



Race, driving, and police organization: Modeling moving and nonmoving traffic stops with citizen self-reports of driving practices

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ABSTRACT

A rapidly growing body of police scholarship has found evidence of racial disparities in traffic stop patterns using police-generated data. Despite the empirical consensus, the question of whether race inappropriately influences traffic stop patterns remains open, largely as a result of methodological weaknesses. The current article helps to address this issue by employing self-report data about citizens' driving practices and traffic stops. It presents a series of models that predict the likelihood of a self-reported traffic stop disaggregated by police organizational type and the reason for the stop. Results suggest that moving and nonmoving driving practices are associated with the likelihood of police stops for moving and nonmoving reasons, respectively. As expected, differences between local police and state police models emerge. Finally, Black drivers and younger drivers are especially vulnerable to traffic stop risk for nonmoving stops by local police, even after controlling for driving behaviors.

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Introduction

Racial profiling could be described as one of the largest contemporary issues facing the police in American society. Racial disparities in the application of state authority call into question the democratic ideals associated with fair and impartial enforcement of the law (Skogan & Meares, 2004). Racial disparities in police-initiated citizen contacts may undermine the trust of racial minority communities in the police and threaten the legitimacy of the police as an institution (Tyler & Waksler, 2004). In addition, evidence of racial disparities in police contacts supports the idea that despite claims that American society has become "colorblind," race, in fact, continues to matter in a variety of ways.

Police researchers and practitioners have responded to this controversy by investing substantial effort in documenting and explaining racial patterns in police traffic stops. As a result, a growing number of studies had established fairly strong evidence of racial disparities in police traffic stop patterns (Engel & Calnon, 2004a; Lange, Johnson, & Voas, 2005; Lundman & Kaufman, 2003; Meehan & Ponder, 2002; Novak, 2004; Rojek, Rosenfeld, & Decker, 2004; Smith & Petrocelli, 2001; Warren, Tomaskovic-Devey, Smith, Zingraff, & Mason, 2006). Determining whether such disparities constitute racial profiling has been more challenging, a reflection of the primary obstacle facing police researchers interested in the issue, the so-called benchmark problem (Engel & Calnon, 2004b; Zingraff et al., 2000).

The need for a benchmark—information used to develop a neutral set of expectations about what the racial distribution of stops should be—is partly the result of relying upon police sources of data about traffic stops. Of course, it is unreasonable to expect police to collect data about drivers they fail to stop, yet data about this group of citizens would help answer key questions: does the race-specific pattern of police stops reflect the pattern of drivers driving on the roads, and does the race-specific pattern of police stops reflect the pattern of drivers driving who are violating the law. The current article proposes a way around the benchmark problem by employing citizen self-reports of driving practices and police traffic stops. Self-reports provide a single source to gauge the race-specific distribution of drivers driving, "risky" drivers driving (Tomaskovic-Devey, Wright, Czaja, & Miller, 2006; Warren et al., 2006), and traffic stop likelihood—information on both those who have been stopped and those who have not—across different police jurisdictions.

This article makes three primary contributions to the rapidly evolving research literature on traffic stop patterns of American police. First, it builds and tests a set of models that disaggregate traffic stops by the reason for the stop. Disaggregated stop measures provide a way to examine stops that are more likely to be discretionary and pretextual in character, such as nonmoving stops. Second, the analysis is concerned with comparing stop patterns evident across different types of police organizations. The organizational features of different types of law enforcement agencies are thought to be important influences on the traffic stop patterns that result from the application of police discretion. Third, it models the effects of race and other status characteristics while accounting for driving practices that increase the likelihood of experiencing different types of traffic stops. It does

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this by employing citizen self-report data about the characteristics of licensed drivers and their driving habits to predict self-reports of moving and nonmoving traffic stops by different types of police organizations.

Research literature

This review of the literature is structured around three themes that bear upon analyses of police traffic stop patterns. The first of these is police organizational research, which highlights the influence of police function, organizational structure, and professionalism on police behavior. The second theme flows from the discovery that all traffic stops are not created equal in terms of their meaning in an officer or agency's interest in attaining elements of its core function. Law enforcement agencies differ in the degree to which they define crime control as an organizational mandate and this has implications for the use of traffic stops as a tactic in achieving their mandate. This observation, combined with growing empirical evidence, suggests that disaggregating stops based upon the nature of the stop may yield a more precise understanding of the dynamics underlying stop patterns. The third area, which builds upon the police organizational literature and the utility of disaggregating stops, is focused on the role that police suspicion plays in the execution of pretextual traffic stops. Research on profiling has begun to focus more squarely on pretextual stops and the composition of police suspicion that triggers such stops.

Police organization

Interest in the effects of organizational factors on police behavior can be traced at least as far back as J. Q. Wilson's (1968) research on organizational style and its relationship to the nature of patrol discretion. The intersection between police organization and the external environment, including geography, social relations, and the legal system, is critical to understanding police outcomes (Reiss & Bordua, 1967). Police decision-making takes place within a specific organizational context that constrains and enables different types of police decision-making. Drawing heavily on police organizational research, Klinger (1997, 2004) linked the importance of environmental factors, the administrative and bureaucratic constraints set on and by police agencies, and the informal cultural features of police work groups to develop expectations about the ways in which police vigor is exercised. It is clear that police organizational factors should be considered to a greater extent in traffic stop research.

Inquiry on race and police traffic stops has begun to incorporate insight about the organizational features of police departments and their importance to understanding stop patterns. For example, Gaines (2006) in a study of traffic stops by the Riverside, California, Police Department found that the organizational focus of police units is an important consideration in the racial pattern of traffic stops. Using population data as a benchmark to interpret stop data, Gaines found that stops conducted by traffic units reflected the race-specific population distribution of the jurisdiction. In contrast, the pattern of traffic stops by patrol and investigative units appeared to be somewhat racially disparate. He argued, however, that the patrol stop patterns were a reflection of deployment patterns associated with environmental factors in the jurisdiction. Patterns of racial disparities in the patrol unit stops reflected the greater presence of police patrols in higher crime and service intensive beats, which were disproportionately racial minority in residential composition.

Warren et al. (2006), drawing on data from the North Carolina Licensed Driver Survey, found a similar pattern with regard to police function. Rather than comparing stop patterns to population data, Warren et al. modeled self-reported traffic stops in the year prior to the survey interview using self-reports of driving practices. They found that traffic stops by local police were predicted by a number of citizen status factors, especially race, age, and vehicle age (interpreted as a

status rather than legal characteristic), but not in a consistent manner by the variety of items used to gauge respondents' driving behaviors. In contrast, traffic stops by the state police agency were unrelated to citizen characteristics with the exception of age, and instead predicted by driving practices, especially miles driven annually, which increased stops, and the use of evasion techniques, which decreased stops. One common predictor, the length of respondent's traffic conviction history increased traffic stops for both types of police. Both Gaines (2006) and Warren et al. (2006), using very different types of data, drew a similar conclusion: incorporating police organizational measures into stop data analyses may be important in the effort to determine the relative importance of race and other citizen characteristics may have in the process of police decision-making.

Disaggregating traffic stops

Aside from organizational influences on stop patterns, the field has recognized that different types of traffic stops may be more or less prone to police discretion (Harris, 1997). For example, some argue that speeding stops are less discretionary compared to stops associated with violations of other types of traffic code. One reason for this is tied to the practical requirements for officers to determine and act upon driver characteristics in the decision to make a stop, which may be severely diminished at high speeds. The empirical record has begun to offer some evidence to support this view. For example, Lange et al. (2005) found in their analysis of traffic stops conducted by New Jersey State Police along road segments of the New Jersey Turnpike that racial disparities in stops closely resembled the racial composition and speeding practices of the driving population along these road segments. The implication is that speeding traffic stops are driven by the race-specific pattern of speeding infractions on specific road segments rather than any organizational or officer-level processes that may target Black or Hispanic drivers. Lange et al.'s (2005) findings contradicted similar research by Lamberth (1997) that focused on the racial distribution of the driving population and the proportion of speeding motorists in Maryland. Lange et al. attributed the differences in the two studies' findings in part to a higher threshold in operationalizing speeding, fifteen miles per hour compared to five in Lamberth's study. Nevertheless, the literature was lacking in studies that examined the possibility that traffic violations aside from speeding are not distributed proportionately across racial or other status groups. Certainly the criticisms of using population data as a benchmark as opposed to developing baseline data is just as applicable to nonspeeding traffic violations as it is to speeding violations. Further, national survey estimates suggest that a large proportion of traffic stops are due to reasons aside from speeding (Langan, Greenfeld, Smith, Durose, & Levin, 2001).

Other researchers have also tracked the type of stop, though previous studies had generally lacked measures of driving violations that may be theorized to result in different types of stops. Smith and Petrocelli (2001) found that investigatory stops, those based upon "suspicion," were not statistically associated with driver race in their study of Richmond, Virginia police stop records. Drivers stopped for moving violations, however, were more likely than those stopped for investigatory purposes to be subject to consent searches, though White drivers appeared to be more likely to receive such requests. Smith and Petrocelli reasoned that this pattern in consent searches may reflect race differences in motorists' willingness to grant consent to search when requested by police, though their data did not provide information about consent search requests that were declined. Novak (2004), relying upon similar police record data drawn from a large suburban police in the Kansas City, Missouri area found that White drivers were more likely than Blacks and Hispanics to be stopped for moving violations, unsafe driving, and speeding, controlling for officer characteristics, the time of day the stop occurred, and jurisdiction resident status. He found no race relationship for equipment violations.

Citations were more likely for Whites as well. Citations were predicted by the type of stop as well, with an increased likelihood of a ticket outcome for moving violations, unsafe driving, and speeding stops while significantly less likely for equipment violations, which was interpreted to suggest the use of traffic stops as pretext to investigate racial minority citizens rather than enforce traffic codes.

Two studies based upon self-report surveys found that Black drivers are more likely to be stopped by police and experience adverse stop outcomes, such as a ticket, search, or arrest subsequent to the stop. Lundman and Kaufman (2003) employed national survey data from the 1999 Police-Public Contact (PPC) module of the NCVS and observed that race, gender, and age increased the likelihood of a self-reported traffic stop. Their research, however, failed to examine whether their findings persisted for different types of traffic stops. Engel and Calnon (2004a) examined the influence of driver, officer, and stop characteristics on a variety of stop outcomes using the same set of PPC data. They found that traffic stops involving Black, male, and younger drivers were significantly more likely to end in cites, searches, arrests, and the use of force by police. With regard to the type of stop, they found that those stopped for nonspeeding traffic offenses were less likely to be ticketed than speeding stops, while those stopped for a DUI roadside check, vehicle defect, license/registration check, driver suspicion, and other/unknown reason were significantly more likely to be ticketed than those stopped for speeding. In addition, those stopped for DUI roadside check, a nonspeeding traffic offense, vehicle defect, license/registration check, driver suspect, or other/unknown reason were more likely to be searched. Further, those stopped for a nonspeeding traffic offense, vehicle defect, driver suspect, or other/unknown reason were significantly more likely than those stopped for speeding to be arrested or to report police use of force. Together, these PPC-based studies suggested that race, gender, and age may be important predictors of not only the likelihood of any stop or the outcome of a traffic stop, but also the type of stop conducted by police, though neither actually examined that aspect of the data.

Racial profiling and pretextual stops

At the crux of the debate about racial profiling is the question of whether race is an appropriate consideration in the formation of police suspicion. The empirical focus on traffic stops stems from the use of traffic code violations by police as pretext to stop and investigate citizens based upon generalized suspicion, the legality of which was upheld by the Supreme Court's *Whren v. U.S.* (1996) decision. As many have suggested (Birzer & Birzer, 2006; Fagan & Davies, 2001; Harris, 1997; Meehan & Ponder, 2002; Smith & Alpert, 2002), pretextual stops have become a primary tactic in the police arsenal to address crime and especially the drug trade. Social scientists have recognized for decades that police form suspicion based upon a set of cues that signal danger (Skolnick, 1966), represent typifications of citizens and suspects (Van Maanen, 1978), and that these reflect the prejudices evident in the public at large (Bittner, 1967). Thus, incorporating information about traffic code violations provides a lens to understand how race and other features that contribute to police suspicion may influence traffic stop patterns.

From a conceptual perspective, understanding of observed racial disparities in traffic stops stands to benefit from disaggregating the type of traffic stop in order to isolate the extent to which extralegal characteristics of drivers predict the kinds of police-initiated stops most prone to pretext compared to those stops thought to be less central to the crime control mandate of law enforcement agencies in the United States. Earlier efforts to collect data that provided both race-specific estimates of the driving population as well as illegal speeding behavior (Lamberth, 1997; Lange et al., 2005; Zingraff et al., 2000) reflected the assumption that speeding violations may be used as pretext for conducting traffic stops, which in fact may be motivated

by racialized suspicion of citizens. This is true despite the likelihood that traffic stops for nonspeeding and other nonmoving violations may be the most discretionary of all the types of traffic stops police conduct. Pretextual traffic stops have come to the fore in questions of police suspicion because, like mobile data terminal queries (Meehan & Ponder, 2002), they are expected to be more discretionary in nature—in which the extralegal basis of decision-making may be more pronounced—compared to other traffic stop decisions. Thus far, researchers have held that pretextual stops can be indirectly observed when a stop ends in a warning rather than a ticket (Fagan & Davies, 2001; Gaines, 2006; Miller, 2008; Novak, 2004; Smith & Petrocelli, 2001). Likewise, there is good reason to expect that stops that are triggered by nonmoving traffic violations are more likely to be pretextual in character.

From a sociological perspective, Tomaskovic-Devey, Mason, and Zingraff (2004), building upon employment discrimination and social psychology literature, theorized four different mechanisms that should be expected to manifest in different patterns of racial disparity in stop outcomes. Two of these, officer-level racial prejudice and cognitive schema or stereotyping about race and criminal behavior, focus attention on the decision-making of individual officers and thus may be properly understood as connected to the dynamics that underlie the formation of suspicion in the field. Others (Alpert, MacDonald, & Dunham, 2005; G. Wilson, Dunham, & Alpert, 2004) have examined the influence of racial prejudice in the formation of suspicion by police. Alpert et al. (2005) found that race was an important contributor to police suspicion though it appeared to be more influential in the formation of nonbehavioral or generalized suspicion. In addition, the presence of passengers in vehicles increased generalized suspicion among officers. Generalized suspicion, however, was found not to predict official police action, such as the decision to conduct a traffic stop or question citizens. Such police action was predicted by citizen behavior, in particular the commission of a traffic offense. Alpert et al.'s findings suggest that questions about the influence of citizen extralegal characteristics, such as race, gender, and age, compared to legal factors, such as the behavioral features that may prompt decisions conduct a traffic stop, merit additional inquiry.

Current study

This article seeks to test for observed group status-level differences in the pattern of the types of traffic stops as a strategy for testing for evidence of racial profiling. This approach also flows from assumptions about the motivation of police traffic stops, linking pretext to the reason provided by police for the stop to the driver. This approach assumes that police use certain types of traffic violations more frequently as pretext to initiate a field investigation of drivers, their vehicles, or their passengers. The question becomes what types of traffic violations are officers more likely to employ as a legal pretext to conduct a stop?

Moving violations, and especially speeding, are less prone to the dynamics that contribute to police use of traffic violations as a pretext to stop and question drivers, though that is not to say that moving violations cannot be used as pretext. Rather, moving violations possess certain characteristics that limit the possibility of police bias mechanisms in traffic stop decisions. Much like stops that occur at night (Grogger & Ridgeway, 2006), moving violations, and especially speeding infractions, make the ability to perceive driver race and other status characteristics much more challenging due to the pace of vehicles and the physical distance between police and the target vehicle. Grogger and Ridgeway describe nighttime stops as occurring from behind a veil of darkness. Moving stops, and especially speeding stops, are less likely to be pretextual because drivers are obscured by a somewhat analogous blur of speed and/or movement, which should likewise limit officer perception of driver features, including race. Indeed, Lange et al. (2005) reported that nearly one in three drivers

(32.0 percent) who were *photographed* at high speeds on the New Jersey Turnpike could not be reliably coded for race in their photographic analysis of roadway survey data. While some of the difficulty in coding was an artifact of lighting and camera position on the roadway, the fact that still photographs do not yield consistent identification of driver race suggests that discerning driver race in motion is challenging, prone to error, and that moving stops are therefore more likely to be based upon evidence of a traffic violation and less likely to be pretextual. In addition, the use of radar technology to identify speeding vehicles limits the degree to which officers exercise discretion in speeding stops.

In contrast, nonmoving traffic violations are more prone to the discretionary processes of officer decision-making. Harris' (1997) now classic article makes the compelling argument that the volume of traffic code found in most states is a foundation for using traffic violations as pretext for police investigations when probable cause is otherwise absent. Further, most state traffic codes, including North Carolina's, define moving violations as more serious offenses than nonmoving violations. This suggests that police may be less inclined to initiate stops for nonmoving violations unless they serve another purpose. This leads to the expectation that nonmoving traffic violations, such as vehicle equipment, licensing and registration, and insurance violations are more commonly used as pretext to conduct a traffic stop.

Hypotheses

The rational-choice or legalistic hypothesis suggests that moving and nonmoving stops are explained by driving behaviors that represent moving and nonmoving violations of the traffic code, respectively. Disaggregating traffic stops based upon whether the stop is related to a moving or nonmoving violation provides a more precise way to infer whether or not traffic stops may be pretextual in character. Thus, modeling the extent to which the likelihood of experiencing a nonmoving stop is associated with features of nonmoving traffic violations, such as vehicle condition, as opposed to race and other driver characteristics, provides a way to examine whether such stops represent a kind of profiling that results in more suspicion stops based upon traffic violation pretext.

Aside from disaggregating stop type and driving behavior, the police literature on organizational effects supports the expectation that pretextual stops are more likely among certain kinds of police. This is a reflection of the organizational mission and functional mandate of different types of law enforcement agencies. Crime control has been identified as among the key institutional objectives that legitimates police in society (Crank & Langworthy, 1992; Kelling & Moore, 1988), though it has been argued that the crime control mandate creates impossible expectations for police to meet (Manning, 2003). Organizational insights about police agencies provide reason to expect that police may vary in the extent to which crime control is an orienting feature. For example, state police agencies tend to be dedicated to traffic work and are also more professional and legalistic (Klinger, 2004) compared to local police agencies, which are more focused on crime fighting. Nonmoving stops are expected to be more common among local police agencies than state police, reflecting differences in the organizational focus of law enforcement agencies in terms of the centrality of the crime control mandate for these types of agencies compared to state police.

In contrast to the legalistic hypothesis, the profiling hypothesis suggests that traffic stops are associated with driver characteristics and especially driver minority racial status rather than legal factors. These two hypotheses are not necessarily in opposition. Drawing on both positions, this study employed a set of expectations for racial disparities for disaggregated stops. In particular, moving stops are less prone to pretext for the reasons outlined above (e.g., a blur of speed phenomenon) and thus are less likely to reflect racial disparity once

legal driving factors are accounted for. On the other hand, nonmoving stops, while associated with illegal driving practices that constitute nonmoving traffic violations, are not expected to be fully explained by group differences in these violations. If racial profiling is reflected in a racial disparity in stop likelihood above and beyond the likelihood of being stopped for reasons related to self-reported driving practices, than one should expect that any race patterns in stop likelihood persist once driving practices are controlled for. This is expected for nonmoving stops, but not for moving stops. Further, based upon the organizationally derived expectations discussed above, one should expect racial or other status-related disparity in nonmoving stops for police with a stronger crime control orientation, such as local police, but not in others, such as state police.

These expectations are summarized in the following set of hypotheses:

Hypothesis 1. The legalistic hypothesis states that driving practices are expected to predict stop likelihood. This expectation extends across two primary types of traffic stops, moving violations and nonmoving violations:

- a. The likelihood of a traffic stop for a moving violation increases as driving practices that entail a moving violation, such as speeding, increase.
- b. The likelihood of a traffic stop for a nonmoving violation increases as driving practices that represent a nonmoving traffic violation, such as a seatbelt violation or vehicle age, increase.

Hypothesis 2. The legalistic hypothesis is conditioned upon the organizational foci of the police agency. More specifically, local police are more likely to conduct nonmoving stops. This expectation is based upon assumptions about the degree to which crime control is central to the police type in question.

Hypothesis 3. Race is unrelated to moving stops conducted by police—the blur of speed hypothesis—regardless of police type.

Hypothesis 4. Black respondents are more likely to report being stopped for nonmoving violations, especially by local police.

Data and methodology

These hypotheses were tested using survey self-report data collected by telephone from Black and White adult licensed drivers in North Carolina in 1999 and 2000 who had renewed their license in the prior twelve months. The sample, drawn from North Carolina Division of Motor Vehicles (NCDMV) records, was stratified by race in order to ensure representation of African American drivers in the data and to facilitate racial comparisons.¹ Hispanic and other race drivers were not included in the sample and represented a weakness of the study design. The decision to focus exclusively on White and Black drivers, however, reflected the relatively small population of Hispanic (4.7 percent) and other race residents in the state at the time. Further, it reflected popular expression of the racial profiling phenomenon at the time as “driving while Black.”² The NCDMV records did not contain telephone information about licensed drivers. As a result, the sample underwent a telephone matching process to develop telephone contact data for the sample cases (match rate = 49 percent). Using American Association of Public Opinion Research definitions, the study achieved a response rate of 38.8 percent. Analysis comparing sample demographics to those of the population of North Carolina licensed drivers revealed that the survey sample, while slightly older than the population, generally reflected North Carolina licensed drivers in terms of age by gender characteristics for both Blacks and Whites.³ The final sample included 2,669 respondents, 49 percent of which were Black.

Survey data possess a number of strengths compared to police-generated sources of data for studying police behavior (see Kowalski & Lundman, 2007). Among the strengths of survey designs is the ability to yield generalizable individual-level sample data about the likelihood of a variety of police actions, such as being stopped. They also yield demographic information about citizens involved in police-citizen encounters as well as those who do not experience police stops providing the capability to model factors that are associated with stop likelihood. A novel feature of self-reports is their ability to measure the legal considerations expected to predict a driver's likelihood of experiencing a traffic stop. Following the logic used in the long tradition of self-report studies of delinquency and crime (Thornberry & Krohn, 2000), self-reports represent one way to tap the driving behaviors that increase the risk of police stops. Modeling the legal factors that may predict police action is paramount to determining whether racial or other disparities simply reflect fair and proper police action or suggest racial profiling.

Only one study had explored the structure of self-report validity with regard to self-reports of police stops. Tomaskovic-Devey et al. (2006) found that both Black and White respondents underreported police stops. Specifically, they found that 70.8 percent of licensed Black drivers who had been cited for speeding in the previous six months compared to 76.7 percent of similar White drivers admitted being stopped in a self-report survey. They also found that self-reports of the "legal factors" of driving practices expected to be correlated with stop risk appear to be less prone to race-based desirability effects than self-reported traffic stops. That is, the less stigmatizing prospect of self-reporting speeding behavior, seat-belt usage, and rolling through stop signs (among other driving practices) is uncorrelated with race. Tomaskovic-Devey et al.'s study had two important implications for this and other studies employing self-report data to test for racial disparities in the likelihood of traffic stops. First, response bias related to self-reported driving practices appears minimal, so that race patterns in self-reported driving practices can be interpreted as valid indicators of driving rather than artifacts of reporting errors. Second, studies of police traffic stop practices that make use of self-report data are likely to somewhat underestimate racial disparities in stop likelihood. The implication for the current study was that findings that result from the following analysis might be slightly prone to hypothesis-testing errors. In particular, the race and moving stop hypothesis may be somewhat prone to a Type I error (rejecting a true null) and the race and nonmoving stop hypothesis is prone to a Type II error (accepting a false null). In this case, hypothesis tests that are susceptible to Type II error are less problematic since they will lead to more conservative tests of race differences in stop likelihood.

Measures

Outcome measures

The questionnaire was comprised of a series of questions asking respondents to self-report driving behaviors, traffic stops, and attitudes about police and other public officials. The survey questionnaire asked respondents to report information about the three most recent police stops that had occurred in the twelve months prior to the interview. The validity of self-reports is likely to be greatest for responses provided about the most recent stop due to memory recall. As such, the most recent stop reported by respondents was used for analysis. Two additional questions were asked of respondents who reported a stop that identified the organizational type of police who conducted the stop and the reason provided by the officer to the respondent for making the stop. Respondents were asked whether the police officer making the stop was an officer in a local police department, a county sheriff's department, a special jurisdiction police, a North Carolina State Highway Patrol (NCSHP) officer, or some

other police, but not a NCSHP trooper. Recall of police type did not appear to be a problem for respondents with all but three respondents able to identify the type of police making the stop. Stops were then coded into two broad police types, trooper stops and local police stops (which included any stop by local police, sheriffs, special police, and other police that were not conducted by the NCSHP).

In addition to the type of police, respondents were asked an item about the reason the officer provided for conducting the stop. These covered speeding, a moving violation aside from speeding, DUI, a seat belt violation, registration, license, or insurance problem, stopped at a road block, and other reasons with an open-ended follow-up to record the reason verbatim. For respondents who reported a stop due to other reasons, verbatim responses were coded into the existing stop categories when possible, coded as suspicion stops, or otherwise excluded from the analysis. A few examples of verbatim responses that were coded as moving stops included: "The officer said I was going too slow," "I ran a red light," "He said he saw me swerve so he stopped to check for drinking." Verbatims, such as "tail light out," "tinted windows," and "expired inspection sticker" were typical and recoded as nonmoving violations. From these questions, a set of four dummy variables were constructed, which simultaneously indicate the type of stop and the type of police making the stop: moving stops by local police, moving stops by North Carolina State Highway Patrol, nonmoving stops by local police, and nonmoving stops by the NCSHP.

Models that predict the likelihood of a stop by local police and by the NCSHP separately provide a way to test the hypothesis that organizational factors, and especially the importance of the crime-control mandate to different types of police, influence the pattern of traffic stops. Although a relatively coarse measure of police organization, comparing local police and state police does provide a meaningful distinction between broad police categories. In addition, disaggregating stops by the reason for the stop provides a way to gauge the use of different types of traffic code violations as pretext to conduct stops in pursuing the crime control mandate.

Independent measures

Independent variables gauged a number of situational measures which could be further categorized into extralegal factors associated with citizen characteristics, and legal factors associated with respondent driving practices. Legal factors could be further categorized into "stop-exposure" measures and legal factors expected to be associated with traffic stop likelihood.

Extralegal status factors

Extralegal status characteristics were drawn from self-reports of respondent demographics. The primary focus was, of course, on respondent race. Race was constructed as a dummy variable with White treated as the reference category (0 = White, 1 = Black). In addition, gender (male = 1) and age were used to model extralegal effects on stop likelihood. Like race, gender and age were observable characteristics of drivers and may influence stop decisions. In addition, two control measures contained in the questionnaire, education (ranging from 1 = less than high school to 7 = graduate degree) and home-owner status (1 = owns, 0 = rent) were included in the models. Despite the fact that these characteristics were not clearly observable by police, they were included since they provided some indication of respondent socioeconomic status.

Legal factors

The survey questionnaire measured an array of legal risk factors that were expected to increase the likelihood of experiencing a police traffic stop. These self-report measures of driving behavior allowed one to determine whether racial disparities in traffic stop patterns

reflect race differences in the legal basis for conducting a traffic stop. Driving-related practices were organized into three broad areas of driving practice that may influence the likelihood of a traffic stop, which include (1) exposure to being stopped by police, (2) moving violations of traffic law, and (3) nonmoving violations of traffic law.

A subset of control variables were included to account for driver-level variation in exposure to stops. These measures accounted for differences in the number of people on the road by race, a function of race-specific estimates of driving volume. The most direct stop-exposure measure was a self-report estimate of miles driven in the past year. Due to its skewed distribution, the natural log transformation was used to adjust miles per annum for purposes of analysis. Aside from driving volume, the extent of interstate driving was asked with a seven-item scale ranging from never to daily. It was expected that increased mileage should increase stop likelihood, regardless of other extralegal and legal characteristics. Further, interstate driving might be expected to be positively related to the likelihood of a trooper stop and negatively related to local police stops. For similar reasons, this item might be positively related to moving stops, but unrelated to nonmoving stops. In addition, respondents were asked to characterize the community they lived in as a rural area, town, suburb, or city, which provided an additional aspect of stop exposure by the type of police—those living in rural areas are likely to have greater levels of trooper stop exposure compared to city dwellers.

Speeding is a common driving behavior and is likely to be among the primary reasons for police stops. According to Langan et al. (2001), roughly half of all traffic stops nationally are due to speeding. The survey asked drivers to self-report typical driving speeds in each of three common speed zones, thirty-five, fifty-five, and sixty-five miles per hour, roughly corresponding to local roads, state highway roads, and interstate highways. The speeding measure was the summed difference between the hypothetical speed limit and the typical speed respondents reported driving in each speed zone.

Moving violations may include violations aside from speeding. To measure driver level involvement in other types of moving violations, respondents were asked about a number of risky driving practices that may serve as the basis for a greater likelihood of engaging in violations of the legal code governing moving vehicles. In particular, four items measured unlawful or otherwise risky driving practices. Specifically, respondents were asked whether they typically (1) change lanes to pass on divided two-way highways, 2) pass slower cars, (3) roll through stop signs, and (4) speed up to get through yellow stop lights. Lane changing and passing other drivers do not directly indicate a moving violation, but are nevertheless expected to be associated with an increased likelihood of other driving practices that involve moving violations. In addition, a variable was constructed from responses to a question about accidents occurring in the past twelve months in which a police officer responded to the scene. Finally, in order to account for driving techniques designed to avoid stops, a scale was constructed from four questions that measured the frequency of use of cruise control, radar detectors, CB and other radio devices, and taking cues from traffic flow (especially tractor trailers). In addition, the analysis explored the ability of traffic conviction records to predict self-reported stops (1 = no convictions, 2 = one or two convictions, 3 = three or more convictions). Conviction records were obtained from NCDMV sources, rather than respondent self-reports.

The age of the car was derived from a question about the make and model of the car that the driver was stopped in, and for the car driven most often by those who did not report a police stop. Vehicle age was a proxy measure of the condition the car was in, and may serve as legal fodder for officers to conduct pretextual stops. Older cars should on average be in worse condition than newer automobiles. Police may use violations associated with the poor condition of a vehicle as a reason to make a stop. Two items about typical driving practices, whether respondents (1) wear seatbelts and (2) use turn signals, are also expected to increase the likelihood of a nonmoving traffic stop by police.

Findings

Univariate descriptive statistics and results of zero order bivariate correlation analysis can be found in Table 1. Moving traffic stops conducted by local police were experienced by 8.0 percent of the sample compared to 5.3 percent for similar stops conducted by the NCSHP. Considering the probability of a self-reported nonmoving traffic stop, such stops conducted by local police were reported by 5.5 percent of respondents compared to 2.5 percent of respondents who reported a NCSHP stop of this nature. This pattern was consistent with the expectation that nonmoving stops are more likely among local police, possibly a reflection of the use of traffic code violations as a pretext to pursue investigatory stops at a greater rate than the NCSHP.

Table 2 shows that stops conducted by local police were reported by 13.5 percent ($n=360$) of the sample compared to 7.8 percent ($n=209$) who reported a trooper stop. Further, disaggregating stops by the type of traffic stop shows that moving stops are most commonly reported for both types of police. Local police conducted traffic stops for moving-related reasons in 213 of the 360 total traffic stops reported (59.2 percent) that could be coded by police type and stop reason. Troopers conducted 142 moving-related stops of the 209 total traffic stops (67.9 percent) reported by respondents. Chi-square analysis revealed that police organizational type was related to the general type of stop (moving and nonmoving stops) as well as to the detailed reason for stop measure. Local police conducted a larger proportion of traffic stops for nonmoving-related reasons than troopers. This was a meaningful observation and was consistent with the organizational expectations derived from previous police research. Whether this pattern was explained by one or more legal, extralegal, or a combination of factors was the focus of the remainder of the analysis.

The heart of the analysis consisted of a series of logistic regression models that examined the effects of extralegal and legal factors on stop type likelihood by police organization in a multivariate context. The logic of the analytic strategy was to regress traffic stops on the panel of extralegal variables associated with respondent characteristics, then introduce the panel of stop-exposure measures in the second set of models, and finally introduce the panel of legal driving practices measures. If there is evidence of disparity in the likelihood of traffic stops associated with driver status, and if this disparity is explained by status group differences in exposure or driving practices, then status variables with significant coefficients in the first model should be reduced to nonsignificance in the latter two models for each type of stop tested. Table 3 presents the results of a series of models for moving-related traffic stops by local police and the NCSHP separately. Results of the logistic analysis showed that Black, younger, and better educated drivers were significantly more likely to report a moving violation traffic stop by local police. Introducing the stop-exposure measures, rural residence, annual miles driven, and interstate driving did not alter the pattern of effects as race, age, and education coefficients continued to be significant predictors of moving stop likelihood by local police. The full model, employing the legal measures of driving practices, showed that youth and education, but not racial minority status, increased the log-odds of experiencing such a stop. In addition, the results showed that two measures associated with driving practices, traffic conviction history and typically passing slower cars, increased the likelihood of a local police stop for a moving violation reason. Race differences in the likelihood of a traffic stop were a function of racial variation in self-reported driving practices for moving stops by local police.

Table 3 also presents a set of similar models predicting the log-odds of a moving-related traffic stop conducted by a North Carolina trooper. The first NCSHP model showed that moving stops by troopers were not associated with driver race or gender, but that younger drivers, higher educated drivers, and renters possessed an increase

Table 1
Bivariate correlations and descriptive statistics (N=2,669)*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---------------------|---------|---------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|--------|--------|--------|-----|-----|-----|------|
| 1 Local moving | | | | | | | | | | | | | | | | | | | | | | | |
| 2 NCSPH moving | -.07** | | | | | | | | | | | | | | | | | | | | | | |
| 3 Local nonmove | -.07*** | -.06*** | | | | | | | | | | | | | | | | | | | | | |
| 4 NCSPH nonmove | -.05** | -.04** | -.04** | | | | | | | | | | | | | | | | | | | | |
| 5 Black | .06** | .02 | .07** | .00 | | | | | | | | | | | | | | | | | | | |
| 6 Male | .03 | .00 | .05*** | .05*** | -.01 | | | | | | | | | | | | | | | | | | |
| 7 Age | -.13** | -.09** | -.09** | -.04 | -.11** | -.02 | | | | | | | | | | | | | | | | | |
| 8 Educ. | .05* | .05** | -.02 | -.03 | -.12** | -.05* | -.10** | | | | | | | | | | | | | | | | |
| 9 Owns home | -.04* | -.07** | -.06** | .00 | -.18** | .03 | .25** | .07** | | | | | | | | | | | | | | | |
| 10 Rural | -.04* | -.02 | .01 | .06** | -.20** | .03 | .09** | -.14** | .20 | | | | | | | | | | | | | | |
| 11 Miles/year (log) | .03 | -.10** | .02 | .04* | -.23*** | .27*** | -.09** | .24** | .07** | .07** | | | | | | | | | | | | | |
| 12 Interstate | .06** | .06** | .03 | .03 | -.07** | .13** | -.17** | .19** | .00 | -.11** | .32** | | | | | | | | | | | | |
| 13 Traffic convict. | .10** | .09** | .06** | .04* | .23** | .26** | -.16** | -.03 | -.11** | -.05 | .11** | | | | | | | | | | | | |
| 14 Recent accident | .02 | .02 | .01 | .03 | .04* | .02 | -.12** | -.03 | -.04 | -.04 | .01 | .01 | | | | | | | | | | | |
| 15 Evasion methods | .01 | .07** | -.01 | .05* | -.06** | .17** | -.04 | .00 | .02 | .03 | .17** | .09** | | | | | | | | | | | |
| 16 Speed | .06** | .11** | .03 | .02 | -.11** | .06** | -.36** | .22** | -.08** | -.10** | .26** | .20** | | | | | | | | | | | |
| 17 Changes lanes | .02 | .07** | .02 | .03 | -.01 | .05** | -.24** | .13** | -.06** | -.03 | .12** | .15** | .10** | | | | | | | | | | |
| 18 Passes others | .05** | .04 | .01 | .00 | -.02 | .08** | -.06** | .08** | -.02 | -.05* | .05** | .04 | .05** | | | | | | | | | | |
| 19 Yellow light | -.02 | -.06** | -.05 | .02 | .12** | .03 | .16** | -.12** | .03 | .08** | -.09** | -.09** | | | | | | | | | | | |
| 20 Rolling stops | -.02 | -.04** | -.03 | -.03 | -.10* | -.08** | -.13** | -.09** | .04* | .00 | -.13** | -.09 | -.07 | | | | | | | | | | |
| 21 Turn signal | -.04 | .05* | .01 | -.16** | .08** | -.12** | .11** | .10** | -.03 | .14** | .10** | .02 | .00 | | | | | | | | | | |
| 22 Wears seatbelt | .02 | .03 | .04* | -.05** | .11** | -.09** | -.03 | -.06** | .02 | .09** | .05** | .12** | -.03 | .01 | .14** | .12** | .05* | -.08** | -.10** | | | | |
| 23 Veh. age | .01 | -.03 | .08** | .07** | -.10** | .14** | .05 | -.20** | -.04 | .03 | -.10** | -.10** | -.01 | -.05* | -.13 | -.04 | -.05** | .02 | -.01 | .00 | .01 | | |
| Mean | .080 | .053 | .055 | .025 | .49 | .47 | .43.3 | .3.92 | 1.79 | .2.27 | 8.81 | .4.81 | .65 | .09 | 1.36 | 2.18 | .76 | .44 | .43 | .71 | .22 | .09 | 6.40 |
| S.D. | .27 | .22 | .23 | .16 | .50 | .50 | 15.5 | 1.90 | .41 | 1.30 | 1.50 | 1.80 | .77 | .29 | .40 | 3.40 | .50 | .43 | .50 | .45 | .41 | .29 | 5.10 |

*p≤.05.
** p≤.01.

Table 2
Cross-tabulation and chi-square tests of stop type by police type*

| Stop type | | Police type | | |
|-----------|-------------------------------------|---------------|---------------|---------------|
| General | Detailed | Local police | NCSHP | Total |
| Moving | | 213 (.374) | 142 (.250) | 355 (.624) |
| | Speeding | 151 (.265) | 126 (.221) | 277 (.487) |
| | Other moving violation | 58 (.102) | 13 (.023) | 71 (.125) |
| | DUI | 4 (.007) | 3 (.005) | 7 (.012) |
| Nonmoving | | 147 (.258) | 67 (.118) | 214 (.376) |
| | Seat belt | 15 (.026) | 28 (.049) | 43 (.076) |
| | Equipment | 39 (.069) | 11 (.019) | 50 (.088) |
| | Registration, license, insurance | 63 (.111) | 13 (.023) | 76 (.134) |
| | Road block | 23 (.040) | 13 (.023) | 36 (.063) |
| | Suspicion | 7 (.012) | 2 (.004) | 9 (.016) |
| Total | | 360 (.633) | 209 (.367) | 569 (1.00) |

*Note: Figures reported in parentheses represent the total proportion of stops.

Total percentages may not sum accurately due to rounding errors.

X² for police type by moving/nonmoving stop = 4.34; d.f. = 1; p < .05.

X² for police type by detailed stop = 52.61; d.f. = 7; p < .001.

likelihood of such a stop. The second NCSHP model introduced the stop-exposure measures, and unlike the local police models in which stop exposure was unrelated to stop likelihood, respondents who reported driving more miles per year (logged) possessed an increased likelihood of a moving violation stop by the NCSHP. The final model included the legal factors associated with driving practices expected to increase the likelihood of a traffic stop. As expected, legal variables representing driving practices were associated with stop likelihood. In particular, miles per annum (logged), past traffic convictions, the use of stop evasion methods, and typical driving speed all increased the likelihood of a trooper stop. In the full NCSHP model, age was no longer a significant predictor of a stop, though gender (female) moved from nonsignificance to become a significant predictor of such stops. Further, renter status continued to be associated with a significant increase in stop likelihood. It was no surprise that the use of stop evasion methods and speeding increased the likelihood of a trooper stop for a moving violation, as 88.7 percent (126 of 142) of all NCSHP stops were related to speeding violations. The stop evasion findings suggested that the use of such techniques as radar and cruise control may have been associated with driving practices that were illegal, including speeding, and that these driving practices may have counteracted any protective function thought to be derived from stop evasion methods.

The presentation now turns to the analysis of nonmoving traffic stops for each police type found in Table 4. The first set of models presents the results of a similar set of logistic regression equations predicting the likelihood of a traffic stop for a nonmoving violation by local police. Black, male, and younger drivers possessed an increased likelihood of reporting a nonmoving traffic stop by local police. None of the stop exposure measures introduced in the second local police stop model were significantly related to nonmoving stop likelihood. Entering information about stop-exposure did not alter the pattern of driver status findings in the first local police model. The final local nonmoving stop model introduced the panel of legal measures covering moving and nonmoving driving practices. Only two of these measures, vehicle age and speeding up at yellow lights, were

associated with stop likelihood. As expected, vehicle age was a significant and positive predictor of nonmoving stop likelihood. That is, older vehicles were more likely to be stopped for nonmoving related violations by local police. Older vehicles are likely to possess defects that provide officers with opportunity to conduct traffic stops. In addition, the pattern of extralegal status effects—associated with Black drivers and younger drivers—persisted in the full model. In other words, nonmoving stops by local police were not explained by race differences in stop-exposure, driving, or vehicle condition.⁴

The yellow light finding was less straightforward. On the surface, slowing down at a yellow traffic light to stop at an impending red light would seem to reduce the likelihood of experiencing a police stop. The negative coefficient, however, indicated that not speeding up (or slowing down to stop) at a yellow traffic light increased one's likelihood of a local police stop for a nonmoving reason. It was difficult to interpret this somewhat unexpected finding, though it could be related to the opportunity structure of local police to run license plates. Slowing down to stop at a changing traffic light could increase the likelihood of being stopped by police because vehicles that are stopped at traffic lights could have possessed a higher likelihood of having their license plates subject to electronic search by mobile data terminal (MDT) queries of officers on patrol. This finding could be interpreted to confirm Meehan and Ponder's (2002) research on the use of MDTs to facilitate racial surveillance via traffic enforcement tactics. Further, the basis of stops that result from this tactic would seem to be more likely to be nonmoving in character.

Table 4 also shows the results of the logistic models predicting the likelihood of a nonmoving NCSHP traffic stop. In the first model, male and younger drivers possessed significantly greater odds of experiencing a nonmoving stop by the NCSHP. Two of the stop-exposure measures, rural residence and interstate driving, were associated with the likelihood of a nonmoving NCSHP stop. Rural areas, in large part, describe the majority of miles the NCSHP defines as its geographical domain, which in many instances may be devoid of other local patrol presence. In short, this may represent a deployment effect. This suggests that in more rural areas compared to urbanized and developed jurisdictions, the NCSHP may serve a more traditional, generalized police function, including a greater element of crime control. A similar interpretation may explain the interstate finding. While the NCSHP spends a lot of its attention on the interstate highways of North Carolina, interstate patrol does not facilitate traffic stops based upon nonmoving violations. The speed of traffic on interstates presents a number of practical challenges to police interested in using nonmoving violations as pretext to investigate a driver or vehicle. If the NCSHP functions in a more crime-control capacity in rural areas, this may also influence deployment decisions so that more NCSHP patrol is located on rural routes rather than interstate highways.

Only two of the driving practices, or legal factors, were associated with nonmoving stop risk for the NCSHP. The use of evasion methods increased the likelihood of a nonmoving stop by the NCSHP. In addition, and consistent with the nonmoving stop effects for the local police models, vehicle age was positively associated with stop likelihood. Inspection of the full NCSHP nonmoving model also shows interesting and important noneffects associated with every measure of driver status, including race. Gender and age both dropped from significance once the legal measures of driving practices were modeled. The findings suggested that nonmoving traffic stops by the NCSHP are explained by legal factors, especially stop-exposure—the tendency to live and drive in rural areas and less interstate driving activity—as well as one driving practice, the use of stop evasion methods, and one legal factor related to the vehicle (its age), a proxy for vehicle condition.

Discussion

This study sought to examine extralegal and legal influences on different types of traffic stops by different types of police organizations.

Table 3
Logistic regression models of moving stops (N = 2,669)

| | Local 1 | Local 2 | Local 3 | NCSHP 1 | NCSHP 2 | NCSHP 3 |
|--------------------------|---------------------|---------------------|--------------------|---------------------|---------------------|----------------------|
| Black | .353* (.149) | .357* (.155) | .260 (.163) | .024 (.179) | .197 (.185) | .192 (.197) |
| Male | .236 (.145) | .191 (.151) | .004 (.161) | .021 (.175) | -.251 (.184) | -.454* (.198) |
| Age | -.032*** (.005) | -.031*** (.006) | -.031*** (.006) | -.023*** (.006) | -.021** (.007) | -.010 (.007) |
| Education | .101* (.040) | .081* (.040) | .086* (.043) | .130** (.048) | .083 (.050) | .061 (.051) |
| Owns home | -.052 (.172) | -.032 (.175) | -.001 (.176) | -.500** (.198) | -.538** (.204) | -.496* (.207) |
| Rural | | -.050 (.062) | -.048 (.062) | | .019 (.074) | .044 (.076) |
| Miles per annum (logged) | | .031 (.055) | .021 (.057) | | .353*** (.079) | .267*** (.080) |
| Interstate | | .061 (.044) | .057 (.044) | | .037 (.054) | .010 (.055) |
| Past traffic convictions | | | .338*** (.097) | | | .350** (.119) |
| Recent accident | | | -.038 (.236) | | | .096 (.286) |
| Evasion methods | | | .003 (.180) | | | .488* (.198) |
| Speed | | | .001 (.025) | | | .100** (.035) |
| Changes lanes | | | -.214 (.156) | | | .127 (.192) |
| Passes others | | | .421* (.199) | | | .182 (.237) |
| Yellow light | | | .007 (.158) | | | -.144 (.200) |
| Rolling stops | | | .028 (.164) | | | -.009 (.193) |
| Turn signal | | | .229 (.174) | | | .173 (.206) |
| Wears seatbelt | | | -.026 (.245) | | | .013 (.278) |
| Vehicle age | | | .011 (.015) | | | -.010 (.020) |
| Constant | -1.795*** (.391) | -2.235*** (.603) | -3.16*** (.939) | -1.648*** (.449) | -4.878*** (.840) | -6.108*** (1.191) |
| -2 log likelihood | 1425.58 | 1421.88 | 1400.60 | 1068.88 | 1042.66 | 1007.95 |
| Chi-square | 59.95*** | 63.65*** | 84.93*** | 34.95*** | 61.03*** | 95.74*** |
| D. F. | 5 | 8 | 19 | 5 | 8 | 19 |

* p ≤ .05.

** p ≤ .01.

*** p ≤ .001.

Of particular interest was the role that racial minority status plays in traffic stop patterns by police type. In the social context of the war on drugs and its related legal implications in decisions such as *Whren v. U.S.* (1996), there is sound reason to focus on pretextual traffic stops, though others have recently been reminders that the racial basis of police stops is much older than the war on drugs (Kowalski & Lundman, 2007). One way to examine pretextual stops is by disaggregating traffic stops by the reason for the stop. Nonmoving stops, which tend to be characterized by a higher level of officer discretion compared to moving stops, provide one strategy to test for any racial basis in the pattern of pretextual stops. If race or other extralegal status properties of citizens contribute to the formation of suspicion that is an outgrowth of the crime-control mandate of police agencies in the U.S., then one should see limited or no race and other status effects in moving stops, which are less discretionary in nature and stronger evidence for race effects in nonmoving traffic stops.

The research was also framed by the expectation that police organization is an important consideration in both the mix of traffic stops (moving versus nonmoving) and the role that driver characteristics play in the pattern of traffic stops. This is based upon the assumption that police agencies differ in the extent to which they adopt or are expected to define crime-control as a primary organiza-

tional objective. Police organizations which place a larger emphasis on crime-control were expected to use pretextual traffic stops as a tactic more frequently and thus be more likely to exhibit stop patterns explained in part by extralegal factors, such as race. In general, the study findings provided some measure of support for these expectations.

As expected, driving practices, disaggregated by moving and nonmoving violations, were significant predictors of traffic stop likelihood. In addition, only a small number of status measures were associated with the likelihood of a moving-related police stop. For local police, age was negatively related to the likelihood of a moving stop and education was positively related to moving stop likelihood. For NCSHP, female gender and renter status both increased the likelihood of a moving stop. Importantly, race was not associated with the likelihood of a moving stop for either type of police. This set of findings was consistent with two of the research expectations. First, these findings showed that self-reports of driving practices related to moving violations of traffic code predict moving-related traffic stops. Second, and more importantly for those interested in the role that race plays in police traffic stop decisions, race was not associated with the likelihood of a moving stop, regardless of police organization. This could be interpreted to be consistent with the “blur of speed”

Table 4

Logistic regression models of nonmoving stops (N=2,669)

| | Local 1 | Local 2 | Local 3 | NCSHP 1 | NCSHP 2 | NCSHP 3 |
|--------------------------|---------------------|---------------------|---------------------|---------------------|----------------------|----------------------|
| Black | .525** (.181) | .595** (.188) | .616** (.198) | -.074 (.254) | .099 (.263) | .065 (.282) |
| Male | .465** (.174) | .396* (.181) | .267 (.193) | .661* (.259) | .568* (.272) | .261 (.289) |
| Age | -.025*** (.006) | -.025*** (.006) | -.025*** (.007) | -.018* (.009) | -.020* (.009) | -.015 (.010) |
| Education | -.037 (.047) | -.050 (.049) | -.026 (.051) | -.125 (.068) | -.098 (.072) | -.053 (.075) |
| Owns home | -.248 (.195) | -.282 (.200) | -.264 (.201) | .174 (.318) | .029 (.325) | .062 (.328) |
| Rural | | .045 (.072) | .043 (.073) | | .227* (.103) | .218* (.105) |
| Miles per annum (logged) | | .065 (.040) | .099 (.067) | | .195 (.100) | .192 (.103) |
| Interstate | | .042 (.051) | .049 (.051) | | -.162* (.072) | -.182* (.073) |
| Past traffic convictions | | | .059 (.114) | | | .095 (.169) |
| Recent accident | | | -.028 (.284) | | | .429 (.367) |
| Evasion methods | | | -.168 (.217) | | | .489* (.273) |
| Speed | | | -.013 (.029) | | | .037 (.047) |
| Changes lanes | | | -.105 (.186) | | | .224 (.275) |
| Passes others | | | .011 (.212) | | | -.070 (.308) |
| Yellow light | | | -.403* (.193) | | | .397 (.272) |
| Rolling stops | | | -.088 (.193) | | | -.207 (.277) |
| Turn signal | | | -.008 (.215) | | | .095 (.313) |
| Wears seatbelt | | | .171 (.271) | | | .388 (.364) |
| Vehicle age | | | .058*** (.015) | | | .066*** (.021) |
| Constant | -1.788*** (.455) | -2.596*** (.698) | -2.51*** (1.086) | -3.072*** (.714) | -4.419*** (1.104) | -6.953*** (1.619) |
| -2 log likelihood | 1092.63 | 1089.88 | 1067.99 | 610.99 | 596.95 | 577.25 |
| Chi-square | 45.44*** | 48.19*** | 70.08*** | 15.07** | 29.12*** | 48.81*** |
| D. F. | 5 | 8 | 19 | 5 | 8 | 19 |

* p≤.05.

** p≤.01.

*** p≤.001.

hypothesis. It is worth considering the possibility, however, that race differences in moving stop likelihood do in fact exist, but are washed out by the finding that Black respondents may underreport speeding-related traffic stops at higher levels compared to Whites (Tomaskovic-Devey et al., 2006).

Among the most noteworthy findings was the interaction between situational and organizational influences on self-reported traffic stops. It was apparent that the organizational meaning of a traffic stop is different for local police and the NCSHP, especially when focused on nonmoving traffic stops. It is in the realm of the discretionary stop that police organizational effects appear most relevant. This may reflect the likelihood that the tactical meaning of traffic stops reflects organizational differences in police mission. For highway patrol and other state police, traffic stops seem to be more likely to be motivated by roadway safety and traffic patterns. For example, state police typically make traffic stops of vehicles driving at high speeds. The variety of stops and their proximate causes are relatively narrow. Troopers may not be able to recognize driver race or other characteristics of drivers at high speeds as easily as local police, and thus, legal factors are the best predictors of trooper stops. This interpretation is buffeted by Lange et al.'s (2005) finding that racial disparities in stops by New Jersey State Police reflect the racial composition of the illegal driving

population on certain road segments on the New Jersey Turnpike as well as Grogger and Ridgeway's (2006) study of lighting/time of day effects on the racial patterns of police stops.

For local police, the tactic of conducting a nonmoving traffic stop is perhaps more closely tied to law enforcement as opposed to traffic regulation. Certainly for some self-reported traffic stops conducted by local police, traffic safety is a primary concern. The findings suggest that this is much more common for moving than nonmoving stops. The findings, however, suggest that local police rely upon extralegal factors, including race, more frequently than troopers, for nonmoving stops. In contrast to the NCSHP, local police are saddled with a broad spectrum of frequently competing organizational goals. One interpretation of the nonmoving traffic stop findings is that local police appear to respond to the situational characteristics of citizen and vehicle encounters that may be construed as "danger signifiers" (Skolnick, 1966), as measured by a combination of extralegal driver characteristics. Controlling crime may encourage local police to make decisions based upon weaker evidence of a traffic violation or more discretionary areas in the traffic code—equipment code, registration, or license violations—as well as the appearance of potential for violation of the criminal law, that is, suspicion. The crime control mission and concomitant concerns about factors thought to be

correlated with an increased potential for crime, most notably race, but also gender, age, and the age of the car being driven, are important indicators of local police suspicion of additional (and presumably more severe) wrongdoing. This interpretation is consistent with Gaines' (2006) research, which found that disaggregating stop data by police organizational function revealed organizational effects on police stop patterns within the same agency. In particular, Gaines' study found no racial disparities in the pattern of stops conducted by traffic division officers, yet evidence of minority overrepresentation among patrol and investigation division stops. Based on the findings presented above, one should expect racial disparities in stop patterns to intensify in those police organizations as well as those units within agencies that are especially focused on crime control.

Vehicle age was the only variable that increased the likelihood of nonmoving related traffic stops for both types of police. Vehicle age was assumed to indicate the mechanical or equipment condition of the automobile, which should have provided a legal basis for a stop. An alternative interpretation of vehicle age is that it served to indicate the socioeconomic status of drivers. This could mean that vehicle age served as a cue in the formation of suspicion by police, along with other extralegal characteristics of drivers. This interpretation is supported by the correlational analysis in Table 1, which shows a modest, but statistically significant negative association between education and vehicle age. Vehicle age is a unique indicator and one that should receive further scrutiny in subsequent police traffic stop research because it straddles the boundary between legal and extralegal features of citizens.

Deployment patterns were another dimension of stop exposure that was unaccounted for in this study. Gaines (2006) found a positive association between patrol deployment and calls for service and serious crime at the neighborhood level. It is no secret that police agencies use these indicators to match police resources with community demand. In the context of higher crime communities, conducting more pretextual stops may be something that is expected of police in an effort to address crime and disorder. The question of racial profiling then becomes a question of values in terms of what communities expect and value in police, police services, and their distribution. It may be that members of high crime and high patrol communities seek more aggressive policing. On the other hand, there is also good reason to believe that members of communities do not uniformly see the police as allies in the project of community safety (Sampson & Bartusch, 1998). Nonmoving stops provide an arena of police decision-making with greater relative discretion on the part of patrol officers. In this context, questions of procedural justice (Engel, 2005; Tyler, 1990) may become pivotal. Engel (2005) for example, found that race and nonmoving related stop rationales were associated with perceptions of the stop decision itself as unfair, but not the outcome of the stop. Since nonmoving stops are based upon more subjective criteria on the part of officers, racial minority citizens and citizens in high crime communities may judge the basis of nonmoving stops as illegitimate.

As with any research, it is worthwhile to keep in mind some of the limitations of the current study. Perhaps the most obvious limitation was the use of data generated from self-reports of driving and police contacts. Tomaskovic-Devey et al. (2006) found evidence of race patterns in social desirability effects in reporting police traffic stops in their analysis of very similar data. Their analysis suggested, however, that social desirability effects do not extend to driving practices. The result was that self-reports might underestimate racial disparities in stop likelihood. This means that the results presented here represented a somewhat relaxed test of the no race effects in moving stops hypothesis, but a conservative test of the hypothesis that expected race differences in nonmoving stops. Others have argued that self-reports contribute an important piece in the triangulation of methodological tools brought to bear upon the issue of race and traffic stops (Lundman & Kaufman, 2003; Tomaskovic-Devey et al., 2006). In addition, it would be preferable to have data on driving behavior that

triggered the police stop itself, rather than typical driving behavior. To model data on the driving practices that immediately preceded the stop would provide more precise measures of the basis of moving compared to nonmoving stops and would serve as a better self-report approximation of baseline data, at least for those who report being stopped.

Conclusion

This study sought to examine extralegal, legal, and police organizational factors in developing models of traffic stop likelihood. Since much of the interest in racial profiling research and policy consideration is focused on the use of traffic violations as pretext to conduct field investigations, it should be clear that disaggregating traffic stops by the reason for the stop provides one way to isolate traffic stops that may be more pretextual in character. This was accomplished by modeling moving-related stops and nonmoving related stops separately, with the assumption that nonmoving stops are more discretionary and should be expected to be more prone to extralegal considerations on the part of officers. This expectation was generally supported as African American drivers were more likely to experience a nonmoving stop by local police, but not state police, controlling for a variety of status characteristics, stop-exposure factors, and driving practices. In contrast, evidence of race effects was absent from moving stop models for both local and state police in North Carolina, a reflection of the lower degree of discretion in moving stop decisions and the practical exigencies of moving stops. In sum, subsequent research on police traffic stops should consider both organizational influences on police decisions as well as the utility of disaggregating stops by stop type.

Acknowledgements

I would like to thank Don Tomaskovic-Devey and Matt Zingraff for their assistance in the preparation of this article. In addition, I appreciate the helpful comments of the anonymous reviewers.

Notes

1. NCDMV keeps track of licensed driver characteristics, such as race, which do not show up on the license issued to drivers. In the case of race, drivers are asked to self-report race in the application. This information is voluntary and often left incomplete. In such cases, NCDMV staff persons make a determination of race based upon their own judgment. Despite the fact that NCDMV provided the researchers with race information for each respondent, along with sex and age, the survey asked respondents to self-report race, sex, and age. Discrepancies in race were found, although it was limited to 4.2 percent of the sample ($n=124$). Those who NCDMV classified as Black were 2.4 times more likely than Whites to self-report a race other than that in the NCDMV records. Black respondents, based upon NCDMV records, were also twice as likely to refuse the race question in the telephone interview, although only thirty-one respondents (1.06 percent) refused this item. This suggests a non-trivial error rate in licensed driver race data maintained by NCDMV. One might, however, expect a similar error rate in the judgment of driver race police personnel since presumably all persons are reacting to the same appearance characteristics for any particular driver. Thus, analysis of individual data was based upon NCDMV records.

2. This presents an area for additional research as Hispanics and other racial groups may be prone to stop disparities as well (Aguirre, 2004; Engel & Calnon, 2004a; Lundman & Kaufman, 2003).

3. Results of the sample analysis are available from the author upon request.

4. One of the anonymous reviewers of the article argued that there is good reason to expect to find race by gender interactions. Indeed, several studies had suggested that Black males have been the primary focus of police suspicion and differential treatment (Brunson & Miller, 2006). Models were run to test for interactions between race and gender. Coefficients for the interaction terms were not statistically significant in any of the full models.

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