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1 Data Description and Difficulties

The Law Enforcement Management and Administrative Statistics (LEMAS) data series is just one source of information on local law enforcement agencies published by the Bureau of Justice Statistics (BJS). One drawback is that it only includes a select sample of all agencies across the country in each year.

The other potential source from BJS is the Census Of State And Local Law Enforcement Agencies (CSLLEA), a data series that surveys *all* state and local law enforcement agencies in the United States. Though this would be the ideal setting to test our hypotheses, CSLLEA does not record detailed, administrative data on each of these agencies. Therefore, LEMAS, while limited in scope, provides the only reliable source of fine-grained administrative data for the purposes of this paper. And, LEMAS gathers the sample of agencies from the CSLLEA, effectively sampling the full universe of local law enforcement agencies across the country.

One potential concern about this data is that it comes from self-reported survey answers. In 2013, the survey questionnaire was sent to over 3,330 law enforcement agencies in the country (those in the 2008 Bureau of Justice Statistics' Census of State and Local Law Enforcement Agencies). In that year, 86% of the questionnaires were returned with complete responses. We have no reason to think that the gender composition of agencies would influence response rates. We cannot be certain, but are confident that the agencies that reported are a reasonable and random sample of those initially surveyed by LEMAS.

The other potential issue with the data is that it collects data from a nationally representative sample of state and local law enforcement agencies in the United States each year, so the agencies sampled in each year are distinct from the agencies sampled in the previous year. This means, for example, that we have agencies represented anywhere from 1 to 9 times (one year to 9 years of data). Of the 10,953 unique agencies in the 23,095 observation dataset, about 59% of the agencies are only represented once, with 19% represented twice and about 21% represented three or more times. This sampling strategy is "designed to be representative of all general purpose state and local law enforcement agencies in the United States, with separate samples drawn of local police departments and sheriffs' offices" (LEMAS 2013). So, while it is not a consistent sample year-by-year, it is designed to provide an accurate snapshot of police departments across the country.

1.1 Matching Difficulties

Though we use the LEMAS data from the years 1987, 1990, 1993, 1997, 2000, 2003, 2007, 2013, and 2016 in the paper, one primary difficulty was matching the records across years. In 2007, 2013, and 2016, BJS began recording Originating Agency Identifiers (ORI's) for agencies. These records are 7-digit unique numbers that identify each unique agency[1], so we are able to link the 2007, 2013, and 2016 records together based on this unique number. The ORI is also vital for our analysis because the arrest and crime data is listed by the agency's ORI: we need an ORI for each agency in the LEMAS data to be able to link it to the crime data.

The remaining years unfortunately do not have an ORI listed. Luckily, the federal government has released a few versions of the Law Enforcement Agency Identifiers Crosswalk (LEAIC), which attempts to link older law enforcement data together using the ORI's they now use in their official records. I take the 1996 (the earliest LEAIC released) and the 2000 LEAIC to link records across the remaining years. The 1987, 1990, and 1993 data were linked to the 1996 crosswalk and the 1997, 2000 and 2003 were linked to the 2000 crosswalk. This helped us identify an ORI for the agencies in the years that that number was not recorded.

But, how do we match the LEAIC records with LEMAS records? We simply match *on name only* for each agency. For the most part, this was straightforward and the matching happened easily. For quite a few agencies, however, the matching was more difficult. An agency that might be listed as 'ABILENE POLICE DEPT' in one year for example, could be listed as any of the following in other years: 'ABILENE POL DEPT', 'ABILENE P D', 'ABILENE POLICE DEP', 'ABILENE POLICE DEPART,' among other perturbations of that phrase. To match across years, then, we replaced all 'POLICE DEPARTMENT' perturbations with 'POLICE DEPT' in all years for both LEMAS and LEAIC. We had a similar issue with county sheriff's departments. 'ABBEVILLE COUNTY SHERIFF'S DEPT,' for example, could be listed as any of the following: 'ABBEVILLE COUNTY SHERIFF S OFF', 'ABBEVILLE COUNTY SHERIFFS OFC', 'ABBEVILLE COUNTY SHERIFF OFFICE', 'ABBEVILLE COUNTY SHERIFFS DEPARTMENT', among others. We

[1]For example, the ORI for Abbeville County Sheriff's Department in South Carolina is SC00100 and the ORI for Abilene Police Department in Texas is TX22101.

standardized this to be 'COUNTY SHERIFFS DEPT' across all years in LEMAS and LEAIC. We do however recognize there is a legal difference between the term 'County Sheriff's Office' and 'County Sheriff's Department,' with the former referring to a body with independent sovereignty and the latter referring to a subordinate unit of government that is subject to a county governing body.[2] Though this is an important distinction in theory, we standardize the names for data matching purposes only, to ensure we are correctly matching across years.

A final issue comes from the 1987 and 1990 data. In those years, quite a few of the LEMAS records simply list 'POLICE DEPT' or 'COUNTY SHERIFFS DEPT' as the name of the agency, without the appropriate location name attached. Because it would take far too much subjective judgment to try and code which police department or county sheriff's department the LEMAS data was referring to, we simply cannot match these data to the LEAIC crosswalk. As best as we can tell, these generic names comprise over 2,000 records[3] in our final dataset of over 23,000, about 9% of the data. Though this is not ideal, there is little we can do to fix those names without introducing massive human error into the name coding.

After thoroughly checking the names of these agencies by hand, we match 15,296 of the 18,136 records in the data from the years 1987, 1990, 1993, 1997, 2000, and 2003, over 84% of the data. While this isn't perfect, we corrected as many of the standardization issues[4] as we could (see above) and we believe this final dataset provides us a fairly comprehensive dataset to estimate our models.

Our final dataset is comprised of 23,095 observations, with approximately 2,000-3,000 observations per LEMAS year. Over 10,000 unique law enforcement agencies (as identifed by ORI) are represented in this final sample.

1.2 Linking LEMAS and Crime and Arrest Data

Next, our task was to connect the final, cleaned LEMAS data with the arrest and crime data in each of the years listed above - 1987, 1990, 1993, 1997, 2000, 2003, 2007, 2013, and 2016. For crime data, we use the Offenses Known and Clearances by Arrest series, that lists the crimes reported by month to each agency. We aggregate to the year and link this data with LEMAS data using ORI. Similarly, the arrests data comes from the Uniform Crime Reporting Program: Arrests by Age, Sex, and Race, Summarized Yearly, also linked to the LEMAS data through ORI.

Our final dataset contains 23,095 observations, with information on the percent of officers that are female and our primary outcome measure, rape arrest rates, among other demographic and control variables.

[2]For more on this, see `https://www.sheriffs.org/sites/default/files/tb/SheriffsOfficevSheriffsDepartment.pdf`.

[3]This refers to records that list the following as agency names: 'POLICE DEPT', 'COUNTY SHERIFFS DEPT', 'CITY POLICE DEPT', 'CAMPUS POLICE DEPT', 'CAMPUS POLICE DEPT FORCE', 'CAMPUS SECURITY', 'CAMPUS SECURITY FORCE', 'CAMPUS SECURITY POLICE DEPT', 'AIRPORT POLICE DEPT', 'AIRPORT PUBLIC SAFETY', 'CONSTABLE OFFICE' 'CONSTABLES OFFICE', 'DEPT OF PUBLIC SAFETY', 'PARISH SHERIFFS DEPT', 'PUBLIC SAFETY DEPT', 'SCHOOL POLICE DEPT', 'TOWN POLICE DEPT', 'TWP POLICE DEPT', 'UNIVERSITY POLICE DEPT', 'VILLAGE POLICE DEPT'. There were other generic names as well, though these were the most common and represent over 2,000 observations in the data.

[4]Other syntax issues we fixed include: we removed all apostrophes, we deleted all references to 'CITY'; 'TOWN'; 'VILLAGE'; or 'MUNICIPAL' as these words were listed in some years of data and not in others, replaced any 'METROPOLITAN' with 'METRO', replaced all references to a public safety department with 'DEPT OF PUBLIC SAFETY', and for the 1996 data, the state postal code for Nebraska was erroneously listed as NB, so we fixed it to reference the correct postal code of NE.

2 Correlation Matrix

	Rape Arrest Rate	% Female Sworn	Total # Employees	% Black Officers	Rape Report Rate	Sheriff	Budget	Community Policing
		% Female Sworn	Total # Employees	% Black Officers		Sheriff	Budget	
Rape Arrest Rate	1.00	0.03	0.03	0.08	0.47	-0.02	0.01	0.01
% Female Sworn Officers	0.03	1.00	0.11	0.24	0.09	0.12	0.13	0.08
Total # Employees	0.03	0.11	1.00	0.12	0.05	-0.01	0.86	0.07
% Black Officers	0.08	0.24	0.12	1.00	0.11	-0.01	0.11	0.03
Rape Report Rate	0.47	0.09	0.05	0.11	1.00	-0.12	0.03	0.08
Sheriff	-0.02	0.12	-0.01	-0.01	-0.12	1.00	0.02	-0.14
Budget	0.01	0.13	0.86	0.11	0.03	0.02	1.00	0.08
Community Policing	0.01	0.08	0.07	0.03	0.08	-0.14	0.08	1.00

Table 1: Correlation Matrix

3 Different Independent Variable: Number of Female Officers

Table 2 uses the number of female officers. The results are substantively the same as those reported in the main body of the paper, though Column 3 does highlight a *negative* relationship between female officers and rape reports.

Table 2: The Effect of Female Police on Rape Report and Arrest Rates, 1987-2016: Using the Number of Female Officers

	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate
	(1)	(2)	(3)	(4)	(5)	(6)
No. Female Officers	0.012^{***}	0.005^{***}	-0.039^{***}	0.005	-0.001	0.008^{**}
	(0.002)	(0.001)	(0.009)	(0.004)	(0.009)	(0.004)
Total Agency Employees			0.007^{***}	-0.001	-0.001	-0.001
			(0.001)	(0.001)	(0.001)	(0.001)
Logged Agency Budget					2.906^{***}	-0.186^{**}
					(0.224)	(0.092)
Perc. Black Officers			0.422^{***}	0.060^{***}	0.231^{***}	0.035^{**}
			(0.031)	(0.013)	(0.035)	(0.014)
Rape Report Rate				0.220^{***}		0.171^{***}
				(0.003)		(0.004)
Sheriff			-11.203^{***}	1.126^{***}	-11.695^{***}	0.948^{**}
			(0.728)	(0.301)	(0.912)	(0.373)
Community Policing					2.470^{***}	-0.068
					(0.842)	(0.342)
N	14,980	15,826	14,980	14,980	9,919	9,919
R^2	0.006	0.021	0.036	0.246	0.050	0.161
Adjusted R^2	0.006	0.021	0.035	0.245	0.049	0.160
Residual Std. Error	37.297 (df = 14970)	17.199 (df = 15816)	36.743 (df = 14967)	15.067 (df = 14966)	35.118 (df = 9908)	14.262 (df = 9907)

$^{*}p < .1$; $^{**}p < .05$; $^{***}p < .01$
Year dummy variables included.

4 Different Dependent Variables

4.1 Number of Rape Arrests

Table 3 uses the number of rape arrests in place of the rate.

Table 3: The Effect of Female Police on Rape Arrests, 1987-2016

	Number of Rape Arrests		
	(1)	(2)	(3)
Perc. Female Officers	0.462^{***}	0.100^{***}	0.049^{**}
	(0.030)	(0.021)	(0.024)
Total Agency Employees		0.026^{***}	0.020^{***}
		(0.0002)	(0.0002)
Logged Agency Budget			1.602^{***}
			(0.107)
Perc. Black Officers		0.164^{***}	0.100^{***}
		(0.017)	(0.017)
Rape Report Rate		0.083^{***}	0.042^{***}
		(0.004)	(0.005)
Sheriff		-2.890^{***}	-2.868^{***}
		(0.399)	(0.429)
Community Policing Component			-0.571
			(0.393)
N	15,826	14,980	9,919
R^2	0.021	0.558	0.561
Adjusted R^2	0.021	0.558	0.561
Residual Std. Error	29.331 (df = 15816)	19.752 (df = 14966)	16.339 (df = 9907)

$^{*}p < .1$; $^{**}p < .05$; $^{***}p < .01$
Year dummy variables included.

4.2 Rate of All Reported Arrests

Table 4 uses the rate of all reported arrests.

Table 4: The Effect of Female Police on All Crimes Arrest Rates, 1987-2016

	All Crimes Arrest Rate		
	(1)	(2)	(3)
Perc. Female Officers	30.576***	−9.246	−3.469
	(9.494)	(7.450)	(6.143)
Total Agency Employees		−0.119*	0.080
		(0.070)	(0.053)
Logged Agency Budget			−298.776***
			(28.067)
Perc. Black Officers		−17.899***	−27.511***
		(5.952)	(4.545)
Rape Report Rate		4.510***	6.757***
		(1.612)	(1.358)
Sheriff		881.440***	705.647***
		(140.689)	(113.187)
Community Policing Component			−115.726
			(102.701)
Violent Crime Rate		0.725***	1.047***
		(0.041)	(0.053)
Property Crime Rate		1.055***	1.021***
		(0.015)	(0.014)
N	14,980	14,897	9,864
R^2	0.008	0.449	0.720
Adjusted R^2	0.007	0.448	0.719
Residual Std. Error	9,163.584 (df = 14970)	6,846.855 (df = 14881)	4,261.862 (df = 9850)

*p < .1; **p < .05; ***p < .01
Year dummy variables included.

4.3 Property Crime Arrests and Reports

Table 5 uses property crime arrest rates and reports.

Table 5: The Effect of Female Police on Property Crime Arrest and Report Rates, 1987-2016

	PC Report Rate	PC Arrest Rate	PC Report Rate	PC Arrest Rate	PC Report Rate	PC Arrest Rate
	(1)	(2)	(3)	(4)	(5)	(6)
Perc. Female Officers	26.322***	1.860*	27.858***	0.052	7.149	0.682
	(5.090)	(1.091)	(5.196)	(0.870)	(7.635)	(0.633)
Total Agency Employees			0.158***	−0.020**	−0.109	−0.020***
			(0.049)	(0.008)	(0.066)	(0.006)
Logged Agency Budget					304.648***	−3.295
					(34.518)	(2.873)
Perc. Black Officers			42.859***	−2.670***	36.271***	−2.298***
			(4.095)	(0.688)	(5.453)	(0.453)
Property Crime Report Rate				0.153***		0.149***
				(0.001)		(0.001)
Sheriff			−2,270.312***	−109.684***	−1,817.969***	−117.305***
			(96.095)	(16.373)	(138.271)	(11.562)
Community Policing					205.142	7.587
					(127.622)	(10.581)
N	14,933	15,826	14,933	14,933	9,887	9,887
R^2	0.025	0.018	0.069	0.482	0.042	0.772
Adjusted R^2	0.024	0.017	0.068	0.482	0.041	0.772
Residual Std. Error	4,907.091 (df = 14923)	1,083.968 (df = 15816)	4,794.673 (df = 14920)	802.047 (df = 14919)	5,304.572 (df = 9876)	439.721 (df = 9875)

*p < .1; **p < .05; ***p < .01
Year dummy variables included.

4.4 Violent Crime Arrests and Reports (No Rape)

Table 6: The Effect of Female Police on Violent Crime Arrest and Report Rates (No Rape Included), 1987-2016

	VC Report Rate	VC Arrest Rate	VC Report Rate	VC Arrest Rate	VC Report Rate	VC Arrest Rate
	(1)	(2)	(3)	(4)	(5)	(6)
Perc. Female Officers	14.354***	2.249***	8.842***	0.331	2.026	−0.544*
	(1.940)	(0.380)	(1.962)	(0.375)	(2.054)	(0.294)
Total Agency Employees			0.072***	0.011***	−0.029	0.005*
			(0.018)	(0.004)	(0.018)	(0.003)
Logged Agency Budget					116.047***	−0.294
					(9.291)	(1.338)
Perc. Black Officers			33.869***	1.751***	30.908***	−1.207***
			(1.547)	(0.300)	(1.469)	(0.214)
Violent Crime Report Rate				0.087***		0.154***
				(0.002)		(0.001)
Sheriff			−773.631***	0.143	−637.272***	38.121***
			(36.279)	(7.039)	(37.222)	(5.398)
Community Policing					74.096**	−3.051
					(34.347)	(4.909)
N	14,943	15,826	14,943	14,943	9,896	9,896
R^2	0.012	0.010	0.074	0.200	0.109	0.561
Adjusted R^2	0.011	0.009	0.074	0.199	0.108	0.561
Residual Std. Error	1,871.161 (df = 14933)	377.710 (df = 15816)	1,810.909 (df = 14930)	346.014 (df = 14929)	1,428.446 (df = 9885)	204.095 (df = 9884)

*p < .1; **p < .05; ***p < .01
Year dummy variables included.

4.5 Rape Clearance Rates

Table 7 uses the rape clearance rate (the number of rapes cleared by agencies in each year per 100,000 jurisdiction population) as an alternative dependent variable in lieu of rape arrest rates. The results are consistent.

Table 7: The Effect of Female Police on Rape Report and Clearance Rates, 1987-2016

	Rape Report Rate	Rape Clearance Rate	Rape Report Rate	Rape Clearance Rate	Rape Report Rate	Rape Clearance Rate
	(1)	(2)	(3)	(4)	(5)	(6)
Perc. Female Officers	0.413^{***}	0.152^{***}	0.384^{***}	-0.008	0.203^{***}	-0.019
	(0.039)	(0.021)	(0.040)	(0.016)	(0.050)	(0.021)
Total Agency Employees			0.001^{***}	0.0003^{**}	-0.001^{**}	0.0003
			(0.0004)	(0.0001)	(0.0004)	(0.0002)
Logged Agency Budget					2.717^{***}	-0.158^{*}
					(0.228)	(0.093)
Perc. Black Officers			0.340^{***}	-0.008	0.196^{***}	-0.012
			(0.031)	(0.012)	(0.036)	(0.015)
Rape Report Rate				0.385^{***}		0.354^{***}
				(0.003)		(0.004)
Sheriff			-12.329^{***}	0.092	-11.982^{***}	0.114
			(0.734)	(0.294)	(0.913)	(0.375)
Community Policing					2.308^{***}	0.219
					(0.843)	(0.343)
N	14,980	14,976	14,980	14,976	9,919	9,915
R^2	0.012	0.012	0.040	0.497	0.052	0.443
Adjusted R^2	0.012	0.012	0.040	0.496	0.051	0.442
Residual Std. Error	37.184 (df = 14970)	20.418 (df = 14966)	36.653 (df = 14967)	14.575 (df = 14962)	35.089 (df = 9908)	14.273 (df = 9903)

*p < .1; **p < .05; ***p < .01
Year dummy variables included.

5 Adding Fixed Effects and Clustered Standard Errors

5.1 State

We add state fixed effects and clustered standard errors to the estimation. The results, in Table 8, are largely similar to the main paper, although they add further doubt that female officers would *increase* the arrest rate for rape as the association is largely negative.

Table 8: The Effect of Female Police on Rape Report and Arrest Rates, 1987-2016: Adding State Fixed Effects and State Clustered Standard Errors

	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate
	(1)	(2)	(3)	(4)	(5)	(6)
Perc. Female Officers	0.304^{***}	0.044^{*}	0.284^{***}	-0.048^{***}	0.088	-0.050^{**}
	(0.063)	(0.025)	(0.062)	(0.017)	(0.069)	(0.022)
Total Agency Employees			0.002	0.0001	-0.001^{**}	0.0003
			(0.001)	(0.0002)	(0.0005)	(0.0002)
Logged Agency Budget					3.775^{***}	-0.388^{**}
					(0.540)	(0.153)
Perc. Black Officers			0.351^{***}	0.049^{*}	0.179^{***}	0.030
			(0.090)	(0.024)	(0.060)	(0.023)
Rape Report Rate				0.227^{***}		0.179^{***}
				(0.021)		(0.021)
Sheriff			-15.020^{***}	1.687^{*}	-15.893^{***}	1.286
			(1.066)	(0.912)	(1.157)	(0.848)
Community Policing Component					2.652^{**}	-0.123
					(1.039)	(0.320)
N	14,980	15,826	14,980	14,980	9,919	9,919
R^2	0.076	0.046	0.110	0.265	0.147	0.185
Adjusted R^2	0.073	0.043	0.107	0.262	0.142	0.180
Residual Std. Error	36.019 (df = 14921)	17.004 (df = 15767)	35.352 (df = 14918)	14.903 (df = 14917)	33.372 (df = 9860)	14.090 (df = 9859)

*p < .1; **p < .05; ***p < .01
State and year dummy variables included. SEs clustered by state.

5.2 County

Second, we include county FIPS code fixed effects and clustered standard errors. The results are substantively similar to those in the main body of the paper.

Table 9: The Effect of Female Police on Rape Report and Arrest Rates, 1987-2016: Adding County Fixed Effects and County Clustered Standard Errors

	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate
	(1)	(2)	(3)	(4)	(5)	(6)
Perc. Female Officers	0.238^{***}	0.049^{*}	0.207^{***}	-0.028	0.077	-0.060^{**}
	(0.056)	(0.025)	(0.060)	(0.021)	(0.063)	(0.026)
Total Agency Employees			0.004^{**}	0.0004	-0.001	0.0002
			(0.002)	(0.0003)	(0.001)	(0.0002)
Logged Agency Budget					5.887^{***}	0.065
					(0.412)	(0.225)
Perc. Black Officers			0.469^{***}	0.035	0.400^{***}	0.046^{**}
			(0.071)	(0.022)	(0.057)	(0.019)
Rape Report Rate				0.227^{***}		0.158^{***}
				(0.019)		(0.020)
Sheriff			-13.918^{***}	1.377^{*}	-20.253^{***}	0.508
			(0.904)	(0.731)	(1.059)	(0.969)
Community Policing Component					2.651^{***}	-0.179
					(0.833)	(0.338)
N	14,733	15,578	14,733	14,733	9,674	9,674
R^2	0.329	0.302	0.352	0.469	0.494	0.507
Adjusted R^2	0.187	0.161	0.214	0.356	0.336	0.353
Residual Std. Error	33.875 (df = 12156)	16.008 (df = 12962)	33.302 (df = 12153)	14.003 (df = 12152)	29.523 (df = 7371)	12.627 (df = 7370)

*p < .1; **p < .05; ***p < .01
County and year dummy variables included. SEs clustered by county.

5.3 Agency

Because LEMAS is a survey, not all agencies that are included in our data are surveyed more than once. Since more than half of the agencies in the data are only surveyed once, this precludes the use of agency fixed effects or clustered standard errors in our main analysis. We revisit this decision here, by subsetting the data to *only those agencies that are surveyed more than once.* Because that subsetting is likely non-random (those agencies that are surveyed more than once tend to be larger), this analysis is tentative. However, Table 10 does point to an overall null effect of female police on rape arrest rates, or even a slightly *negative* effect. On the other hand, female police appear to be positively associated with rape reports (at least in some specifications), bolstering the main findings.

Table 10: TThe Effect of Female Police on Rape Report and Arrest Rates, 1987-2016: Fixed Effects

	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate
	(1)	(2)	(3)	(4)	(5)	(6)
Perc. Female Officers	0.262^{***}	0.032	0.215^{***}	-0.056^{**}	0.187^{*}	-0.064
	(0.074)	(0.033)	(0.077)	(0.028)	(0.102)	(0.041)
Total Agency Employees			0.006^{**}	0.00000	0.002	0.001
			(0.003)	(0.0004)	(0.002)	(0.001)
Logged Agency Budget					3.234^{***}	-0.211
					(0.607)	(0.255)
Perc. Black Officers			0.134^{**}	0.053^{**}	0.100	0.075^{**}
			(0.062)	(0.025)	(0.075)	(0.033)
Rape Report Rate				0.242^{***}		0.165^{***}
				(0.019)		(0.017)
Sheriff			-1.116	1.052	-1.751	0.837
			(2.669)	(1.214)	(2.833)	(1.358)
Community Policing Component					1.606	0.392
					(1.225)	(0.483)
N	10,119	10,757	10,119	10,119	5,964	5,964
R^2	0.553	0.512	0.554	0.640	0.680	0.742
Adjusted R^2	0.353	0.310	0.355	0.479	0.382	0.501
Residual Std. Error	28.451 (df = 6992)	14.120 (df = 7618)	28.405 (df = 6989)	12.239 (df = 6988)	25.447 (df = 3082)	10.248 (df = 3081)

*p < .1; **p < .05; ***p < .01
Agency and year dummy variables included. SEs clustered by agency.

6 Non-Parametric Measures of Gender Representation

Table 11 adds a squared term of gender representation in the police to the specification. There is a significant and positive association between the percent of female officers and rape reports (as in the main body), but a significant and *negative* association between the squared percent of female officers and rape reports. The converse is true for the rape arrest rates variable. This is intriguing, and could point to the presence of an effect whereby sexual assault victims are more likely to report rapes if they see a lone woman, but not necessarily a police force that is comprised of more women. We can only speculate, however, and further work ought to illuminate these patterns.

Table 11: The Effect of Female Police on Rape Report and Arrest Rates, 1987-2016: Adding a Squared Term

	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate
	(1)	(2)	(3)	(4)	(5)	(6)
Perc. Female Officers	1.185^{***}	0.266^{***}	1.107^{***}	-0.045	0.569^{***}	-0.005
	(0.067)	(0.030)	(0.068)	(0.028)	(0.091)	(0.037)
Perc. Female Officers Sq.	-0.023^{***}	-0.005^{***}	-0.021^{***}	0.0004	-0.010^{***}	-0.0004
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Total Agency Employees			0.001^{**}	0.0002	-0.001^{**}	0.0003
			(0.0004)	(0.0002)	(0.0004)	(0.0002)
Logged Agency Budget					2.348^{***}	-0.200^{**}
					(0.241)	(0.098)
Perc. Black Officers			0.302^{***}	0.067^{***}	0.186^{***}	0.042^{***}
			(0.031)	(0.013)	(0.036)	(0.015)
Rape Report Rate				0.220^{***}		0.171^{***}
				(0.003)		(0.004)
Sheriff			-12.390^{***}	1.229^{***}	-11.866^{***}	0.982^{***}
			(0.730)	(0.304)	(0.913)	(0.375)
Community Policing Component					2.200^{***}	-0.055
					(0.842)	(0.343)
N	14,980	15,826	14,980	14,980	9,919	9,919
R^2	0.025	0.025	0.051	0.246	0.054	0.161
Adjusted R^2	0.025	0.024	0.050	0.245	0.053	0.160
Residual Std. Error	36.941 (df = 14969)	17.168 (df = 15815)	36.450 (df = 14966)	15.067 (df = 14965)	35.051 (df = 9907)	14.265 (df = 9906)

$^{*}p < .1$; $^{**}p < .05$; $^{***}p < .01$
Year dummy variables included.

7 Eliminating Outliers

In the main paper, we note that there are some agencies with 100% female officers, 28 agency-year of our data. We estimate an additional robustness check excluding these outliers from the data. The results are in Table 12 and are substantively similar to those in the main body of the paper.

Table 12: The Effect of Female Police on Rape Report and Arrest Rates, 1987-2016: Excluding All-Female Agencies

	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate
	(1)	(2)	(3)	(4)	(5)	(6)
Perc. Female Officers	0.441^{***}	0.099^{***}	0.414^{***}	-0.031^{*}	0.222^{***}	-0.018
	(0.039)	(0.018)	(0.041)	(0.017)	(0.051)	(0.021)
Total Agency Employees			0.001^{***}	0.0002	-0.001^{**}	0.0003
			(0.0004)	(0.0002)	(0.0004)	(0.0002)
Logged Agency Budget					2.689^{***}	-0.188^{**}
					(0.229)	(0.094)
Perc. Black Officers			0.333^{***}	0.067^{***}	0.193^{***}	0.042^{***}
			(0.031)	(0.013)	(0.036)	(0.015)
Rape Report Rate				0.220^{***}		0.171^{***}
				(0.003)		(0.004)
Sheriff			-12.437^{***}	1.227^{***}	-12.020^{***}	0.978^{***}
			(0.734)	(0.305)	(0.914)	(0.375)
Community Policing					2.313^{***}	-0.052
					(0.843)	(0.343)
N	14,976	15,822	14,976	14,976	9,917	9,917
R^2	0.013	0.022	0.041	0.246	0.052	0.161
Adjusted R^2	0.012	0.021	0.040	0.245	0.051	0.160
Residual Std. Error	37.172 (df = 14966)	17.194 (df = 15812)	36.642 (df = 14963)	15.069 (df = 14962)	35.087 (df = 9906)	14.266 (df = 9905)

$^{*}p < .1$; $^{**}p < .05$; $^{***}p < .01$
Year dummy variables included.

8 Matched Analysis

One of the potential concerns with our analysis could be concerns that the percent of female officers is correlated with other characteristics that might influence how many rape arrests police departments make or rape reports received: the agency budget, for example. To account for this, we conduct an additional analysis using nearest neighbor matching using `MatchIt` in R. Because the percent female officers variable is a continuous treatment (and conducting a matching algorithm to a continuous treatment is much more complicated), we changed that variable to a binary one, that takes on the value of 1 if the percent of female officers is over 8% (the mean of the data) and 0 otherwise. We matched on the total number of agency employees, whether the agency is a sheriff's department or not, and year.

Our matched sample resulted in 11,974 observations with improved balance on covariates: see Figure 1 for more details.

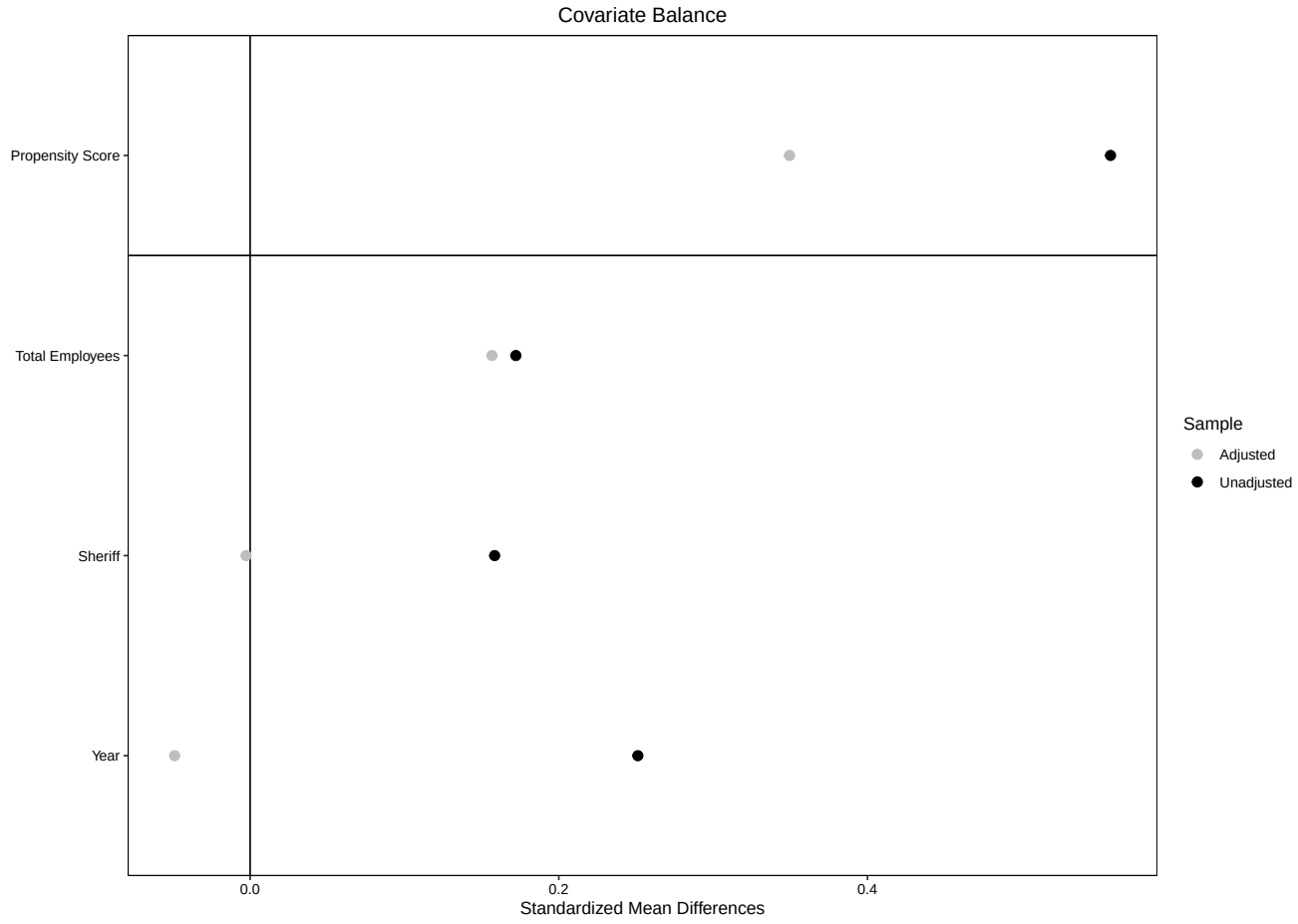

Figure 1

Using the matched dataset, we reestimate the main models using the most common covariates in our data, total employees, rape rate, and the binary indicator for a sheriff's department. The results are in Table 13 below.

The results are substantively similar to those in the main body of the paper. We do find a *negative* effect of female officers on arrest rates and the positive and significant association between female officers and rape reports remains.

Table 13: TThe Effect of Female Police on Rape Report and Arrest Rates, 1987-2016: Matching Analysis

	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate
	(1)	(2)	(3)	(4)
Female Officers Over 8 Perc.	0.269^{***}	0.060^{***}	0.215^{***}	-0.022
	(0.041)	(0.018)	(0.042)	(0.017)
Total Agency Employees			0.001^{***}	0.0002
			(0.0004)	(0.0001)
Perc. Black Officers			0.344^{***}	0.075^{***}
			(0.033)	(0.013)
Rape Report Rate				0.203^{***}
				(0.004)
Sheriff			-14.234^{***}	1.093^{***}
			(0.781)	(0.314)
N	11,968	11,968	11,968	11,968
R^2	0.008	0.028	0.047	0.240
Adjusted R^2	0.007	0.028	0.046	0.239
Residual Std. Error	37.069 (df = 11958)	16.277 (df = 11958)	36.349 (df = 11955)	14.401 (df = 11954)

$^{*}p < .1$; $^{**}p < .05$; $^{***}p < .01$
Year dummy variables included.

9 Data Subsets

9.1 By Year

In 1997, the LEMAS survey slightly changed their weighting strategy. To account for potential differences in this weighting scheme, we estimate subset analyses, first from 1987-1993 and second, from 1997-2016. The results are below. The results are robust to the main findings from the paper. Note: we do not include community policing or logged agency budget in any specification that includes the years 1987-1997 as budget is *not reported* for any agencies in those years (and community policing is only reported 1997 onwards). However, we do include it in the later years if possible. In 2013 and 2016, LEMAS also included information on whether the agency had a domestic violence unit, so we include it in those years as well.

Table 14: The Effect of Female Police on Rape Report and Arrest Rates, 1987-1993

	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate
	(1)	(2)	(3)	(4)	(5)	(6)
Perc. Female Officers	0.183^{**}	0.073^{*}	0.181^{**}	-0.006	0.181^{**}	-0.006
	(0.082)	(0.044)	(0.082)	(0.038)	(0.082)	(0.038)
Total Agency Employees			0.023^{***}	0.0003	0.023^{***}	0.0003
			(0.002)	(0.001)	(0.002)	(0.001)
Perc. Black Officers			0.599^{***}	0.174^{***}	0.599^{***}	0.174^{***}
			(0.115)	(0.053)	(0.115)	(0.053)
Rape Report Rate				0.313^{***}		0.313^{***}
				(0.009)		(0.009)
Sheriff			-11.133^{***}	1.499^{*}	-11.133^{***}	1.499^{*}
			(1.775)	(0.815)	(1.775)	(0.815)
N	2,368	2,379	2,368	2,368	2,368	2,368
R^2	0.002	0.005	0.074	0.346	0.074	0.346
Adjusted R^2	0.001	0.004	0.072	0.344	0.072	0.344
Residual Std. Error	38.034 (df = 2365)	20.546 (df = 2376)	36.664 (df = 2362)	16.701 (df = 2361)	36.664 (df = 2362)	16.701 (df = 2361)

*p < .1; **p < .05; ***p < .01
Year dummy variables included.

Table 15: The Effect of Female Police on Rape Report and Arrest Rates, 1997-2016

	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate
	(1)	(2)	(3)	(4)	(5)	(6)
Perc. Female Officers	0.457^{***}	0.096^{***}	0.413^{***}	-0.020	0.203^{***}	-0.018
	(0.046)	(0.020)	(0.047)	(0.019)	(0.050)	(0.021)
Total Agency Employees			0.001	0.0001	-0.001^{**}	0.0003
			(0.0004)	(0.0002)	(0.0004)	(0.0002)
Logged Agency Budget					2.717^{***}	-0.188^{**}
					(0.228)	(0.093)
Perc. Black Officers			0.278^{***}	0.048^{***}	0.196^{***}	0.042^{***}
			(0.034)	(0.014)	(0.036)	(0.015)
Rape Report Rate				0.198^{***}		0.171^{***}
				(0.004)		(0.004)
Sheriff			-12.603^{***}	1.177^{***}	-11.982^{***}	0.979^{***}
			(0.847)	(0.341)	(0.913)	(0.375)
Community Policing					2.308^{***}	-0.052
					(0.843)	(0.343)
N	11,782	11,973	11,782	11,782	9,919	9,919
R^2	0.013	0.016	0.038	0.216	0.052	0.161
Adjusted R^2	0.013	0.016	0.037	0.215	0.051	0.160
Residual Std. Error	37.351 (df = 11775)	16.378 (df = 11966)	36.885 (df = 11772)	14.699 (df = 11771)	35.089 (df = 9908)	14.264 (df = 9907)

*p < .1; **p < .05; ***p < .01
Year dummy variables included.

Next, we consider subsets by each year separately. The results are below.

Table 16: The Effect of Female Police on Rape Arrest Rates, 1987-2016: Regressions By Year

	Rape Arrest Rate								
	1987	1990	1993	1997	2000	2003	2007	2013	2016
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Perc. Female Officers	0.020	−0.071	−0.252***	−0.004	0.030	0.057	−0.009	−0.015	−0.077*
	(0.043)	(0.063)	(0.069)	(0.057)	(0.052)	(0.063)	(0.045)	(0.034)	(0.040)
Total Agency Employees	0.004***	−0.002	0.001	0.0001	0.0002	0.0004	0.001	0.00005	0.001
	(0.001)	(0.002)	(0.001)	(0.0004)	(0.0002)	(0.001)	(0.001)	(0.0003)	(0.001)
Logged Agency Budget					0.076	−0.115	−0.254	0.002	−0.338
					(0.205)	(0.277)	(0.207)	(0.178)	(0.234)
Perc. Black Officers	0.225***	−1.454	0.186***	0.087**	0.070*	0.028	0.024	0.038	0.054
	(0.046)	(2.608)	(0.044)	(0.040)	(0.036)	(0.040)	(0.027)	(0.025)	(0.037)
Rape Report Rate	0.212***	0.403***	0.262***	0.306***	0.189***	0.177***	0.194***	0.158***	0.151***
	(0.012)	(0.014)	(0.016)	(0.009)	(0.010)	(0.011)	(0.009)	(0.008)	(0.008)
Sheriff	1.664	2.096*	1.405	2.113**	1.801***	0.877		0.103	1.163
	(1.013)	(1.239)	(1.064)	(0.913)	(0.684)	(0.886)		(0.588)	(0.875)
Community Policing					0.704	−0.947	−0.619	0.261	0.415
					(0.786)	(0.967)	(0.659)	(0.602)	(0.818)
Domestic Violence Unit								−1.226**	−1.559*
								(0.550)	(0.800)
Constant	3.187***	2.578***	4.788***	1.054	0.426	5.202	6.182**	1.552	7.137**
	(0.655)	(0.790)	(0.772)	(0.647)	(2.871)	(3.984)	(2.970)	(2.549)	(3.249)
N	1,165	1,203	830	1,700	2,058	1,911	2,136	1,813	1,955
R^2	0.282	0.419	0.310	0.426	0.169	0.131	0.174	0.182	0.164
Adjusted R^2	0.279	0.416	0.306	0.424	0.166	0.128	0.171	0.179	0.161

*p < .1; **p < .05; ***p < .01

Table 17: The Effect of Female Police on Rape Report Rates, 1987-2016: Regressions By Year

	Rape Report Rate								
	1987	1990	1993	1997	2000	2003	2007	2013	2016
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Perc. Female Officers	−0.002	0.461***	0.753***	0.698***	0.175	0.378***	0.026	0.204**	0.287**
	(0.106)	(0.130)	(0.152)	(0.154)	(0.115)	(0.135)	(0.106)	(0.098)	(0.114)
Total Agency Employees	0.024***	0.020***	0.004**	−0.0001	−0.001**	−0.003	−0.001	−0.001	−0.001
	(0.003)	(0.003)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)
Logged Agency Budget					3.974***	1.809***	2.031***	2.432***	3.571***
					(0.447)	(0.589)	(0.483)	(0.512)	(0.674)
Perc. Black Officers	0.605***	1.610	0.676***	0.526***	0.330***	0.324***	0.219***	0.051	0.080
	(0.114)	(5.387)	(0.095)	(0.108)	(0.080)	(0.086)	(0.063)	(0.072)	(0.107)
Sheriff	−7.992***	−15.011***	−11.024***	−16.612***	−10.587***	−12.914***		−11.477***	−14.508***
	(2.522)	(2.523)	(2.342)	(2.452)	(1.506)	(1.863)		(1.682)	(2.511)
Community Policing					−0.132	2.880	4.195***	2.196	2.220
					(1.750)	(2.059)	(1.539)	(1.742)	(2.368)
Domestic Violence Unit								−0.268	−1.154
								(1.592)	(2.315)
Constant	23.355***	26.106***	20.438***	28.874***	−30.548***	1.343	−7.205	−9.424	−20.467**
	(1.488)	(1.447)	(1.567)	(1.613)	(6.358)	(8.486)	(6.950)	(7.381)	(9.392)
N	1,165	1,203	830	1,700	2,058	1,911	2,136	1,813	1,955
R^2	0.085	0.071	0.133	0.054	0.088	0.054	0.026	0.048	0.043
Adjusted R^2	0.082	0.067	0.129	0.052	0.086	0.051	0.024	0.045	0.039

*p < .1; **p < .05; ***p < .01

9.2 By Agency Type

Table 18: The Effect of Female Police on Rape Report and Arrest Rates, 1987-2016: Only Sheriffs' Offices

	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate
	(1)	(2)	(3)	(4)	(5)	(6)
Perc. Female Officers	0.250***	0.070**	0.184***	−0.021	0.074	−0.021
	(0.042)	(0.030)	(0.044)	(0.030)	(0.062)	(0.044)
Total Agency Employees			0.003***	−0.0005	−0.002**	−0.00005
			(0.001)	(0.001)	(0.001)	(0.001)
Logged Agency Budget					2.942***	−0.036
					(0.349)	(0.247)
Perc. Black Officers			0.179***	0.082***	0.082	0.038
			(0.043)	(0.029)	(0.055)	(0.038)
Rape Report Rate				0.267***		0.229***
				(0.011)		(0.015)
Sheriff						
Community Policing					0.257	−1.457*
					(1.152)	(0.804)
N	3,538	3,807	3,538	3,538	2,124	2,124
R^2	0.017	0.017	0.026	0.153	0.055	0.109
Adjusted R^2	0.015	0.015	0.023	0.151	0.051	0.106
Residual Std. Error	24.103 (df = 3529)	17.583 (df = 3798)	24.007 (df = 3527)	16.280 (df = 3526)	23.184 (df = 2115)	16.181 (df = 2114)

*p < .1; **p < .05; ***p < .01
Year dummy variables included.

Table 19: The Effect of Female Police on Rape Report and Arrest Rates, 1987-2016: Only Municipal Police Departments

	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate
	(1)	(2)	(3)	(4)	(5)	(6)
Perc. Female Officers	0.748***	0.156***	0.595***	−0.035	0.373***	−0.015
	(0.060)	(0.025)	(0.062)	(0.022)	(0.079)	(0.027)
Total Agency Employees			0.001**	0.0002	−0.001*	0.0003
			(0.0005)	(0.0002)	(0.001)	(0.0002)
Logged Agency Budget					3.069***	−0.244**
					(0.336)	(0.117)
Perc. Black Officers			0.454***	0.077***	0.230***	0.053***
			(0.047)	(0.017)	(0.056)	(0.019)
Rape Report Rate				0.216***		0.153***
				(0.004)		(0.005)
Sheriff						
Community Policing					2.769**	0.928**
					(1.328)	(0.460)
N	9,184	9,705	9,184	9,184	5,598	5,598
R^2	0.021	0.028	0.032	0.290	0.041	0.178
Adjusted R^2	0.020	0.027	0.031	0.289	0.039	0.176
Residual Std. Error	41.299 (df = 9175)	17.433 (df = 9696)	41.067 (df = 9173)	14.860 (df = 9172)	39.134 (df = 5589)	13.561 (df = 5588)

*p < .1; **p < .05; ***p < .01
Year dummy variables included.

10 Adding Additional Control Variables

The main body of the paper uses control variables that are available in LEMAS to prevent data loss as much as possible. Here, we add two additional variables: first, the percent of the place's population that is Black and logged population. The Black population is only available for the years of 1990, 2000, 2007, 2013, and 2016 because of data limitations with Census information, so this sample size is smaller. The results are substantively similar to those in the main body. And, the R^2 between percent Black in the place and percent Black officers is 0.71, providing encouraging evidence that this is a fairly good proxy of demographic diversity of the place.

Table 20: The Effect of Female Police on Rape Report and Arrest Rates, 1987-2016: Adding Place Controls

	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate	Rape Report Rate	Rape Arrest Rate
	(1)	(2)	(3)	(4)	(5)	(6)
Perc. Female Officers	0.386^{***}	0.055^{***}	0.264^{***}	-0.034	0.264^{***}	-0.041^{*}
	(0.047)	(0.021)	(0.069)	(0.024)	(0.069)	(0.024)
Total Agency Employees			-0.001^{**}	0.0003^{*}	-0.001^{*}	0.0003^{*}
			(0.0005)	(0.0002)	(0.0005)	(0.0002)
Logged Agency Budget			3.064^{***}	-0.270^{**}	2.944^{***}	0.421
			(0.320)	(0.113)	(0.329)	(0.281)
Perc. Black			0.173^{***}	0.017	0.180^{***}	0.014
			(0.042)	(0.015)	(0.042)	(0.015)
Perc. Black Officers			-0.083	0.039	-0.094	0.043^{*}
			(0.074)	(0.026)	(0.074)	(0.026)
Logged Population						-0.880^{***}
						(0.312)
Rape Report Rate				0.158^{***}		0.158^{***}
				(0.005)		(0.005)
Sheriff			-13.621^{***}	0.397	-13.189^{***}	0.420
			(1.246)	(0.440)	(1.276)	(0.451)
Community Policing Component					2.576^{**}	0.481
					(1.254)	(0.438)
N	9,373	9,507	4,958	4,958	4,938	4,938
R^2	0.013	0.020	0.057	0.184	0.059	0.187
Adjusted R^2	0.012	0.020	0.056	0.183	0.057	0.185
Residual Std. Error	35.890 (df = 9367)	16.063 (df = 9501)	35.149 (df = 4948)	12.269 (df = 4947)	35.130 (df = 4927)	12.268 (df = 4925)

$^{*}p < .1$; $^{**}p < .05$; $^{***}p < .01$
Year dummy variables included.

11 Ba (et al.) 2021 Replication

Here, we use the replication materials from Ba et al. (2021*a*), found here `https://codeocean.com/capsule/8907164/tree/v1` (Ba et al. 2021*b*). Briefly, Ba et al. (2021*a*) use data on daily patrol assignments from the Chicago Police Department (CPD) to compare how officers of different demographic profiles behave while on the job. One of their findings is that female officers arrest less than their male counterparts. Here, we use their data and code to replicate their results exactly with one key difference: we subset arrests to only *sex crimes* to analyze how female officers behave with regards to arrests for these crimes.

We filter their data for sex crimes arrests following the CPD's coding of these crimes.[5] From this, we filtered to those crimes that contained any or all of the following text strings: sex, pornography, obscene, obscenity, indecency, indecent, peeping tom, expose, child luring, lewd, videotape through clothes. Note this matching is a string match, so filtering for "sex," for instance, will catch crimes like criminal sexual assault and criminal sexual abuse (rape is not one of the categories listed by CPD). Note that this is a slightly more expansive definition of sexual assault than we include in our main analyses, which is rape only. In total, there were 2,320 arrests for these crimes (out of over 300,000 in the larger database, less than 1% of all arrests) made by 1,657 officers. Largely, this means that officers were making about 1 arrest for a sex crime each, which is a much smaller number than the total number of arrests.

We replicate their main findings as seen below - this graph is identical to the gendered comparison in Figure 3 from Ba et al. (2021*a*), except for the subset to arrests for sex crimes. (The code is identical otherwise).

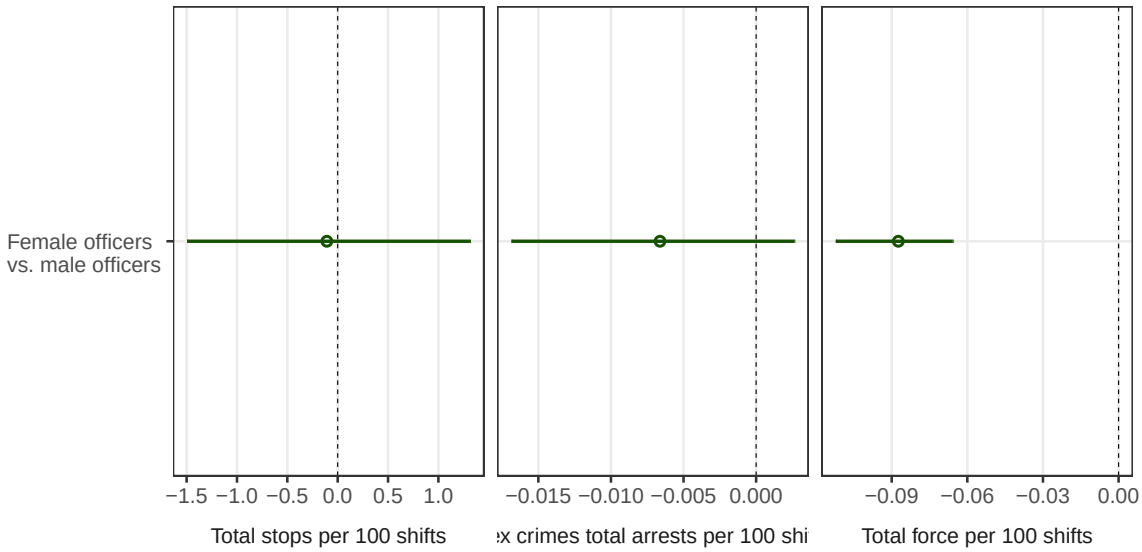

Figure 2: The effect of female officers on total stops, sex crimes arrests, and force per 100 shifts. The first and third panel are the same as Figure 3 from Ba et al. (2021*a*) (i.e. stops of all types and force of all types) and the middle reflects sex crimes arrests only.

When we subset to only sex crimes, there is a nearly imperceptible effect of female officers on sex crimes arrests. We take part of this result to be because of the low number of these arrests, but we still find support for our main results with this individual-level data: female officers are not significantly associated with substantive increases in arrests for sex crimes.

Importantly, these results provide supplemental support for our main results. Our paper uses aggregate data from police departments and Ba et al. (2021*a*) use individual-level data and we find similar outcomes, that female officers are not significantly associated with substantive increases in arrests for sex crimes. This suggestive evidence supports our main findings.

[5] See: `https://gis.chicagopolice.org/pages/crime_details`.

References

Ba, Bocar A., Dean Knox, Jonathan Mummolo and Roman Rivera. 2021*a*. "The role of officer race and gender in police-civilian interactions in Chicago." *Science* 371(6530):696–702.

Ba, Bocar, Dean Knox, Jonathan Mummolo and Roman Rivera. 2021*b*. "The Role of Officer Race and Gender in Police-Civilian Interactions in Chicago." `https://www.codeocean.com/`.