

Analysis of Black-White Differences in Traffic Stops and Searches
by the Forsyth County Sheriffs Department, NC, 2002-2013

Frank R. Baumgartner, Derek Epp, and Kelsey Shoub¹
University of North Carolina at Chapel Hill
Department of Political Science
<http://www.unc.edu/~fbaum/traffic.htm>

Contact: Frankb@unc.edu

October 15, 2015

¹ Baumgartner is the Richard J. Richardson Distinguished Professor of Political Science at UNC-Chapel Hill. Epp and Shoub are graduate students in political science. We thank UNC undergraduates Katherine B. Elliott, Amirah Jiwa, Morgan Herman, and Reena Gupta for assistance on the logistics of this project. We also acknowledge the assistance of the NC Department of Justice and State Bureau of Investigation for making available the official statistics on which this analysis relies, and for answering technical questions about the organization of this complex database.

Table 1. Overview of the Data

Data Subsets	Observations
Total stops	101,539
-2014	2,326
-Passengers	2,289
-Checkpoint stops	549
Stops for analysis	96,440
Searches	4,522

Search Rate = 4.69

Figure 1. Number of Traffic Stops per Year

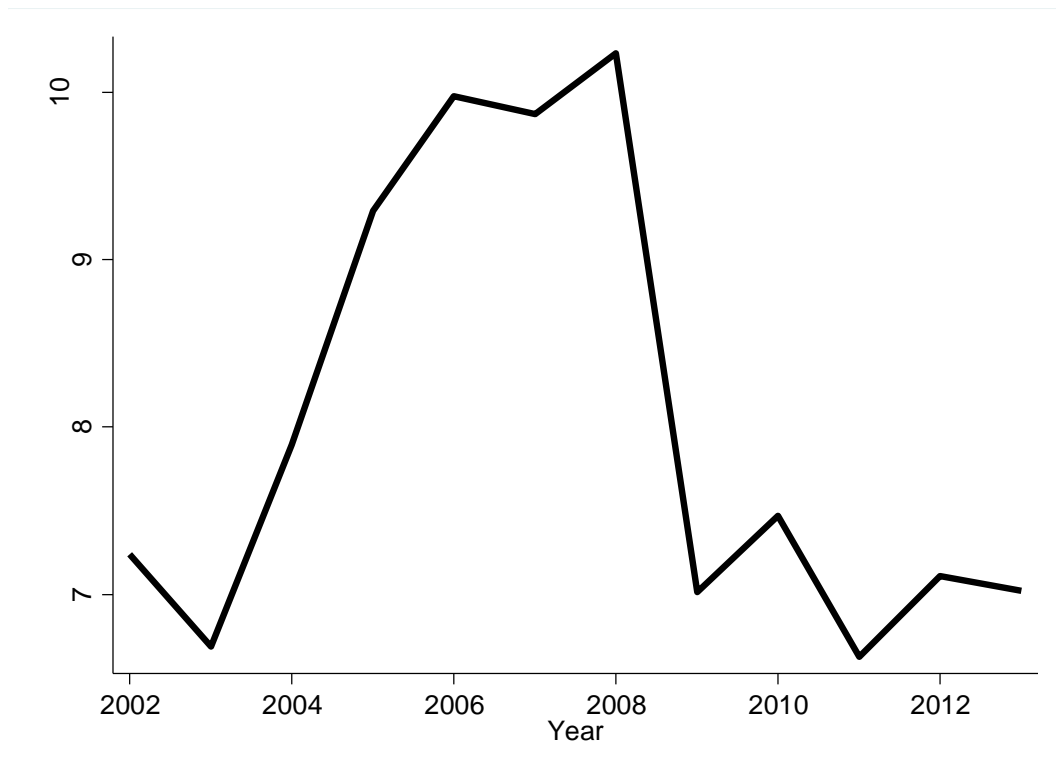


Figure 2. Racial Composition of Traffic Stops by Year

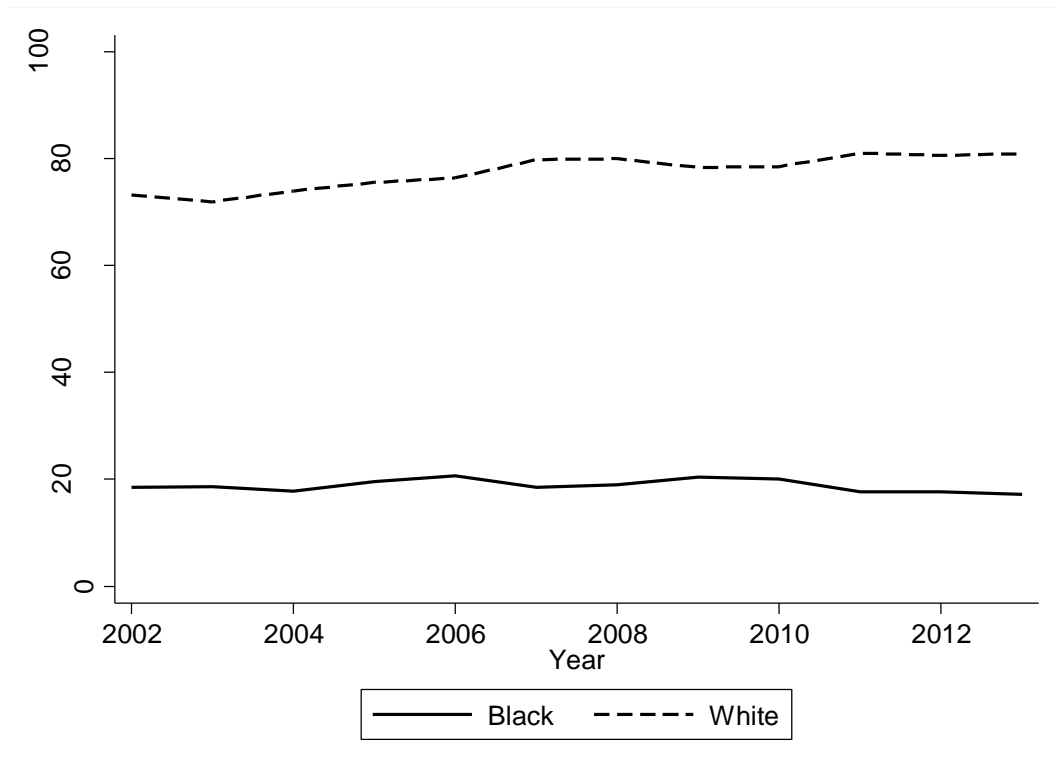


Table 2. Racial Composition of Traffic Stops by Purpose, Drivers

Purpose	Number	Percent	
		White	Black
Total Stops	96,440	77.59	18.87
Speed Limit	37,024	81.73	14.84
Stop Light/Sign	6,460	81.22	15.79
Driving Impaired	839	73.30	19.79
Safe Movement	11,081	73.53	20.10
Vehicle Equipment	9,367	74.77	21.35
Vehicle Regulatory	18,602	74.05	24.03
Seat Belt	2,466	79.36	17.03
Investigation	6,187	75.30	22.16
Other Vehicle	4,414	71.57	23.33

Note: Includes only drivers. Excludes 549 checkpoint stops. Excludes 2,289 passengers.

Table 3. Percent Searched by Race and Purpose of Stop

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	96,440	-	77.59	18.87	-
Total Searches	4,522	4.69	4.24	5.11	1.21
Speed Limit	37,024	2.44	2.11	3.02	1.43
Stop Light/Sign	6,460	1.83	1.79	1.86	1.04
Driving Impaired	839	56.97	59.19	51.81	0.88
Safe Movement	11,081	8.47	7.90	6.42	0.81
Vehicle Equipment	9,367	5.43	5.40	4.80	0.89
Vehicle Regulatory	18,602	3.20	2.59	4.63	1.79
Seat Belt	2,466	4.87	4.09	6.43	1.57
Investigation	6,187	9.07	9.12	8.61	0.94
Other Vehicle	4,414	6.71	5.98	6.60	1.10

Note: See the appendix for this same table broken down for Men and Women.

Figure 3. Difference in Likelihood of Being Searched, by Race and Type of Stop

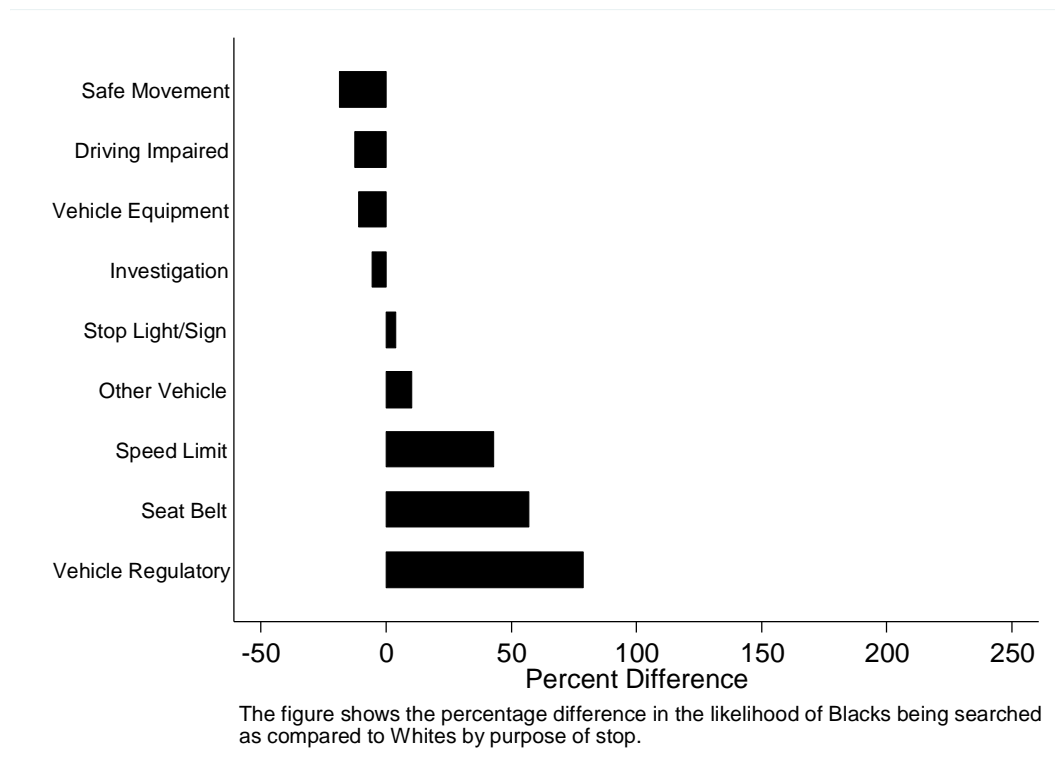


Figure 4. Racial Differences in the Likelihood of Search

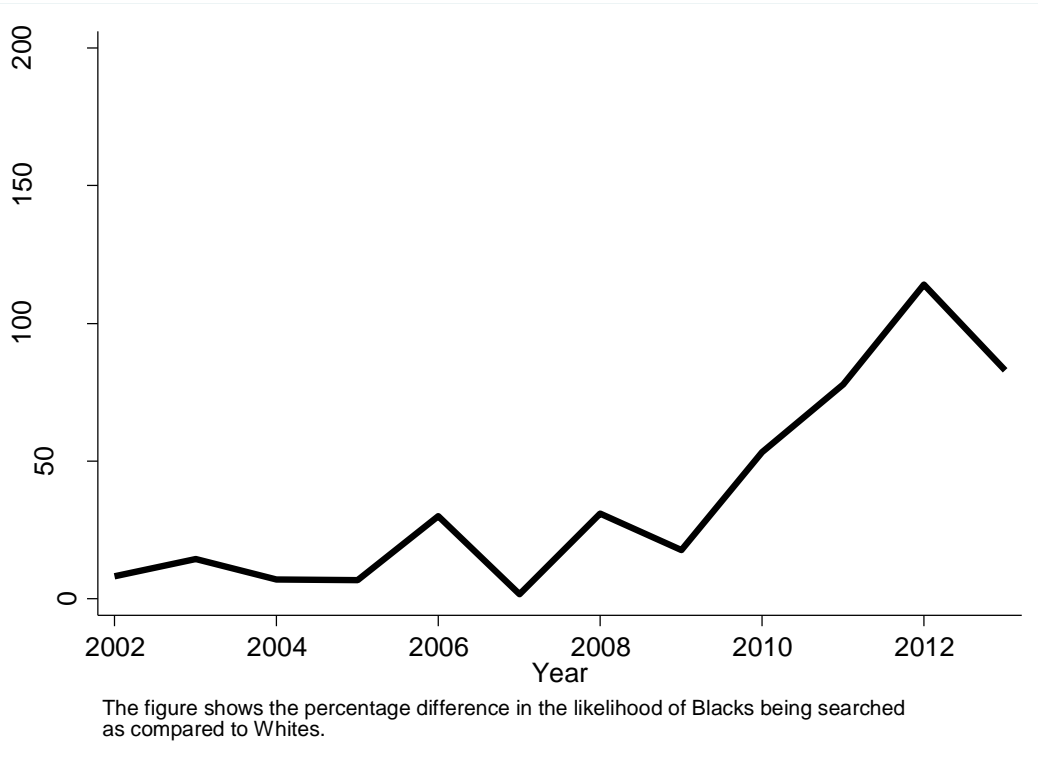


Figure 5. Racial Differences in the Likelihood of Search by Gender

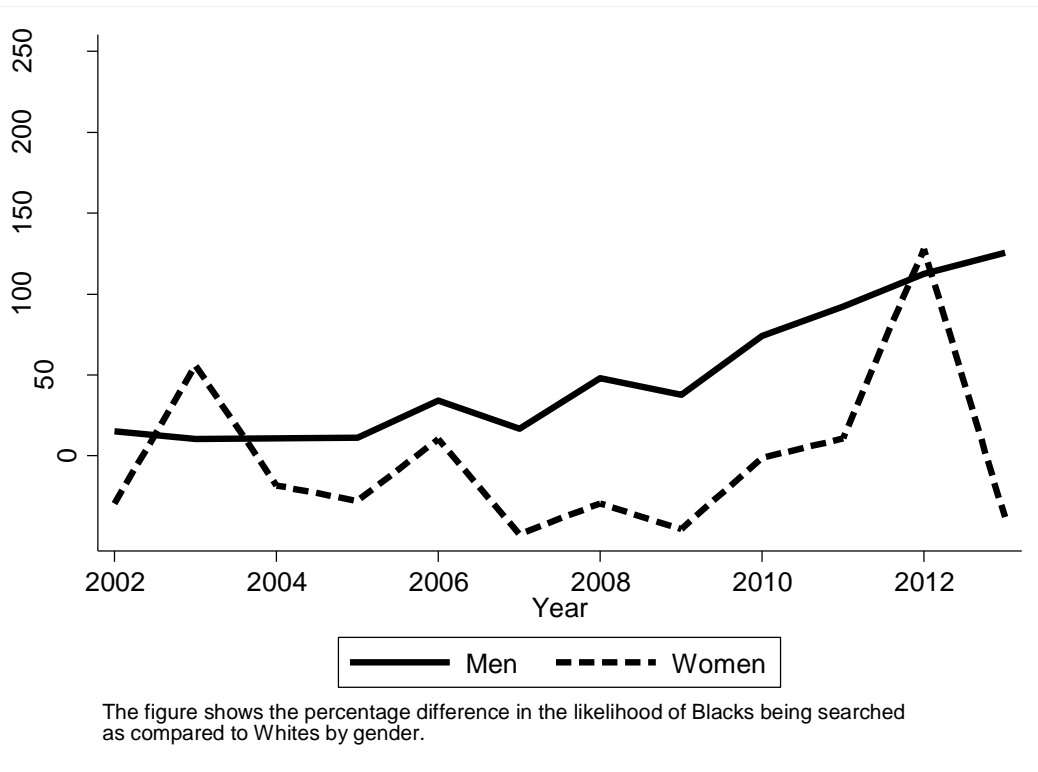


Figure 6. Racial Differences in the Likelihood of Search by Gender, for Drivers Under 30

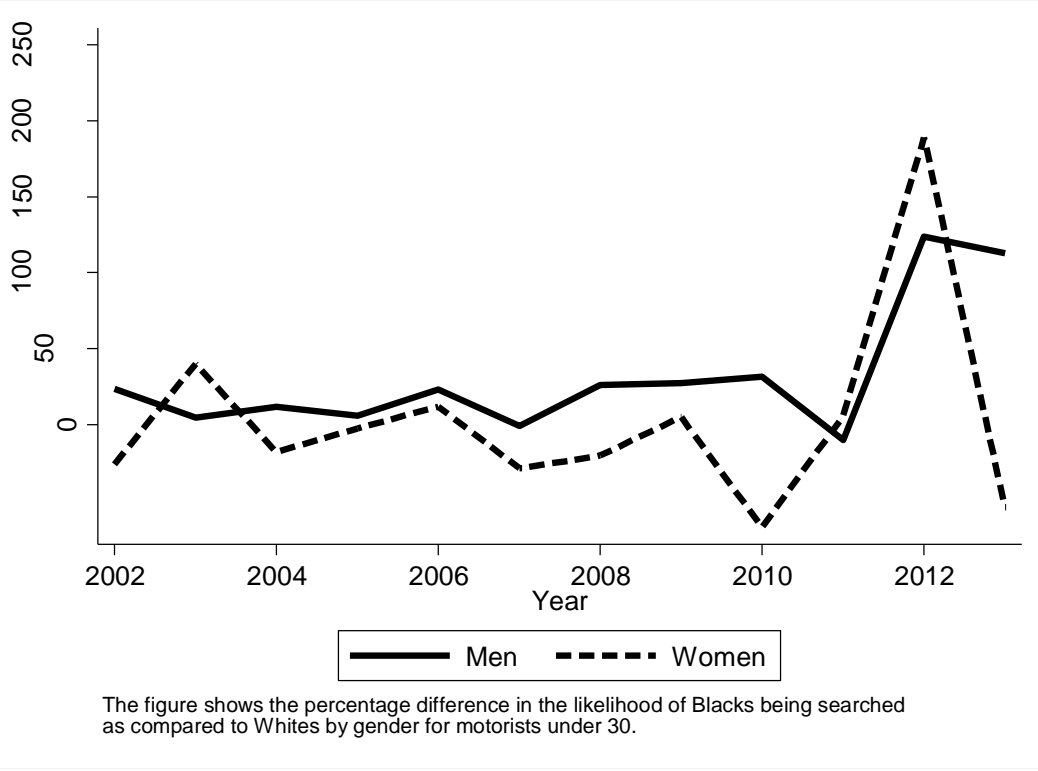


Figure 7. Search Rates by Race, Gender, and Age Group

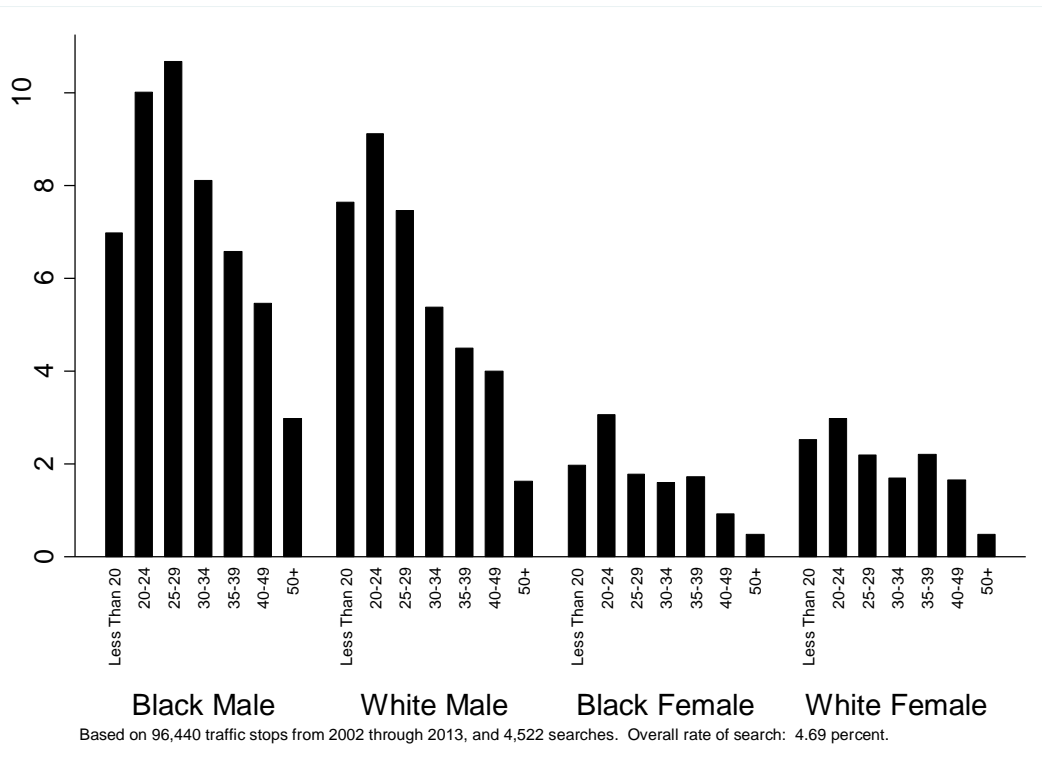


Figure 8. Number of Stops, by Race and Gender

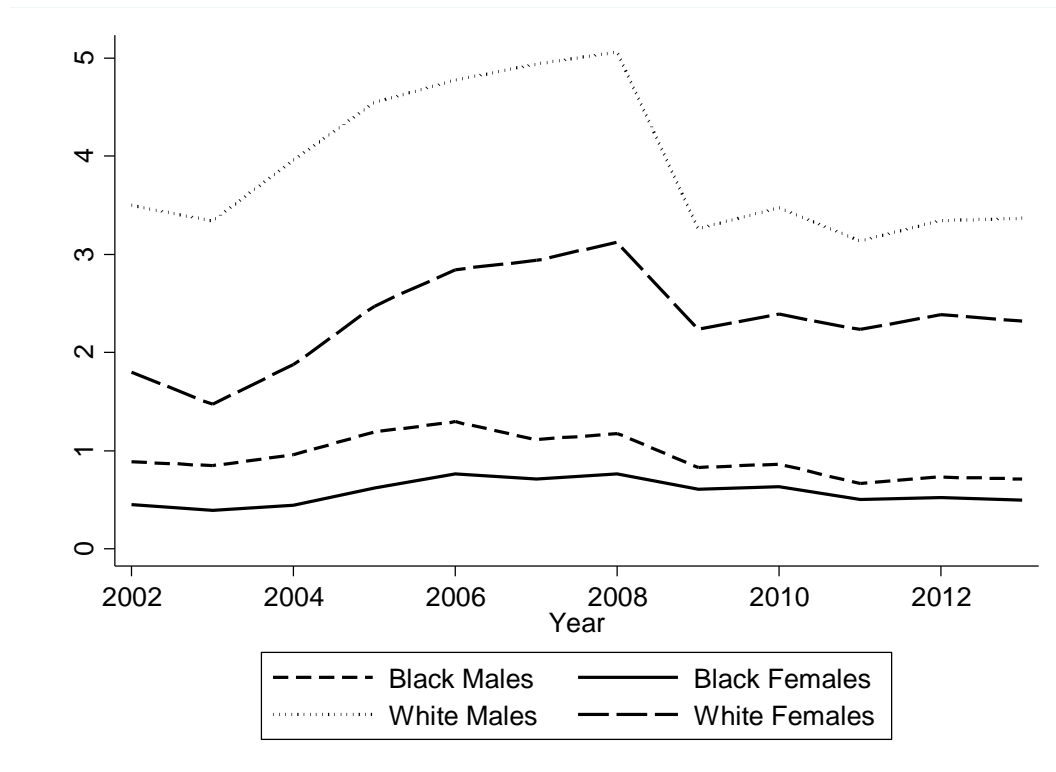


Figure 9. Percent of Stops Resulting in a Search, by Race and Gender

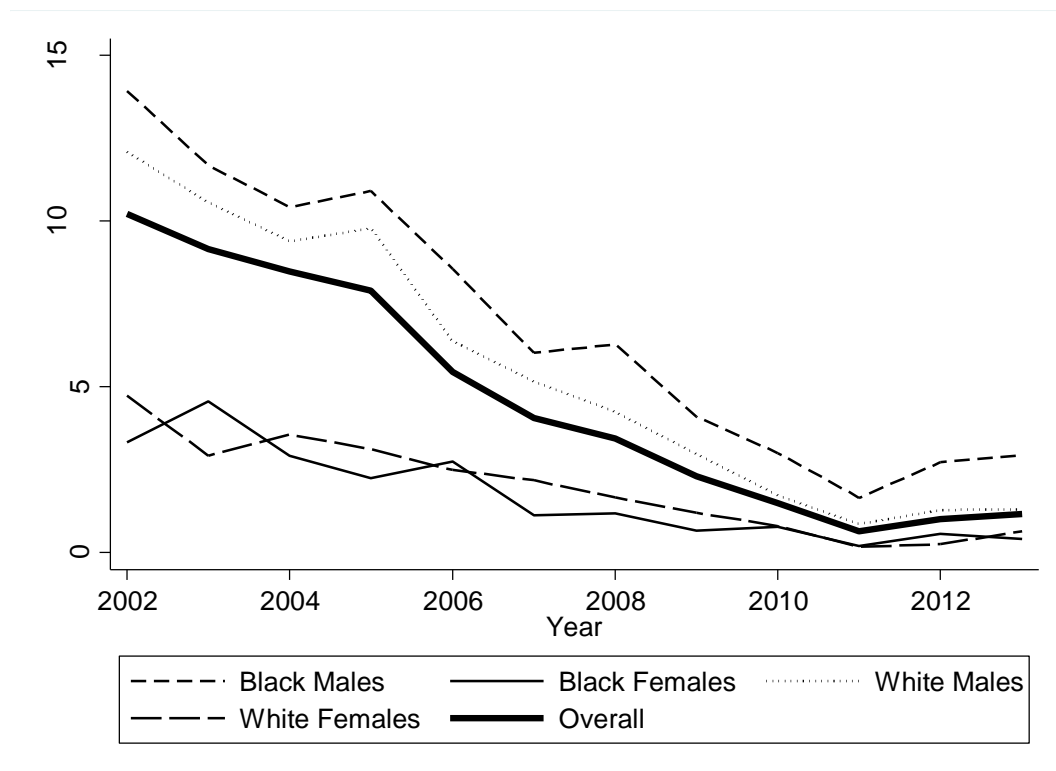


Table 4. Type of Search by Race

Search Type	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	96,440	-	77.59	18.87	-
Total Searches	4,522	4.69	4.24	5.11	1.21
Consent	2,469	2.56	2.35	2.39	1.02
Search Warrant	21	-	-	-	-
Probable Cause	601	0.62	0.53	0.82	1.55
Incident to Arrest	1,299	1.35	1.22	1.66	1.36
Protective Frisk	132	0.14	0.12	0.21	1.75

Note: See the appendix for this same table separately for Men and Women.

Table 5. Distribution of Officer IDs by Stop

Number of Stops	Officers w/ this many Stops	Percent of Officers	Cumulative Percent	Percent of Stops	Cumulative Percent
1	350	42.12	42.12	0.36	0.36
2 – 10	197	23.71	65.82	0.88	1.24
11 - 100	140	16.85	82.67	5.83	7.07
101 – 1,000	124	14.92	97.59	48.39	55.46
1,001 +	20	2.41	100.00	44.54	100.00
Total	831	100	-	100	-

Figure 10. Number of Black and White Motorists Stopped, by Officer

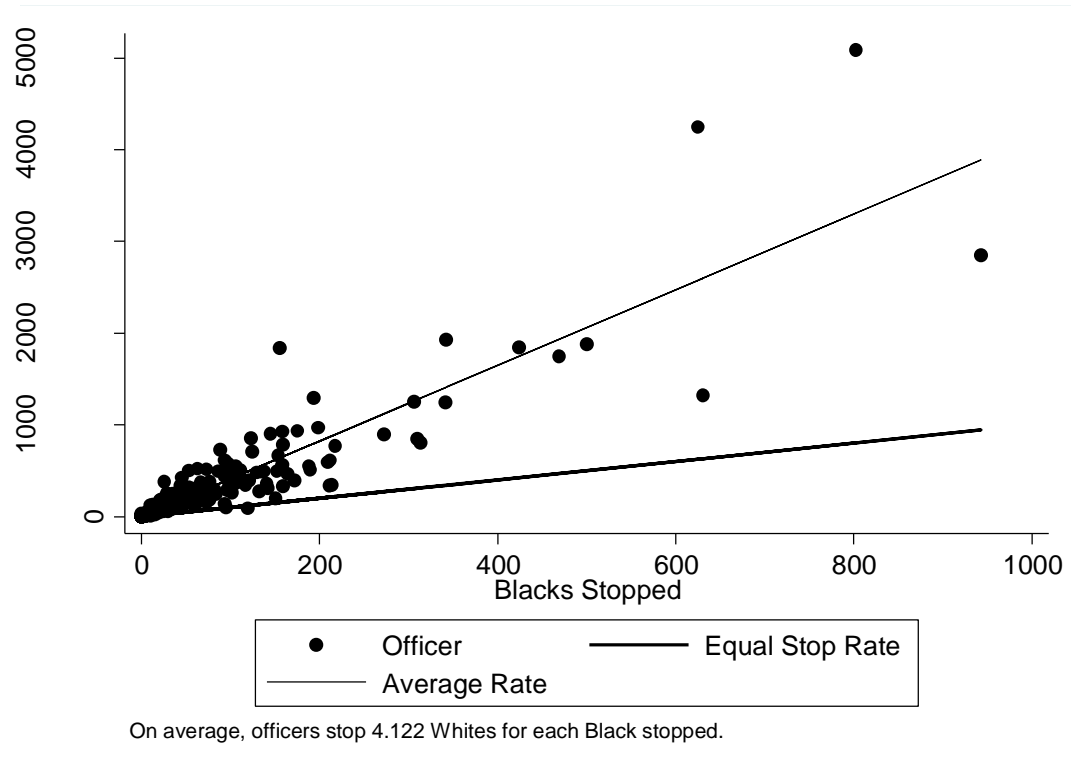


Figure 11. Number of Black and White Motorists Searched, by Officer

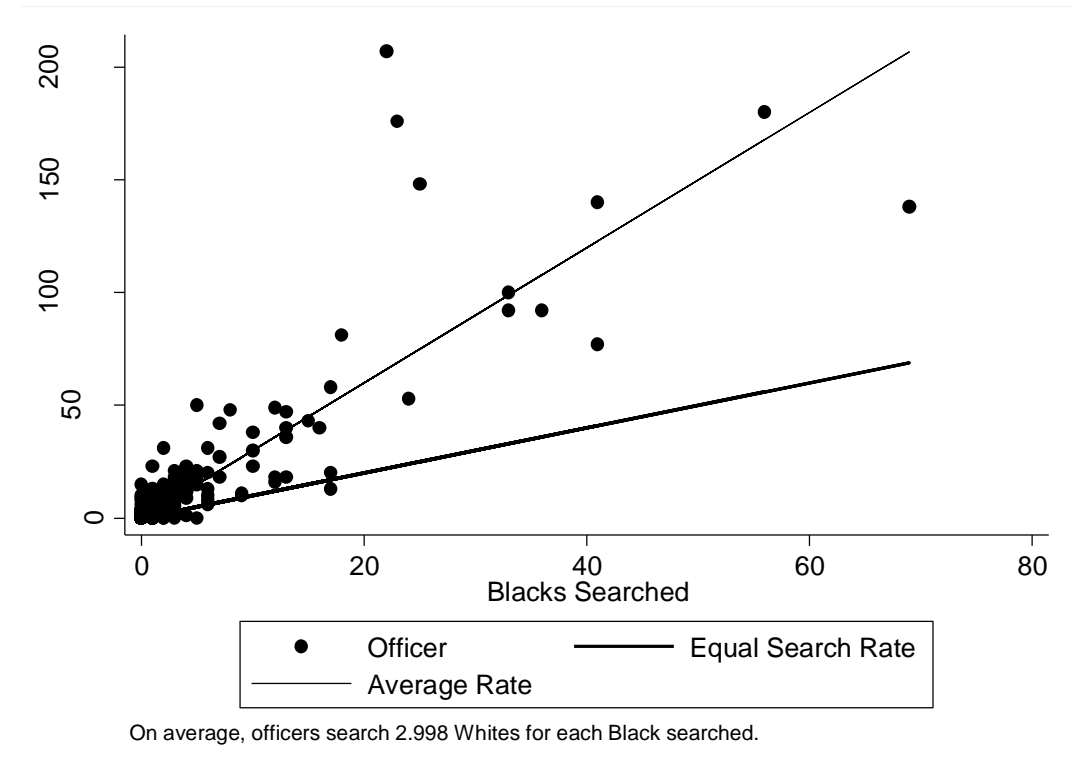
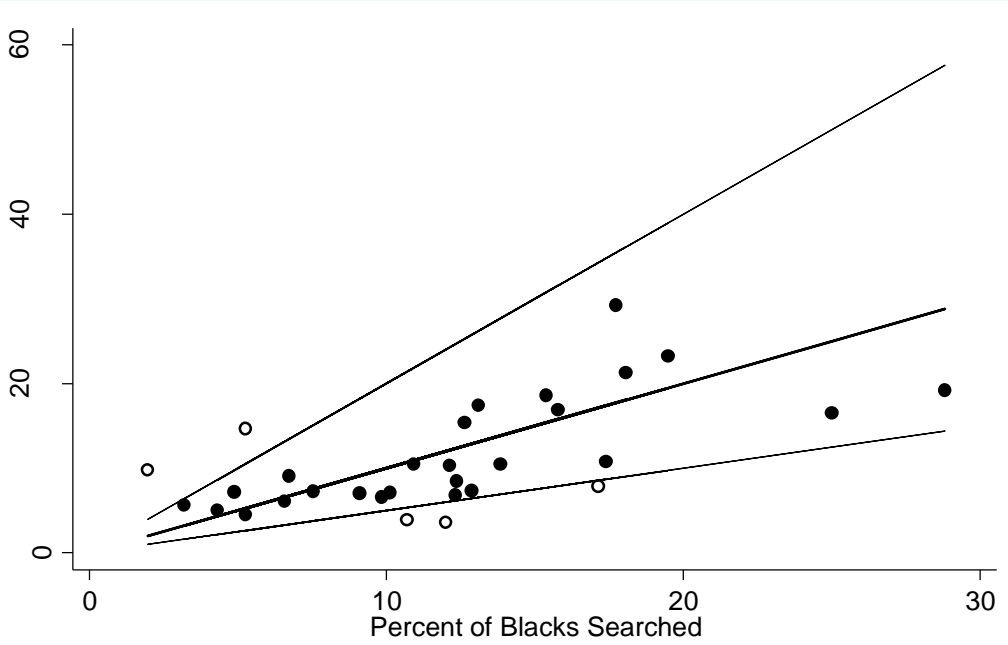


Figure 12. Percent of White and Black Drivers Searched, by Officer



Includes 31 officers with a minimum of 50 White stops, 50 Black stops, and a search rate above the department average of 4.69. The hollow circles indicate high disparity officers. 3 officers search Whites at more than twice the rate that they search Blacks. 2 officers search Blacks at more than twice the rate that they search Whites.

Table 6. Predicting the Occurrence of a Search, Male Drivers

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Demographics					
Race	1.43*(0.06)	1.45*(0.06)	1.34*(0.06)	1.34*(0.06)	1.30*(0.06)
Hispanic	1.99*(0.10)	1.79*(0.09)	1.38*(0.08)	1.37*(0.08)	1.38*(0.08)
Age	-	0.96*(0.00)	0.96*(0.00)	0.96*(0.00)	0.96*(0.00)
Stop Purpose					
Speed Limit	-	-	-	-	-
Stop Light	-	-	0.75*(0.09)	0.75*(0.09)	0.75*(0.09)
Impaired	-	-	51.79*(4.97)	51.77*(4.97)	42.70*(4.27)
Movement	-	-	3.07*(0.17)	3.03*(0.17)	2.90*(0.17)
Equipment	-	-	1.98*(0.13)	1.95*(0.13)	1.67*(0.11)
Regulatory	-	-	1.35*(0.08)	1.33*(0.08)	1.34*(0.08)
Seat Belt	-	-	1.73*(0.20)	1.73*(0.20)	1.84*(0.22)
Investigation	-	-	3.41*(0.22)	3.40*(0.22)	3.07*(0.20)
Other	-	-	2.37*(0.19)	2.35*(0.19)	2.26*(0.19)
Officer Type					
Black Disparity [†]	-	-	-	1.57*(0.22)	1.44*(0.21)
White Disparity [‡]	-	-	-	1.79*(0.31)	1.86*(.33)
Time					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
Constant	0.05*(0.00)	0.17*(0.01)	0.10*(0.01)	0.10*(0.01)	0.13*(0.01)
N	58,000	58,000	58,000	58,000	57,093
Pseudo R²	0.01	0.03	0.11	0.11	0.12

Note: Entries are odds-ratios, with standard errors in parenthesis.

Note: The number of observations is smaller for Model 5 because the “hour of stop” variable is missing in some cases.

* = Significant at 0.05 p-value

† = Coded 1 for 2 officers who searched Blacks at twice the rate of Whites; otherwise zero.

Officers with fewer than 50 searches of Black motorists are automatically coded zero.

‡ = Coded 1 for 3 officers who searched Whites at twice the rate of Blacks; otherwise zero.

Officers with fewer than 50 searches of White motorists are automatically coded zero.

Table 7. Predicting the Occurrence of a Search, Female Drivers

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Demographics					
Race	0.86 (0.09)	0.85 (0.09)	0.75*(0.08)	0.75*(0.08)	0.77*(0.08)
Hispanic	0.86 (0.18)	0.80 (0.16)	0.57*(0.12)	0.57*(0.12)	0.59*(0.13)
Age	-	0.97*(0.00)	0.97*(0.00)	0.97*(0.00)	0.97*(0.00)
Stop Purpose					
Speed Limit	-	-	-	-	-
Stop Light	-	-	1.36 (0.30)	1.36 (0.30)	1.28 (0.29)
Impaired	-	-	109.27*(19.58)	109.78*(19.68)	60.28*(11.58)
Movement	-	-	4.25*(0.59)	4.22*(0.58)	3.46*(0.49)
Equipment	-	-	3.25*(0.49)	3.22*(0.48)	2.16*(0.34)
Regulatory	-	-	1.91*(0.26)	1.89*(0.26)	1.88*(0.26)
Seat Belt	-	-	3.10*(0.74)	3.09*(0.74)	3.81*(0.93)
Investigation	-	-	6.17*(0.91)	6.15*(0.91)	4.23*(0.65)
Other	-	-	3.40*(0.66)	3.39*(0.64)	2.95*(0.57)
Officer Type					
Black Disparity [†]	-	-	-	1.26 (0.47)	1.12 (0.41)
White Disparity [‡]	-	-	-	3.47*(1.38)	3.68*(1.48)
Time					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
Constant	0.02*(0.00)	0.06*(0.01)	0.03*(0.00)	0.03*(0.00)	0.05*(0.01)
N	35,024	35,024	35,024	35,024	34,524
Pseudo R²	0.00	0.02	0.12	0.12	0.15

Note: Entries are odds-ratios, with standard errors in parenthesis.

Note: The number of observations is smaller for Model 5 because the “hour of stop” variable is missing in some cases.

* = Significant at 0.05 p-value

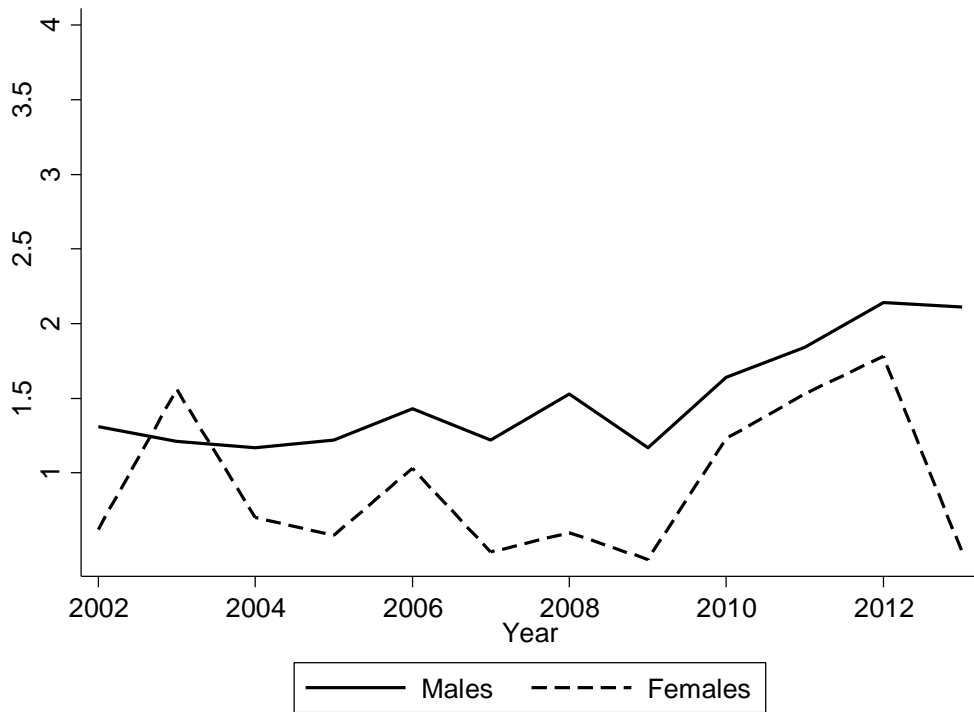
† = Coded 1 for 2 officers who searched Blacks at twice the rate of Whites; otherwise zero.

Officers with fewer than 50 searches of Black motorists are automatically coded zero.

‡ = Coded 1 for 3 officers who searched Whites at twice the rate of Blacks; otherwise zero.

Officers with fewer than 50 searches of White motorists are automatically coded zero.

Figure 14. Increased Odds of Search for Blacks, by Gender, 2002-2013



Appendix

Table A1. Racial Composition of Traffic Stops by Purpose, Passengers

Purpose	Number	Percent	
		White	Black
Total Stops	2,289	69.86	19.66
Speed Limit	447	71.81	15.88
Stop Light/Sign	53	75.47	22.64
Driving Impaired	89	85.39	4.49
Safe Movement	497	70.22	15.49
Vehicle Equipment	291	71.48	19.24
Vehicle Regulatory	267	65.54	26.59
Seat Belt	95	55.79	31.58
Investigation	378	70.63	24.60
Other Vehicle	157	64.33	19.11
	15	60.00	40.00

Table A2. Percent of Men Searched by Race and Purpose of Stop

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	60,670	-	77.01	18.59	-
Total Searches	3,871	6.38	5.65	7.24	1.28
Speed Limit	22,038	3.57	3.09	4.18	1.35
Stop Light/Sign	3,807	2.39	2.22	3.14	1.41
Driving Impaired	652	60.74	62.63	58.21	0.93
Safe Movement	7,678	10.86	9.97	8.53	0.86
Vehicle Equipment	6,368	6.80	6.58	6.49	0.99
Vehicle Regulatory	11,267	4.38	3.34	6.89	2.06
Seat Belt	1,582	6.26	5.06	8.55	1.69
Investigation	4,366	10.97	10.73	11.49	1.07
Other Vehicle	2,912	8.86	7.65	9.31	1.22

Table A3. Percent of Women Searched by Race and Purpose of Stop

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	35,770	-	78.57	19.35	-
Total Searches	651	1.82	1.89	1.63	0.86
Speed Limit	14,986	0.79	0.70	1.28	1.83
Stop Light/Sign	2,653	1.02	1.17	0.22	0.19
Driving Impaired	187	43.85	48.68	25.00	0.53
Safe Movement	3,403	3.09	3.29	2.46	0.74
Vehicle Equipment	2,999	2.53	2.84	1.80	0.63
Vehicle Regulatory	7,335	1.39	1.45	1.23	0.85
Seat Belt	884	2.38	2.39	2.65	1.11
Investigation	1,821	4.50	5.29	2.13	0.40
Other Vehicle	1,502	2.53	2.72	2.27	0.83

Table A4. Type of Search by Race: Men

Search Type	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	60,670	-	77.01	18.59	-
Total Searches	3,871	6.38	5.65	7.24	1.28
Consent	2,138	3.52	3.17	3.44	1.09
Search Warrant	18	-	-	-	-
Probable Cause	520	0.86	0.71	1.20	1.69
Incident to Arrest	1,075	1.77	1.57	2.26	1.44
Protective Frisk	120	0.20	0.17	0.31	1.82

Table A5. Type of Search by Race: Women

Search Type	Number	% Total	% White	% Black	Ratio Black:White
Total Stops	35,770	-	78.57	19.35	-
Total Searches	651	1.82	1.89	1.63	0.86
Consent	331	0.93	0.99	0.68	0.69
Search Warrant	3	-	-	-	-
Probable Cause	81	0.23	0.23	0.22	0.96
Incident to Arrest	224	0.63	0.63	0.68	1.08
Protective Frisk	12	0.03	0.03	0.04	1.33

Figure A6. Stops by Day of the Week

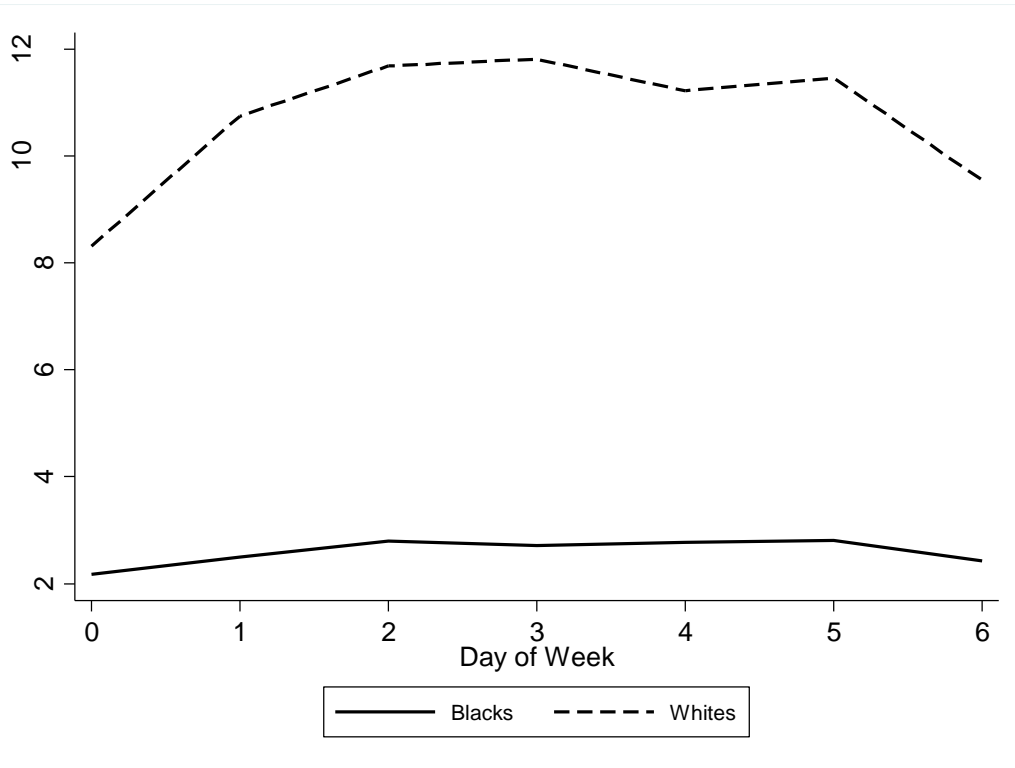


Figure A7. Searches by Day of the Week

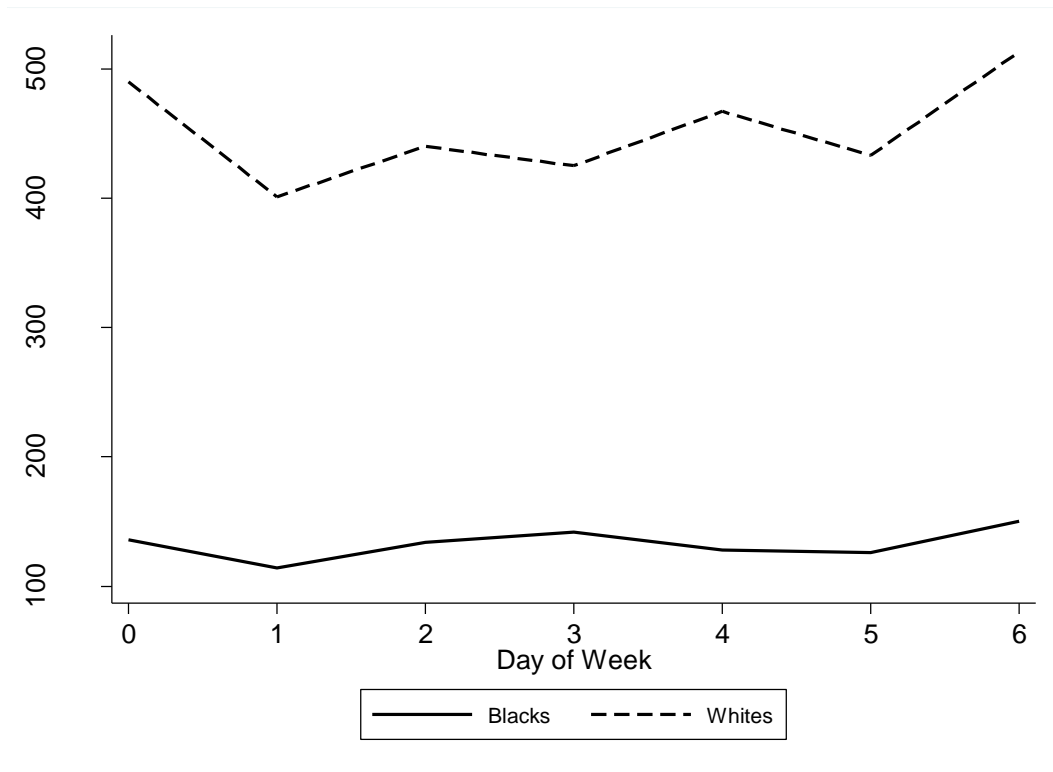


Figure A8. Stops by Hour of the Day

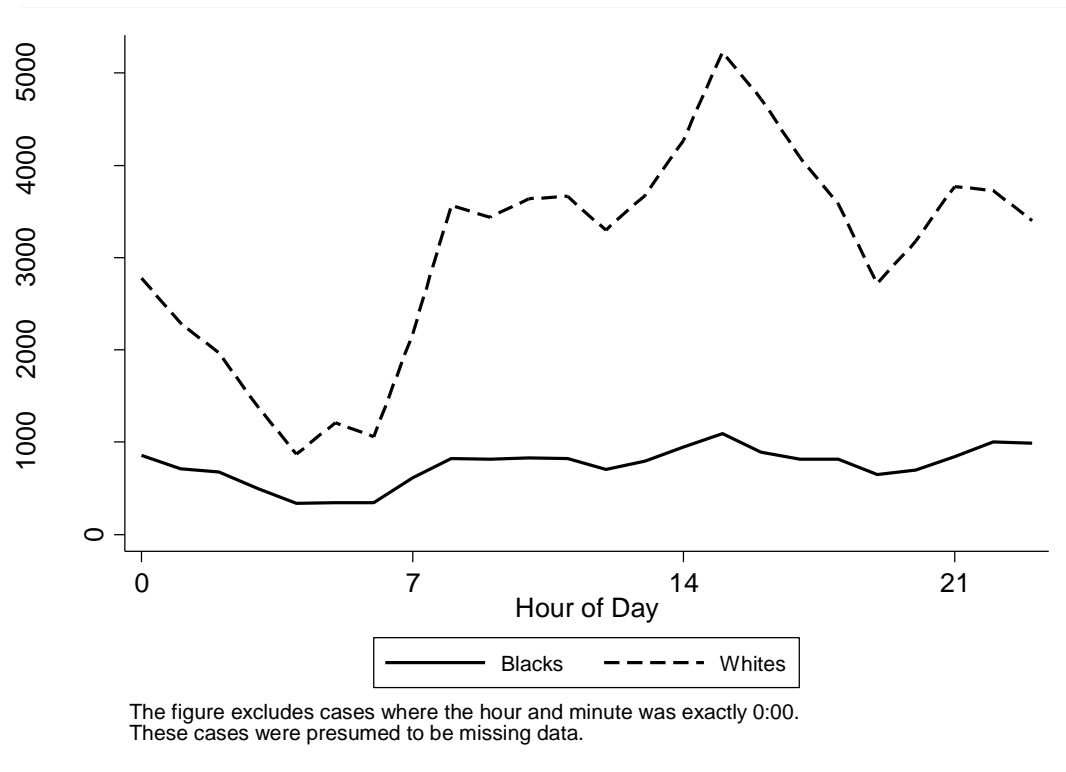


Figure A9. Searches by Hour of the Day

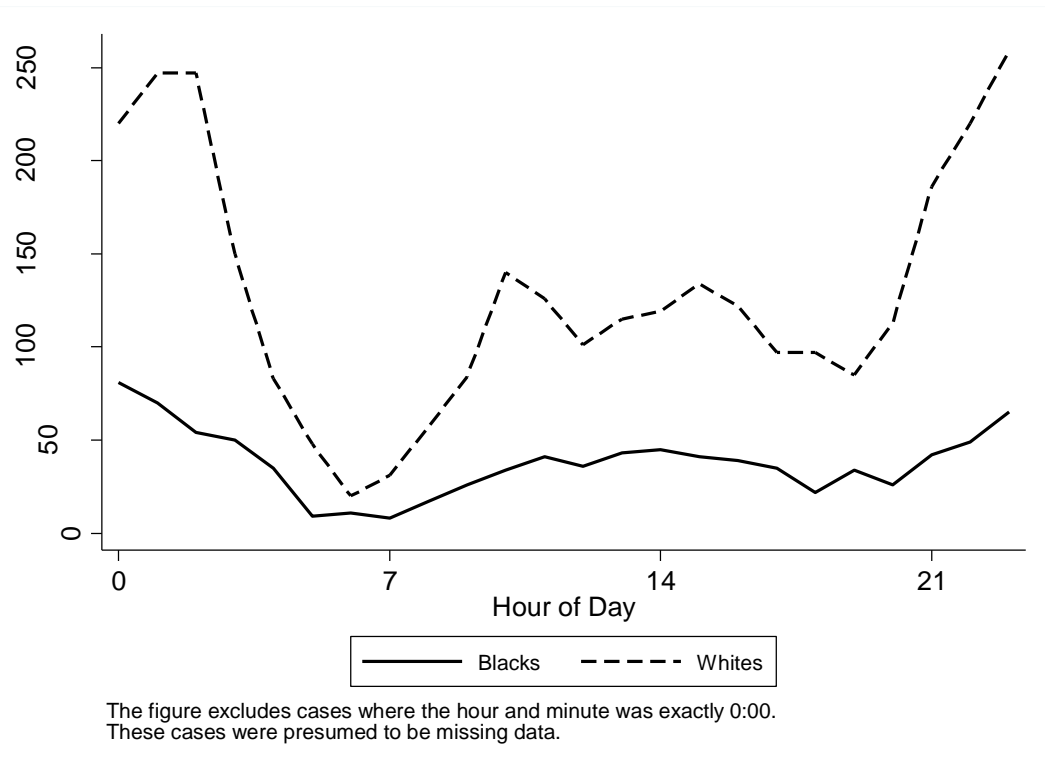


Figure A10. Correlation Between Percent Difference in Likelihood of Black Men being Searched as Compared to Whites and Odds-Ratios from Logistic Regression

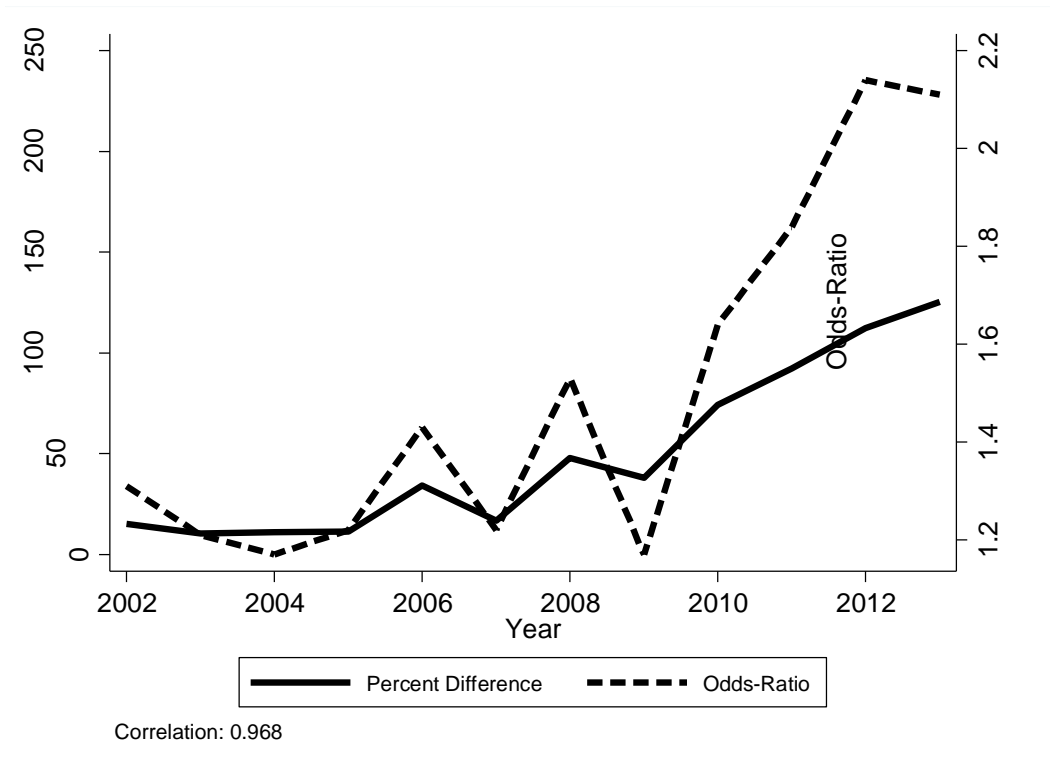


Figure A11. Correlation Between Percent Difference in Likelihood of Black Women being Searched as Compared to Whites and Odds-Ratios from Logistic Regression

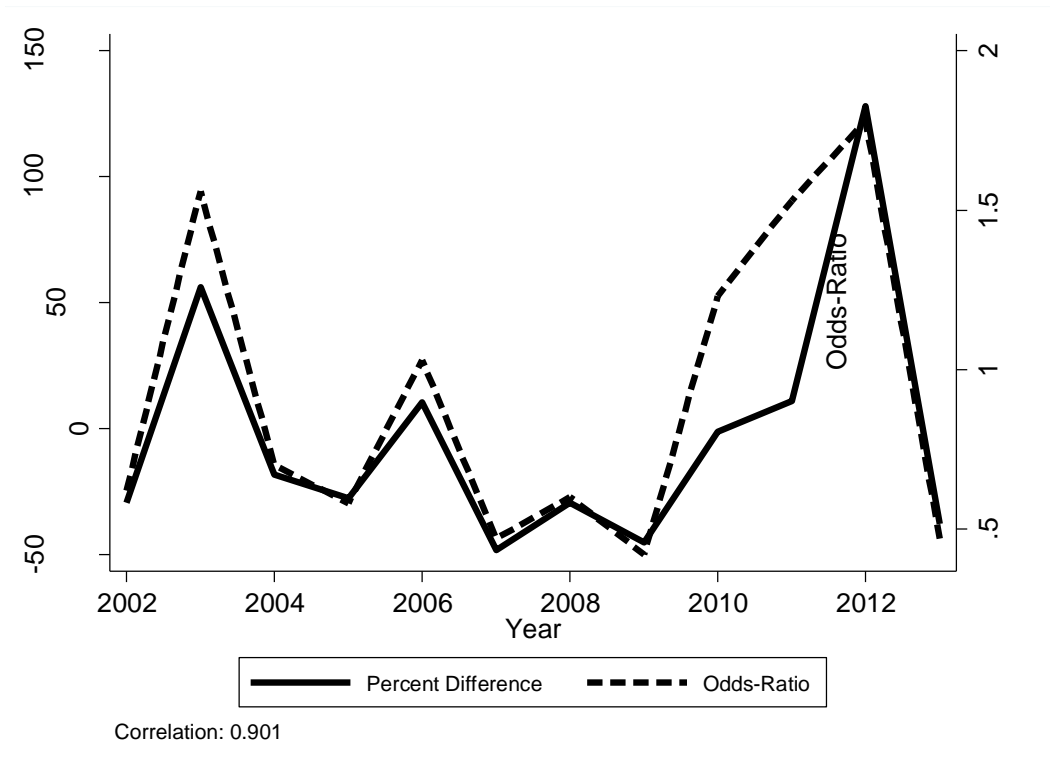


Figure A12. Racial Differences in the Likelihood of Search: Consent Searches Only

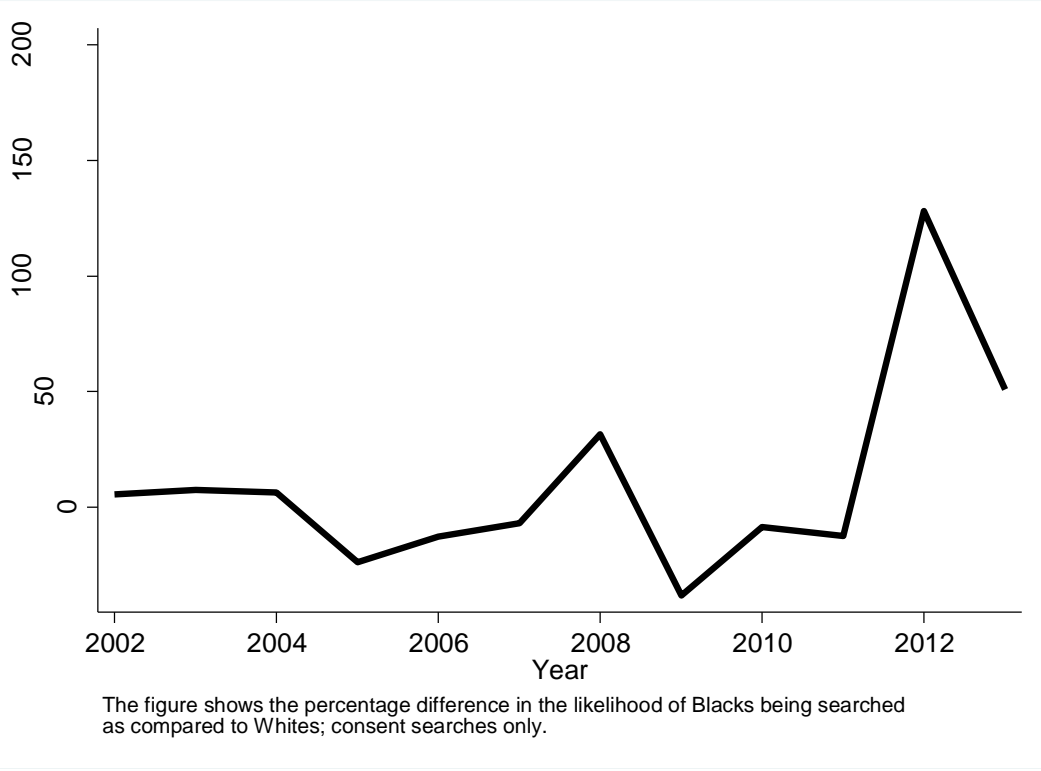


Table A6. Likelihood of Finding Contraband Given a Search, by Race

Contraband	Number	% Total	% White	% Black
Yes	1,284	28.39	29.50	29.89
No	3,238	71.61	70.50	70.11
Total	9,306	100.00	100.00	100.00

Table A7. Differential Outcomes by Whether or not a Search Occurs

Race	Search Occur	N	No Action	Verbal Warning	Written Warning	Citation Issued	Arrest	Total
White	No	71,655	2.80	31.38	19.64	45.83	0.37	100.0
Black	No	17,270	3.13	35.23	13.83	47.35	0.45	100.0
Total	No	2,993	2.85	32.36	18.47	45.92	0.39	100.0
White	Yes	3,169	3.28	16.03	10.13	37.14	33.42	100.0
Black	Yes	930	3.66	11.72	6.67	42.69	35.27	100.0
Total	Yes	423	3.23	15.81	11.21	37.00	32.75	100.0