

Analysis of Black-White Differences in Traffic Stops and Searches in Greensboro, NC, 2002-2013

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Table 1. Overview of the Data

Data Subsets	Observations
Total stops	517,114
-2014	11,902
-Passengers	16,715
-Checkpoint stops	0
Total number of cases deleted	28,356
Stops for analysis	488,758
Searches	24,011
Percent of stops leading to search (search rate)	4.91%

Figure 1. Number of Traffic Stops per Year

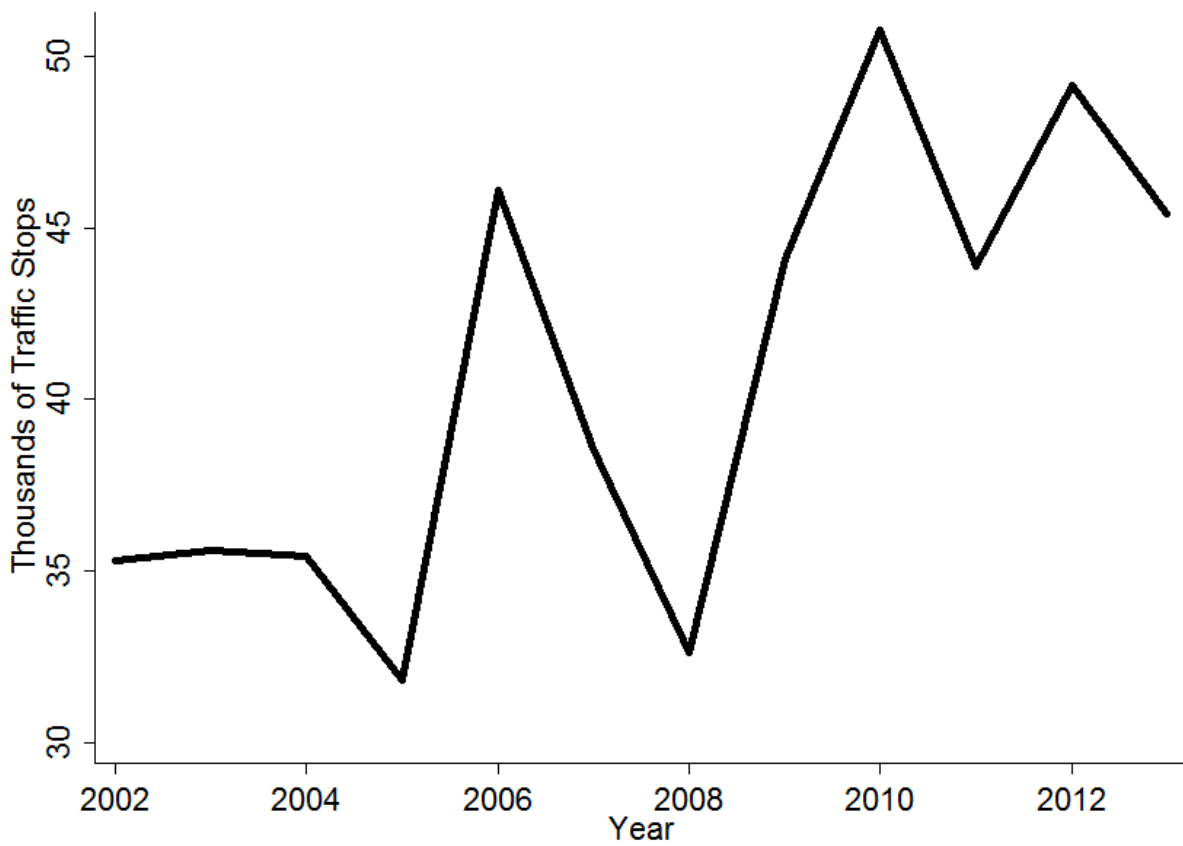


Figure 2. Racial Composition of Traffic Stops by Year

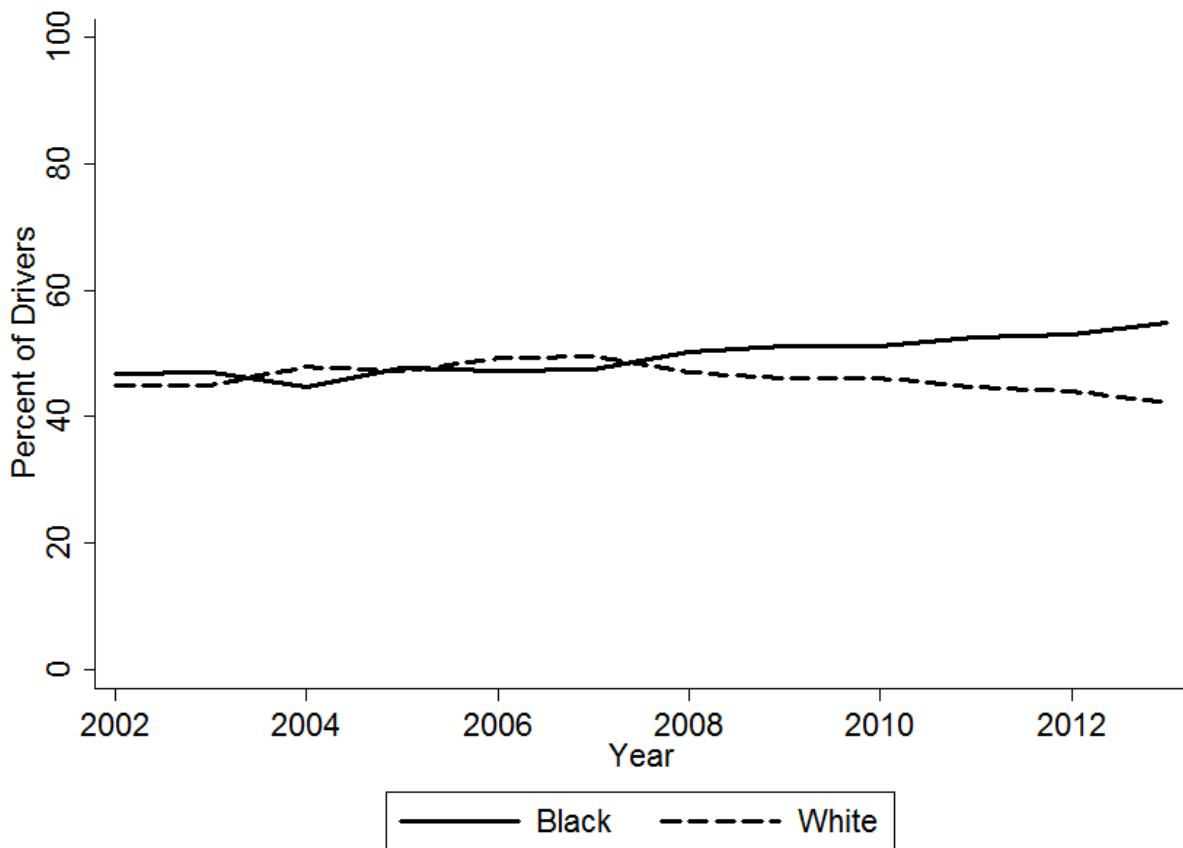


Table 2. Racial Composition of Traffic Stops by Purpose, Drivers

Purpose	Number	Percent	
		White	Black
Total Stops	488,754	46.07	49.78
Speed Limit	205,185	54.48	41.01
Stop Light/Sign	27,590	46.30	47.73
Driving Impaired	2,030	53.00	38.62
Safe Movement	38,526	45.67	49.46
Vehicle Equipment	48,447	34.20	61.43
Vehicle Regulatory	101,405	38.61	58.61
Seat Belt	19,200	43.08	53.18
Investigation	30,084	37.51	59.16
Other Vehicle	16,287	40.85	54.87

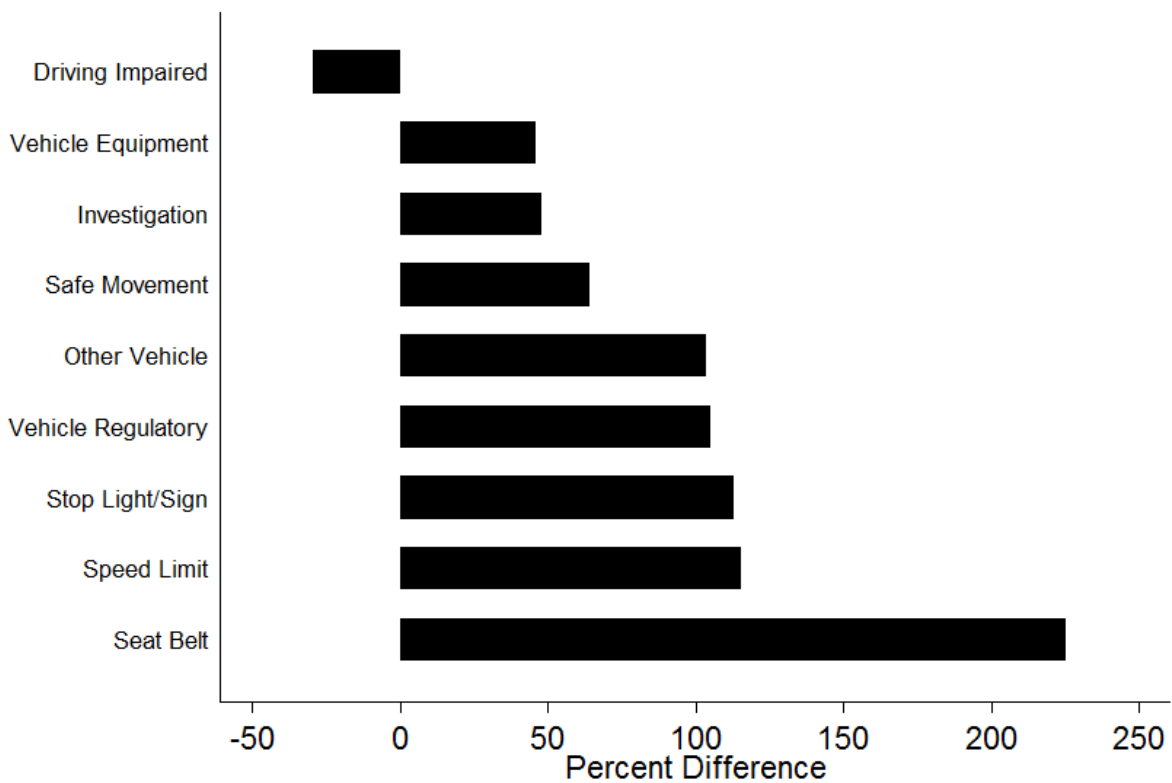
Note: Includes only drivers. Excludes 0 checkpoint stops. Excludes 16,715 passengers.

Table 3. Percent Searched by Race and Purpose of Stop

Purpose	Number	Total	% White	% Black	Ratio
					Black:White
Total Stops	488,754	-	46.07	49.78	-
Total Searches	24,011	4.91	3.16	6.58	2.08
Speed Limit	205,185	1.71	1.14	2.46	2.16
Stop Light/Sign	27,590	4.49	2.90	6.17	2.13
Driving Impaired	2,030	42.61	47.77	33.80	0.71
Safe Movement	38,526	7.40	5.61	9.22	1.64
Vehicle Equipment	48,447	7.53	5.87	8.55	1.46
Vehicle Regulatory	101,405	5.19	3.17	6.50	2.05
Seat Belt	19,200	7.12	3.23	10.50	3.25
Investigation	30,084	12.98	10.09	14.92	1.48
Other Vehicle	16,287	8.36	5.28	10.74	2.03

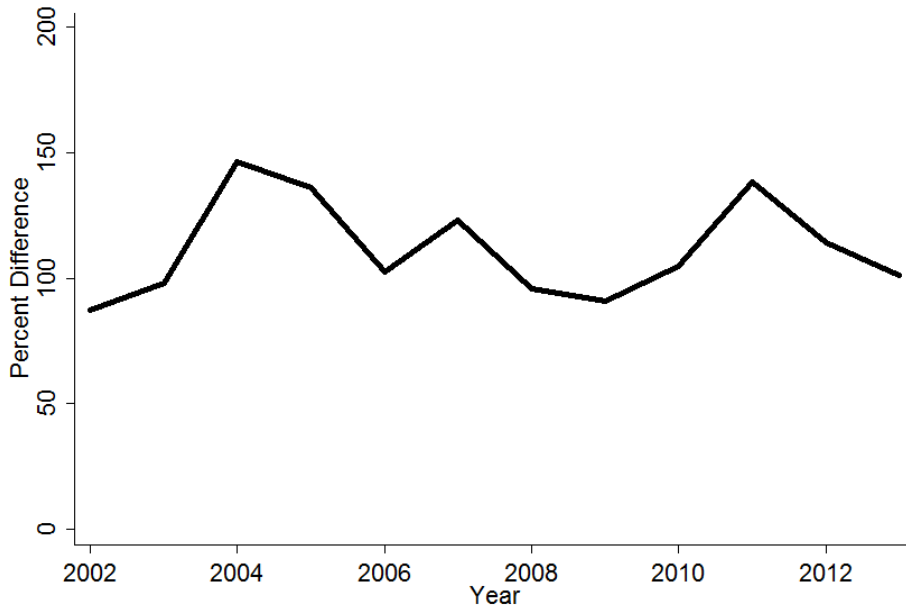
Note: See the appendix for this same table broken down for Men and Women.

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



The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites by purpose of stop.

Figure 4. Racial Differences in the Likelihood of Search



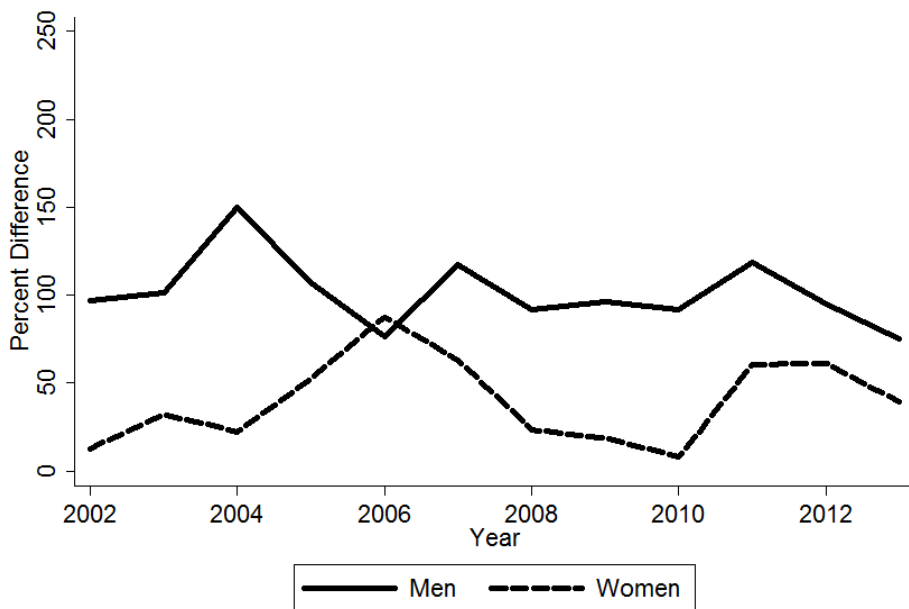
The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites.

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



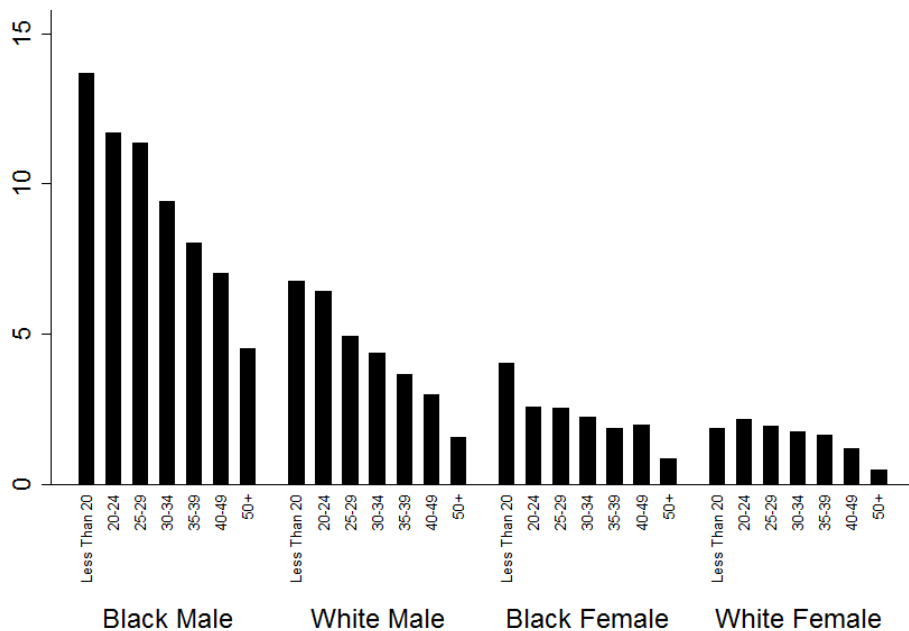
The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites by gender.

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



The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites by gender for motorists under 30.

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



Based on 488,758 traffic stops from 2002 through 2013, and 24,011 searches. Overall rate of search: 4.91 percent.

Black men under the age of 30 are searched at rates of about 11 percent whereas white men of that age see rates of about 6 percent, and women in general are typically below 4 percent. The figure makes clear how race, gender, and age combine to indicate where searches are most likely.

The patterns in Figure 7 are highly consistent over time. Figures 8 and 9 show the number of stops, then searches, by the four race/gender groups.

Figure 8. Number of Stops, by Race and Gender

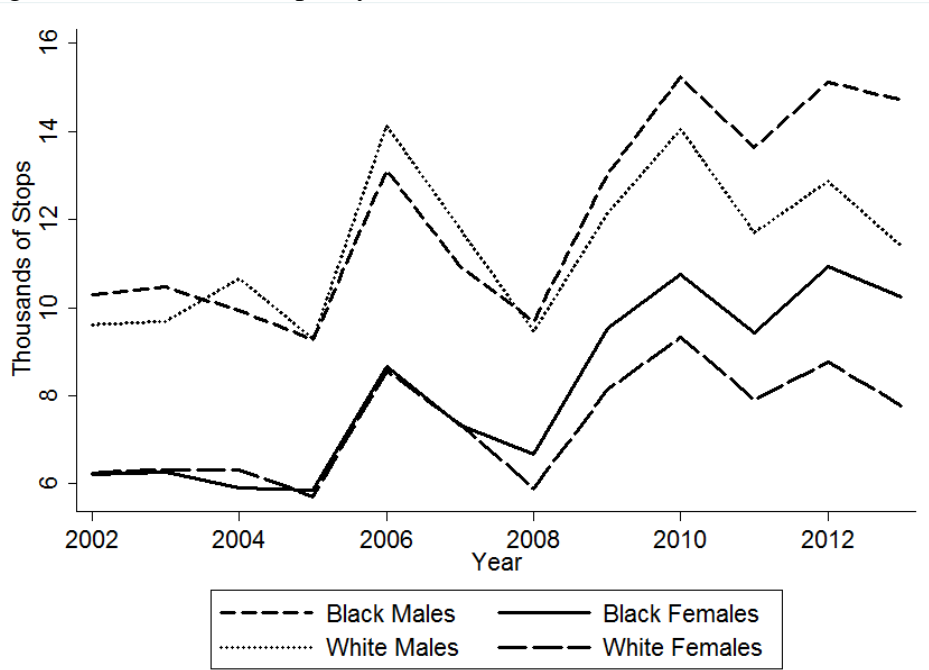


Figure 9. Percent of Stops Resulting in a Search, by Race and Gender

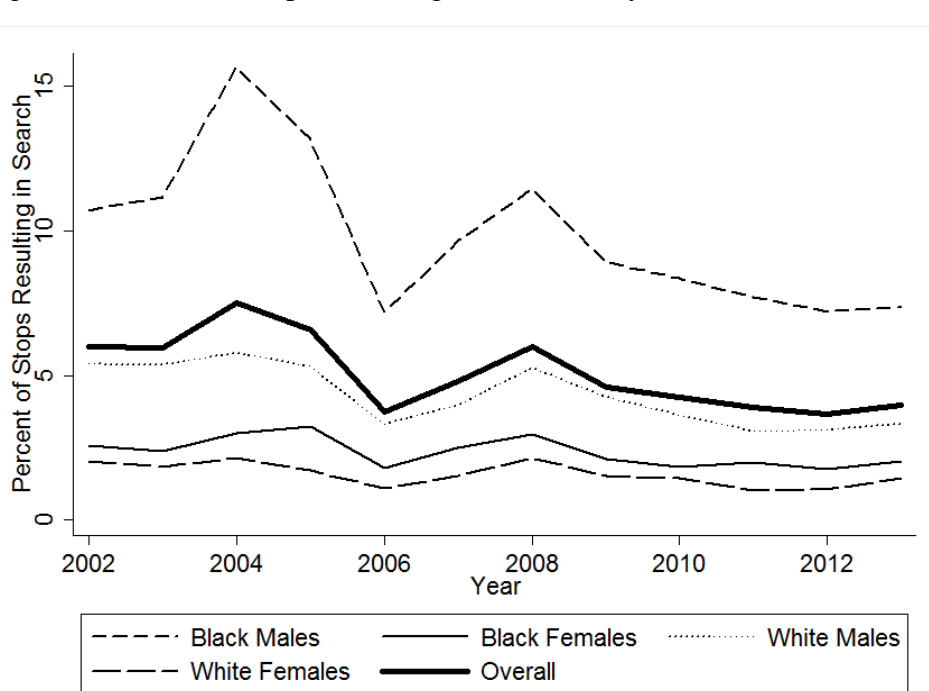


Table 4. Type of Search by Race-redo this one

Search Type	Number	Total	Ratio		
			White	Black	Black:White
Total Stops	488,754	-	46.07	49.78	-
Total Searches	24,011	4.91	3.16	6.58	2.08
Consent	13,808	2.83	1.87	3.77	2.02
Search Warrant	41	0.01	0.01	0.01	1.00
Probable Cause	3,844	0.79	0.43	1.15	2.67
Incident to Arrest	5,746	1.18	0.79	1.50	1.90
Protective Frisk	572	0.12	0.07	0.16	2.29

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	3,071	55.71	55.71	0.63	0.63
2 – 10	1,404	25.47	81.19	1.04	1.67
11 - 100	373	6.77	87.95	2.90	4.57
101 – 1,000	577	10.47	98.42	48.08	52.65
1,001 +	87	1.58	100.00	47.35	100.00
Total	5,512	100.00	-	100.00	-

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

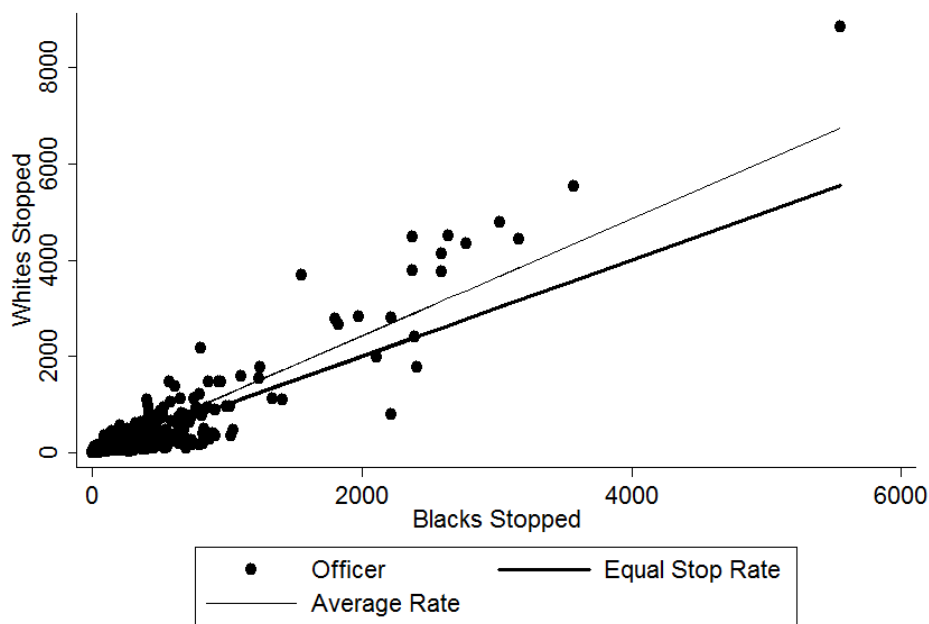


Figure 11. Number of Black and White Motorists Searched, by Officer

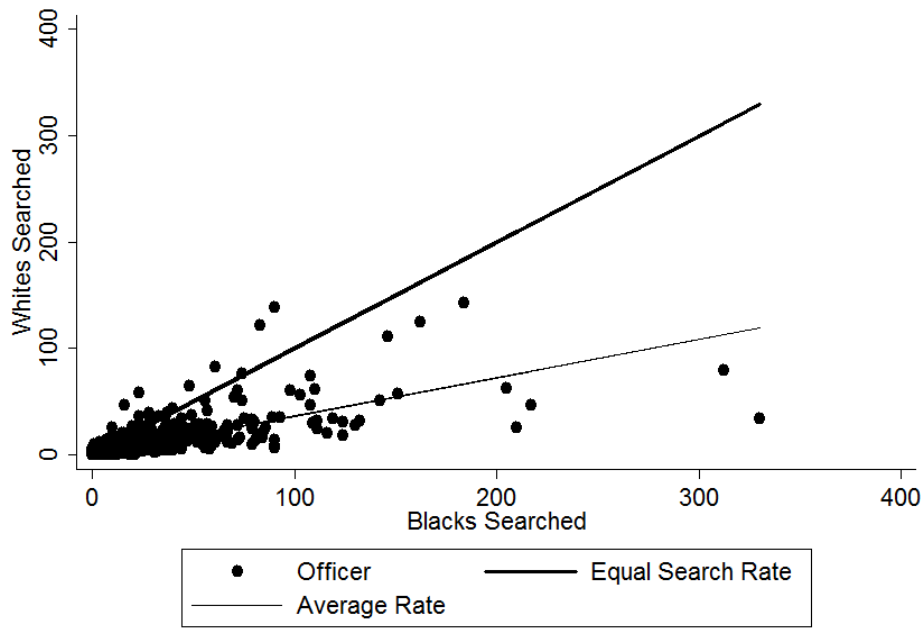
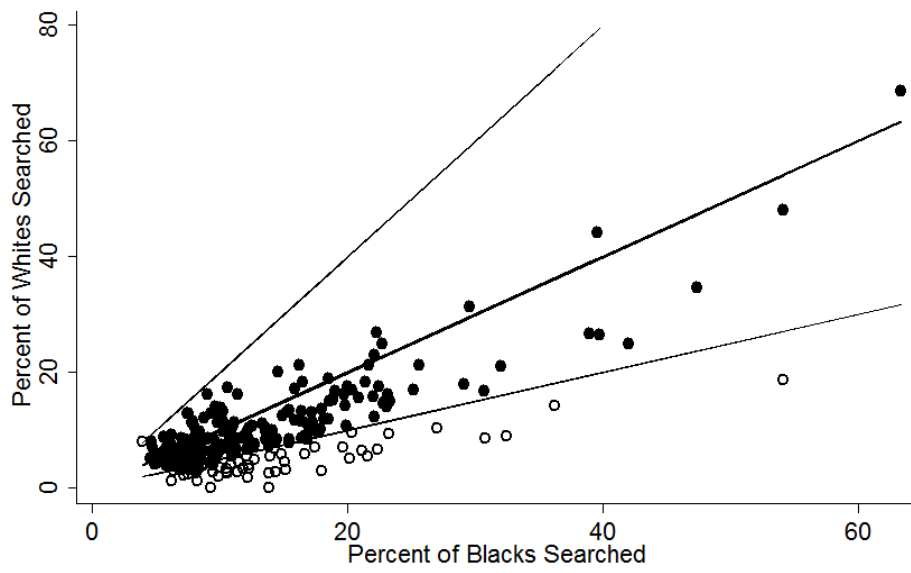


Figure 12. Percent of White and Black Drivers Searched, by Officer



Includes 259 officers with a minimum of 50 White stops, 50 Black stops, and a search rate above the department average of 4.91. The hollow circles indicate high disparity officers. 1 officers search Whites at more than twice the rate that they search Blacks. 59 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	2.55*(0.04)	2.39*(0.04)	2.02*(0.04)	1.99*(0.04)	1.86*(0.03)
Hispanic	1.80*(0.07)	1.61*(0.06)	1.20*(0.05)	1.20*(0.05)	1.19*(0.05)
Age	-	0.97*(0.00)	0.97*(0.00)	0.97*(0.00)	0.97*(0.00)
Stop Purpose					
Speed Limit	-	-	-	-	-
Stop Light	-	-	2.42*(0.09)	2.35*(0.09)	1.90*(0.07)
Impaired	-	-	35.42*(2.08)	35.15*(2.08)	22.84*(1.39)
Movement	-	-	3.89*(0.11)	3.77*(0.11)	3.02*(0.09)
Equipment	-	-	3.50*(0.10)	3.41*(0.09)	2.51*(0.07)
Regulatory	-	-	2.74*(0.07)	2.69*(0.07)	2.32*(0.06)
Seat Belt	-	-	3.64*(0.13)	3.57*(0.13)	3.85*(0.14)
Investigation	-	-	6.39*(0.18)	6.30*(0.17)	4.92*(0.14)
Other	-	-	4.30*(0.16)	4.25*(0.16)	3.65*(0.14)
Officer Type					
Black Disparity [†]	-	-	-	1.90*(0.05)	1.86*(0.05)
White Disparity [†]	-	-	-	1.19(0.42)	1.36(0.49)
Time					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
Constant	0.04*(0.00)	0.12*(0.00)	0.05*(0.00)	0.06*(0.00)	0.08*(0.00)
N	282,263	282,263	282,263	282,263	279,312
Pseudo R²	0.02	0.04	0.09	0.10	0.11

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.

* $p < 0.05$

† See Figure 12 for an explanation of the identification of high disparity officers.

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

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Demographics					
Race	1.45*(0.05)	1.39*(0.05)	1.16*(0.04)	1.15*(0.04)	1.09*(0.04)
Hispanic	0.76*(0.11)	0.72*(0.10)	0.47*(0.07)	0.47*(0.07)	0.48*(0.07)
Age	-	0.97*(0.00)	0.97*(0.00)	0.97*(0.00)	0.98*(0.00)
Stop Purpose					
Speed Limit	-	-	-	-	-
Stop Light	-	-	2.78*(0.25)	2.69*(0.25)	1.97*(0.18)
Impaired	-	-	76.85*(8.53)	75.63*(8.42)	35.55*(4.15)
Movement	-	-	5.31*(0.36)	5.16*(0.35)	3.54*(0.25)
Equipment	-	-	5.45*(0.34)	5.32*(0.33)	3.23*(0.21)
Regulatory	-	-	3.70*(0.21)	3.62*(0.20)	2.88*(0.17)
Seat Belt	-	-	3.28*(0.34)	3.28*(0.34)	3.48*(0.37)
Investigation	-	-	13.08*(0.79)	12.88*(0.78)	8.62*(0.55)
Other	-	-	4.96*(0.45)	4.92*(0.45)	3.94*(0.37)
Officer Type					
Black Disparity [†]	-	-	-	1.68*(0.10)	1.67*(0.10)
White Disparity [†]	-	-	-	1.29(0.76)	1.42(0.84)
Time					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
Constant	0.02*(0.00)	0.04*(0.00)	0.01*(0.00)	0.02*(0.00)	0.03*(0.00)
N	186,208	186,208	186,208	186,208	184,315
Pseudo R²	0.00	0.02	0.09	0.09	0.11

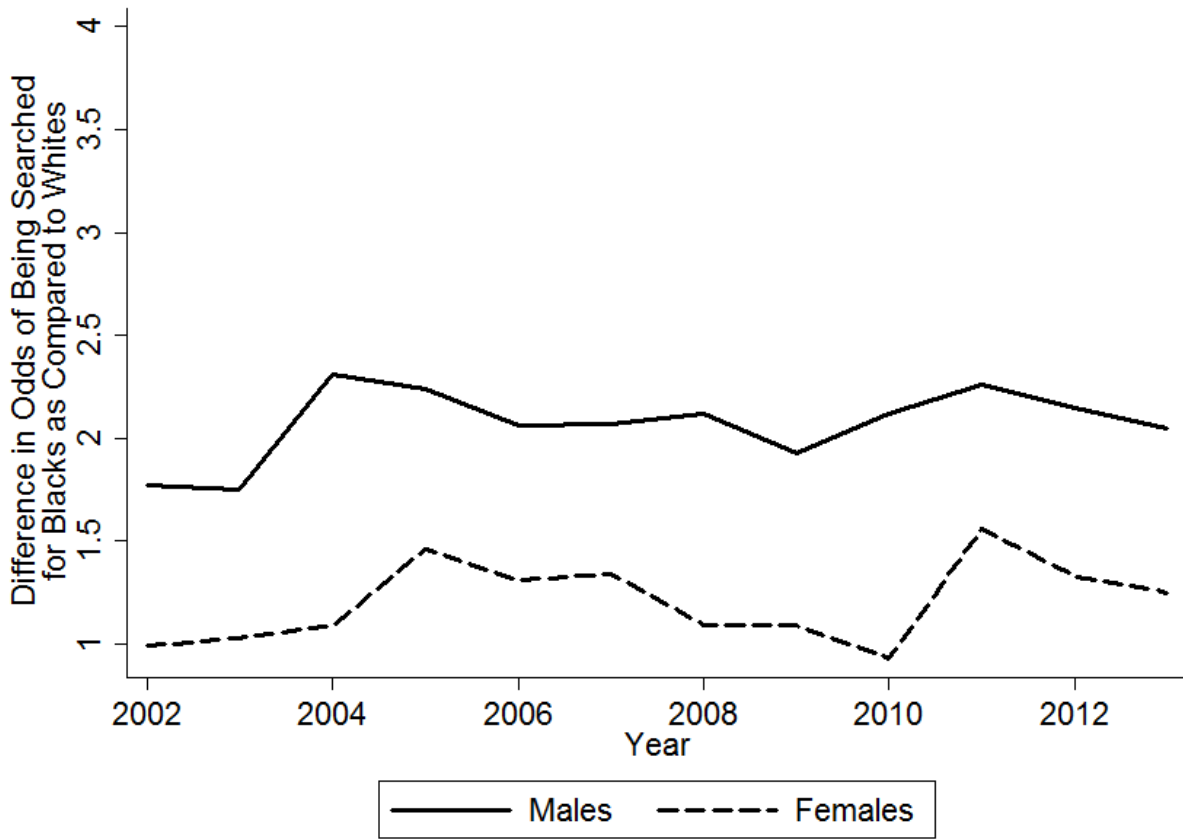
Note: Entries are odds-ratios, with standard errors in parenthesis.

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

* $p < 0.05$

† See Figure 12 for an explanation of the identification of high disparity officers.

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	16,715	28.00	68.79
Speed Limit	2,286	35.39	59.41
Stop Light/Sign	768	29.30	67.71
Driving Impaired	254	61.42	28.74
Safe Movement	2,099	33.11	63.22
Vehicle Equipment	2,588	25.73	71.75
Vehicle Regulatory	3,724	23.82	73.98
Seat Belt	1,069	21.52	76.05
Investigation	3,028	26.55	70.41
Other Vehicle	899	23.25	73.75

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

Purpose	Number	Total	% White	% Black	Ratio
					Black:White
Total Stops	297,349	-	46.01	48.92	-
Total Searches	20,378	6.85	4.21	9.49	2.25
Speed Limit	2,998	2.56	1.61	3.96	2.46
Stop Light/Sign	1,074	6.18	3.82	8.77	2.30
Driving Impaired	719	46.36	51.36	37.59	0.73
Safe Movement	2,447	9.68	7.00	12.46	1.78
Vehicle Equipment	3,082	9.77	7.32	11.36	1.55
Vehicle Regulatory	4,369	7.30	4.20	9.40	2.24
Seat Belt	1,252	9.50	4.33	13.74	3.17
Investigation	3,238	15.52	11.62	18.29	1.57
Other Vehicle	1,199	11.30	7.00	14.57	2.08

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

Purpose	Number	Total	% White	% Black	Ratio
					Black:White
Total Stops	191,405	-	46.16	51.13	-
Total Searches	3,633	1.90	1.54	2.25	1.46
Speed Limit	520	0.59	0.48	0.74	1.54
Stop Light/Sign	166	1.63	1.38	1.87	1.36
Driving Impaired	146	30.48	37.04	22.45	0.61
Safe Movement	402	3.04	3.10	3.04	0.98
Vehicle Equipment	564	3.33	3.29	3.37	1.02
Vehicle Regulatory	889	2.14	1.67	2.46	1.47
Seat Belt	116	1.93	1.12	2.73	2.44
Investigation	668	7.24	6.57	7.64	1.16
Other Vehicle	162	2.85	2.38	3.35	1.41

Table A4. Type of Search by Race: Men

Search Type	Number	Total	White	Black	Ratio
					Black:White
Total Stops	297,349	-	46.01	48.92	-
Total Searches	20,378	6.85	4.21	9.49	2.25
Consent	11,853	3.99	2.50	5.52	2.21
Search Warrant	35	0.01	0.01	0.01	1.00
Probable Cause	3,249	1.09	0.58	1.64	2.83
Incident to Arrest	4,728	1.59	1.02	2.07	2.03
Protective Frisk	513	0.17	0.10	0.24	2.40

Table A5. Type of Search by Race: Women

Search Type	Number	Total	White	Black	Ratio Black:White
Total Stops	191,405	-	46.16	51.13	-
Total Searches	3,633	1.90	1.54	2.25	1.46
Consent	1,955	1.02	0.88	1.16	1.32
Search Warrant	6	-	-	-	-
Probable Cause	595	0.31	0.21	0.41	1.95
Incident to Arrest	1,018	0.53	0.43	0.63	1.47
Protective Frisk	59	0.03	0.02	0.04	2.00

Figure A6. Stops by Day of the Week

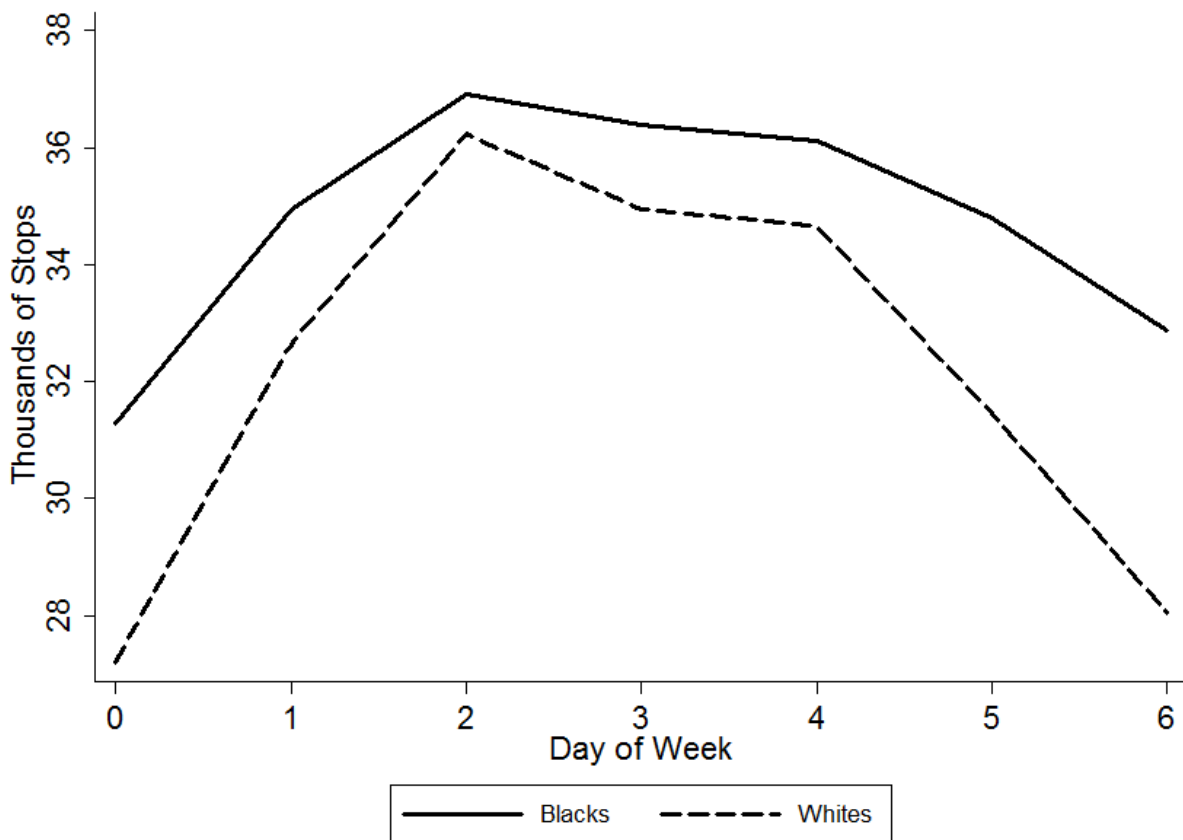


Figure A7. Searches by Day of the Week

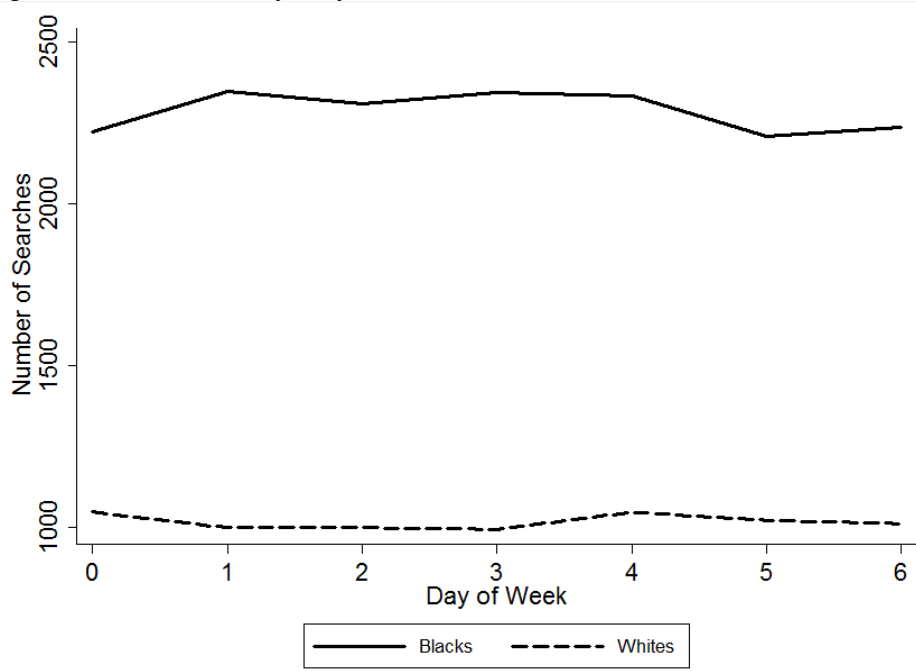
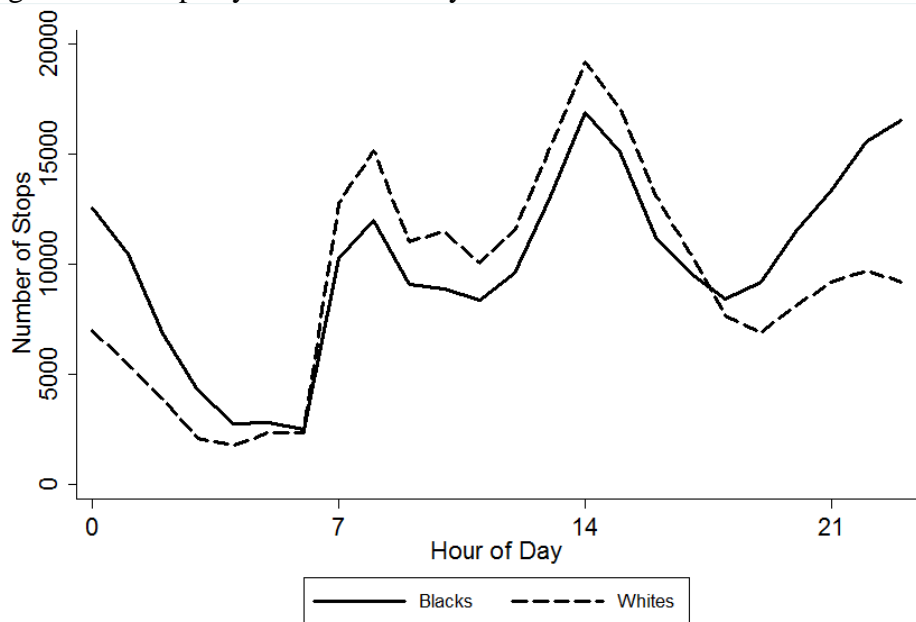


Figure A8. Stops by Hour of the Day



The figure excludes cases where the hour and minute was exactly 0:00. These cases were presumed to be missing data.

Figure A9. Searches by Hour of the Day

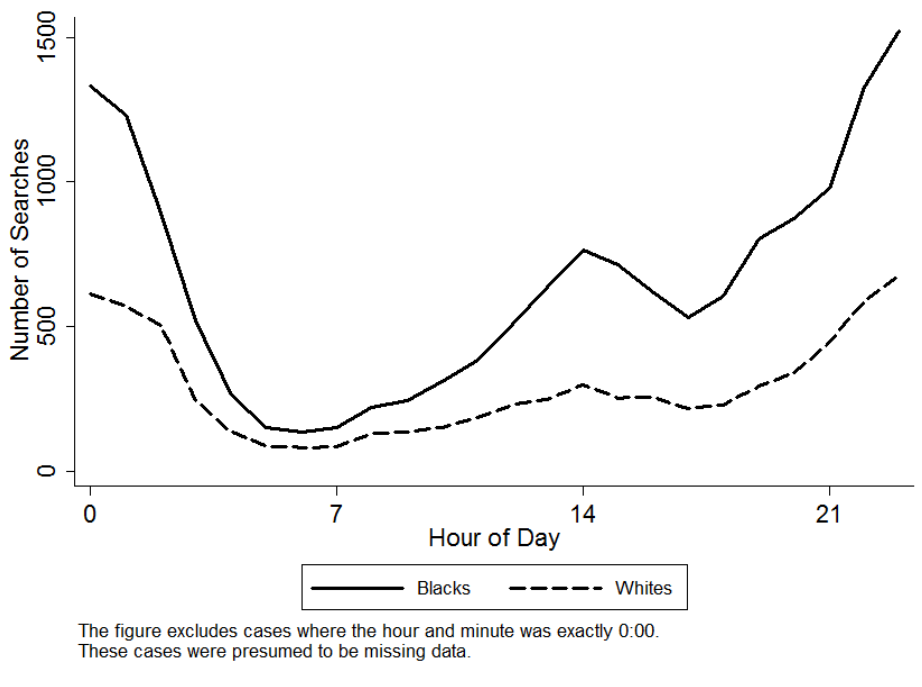


Figure A10. Correlation Between Percent Difference in Likelihood of Black Men being Searched as Compared to Whites and Odds-Ratios from Logistic Regression

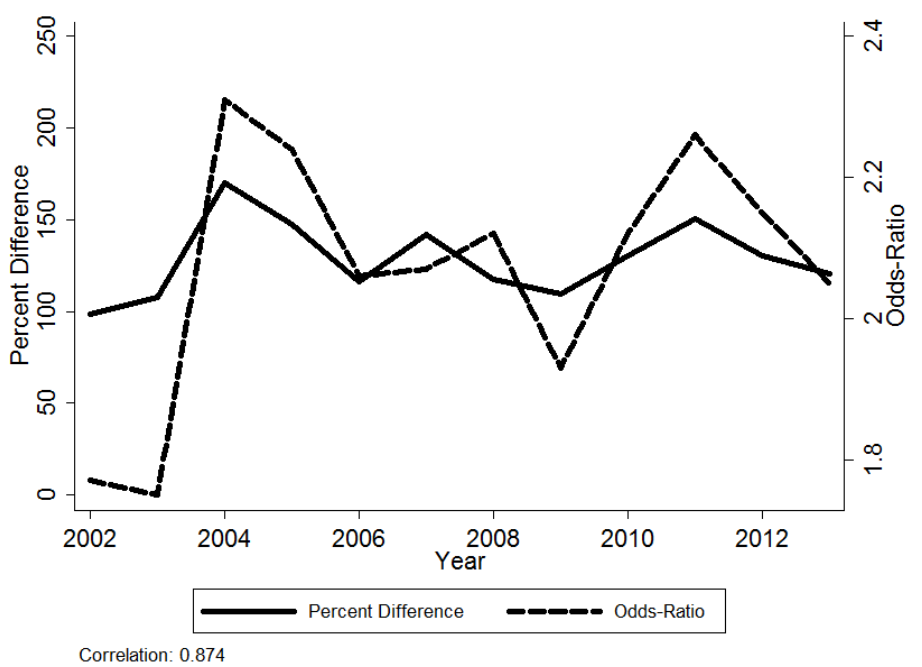


Figure A11. Correlation Between Percent Difference in Likelihood of Black Women being Searched as Compared to Whites and Odds-Ratios from Logistic Regression

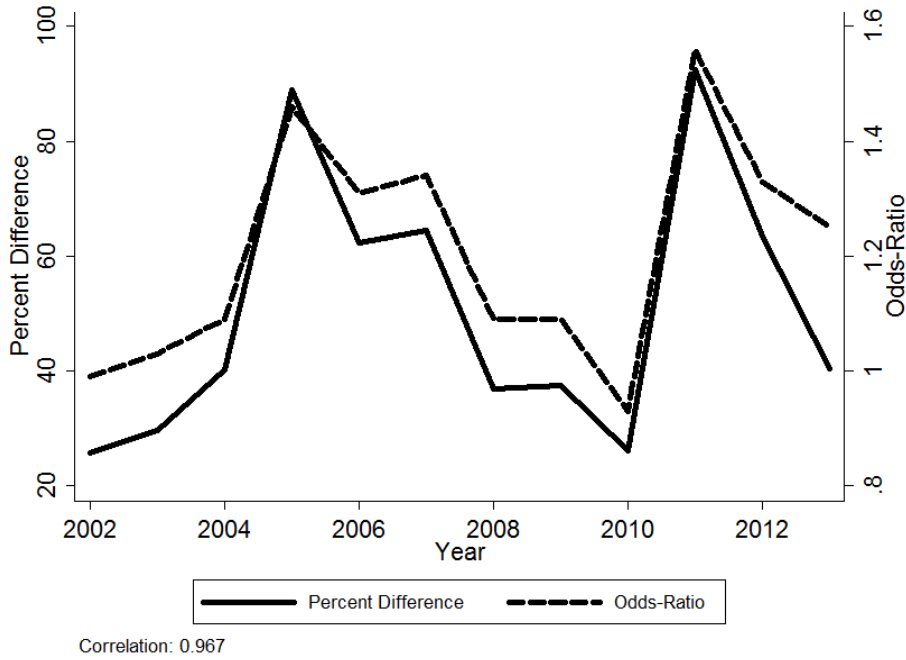


Figure A12. Racial Differences in the Likelihood of Search: Consent Searches Only

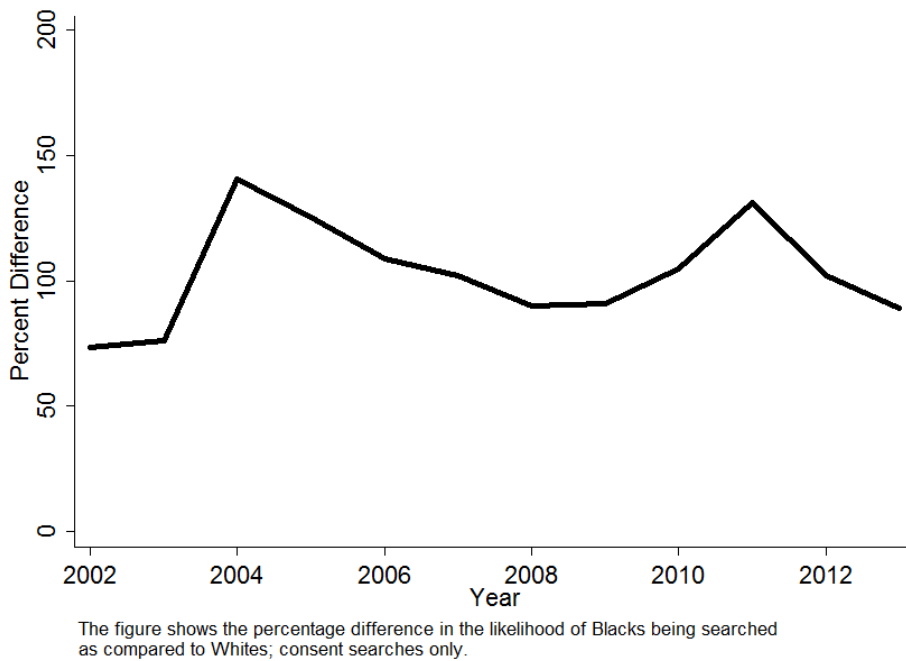


Table A6. Likelihood of Finding Contraband Given a Search, by Race

Contraband	Number	% Total	% White	% Black
Yes	6,799	28.32	28.85	28.41
No	17,212	71.68	71.15	71.59
Total	24,011	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	218,047	2.35	26.58	6.24	64.33	0.50	100.0
Black	No	227,299	3.63	32.60	6.28	56.65	0.84	100.0
Total	No	464,743	2.98	29.61	6.20	60.53	0.67	100.0
White	Yes	7,119	1.71	17.59	4.58	43.57	32.55	100.0
Black	Yes	16,006	1.97	17.85	3.97	46.74	29.48	100.0
Total	Yes	24,011	1.87	17.62	4.08	45.83	30.60	100.0