

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

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Table 1. Overview of the Data

Data Subsets	Observations
Total stops	760,910
-2014	29,676
-Passengers	11,884
-Checkpoint stops	85
Total number of cases deleted	41,195
Stops for analysis	719,715
Searches	23,487
Percent of stops leading to search (search rate)	3.26%

Figure 1. Number of Traffic Stops per Year

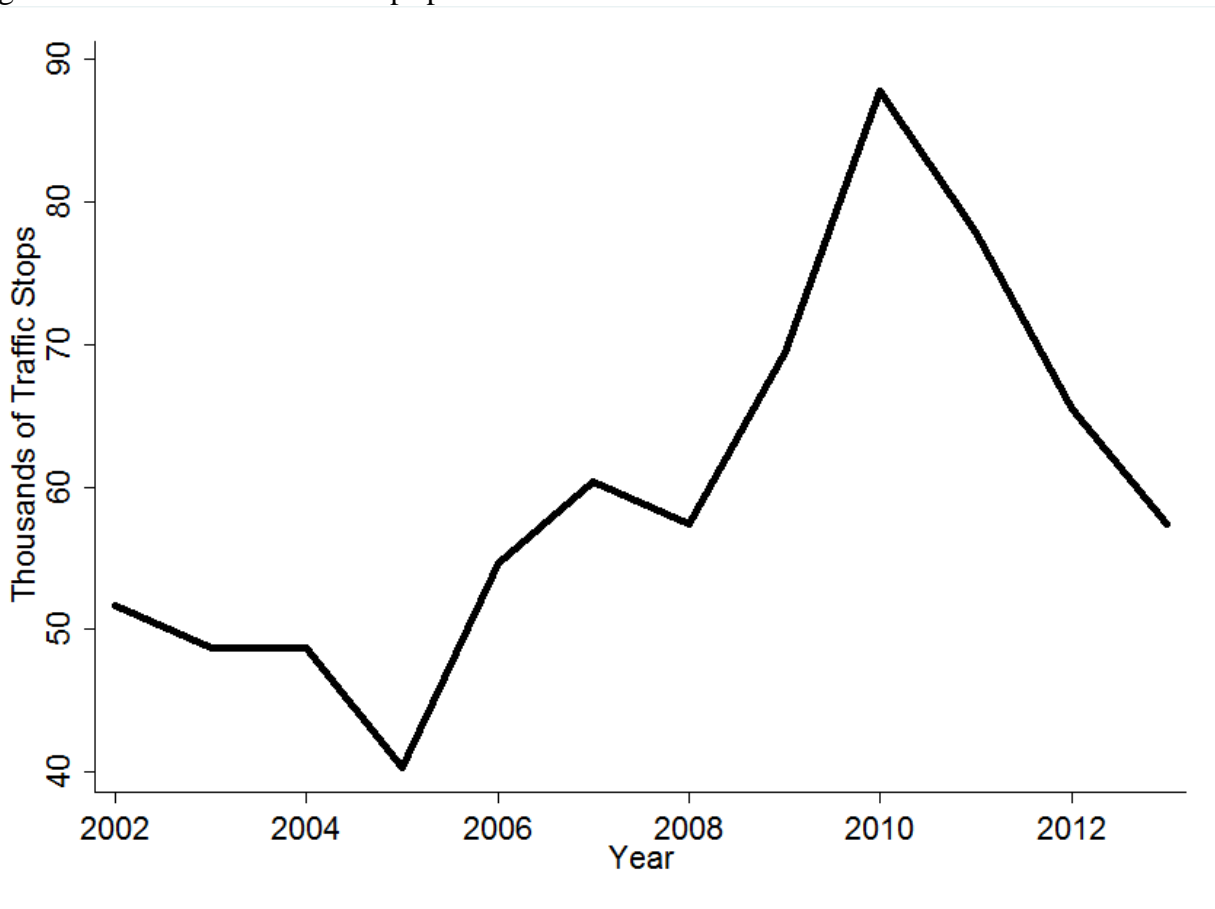


Figure 2. Racial Composition of Traffic Stops by Year

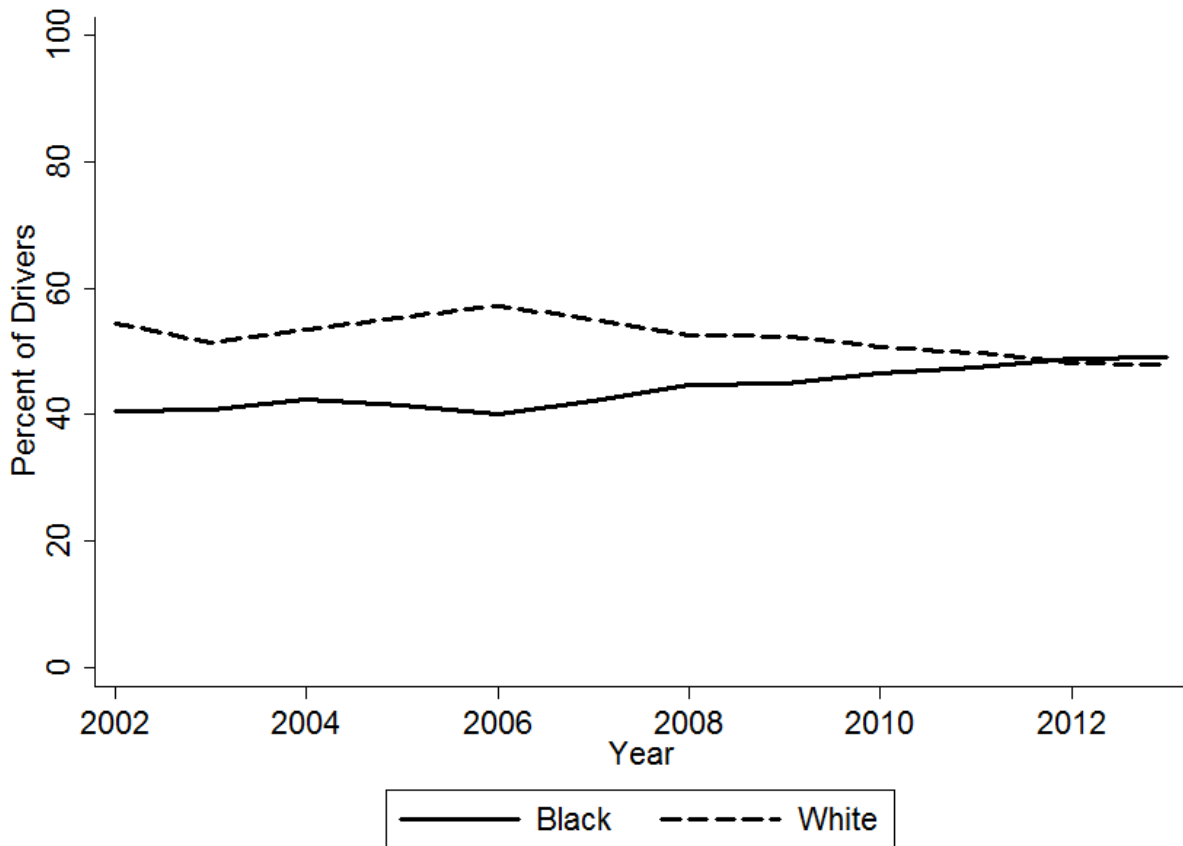


Table 2. Racial Composition of Traffic Stops by Purpose, Drivers

Purpose	Number	Percent	
		White	Black
Total Stops	719,715	52.10	44.49
Speed Limit	216,451	58.57	37.09
Stop Light/Sign	46,609	57.96	36.94
Driving Impaired	10,025	70.63	25.73
Safe Movement	39,924	54.48	40.88
Vehicle Equipment	74,500	41.99	55.00
Vehicle Regulatory	215,598	48.95	48.73
Seat Belt	23,529	50.21	46.24
Investigation	32,481	43.91	53.51
Other Vehicle	60,598	48.64	48.76

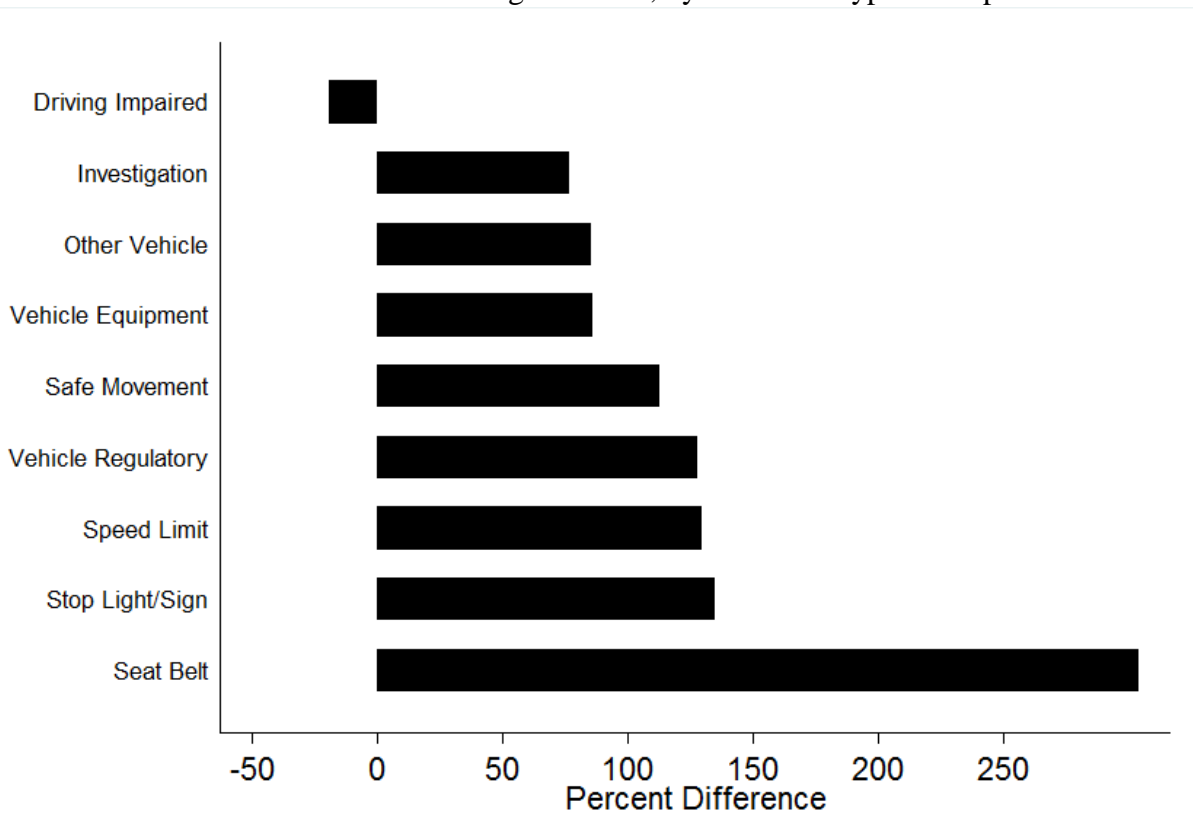
Note: Includes only drivers. Excludes 85 checkpoint stops. Excludes 11,884 passengers.

Table 3. Percent Searched by Race and Purpose of Stop

Purpose	Number	Total	% White	% Black	Ratio
					Black:White
Total Stops	719,715	-	52.10	44.50	-
Total Searches	23,487	3.26	2.56	4.15	1.62
Speed Limit	216,251	0.99	0.66	1.52	2.30
Stop Light/Sign	46,609	1.93	1.28	3.01	2.35
Driving Impaired	10,025	47.58	50.13	40.60	0.81
Safe Movement	39,924	2.97	2.03	4.31	2.12
Vehicle Equipment	74,500	3.43	2.32	4.32	1.86
Vehicle Regulatory	215,598	2.51	1.53	3.50	2.29
Seat Belt	23,529	2.29	0.95	3.83	4.03
Investigation	32,481	10.09	7.18	12.68	1.77
Other Vehicle	60,598	4.49	3.17	5.88	1.85

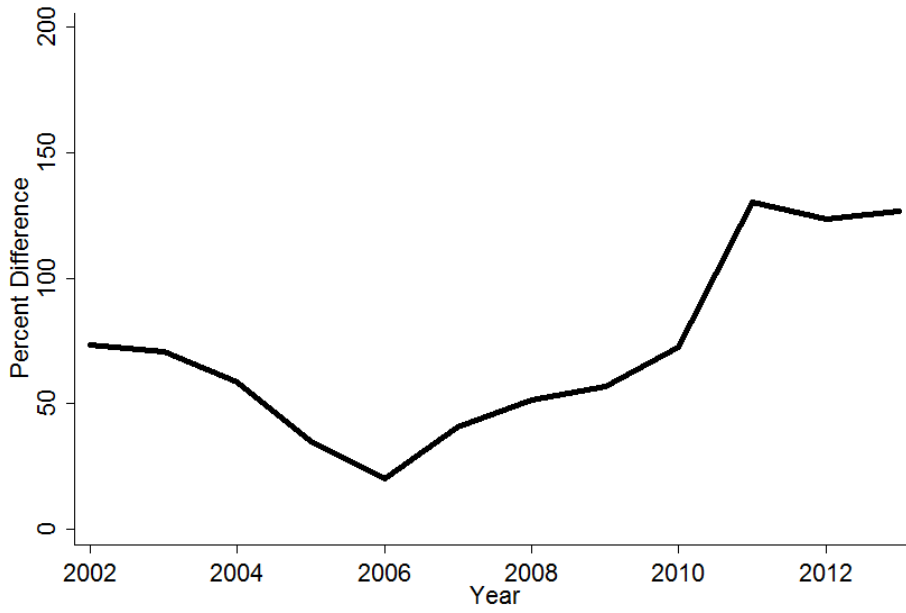
Note: See the appendix for this same table broken down for Men and Women.

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



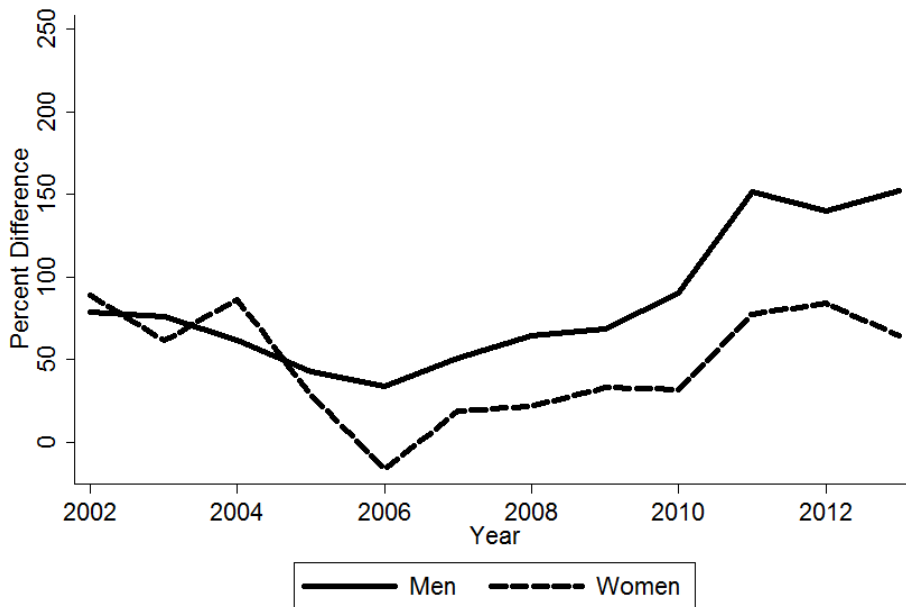
The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites by purpose of stop.

Figure 4. Racial Differences in the Likelihood of Search



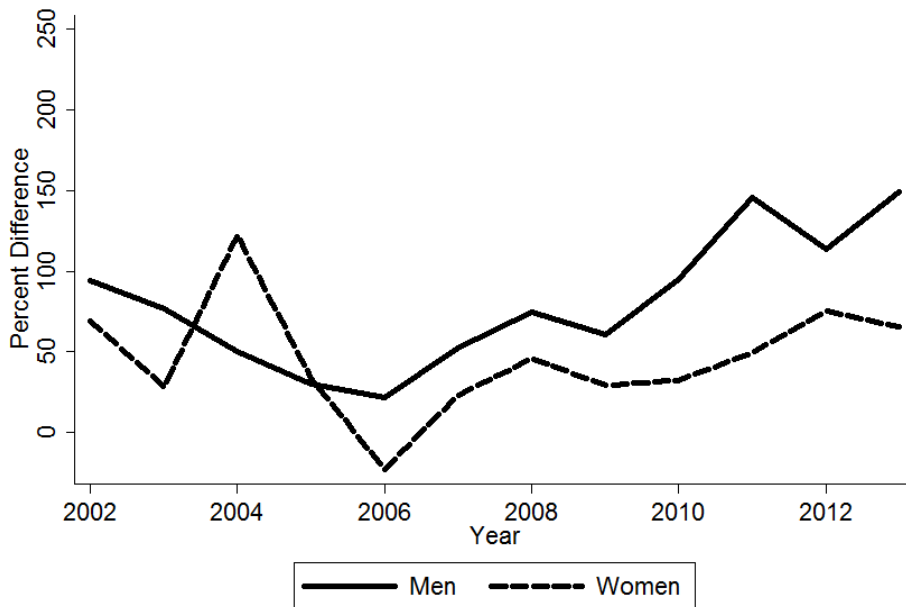
The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites.

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



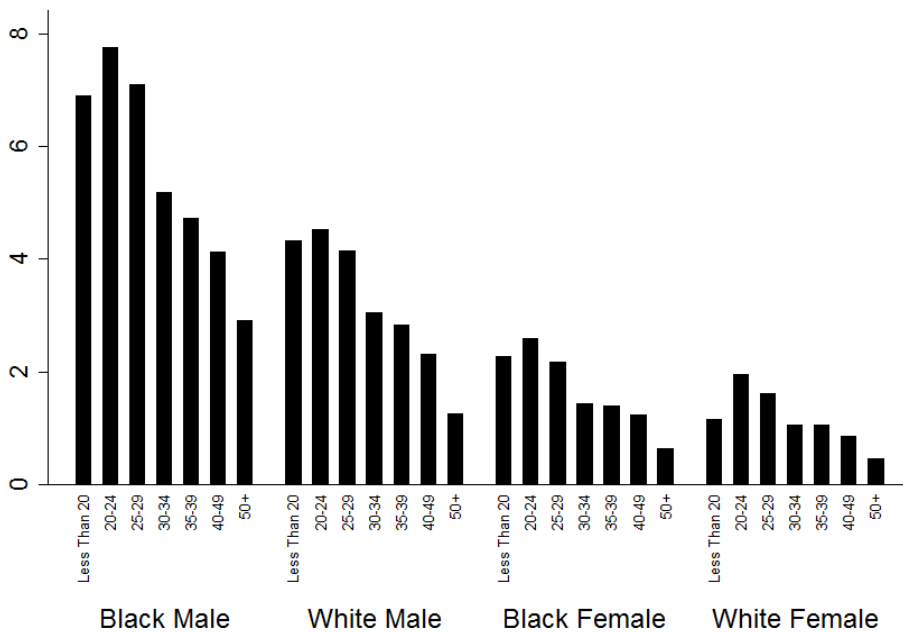
The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites by gender.

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 719,715 traffic stops from 2002 through 2013, and 23,487 searches. Overall rate of search: 3.26 percent.

Black men under the age of 30 are searched at rates of about 7 percent whereas white men of that age see rates of about 4 percent, and women in general are typically below 2 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

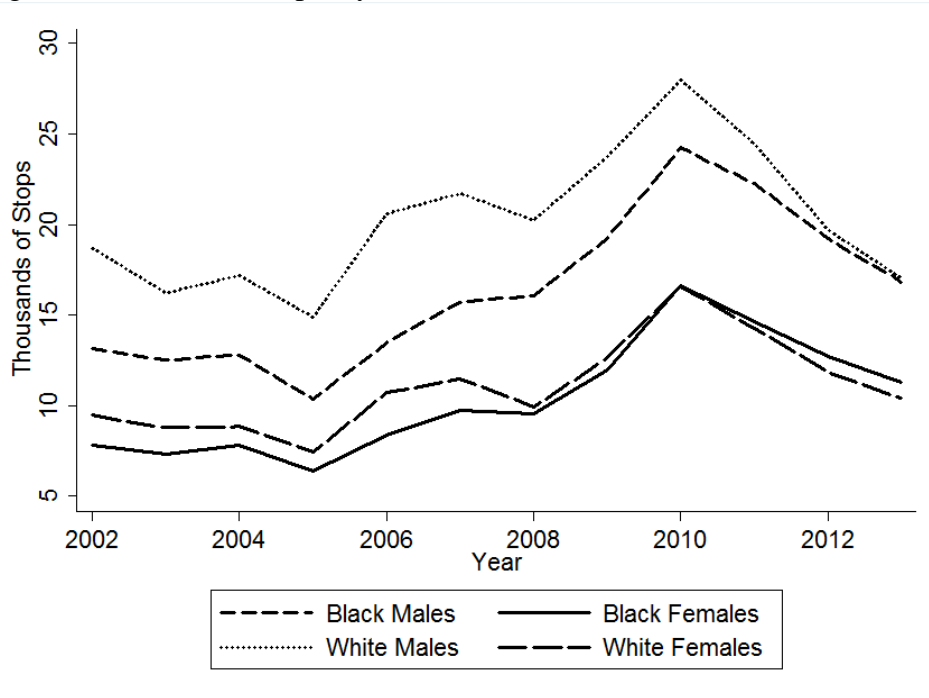


Figure 9. Percent of Stops Resulting in a Search, by Race and Gender

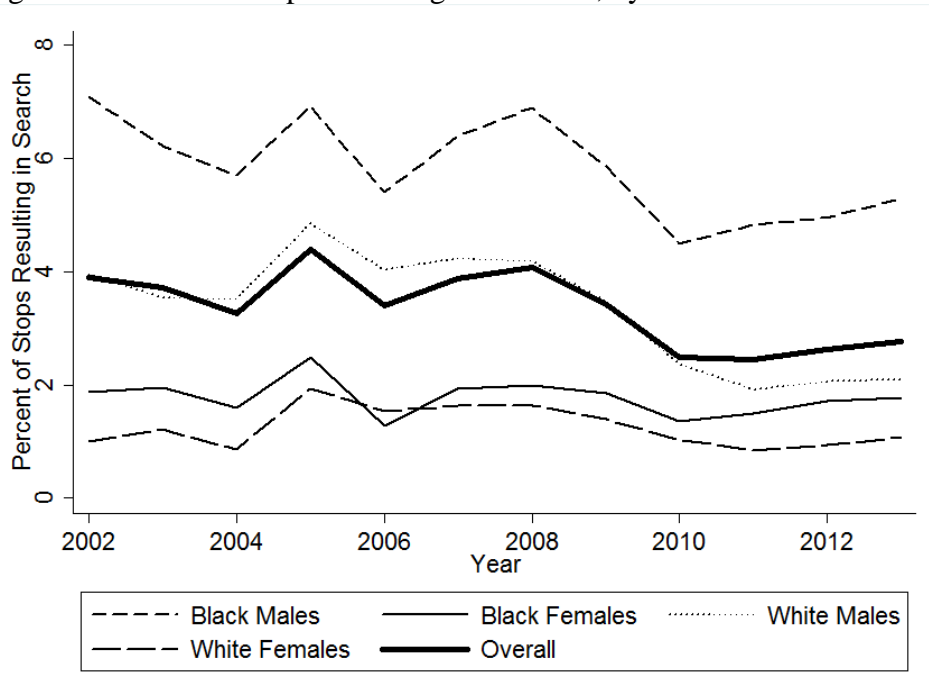


Table 4. Type of Search by Race

Search Type	Number	Total	White	Black	Ratio
					Black:White
Total Stops	719,715	-	52.10	44.50	-
Total Searches	23,487	3.26	2.56	4.15	1.62
Consent	7,441	1.03	0.65	1.51	2.32
Search Warrant	6	0.00	0.00	0.00	-
Probable Cause	4,547	0.63	0.34	1.00	2.94
Incident to Arrest	11,087	1.54	1.54	1.54	1.00
Protective Frisk	406	0.06	0.03	0.09	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	28	2.40	2.40	0.00	0.00
2 – 10	80	6.86	9.26	0.05	0.05
11 - 100	175	15.01	24.27	1.14	1.19
101 – 1,000	656	56.26	80.53	41.97	43.17
1,001 +	227	19.47	100.00	56.84	100.00
Total	1,166	100.00	-	100.00	-

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

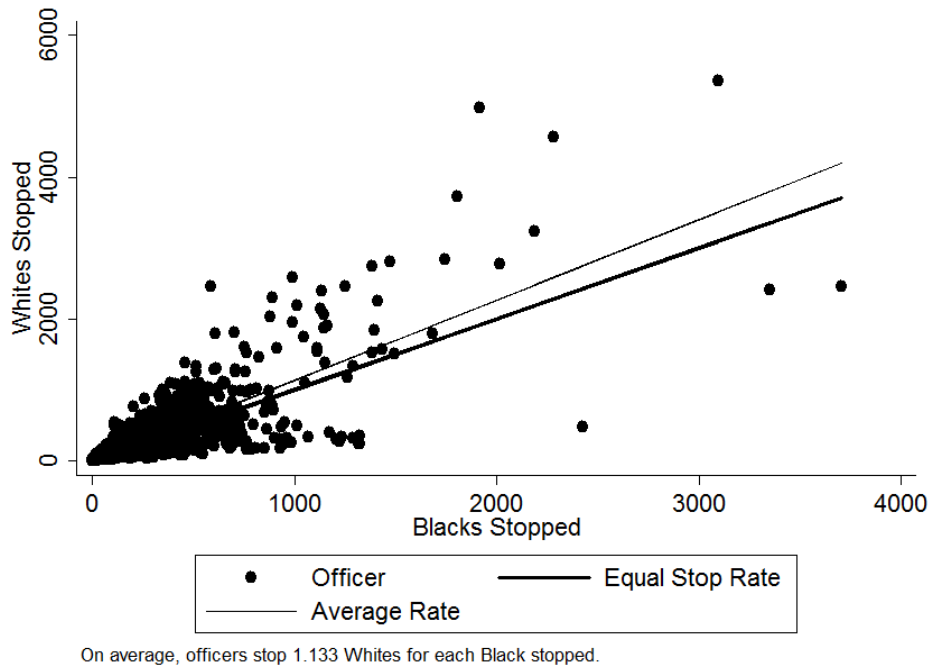


Figure 11. Number of Black and White Motorists Searched, by Officer

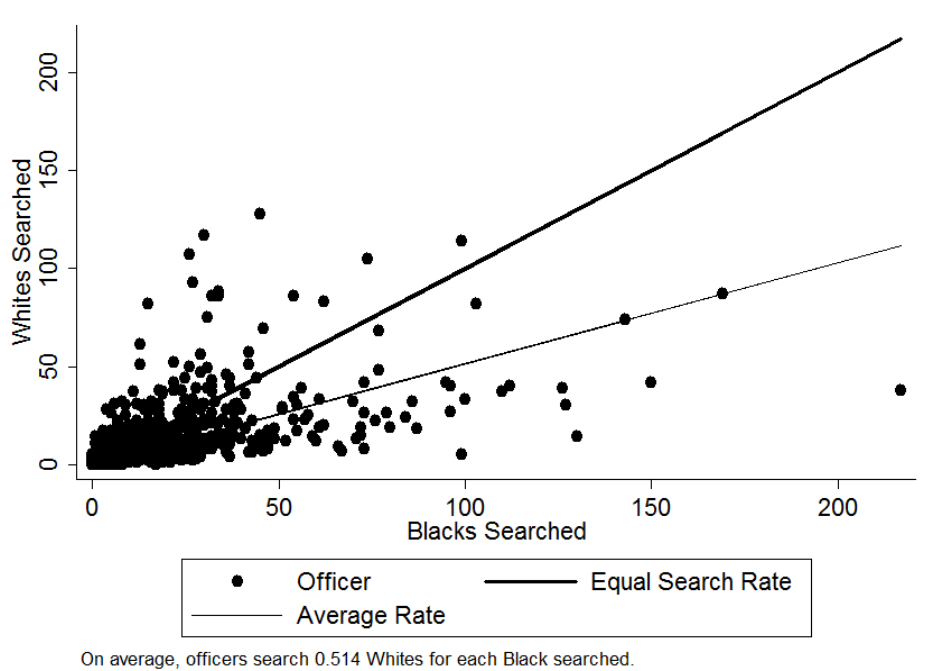
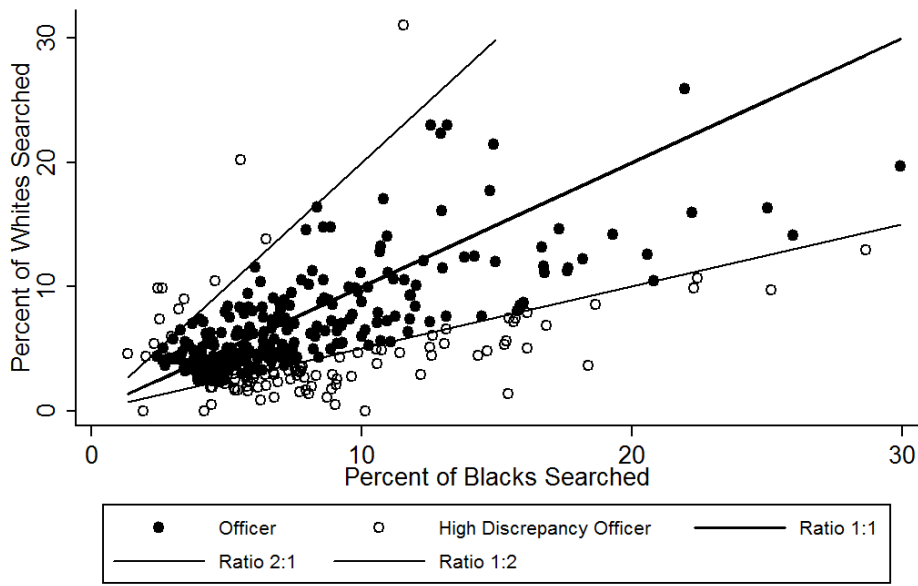


Figure 12. Percent of White and Black Drivers Searched, by Officer



Includes 328 officers with at least 50 stops of Blacks and 50 stops of Whites and a search rate of over 3.26. Of these officers, 80 have rates of searching Blacks more than twice their rate of searching Whites and 13 have rates of searching Whites at twice the rate of Blacks.

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

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Demographics					
Race	2.19* (0.04)	2.16* (0.04)	2.35*(0.04)	2.30*(0.04)	2.25*(0.04)
Hispanic	2.12* (0.05)	1.94* (0.04)	1.50*(0.04)	1.52*(0.04)	1.54*(0.04)
Age	-	0.97* (0.00)	0.97* (0.00)	0.97*(0.00)	0.97*(0.00)
Stop Purpose					
Speed Limit	-	-	-	-	-
Stop Light	-	-	1.88* (0.08)	1.82*(0.08)	1.72*(0.08)
Impaired	-	-	73.48*(2.52)	75.45*(2.61)	57.90*(2.09)
Movement	-	-	2.75*(0.11)	2.70*(0.11)	2.46*(0.10)
Equipment	-	-	2.61*(0.09)	2.47*(0.08)	2.19*(0.07)
Regulatory	-	-	2.24*(0.06)	2.22*(0.06)	2.18*(0.06)
Seat Belt	-	-	1.80*(0.09)	1.70*(0.09)	1.85*(0.10)
Investigation	-	-	7.60*(0.24)	7.44*(0.24)	6.76*(0.22)
Other	-	-	3.56*(0.12)	3.56*(0.12)	3.38*(0.11)
Officer Type					
Black Disparity [†]	-	-	-	2.58*(0.06)	2.57*(0.06)
White Disparity [†]	-	-	-	1.64*(0.10)	1.58*(0.10)
Time					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
Constant	0.03* (0.00)	0.07* (0.00)	0.02* (0.00)	0.02*(0.00)	
N	438,447	438,447	438,447	438,447	437,999
Pseudo R²	0.02	0.03	0.15	0.16	0.16

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	1.40*(0.05)	1.38*(0.05)	1.65*(0.06)	1.62*(0.06)	1.62*(0.06)
Hispanic	0.88(0.07)	0.83*(0.07)	0.69*(0.06)	0.69*(0.06)	0.70*(0.06)
Age	-	0.97*(0.00)	0.97*(0.00)	0.97*(0.00)	0.97*(0.00)
Stop Purpose					
Speed Limit	-	-	-	-	-
Stop Light	-	-	2.07*(0.23)	2.00*(0.22)	1.89*(0.21)
Impaired	-	-	227.81*(16.79)	262.55*(17.31)	156.65*(12.49)
Movement	-	-	2.78*(0.30)	2.74*(0.30)	2.45*(0.26)
Equipment	-	-	4.17*(0.33)	3.97*(0.31)	3.31*(0.27)
Regulatory	-	-	3.19*(0.22)	3.17*(0.21)	3.10*(0.21)
Seat Belt	-	-	2.58*(0.37)	2.52*(0.36)	2.74*(0.39)
Investigation	-	-	18.26*(1.35)	18.05*(1.34)	15.37*(1.16)
Other	-	-	6.08*(0.50)	6.13*(0.47)	3.65*(0.44)
Officer Type					
Black Disparity [†]	-	-	-	2.51*(0.13)	2.48*(0.13)
White Disparity [‡]	-	-	-	1.62*(0.22)	1.55*(0.21)
Time					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
Constant	0.01*(0.00)	0.04*(0.00)	0.01*(0.00)	0.01*(0.00)	0.01*(0.00)
N	256,786	256,786	256,786	256,786	256,581
Pseudo R²	0.00	0.02	0.19	0.20	0.21

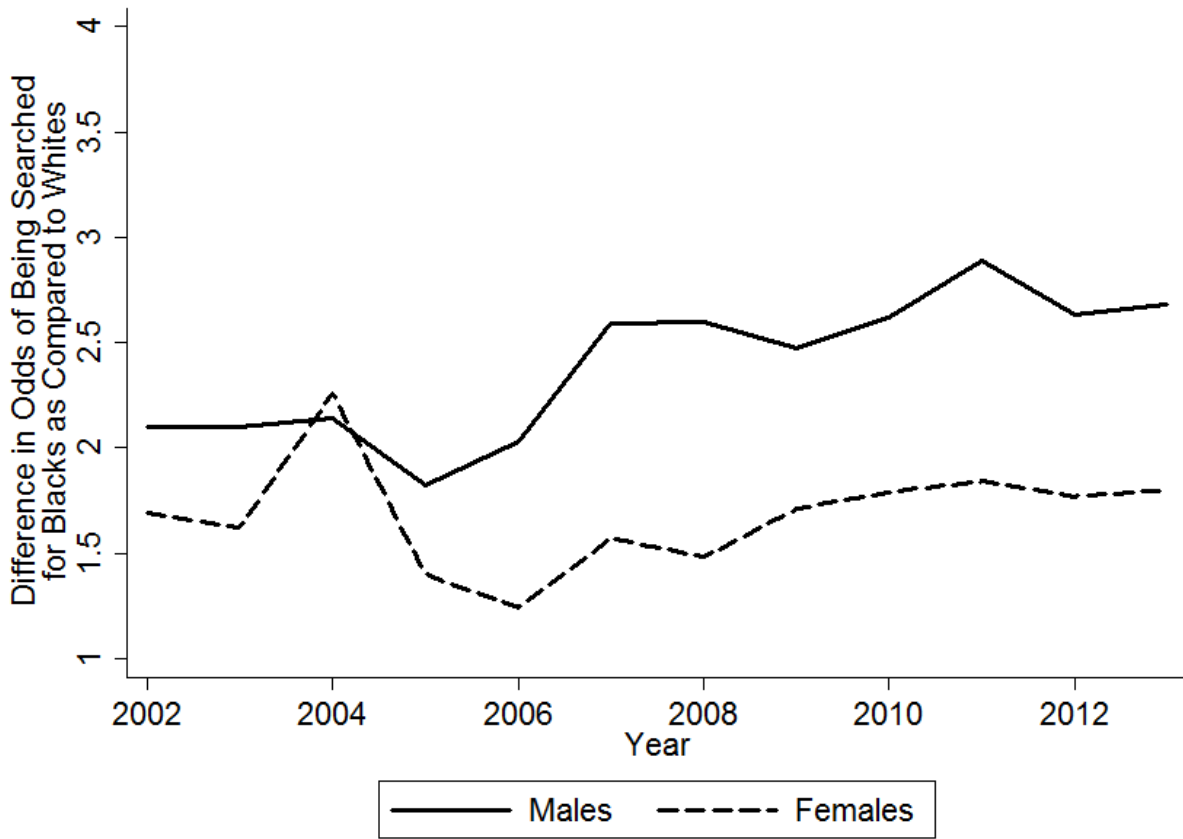
Note: Entries are odds-ratios, with standard errors in parenthesis.

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	11,884	30.81	67.46
Speed Limit	985	31.47	64.77
Stop Light/Sign	565	37.17	60.88
Driving Impaired	998	67.23	29.66
Safe Movement	674	34.87	63.35
Vehicle Equipment	1,694	23.26	75.44
Vehicle Regulatory	3,112	26.80	71.75
Seat Belt	388	19.85	77.84
Investigation	2,095	25.68	73.08
Other Vehicle	1,370	28.69	70.51

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

Purpose	Number	Total	% White	% Black	Ratio
					Black:White
Total Stops	455,533	-	53.19	42.97	-
Total Searches	19,658	4.31	3.28	5.69	1.73
Speed Limit	127,993	1.44	0.95	2.31	2.43
Stop Light/Sign	29,533	2.66	1.74	4.26	2.45
Driving Impaired	7,739	49.15	51.68	42.60	0.82
Safe Movement	26,390	4.02	2.68	6.00	2.24
Vehicle Equipment	50,311	4.34	2.92	5.54	1.90
Vehicle Regulatory	131,911	3.39	2.03	4.91	2.42
Seat Belt	17,110	2.79	1.12	4.80	4.29
Investigation	23,785	11.47	7.88	14.81	1.88
Other Vehicle	41,177	5.59	3.92	7.52	1.92

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

Purpose	Number	Total	% White	% Black	Ratio
					Black:White
Total Stops	263,766	-	50.22	47.13	-
Total Searches	3,829	1.45	1.23	1.73	1.41
Speed Limit	88,458	0.34	0.22	0.52	2.36
Stop Light/Sign	17,076	0.67	0.47	1.01	2.15
Driving Impaired	2,286	42.26	45.09	33.68	0.75
Safe Movement	13,534	0.92	0.74	1.19	1.61
Vehicle Equipment	24,189	1.55	0.99	1.97	1.99
Vehicle Regulatory	83,687	1.11	0.67	1.51	2.25
Seat Belt	6,419	0.93	0.48	1.41	2.94
Investigation	8,696	6.30	5.09	7.32	1.44
Other Vehicle	19,421	2.14	1.38	2.83	2.05

Table A4. Type of Search by Race: Men

Search Type	Number	Total	White	Black	Ratio
					Black:White
Total Stops	455,949	-			-
Total Searches	19,658	4.31	3.28	5.69	1.74
Consent	6,583	1.44	0.87	2.21	2.54
Search Warrant	5	-	-	-	-
Probable Cause	3,780	0.83	0.43	1.37	3.19
Incident to Arrest	8,921	1.96	1.95	1.97	1.01
Protective Frisk	369	0.08	0.04	0.14	3.50

Table A5. Type of Search by Race: Women

Search Type	Number	Total	White	Black	Ratio Black:White
Total Stops	263,766	-	50.22	47.13	-
Total Searches	3,829	1.45	1.23	1.73	1.41
Consent	858	0.33	0.25	0.41	1.64
Search Warrant	1	-	-	-	-
Probable Cause	767	0.29	0.18	0.42	2.33
Incident to Arrest	2,166	0.82	0.79	0.87	1.10
Protective Frisk	37	0.01	0.00	0.03	-

Figure A6. Stops by Day of the Week

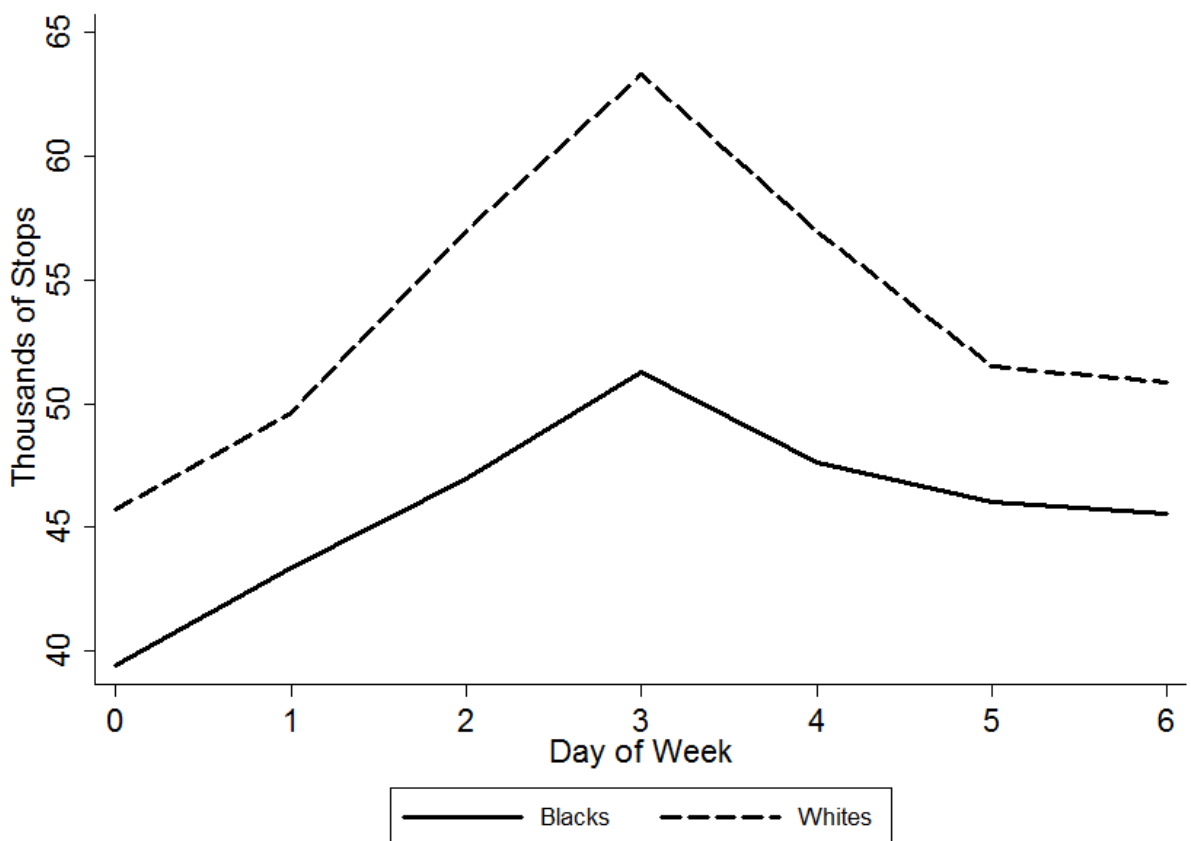


Figure A7. Searches by Day of the Week

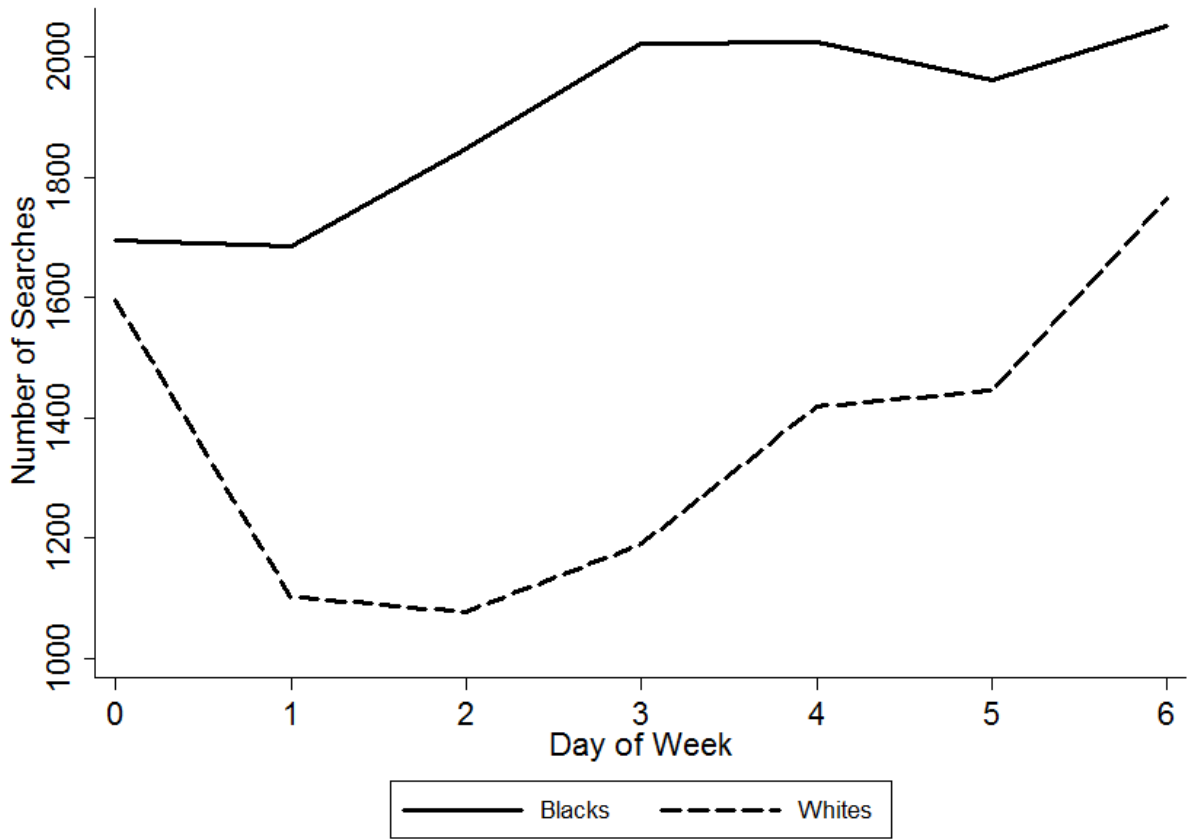
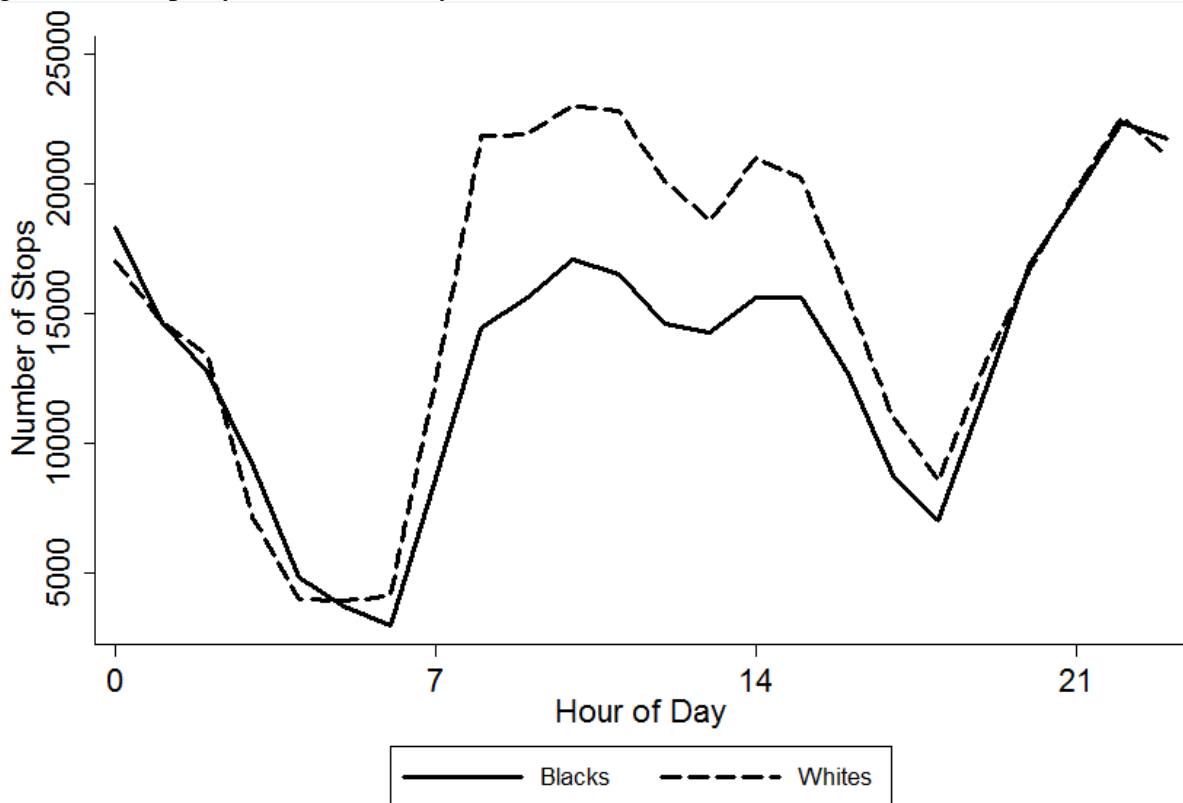
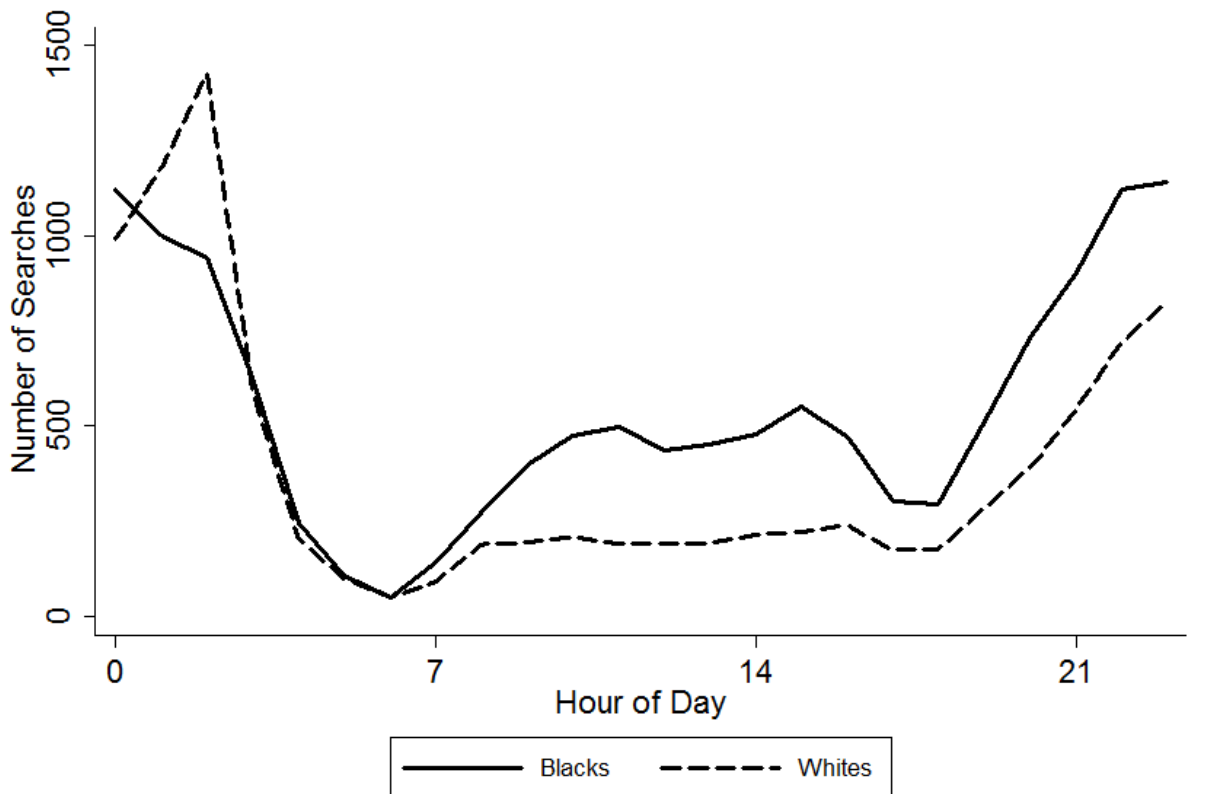


Figure A8. Stops by Hour of the Day



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

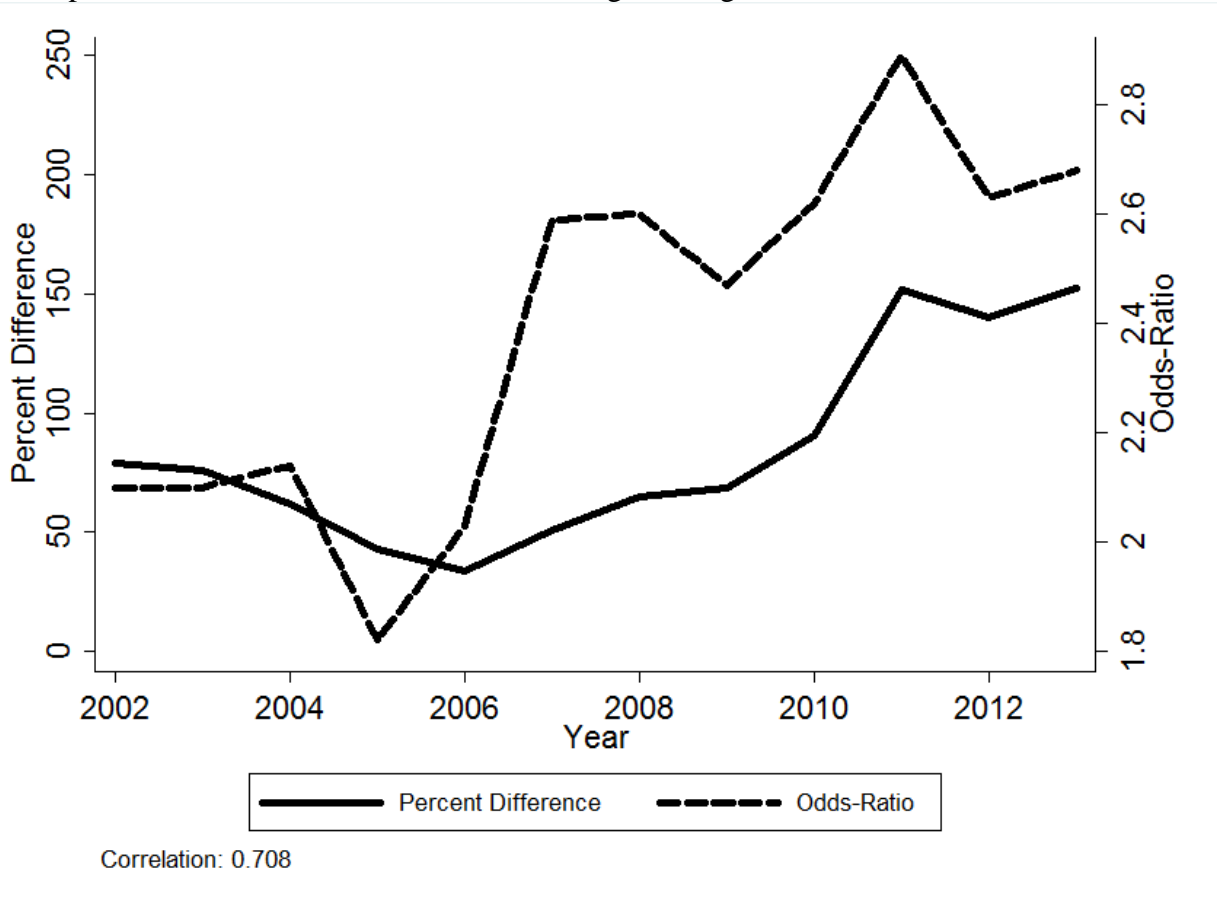
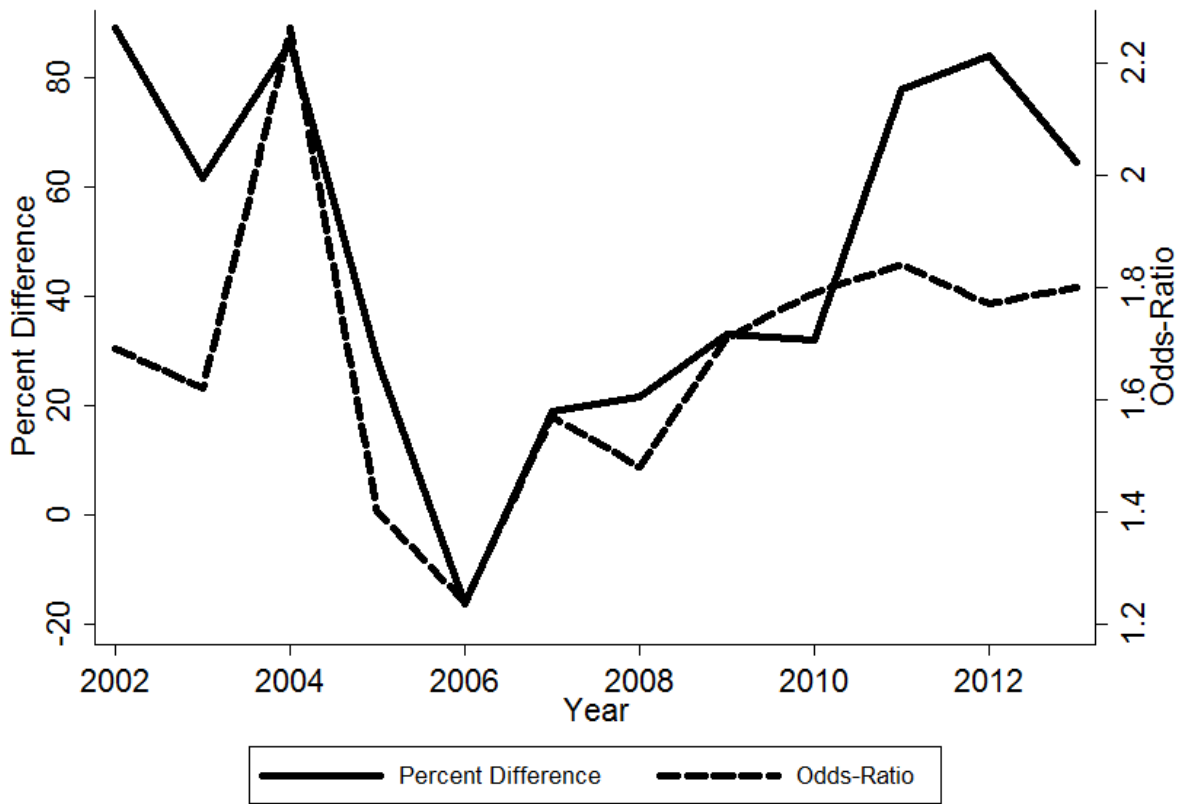


Figure A11. Correlation Between Percent Difference in Likelihood of Black Women being Searched as Compared to Whites and Odds-Ratios from Logistic Regression



Correlation: 0.760

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

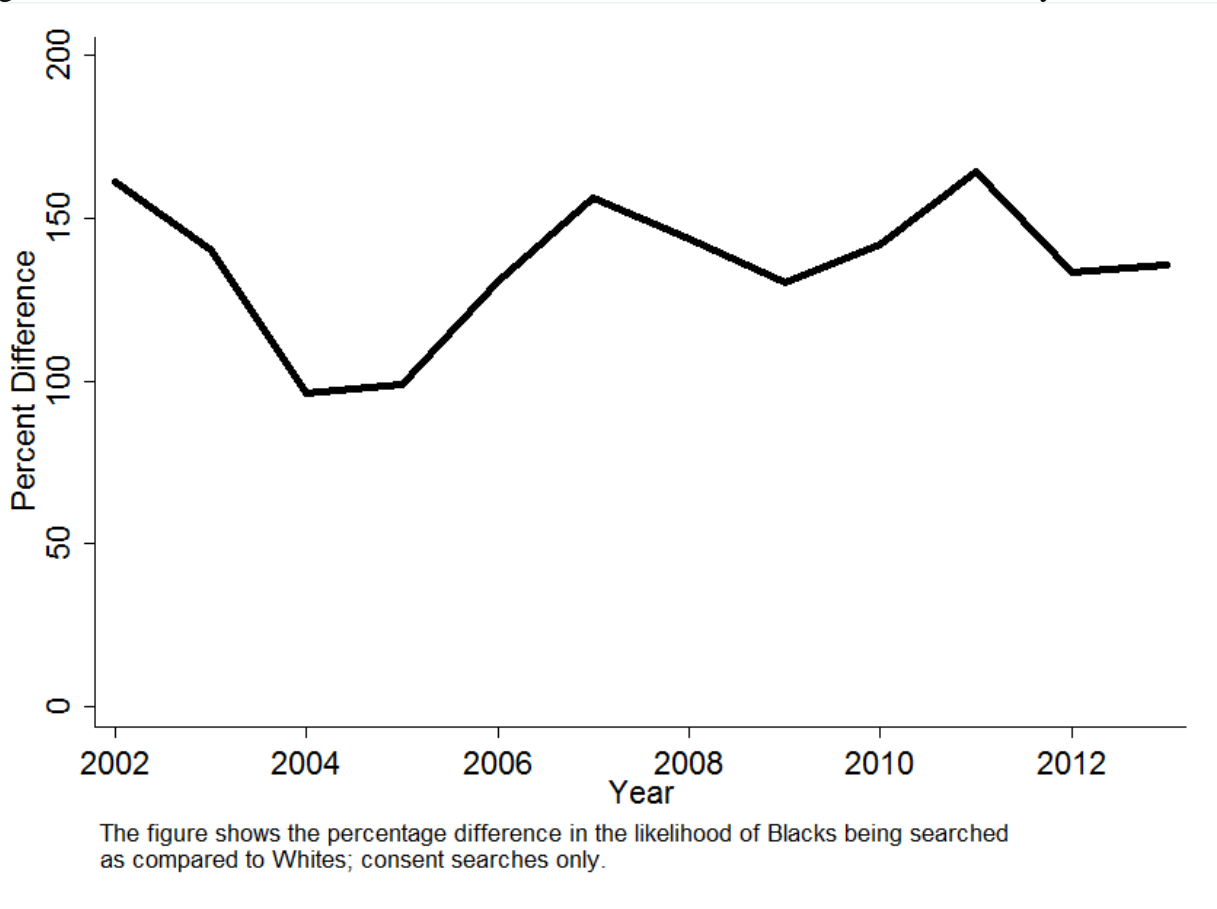


Table A6. Likelihood of Finding Contraband Given a Search, by Race

Contraband	Number	% Total	% White	% Black
Yes	2,795	11.90	9.97	13.43
No	20,692	88.10	90.03	86.57
Total	23,487	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	365,402	1.99	28.22	5.32	63.48	0.99	100.0
Black	No	306,943	2.70	36.25	3.80	56.09	1.16	100.0
Total	No	696,228	2.31	31.73	4.62	60.28	1.06	100.0
White	Yes	9,594	1.07	8.54	0.34	24.87	65.18	100.0
Black	Yes	13,294	1.55	16.57	0.60	38.15	43.12	100.0
Total	Yes	23,487	1.33	13.02	0.49	32.52	52.64	100.0