



# Do Female Officers Police Differently? Evidence from Traffic Stops • • •

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Abstract: Political scientists have increasingly begun to study how citizen characteristics shape whether—and how—they interact with the police. Less is known about how officer characteristics shape these interactions. In this article, we examine how one officer characteristic—officer sex—shapes the nature of police-initiated contact with citizens. Drawing on literature from multiple fields, we develop and test a set of competing expectations. Using over four million traffic stops made by the Florida State Highway Patrol and Charlotte (North Carolina) Police Department, we find that female officers are less likely to search drivers than men on the force. Despite these lower search rates, when female officers do conduct a search, they are more likely to find contraband and they confiscate the same net amount of contraband as male officers. These results indicate that female officers are able to minimize the number of negative interactions with citizens without losses in effectiveness.

**Verification Materials:** The data and materials required to verify the computational reproducibility of the results, procedures and analyses in this article are available on the American Journal of Political Science Dataverse within the Harvard Dataverse Network, at: https://doi.org/10.7910/DVN/QTUF6D.

n 2015, 21.1% of U.S. residents aged 16 or older had some form of direct, personal contact with the police (Davis, Whyde, and Langton 2018).1 In addition to these interactions, an additional 2.2 million individuals were incarcerated (Kaeble and Cowhig 2018). The pervasive and expansive reach of the criminal justice system has led many scholars to examine the role that these types of interactions play in individual political behavior and the consequences for democratic norms. To that end, scholars have shown the demobilizing effects that personal—or even proximal—contact with police and the criminal justice system has on voter turnout (Lerman and Weaver 2014; Walker 2020; Weaver and Lerman 2010; White 2019).<sup>2</sup> More broadly, negative contact with the police—particularly when seen as unjust delegitimizes the police, the justice system, and politi-

cal institutions more broadly (Gibson and Nelson 2018; Mondak et al. 2017; Weitzer and Tuch 2006).

With clear links between police–citizen contact and political outcomes, political scientists have begun to turn their attention to understanding who is more or less likely to interact with the police by drawing from work in criminology and sociology. One of the most common forms of police–citizen interaction examined in this research is traffic stops, which account for approximately half of all direct interactions with the police. Here, scholars have found that driver characteristics (e.g., race, sex) play a large role in shaping these interactions (e.g., Baumgartner, Epp, and Shoub 2018; Epp, Maynard-Moody, and Haider-Markel 2014).

Fewer studies, however, have examined how *in-dividual officer* characteristics shape these encounters.

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<sup>1</sup>This statistic covers a range of interactions from police-initiated contact (e.g., street or traffic stops) to resident-initiated (e.g., reporting a crime; Davis, Whyde, and Langton 2018). We use 2015 because these are the most recently released statistics by the Bureau of Justice Statistics at the time of writing.

<sup>2</sup>Recent studies have additionally shown that proximal contact may have mobilizing effects for *other* forms of participation (e.g., Walker 2020)

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To the degree that political science and public administration have explored these questions, the scope has been limited to a handful of specific agency policies (e.g., Baumgartner, Epp, and Shoub 2018; Mummolo 2018) or officer race (e.g., Baumgartner et al. 2020; Hong 2017a, 2017b; Nicholson-Crotty, Nicholson-Crotty, and Fernandez 2017). However, largely absent from these studies is an understanding of another important characteristic that may influence how officers view their job and approach their interactions with citizens: officer sex.<sup>3</sup> With women's presence on forces rising (U.S. Department of Justice 2010), understanding the consequences this representation has for police-citizen interactions is increasingly important. While existing work provides insight into how officer sex shapes interactions in highly gendered contexts like sexual assault reporting (e.g., Meier and Nicholson-Crotty 2006), our understanding of whether women's representation on the force has broader consequences for citizen interactions is limited.

To the degree that this question has been asked in other disciplines, evidence has been decidedly mixed. Moreover, current scholarship provides no clear expectation for how officer sex might influence behavior. Some scholars argue that there is no difference in how men and women carry out their duties as officers due to agency norms and culture (e.g., Hoffman and Hickey 2005; Lundman 2009). Others, including studies on representative bureaucracy, suggest that gendered socialization and differences in life experiences manifest in differences in how men and women engage in policing activities (e.g., Meier and Nicholson-Crotty 2006).

In this article, we use data from millions of traffic stops conducted in Charlotte, North Carolina, and Florida to adjudicate between these competing perspectives. These data provide us with several advantages, including the ability to capture the widest possible swath of police–citizen interactions, the ability to examine the breadth of the impact of officer sex by examining a context that is not explicitly gendered (cf. Meier and Nicholson-Crotty 2006), and a context where officers are afforded a high degree of discretion.

Our analysis reveals that differences do exist in officer behavior, with women being less likely than men to conduct a discretionary search following a traffic stop. Despite conducting fewer searches, we observe that female officers find contraband at a higher rate than male officers when they do search (i.e., they are more accurate and carry out fewer fruitless searches) and find just as much contraband in raw terms. Thus, our findings indicate that female officers are able to minimize negative interactions with civilians without compromising their effectiveness.

While our findings have important implications for the literatures on representative bureaucracy and women and politics, as well as the burgeoning literature on policing, they also have important normative implications for the health and legitimacy of American democracy. Because police-citizen interactions have the potential to shape citizens' willingness to engage and interact with politics, understanding the attitudes, predispositions, and behaviors of officers who participate in these interactions has implications for improving policecommunity relations. At a time when trust in the police is at an all-time low (Gallup 2020), our findings indicate that improving women's representation on forces could lead to fewer negative police-citizen interactions and have downstream benefits for the trust and legitimacy the public places in law enforcement, and government institutions more broadly.

## Do Men and Women Police Differently?

Do female officers approach their jobs differently than male officers? Existing literature has offered competing perspectives on this question. In this section, we draw on theories of representative bureaucracy, bureaucratic norms and culture, and race and policing to derive a series of competing expectations about whether or not women police differently than men. To test these hypotheses, we rely on data on traffic stops and the discretionary searches that may or may not follow. Traffic stops provide great empirical traction because they are the most pervasive form of citizen—police interaction and offer an enormous amount of discretion.

#### Why Officer Sex and Behavior May Be Linked

Why should we expect men and women to engage in different behaviors as officers? One explanation relates to gendered socialization and the lived experiences of officers (Dolan 2000; Nielsen 2015; Selden 1997). The

<sup>&</sup>lt;sup>3</sup> A notable exception to this is Meier and Nicholson-Crotty (2006). Additionally, Baumgartner et al. (2020) discuss and consider officer sex but are primarily concerned with officer race (black versus white) and driver characteristics.

<sup>&</sup>lt;sup>4</sup>This is consistent with comparable work on race and policing (Baumgartner, Epp, and Shoub 2018; Epp, Maynard-Moody, and Haider-Markel 2014).

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theory of representative bureaucracy, generally, suggests that *who* bureaucrats are matters for bureaucratic behavior and policy outcomes (Mosher 1982). The theory presumes that individuals with the same backgrounds undergo similar socialization experiences, and those experiences influence their values and attitudes, which, in turn, shape behaviors (Selden 1997). These differences in behaviors lead to different substantive outcomes (Coleman, Brudney, and Kellough 1998; Keiser et al. 2002; Meier 1993a, 1993b; Meier, Wrinkle, and Polinard 1999), which in turn improve citizen perceptions of agencies and democracy more broadly (Theobald and Haider-Markel 2009; Riccucci, Van Ryzin, and Jackson 2018).<sup>5</sup>

Although aspects of policing—such as academy training and job duties—and bureaucratic culture more generally, are meant to foster uniformity, some scholars argue that the experiences and perspectives individual officers bring with them to the force are so deeply ingrained that they cannot be completely erased (Harrington 2003; LeCount 2017). Here, the literature on race and policing offers some insights. Scholars find that experiences with authorities and a shared group identity lead to racial differences in views of legal systems and reactions to it (e.g., Gibson and Nelson 2018; Walker 2020), and when more minority officers are on the force, fewer black citizens file civilian complaints (Hong 2017b). Moreover, black officers themselves behave differently than white officers, such as searching drivers at a lower rate following a traffic stop (Baumgartner et al. 2020), and they hold attitudes that are more similar to those of black civilians than white officers, leading to the conclusion that for many black cops, when thinking about race and policing, they are "more Black than blue" (LeCount 2017, 1066).

Just as race can influence how officers approach their jobs, so too may women's experiences prior to joining the force result in them behaving differently. This may especially be the case because women have traditionally been excluded from policing. Paoline (2003, 208), for example, argues that "one might expect the groups that have been excluded from the police culture to question, or outwardly reject, the attitudes, values, and norms associated with it." In this framework, women bring a distinct perspective with them to the force and are motivated to act out of this perspective, leading to observable differences in behavior.

Representative bureaucracy theory more generally suggests that the lived experiences of bureaucrats influence how those bureaucrats do their jobs and the out-

<sup>5</sup>See Schwindt-Bayer and Mishler (2005) for a discussion of the integrated nature of this relationship in a legislative context.

comes they produce. In particular, this literature argues that the inclusion of women and racial or ethnic minorities will lead to substantive outcomes more in line with the group's interests (Bradbury and Kellough 2011; Keiser et al. 2002; Meier 1993a, 1993b; Meier and Stewart 1992). Research on women and sexual assault reporting supports this argument. Meier and Nicholson-Crotty (2006), for example, find that forces with more women are associated with higher levels of sexual assault reporting and arrests, which they argue is the result of female officers being more willing to resolve these crimes due to shared concerns and empathy for the victim.

Though prior literature often focuses on how inclusion shapes outcomes related to group salient issues, the ramifications of women's inclusion may be further reaching and have consequences for all citizens who interact with these officers and their units. Scholars observe that female bureaucrats often have different priorities (Dolan 2002; Johansen and Zhu 2017; Wilkins 2006), allocate their time and resources differently (Jacobson, Palus, and Bowling 2010), engage in different managerial styles (Meier, O'Toole, and Goerdel 2006), and produce different outcomes (Meier, O'Toole, and Goerdel 2006) compared to men. Work on policing has also noted that female officers tend to have more community-oriented views of policing and possess better communication skills compared to men on the force (Chan, Doran, and Marel 2010; Kakar 2002; Morash and Haarr 2012). These differences in orientation and skill set could manifest in different behaviors and outcomes on the job, and these differences should be consequential for any citizen interacting with a particular officer or unit. If women's experiences prior to joining the force and their more community-focused orientations lead to broad differences in behaviors and decision making, we would expect female officers to engage less frequently in aggressive policing and to minimize needlessly negative interactions with citizens.

## Why There May Not Be Differences by Officer Sex

Whereas some scholars argue that the individual identities of officers (or bureaucrats more generally) lead to differences in on-the-job behavior, others argue that the descriptive identities of officers should not manifest in behavioral differences. Even if officers do bring different experiences and perspectives with them to the force initially, factors such as training, policing culture, and job demands should socialize *all* officers—regardless of sex—into a certain set of attitudes and behaviors

(Oberfield 2014). Because bureaucratic agencies are structured in ways that dehumanize and depoliticize the individual (Ferguson 1985), scholars in this perspective argue that any differences in men's and women's experiences should not manifest in observable discrepancies in officer behavior.

Moreover, officers from historically marginalized groups may feel additional pressure to conform to agency norms and the behaviors of the dominant voices (typically white and male) in the agency in order to prove they belong. Again, the literature on race and policing offers insights. Whereas some argue black officers behave differently, others find no differences in officer or agency outcomes when black officers are included in greater numbers, such as differences in rates of excessive use of force (e.g., Holmes and Smith 2008). These studies argue that the pressures faced by black officers incentivize them to act "blue" (Wilkins and Williams 2008). Women may face similar pressures to conform to agency norms and cultures. Some scholars, for example, argue that within bureaucratic agencies, managers are socialized to use rewards and punishments to discourage "feminine" characteristics (Ferguson 1985). This creates an environment where female bureaucrats face pressures to mimic the behavior of men in their organizations in order to succeed (Eagly 2007; Nielsen 2015). This pressure is likely heightened in police forces, which have been characterized as "hypermasculine" compared to other organizations (Franklin 2007).

Another reason we might not expect to see differences in behaviors are self-selection mechanisms. Men and women do not randomly become police officers. Just as individuals with certain characteristics are more likely to select into government jobs (Nielson 2015), the men and women who choose to become officers may share a similar set of characteristics that play a stronger role in shaping their behaviors than their sex (Twersky-Glasner 2005).

While there is some evidence that women's presence leads to differences in cases where sex/gender is salient (Meier and Nicholson-Crotty 2006), scholars often observe no differences between men and women in contexts where this salience is lacking. For example, recent research finds no differences in use of weapons (Hoffman and Hickey 2005), ticketing (Lundman 2009), or general orientations toward and interactions with citizens (Bradford 2014; DeJong 2004; Poteyeva and Sun 2009). This is consistent with a story of agency socialization. Moreover, early work on officer sex and policing found that women often engaged in verbally and physically aggressive behaviors (i.e., behaviors more frequently associated with men) and deemphasized feminine traits (Berg and

Budnick 1986; Gross 1981). Given these arguments, we would not expect men and women to engage in different forms of policing, and there should be few, if any, observable differences in officer behavior rooted in sex.

## Officer Sex and Policing Outcomes in the Context of Traffic Stops

We adjudicate between these competing perspectives in the present study through an analysis of data on traffic stops and discretionary searches from Charlotte, North Carolina, and the state of Florida. Traffic stops, and the discretionary searches that occur (or do not occur) after these stops, offer the ideal context to test the competing expectations of extant literature for several reasons. First, traffic stops are a routine activity that are one of the most frequent forms of interaction between citizens and the police. A focus on traffic stops thus allows us to capture the widest possible swath of police-citizen interactions (see Lundman 2009). Relatedly, by focusing on searches following a traffic stop, we have a relatively impartial way to evaluate whether potential differences come at a cost to effectiveness (i.e., whether officers find contraband at different rates).

Second, if male and female officers behave differently, the use of traffic stop data allows us to better understand the breadth of these differences. Although past research has found evidence that female officers are associated with higher levels of reporting for sexual violence (e.g., Meier and Nicholson-Crotty 2006), these types of officer-citizen interactions occur in a highly gendered context. Many scholars argue that while men and women may behave differently as bureaucrats in some contexts, they are less likely to do so in contexts where sex/gender is not salient (Keiser et al. 2002; Wilkins and Keiser 2006). By focusing on a context where these identities are not salient, we are able to build on this past research by examining the breadth of women's impact as officers. Additionally, where many interactions (including reporting crimes) can be initiated by citizens, a traffic stop (and subsequent search) is virtually always initiated by the officer. Thus, to the extent we observe differences in outcomes based on officer sex, we can be more confident that these are the result in differences in officer decision making.

Finally, traffic stops and subsequent searches provide a context where officers are afforded a great deal of discretion. Unlike cases where officers have less discretion over stop outcomes (i.e., giving a warning, writing a ticket, or making an arrest), searches are a context where officers have a great deal of autonomy. The extent

to which the individual characteristics of a bureaucrat influence outcomes should be most pronounced among "street-level" bureaucrats (e.g., police officers or teachers), where the ability to exercise discretion is enhanced (Lipsky 1980).

If male and female officers approach their jobs differently, we expect to see differences in traffic stop and search behavior precisely because this is a context where officers have the ability to behave differently. If women's experiences prior to joining the force and more community-focused orientations lead to observable differences in behavior, we would expect female officers to minimize negative interactions with citizens by conducting fewer discretionary searches compared to male officers. If, on the other hand, agency norms and practices socialize male and female officers in a similar manner, or women feel pressure to conform to the behaviors of men on the force, then we expect to see male and female officers exercising their discretion in a similar manner (i.e., conducting similar numbers of searches).

#### Traffic Stops in Charlotte, North Carolina and in Florida

To test our expectations, we use data from the Charlotte (North Carolina) Police Department and the Florida Highway Patrol. While an increasing number of departments make data on traffic stops publicly available, few data sets include all necessary information. Any data set used here must have information on (1) whether a search is performed, (2) sex of the officer conducting the stop, and (3) controls for prominent additional explanations of why a search may be conducted (i.e., initial stop purpose and driver race). Whereas the first two points are simply necessary to perform our tests, the last highlights that there is a robust literature on when and why searches occur. Without including this associated information, we know that our models would be underspecified, introducing significant omitted variable bias. Of the publicly available data sets on traffic stops identified by the authors, only two contain all the necessary information: the Charlotte (North Carolina) Police Department (CPD) via Baumgartner et al. (2020) for data from 2016 to 2017 and via the city's open data portal for data from 2019 to 2020 and the Florida Highway Patrol (FHP) via the Stanford Open Policing Project for data from 2010 to 2015 (Pierson et al. 2020).

While both of these agencies belong to the same region—the U.S. South—there is little reason to think our case selection, with regard to geography, should in-

fluence our results. Others have shown that similar patterns in policing can be observed nationwide, even in the case of racial disparities in policing, which are sometimes framed as a "Southern" problem (e.g., Baumgartner et al. 2017; Pierson et al. 2020). However, our results and subsequent conclusions may not transfer to sheriff's departments, as their jurisdictional bounds and structure are distinct (e.g., the sheriff is typically elected), small towns, or areas that are extremely homogeneous in their makeup, as both Florida and Charlotte, North Carolina, are relatively diverse areas.

Using the publicly available data from the CPD and FHP, we construct separate tests for each agency, where the unit of analysis is the traffic stop itself. One reason we do this is because these agencies are fundamentally different types: One is a municipal police department, whereas the other is a statewide agency. By examining these two different types of agencies, we additionally test whether agency type alters our results. On average, municipal departments must allocate their time between crime prevention, crime solving, and traffic safety among other tasks, whereas the primary focus of state highway patrols is on traffic safety. As such, municipal departments tend to conduct searches as part of routine traffic stops more frequently, as traffic stops have become a supplemental investigatory tool, which is seen in Table 1.6

Our dependent variable is whether or not a search occurred. For any agency, there are two general types of searches that may be conducted: those where the officer has discretion over whether to search and those where they do not. The primary two types of discretionary searches are probable cause searches, where an officer has reasonable suspicion that there is contraband in the car or on the driver, and consent searches, where an officer asks the driver for consent to conduct a search. Additionally, the FHP separately identifies "in plain view" searches, where contraband (e.g., an open container of

<sup>6</sup>There are 4,842,950 observations in the FHP data set. Of these, 434,322 either do not contain search information or are coded as "other type of search," which is excluded in this analysis as these are likely not discretionary searches. Additionally, of those observations where we have search information, an additional 1,695,594 are missing information on one or more of the control variables included in the full models. These entries are incomplete either due to entry error or error in accessing and transferring the data. If the first, it is likely the racial differences discussed in the online supporting information (SI, pp. 1-14) are underestimated (Knox, Lowe, and Mummolo 2020). At this point in time, there is no direct evidence that male and female officers differ in how they fill out these forms. However, if stereotypes about female officers are correct—that they are more community and detail oriented—then it may be the case that we are underestimating the differences between male and female officers. Finally, 556 observations are excluded because too few stops (fewer than 1,000) were made in that county to provide a robust estimate of the county fixed effect.

TABLE 1 Summary of Stops and Searches by Agency

Department	Type	Years	Stops	Searches	Search Rate
Charlotte PD (North Carolina)	Municipal	2016–17, 2019–20	218,158	10,444	0.048
Male officers			199,234	9,623	0.048
Female officers			18,924	821	0.043
Florida Highway Patrol	Statewide	2010–15	4,408,628	17,356	0.004
Male officers			3,859,781	16,422	0.004
Female officers			291,092	272	0.001
Total			4,626,789	20,404	0.006

Note: There are 2,708 unique officers in the Florida Highway Patrol (FHP) data set. Of these, 1,916 are men, and 244 are women. The Charlotte Police Department (CPD) data set does not include a unique officer identifier, and as such we do not know the precise breakdown for the CPD. Publicly available data from the department from 2019 indicate there were 1,540 police officers, with 240 women and 1,300 men.

alcohol) is in plain view where the officer can see it. Outside of these types, there are a number of search types where an officer must search (i.e., has no discretion), such as warrant searches and searches incident to arrest. As a result, when possible, to ensure we are modeling and focusing on discretionary situations, we only include probable cause, consent, and in plain view searches and exclude instances where no discretion could be exercised. Only the FHP data set indicates the type of search conducted; we include 17,356 (discretionary) searches and 4,408,628 stops for the FHP, but we exclude 7,730 searches classified as "other" for the FHP. We include all searches conducted by the CPD because a more specific search type is not provided.

Our main independent variable is officer sex. Figure 1 shows the rate of search following a traffic stop conducted by male and female officers by agency, and Table 1 provides the counts of the numbers of stops and searches made by officers of each sex by department.

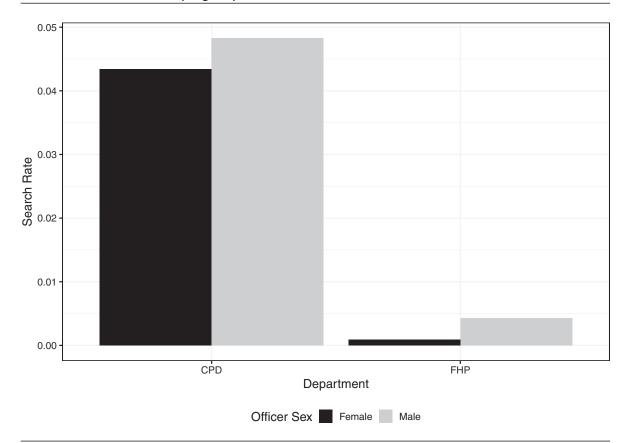
Figure 1 highlights that in the simple bivariate case, stops made by female officers result in searches at lower rates compared to stops made by male officers. Although this is not a causal test and does not account for other explanations, this supports the perspective that female officers conduct searches at a lower rate.

While the focus of this article is on whether men and women officers search drivers at different rates, there are many reasons a driver may be searched after being stopped. For example, studies have shown that young, black male drivers are more likely to be searched than similarly situated white male drivers (Baumgartner, Epp, and Shoub 2018; Epp, Maynard-Moody, and Haider-Markel 2014; Peffley and Hurwitz 2010). More broadly, one general key set of alternative or additional explana-

tions is tied to the context of the stop itself, relating to the characteristics of the driver, why the stop was initiated, and when and where the stop occurred (for an overview, see Shoub et al. 2020). As for stop-specific characteristics and context, we are limited in what we can include by what information is collected. Both the forms filled out by the Florida Highway Patrol and the Charlotte Police Department record information on driver race, driver sex, driver age, initial purpose of the stop, month of stop, and race of officer. Additionally, for the FHP, we control for whether the car had out-of-state plates, the officer's age, and the hour of day of the stop. While this does not account for everything that might matter (e.g., we have no information explicitly on how the driver and officer interact), it does include as many controls concerning the stop itself as possible. In addition to considering the context and characteristics of the stop, we control for two additional officer characteristics: officer race and the number of years an officer has been on the force, as experience may alter search propensity.

Finally, others have shown that the composition of the area surrounding where a stop takes place and the characteristics and policies of the associated policing agency matter. Here, we do not include any controls explicitly accounting for these alternative theories (e.g., racial threat theory, social disorganization theory, or broken windows policing). Instead, we include fixed effects for the year the stop took place to account for possible policy changes from year to year. Additionally, we include fixed effects for either the division within which the stop took place (for the CPD) or the county (for the FHP) to account for variation within agency but across different internal jurisdictions and geographic areas with different demographic compositions.

FIGURE 1 Search Rates by Agency and Sex of Officer



Note: Differences in search rates by officer sex within each department are significant at the .05 level.

#### Who Is More Likely to Conduct a Search?

Using these data sets and measures, we fit and then evaluate two ordinary least squares (OLS) regressions: one for each agency. We note that these models only provide support that a statistical connection exists between officer sex and whether a search is conducted; we cannot test and show whether a causal relationship exists. The results of these regressions are shown in Table 2 (full results are presented and discussed in the SI, pp. 1–3).

Overall, the regressions for both agencies show patterns similar to those in past research: Black drivers are more likely to be searched than white drivers, men are more likely to be searched than women, younger drivers are more likely to be searched than older drivers, and those stopped for "investigatory" rather than "safety" purposes are more likely to be searched. Additionally, in line with Baumgartner et al. (2020), we find that black officers in both Charlotte and Florida are less likely to conduct searches than white officers. Finally, if these regressions are reestimated as logistic regressions, with officer intercepts, or if a more restrictive approach using

exact matching is adopted, the statistical relationship holds (see SI, pp. 4–5).

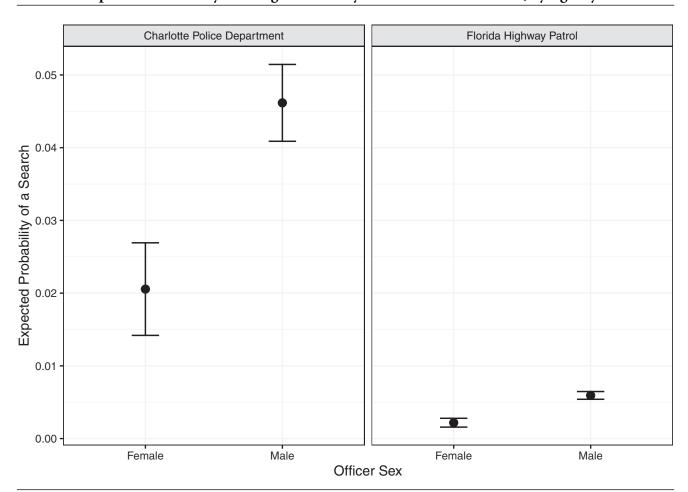
Our central question is whether female officers are more, less, or neither more nor less likely to conduct a

TABLE 2 OLS Regressions Explaining Searches Following a Traffic Stop

	CPD	FHP
Female officer	$-0.026^{*}$	$-0.004^{*}$
	(0.002)	(<0.001)
Intercept	$0.086^{*}$	$0.026^{*}$
	(0.004)	(0.001)
Controls	Yes	Yes
Year fixed effects	Yes	Yes
Division fixed effects	Yes	No
County fixed effects	No	Yes
$R^2$	0.071	0.009
Adjusted $R^2$	0.071	0.009
N	150,547	2,712,478

Note: Each observation is an individual traffic stop. p < .05.

FIGURE 2 Expected Probability of Being Searched by a Male or Female Officer, by Agency



Note: Estimates are based on regressions from Table 2. Other values are held to their means or modes.

search. In the previous section, we saw that in the bivariate case, female officers conducted searches at a lower rate than male officers across both agencies. Once we control for other explanations and theories known to be related to the probability of a driver being searched, we see that this result holds: If a female officer is conducting the stop, then the driver has a lower probability of being searched. This is seen in the consistently negative and statistically significant coefficient associated with a female officer carrying out the stop and the marginally larger coefficient when alternative or additional explanations or factors are controlled for. Next, we turn to a graphical depiction of the expected probability of a search by officer sex for each agency where other values are held to their means or modes for each agency (Figure 2).

Figure 2 highlights that while conducting a search is unlikely, similar patterns are seen as in the simple bivariate case. If a male officer is conducting the stop, it is much more likely that a driver or his or her car will be searched.

In addition to evaluating the expected probabilities, we can examine the relative odds of a search being conducted. In the Charlotte Police Department, if a man is conducting the traffic stop as compared to a woman, the driver is about 225% more likely to be searched (Model 1). In the Florida Highway Patrol, the relative difference is even larger: Male officers are over 272% more likely to conduct a search than female officers in the same context (Model 2).

In addition to the regressions shown here, we test alternative explanations for whether and how officer sex might relate to behavior in the SI (pp. 9–14). First, we question whether, as officers gain experience and are further socialized on the force, any sex differences are amplified or dampened (e.g., Chan, Devey, and Doran 2003; Conlon 2004; Reuss-Ianni 1983). Our main result holds even with this interactive specification; we find no interactive relationship between time on the force and officer sex with behavior. This result, however, does not necessarily preclude socialization from influencing this

relationship, as socialization and learning may occur at different points.

Second, we question whether the proportion of women on the force in a given area amplifies or dampens differences in officer behavior. Scholars argue that as women's presence in police forces grows, there are increased opportunities to challenge and chip away at the hypermasculine policing environment (Paoline 2003). This dampening of aggressive policing norms may manifest in differences between women and men. Again, we find no evidence of an interactive relationship, and our main result holds.

Third, we test whether the initial stop purpose moderates the relationship. In our data, we see that men stop more drivers compared to women; in the FHP, women stop an average of 294 cars per year, whereas men stop an average of 465 cars per year. Additionally, the distribution of stop purposes between officers of each sex modestly differs; in the FHP, 56.65% of stops made by women are investigatory in nature, whereas 53.51% of stops made by men are. When respecified to look only at investigatory stops, our main results hold.

Finally, we question whether this relationship is conditioned by driver sex (Baumgartner et al. 2020). Here, we interact driver sex and officer sex. As with our other specifications, our main result holds, and we find no consistent interactive relationship.

In sum, we find that female officers conduct searches at a lower rate than male officers, all else equal, which supports the perspective that women bring a distinct style of policing to the force. This indicates that women may retain their community-oriented view of policing, people-oriented and caring approaches, and superior communication skills even in the face of training and agency norms aimed at creating uniformity (Chan, Doran, and Marel 2010; Kakar 2002; Morash and Haarr 2012). In turn, they conduct fewer searches and subject fewer drivers to more intrusive and harsher interactions with the law. However, these findings leave a significant question unanswered: Do these differences in search rates mean that female officers find and confiscate less contraband?

#### From Differential Search Rates to Differential Hit Rates

To test whether differences in search rates represent an effectiveness trade-off, we examine how often discretionary searches bear fruit and how much contraband is recovered. As others have highlighted (e.g., Mum-

molo 2018), one main purpose of discretionary searches is to find contraband. Further, whether contraband is found is a more objective measure of whether a search is fruitful, as it is subject to comparatively less officer discretion. The types of items typically confiscated under the label of "contraband" include drugs, illegal weapons, alcohol, and abnormally large sums of money.

One potentially negative effect of women's lower search rates is that even if they find contraband at an equal rate to men, they would necessarily confiscate less contraband because they conduct fewer searches. Thus, a potential downside of women's lower search rates may be that more contraband stays on the street when female officers are on duty compared to male officers. However, one potentially positive effect of women's lower search rates is that they expose fewer drivers to negative police interactions. Thus, a potential upside of women's lower search rates may be that fewer members of the public lose their trust in the police, see the government as less legitimate, and are demobilized toward government due to negative interactions with the police (e.g., Baumgartner, Epp, and Shoub 2018; Epp, Maynard-Moody, and Haider-Markel 2014; Lerman and Weaver 2014; Weaver and Lerman 2010; White 2019).

#### **Evaluating Differences in Contraband Hits**

To evaluate whether there is a trade-off between lower search rates and effectiveness, we turn to testing whether male and female officers are more or less successful at finding contraband. Of the two data sources we evaluated in the first section, only one provides us with information on whether contraband is found: the Florida Highway Patrol. As such, the following analysis focuses on the FHP. To provide a preliminary look at whether there are differences in who finds contraband following a search, we examine the relative contraband hit rates of officers of each sex and test whether the observed difference is statistically significant using a difference-of-proportions test (Table 3).

Table 3 shows that male officers find contraband approximately 29.9% of the time, whereas female officers find contraband approximately 41.5% of the time. This 11.6% difference is statistically significant at the .05 level, which indicates that female officers seem to be more accurate when deciding to search. This finding is replicated if we conduct a more stringent test by exactly matching based on everything but officer sex and then conduct a simple paired t-test (see SI pp. 4–5 for results and more details).

TABLE 3 Contraband Hit Rates by Officer Sex (Florida Highway Patrol)

Officer Sex	Searches	Contraband	Contraband Hit Rate	Difference
Male	16,422	4,911	0.299	$-0.116^*$
Female	272	113	0.415	
Total	16,694	5,024	0.30	

*Note*: Statistical significance is based on the results of a difference-of-proportions test. \*p < .05.

While this analysis shows that female officers find contraband at a higher rate than male officers, it does not control for any other factors that may also be related to the probability of finding—or the (relative) frequency of finding—contraband. As in the previous section and analysis, a variety of other factors may be related to the probability a given driver has contraband—and here more precisely the rate at which an officer finds contraband. To mirror the analysis from the previous section, we include the same (or equivalent) controls. From the FHP data set, we construct three measures to capture whether contraband is found and the rate at which a given officer, in a given circumstance, finds contraband. The first is a direct extension of the previous analysis: We predict whether contraband is found following a discretionary search, where the unit of analysis is still the individual stop. As in the previous analysis, we estimate an OLS regression and include the same control variables.<sup>7</sup>

We then collapse the data set to generate two measures that capture the rate at which an officer finds contraband in a given context. The first is the rate contraband is found per 10 searches conducted, and the second is the rate contraband is found per 100 stops made. To generate these measures and facilitate the inclusion of the desired control variables, the number of stops, searches, and searches producing contraband are counted by officer-unique identifier, officer race, officer sex, whether an officer has more than the mean number of years of experience, whether an officer is older than the mean officer age, driver race and sex, whether a driver is older/younger than 30 or older than 64, whether the car had out-of-state license plates, whether the initial stop purpose was investigatory in nature, year of the stop, and time of day of the stop. Each is predicted using OLS regression. These regressions allow for us to more fully and reliably evaluate whether female officers find contraband at a higher, a lower, or the same rate compared to male officers and whether they find more, less, or the same amount of contraband. Table 4 shows the results of these

regressions.

Between the first two models in Table 4, we see that female officers are more likely to find contraband following a search: Women are 10% more likely to find contraband on average, all else equal, when conducting any given search (Model 1, Table 4). The substantive significance of this is better seen if we turn to the second model in Table 4: Women are expected to find one additional car or driver with contraband per 10 searches compared to male officers. Both of these results are statistically significant at the .05 level and are substantively similar to the difference detected in the difference-of-proportions test conducted (Table 3).

While the first two models support the proposition that female officers are more efficient, there is still an open question of whether this results in more, less, or the same amount of contraband being taken off the roadways. For this, we turn to Model 3 in Table 4. Here, we see a negative, statistically significant coefficient associated with female officers, which seems to indicate that women recover less contraband than men. However, solely looking at the statistical relationship obscures the relatively small substantive relationship. Male officers are expected to find contraband approximately 0.08 more times per 100 stops than female officers. If rounded, this becomes zero times per 100 stops. Additionally, if adjusted for how many stops the average man and woman make— 465 versus 294 stops per year per officer on average we would still expect men to find contraband only 0.65 times per year on average given their average number of stops, whereas women would find contraband 0.18 times per year on average given their average number of stops made. In essence, both men and women are expected to find little or no contraband while conducting traffic stops on average, which indicates a negligible substantive relationship between officer sex and contraband hit rate per 100 stops. Further, the statistically significant relationship disappears if officer effects are included in the model, which indicates that the statistical relationship is unstable.

As with our previous analysis, we are concerned that our modeling strategy and the exclusion of possible

<sup>&</sup>lt;sup>7</sup>As before, we respecify this as a logistic regression, which is shown in the SI (pp. 5–8). The substantive and statistical results do not change.

TABLE 4 OLS Regressions Explaining Probability and Frequency of Finding Contraband

	(1)	(2)	(3) Hit Rate per
	<b>Pr(Contraband</b>	Hit Rate per	
	Found Search)	10 Searches	100 Stops
Female officer	0.103*	1.122*	$-0.077^{*}$
	(0.029)	(0.276)	(0.012)
Intercept	$0.112^{*}$	0.301	$0.138^{*}$
	(0.042)	(0.215)	(0.018)
Controls	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
County fixed effects	Yes	No	No
$R^2$	0.135	0.131	0.004
Adjusted $R^2$	0.127	0.128	0.004
N	12,782	9,677	747,784

*Note*: In Model 1, each observation is an individual stop. In Models 2 and 3, each observation is an individual officer operating in a specified context (e.g., white female driver stopped for safety reasons). \*p < .05.

interactive relationships may shape our results. To test this, we run a similar set of robustness checks as in the previous section. These alternative specifications do not alter the statistical or substantive relationship identified in the first or second models explaining hit rates conditional on a search occurring, but the relationship between the hit rate per stops (i.e., results shown in Model 3 in Table 4) is unstable. For these, see the online appendix (SI, pp. 15–16).

In sum, we find support for the claim that female police officers find contraband at a higher rate when conducting searches, all else equal (Models 1–2 in Table 4), and that they *substantively* find no less contraband overall when stopping cars (Model 3 in Table 4). Put simply, female (FHP) officers appear to be more effective in this respect.

#### **Discussing Differences in Contraband Hits**

Results of the preceding analysis are striking. First, we see that when female officers decide to conduct a search, the probability that thatsearch bears fruit is significantly higher than when male officers conduct a search. Moreover, we see that they are more accurate and confiscate approximately the same net amount of contraband compared to male officers, suggesting that on nearly every dimension female officers are more effective than comparable men. One potential explanation for our findings may have to do with male and female officers having a different orientation toward their jobs.

Scholars who support that argument for differences in men's and women's policing behaviors often discuss female officers as more community oriented in their duties (Lopez 2006). This orientation is thought to alter the behaviors of female officers, such that they are more likely to engage in activities that will support and maintain community trust and values. In more concrete terms, with respect to traffic stop interactions, we would expect those who are more community oriented (i.e., women) to be less likely to engage in harsh negative actions with citizens (i.e., conduct searches and make arrests at a lower rate but be more fruitful when doing so), which is what is observed in this study. Thus, one feasible explanation for our findings may be that female officers are more concerned with being "correct" when they make the decision to conduct a search. This difference in decision calculus would help to explain our finding that though women conduct fewer searches, they outperform men on nearly every metric of effectiveness we use in this article. Though we are unable to delineate the effects of a communal style of policing in the present analysis, we view this as a fruitful opportunity for future research.

#### **Discussion and Conclusion**

Since 2000, the number of female police officers in the United States has more than doubled (U.S. Department of Justice 2010). At the same time, political science has increasingly focused its attention on the role that policing plays in American politics. Scholars in this vein find

that negative interactions with the police depress voter turnout and delegitimize the political system in the eyes of citizens (Gibson and Nelson 2018; Mondak et al. 2017; Weitzer and Tuch 2006). Increasingly, this work has turned to examining how the identities of citizens and officers intersect to shape interactions between these two groups. Yet despite the increasing number of female officers on the force, political science has yet to gain a comprehensive understanding of how officer sex shapes interactions with everyday citizens, and whether there are appreciable differences in how men and women carry out their duties. This omission is unfortunate, as understanding whether women engage in policing differently has important implications for how citizens interact with, and ultimately respond to, the criminal justice system.

To address this gap in our understanding, we used data from millions of traffic stops in Charlotte, North Carolina, and the state of Florida. Using these data, we were able to examine whether male and female officers were more likely to engage in a search following a routine traffic stop. We find that differences do exist in search rates, such that female officers are far less likely to conduct a search following a traffic stop compared to male officers. Though our initial results provide evidence that male and female officers do their jobs differently, the normative implications of this finding were unclear. On the one hand, the fact that female officers were less likely to conduct searches could be seen as reducing the frequency and intensity of negative police-citizen interactions. Given the corrosive effects these interactions can have on citizens' participation and democratic legitimacy, the reduction of such interactions could be seen as positive. On the other hand, fewer searches could lead to lower levels of contraband confiscation, meaning that more illicit and dangerous items remain on the streets.

To investigate whether such a trade-off exists, we conducted a follow-up analysis to examine whose searches bear fruit among the officers in our data. This analysis provides virtually no evidence of such a trade-off. To the contrary, our analysis indicates that female officers are more adept at their jobs in nearly all respects. Though female officers search at a lower rate than male officers, when they do decide to conduct a search it is more likely that the search will bear fruit. In other words, female officers conduct fewer unnecessary searches. Moreover, in raw terms, female officers substantively confiscate just as much contraband as male officers. Thus, there appears to be no trade-off between the lighter touch employed by female officers and their job effectiveness. This finding has important implica-

tions both for the academic literature on policing and for practitioners.

Our findings have implications for a number of literatures. First, this research contributes to the growing literature in political science on policing. Previous research has examined how citizen characteristics and officer characteristics (notably race) intersect to shape citizen-police interactions. This research indicates that citizen characteristics play a large role in shaping these interactions, and in some cases officer characteristics such as race can play a role as well, suggesting that identity has the potential to play a large role in structuring citizen interactions with the police. Yet, despite growing numbers of female officers, our understanding of how this identity structures these interactions is limited. This is particularly unfortunate because fields such as sociology and criminology have pointed to the role of officer sex in policing. The findings here bridge the gap between this work in other disciplines and political science, providing a comprehensive view of how sex shapes officer behavior, and provides insights into the consequences of these differences. These findings, however, do not mean that simply increasing the number of women on the force will wholly address issues of overpolicing and racially disparate policing. Rather, further understanding differences in behavior between male and female officers, and their sources, may help us understand what types of policies could be implemented to additionally address these problems.

Second, this study also provides insights into the theory of representative bureaucracy. Research on bureaucratic representation often assumes that female bureaucrats behave differently from their male counterparts when they are dealing with a women's issue; in this perspective, women's representation only matters in a gendered policy area. By showing significant differences between men and women in traffic stop and search behavior, our study highlights that officer sex matters not only in a gendered area, such as sexual assault reports (Meier and Nicholson-Crotty 2006) or child support enforcement (Wilkins and Keiser 2006), but also in a nongendered policy area. Our findings also echo previous work showing increased women's representation relates to citizens' willingness to cooperate with the agency in a nongendered area such as recycling (Riccucci, Van Ryzin, and Li 2016). In sum, our results suggest that having more female officers in bureaucratic agencies may bring more policy benefits in various contexts.

Third, our findings have important implications for the literature on women and politics. Women and politics scholars often examine questions related to women's descriptive representation, substantive outcomes, and symbolic attitudes among members of the public (e.g., Schwindt-Bayer and Mishler 2005). This framework is most frequently applied to the study of elected public officials, their actions, and how citizens respond to these officials. Our research extends this framework to the study of non-elected government agents, which builds a bridge between traditional women and politics scholarship and representative bureaucracy theory in public administration. Though our findings speak only to the link between descriptive and substantive representation, existing research indicates that women's presence on police forces also shapes how citizens view and judge a law enforcement agency. Research finds that increased representation of women in the agencies influences the extent to which agencies are viewed as trustworthy, fair, and high performing (Riccucci, Van Ryzin, and Lavena 2014) and in turn influences citizens' willingness to coproduce public services (Riccucci, Van Ryzin, and Li 2016). Coupled with our results, this research suggests that women's inclusion can have widespread ramifications for public trust in the police by providing better outcomes for citizens and shifting the lens through which agencies are viewed.

Police—citizen interactions can shape how citizens view the government's legitimacy, which, in turn, can influence political behavior and their willingness to comply (Burch 2013; Lerman and Weaver 2014; Riccucci, Van Ryzin, and Jackson 2018). Police officers directly interact with citizens, and their predispositions, attitudes, and behaviors are important in understanding law enforcement and improving police—community relations. The findings of this study highlight that female officers engage in policing activities differently than male officers and suggest that diversifying police forces can produce more positive police—citizen interactions. This study offers a route toward understanding the effects of policing and important implications for American democracy.

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#### **Supporting Information**

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix A: Full Regression Result

**Appendix B:** Exact Matching Analysis (Paired T-Tests)

**Appendix C:** Alternative Specifications of the Models

**Appendix D:** Testing Conditional or Interactive Relationships

**Appendix E:** A Conservative Test with the Charlotte Police Department