

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

December 7, 2014

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Table 1. Overview of the Data

Data Subsets	Observations
Total stops	91,418
-2014	4,375
-Passengers	2,491
-Checkpoint stops	763
Stops for analysis	84,010
Searches	5,554

Search Rate = 6.61

Figure 1. Number of Traffic Stops per Year

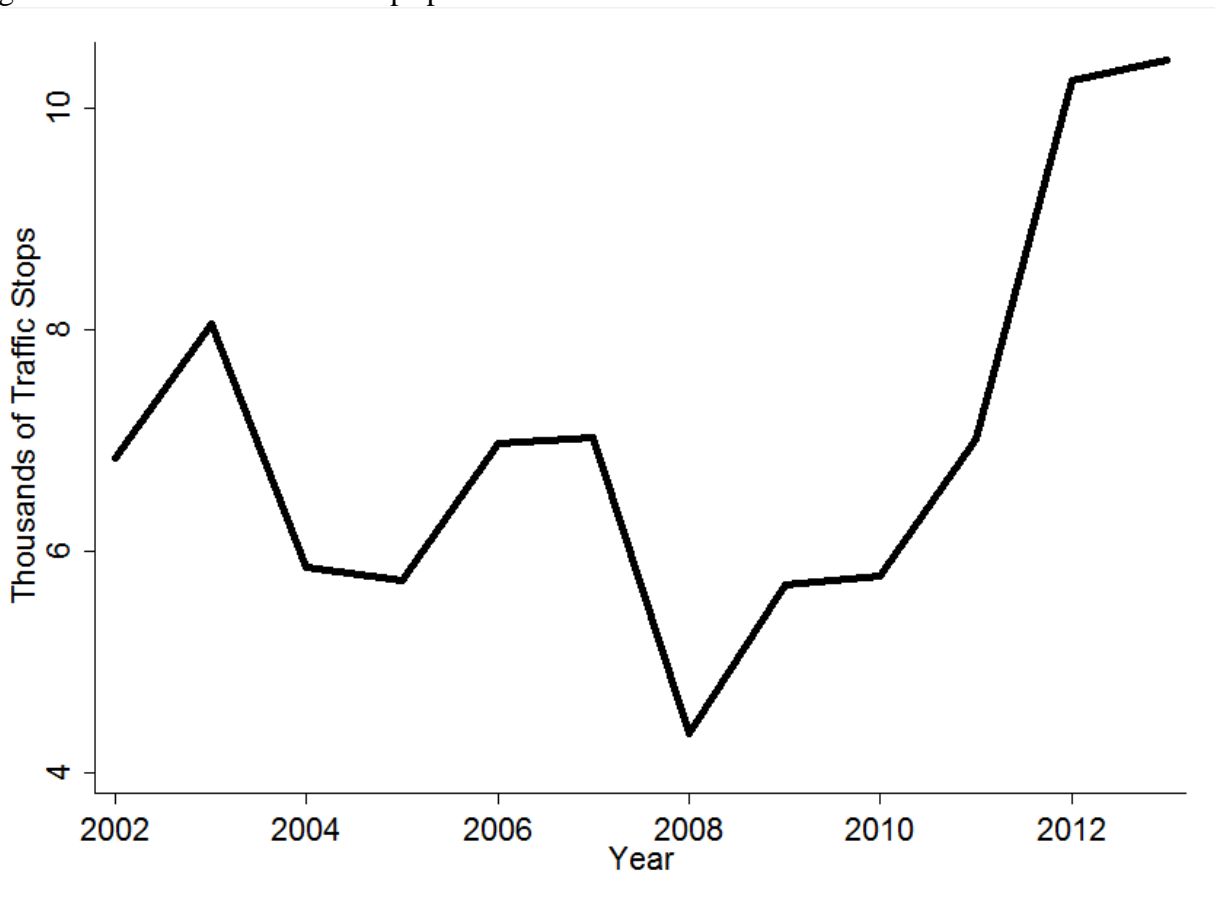


Figure 2. Racial Composition of Traffic Stops by Year

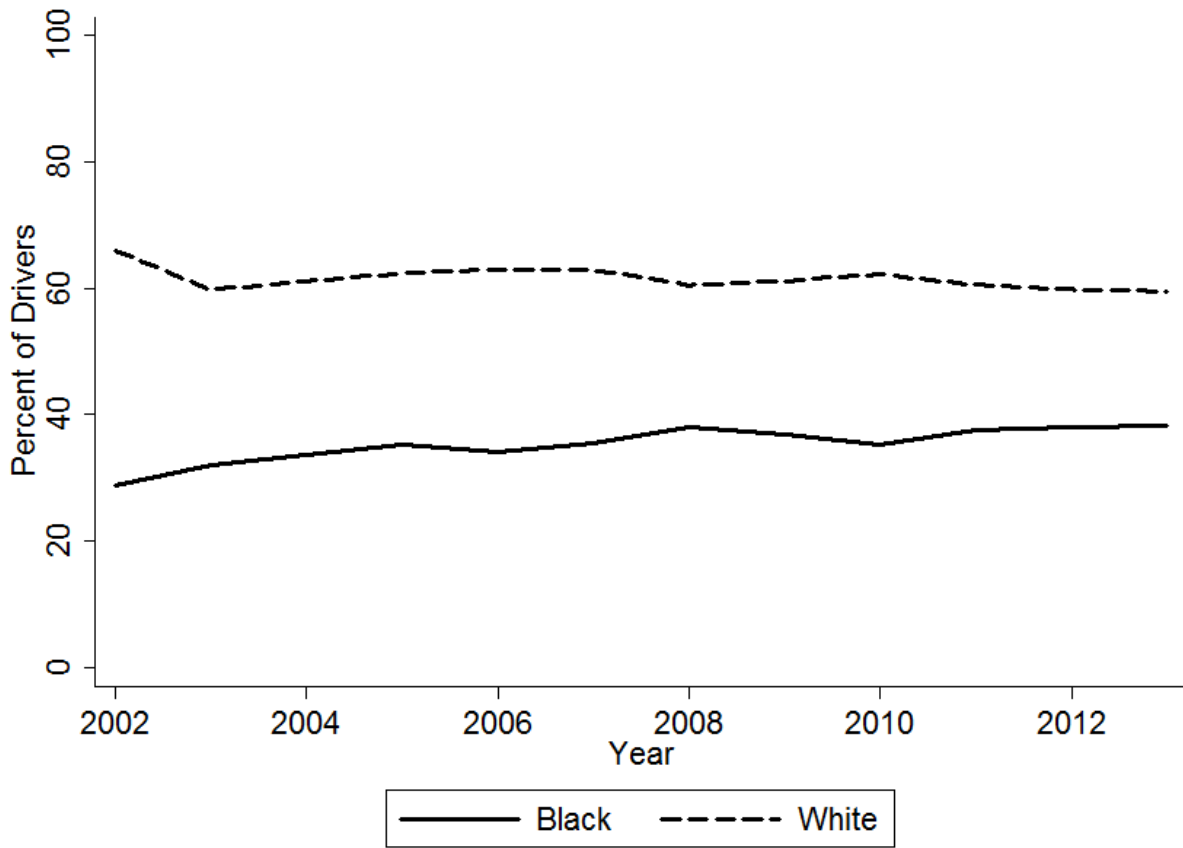


Table 2. Racial Composition of Traffic Stops by Purpose, Drivers

Purpose	Number	Percent	
		White	Black
Total Stops	84,010	61.44	35.45
Speed Limit	25,140	66.23	30.39
Stop Light/Sign	5,700	60.89	35.21
Driving Impaired	1,991	67.35	27.21
Safe Movement	6,968	66.26	30.24
Vehicle Equipment	12,605	57.18	39.87
Vehicle Regulatory	15,252	58.54	39.53
Seat Belt	5,552	57.53	39.72
Investigation	5,998	58.32	38.65
Other Vehicle	4,804	56.33	39.80

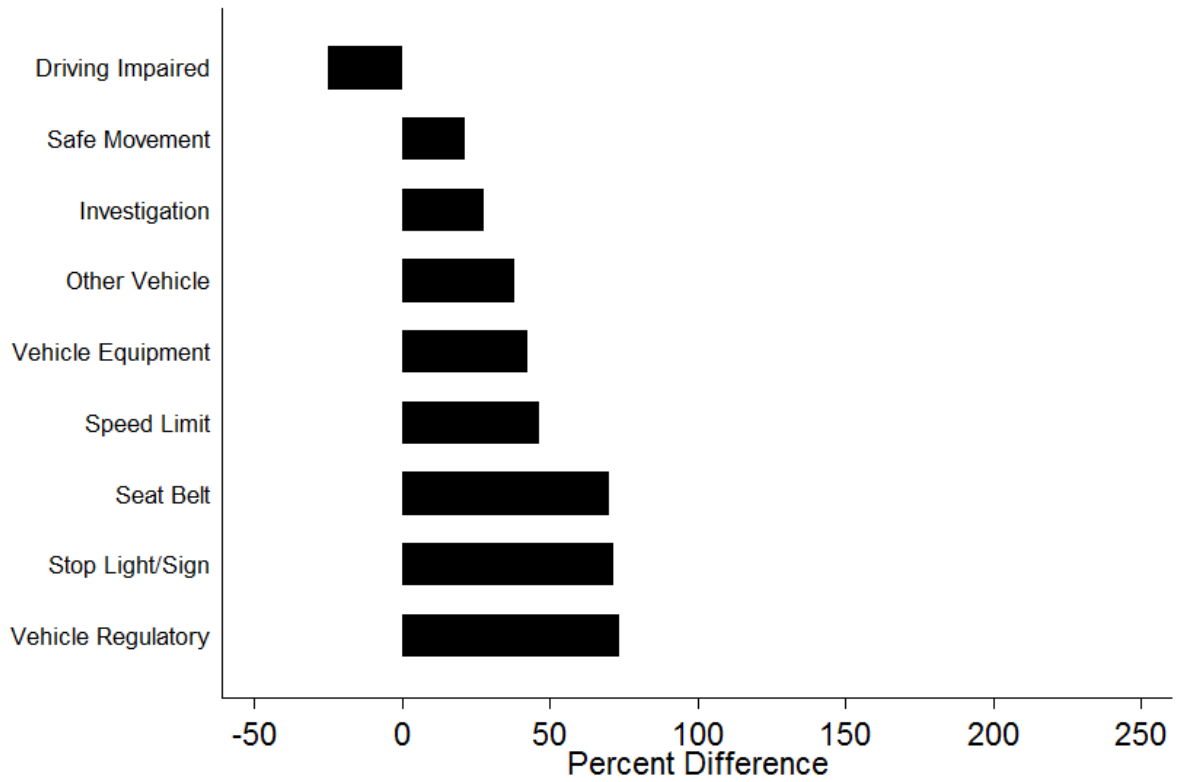
Note: Includes only drivers. Excludes 763 checkpoint stops. Excludes 2,491 passengers.

Table 3. Percent Searched by Race and Purpose of Stop

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	84,010	-	61.44	35.45	-
Total Searches	5,554	6.61	5.86	7.83	1.34
Speed Limit	25,140	2.70	2.34	3.42	1.46
Stop Light/Sign	5,700	5.40	4.18	7.17	1.72
Driving Impaired	1,991	39.73	42.73	32.04	0.75
Safe Movement	6,968	8.21	7.62	9.25	1.21
Vehicle Equipment	12,605	6.45	5.51	7.86	1.43
Vehicle Regulatory	15,252	4.87	3.77	6.55	1.74
Seat Belt	5,552	5.10	3.94	6.71	1.70
Investigation	5,998	17.04	15.44	19.72	1.28
Other Vehicle	4,804	7.16	6.17	8.53	1.38

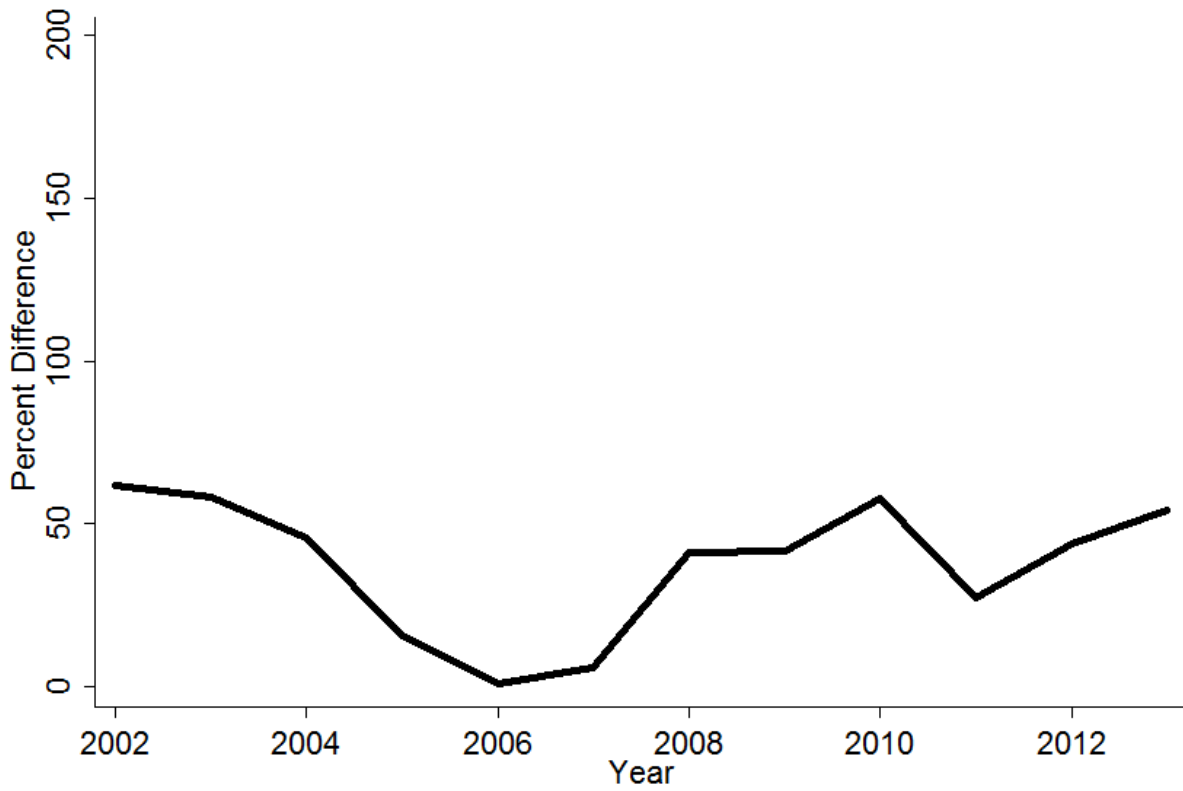
Note: See the appendix for this same table broken down for Men and Women.

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



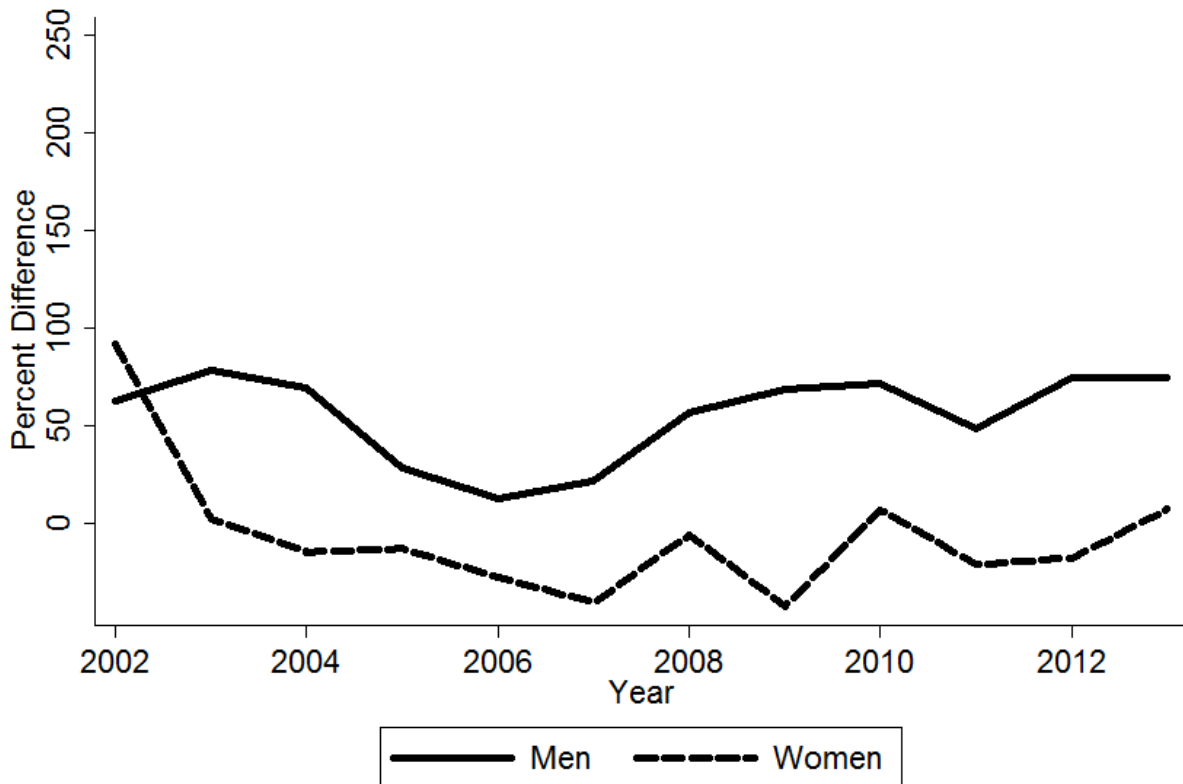
The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites by purpose of stop.

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

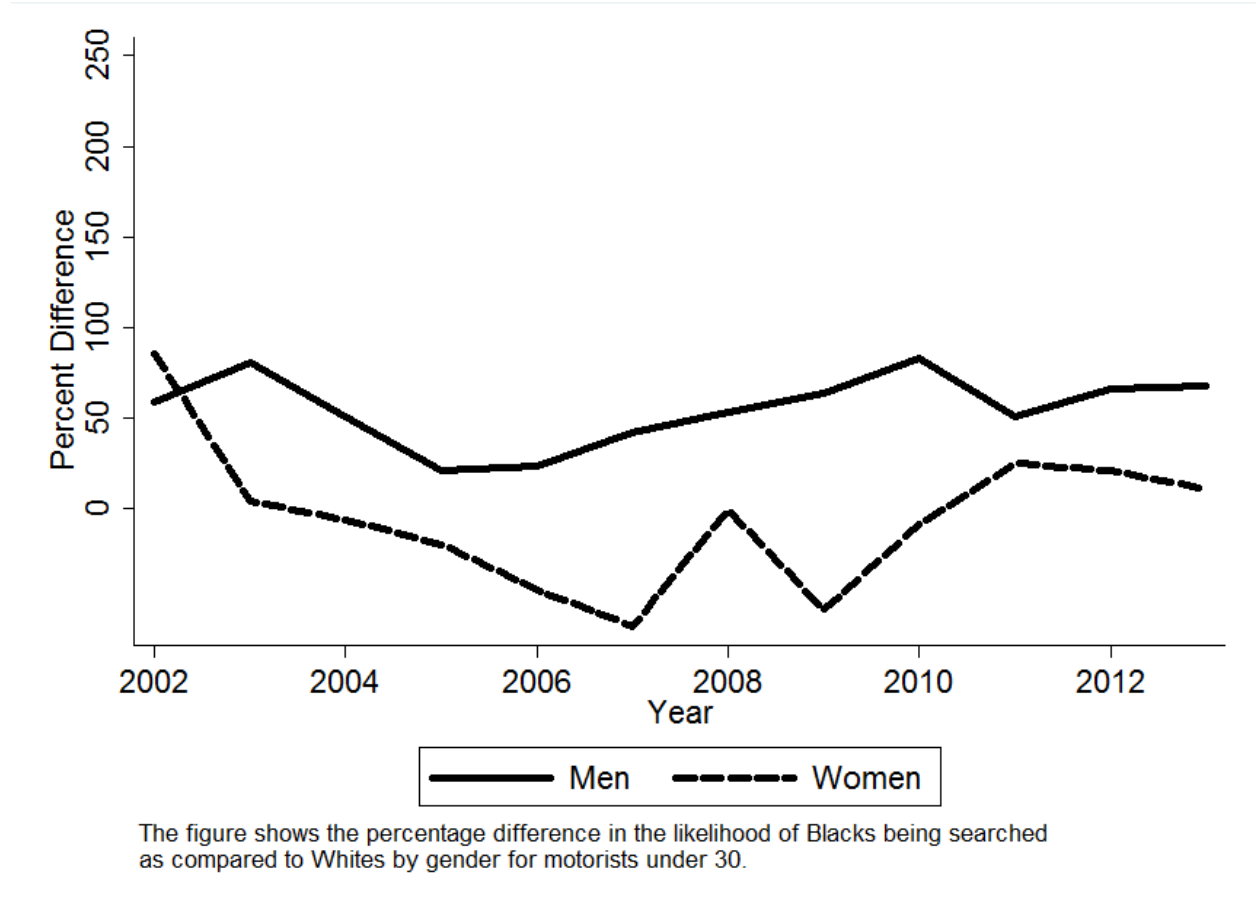
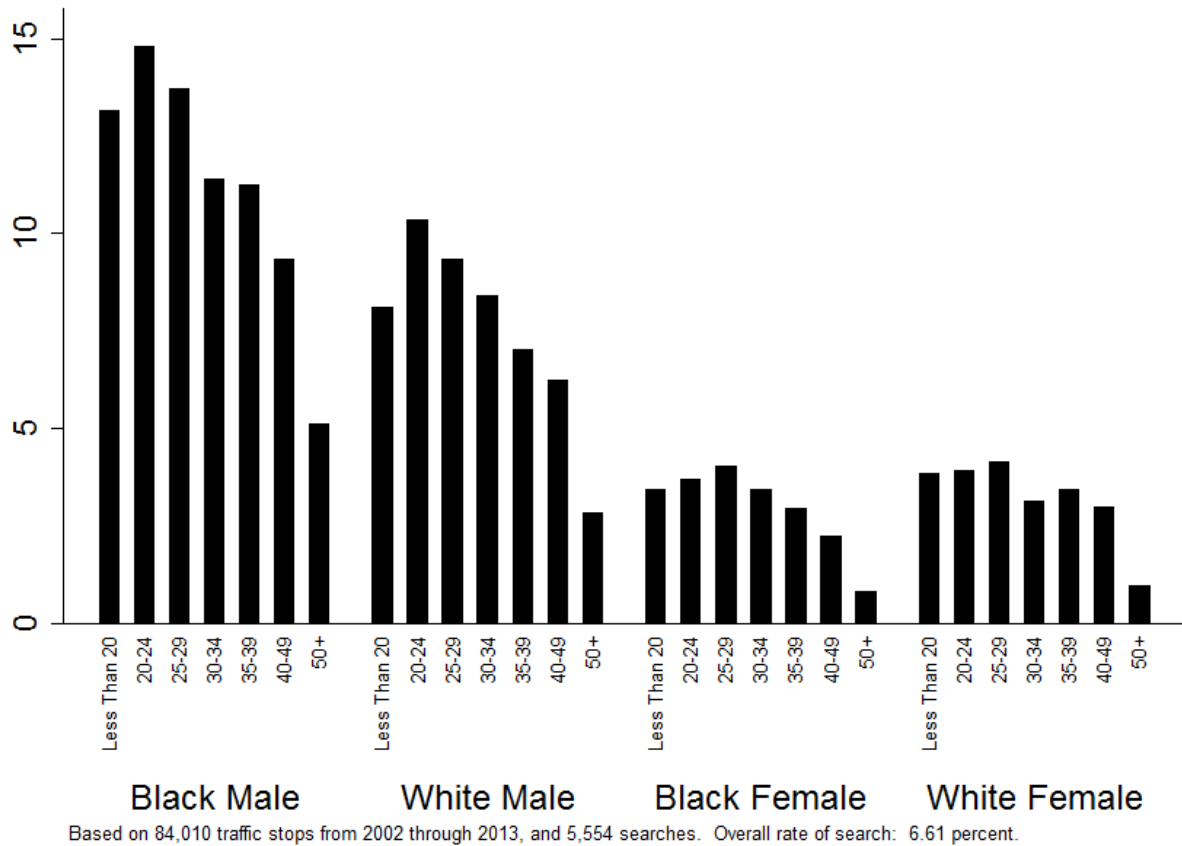


Figure 7. Search Rates by Race, Gender, and Age Group



Black men under 35 years are searched at rates around or above 12 percent; women in general are searched in less than 5 percent of all stops. The figure makes clear how race, age, and gender 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

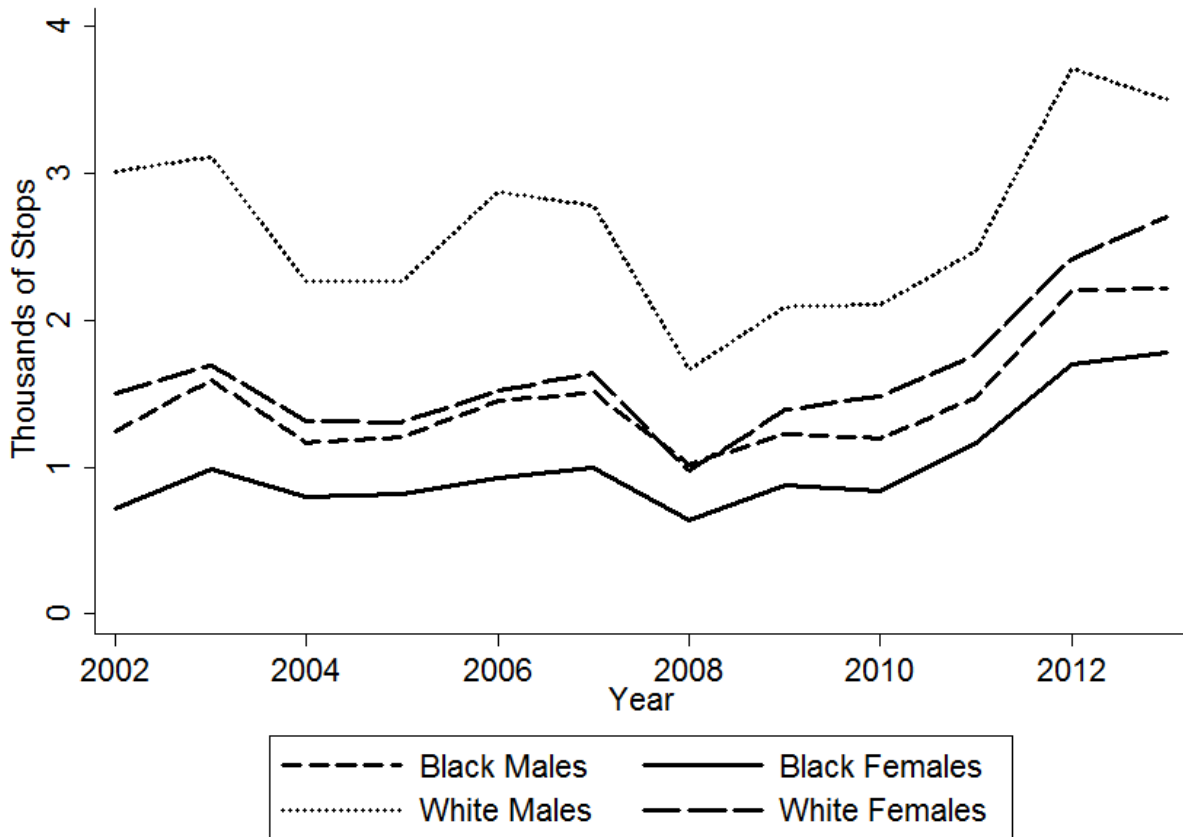


Figure 9. Percent of Stops Resulting in a Search, by Race and Gender

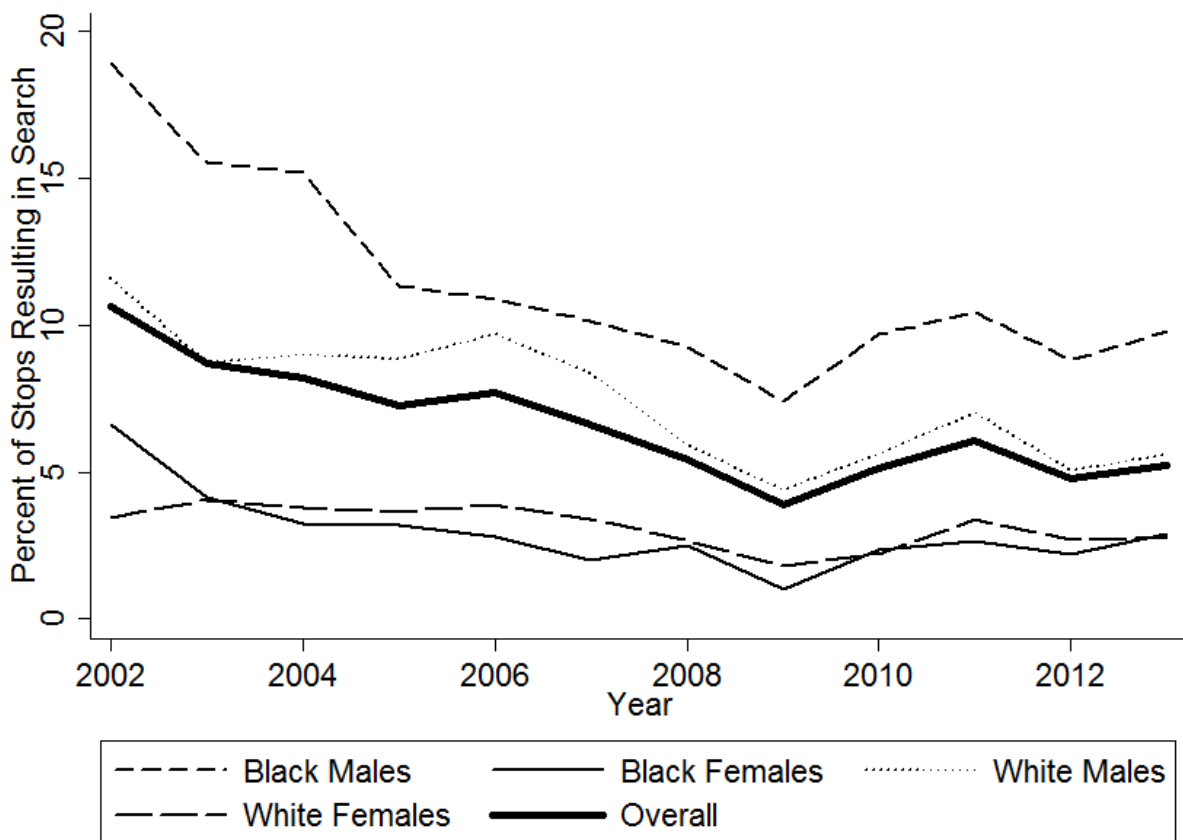


Table 4. Type of Search by Race

Search Type	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	84,010	-	61.44	35.45	-
Total Searches	5,554	6.61	5.86	7.83	1.34
Consent	1,788	2.13	1.89	2.60	1.38
Search Warrant	23	-	-	-	-
Probable Cause	996	1.19	0.83	1.86	2.24
Incident to Arrest	2,643	3.15	3.05	3.12	1.02
Protective Frisk	104	0.12	0.07	0.21	3.00

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	621	48.55	48.55	0.74	0.74
2 – 10	258	20.17	68.73	1.26	2.00
11 - 100	199	15.56	84.28	9.15	11.15
101 – 1,000	194	15.17	99.45	65.04	76.19
1,001 +	7	0.55	100.00	23.81	100.00
Total	1,279	100	-	100	-

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

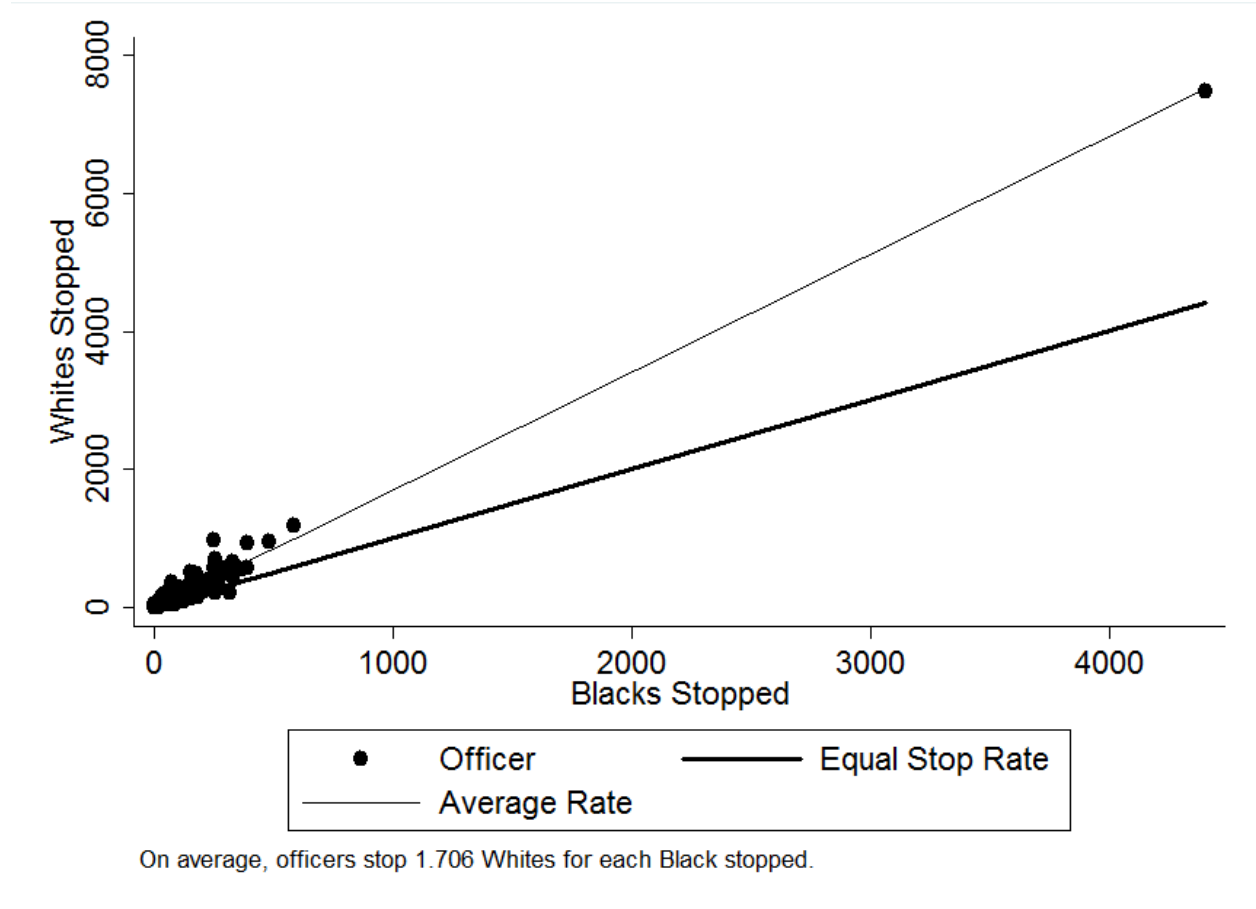


Figure 11. Number of Black and White Motorists Searched, by Officer

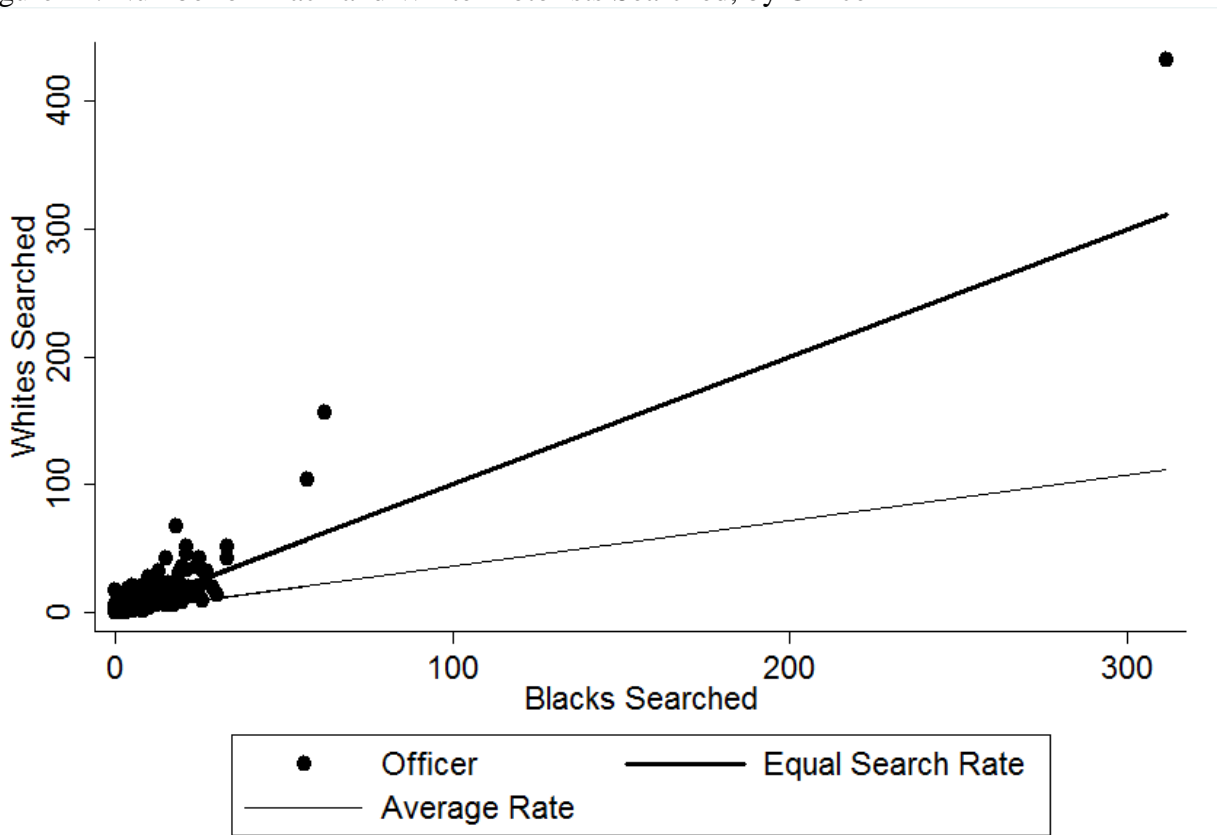
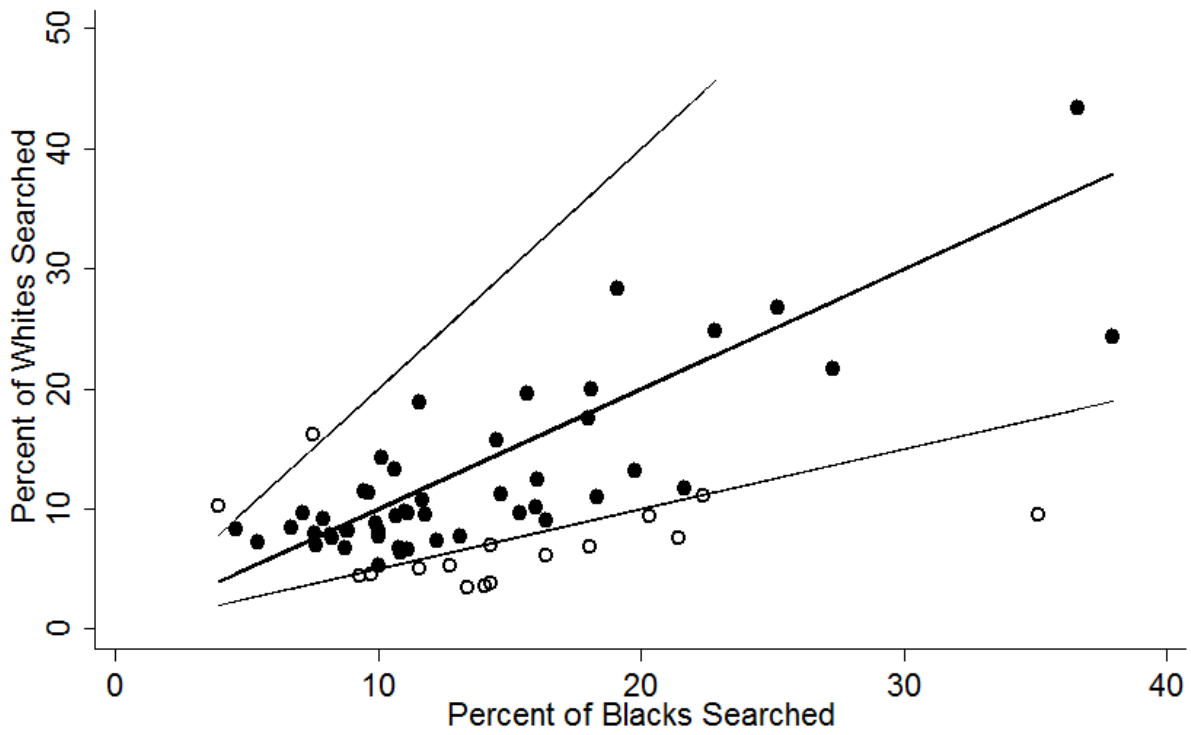


Figure 12. Percent of White and Black Drivers Searched, by Officer



Includes 65 officers with a minimum of 50 White stops, 50 Black stops, and a search rate above the department average of 6.61. The hollow circles indicate high disparity officers. 2 officers search Whites at more than twice the rate that they search Blacks. 14 officers search Blacks at more than twice the rate that they search Whites.

Table 6. Predicting the Occurrence of a Search by Burlington Police Officers for Male Motorists with Odds-Ratios and Standard Errors in Parentheses, 2002-2013

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Demographics					
Race	1.89*(0.07)	1.88*(0.07)	1.81*(0.07)	1.81*(0.07)	1.81*(0.07)
Hispanic	1.91*(0.08)	1.71*(0.08)	1.36*(0.06)	1.36*(0.06)	1.41*(0.07)
Age	-	0.97*(0.00)	0.97*(0.00)	0.97*(0.00)	0.97*(0.00)
Stop Purpose					
Speed Limit	-	-	-	-	-
Stop Light	-	-	1.84*(0.15)	1.84*(0.15)	1.63*(0.14)
Impaired	-	-	19.81*(1.42)	19.82*(1.42)	16.25*(1.27)
Movement	-	-	2.55*(0.17)	2.56*(0.17)	2.23*(0.16)
Equipment	-	-	1.98*(0.12)	2.00*(0.12)	1.79*(0.12)
Regulatory	-	-	1.74*(0.11)	1.74*(0.11)	1.68*(0.11)
Seat Belt	-	-	1.51*(0.12)	1.52*(0.12)	1.61*(0.14)
Investigation	-	-	5.41*(0.33)	5.43*(0.33)	4.91*(0.32)
Other	-	-	1.97*(0.15)	1.98*(0.15)	1.98*(0.16)
Officer Type					
Black Disparity [†]	-	-	-	1.31*(0.08)	1.38*(0.09)
White Disparity [‡]	-	-	-	1.70*(0.42)	1.71*(0.43)
Time					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
Constant	0.07*(0.00)	0.16*(0.01)	0.08*(0.01)	0.08*(0.01)	0.09*(0.01)
N	49,409	49,409	49,409	49,409	46,341
Pseudo R²	0.01	0.03	0.10	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.

* = Significant at 0.05 p-value

† = Coded 1 for 14 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 2 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 by Burlington Police Officers for Female Motorists with Odds-Ratios and Standard Errors in Parentheses, 2002-2013

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Demographics					
Race	0.88(0.06)	0.88(0.06)	0.85*(0.06)	0.85*(0.06)	0.83*(0.06)
Hispanic	0.73*(0.10)	0.66*(0.09)	0.49*(0.07)	0.49*(0.07)	0.51*(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	-	-	1.96*(0.33)	1.96*(0.33)	1.64*(0.30)
Impaired	-	-	31.73*(4.42)	31.74*(4.43)	19.52*(3.02)
Movement	-	-	4.35*(0.59)	4.35*(0.59)	3.10*(0.45)
Equipment	-	-	2.77*(0.34)	2.77*(0.34)	2.02*(0.27)
Regulatory	-	-	2.04*(0.25)	2.04*(0.25)	1.95*(0.25)
Seat Belt	-	-	1.61*(0.32)	1.61*(0.32)	1.64*(0.35)
Investigation	-	-	11.45*(1.33)	11.47*(1.33)	9.16*(1.13)
Other	-	-	2.98*(0.51)	2.98*(0.51)	2.38*(0.44)
Officer Type					
Black Disparity [†]	-	-	-	1.03(0.14)	1.06(0.15)
White Disparity [‡]	-	-	-	2.17(1.05)	1.96(0.95)
Time					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
Constant	0.03*(0.00)	0.09*(0.01)	0.03*(0.00)	0.03*(0.00)	0.05*(0.01)
N	31,989	31,989	31,989	31,989	30,408
Pseudo R²	0.00	0.01	0.11	0.11	0.13

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

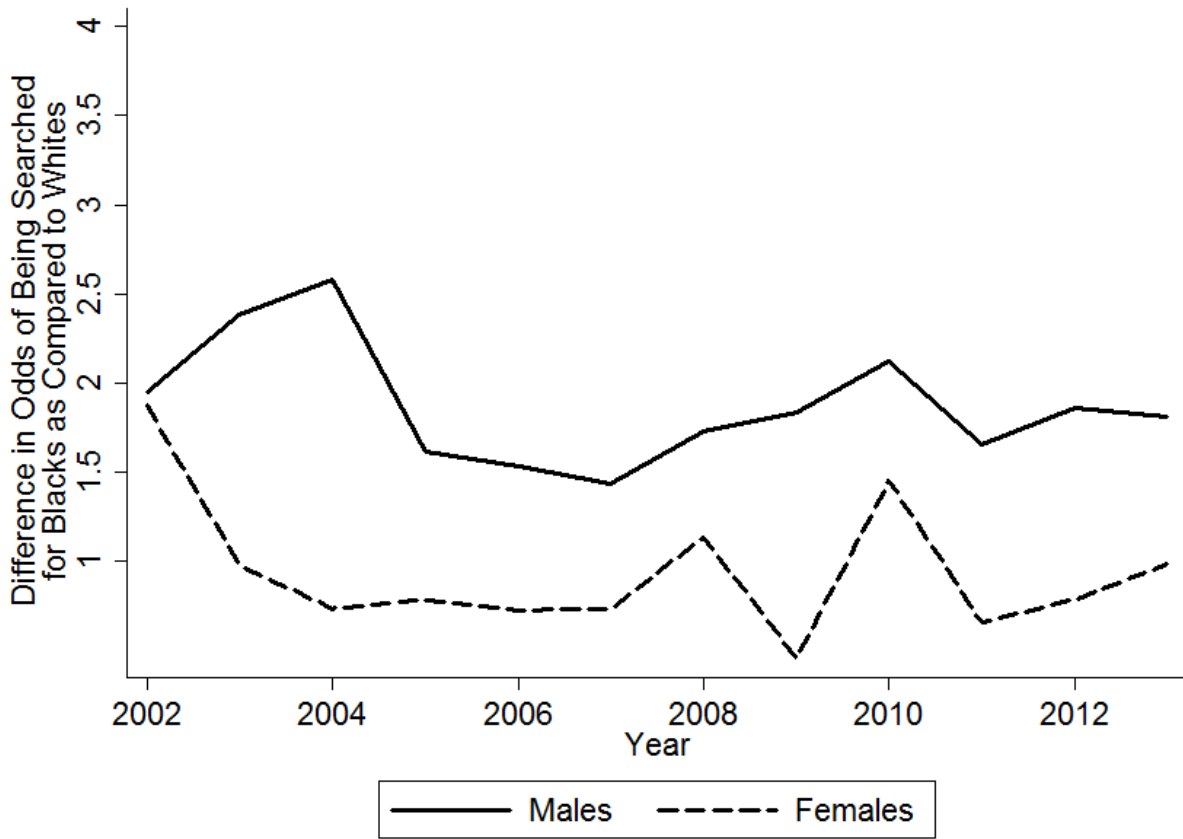
Note : The number of observations is smaller for Model 5 because the “hour of stop” variable is missing in some cases.

* = Significant at 0.05 p-value

† = Coded 1 for 14 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 2 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	2,491	44.52	53.55
Speed Limit	249	44.58	54.62
Stop Light/Sign	132	41.67	57.58
Driving Impaired	161	56.52	32.27
Safe Movement	243	56.38	42.39
Vehicle Equipment	423	44.21	53.43
Vehicle Regulatory	335	39.40	61.15
Seat Belt	647	43.12	55.64
Investigation	140	42.86	53.57
Other Vehicle	22	27.27	72.73

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

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	51,298	-	62.15	34.17	-
Total Searches	4,564	8.90	7.55	11.29	1.50
Speed Limit	13,405	4.05	3.30	5.85	1.77
Stop Light/Sign	3,448	7.42	5.62	10.24	1.82
Driving Impaired	1,521	43.92	46.98	36.36	0.77
Safe Movement	4,729	9.92	8.86	11.99	1.35
Vehicle Equipment	8,011	8.35	6.73	10.95	1.63
Vehicle Regulatory	8,780	6.81	4.98	9.72	1.95
Seat Belt	3,875	6.43	4.75	8.92	1.88
Investigation	4,175	19.52	17.12	23.64	1.38
Other Vehicle	3,354	8.86	7.18	11.27	1.57

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

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	32,712	-	60.32	97.79	-
Total Searches	990	3.03	3.13	2.88	0.92
Speed Limit	11,735	1.15	1.16	1.16	1.00
Stop Light/Sign	2,252	2.31	2.01	2.51	1.25
Driving Impaired	470	26.17	29.82	17.21	0.58
Safe Movement	2,239	4.60	5.00	3.72	0.74
Vehicle Equipment	4,594	3.13	3.21	3.20	1.00
Vehicle Regulatory	6,472	2.24	2.09	2.52	1.21
Seat Belt	1,677	2.03	2.08	1.76	0.85
Investigation	1,823	11.35	11.55	11.07	0.96
Other Vehicle	1,450	3.24	3.76	2.76	0.73

Table A4. Type of Search by Race: Men

Search Type	Number	% Total	% White	% Black	Ratio Black:White
Total Stops	51,298	-	62.15	34.17	-
Total Searches	4,564	8.90	7.55	11.29	1.50
Consent	1,464	2.85	2.42	3.77	1.56
Search Warrant	20	-	-	-	-
Probable Cause	817	1.59	1.02	2.74	2.69
Incident to Arrest	2,173	4.24	3.99	4.40	1.10
Protective Frisk	90	0.18	0.10	0.31	3.10

Table A5. Type of Search by Race: Women

Search Type	Number	% Total	% White	% Black	Ratio Black:White
Total Stops	32,712	-	60.32	97.79	-
Total Searches	990	3.03	3.13	2.88	0.92
Consent	324	0.99	1.04	0.93	0.89
Search Warrant	3	-	-	-	-
Probable Cause	179	0.55	0.52	0.60	1.15
Incident to Arrest	470	1.44	1.52	1.29	0.85
Protective Frisk	14	0.04	0.04	0.06	1.50

Figure A6. Stops by Day of the Week

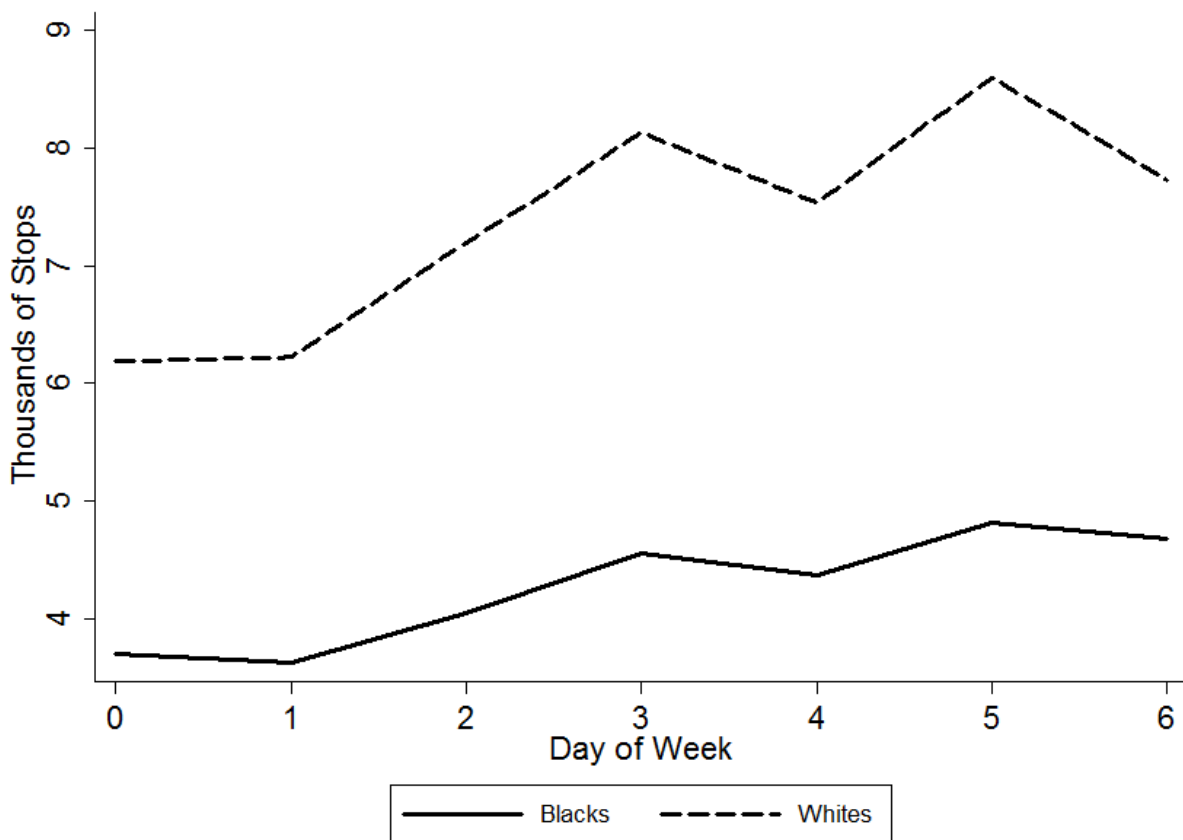


Figure A7. Searches by Day of the Week

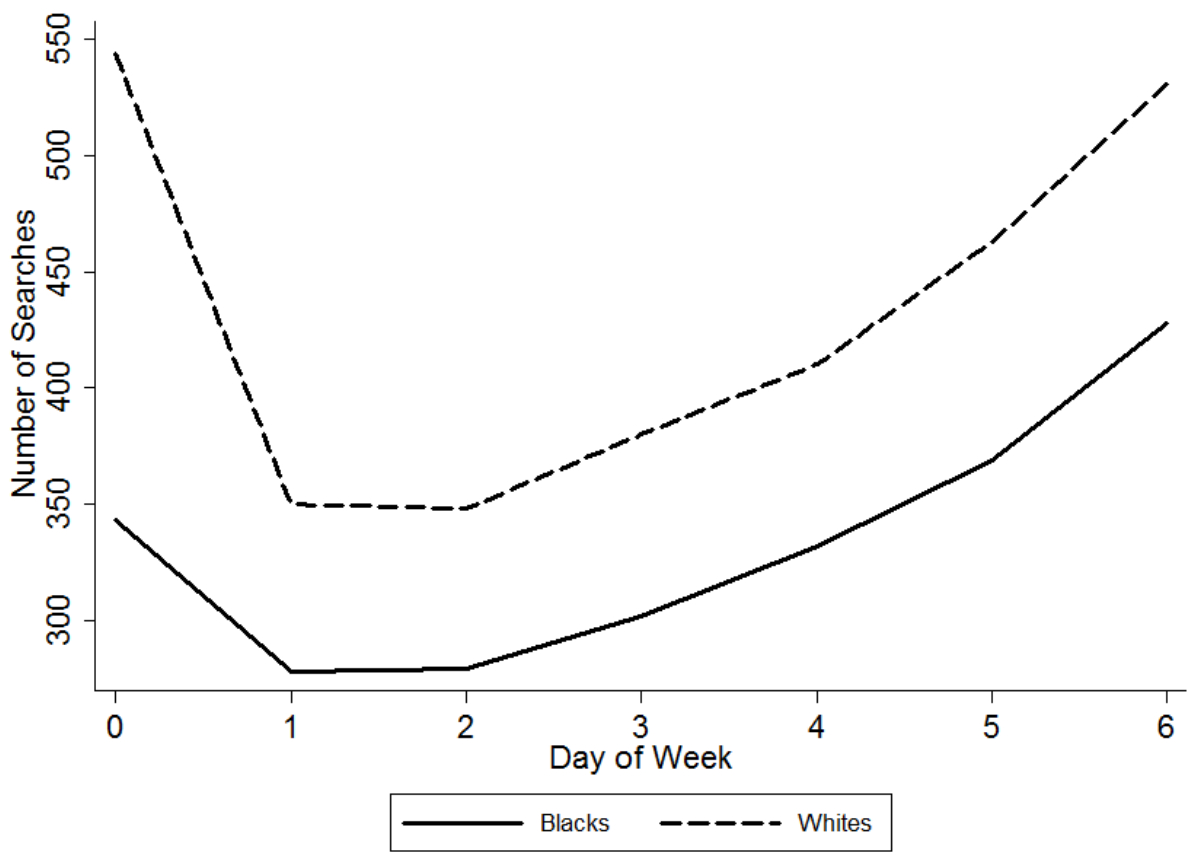
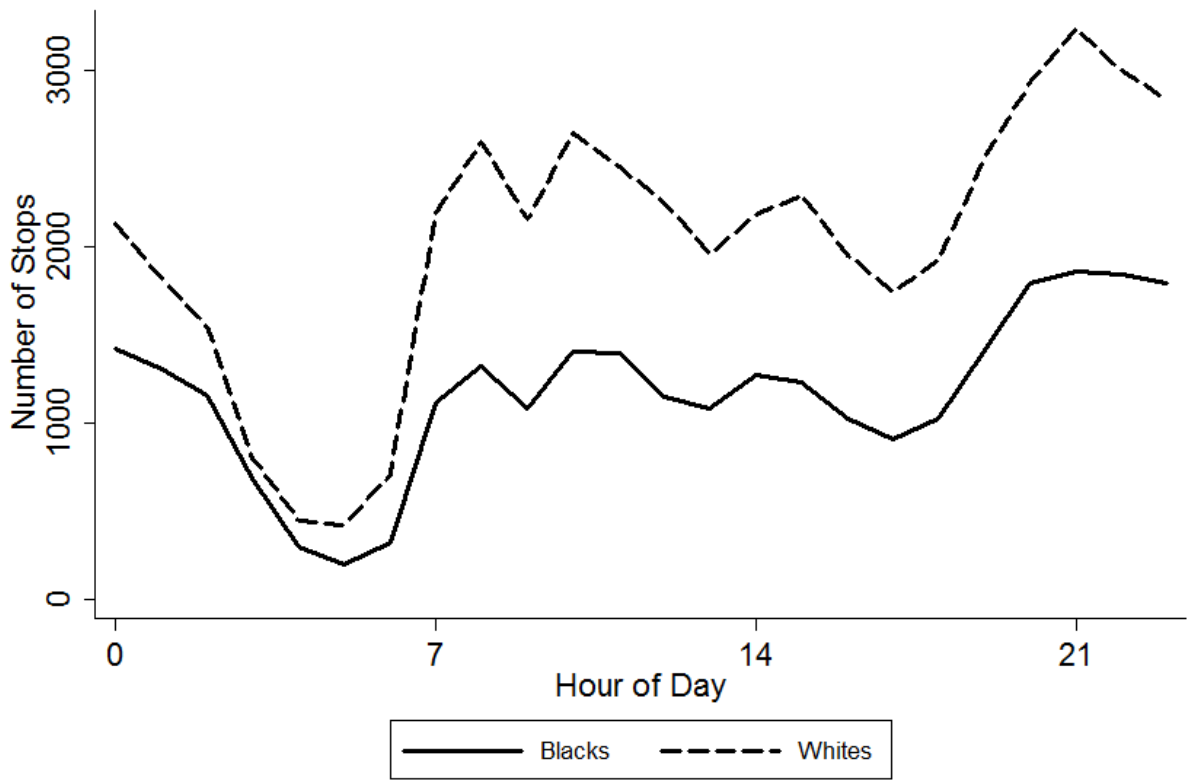
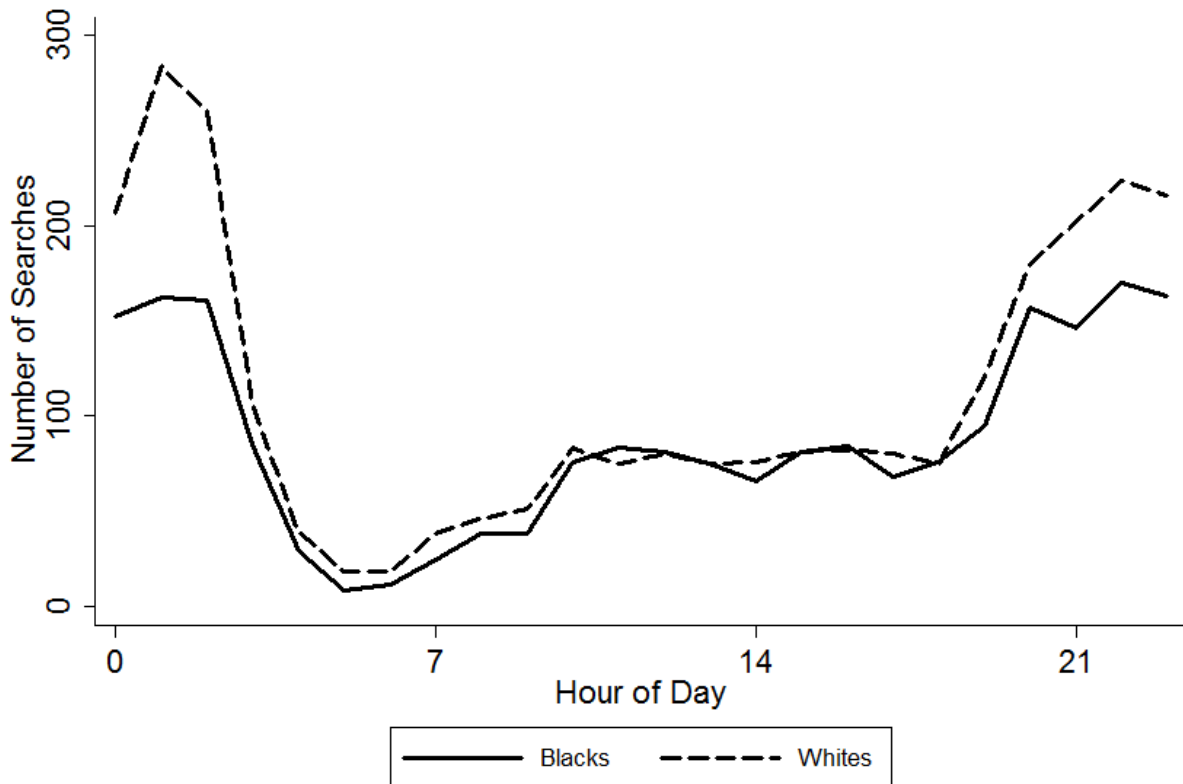


Figure A8. Stops by Hour of the Day



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



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

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

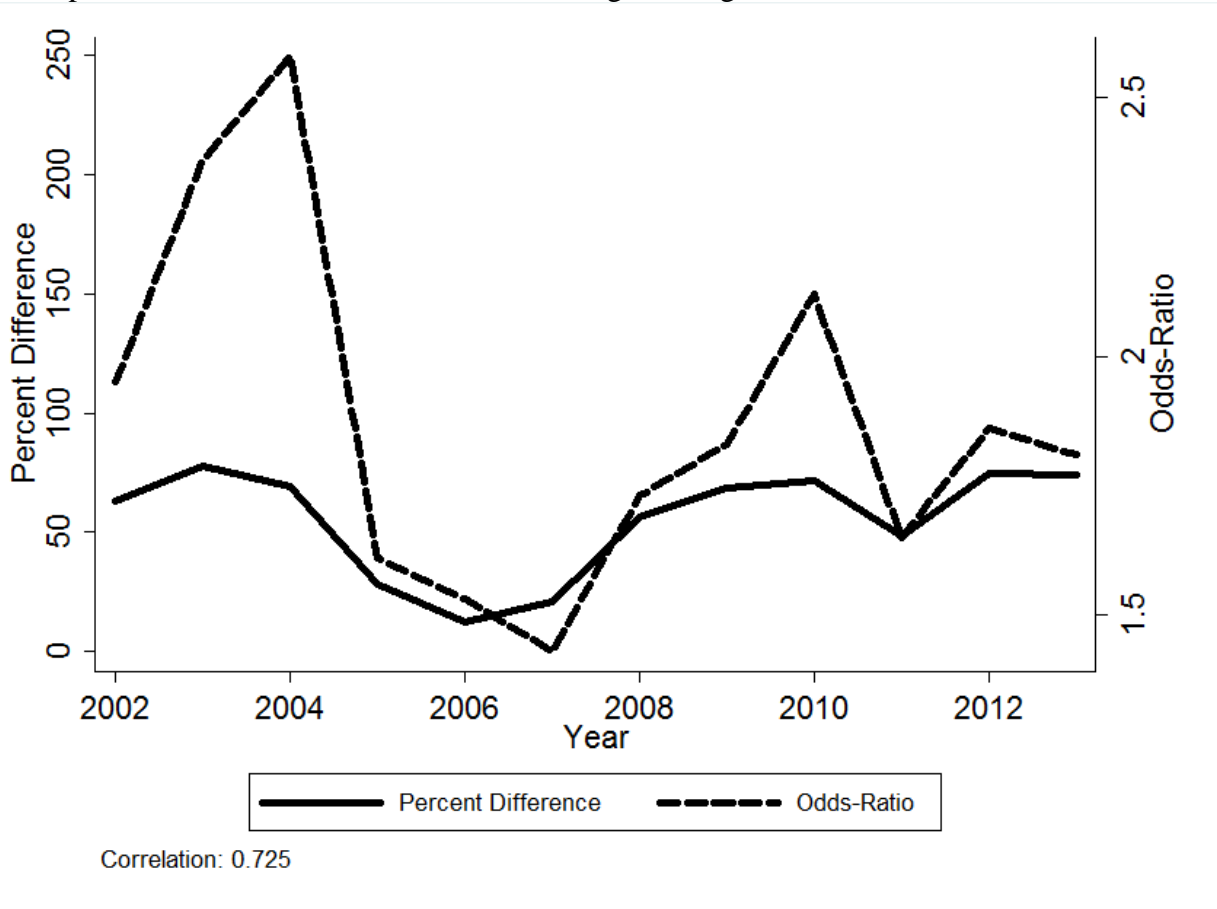
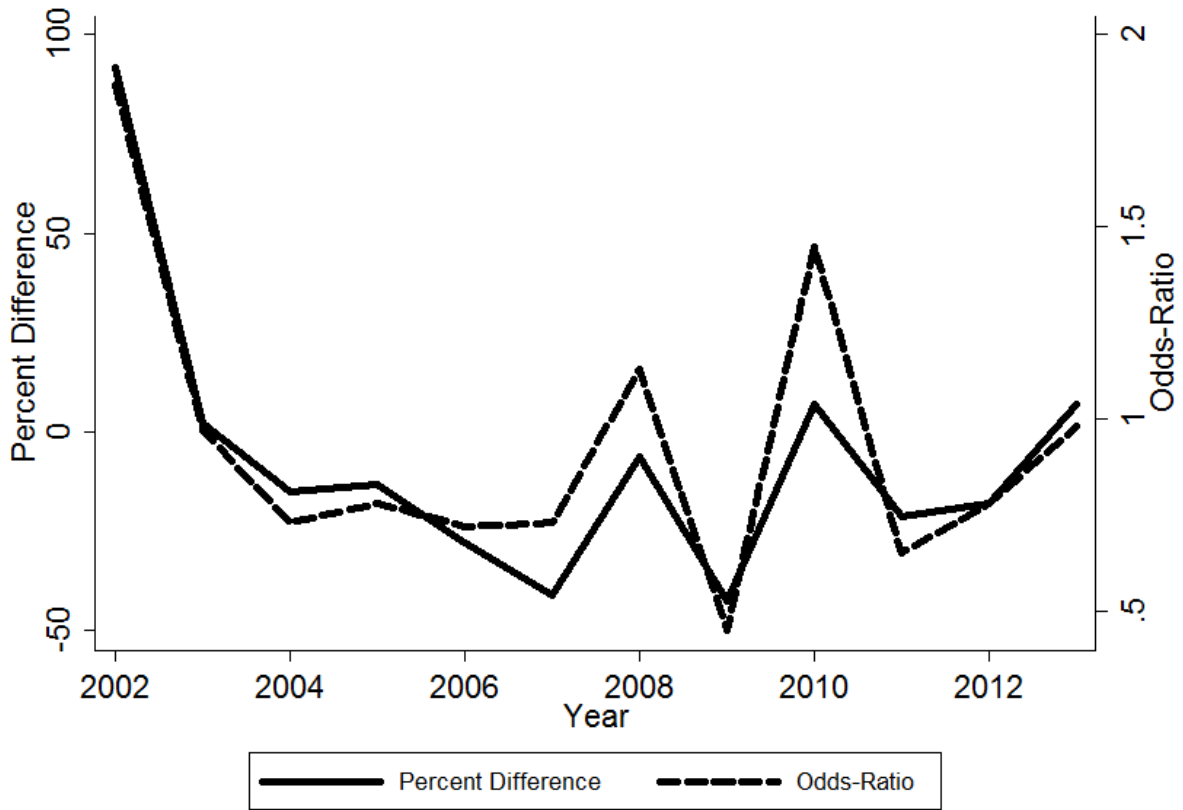
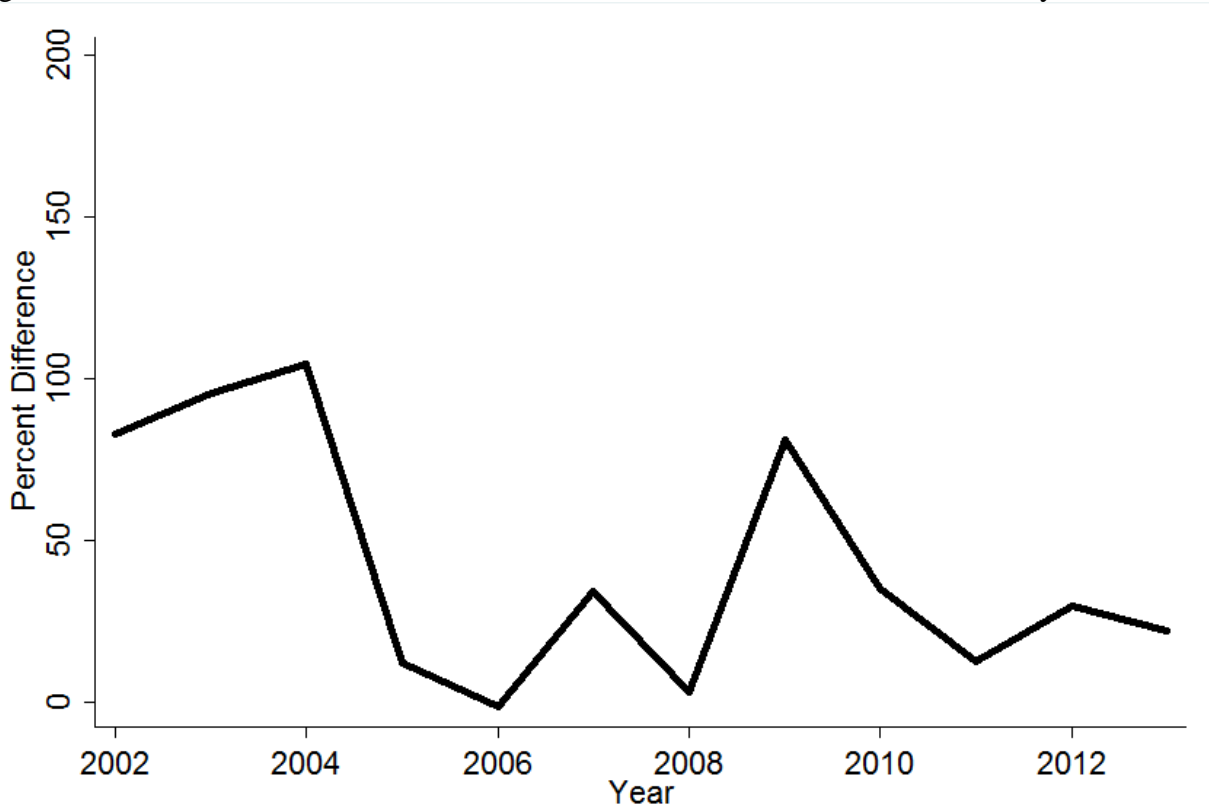


Figure A11. Correlation Between Percent Difference in Likelihood of Black Women being Searched as Compared to Whites and Odds-Ratios from Logistic Regression



Correlation: 0.915

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



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

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

Contraband	Number	% Total	% White	% Black
Yes	1,248	22.47	20.42	25.61
No	4,306	77.53	79.58	74.39
Total	5,554	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	48,588	4.02	41.90	2.46	50.18	1.45	100.0
Black	No	27,453	5.19	45.16	2.23	45.83	1.58	100.0
Total	No	78,456	4.51	42.81	2.36	48.81	1.51	100.0
White	Yes	3,026	2.35	13.52	1.42	27.36	55.34	100.0
Black	Yes	2,331	3.90	15.62	1.29	32.48	46.72	100.0
Total	Yes	5,554	3.06	14.17	1.35	29.40	52.02	100.0