

Race and Ethnicity Missingness in the Traffic Stop Data Reported by 308 Massachusetts Police Agencies

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Abstract

Data reported by police agencies were at the core of most analyses of Driving While Black in the 1990s and 2000s. There is, however, no previous macro-level research directed exclusively at the accuracy of the Driving While Black traffic stop data reported by police agencies. This article remedies that omission by reaching back across a little more than 10 years to examine data reported by 308 Massachusetts police agencies during April and May of 2001, a time when collection of driver race and ethnicity data was still relatively new. The baseline data show that race and ethnicity missingness is nonrandom on several important dimensions. The article concludes that the Driving While Black data reported by most of the 308 Massachusetts police agencies during April and May of 2001 appear to underestimate the frequency with which police stopped Black and African American drivers for traffic law violations.

Keywords

driving while black, data reported by police agencies, race and ethnicity missingness

Introduction

Most of the many studies directed at Driving While Black in the late 1990s (see, for instance, Harris, 1999) and early 2000s (see, for instance, Bejerano, 2001) used data

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reported by police agencies to attempt to determine whether race affects traffic stops by police (also see Center for Biostatistics, 2003; Cordner, Williams, & Velasco, 2002; Eck, Lui, & Growette Bostaph, 2003; Engel et al., 2005; Institute on Race and Poverty, 2003; Thomas & Hansen, 2004). A central and long-recognized problem with data reported by police agencies, however, is the extent to which agency-reported data accurately represent what they appear to measure (Black, 1970; Boivin & Cordeau, 2011; Gove, Hughes, & Geerken, 1985; Lundman, 2010; Moskos, 2009, p. 53).

In the context of Driving While Black, police agencies have multiple reasons for providing inaccurate and incomplete data. Four are especially important. One is simple indifference. Just as Driving While Black is not important to all people (Kochel, Wilson, & Mastrofski, 2011, p. 474; Weitzer & Tuch, 2005), Driving While Black is not important to all police agencies (McMahon, Garner, Davis, & Kraus, 2002). A second is outright hostility because data collection and reporting seem to assume race-based misconduct by police agencies (see Dedman, 2004; Withrow, 2006, p. 3). A third is argument that racial profiling is good police work and race-based pretextual stops are entirely legal (see Goldberg, 1999; Hall, 1996; Johnson, 2010). A fourth is that data that appear to show disproportionate stops of Black and African American drivers are very easy to misinterpret (Dedman, 2004; Engel, Calnon, & Bernard, 2002; Holbert & Rose, 2004, p. 133).

Despite recognition of the problems posed by data reported by police agencies (Boivin & Cordeau, 2011), there is, as best I can determine, no previous macro-level research directed exclusively at race and ethnicity missingness in the Driving While Black data reported by police agencies. The consequence is that the accuracy of the agency-level data at the core of most analyses of the effects of race on traffic stops by police remains unclear.

The issue is important. Driving While Black data reported by police agencies are routinely used by scholars to assess the impact of race, and other factors, on police traffic stop actions (see, for instance, Moon & Corley, 2007; for a recent analysis of race effects across different types of encounters, see Kochel et al., 2011). Similarly, police agencies and administrators use agency-reported data to assess the extent to which race is among the factors shaping traffic stop decisions (Bejerano, 2001; Thomas & Hansen, 2004). So too with the elected officials who make policy decisions (Koster, 2010; Massachusetts Executive Office of Public Safety, 2001). In addition, Driving While Black has been the focus of lawsuits (Lamberth, 1996), with some of those lawsuits firmly grounded in police-reported data (Tomaskovic-Devey, Mason, & Zingraff, 2004, p. 4; also see Lange, Blackman, & Voas, 2005).

The present research therefore reaches back a little more than 10 years to examine the accuracy of the race and ethnicity data reported by 308 Massachusetts police agencies during April and May of 2001. The goal is to provide baseline data on race and ethnicity missingness at a time when collection of driver race and ethnicity data was still relatively new.

The article begins with a framework that briefly defines Driving While Black, isolates three data sources for its study, explains why Driving While Black data reported by police agencies are the most common, and discusses the problems posed

by Driving While Black data reported by police agencies. Following formal statement of the present research and description of the methods, baseline macro-level multivariate attention is directed at race and ethnicity missingness in traffic stop data reported by 308 Massachusetts police agencies during April and May of 2001. The article concludes that the Driving While Black data reported by most of the police agencies appear to underestimate the frequency with which police stopped Black and African American drivers for traffic law violations.

Framework

Driving While Black

Driving While Black is an accusation that police use race to help determine which drivers to stop for traffic law violations (Corlett, 2011; Goldberg, 1999; Holbert & Rose, 2004; Kowalski & Lundman, 2007; Rice & White, 2010; Withrow, 2006). Ubiquitous traffic law violations (Schafer & Mastrofski, 2005), accordingly, serve as an entirely legal pretext (also see Hall, 1996; Johnson, 2010) for stopping disproportionate numbers of Black and African American drivers.

However, Driving While Black is not just a “volatile” (Engel et al., 2002, p. 253) accusation that race is an engine that helps drive traffic stop decisions by police (for analysis see, for instance, Lange et al., 2005). Driving While Black is also more sweeping accusation that racial profiling by police in the context of traffic stops is simply another manifestation of the racism that has long been at the core of policing in the United States (Anderson, 1999, pp. 320–321; Harris, 2002; Kochel et al., 2011; Meeks, 2000; Roberg, Novak, & Cordner, 2009, pp. 248–249; Stamper, 2005, pp. 91–108; Websdale, 2001).

Scholars document that the earliest police agencies were the Slave Patrols formed by Whites during the 1700s to enforce slave codes (Hadden, 2001; Roussey, 1996). After the Civil War, police agencies were central to the maintenance of Jim Crow racism in both the south (Cobb, 1992) and the north (Loewen, 2005; also see Saporu, Patton, Krivo, & Peterson, 2011), with some police agencies unmistakably complicit in the public torture lynchings of African Americans (Fedo, 2000; Garland, 2005; Jacobs, Carmichael, & Kent, 2005; Tolnay & Beck, 1992). Scholars also call attention to the hostile work environments experienced by Black and African American officers (Alex, 1969; Leinen, 1984; Martin, 1994; Sun & Payne, 2004).

Driving While Black Data Come From Three Sources

Driving While Black data come from three sources. First, data come from surveys where citizens self-report their traffic stop experiences with police (Warren, Tomaskovic-Devey, Smith, Zingraff, & Mason, 2006; Weitzer & Tuch, 2005). Second, data come from specially trained observers who report traffic stops by police (Kowalski & Lundman, 2007; The Alpert Group, 2004). Third, data come from police agencies that report traffic stops by their officers (Bejerano, 2001; Center for

Biostatistics, 2003; Cordner et al., 2002; Eck et al., 2003; Engel et al., 2005; Institute on Race and Poverty, 2003; Thomas & Hansen, 2004).

Data Reported By Police Agencies Are The Most Common

Data reported by police agencies are the most common because, on a case-by-case basis, they are the fastest and least expensive to collect. Unlike data self-reported by citizens that require time-consuming and expensive surveys to collect (see, for instance, Durose, Schmidt, & Langan, 2005; Durose, Langan, & Smith, 2007; Langan, Greenfield, Smith, Durose, & Levin, 2001), cases reported by police agencies are quickly and inexpensively collected by officers using traffic tickets and written warnings (Massachusetts Executive Office of Public Safety, 2001), drop-down computer screens (Center for Biostatistics, 2003), or vehicle stop forms (Thomas & Hansen, 2004). And, unlike observer-reported data that require extensive and expensive training and then extensive and expensive periods in the field to assemble a sufficiently large number of cases to permit meaningful analyses (see, for instance, Black & Reiss, 1970; Engel, Sobol, & Worden, 2000; Klinger, 1994; Mastrofski, Reisig, & McCluskey, 2002; Mastrofski, Snipes, Parks, & Maxwell, 2000; Ostrom, Parks, & Whittaker, 1982; Sykes & Brent, 1983; Sykes & Clark, 1975), police agencies are able to easily and inexpensively collect a large number of cases with very little additional training (Eck et al., 2003; Engel et al., 2005; Farrell & McDevitt, 2006). While there is no mistaking that from the perspective of police agencies, collection and assembly of data take time and cost money (see, for instance, Koster, 2010), there is also no mistaking that agency-reported data are, stop for stop, faster and less expensive than survey-based data (see, for instance, Durose et al., 2007) and observation-based data (see, for instance, The Alpert Group, 2004).

Driving While Black Data Reported By Police Agencies Pose Accuracy Problems

However, Driving While Black data reported by police agencies pose accuracy problems (Black, 1970; Boivin & Cordeau, 2011; Gove et al., 1985; Grogger & Ridgeway, 2006; Lundman, 2010). Driving While Black data reported by police agencies are the result of either legislators mandating that police officers report driver race and ethnicity (see, for instance, Massachusetts Executive Office of Public Safety, 2001) or “management cops” mandating that “street cops” (Reuss-Ianni, 1983) report driver race and ethnicity (see, for instance, Thomas & Hansen, 2004). Irrespective of source, police agencies and their officers are frequently displeased with race and ethnicity reporting for reasons that range from simple indifference to argument that Driving While Black data are very easy to misinterpret (Dedman, 2004, p. B1; Eck et al., 2003, p. 3; Engel et al., 2002; Engel et al., 2005, pp. 8–10; Lundman & Kaufman, 2003; Warren et al., 2006, p. 712).

One way police agencies and officers express their displeasure is race and ethnicity missingness in the traffic stop data they report (see Dedman & Latour, 2003;

Donohue, 2000; Kowalski & Lundman, 2007; Lundman, 2010; Meeks, 2000, pp. 6–7; Verniero & Zoubeck 1999, pp. 31–32). Consider Cordner, Williams, and Velasco's (2002) instructive documentation of missingness in the Driving While Black data reported by San Diego police. In comparing the agency-mandated data reported by San Diego police in 2001 with the agency-mandated data reported in 2000, Cordner et al. (pp. 1–2) report a “substantial decrease” in the number of vehicle stop forms in the second year as compared to the first and observe, “This very substantial decrease raises serious questions about the validity of the vehicle stop data. One question is whether officers always filled out the vehicle stop forms—the answer ... is clearly no ... A crucial ... question is whether officer compliance ... was random or systematically skewed ... non-compliance ... was a bigger problem in more ethnically-diverse ... divisions.”

A specific accuracy question. Is race and ethnicity missingness random or nonrandom? If race and ethnicity data are missing at random and not the significant result of other measures in a data set, then cases with complete information are more likely to be representative of the entire data set, missingness can be cautiously ignored save for power problems, and inferences and conclusions are more likely to be accurate (Little & Rubin, 1987). However, if missingness is nonrandom and the significant result of other measures in a data set such as the percent of Black or African American alone in an agency's jurisdiction (also see Cordner et al., 2002), then missingness cannot be ignored because cases with complete information are less likely to be representative of all of the traffic stops police make and inferences and conclusions are less likely to be accurate (see, for instance, Allison, 2001; Schafer, 1997; also see Downey, Von Hippel, & Broh, 2004).

Previous Research

As best I can determine, there is no previous macro-level research devoted exclusively to race and ethnicity missingness in the Driving While Black traffic stop data reported by police agencies. There is, accordingly, no macro-level multivariate understanding of whether race and ethnicity missingness is random or nonrandom and hence no clear scholarly understanding of the accuracy of the Driving While Black data reported by police agencies.

Formal Statement of the Present Research

The present research remedies that omission by analyzing race and ethnicity missingness in the Driving While Black traffic stop data reported by police agencies. The goal is to provide baseline multivariate data on the accuracy of the Driving While Black data reported by police agencies, with a sustained focus on whether race and ethnicity missingness is random or nonrandom. This issue is addressed using data reported by 308 Massachusetts police agencies during April and May of 2001 and, therefore, at a time when collection of Driving While Black data was still relatively new.

Method

Data Reported By 308 Massachusetts Police Agencies During April and May of 2001

Massachusetts' legislators responded to the journalistic, legal, public, and scholarly attention given *Driving While Black* in the 1990s (see, for instance, Harris, 1999; Lamberth, 1996) by passing a state law mandating that police agencies report data focused on whether traffic stops were grounded in race and ethnicity (Dedman & Latour, 2003; Latour & Dedman, 2003) and, to a far lesser extent, gender (Schweitzer, 2001). Massachusetts state legislators specifically passed Chapter 228 of the Acts of 2000 to "identify and eliminate any instances of unlawful racial and gender profiling by police" (Massachusetts Executive Office of Public Safety, 2001). The Act required that Massachusetts police officers record race, ethnicity, and gender data on the traffic tickets they wrote or, using the same form, the inconsequential written warnings they issued (Schweitzer, 2001). Also recorded was standard additional information found on all tickets and warnings including police agency.

The law mandating data collection became effective April 1, 2001, and data assembly by the Massachusetts Registry of Motor Vehicles was supposed to occur across a full year. However, "lack of funds" (Dedman & LaTour, 2003, p. A1) from the Legislature limited the data to the 166,368 police-reported traffic stops occurring statewide during April and May of 2001. Incomplete data involving tickets but not written warnings across approximately 2 years were eventually assembled (see Farrell, McDevitt, Bailey, Andresen, & Pierce, 2004; Latour, 2002).

Boston Globe journalists Francie Latour and Bill Dedman used Massachusetts' public records law to gain access to the publicly funded and collected data from April and May of 2001. They then used those data as the foundation for a series of very important stories appearing in the *Boston Globe* (see, for instance, Dedman & LaTour, 2003; Latour & Dedman, 2003). When asked, Mr. Dedman provided an electronic copy of the statewide data from April and May of 2001.

308 Massachusetts Police Agencies

A total of 166,368 traffic stop cases were reported during April and May of 2001 by 347 Massachusetts police agencies. Because most of the macro-level explanatory measures are drawn from 2000 census data (please see below), police agencies that do not serve unique and distinct census-reported city or town places, such as the Massachusetts State Police (42,986 total stops), the B&M Railroad Police (31 total stops), and the Massachusetts Environmental Police (159 stops) are excluded. In addition, unique and distinct city and town police agencies with fewer than 20 total stops such as Windsor (one stop) are excluded. Accordingly, the present research is based upon 308 unique and distinct city and town police agencies reporting at least 20 traffic stops. Together, these 308 city and town police agencies reported 122,545 of the 166,368 (73.7%) stops reported by all of the police agencies, with 42,986 of the 43,823 excluded stops (98.1%) reported by the Massachusetts State Police.

Table 1. Count Race and Ethnicity Missing and Dichotomous Race and Ethnicity Missing Dependent Measures, by Number of Agencies and Percent Agencies: 308 Massachusetts Police Agencies During April and May of 2001

Count Race and Ethnicity Missing	Dependent Measures	
	Number of Agencies	Percent Agencies
0.0% (count/base)	87	28.3
0.1% to < 1.0%	89	28.9
1.0–1.99%	55	17.9
2.0–4.99%	54	17.5
≥ 5.0%	23	7.5
Totals	308	100.1
Dichotomous Race and Ethnicity Missing		
1 (≥ 5.00%)	23	7.5
0 (< 4.99%)	285	92.5
Totals	308	100.0

Note: Count race and ethnicity missing is an integer (count) dependent measure in the negative binomial multivariate model in Table 3, with exposure (base) specification. Dichotomous race and ethnicity missing is a two-value dependent measure ($\geq 5.00\%$ missing = 1, $\leq 4.99\%$ missing = 0) in the multivariate logistic model in Table 3.

Dependent Measures

When Massachusetts state legislators mandated that police agencies report the race and ethnicity of drivers they stop, a new Massachusetts Uniform Citation (traffic ticket) was created. As part of that new traffic ticket, a small box labeled “race” was added in the upper right-hand corner. Accompanying information instructed officers to “use their best judgment at the time of the citation” to identify race and ethnicity and cautioned that “one and only one of . . . six codes must be entered and officers shall not enter any other information in this box such as ‘unknown’ nor leave the box empty.” Officers were instructed to use one of the six mutually exclusive race and ethnicity categories—“A” for Asian or Pacific Islander, “B” for Black, “H” for Hispanic, “I” for American Indian or Alaskan Native, “M” for Middle Eastern or East Indian, and “W” for White.

It is important to note that because the race and ethnicity was required to be recorded by checking one of the six boxes on the traffic ticket, a second data collection step was not required which is frequently the case. Unlike drop-down computer screens (Center for Biostatistics, 2003) or vehicle stop forms (Thomas & Hansen, 2004) which both require a second procedure to record race and ethnicity, the boxes for race and ethnicity were on the traffic ticket itself. It therefore cannot be argued that more work, balky computers, or forms that could not be found explain race and ethnicity missingness.

Table 1 provides the frequencies and descriptive statistics for race and ethnicity missingness. The data show considerable variation in compliance with and violation of state law by Massachusetts police agencies. Of the 308 agencies, 87% or 28.3%

fully complied with state law and reported 0 race and ethnicity missingness. Most agencies therefore violated state law and 23% or 7.5% of the 308 police agencies violated state law at rates equal to or greater than 5% of total stops.

To represent the variation in violation of state law, two dependent measures are modeled. The first is count race and ethnicity missing and it is the number of traffic stops in each police agency with missing race and ethnicity information, controlling for the exposure or base number of traffic stops. For instance, the count race and ethnicity missing number is 1,035 (of 19,628 exposure or base number of traffic stops) for the Boston Police Department, the police agency with the largest number of stops.

The second dependent measure is Dichotomous Race and Ethnicity Missing ($\geq 5.00\%$ race and ethnicity missing = 1, $\leq 4.99\%$ race and ethnicity missing = 0). Dichotomous Race and Ethnicity Missing represents and captures the high- and low-end variation across the 308 Massachusetts police agencies in race and ethnicity missingness. For instance, the Acton police agency race and ethnicity missing count was 109 of the 225 exposure or base traffic stops (48.4%), while the Athol police agency race and ethnicity missing rate count was 0 of the 76 exposure or base traffic stops (0.0%).

Analysis. Because 87 of the 308 police agencies reported a zero race and ethnicity missing count (also see Table 1), the first dependent measure, Count Race and Ethnicity Missing, is fitted using negative binomial regression which is specifically intended for analyzing integer outcomes with a large number of zero counts (Berk & MacDonald, 2008; Hoffman, 2003; Long, 1997). To control for the differences in the base number of traffic stops, the exposure (base) option was used. To err on the side of caution, conservative robust standard errors are reported.

The second dependent measure, Dichotomous Race and Ethnicity Missing is categorical. Logistic regression is therefore the proper data analytic choice (Kaufman, 1996). Here too conservative robust standard errors are reported.

Explanatory Measures

Because the present research is the first macro-level analysis of the accuracy of Driving While Black data reported by police agencies, there is no precise model specification guidance, save for Cordner et al.'s (2002) instructive documentation of missingness in San Diego. I therefore use Cordner et al. (2002) to guide model specification, as well as the micro-level police literature on the factors that affect police actions (for summaries see Kochel et al., 2011; Riksheim & Chermak, 1993; Sherman, 1980).

The explanatory measures are presented in the approximate order in which they unfold during a traffic stop, starting with measures representing the city or town place where the traffic stop occurred, continuing with measures representing the police agency making the traffic stop, and ending with measures representing the traffic stop itself (please see Table 2). Finally, the expected direction and strength of the effect of each of the explanatory measures on the dependent measures is specified.

Table 2. Descriptive Statistics for Explanatory Measures: 308 Massachusetts Police Agencies During April and May of 2001

Explanatory Measures	<i>M</i>	<i>SD</i>	Maximum	Minimum
City or Town Place				
Percent female residents	51.36	1.83	58.10	41.20
Median age of residents	38.66	3.55	55.50	21.80
Percent Black or African American alone residents	1.72	2.94	25.30	0.00
Police agency				
Unionized	44.50	49.80	1.00	0.00
Stops per 1,000 residents	22.91	19.28	126.65	1.26
Traffic stop				
Percent may stops	49.22	11.17	87.80	9.35
Percent night stops	20.48	9.79	56.82	0.00
Percent missing driver's zip code	0.48	0.76	5.48	0.00
Percent missing driver's gender	0.46	0.84	8.00	0.00
Percent traffic ticket	49.92	23.54	100.00	4.71

Measures representing city or town place. Four measures represent the city or town place where the traffic stop occurred. Percent Female Residents (all of the city or town measures are from the 2000 census at www.census.gov) is grounded in previous micro-level research showing that the gender affects police actions (see Rubinstein, 1973, p. 265; Sykes & Clark, 1975; Visser, 1983). It is also important to note there is considerable variation across city and town places in Percent Female Residents. The maximum Percent Female Residents is 58.1% in South Hadley (home of Mount Holyoke College and its approximately 2,100 female students) and the minimum is 41.2% in Norfolk (home of the Massachusetts Correctional Institution at Norfolk and its approximately 1,500 male inmates and the mostly male staff responsible for those inmates). If previous micro-level research also applies to macro-level data, then the relationship between Percent Female Residents and the Count Race and Ethnicity Missing and Dichotomous Race and Ethnicity Missing dependent measures should be negative and significant (see Visser, 1983).

The second city or town place measure is Median Age of Residents. Previous micro-level research reports that age affects police actions (Weidner & Terrill, 2005). Median Age of Residents assesses whether the age composition of a city or town serves as a macro-level foundation for race and ethnicity missingness. Here too there is considerable variation, the maximum for Median Age of Residents is 55.5 in Orleans (a retirement and vacation place on Cape Cod) and the minimum is 21.8 in Amherst (a college and university place). Based upon previous micro-level research, the relationship between Median Age of Residents and the Count Race and Ethnicity Missing and Dichotomous Race and Ethnicity Missing dependent measures should be negative and significant.

The third city or town place measure is Percent Black or African American Alone Residents. This measure should be pivotal if Cordner et al.'s (2002) instructive

documentation of missingness in San Diego police-reported data applies to the Massachusetts data. Moreover, there is considerable variation Percent Black or African American Alone among the residents of the 308 city or town police agencies. For instance, of the 921 residents of Goshen in 2000, 0.0% reported they were Black or African American alone. In contrast, of the 589,141 residents of Boston, 25.3% reported they were Black or African American Alone. The relationship between Percent Black or African American Alone and the dependent measures is expected to be strongly positive and significant.

Measures representing the police agency. Two explanatory measures represent the 308 Massachusetts police agencies. Unionized is the first. Unionized police agencies have been among the most vociferous in objecting to mandated collection of race and ethnicity traffic stop data (see, especially, Dedman 2004, p. B1; Engel et al., 2005, p. 50). In addition, unions buffer officers from actions and complaints by legislators, management cops, and residents (Boivin & Cordeau, 2011; Walker & Katz 2011, pp. 106–112). If union words and protection translate into officer member deeds, then Unionized¹ (*unionized* = 1, *else* = 0) ought to have a positive and significant effect on both dependent measures.

The second explanatory measure representing the Massachusetts police agency is stops per 1,000 residents. Previous research indicates that irrespective of proximity to major traffic systems or traffic accident and traffic fatality rates, police agencies vary dramatically in how much they emphasize traffic stops and therefore how many traffic stops their officers make (for the classic statements on these very different agency postures see Gardiner, 1969; Wilson, 1968; for more recent statements and analyses, see Schafer & Mastrofski, 2005; Ward, Nobles, Lanza-Kaduce, Levett, & Tillyer, 2011). That clearly is the case among the Massachusetts police agencies. The Egremont police agency, for instance, reported 169 stops and the 2000 Egremont resident population was 1,345, yielding 125.7 stops per 1,000 residents ($(169/1,345) \times 1,000$), the highest among the 308 police agencies. In clear contrast, the Gloucester police agency reported 38 stops and the 2,000 Gloucester resident population was 30,273, yielding 1.26 stops per 1,000 residents ($(38/30,273) \times 1,000$), the lowest among the 308 police agencies.

Previous research suggests that the volume of traffic stops by police agencies should be linked to both dependent measures. Police agencies that emphasize traffic stops insure compliance with agency traffic stop expectations by paying careful attention to the traffic tickets and warnings their officers write (Gardiner, 1969; Lundman, 1979; Schafer & Mastrofski, 2005; Ward et al., 2011; Wilson, 1968), possibly including whether all fields on those tickets and warnings are complete. In contrast, police agencies that do not emphasize traffic stops pay less attention to the traffic tickets and warnings their officers write and, perhaps, less attention to whether all fields are complete. Stops Per 1,000 Residents represents this possible linkage. I expect that Stops Per 1,000 Residents will have a negative and significant effect on both dependent measures.

Measures representing the traffic stop. Five measures represent the traffic stop. The first, Percent May Stops, is grounded in Cordner et al.'s (2002) report that compliance by San Diego police officers was lower during the second year of reporting than the first. Although the time period is far shorter, Percent May Stops (stops in May/total stops) explores whether compliance with Massachusetts state law was lower during the second month of reporting, as compared to the first. Overall, the maximum value for Percent May Stops is 87.8% in the Leverett police agency (41 total stops) and the minimum value is 9.4% in the Foxborough police agency (139 total stops). Percent May Stops ought to have a positive and significant effect on Count Race and Ethnicity Missing and Dichotomous Race and Ethnicity Missing.

Percent Night Stops is the second traffic stop measure. Percent Night Stops is also the first of several measures directed at determining whether race and ethnicity missingness is entirely innocent, the result of simple sloppiness, or perhaps intentional violation of state law.

Percent Night Stops probes an entirely innocent possibility. Race and ethnicity identification is far more difficult during night stops (Center for Biostatistics, 2003, p. 1; Durose, Schmidt, & Langan, 2005, p. 7; Engel et al., 2005, p. xiv; Greenwald, 2001, p. 39; Grogger & Ridgeway, 2006; The Alpert Group, 2004, p. 23; Thomas & Hansen, 2004, p. 16). Although police officers routinely "light up" the interior of vehicles stopped at night by turning on the police car's bright lights and shining the spotlight/spotlights at the stopped vehicle's sideview or rearview mirror/mirrors, it is also the case that the lighting, when coupled with the "takedown" lights on the light bar, remains uneven and blinds not just the driver, which is the purpose, but, to a somewhat lesser extent, the officer. Moreover, once an officer has a driver's license and returns to the police vehicle to more fully "run" the driver and vehicle and make their traffic ticket decision (see Schafer & Mastrofski, 2005), the uneven lighting inside the police vehicle, even when coupled with the very infrequent use of a flashlight to more carefully examine the license, makes clear race and ethnic identification using both the license and the computer screen photograph difficult.

It thus is possible that race and ethnicity missingness is entirely innocent and traceable to higher rates of nights stops by some police agencies.² Here too there is considerable variation, with the Lee (56 stops), Leverett (41 stops), and Monterey (45 stops) police agencies reporting no night stops and the Edgartown (44 stops) police agency reporting the highest percentage of night stops at 56.8%. Percent Night Stops represents and explores the possible effects of night stops on race and ethnicity missingness. Because race and ethnicity identification is more difficult at night, Percent Night Stops should have a positive and significant effect on both dependent measures, if missing race and ethnicity is entirely innocent.

Percent Missing Driver's Zip Code (zip code appearing on each ticket or written warning missing) is the third traffic stop-based explanatory measure and the second to represent and explore alternative explanations of race and ethnicity missingness. There are multiple fields on all traffic tickets or written warnings including the new Uniform Traffic Citation (Massachusetts Executive Office Public Safety, 2001), not just the mandated race and ethnicity (the dependent measures) and the mandated

gender (please see immediately below). It therefore is possible that race and ethnicity missingness is the result of simple sloppiness across multiple fields. These multiple citation fields include (number missing of the 122,545 stops by the 308 agencies in parentheses) the offense that gave rise to the stop (zero missing), the state that issued the plate on the stopped vehicle (zero missing), the date of the stop (zero missing), the day of the week of the stop (zero missing), the time of the stop (zero missing), whether the driver's license was commercial (zero missing), the driver's age (23 missing), and the zip code appearing on each driver's license (741 missing). Because the number of cases with missing zip code is relatively large, Percent Missing Driver's Zip Code is used to explore a simple sloppiness explanation of race and ethnicity missingness. If simple sloppiness is indeed an explanation, then the multivariate data should show the greater the Percent Missing Driver's Zip Code, then the significantly greater the race and ethnicity missingness.

Percent Missing Driver's Gender (632 missing of the 122,545 stops by the 308 police agencies) also focuses on the alternative explanations of the dependent measures. Although the Massachusetts law was primarily directed at race and ethnicity (Schweitzer, 2001), it also mandated gender reporting (Massachusetts Executive Office of Public Safety, 2001). If, therefore, race and ethnicity missingness is less the innocent result of simple sloppiness and closer to intentional violation of state law, then the multivariate data should show greater the Percent Missing Driver's Gender, the greater the Count Race and Ethnicity Missing and the greater the Dichotomous Race and Ethnicity Missing.

Percent Traffic Ticket is the last of the explanatory measures. It too probes the entirely innocent, simple sloppiness, or intentional violation explanations of missingness. When a police officer decides to write a traffic ticket instead of a warning (see, for instance, Texas Department of Public Safety, 2004), the decision to write a ticket ups the odds of the driver appearing in traffic court to appeal because a ticket is frequently expensive and consequential (Farrell & McDevitt, 2006, p. 54; Ward et al., 2011). Going to court therefore opens all aspects of the stop including the ticket to scrutiny (see Schafer & Mastrofski, 2005). Simple sloppiness should logically be lower when a traffic stop ends in a traffic ticket. Percent Traffic Ticket is, accordingly, expected to be negatively and significantly associated with Count Race and Ethnicity Missing and Dichotomous Race and Ethnicity Missing.

Results

Most of the parameter estimates for the explanatory measures on the Count Race and Ethnicity Missing and Dichotomous Race and Ethnicity Missing dependent measures are insignificant and random. Other of the parameter estimates are significant and nonrandom and, with one exception, consistent across both dependent measures (see Table 3). Presentation of the results begins with the insignificant and random parameter estimates. Attention is then directed to the significant and nonrandom parameter estimates.

Table 3. Negative Binomial Regression of Explanatory Measures on Count Race and Ethnicity Missing (with Robust Standard Errors) and Logistic Regression of Explanatory Measures on Dichotomous Race and Ethnicity Missing (with Robust Standard Errors): 308 Massachusetts Police Agencies During April and May of 2001

Explanatory Measures	Count Race and Ethnicity Missing <i>b</i> (SE) Model 1	Dichotomous Race and Ethnicity Missing <i>b</i> (SE) Model 2
City or town place		
Percent female residents	.041 (.038)	.147 (.110)
Median age of residents	-.011 (.026)	.020 (.073)
Percent Black or AfricanAmerican alone residents	.034* (.017)	.098* (.057)
Police agency		
Unionized	-.007 (.158)	-.012 (.494)
Stops per 1,000 residents	-.010*** (.004)	-.047** (.019)
Traffic stop		
Percent may stops	.014 (.008)	-.002 (.025)
Percent night stops	-.002 (.009)	-.002 (.021)
Percent missing driver's zip code	.192* (.096)	.247 (.310)
Percent missing driver's gender	.600*** (.104)	.659* (.198)
Traffic stop		
Percent traffic ticket	.000 (.003)	.001 (.012)
Constant	-6.832 (2.379)	-10.713 (7.043)
Overdispersion parameter	.706*** (.128)	
Log-pseudolikelihood	-671.513	-69.440
Chi square (for fitted model vs. model of no effects)	77.06***	28.98**
<i>Df</i>	10	10
Pseudo <i>R</i> ²		.151

Note: ****p* < .001. ***p* < .01. **p* < .05 (one-tailed).

The Insignificant and Random Parameter Estimates

Because previous micro-level research has shown that gender (Visser, 1983) and age (Sykes & Clark, 1975) sometimes affect police actions, it was expected that macro-level gender and age effects would be visible in the Massachusetts data from April and May of 2001. They are not. Percent Female Residents and Median Age of Residents are both unrelated to the dependent measures in Table 3.

It was also expected that because police unions have voiced strong objection to mandated collection of race and ethnicity data (see, especially, Dedman, 2004, p. B1), agencies with police unions would have higher rates of race and ethnicity missingness. They do not. Unionized is unrelated to Count Race and Ethnicity Missing and Dichotomous Race and Ethnicity Missing.

Cordner et al. (2002) reported that San Diego race and ethnicity missingness was higher during the second year of mandated reporting than the first. Although the time

period is far shorter, it was expected that would be the case in Massachusetts as well. Percent May Stops, however, is unrelated to Count Race and Ethnicity Missing and Dichotomous Race and Ethnicity Missing.

It was also expected that police agencies with higher rates of night stops would report higher rates of Race and Ethnicity Missing because it is far harder to discern race and ethnicity at night (see, for instance, Grogger & Ridgeway, 2006). At least in the present research, that logic is incorrect. Percent Night Stops is unrelated to race and ethnicity missingness in both of the models in Table 3.

The final insignificant parameter estimates provide an especially important answer to questions about race and ethnicity missingness. In particular, if simple sloppiness explains Race and Ethnicity Missing, then Percent Traffic Ticket should be negatively and significantly related to the dependent measures. It is not.

The Significant and Nonrandom Parameter Estimates

There are three consistently significant and therefore nonrandom parameter estimates. There is also fourth significant effect that applies only to the Count Race and Ethnicity Missing dependent measure. All are important.

In both Models 1 and 2 in Table 3, Stops Per 1,000 Residents is negatively and significantly associated with the dependent measures. This comports with the expectation that police agencies that emphasize traffic stops do so by monitoring the traffic stops of their officers (Gardiner, 1969; Lundman, 1979; Schafer & Mastroski, 2005; Ward et al., 2011; Wilson, 1968), including, in the present research, the completeness of the tickets and warnings their officers write.

The significant and positive Percent Black or African American Alone Residents parameter estimate follows directly from Cordner et al. (2002, pp. 1–2). Their research and the present research combine to indicate that agencies are more likely to have higher rates of missing race and ethnicity when they have larger numbers of People of Color in their police care.

The final consistently significant parameter estimate, Percent Gender Missing, is positively associated with missing race and ethnicity data. This suggests that volition was at work when it came time for police officers in 308 Massachusetts police agencies during April and May of 2001 to decide which traffic ticket fields to complete and which ones to leave blank.

There is also one parameter estimate that is both nonrandom and random. Percent Missing Driver's Zip Code is positive and significant, and therefore nonrandom, when the dependent measure is Count Race and Ethnicity Missing. This suggests that when understanding of race and ethnicity missingness is directed at and captures both low-end and high-end violation of state law, simple sloppiness is a reasonable explanation. However, when the dependent measure is Dichotomous Race and Ethnicity Missing and thus directed primarily at understanding high-end missingness, simple sloppiness is a less viable explanation, making intentional violation a more viable explanation.

Summary and Discussion

Summary

Based upon data from 308 Massachusetts police agencies during April and May of 2001, race and ethnicity missingness is consistently nonrandom in three important ways. First, race and ethnicity missingness is significantly less likely in police agencies that emphasize traffic stops. Second, race and ethnicity missingness is significantly more likely in agencies with higher proportions of Black or African American alone residents. Third, missing race and ethnicity data is significantly more likely when gender is also missing.

Discussion

Entirely innocent, simple sloppiness, or intentional violation? The significant parameter estimate effects do not appear to be entirely innocent and they do not appear to be the result of simple sloppiness. Other measures seem to rule out these explanations. For instance, if race and ethnicity missingness is entirely innocent, then police agencies with higher proportions of night stops should also have higher counts of race and ethnicity missingness. They do not.

Instead, the significant effects appear to be intentional violation of Massachusetts state law mandating the reporting of race and ethnicity. The effects also appear to have a notable and important organizational component (see, for instance, Coleman, 1990). To understand that organizational component and to more fully understand the macro-level race results, it is useful to more clearly establish what affects traffic stop rates across police agencies.

Traffic stop rates across police agencies. Drivers in all places routinely and regularly violate traffic laws (Gardiner, 1969; Lamberth, 1996; Lange et al., 2005; Lundman, 1979; Schafer & Mastroski, 2005; Wilson, 1968). Indeed, to have spent time in the company of a street cop is to have spent time observing an endless stream of traffic law violations materialize in direct view of the officer. The question, never, is whether frontline police officers can find traffic law violators. They always can and it's always very easy.

The pivotal question is whether a police agency emphasizes traffic stops. Schafer and Mastroski (2005, p. 226) explain, "The pressure to generate traffic 'stats' varies from department to department ... Some departments stress the importance of issuing traffic citations ... Others emphasize a high volume of traffic stops to control such offenses, while placing little pressure on officers to use formal disposition mechanisms. Still other departments take no clear stand on the degree to which traffic enforcement of any kind is desired."

Stop rates therefore are never a reflection of how people in places drive, whether an agency's jurisdiction includes major traffic systems, or whether traffic accident and traffic fatality rates have recently spiked or drawn complaint (Gardiner, 1969). Instead, stop rates are the result of how much attention an agency gives to working traffic (Ward et al., 2011).

What the Massachusetts data show is that in police agencies where traffic stops are common, race and ethnicity missingness is significantly less common. That is because agency administrators pay attention to not just the number stops officers make but also to the completeness of the tickets and warnings officers bring in off the street for their review and approval (Gardiner, 1969; Lamberth, 1996; Lange et al., 2005; Lundman, 1979; Schafer & Mastrofski, 2005; Ward et al., 2011; Wilson, 1968).

The lesson. However, the lesson is not that police agencies need to emphasize traffic stops to reduce race and ethnicity missingness. Emphasizing traffic stops is a choice and it is not necessarily the right choice. Because traffic law violations are everywhere always easy for police officers to find, the frequency of traffic stops is never an indicator of the quality of policing an agency provides the people in their care (Muir, 1977). All police agencies are equally capable of large numbers of traffic stops and traffic tickets if that is what an agency tells its officers to do with some of their time (Gardiner, 1969; Ward et al., 2011; Wilson, 1968).

Accordingly, the relationship between the frequency of traffic stops and missing race and ethnicity data is a reflection of how closely police agencies monitor the actions of their officers. Police agencies that emphasize traffic stops and therefore keep close track of what their officers are doing with at least some of their time significantly increase compliance with state law mandating reporting of driver race and ethnicity. Police agencies that do not emphasize traffic stops and do not keep close track of what their officers are doing with at least some of their time, and, instead, leave such things up to their front-line officers, leave compliance with state law up to their officers as well. The result is not just fewer traffic stops but also significantly higher rates of violation of state law.

It is important to note that this argument applies not just to police agencies required by state law to report race and ethnicity (Massachusetts Executive Office of Public Safety, 2001) but also to police agencies where race and ethnicity reporting is mandated by local elected officials or top management cops (Bejerano, 2001; Thomas & Hansen, 2004). Here too, the issue is monitoring. Otherwise San Diego police officers could not have gotten away with reporting fewer traffic stops than traffic tickets (Cordner et al., 2002).

The accuracy of driving while black data. The results raise questions about the accuracy of the Driving While Black data reported by police agencies. The present research supports two answers.

First, Driving While Black data are significantly more likely to be accurate in agencies wherein officers make large numbers of traffic stops relative to population size. When an agency emphasizes traffic stops (Gardiner, 1969; Ward et al., 2011), an agency administrator somewhere is awake at the paper switch and paying attention to whether the paper is complete and tells not just a story about what officers are doing with some of their time, but also, as the present research indicates, the race and ethnicity of the drivers they stop.

Second, the Massachusetts data from April and May of 2001 teach that Driving While Black data reported by agencies with large percentages of Black and African American alone residents appear significantly less likely to be accurate. These are places where accurate reporting is pivotally important. They also apparently are places where police agencies believe they can get away with violating state law (also see Cordner et al., 2002), agencies worried about how complete data might be interpreted (Dedman, 2004, p. B1; Engel et al., 2005, pp. 8–10; Lundman & Kaufman, 2003; Warren et al., 2006, p. 712), or both (Eck et al., 2003, p. 3; Engel et al., 2002).

Two ways of probing and increasing agency-reported data. There are, however, two ways of probing the accuracy of the Driving While Black data reported by police agencies, and, perhaps, increasing the accuracy of those data as well. The first is dispatch audio tapes. Although there is variation by area of country and agency, most police officers radio to tell dispatch they have a “TV” (traffic violator) and report the “L” (location) of their traffic stop (also see Schafer & Mastrofski, 2005, p. 226). This “airing” of a traffic stop is an important part of what police officers mean when they tell each other “be safe” because it alerts police colleagues of the traffic stop. The result is that other officers “swing by” to make sure the officer is and remains safe. Comparing recorded dispatch audio tapes with police reports of traffic stops is a first way of further assessing and perhaps increasing the accuracy of the Driving While Black data reported by police agencies.

A second is the log many front-line police officers keep. Although here too there is variation by area and agency, the log is central to the “police numbers game” (Skolnick & Fyfe, 1993, pp. 125–128) in many police agencies and used by front-line police officers and then agency administrators to document “activity” (Rubinstein, 1973, pp. 44–54). Comparing an officer’s log with an officer’s reports of traffic stops is a second way of further assessing the accuracy of the Driving While Black data reported by police agencies, and perhaps increasing accuracy as well.

Finding ways to increase accuracy should be unnecessary. It needs to be clearly said and clearly understood that while recourse to dispatch audio tapes and officer logs are two ways of better understanding and perhaps increasing the accuracy of the Driving While Black data reported by police agencies, finding ways to increase accuracy should be unnecessary. Police agencies are commonweal (public serving) organizations (Blau & Scott, 1962, pp. 54–57) centrally and unmistakably in the business of enforcing the law (Bittner, 1970). When viewed in these ways, it seems unconscionable when police agencies ignore their commonweal and law enforcement obligations by violating state law (also see Seron, Pereira, & Kovath, 2006).

A game without immediate end. It also needs to be clearly said and understood that this is a game without immediate end. If legislators, management cops, and researchers turn to dispatch audio tapes, then at least some police officers will forget to tell dispatch about some of their traffic stops, even when doing so undermines their safety and the safety of their colleagues (FBI, 2010; Schafer & Mastrofski, 2005,

p. 226). If legislators, management cops, and researchers turn to officer logs, then at least some police officers will forget to log all of the traffic stops they make, even though doing so is central to the “police numbers game” (Skolnick and Fyfe 1993, pp. 125–128) and creating the appearance of “activity” (Rubinstein 1973, pp. 44–54). If other options fail or threaten to fail because most have been eliminated or severely constrained, then police officers can “get the white count up” by making some Black and Other Drivers of Color they stop white (also see Institute on Race and Poverty, 2003, p. 31). Last, the present research reached back across slightly more than 10 years to advance baseline understanding of missing race and ethnicity data in the Driving While Black data reported by police agencies. Police agencies therefore can be confident that by the time researchers examine their data collection and reporting deeds, nobody really cares, save for a few harmless academics.

Conclusion

The Driving While Black data reported by most of the 308 Massachusetts police agencies during April and May of 2001 appear to underestimate the frequency with which Black and African American drivers were stopped for traffic law violations.

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Notes

1. Unionized police agencies were identified in two ways. First, agencies were identified as unionized if the agency appeared in the list at www.masscop.org which lists American Federation of Labor and Congress of Industrial Organizations (AFL-CIO) represented police agencies in Massachusetts. Second, LexisNexis Academic was searched using “police union” and *Boston Globe* between January 1, 1998 and December 31, 2001. Each resulting article was read and if it indicated that a police agency was represented by a union, the agency was identified as unionized. This measure is imperfect because the AFL-CIO affiliation is as of December, 2007 while the *Boston Globe* does not present stories on all unionized police agencies. At the same time, however, it is likely that both techniques yielded agencies with strong police unions.
2. Isolation of night stops began with the officers’ reports of the hour of the stop and whether it was ante meridiem or post meridiem. Because officers did not report the minute in an hour when a stop started (e.g., a stop reported at 4:00 a.m. could have started at 4:01 a.m. or 4:59 a.m.), it was assumed that all stops on the cusp of daylight were day stops. With that assumption in place, civil twilight (the times immediately after sunset and immediately before sunrise when objects can be clearly distinguished) data for April and May of 2001 in

Massachusetts were used to establish when it was dark statewide in Massachusetts based on www.sunrisesunset.com. For instance, between April 5 and April 12, 2001, the night statewide start and end times were 8:00 p.m. and 4:00 a.m.

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Bio

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