident drivers in an area. Although a more preferable measure, it does not capture all of the important information such as racial differences in the access and use of a vehicle and differences in driving behavior. In addition, this measure is susceptible to problems associated with spatial heterogeneity. If the racial composition of drivers in a district varies throughout that district, which is no doubt often the case, then the estimated racial composition of drivers may both over and under estimate the actual racial distribution of drivers in the specific areas patrolled by individual officers. As the area and police agencies under consideration in DWB research continues to expand the development of an adequate baseline measure will continue to present a challenge to researchers. The task of future research will be to continue to explore possible solutions to the problems associated with developing an estimate of the racial composition of drivers in a geographical area.

### Policy Implications

The findings in this dissertation have many policy implications. The results suggest that an officer's personal attributes along with the characteristics of the organization and the community in which they work are associated with an officer's issuance of African American citations. This

dissertation found that those who disproportionately over and under cite African Americans are found in patrol districts with less supervision as measured here. The implications of these findings suggest that closer scrutiny of officer behavior may reduce racial disparity in the issuance of citations. A primary way to accomplish this is through the development of formalized evaluative systems to determine the extent of racial bias (Bielby 2000). Such a system would include the evaluation of individual officers for their independent contribution to racial disparity. In addition, the regular monitoring of policing patterns across a police jurisdiction is necessary to identify possible problem organizations.

The statistical outlier analysis in Chapter 8 suggested a means for identifying officers who may warrant further investigation and possibly increased supervisory scrutiny. It also allowed the identification of troops or districts that could also be examined due to having a relatively high number of statistical outlier officers. As such, a statistical outlier analysis could serve as an “early warning system” to identify officers who may be producing an extreme number of citations, relative to peers, and identify organizations that may be, perhaps inadvertently, encouraging racial disparity (Kappeler et al. 1994; Verniero and Zoubek 1999; Walker nd). The findings from a statistical outlier analysis combined with other officer information available to police organizations such as peer reviews, performance reviews, and citizen complaints would help organizations identify problems at the individual-level. Similarly, troop or district-level statistics and citizens complaints, in addition to other troop or district-level information available to administrators, could be combined with the findings from a statistical outlier analysis to identify problems at the organization-level before the situation escalates. For instance, the findings from both of the models estimated in Chapter 8 suggested that Troop 1 may warrant further investigation since a relatively high number of positive

outliers are located in this troop. There may or may not be organizational factors such as the lack of effective supervision or something about the organization's climate that account for some officers in this troop to excessively cite African Americans.

The finding that racial disparity in an officer's issuance of citations to African Americans increases with the representation of African Americans in the population also warrants further study and may have implications for policy. Officers, similar to the larger community, are argued to associate African Americans with crime and deviance. These negative perceptions of African Americans are then suggested to impact the level of social control directed toward this threatening group. Consequently, African Americans are at a greater risk of receiving a citation in contexts where they represent a greater proportion of the population. Underlying this argument, it seems, is the relevance of racial categorization and the resulting cognitive biases, especially those related to stereotypes.

The implication is that if racial disparity is to be reduced and, ideally, eliminated, then the discovery of ways to avoid the reliance on racial categories for indicators of suspicion and triggering fear in the perceptions of the police is necessary. At the individual-level, changes need to occur in how officers, citizens, and police organization leaders process and interpret information. This would include reducing the tendency for individuals to use social categories when judging others so that they are more likely to individuate others. Cognitive psychologists suggest that training programs that are focused on the extent to which officers resort to their own biases might be a prerequisite to changing their behavior. The discussion of categorization, ingroup and outgroup bias, and stereotyping noted how much of these cognitive processes occur automatically and unconsciously. Thus, a first step would be to make individuals aware of how their perceptions and interpretations of

others are potentially biased. In addition, teaching people that their racial beliefs are incorrect or at least exaggerated may also help to lessen cognitive bias. This may be accomplished through racial sensitivity training, which may help provide greater understanding of racial minorities and, ideally, more positive perceptions of the group. Exercises that encourage officers to confront their own biases and to examine the risks of resorting to stereotypic judgments in cross-racial encounters would also be helpful. Organizations also need to be aware of how aspects of the organization may inadvertently encourage officers to rely on racial categories. Such things as the policies, procedures, training, incentive system, and expectations should especially be scrutinized, particularly with regard to how they may be interpreted by officers.

The combined findings from the individual, organizational, and statistical outlier analyses suggest that experience is related to the issuance of citations. This suggests that organizations may need to explore why those who are less experienced cite more African Americans and why those who excessively cite African Americans, compared to their peers, are less experienced. Does it reflect a lack of skills or knowledge, are there organizational pressures that impact the behavior of less experienced officers, or does it merely reflect some aspect of patrol assignments not examined here? To the extent that there are organizational pressures that are unique to less experienced officers, does the interpretation of these pressures vary by the race of the officer? These are the some of questions that organizations must find the answers to if they hope to eliminate racial disparity in the issuance of citations. Surveys and focus groups could be conducted by police organizations to shed light on some of these questions.

## NOTES

1. Police throughout US history have had serious conflicts with various minority groups such as Chinese, Italian, Irish immigrants, and more recently the Hispanic population. However, this paper's primary focus is on conflicts between the police and African Americans since the most consistent and widespread police confrontations have been with this racial minority group.
2. The speed of the passing vehicle was estimated by considering the speed that the research vehicle was traveling and the time it took the passing vehicle to travel from the back bumper to the front bumper of the research vehicle. Two different researchers using stopwatches recorded the time estimated for the vehicle to pass the research vehicle. Field tests suggested this method was quite reliable.
3. I estimated the equations in Table 6.1 of Chapter 6 and Table 7.1 of Chapter 7 with age instead of length service. Age was not found to be related to the number of African American citations issued at the .05 level, but the coefficient was negative. I also estimated a model predicting the total number of citations issued with age instead of years of experience in the regression equation, holding constant the officer's race, training, and individual and district level control variables. The results suggest that while age is significantly and negatively related to the outcome measures, it is a weaker predictor of total citations than years of experience.
4. The regression equation estimated also included the density, ratio of black to white median income, percent below the poverty level, civil rights mobilization activity, and the number of riots.
5. The regression equation estimated also included police strength (lagged), mean income, and inequality (Gini index).
6. Jackson and Carroll's (1981) research found that the relationship between the percent of the population that was African American and the total per capita city expenditures was negative between 0 and 10 percent and beyond 50 percent African American, while it was nonlinear positive with an increasing slope between 10 and 40 percent African American. Greenberg et al. (1985) found that the relationship between the percent nonwhite in the population and police strength during the 1950-1960 decade in Southern cities was positive up to 22.9 percent and then began to decline. In non-Southern cities police strength was the highest when the percent nonwhite was 14.4 percent. For the 1960-1970 time period in Southern cities the maximum police strength was when the percent nonwhite was 30.3 percent. Police strength was not found to reach a maximum in non-Southern cities in the 1960-1970 decade.
7. The idea that African Americans are more criminally inclined than whites is defended on the grounds that arrest and imprisonment statistics demonstrate the higher propensity for African Americans than whites to be involved in drug offenses. The problem with such an argument is that due to the historical connection of race and crime control, the overrepresentation of African

Americans in the criminal justice system represents past discrimination of racial minorities by the police and other criminal justice agents. With regard to media representations of African Americans, the cultivation hypothesis posits that television communicates information about the social environment that influences perceptions about the social world (Gerbner & Gross 1976). Research indicates that portrayals of crime and violence on television lead to increased fears and perceptions of danger among television viewers (Gerbner and Gross 1976; Hawkins and Pingree 1981; Potter 1994). In addition, information about social groups depicted in these contexts may be conveyed, leading viewers to consume distorted portrayals of race and ethnicity as they do crime and criminal justice issues. Research suggests that portrayals of African Americans on the news and in reality-based programs such as *Cops* are considerably more negative than images of whites (Entman 1990, 1994; Oliver 1994; Sheley & Askins 1981). Research has shown that while only 42 percent of news stories featured white criminal suspects, 77 percent of crime stories were related to African American suspects (Entman 1994). Programming that consistently depicts minorities in roles that illicit fear from viewers may encourage racial stereotyping along these lines (Takata and Levitz 1990).

8. The data used in this dissertation were collected as part of the North Carolina Highway Study, funded by the National Institute of Justice, award 1999-MU-CX-0022.

9. The researchers chose several locations where there had been a high number of police initiated traffic stops and counted vehicles and, based on observation, classified the race of drivers passing through the intersection. The “spot checks” were conducted during the times of 6:00 p.m. and 2:00 a.m.

10. Examination of a scatterplot for the dependent variable and the proportion of citations issued during late night/early morning hours suggests that the relationship is curvilinear when the natural metric is used. This curvilinear relationship disappears when the natural log of the proportion of citations issued during late night/early morning hours is used.

11. The HLM reliability estimate of the intercept parameters are useful for determining how much of the variability in the intercept is due to error versus parameter variance. The estimate is a function of variability in means across districts and the within-group sample size (Bryk and Raudenbush 1992).

12. The significant and negative relationship between an officer’s length of service and the number of citations issued to African Americans is also supported in the model estimating the natural metric of the outcome measure and the model estimated with the Poisson distribution (See Appendices 1 and 2).

13. The proportion of an officer’s citations issued on an interstate was not found to be significant in the models estimating the natural metric of the outcome measure or the Poisson over-dispersed model (See Appendices 1 and 2).

14. The natural metric and the Poisson estimates reported in the Appendices 1 and 2 also found the individual-level product term of race and experience to be significant. The estimates of the natural metric of the outcome measure also found the individual-level product term of experience and training to be significant but the Poisson estimates did not.

15. A model similar to Equation 4 was estimated but also included a measure of the district's workload (number of white and African American drivers driving) to make sure the significant findings for the supervisory intensity measure was not a result of it being correlated with the "workload" or "size" of the district. The findings suggested that the number of white and African American drivers driving was not a significant predictor of the outcome measure and the inclusion of this control variable did not significantly alter the direction or significance of the findings and so it was dropped from the final estimated equation. It should also be noted that multicollinearity tests were conducted to make sure that the inclusion of the number of white and African American drivers driving in the district in the equation did not present multicollinearity problems. The tests suggested that multicollinearity was not a problem. Finally, the findings of the model estimating the natural metric of the dependent variable did not find support for supervisory intensity being a significant predictor of the number of citations issued to African Americans (See Appendix 2). The Poisson model like the model reported in Table 6.1 found declining citations of African Americans with increased supervision intensity (See Appendix 1).

16. The model estimating the natural metric of the number of African American citations issued suggests that the training composition of the organization is a positive and significant predictor of the outcome measure at the .05 significance level (See Appendix 2).

17. The Poisson over-dispersed model suggested that the cross-level interaction terms of officer experience and district training and officer training and district supervision were significant predictors of the number of citations issued to African Americans (Appendix 1). The model estimating the natural metric of the number of citations issued to African Americans indicated that two cross-level interaction terms were significant: officer experience and district training and officer experience and district representation of African American officers (Appendix 2).

18. Research suggests that the visibility of African American *males* may be most criminally threatening. Therefore, I considered using the proportion of drivers who are African American males instead of the total African American population. Examination of bivariate correlations suggested that the proportion of drivers who are African American and the proportion of drivers who are African American males are highly correlated (.99). I ran the multi-level equations using both proportions (i.e., total African American populations and total African American male Population) and the results were similar. I chose to use the proportion of drivers who are African American in the final analysis.

19. The experience-related intensity of policing slope was created by, first, estimating a model that predicted the total number of citations that included the predictors of the proportion of drivers in the district who are African American, and the control variables of the proportion of an officer's

citations issued on the interstate, US highways, rural highways, and during late night/early morning hours. The intercept value of 361.63 was adjusted by considering the control variables. Specifically, the mean value of each of the control variables was multiplied by its' respective coefficient. Each control variable's adjusted value was then added to the intercept. This resulted in an adjusted mean value of 332.87 total citations issued by officers. Next, the coefficient for the racial composition of drivers (152.65) was multiplied by the different levels of the racial composition of drivers (i.e., 0, .1, .2, .3, .4). This number was then added to the adjusted mean value of the total number of citations issued (332.87). For instance, at .1 proportion of drivers who are African American, 15.27 was added to 332.87 resulting in an estimate of 348.14 total citations issued in these areas. Finally, the number was adjusted to estimate the number of citations issued to African American at the different levels of proportion of drivers in the district who are African American. Thus, using the above example, 348.14 was multiplied by .1 to attain the expected number of citations issued to African Americans taking into account intensity of policing (i.e., 34.8). These numbers were then plotted (See Appendix 5).

20. In order to maintain anonymity, the troop numbers of one through eight do not correspond to the official designation of Troop A through Troop H.

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## **APPENDICES**

**Appendix 1. Results of Multilevel Equations: Officer and Organizational Predictors of the Number of African American Citations (Poisson distribution)**

	Equation 1	Equation 2	Equation 3	Equation 4
Constant	4.538** (.072)	4.342** (.058)	4.467** (.074)	4.260** (.042)
<b>Control Variables</b>				
<i>Individual Level</i>				
Proportion Interstate		-.006 (.208)	.017 (.209)	-.031 (.194)
Proportion US Highways		-.073 (.238)	-.055 (.239)	-.060 (.228)
Proportion Rural Roads		-.288 (.251)	-.274 (.249)	-.307 (.237)
Proportion Night		.537** (.238)	.526* (.238)	.530* (.226)
# White Citations		.002** (.0001)	.002** (.0001)	.002** (.0001)
<i>District Level</i>				
Proportion of Drivers Driving in the District who are African American		6.682** (.457)	6.704** (.453)	6.339** (.419)
<b>Officer Variables</b>				
Race (white=1)		-.078 (.043)	-.225** (.077)	-.074 (.042)
Length of Service		-.011** (.002)	-.026** (.006)	-.011** (.002)
Training (adjusted for yrs. exp.)		.005 (.029)	.001 (.030)	.002 (.029)
<b>Interaction between Officer Variables</b>				
Race * Length of Service			.017** (.006)	
<b>Organization Variables</b>				
Supervisory Intensity (x 1,000)				-1.417* (.547)
Experience Composition of Org.				.049 (.032)
Training Composition of Org.				.872 (.493)
Racial Composition of Org.				.004 (.330)
<b>Variance Components</b>				
<i>District-level Variance Component</i>	.707	.100	.100	.09
Percent of District-level Variance Explained		(86%)	(86%)	(87%)
<i>Individual-level Variance Component</i>	26.090	15.290	15.215	15.28
Percent of Individual-level Variance Explained		(41%)	(42%)	(41%)
<b>Reliability</b>	.96	.868	.868	.853

Notes: All IV's, with the exception of the race dummy variable, are centered at their grand mean. Standard errors are in parenthesis. Analysis includes only officers ranked as troopers. N= 1024 troopers, 53 districts.

\*\*p<.01; \*p<.05 (two-tailed tests)

**Appendix 1. (continued) Results of Multilevel Equations: Officer and Organizational Predictors of the Number of African American Citations (Poisson distribution)**

	<b>Equation 5</b>
Constant	4.320** (.504)
<b>Officer Variables</b>	
Race (white=1)	-.076 (.040)
Length of Service	-.011** (.002)
Training (adjusted for yrs. exp.)	.030 (.030)
<b>Organization Variables</b>	
Supervisory Intensity (x 1,000)	-1.401* (.556)
Experience Composition of Org.	.046 (.032)
Training Composition of Org.	.725 (.494)
Racial Composition of Org.	.020 (.329)
<b>Cross-level Interactions</b>	
Length of Service*Training Composition of Org.	-.063** (.020)
Train*Supervisory Intensity	.909** (.243)
<b>Variance Components</b>	
<i>District-level Variance Component</i>	.091
Percent of District-level Variance Explained	(87%)
<i>Individual-level Variance Component</i>	15.017
Percent of Individual-level Variance Explained	(42%)
<b>Reliability</b>	.857

Notes: All IV's, with the exception of the race dummy variable, are centered at their grand mean. Standard errors are in parenthesis. Analysis includes only officers ranked as troopers. N= 1024 troopers, 53 districts.

\*\*p<.01; \*p<.05 (two-tailed tests)

**Appendix 2. Results of Multilevel Equations: Officer and Organizational Predictors of Number of the African American Citations (natural metric)**

	Equation 1	Equation 2	Equation 3	Equation 4
Constant	93.066** (7.426)	93.923** (2.541)	93.942** (2.573)	93.710** (2.417)
<b>Baseline Variables</b>				
<i>Individual Level</i>				
Proportion Interstate		-2.519 (18.539)	.887 (18.271)	-6.939 (18.127)
Proportion US Highways		-8.350 (21.092)	-7.686 (20.650)	-8.679 (20.870)
Proportion Rural Roads		-26.190 (23.398)	-28.109 (22.735)	-30.147 (23.082)
Proportion Night (LN)		9.909 (5.532)	12.530* (5.508)	10.046 (5.538)
# White Citations		.219** (.024)	.218** (.023)	.219** (.024)
<i>District Level</i>				
Proportion of Drivers Driving in the District who are African American		479.890** (23.143)	482.698** (23.581)	452.661** (31.954)
<b>Officer Variables</b>				
Race (white=1)		-5.343 (6.060)	-34.628** (.08)	-4.463 (6.215)
Length of Service		-.459* (.221)	-2.505** (.968)	-.478* (.237)
Training (adjusted for yrs. exp.)		6.240 (4.118)	11.274* (4.970)	4.753 (3.999)
<b>Interactions between Officer Variables</b>				
Race * Length of Service			2.968** (.925)	
Length of Service * Training			-2.442** (.920)	
<b>Organization Variables</b>				
Supervisory Intensity (x 1,000)				9.670 (28.046)
Experience Composition of Org.				1.311 (1.554)
Training Composition of Org.				79.155* (35.878)
Racial Composition of Org.				30.131 (30.138)
<b>Variance Components</b>				
<i>District-level Variance Component</i>	2808.312	246.611	260.641	229.048
Percent of District-level Variance Explained		(91%)	(91%)	(92%)
<i>Individual-level Variance Component</i>	3044.217	1990.956	1937.935	1991.292
Percent of Individual-level Variance Explained		(35%)	(36%)	(35%)
<b>Reliability</b>	.94	.69	.71	.68

Notes: All IV's, with the exception of the race dummy variable, are centered at their grand mean. Standard errors are in parenthesis. Analysis includes only officers ranked as troopers. N= 1024 troopers, 53 districts.

\*\*p<.01; \*p<.05 (two-tailed tests)

**Appendix 2. (continued) Results of Multilevel Equations: Officer and Organizational Predictors of the Number of African American Citations (natural metric)**

	<b>Equation 5</b>
Constant	97.149** (5.714)
<b>Officer Variables</b>	
Race (white=1)	-5.417 (5.907)
Length of Service	-.641** (.233)
Training (adjusted for yrs. exp.)	2.596 (3.569)
<b>Organization Variables</b>	
Supervisory Intensity (x 1,000)	12.679 (27.496)
Experience Composition of Org.	1.124 (1.701)
Training Composition of Org.	68.764 (37.767)
Racial Composition of Org.	26.382 (31.960)
<b>Cross-level Interactions</b>	
Length of Service * Racial Composition of Org.	-7.614** (1.707)
Length of Service* Training Composition of Org.	-7.191** (2.274)
<b>Variance Components</b>	
<i>District-level Variance Component</i>	262.366
Percent of District-level Variance Explained	(91%)
<i>Individual-level Variance Component</i>	1916.789
Percent of Individual-level Variance Explained	(37%)
<b>Reliability</b>	.71

Notes: All IV's, with the exception of the race dummy variable, are centered at their grand mean. Standard errors are in parenthesis. Analysis includes only officers ranked as troopers. N= 1024 troopers, 53 districts.

\*\*p<.01; \*p<.05 (two-tailed tests)

**Appendix 3. Results of Multilevel Equations Predicting the Total Number of White and African American Citations (OLS Results)**

	<b>Equation 1</b>	<b>Equation 2</b>
Constant	364.424** (41.006)	448.437** (39.462)
<i><b>Individual-Level</b></i>		
Proportion Interstate	1.829 (39.622)	-.353 (37.427)
Proportion US Highways	-53.500 (39.965)	-59.279 (37.754)
Proportion Rural Roads	18.041 (50.682)	-31.264 (48.078)
Proportion Night (LN)	8.804 (13.520)	-12.390 (12.912)
Length of Service		-8.782** (.789)
<i><b>District-Level</b></i>		
Proportion of Drivers Driving in the District who are African American	137.304** (51.526)	79.884 (48.944)
<b>Adj. R-Square</b>	.009	.116

Notes: All IV's are entered uncentered. Standard errors are in parenthesis. Analysis includes only officers ranked as troopers. N= 1024 troopers, 53 districts.

\*\*p<.01; \*p<.05 (two-tailed tests)

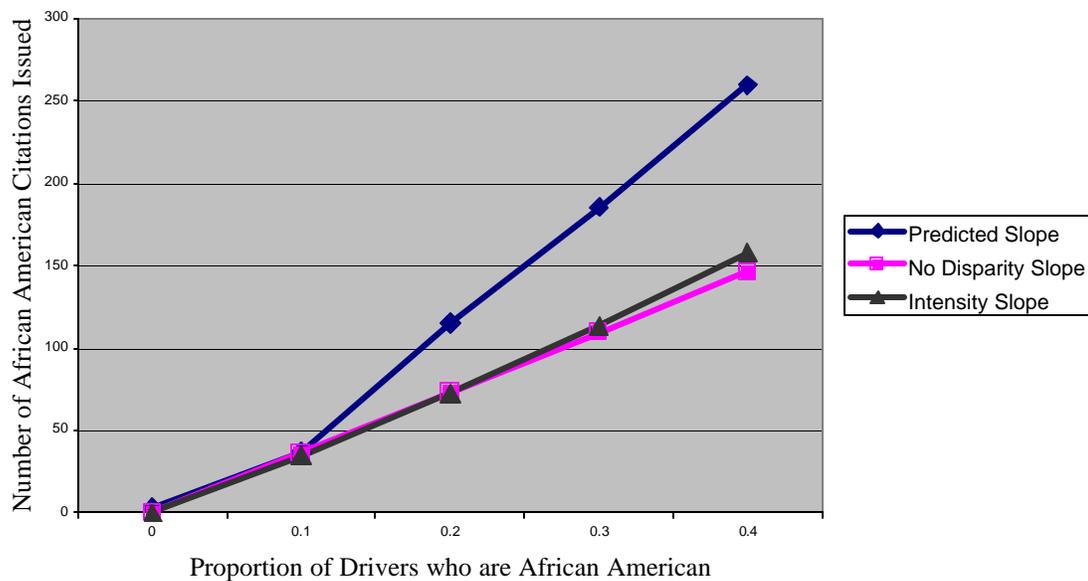
**Appendix 4. Results of Multilevel Equations Predicting the Total Number of White and African American Citations (HLM Results)**

	<b>Equation 1</b>	<b>Equation 2</b>
Constant	362.545** (9.623)	363.988** (9.909)
<i><b>Individual-Level</b></i>		
Proportion Interstate	33.529 (50.691)	59.608 (49.983)
Proportion US Highways	15.892 (46.056)	10.800 (44.065)
Proportion Rural Roads	11.271 (69.993)	-60.532 (65.692)
Proportion Night (LN)	6.786 (14.846)	-17.129 (13.926)
Length of Service		-9.321** (.809)
<i><b>District-Level</b></i>		
Proportion of Drivers Driving in the District who are African American	162.254 (90.665)	111.502 (98.138)
<b>Reliability</b>	.94	.69

Notes: All IV's, with the exception of the race dummy variable, are centered at their grand mean. Standard errors are in parenthesis. Analysis includes only officers ranked as troopers. N= 1024 troopers, 53 districts.

\*\*p<.01; \*p<.05 (two-tailed tests)

### Appendix 5. Predicted, No Racial Disparity, and Experience-Related Intensity of Policing Slopes of the Number of Citations Issued to African Americans



**Appendix 6. Results of Multilevel Equations Predicting the Number of Citations Issued to African Americans**

	<b>Equation 1</b>
Constant	-44.009* (20.612)
<i>Individual-Level</i>	
Proportion Interstate	-3.543 (18.981)
Proportion US Highways	-8.138 (21.547)
Proportion Rural Roads	-22.917 (23.575)
Proportion Night (LN)	12.061* (5.462)
# White Citations	.228** (.024)
<i>District-Level</i>	
Proportion of Drivers Driving in the District who are African American	488.818** (24.601)

Notes: Standard errors are in parenthesis. Analysis includes only officers ranked as troopers. N= 1024 troopers, 53 districts.

\*\*p<.01; \*p<.05 (two-tailed tests)

**Appendix 7. Mean Values on Control, Individual, and District Measures for Troopers with a Nonoutlier, Positive Outlier, or Negative Outlier Residual Score Based on the Model Predicting the Number of Citations Issued to African Americans**

<b>Mean Value of Measure</b>	<b>Nonoutliers</b>	<b>Positive Outliers</b>	<b>Negative Outliers</b>
<i>Individual-Level Measures</i>			
Proportion of Cites issued on Interstate	.14	.16	.16
Proportion of Cites issued on US HWY	.38	.36	.29
Proportion of Cites issued on NC HWY	.23	.22	.26
Proportion of Cites issued on Rural Road	.25	.26	.29
Proportion of Cites issued during Night Hours	.25	.29	.28
Number of Total Cites Issued	355.27	594.69	467.69
Race	.85	.78	.77
Length of Service	10.17	5.52	10.54
Number of Trainings Completed	5.03	4.33	4.92
<i>District-level Measures</i>			
Proportion of Drivers in District who are African American	.21	.31	.33
Supervisory Intensity of District	.48	.39	.40
Experience Composition of Organization	11.94	10.84	11.79
Training Composition of Organization (x 100)	1.91	1.95	1.65
Racial Composition of Organization	.15	.24	.25
N=	975	36	13

**Appendix 8. Results of Multilevel Equations Predicting the Proportion of Citations Issued to African Americans**

<b>Equation 1</b>	
Constant	.052 (.035)
<i>Individual-Level</i>	
Proportion Interstate	.028 (.033)
Proportion US Highways	-.011 (.038)
Proportion Rural Roads	-.038 (.041)
Proportion Night (LN)	.026* (.009)
<i>District-Level</i>	
Proportion of Drivers Driving in the District who are African American	1.186** (.031)

Notes: Standard errors are in parenthesis. Analysis includes only officers ranked as troopers. N= 1024 troopers, 53 districts.

\*\*p<.01; \*p<.05 (two-tailed tests)

**Appendix 9. Mean Values on Control, Individual, and District Measures for Troopers with a Nonoutlier, Positive Outlier, or Negative Outlier Residual Score Based on the Model Predicting the Proportion of Citations Issued to African Americans**

<b>Mean Value of Measure</b>	<b>Nonoutliers</b>	<b>Positive Outliers</b>	<b>Negative Outliers</b>
<i>Individual-Level Measures</i>			
Proportion of Cites issued on Interstate	.14	.14	.06
Proportion of Cites issued on US HWY	.38	.42	.33
Proportion of Cites issued on NC HWY	.23	.18	.28
Proportion of Cites issued on Rural Road	.25	.26	.33
Proportion of Cites issued during Night Hours	.25	.27	.23
Number of Total Cites Issued	364.77	355.70	405.06
Race (white=1)	.85	.76	.94
Length of Service	10.05	8.81	9.94
Number of Trainings Completed	5.02	4.86	4.53
<i>District-level Measures</i>			
Proportion of Drivers in District who are African American	.21	.24	.32
Supervisory Intensity of District	.34	.33	.33
Experience Composition of the Organization	11.90	11.84	11.97
Training Composition of the Organization (x 100)	.48	.51	.44
Racial Composition of the Organization	.15	.19	.23
N=	970	37	17