Article

The Eyes of Law Enforcement in the New Panopticon:

Police-Community Racial Asymmetry and the Use of Surveillance Technology

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Abstract

This study examines the relationship between police-community racial asymmetry and the use of surveillance technology by local law enforcement. The data come from a nationally representative survey of law enforcement agencies, with supplementary information provided by the Law Enforcement Management and Administrative Statistics Survey, the Census, and the Uniform Crime Reports. Results indicate that police departments that underrepresent African Americans in the community are more likely to use or plan to implement surveillance technology, controlling for a range of agency-and contextual-level factors. One potential explanation for these findings is that surveillance technology operates as a form of social control that is differentially applied to racial minorities to manage what is perceived to be a greater proclivity toward criminal behavior. The implications of these findings are discussed.

Introduction

In the late 18th century, utilitarianism philosopher Jeremy Bentham imagined the panopticon prison design, a circular inspection house containing a central observation tower with full view of prisoners' cells populating the prison's outer wall. Unable to view the inspectors themselves, prisoners had to assume that they were being watched at all times. Eventually, Bentham envisioned that this external control would convert to internal control whereby prisoners would self-police their own behavior to conform to socially desirable expectations and to avoid punishment (Foucault 1977; 1978). Put succinctly by Foucault, "inmates should be caught up in a power situation of which they are themselves the bearers" (1977: 201).

A panopticon was never built during Bentham's lifetime. However, scholars have argued that his vision lives on in the modern age through various forms of surveillance technology (Davis 1990; Koskela 2003; Marx 1988; McMullan 2015; Staples 1997). Specifically, the core function of surveillance technology is compatible with the concept of "central inspection," or the notion that citizens' behaviors can be better

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controlled when they are surveilled from a central location (see Davis 1990; Fyfe and Bannister 1996; Norris 2003; Reeve 1998; Simon 2005). Likewise, akin to the inspection tower, surveillance technology can be understood as a physical embodiment of citizen distrust and a mechanism of social control by which that distrust is mollified.

In the present study, we explore key factors that may influence the use of surveillance technology among law enforcement agencies (LEAs) in the United States. We focus our attention on one previously unexplored factor, police-community racial asymmetry (also known as “representative policing,” see Barrick, Hickman, and Strom 2014; Walker and Katz 2002), that may give rise to citizen distrust and corresponding perceptions that the public needs to be surveilled. We hypothesize that police departments that underrepresent racial minorities in their community will be more likely to adopt or plan to implement technology that is designed for public surveillance, such that certain “problem” or “high risk” segments of the population can be better monitored.

Theoretical Framework and Literature Review

Our theoretical argument is inspired by research on “knowledge-based” trust, which describes trust as a key societal resource that encourages cooperation between individuals and reduces the need to monitor the behaviors of others (Blau 1964; Coleman 1988; Macauley 1963; Powell 1990; Zucker 1986; see Williams 2001 for a review). Trust is predicated on individuals’ beliefs or expectations that others will act in ways that are beneficial, not harmful, and in accordance with their own goals, values, and belief systems (Gambetta 1998). Critically, trusting relationships are likely to emerge between individuals who share similar traits and experiences and, therefore, perceive one another to be trustworthy (Dasgupta 1988; Hardin 2003; Uslaner 2002; Yamagishi and Yamagishi 1994). Individuals who share specific traits, such as race or ethnicity, may internalize a sense of belongingness to an “in-group” through which trust and cooperation are easily fostered.

Conversely, feelings of shared identity with members of the in-group can also promote feelings of distrust, suspicion, and even hostility towards those in the “out-group,” as well as beliefs that members of the out-group are untrustworthy and therefore need to be monitored (Bobo 1988; Brewer 1981; Brewer and Brown 1998; Cox 1993; Donellon 1996; Dovidio and Gaertner 1999; Fox 1974; Gaertner et al. 1996; Kanter 1977; Kelly and Kelly 1991; Kramer 1994; Kramer and Messick 1998; Olsen 1972; Shingles 1981; Sitkin and Stickel 1996). Likewise, the out-group may be perceived as a real or symbolic threat to the in-group’s core goals or values (Fiske and Ruscher 1993; Tjosvold 1988). Whereas repeated interactions over time can help to build trust, sentiments of untrustworthiness can demotivate individuals from interacting with members of the out-group and further jeopardize the development of trusting and cooperative relationships (Lewicki and Bunker 1996). In turn, a lack of regular and positive interaction can lead those in the in-group to rely on inaccurate or unfair stereotypes to process, categorize, and understand the “other” (Bobo 1988; Norris 2003). Relying on negative stereotypes can increase the extent to which the out-group is viewed as a threat to the goals and values of the in-group; consequently, some degree of surveillance of the out-group may be perceived as compulsory.

Building from these insights, we argue that police-community racial asymmetry may increase the likelihood that police departments use surveillance technology to monitor what they perceive as “problem” minority segments of the community. It is logical to expect that law enforcement personnel develop a sense of in-group belongingness simply by working together in the same department, interacting regularly, and seeking to achieve the same goals. For instance, police officers may feel bonded to one another and develop in-group sentiments because their job functions simultaneously require each of them to preserve and promote public safety (see Woody 2005). However, these bonds can be bolstered when officers share characteristics across additional domains, such as race and ethnicity (Harr and Morash 1999). In these circumstances, their sense of belongingness and perceptions of trustworthiness for one

another are enhanced because they share similar sociodemographic backgrounds, perceive that they have had similar experiences, and therefore believe that their peers will behave in ways that are consistent with the goals and values of the group.

In scenarios in which a police department employs primarily or exclusively White officers in a community that indwells a sizeable proportion of racial minorities, officers may implicitly or explicitly deem racial minorities as members of an out-group that present some amount of risk to core goals and values (see Skolnick and Fyfe 1993 for an example). Consistent with the trust literature, White departments may rely on racial stereotypes to assess the amount of risk or threat minorities pose to public safety. Although not limited to the views of the police, numerous studies have indicated that US citizens perceive African Americans to engage in more criminal behavior than other racial groups (e.g., Barlow 1998; Drummond 1990; Hawkins 1995; Kennedy 1997; Mauer 1999; Russell 2002), and they are more likely than other groups to be described as violent or as criminals (Chiricos, Welch, and Gertz 2004; Hurwitz and Peffley 1997; Sigelman and Tuch 1996; Sniderman and Piazza 1993; Welch 2007). Whereas employing many officers of color could increase their positive exposure to members of other racial groups and thus interrupt or deter the use of negative racial stereotypes, primarily White departments may become dependent on such stereotypes as a lens for viewing minorities in the community.

At the same time, departments that do not employ many officers of color may lack the insight needed to interact positively, form meaningful connections, and develop trusting relationships with minorities in their community (Skolnick and Fyfe 1993). In turn, minorities who feel unrepresented by their local police department could internalize a sense of disconnect from the police or come to believe that the department is not working on behalf of the minority community's best interests. Such perceptions can feed into a loss of police legitimacy and decrease citizens' willingness to cooperate with the police (Kappeler, Sluder, and Alpert 1998; Wilson Huang, and Vaughn 1996). Collectively, these processes may reinforce in-group/out-group sentiments, increase suspicions, and influence police departments to adopt surveillance technologies that help them to monitor the community. The notion that police departments adopt specific technologies to manage high-risk segments of the population is consistent with the logic of prior works that depict the police as consumers of information who use knowledge of risk to control danger (see Ericson and Haggerty 1997; Goold 2004).

Surveillance Technology

Surveillance technology refers to technology, tools, or devices used to monitor the behavior of citizens (Lyon 2007). As described by Goold (2004), surveillance has always been a core component of police work, although its form has changed substantially over time. Before the advent of modern day surveillance technology, much of police surveillance required officers to be on the street, actively watching citizens or recruiting members of the public to cooperate in the investigation of a crime. With modern-day inventions such as closed-circuit television (CCTV), the police have become increasingly capable of watching citizens from afar and without direct face-to-face contact with the public.

Law enforcement's use of surveillance technology has attracted controversy in recent years. For instance, the American Civil Liberties Union (ACLU 2016) has made allegations regarding what it perceives as "surveillance abuse," or the unconstitutional use of surveillance technology by the police to monitor the public. The ACLU has raised important issues related to rights for privacy and the rise of a "surveillance state" in its discussions of technologies, and has recommended against the use of these technologies for surveillance purposes. Other social critics have likened law enforcement's use of surveillance tactics to a modern-day panopticon, whereby invisible instruments are deployed throughout society to watch over citizens (Brignall 2002; Kavanagh 2006; McMullan 2015).

Extensive media coverage of law enforcement's usage of surveillance technology in the past few years might give one the impression that the use of such technology by the police is rampant (e.g., see Reese

2015; ACLU 2018). However, empirical studies identifying the prevalence of this technology in American law enforcement are scarce. A recent report by Strom et al. (2016) indicates that about 17% of police agencies in the United States had used CCTV in the past 2 years and less than 1% had used unmanned aerial vehicles (UAVs, also known as “drones”) (see also Koper, Taylor, and Kubu 2009; Lum, Merola, Willis, and Cave 2010; Roberts and Casanova 2012). Unsurprisingly, results differed significantly by agency size. For police departments with 250 or more full-time sworn officers, 40% had used CCTV and 3% had used UAVs in the past 2 years. Results also suggested that UAV usage will increase considerably among large agencies in the near future.

Research on the effectiveness of surveillance technology to control crime has been mixed. A 2009 meta-analysis by Welsh and Farrington (2009) reviewed 44 studies and found that CCTV use was associated with crime reductions in parking lots but had no impact on crimes in city and town centers or public housing communities. Most of the crime reduction impact found in the meta-analysis was associated with studies conducted in the UK; US-based studies were less supportive of the crime reduction effects of CCTV. Studies published since the 2009 meta-analysis, however, provide reason to believe that CCTV may be effective at reducing crime (Caplan, Kennedy, and Petrossian 2011; McLean, Worden, and Kim 2013). Given the novelty of UAVs, there is little research to assess if they are effective for crime control. Agencies have been adopting this technology in the absence of reliable information evaluating its effectiveness.

Little is known about agency or community factors that influence the implementation of surveillance technology among the police. In fact, the knowledge base regarding how agencies decide to implement technology of any kind is underdeveloped, although a few studies have attempted to examine these uncertainties. According to Schuck (2015), the adoption of technology can be understood as an interaction between several factors, including characteristics of the technology, organizational culture, and features of the larger social-structural environment. Using data from multiple iterations of the Law Enforcement Management and Administrative Statistics (LEMAS) survey, Schuck explores factors leading to police departments’ adoption of dash and mobile cameras. Community and political characteristics were generally better predictors than agency characteristics in explaining why agencies adopt camera technologies. While the strongest predictor of mobile camera adoption in large agencies was the crime rate, organizational size and spatial sprawl were positively associated with mobile camera adoption in smaller and medium-sized agencies. Additionally, agencies situated in communities with higher levels of poverty, inequality, and crime operated more in-car cameras.

Additional evidence suggests that the size of an agency can influence its likelihood of adopting select types of technology (Chamard 2003; Mamalian et al. 1999), although the mechanisms behind this adoption are not entirely understood. Larger agencies could reasonably be expected to have more slack resources with which to invest in new technologies (Mastrofski, Parks, and Wilson 2003). Additionally, larger organizations may have more diverse job functions (i.e., “specialization”) that would presumably lead to more adoption, as specialized units (e.g., crime analysis units) require certain technologies to perform their function at the highest level (King 1998; Randol 2012; Skogan and Hartnett 2005). Scholars also argue that agencies with specializations are more likely to be characterized as “cosmopolitan,” or “in the know” of the newest research, practices, and technologies available to best achieve agency goals (Weisburd and Lum 2005).

Weisburd and Lum (2005) found in their survey of 125 police agencies that adoption of computerized crime mapping was related to the “cosmopolitanness” of the police organization (see also Rogers 1962). That is, early adopters of this technology tended to have officers with more knowledge of and interaction with research surrounding crime mapping and hot spot policing. Skogan and Hartnett (2005) found a similar association in their study of the adoption of a centralized data warehouse that the Chicago Police Department made available to 122 other police agencies. Agencies that were involved in “cosmopolitan

networks,” as measured by the departments’ association with various professional agencies (e.g., Police Executive Research Forum), were more likely to adopt the centralized data warehouse. The idea that agencies with larger numbers of specialized units are positively associated with technological innovations is consistent with prior findings in innovation research (Damanpour 1991; King 1998).

It has also been theorized that police agencies do not invest rationally or strategically in technology; rather, they adopt technology without understanding how it fits in with the agency’s guiding philosophy or strategic goals. Indeed, some research has suggested that LEAs select, implement, and integrate technology independent of existing empirical evidence or concern for how these systems affect departmental operations, strategic decisions, or crime outcomes. In essence, it is argued that law enforcement adopts technology as a “black box” (Byrne and Marx 2011; Weisburd and Neyroud 2011). For example, Byrne and Marx (2011) argue that empirical research documenting the effectiveness of a given technology typically plays a minor role in the decisions to adopt or continue using that technology.

In the present study, we turn our attention to one potential factor that might influence the use of surveillance technology: police-community racial asymmetry. We hypothesize that police departments that underrepresent racial minorities in their community will be more likely to adopt or plan to implement technology that is designed for public surveillance, such that certain “problem” segments of the population can be better monitored. We anticipate that these relationships will hold even controlling for important agency-and community-level characteristics such as agency size or crime rate. While we recognize that the majority of police departments in the US are predominantly made up of White males and thus that there is an inherent racial asymmetry in American law enforcement, our contention is that this feature may be especially influential on the use of particular technologies when the department’s racial makeup differs substantially from the surrounding community.

Data and Sample

We draw from a variety of data sources, including a nationally representative survey of LEAs in the United States,¹ the 2013 LEMAS dataset, the US Census Bureau, and the 2013 Uniform Crime Reports. The survey was designed to assess the relationship between policing strategy and technology use, which we rely on for the measurement of our dependent variables and for the measurement of LEA orientations toward policing strategies. The sampling frame for the survey was developed using the 2012 National Directory of Law Enforcement Administrators (NDLEA). The 2012 NDLEA contains contact information for 15,847 LEAs in the United States. The dataset was stratified to ensure adequate representation across census regions and each was further stratified by agency type (primary state, sheriff, and local police) and agency size (1 to 99, 100 to 249, 250 to 499, and more than 500 sworn officers). Agencies were randomly selected from within each stratum. A response rate of 60.5% was obtained ($n = 776$).²

To gain information on agency-level characteristics, we merged the sample with the 2013 LEMAS survey. The LEMAS is conducted periodically by the Bureau of Justice Statistics to collect information from more than 3,000 general purpose state and local LEAs. The LEMAS sample includes all agencies that employ 100 or more sworn officers in addition to a nationally representative sample of agencies with fewer than 100 sworn officers. For the 2013 dataset, a total of 2,822 agencies responded to the LEMAS questionnaire producing a response rate of 86%. The dataset contains a wealth of information such as agency

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² Twenty-seven agencies were dropped because they did not complete the survey. An assessment of these agencies’ key characteristics as they relate to size, type, and region did not indicate any systematic bias.

expenditures and demographic characteristics of officers. Two hundred and forty municipal agencies were successfully matched with the LEMAS dataset. To collect information on community context, we merged in data from the 2009–2013 Census and the 2013 Uniform Crime Reports. Item-level missing data were minimal; however, we used multiple imputation to account for missing data on individual items (Little and Rubin 2002).

Measures

Dependent Variables

The study has two binary dependent variables, one for each type of surveillance technology. Respondents were asked to indicate whether they had used CCTV or UAVs in the past two years, and if not, whether they had plans to use each technology in the next two years. To measure CCTV use, a binary variable was created in which 1=*the agency reported using CCTV in the past two years*; and 0=*the agency reported that they had not used CCTV in the past two years*. Because UAVs are a relatively new technology in law enforcement, only a small handful of agencies in our sample reported that they had used them (n=4). Therefore, our measure of UAV use includes agencies that have used them in the past two years or plan to use them in the next two years; specifically, 1=*the agency reported using UAVs in the past two years or has plans to acquire them in the future*; and 0=*the agency reported that they had not used UAVs in the past two years and had no plans to use them in the future*. Constructing this dependent variable in this fashion helps to capture an important latent quality regarding LEA technology acquisition: favorable attitudes towards surveillance technology regardless of whether or not financial or other resources allow for its acquisition. Additionally, because UAVs are a new technology, measuring UAV use to capture only early adopters would miss out on those who view the technology favorably and who would implement it if they could.

Independent Variables

Racial Asymmetry

Our primary independent variables are two items reflecting the extent to which LEAs represent minorities in their community. Following Barrick, Hickman, and Strom (2014), *African American asymmetry* is a ratio of the percentage of full-time sworn officers in the department that are African American (retrieved from the LEMAS), divided by the percentage of African American residents in the city (retrieved from the Census). Likewise, *Hispanic asymmetry* is a ratio of the percentage of sworn officers in the department that are Hispanic, divided by the percentage of Hispanic residents in the city. We also include a number of control variables that may influence an agency's adoption of surveillance technology, as described below.

Agency-level Characteristics

Agency characteristics help to provide a profile of LEAs in the study and may have some impact on the acquisition of surveillance technology. For example, agencies that adhere to zero tolerance policing may perceive a greater need for surveillance technology based on their desire to control more minor types of crime and disorder. Other factors such as agency size and budget may influence the capacity and resources that an agency has to adopt technology (see Strom et al. 2016). We controlled for several agency-level traits, including operational budget per capita, agency size, and orientation toward common policing strategies. *Operational budget per capita* (retrieved from the LEMAS) represents each agency's operating budget for the previous year before administration of the survey, divided by the population of the city in which the LEA is located. *Agency size* is the number of full-time sworn officers as recorded in the NDLEA.

The likelihood that agencies have used or plan to use surveillance technology may depend on the types of activities they engage in, and likewise their general outlook on what qualifies as effective policing (Strom et al. 2016). To measure LEA orientation toward policing strategy, we used nineteen survey items that

asked respondents to indicate how important a series of policing activities were in helping their agency meet its core mission. The items were measured on a scale of one to five, with a one being “not important at all” and a 5 being “of highest importance.” Iterated principal axes factor analysis, with oblique rotation, was conducted on all 19 policing activity items (full list provided in Table 1) to reduce the number of items into manageable subscales. Results showed three factors to have eigenvalues above one: community policing, hotspot/problem-oriented policing, and broken window/zero tolerance policing. Item analysis was conducted for each factor, and three indices were created for each factor by taking the mean across the items. *Community policing* ($\alpha = 0.82$) consists of five items: involve community members in developing priorities, involve community members in implementing strategies, conduct crime prevention with community members, implement community engagement activities, and generate crime intelligence from the community. *Hot spot/problem-oriented policing* ($\alpha = 0.80$) consists of six items: target identified high-risk areas, identify and analyze specific crime problems, identify focused solutions to the causes of crime, implement saturation patrols, conduct analysis to identify repeat offenders, and implement directed patrols in high-risk areas). Finally, *broken windows/zero tolerance policing* ($\alpha = 0.75$) consists of four items: make arrests for minor offense, surveil high-risk people, achieve high arrest volumes, and stop and question suspicious individuals.

Contextual Characteristics

Community and contextual characteristics may affect police perceptions that surveillance is needed and should therefore be controlled in models assessing the effects of racial asymmetry. For example, higher crime rates may lead an agency to adopt surveillance technology as a method of crime control (Schuck 2015). Likewise, areas with high levels of citizen turnover may increase anonymity and decrease the strength of community ties or collective efficacy (Anderson 1999; Kornhauser 1978; Sampson and Groves 1989), which may further weaken community-police relations (Sampson and Bartusch 1998) and enhance perceptions that surveillance technology is needed. It is also possible that local political forces may exert pressures for law enforcement to engage in or avoid certain types of technology or policing strategies (see Stucky 2005 for an example of political influences on local policing). Because some research has identified geographic differences in the distribution of police technology (e.g., Chamard 2006), it is also important to consider the effects of geographic region.

We draw from the US Census Bureau and the Uniform Crime Reports to create community and contextual constructs. *Geographic region* (designated by the US Census Bureau) was represented by four dummy variables: West, Northeast, South, and Midwest (West region assigned as the reference category). *Median household income* is the average household income for the city in which each police department is located. *Political context* is two dummy variables indicating whether the agency is located in a city with a democrat or republican mayor in 2012.³⁴ *Residential stability* (drawn from the Census) is the percentage of the city population that has remained in the same residence for the past 5 years. *Violent crime rate* was collected from 2013 Uniform Crime Reports.⁵ Finally, four common measures of racial composition are included in the models: percent of city that is African American (centered), a percent African American quadratic term, percent of city that is Hispanic (centered), and a percent Hispanic quadratic term.

³ This item was constructed by manually attaching mayor political affiliation to each department and did not come from a specific data source.

⁴ We also constructed the political context measure by measuring the political party of the governor in 2012. Results were highly similar to the model that included political context as measured by the mayor’s political party affiliation.

⁵ Original models controlled for population size and racial segregation (measured by the US Census dissimilarity index); however, including these items created collinearity with violent crime and agency size and had to be dropped from analysis. Likewise, property crime rate was also controlled for as an alternative to violent crime rate; results were substantively similar to one another.

Results

Table 1 shows means and standard deviations for all key variables in the analysis. As shown, about 41% of agencies in the sample had used CCTV in the past year, and about 8% used UAVs or had plans to acquire UAVs in the future. The mean scores of 0.66 and 0.51 for African American symmetry and Hispanic symmetry, both below 1, indicate that on average, agencies in the sample underrepresent the minorities in their community. On average, agencies have more than 700 sworn officers, which indicates that our sample is skewed towards larger agencies (i.e., on average, law enforcement agencies in the US have fewer than 100 sworn officers, see Strom et al. 2016). The hot spot/problem-oriented policing index has the highest average score of all the strategy indices, followed by community policing and then broken windows/zero tolerance policing. Turning to contextual characteristics, the fewest agencies are located in the Northeast while the largest group of agencies are located in the South. On average, 81% of the population in which agencies are located lived in the same residence for the past 5 years.

Table 1: ***Descriptive Statistics for Key Variables (n = 240)***

Variable	Mean	SD
Technology		
CCTV	0.49	0.50
UAVs	0.08	0.27
African American asymmetry	0.66	0.60
Hispanic asymmetry	0.51	0.37
Agency characteristics		
Agency size	741.8	2,610.6
Community policing	4.16	0.65
Hot spot/problem-oriented policing	4.32	0.52
Broken windows/zero tolerance policing	3.39	0.71
Operational budget per capita	291.2	113.6
Police activities		
Respond to calls for service	4.68	0.56
Conduct follow-up investigations	4.49	0.65
Target identified high-risk areas	4.51	0.62
Implement directed patrols in high-risk areas	4.51	0.61

Variable	Mean	SD
Identify and analyze specific problems	4.51	0.72
Conduct crime prevention with community members	4.38	0.71
Generate crime intelligence from the community	4.25	0.79
Implement solutions to underlying causes of crime	4.24	0.78
Implement saturation patrols in high-risk areas	4.14	0.85
Conduct community engagement activities	4.22	0.87
Implement systems to track officer conduct	3.82	1.06
Work with probation officers	3.82	0.97
Involve community in implementing strategies	3.87	0.93
Arrest suspects for minor crime	3.47	0.87
Conduct surveillance of high-risk individuals	3.20	1.07
Achieve high arrest volumes	2.93	1.02
Contextual variables		
Geographic region		
Northeast	0.15	0.36
Midwest	0.25	0.43
South	0.35	0.47
West	0.25	0.43
Median household income	\$50,186	\$15,050
Political context		
Democrat Mayor	0.71	0.45
Republican Mayor	0.29	0.45
Residential stability	81.27	5.35
Violent crime rate per 100,000	583.80	408.29
Percent African American (uncentered)	18.5	17.7
Percent Hispanic (uncentered)	21.6	20.1

Table 2 presents results of two logistic regression models, predicting the odds of CCTV use in the past 2 years and the odds of UAV use or plans for use by agency- and contextual-level characteristics using logistic regression. Beginning with CCTV, the effect of African American asymmetry is negative in direction and statistically significant; the odds of CCTV use are about 51% lower with each incremental increase on the asymmetry scale. An assessment of the predicted probabilities, holding all other variables at their means, shows that agencies that scored near zero on the African American symmetry measure have a 49% chance of having used CCTV, compared with a 21% chance for agencies that scored near 2 on the measure.

Table 2: *Logistic Regression Predicting Technology Use (n = 240)*

Variable	CCTV	UAVs
African American asymmetry	.49* (.15)	.59* (.13)
Hispanic asymmetry	1.36 (.66)	1.33 (1.09)
Agency size	1.00 (.00)	1.00 (.00)
Community policing	1.19 (.24)	1.21 (.57)
Hot spot/problem-oriented policing	.99 (.40)	1.22 (.84)
Broken windows/Zero tolerance policing	1.17 (.26)	1.55 (.61)
Operational budget per capita	1.01* (.00)	1.01 (.00)
Geographic region		
West	-	-
Northeast	1.00 (.43)	.45 (.45)
South	.63 (.29)	1.22 (.62)
Midwest	.68 (.34)	.38 (.39)

Variable	CCTV	UAVs
Median household income	.99 (.00)	.99 (.00)
Political context		
Democrat Mayor	-	-
Republican Mayor	1.29 (.43)	.78 (.45)
Residential stability	1.01 (.04)	1.05 (.05)
Violent crime rate	1.00 (.01)	.99 (.00)
Percent African American (centered)	1.01 (.03)	.99 (.03)
Percent African American quadratic	.99 (.00)	.99 (.00)
Percent Hispanic (centered)	.94 (.03)	1.05 (.03)
Percent Hispanic quadratic	1.00 (.00)	.99 (.00)
<i>F</i>	6.69***	4.40***
Pseudo R ²	0.16	0.08

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Note: Coefficients are odds ratios; standard errors are in parentheses.

The odds of UAV use or plans for use are also significantly lower as African American asymmetry increases. For each one-unit increase in asymmetry, the odds of UAV use/plans are about 41% lower. Predicted probabilities demonstrate that agencies that scored near zero on the African American symmetry measure had a 7% chance of using or planning to use UAV's, compared with a near 0% chance for agencies that highly overrepresented the African American residents in their community. Substantively compatible with prior studies, agencies' alignment with Hispanic residents in the community does not have a substantial impact on the use or plans for use of surveillance technology (e.g., Holmes et al. 2008).⁶

⁶ Building from Kent and Jacobs (2004), we investigated alternate models that tested the effects of an interactive term between racial asymmetry and racial segregation, the effect was positive in direction for both technologies but was statistically nonsignificant.

Discussion

Drawing from literature on knowledge-based trust, we conceptualize racial asymmetry between police departments and the communities they serve as one of many factors that gives rise to the use of surveillance technology by the police. Under this perspective, social distance caused by racial asymmetry may perpetuate existing stereotypes regarding the relationship between race and crime, which in turn incites the perception that panoptic mechanisms of control are necessary to monitor racial minorities in the surrounding community.

We found support for the hypothesis that police departments that underrepresent the African Americans in their community would be more likely to use surveillance technology as a method of monitoring citizens. Our models suggest not only that African American racial asymmetry was a statistically significant predictor of CCTV use or UAV use/plans in the predicted direction, it was one of a few statistically significant effects in the models. Interestingly, while racial asymmetry was a predictor of both types of technology, orientation toward policing strategy was not, which suggests that the process linking surveillance technology and racial asymmetry may be different or more consistent than the process linking strategy and technology.

These findings run somewhat counter to William Staples' assertion that we are in the midst of a "historical shift from the specific punishment of the individual deviant to the generalized surveillance of us all" (1997:6). Although we agree that contemporary society has witnessed large-scale efforts among law enforcement and other agencies to manage risk, moving away from reactive strategies in favor of proactive approaches to prevent problematic behaviors (see McCahill 1998), our results suggest that the subjects of risk-management are not equally distributed throughout US communities. Specifically, the acquisition and implementation of surveillance technology may be the outcome of social sorting (Lyon 2003) among the police, through which risk levels are assigned to communities and decisions are subsequently made to manage perceptions of risk. Our viewpoint is therefore more compatible with Fiske's (1998) assertion that although surveillance is increasingly infiltrating modern-day society, its implementation differentially targets communities of color. However, importantly, our findings add important nuances to this discussion; specifically, they suggest that the process of social sorting and community risk assessments may be strongly influenced by the social distance between police departments and the communities they serve and not necessarily by the racial composition of the community alone.

Although the present study contributes to the understanding of policing and technology, a few limitations should be noted. First, the measurement of surveillance technology use is limited, as it captures whether agencies have used or plan to use CCTV or UAVs and therefore says little about the nature or extent of that usage. Future research should attempt to examine the relationship between the racial composition of the population or racial asymmetry between the police and the community with the frequency or depth of surveillance technology usage (e.g., the number of cameras stationed with a given jurisdiction). Second, although we assume that the use of surveillance is at least partially driven by some element of community distrust, we do not have data to test this assertion empirically. Some types of technology may be adopted for their investigative capabilities in addition to or rather than their ability to surveil the public. Disentangling the reasons for adoption may require in-depth assessments with the technology decision makers of an agency. Future research should attempt to conduct more formal mediation tests of the intervening effect of distrust on racial asymmetry and the use of surveillance technology. It is also unclear as to whether LEAs explicitly and strategically consider the racial composition of the community in their decisions to acquire and implement certain types of technology, or rather, if the relationship between racial asymmetry and surveillance technology is a reflection of implicit and unconscious bias among

police personnel in key decision-making roles. The present study, although informative, should be considered a preliminary investigation of the argument to establish a foundation for future research.

Finally, our sample is disproportionately representative of large agencies, which only make up a small proportion of law enforcement agencies in the United States. Nevertheless, we feel that this limitation is justified, given that larger agencies are considerably more likely to adopt most types of police technology. Likewise, past research has indicated that larger agencies are more strategic in the types of technology they implement (e.g., Strom et al. 2016).

Summary and Conclusion

National scrutiny on law enforcement in the past few years has demonstrated the important role that race continues to play in American policing. In the present study, we build on decades of research demonstrating that the racial composition of the population has a tangible relationship to the police department that serves the community. Incorporating insights from the knowledge-based trust literature and philosophical elements of the panopticon, we hypothesized that racial asymmetry between police departments and the communities they serve would be positively associated with the likelihood that the agency had used, or had plans to use, two types of surveillance technology. The results indicate that the odds of agencies using CCTV or using/planning to use UAVs are about 51% and 41% lower, respectively, with each incremental increase on the racial asymmetry scale. In other words, the closer agencies approach representation, or overrepresentation of African Americans, the less likely they are to have used or have plans to use surveillance technology. In addition, racial asymmetry was one of a few statistically significant effects identified in the models. These findings are noteworthy, as they indicate that the racial composition of the police department and the local community plays a more consistent role in understanding an agency's surveillance technology portfolio than a host of other seemingly important factors, such as operational budget and crime rate.

The finding that African American racial asymmetry was a more important factor than agencies' orientation toward specific policing strategic models is especially interesting, because it indicates that police departments are not necessarily making decisions about the types of technology to implement based on their guiding philosophies or the types of activities they conduct. Whereas scholars have argued that LEAs implement technology in a "black box" without understanding its potential uses, effectiveness, or compatibility with their mission (Byrne and Marx 2011; Weisburd and Neyroud 2011), our findings suggest that the selection of technology is not totally entropic. Rather, the degree of racial asymmetry between the department and the community may make certain types of technology more attractive; consequently, the strategic process by which technology is implemented may not have as much to do with an overarching vision of how policing should be done than it does with issues related to trust and resemblance of the surrounding community.

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