Analysis of Black-White Differences in Traffic Stops and Searches

in Fayetteville, NC, 2002-2013

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Frank R. Baumgartner, Derek Epp, and Kelsey Shoub[1]
University of North Carolina at Chapel Hill
Department of Political Science
http://www.unc.edu/~fbaum/traffic.htm

Contact: Frankb@unc.edu

Table 1. Overview of the Data

Data Subsets	Observations
Total stops	416,790
-2014	13,115
-Passengers	12,903
-Checkpoint stops	812
Total number of cases deleted	26,576
Stops for analysis	390,214
Searches	23,189
Percent of stops leading to search (search rate)	5.94%

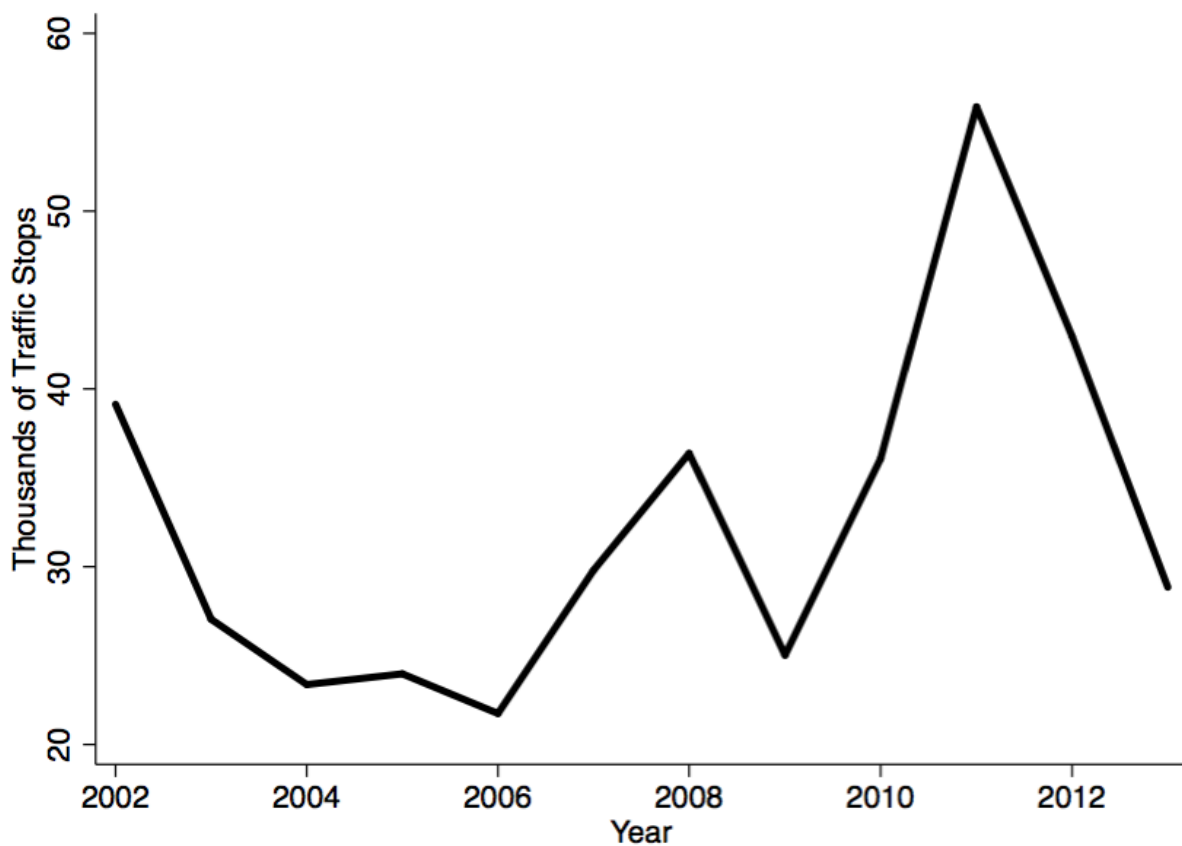Figure 1. Number of Traffic Stops per Year

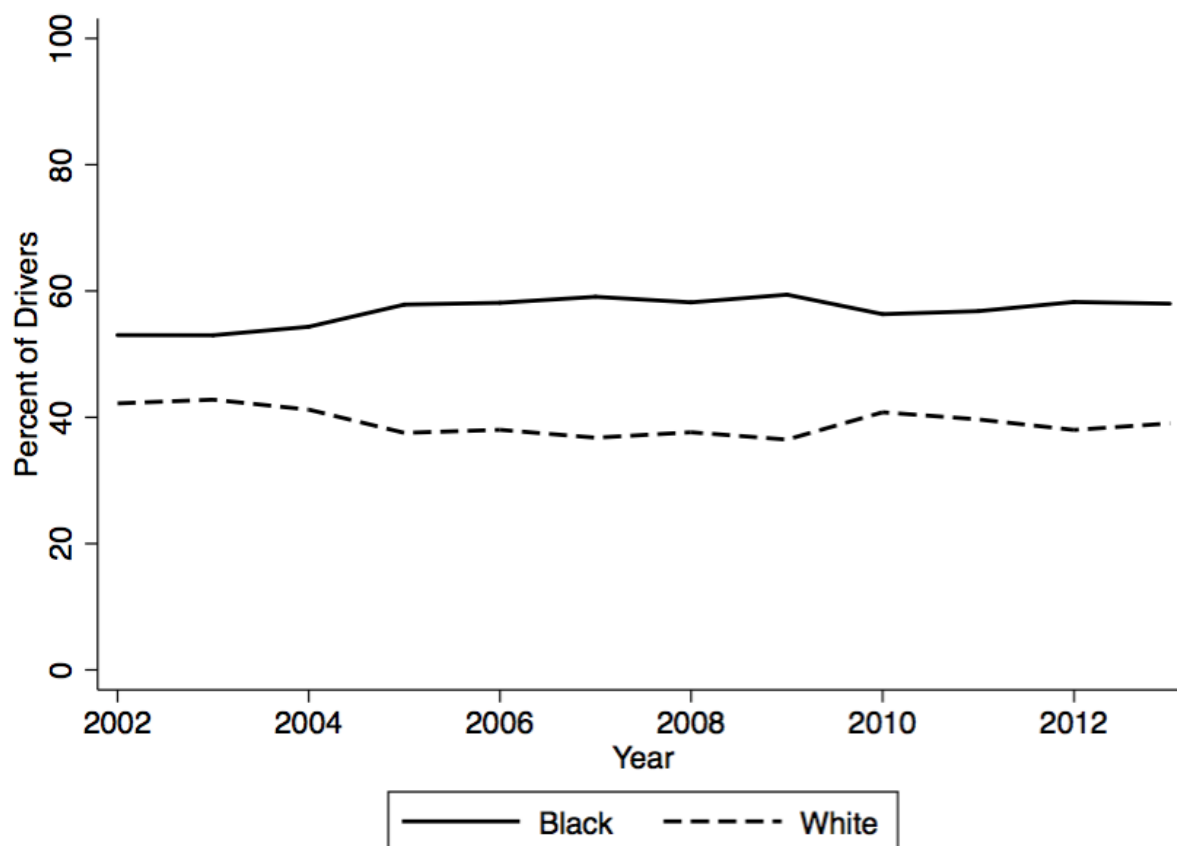Figure 2. Racial Composition of Traffic Stops by Year

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

Purpose	Number	Percent	
		White	Black
Total Stops	390,214	39.27	56.83
Speed Limit	117,727	45.44	49.90
Stop Light/Sign	29,828	42.23	53.29
Driving Impaired	2,099	52.31	41.83
Safe Movement	20,811	42.25	53.33
Vehicle Equipment	57,820	32.90	63.79
Vehicle Regulatory	113,323	37.26	59.53
Seat Belt	16,408	36.04	60.51
Investigation	15,567	30.82	65.67
Other Vehicle	16,631	31.75	64.02

Note: Includes only drivers. Excludes 12,903 checkpoint stops. Excludes 812 passengers.

Table 3. Percent Searched by Race and Purpose of Stop

Purpose	Number	% Total	% White	% Black	Ratio Black:White
Total Stops	390,214	-	39.27	56.83	-
Total Searches	23,189	5.94	4.05	7.34	1.81
Speed Limit	117,727	2.22	1.57	2.89	1.84
Stop Light/Sign	29,828	4.64	3.07	6.00	1.95
Driving Impaired	2,099	31.73	30.15	33.14	1.10
Safe Movement	20,811	8.44	6.70	9.92	1.48
Vehicle Equipment	57,820	8.15	6.13	9.26	1.51
Vehicle Regulatory	113,323	5.24	3.33	6.46	1.94
Seat Belt	16,408	10.32	6.21	12.98	2.09
Investigation	15,567	19.58	16.59	21.00	1.27
Other Vehicle	16,631	8.32	6.02	9.55	1.59

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

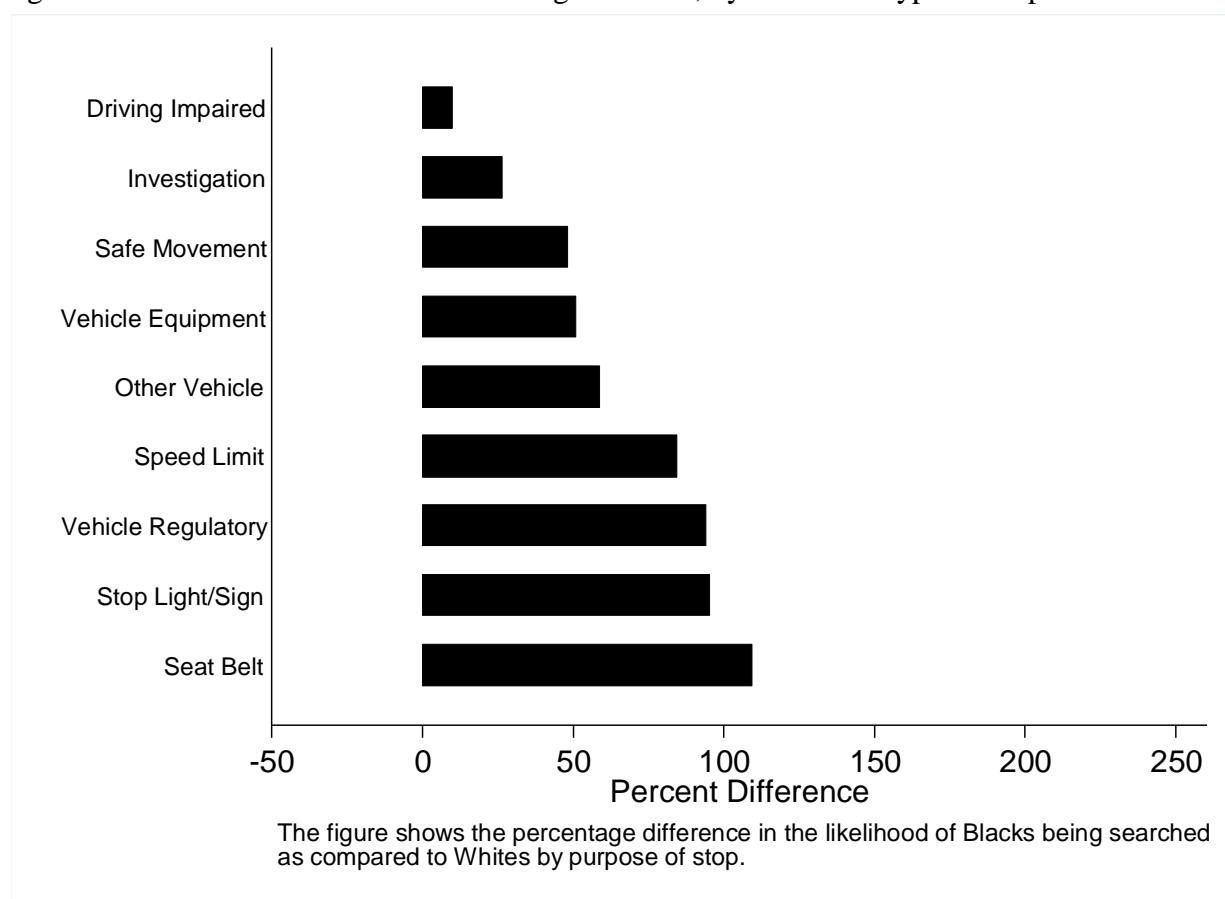Figure 3. Difference in Likelihood of Being Searched, by Race and Type of Stop

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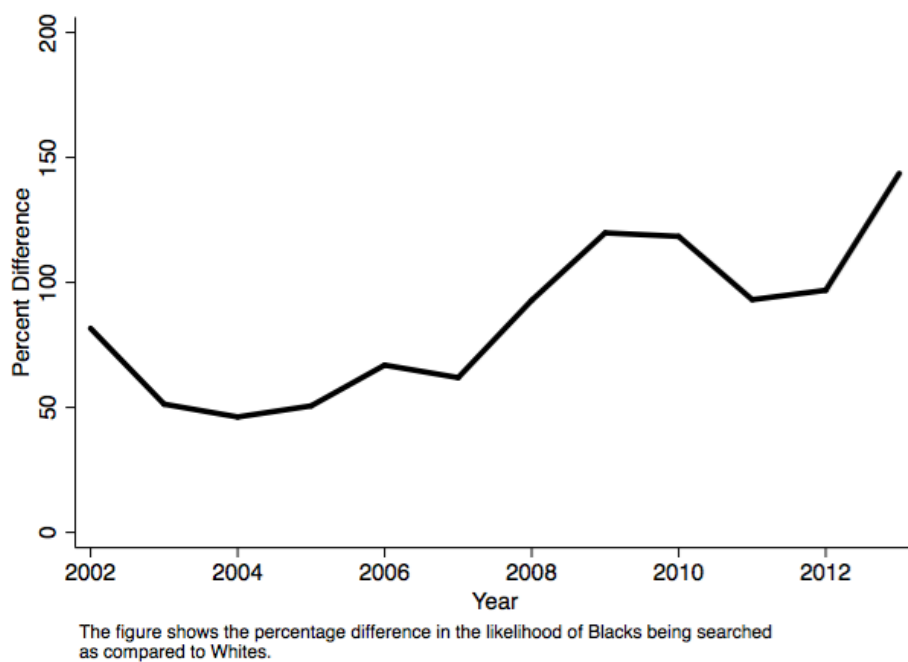
Figure 5. Racial Differences in the Liklihood of Search by Gender

The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites by gender.
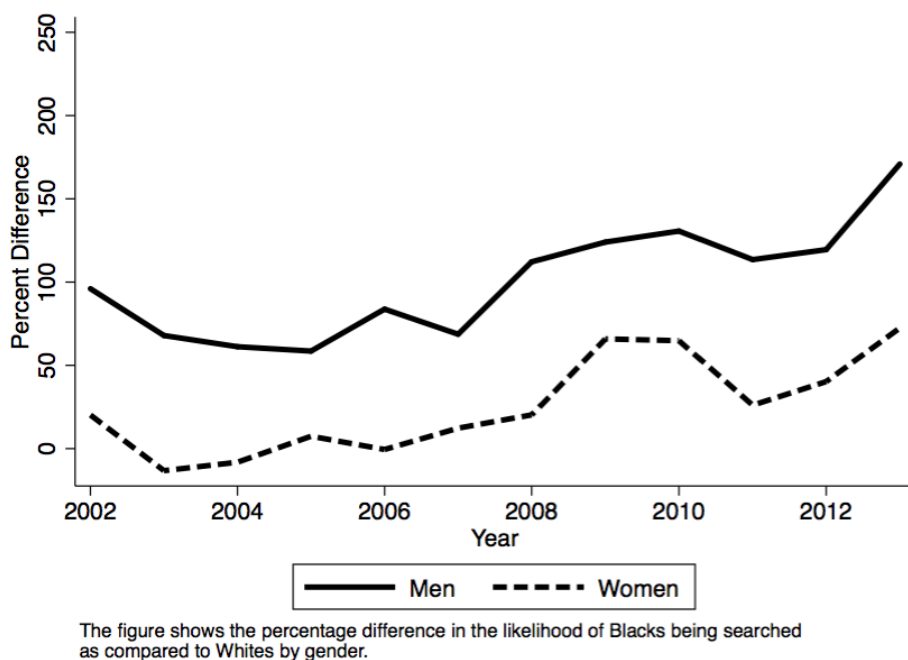
Figure 6. Racial Differences in the Liklihood of Search by Gender, for Drivers Under 30

The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites by gender for motorists under 30.
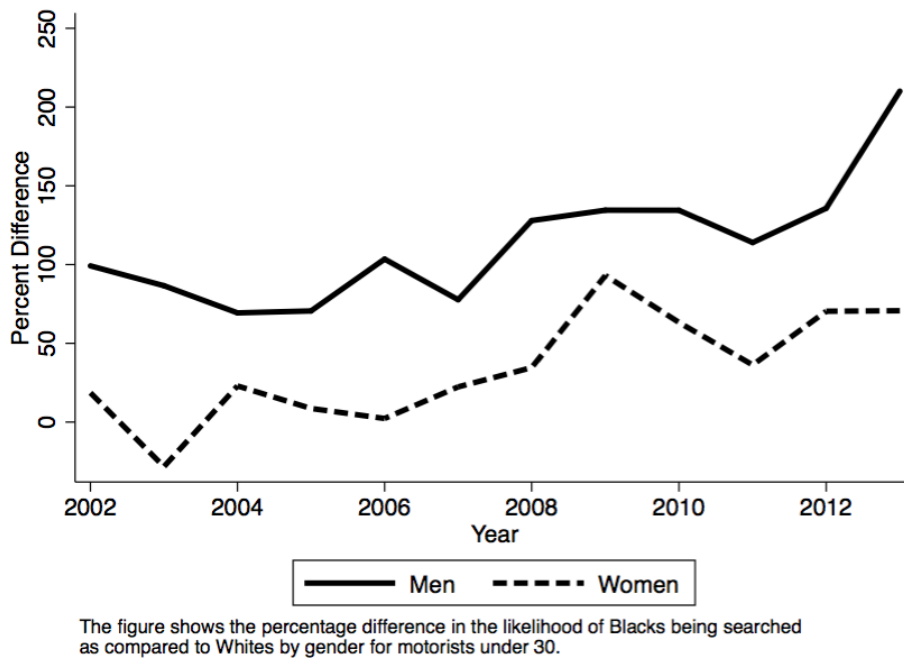
Figure 7. Search Rates by Race, Gender, and Age Group

Based on 390,214 traffic stops from 2002 through 2013, and 23,189 searches. Overall rate of search: 5.94 percent.
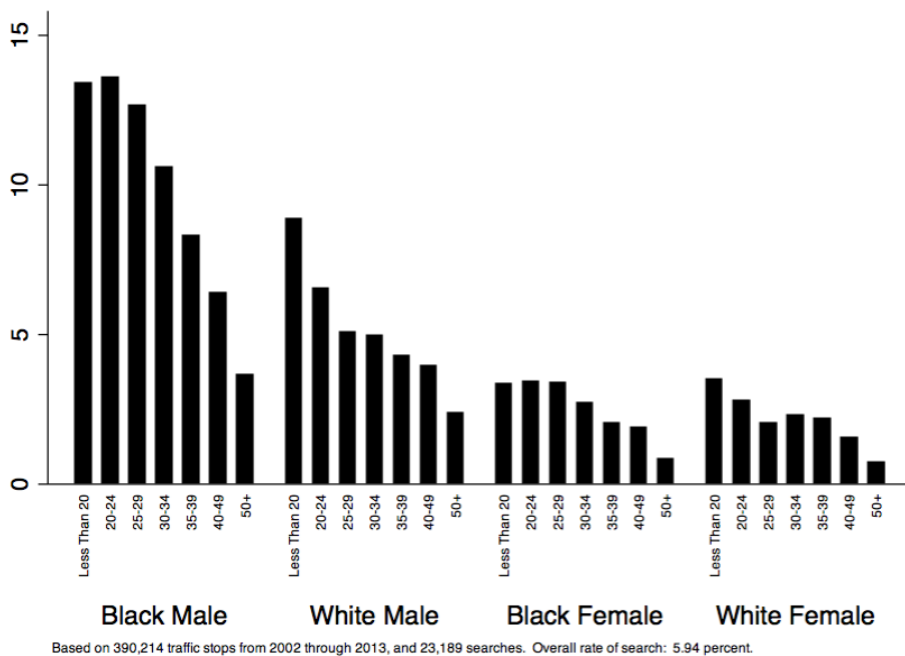
Black men under the age of 30 are searched at rates of about 13 percent whereas white men of that age see rates of about 9 percent, and women in general are typically below 4 percent. The figure makes clear how race, gender, and age combine to indicate where searches are most likely.

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.
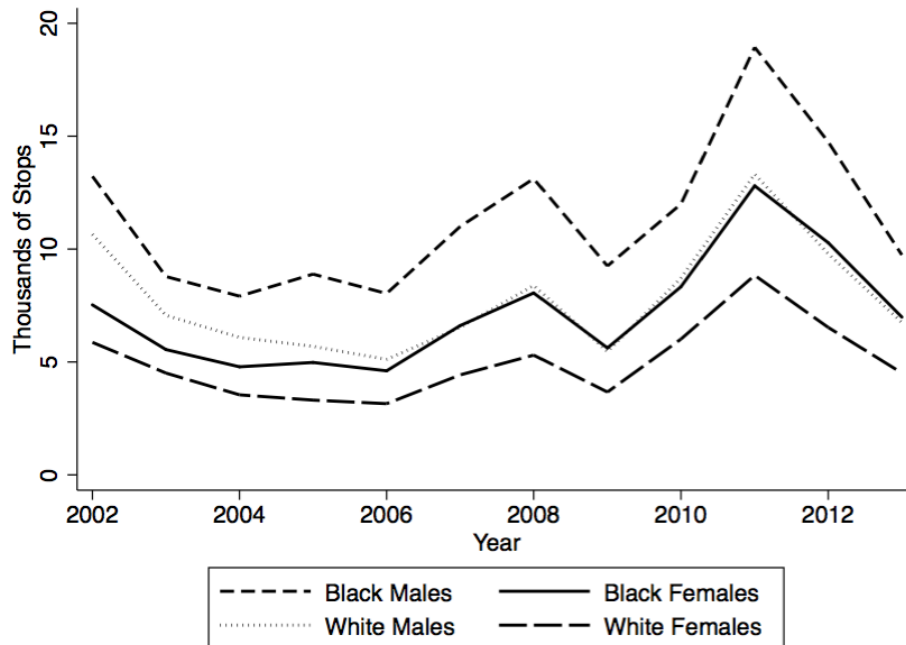
Figure 8. Number of Stops, by Race and Gender

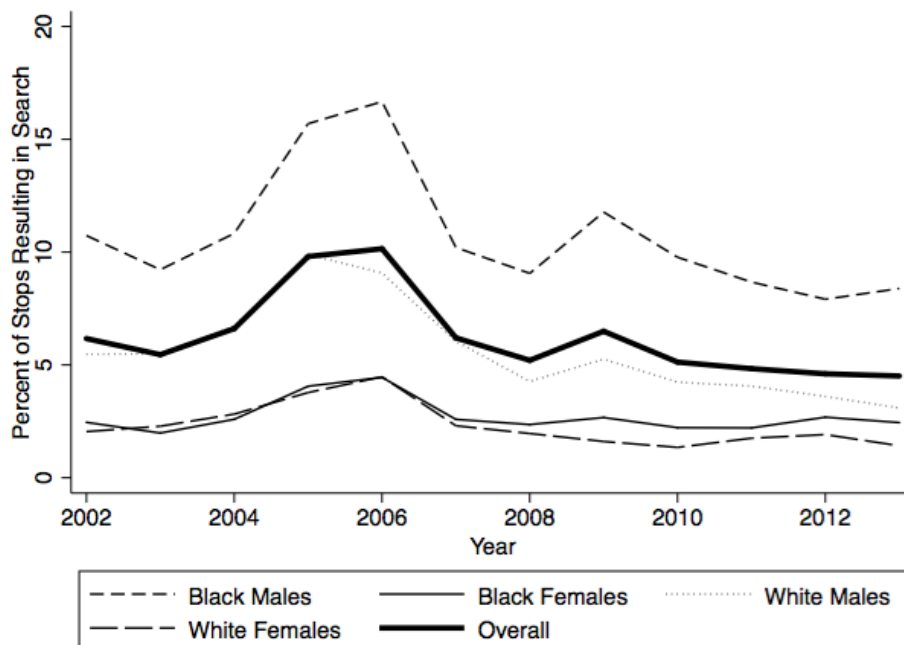Figure 9. Percent of Stops Resulting in a Search, by Race and Gender

Table 4. Type of Search by Race

Search Type	Number	% Total	% White	% Black	Ratio Black:White
Total Stops	390,214	-	39.27	56.83	-
Total Searches	23,189	5.94	4.05	7.34	1.81
Consent	10,482	2.69	2.04	3.16	1.55
Search Warrant	52	0.01	0.01	0.02	-
Probable Cause	6,804	1.74	0.92	2.36	2.57
Incident to Arrest	4,724	1.21	0.92	1.41	1.53
Protective Frisk	1,127	0.29	0.17	0.38	2.24

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	1,494	45.33	45.33	0.38	0.38
2 – 10	906	27.49	72.82	0.81	1.19
11 - 100	280	8.50	81.31	2.89	4.08
101 – 1,000	519	15.75	97.06	56.21	60.29
1,001 +	97	2.94	100.00	39.72	100.00
Total		100	-	100	-

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

On average, officers stop 0.709 Whites for each Black stopped.
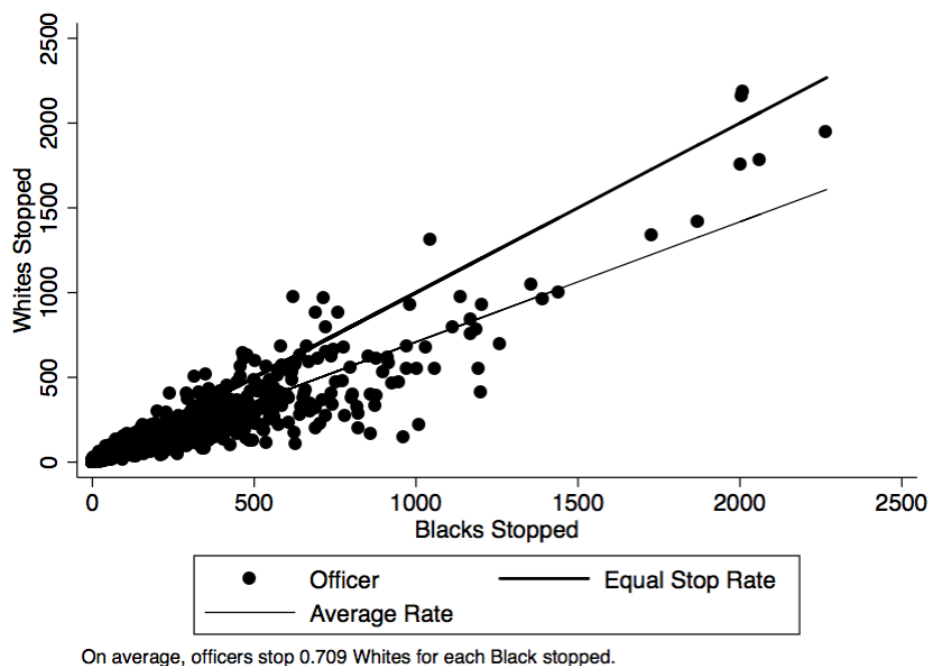
Figure 11. Number of Black and White Motorists Searched, by Officer

On average, officers search 0.335 Whites for each Black searched.

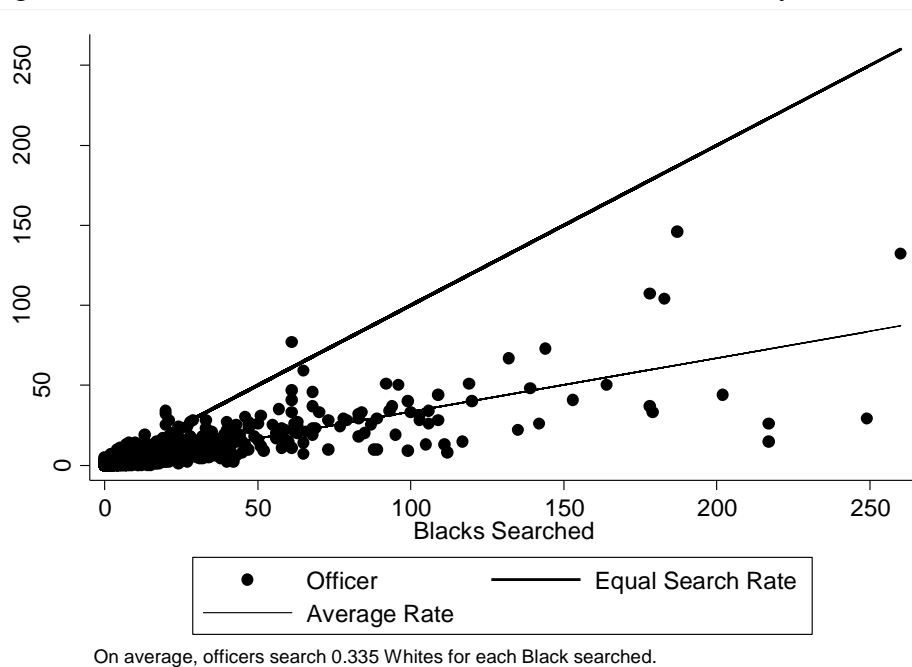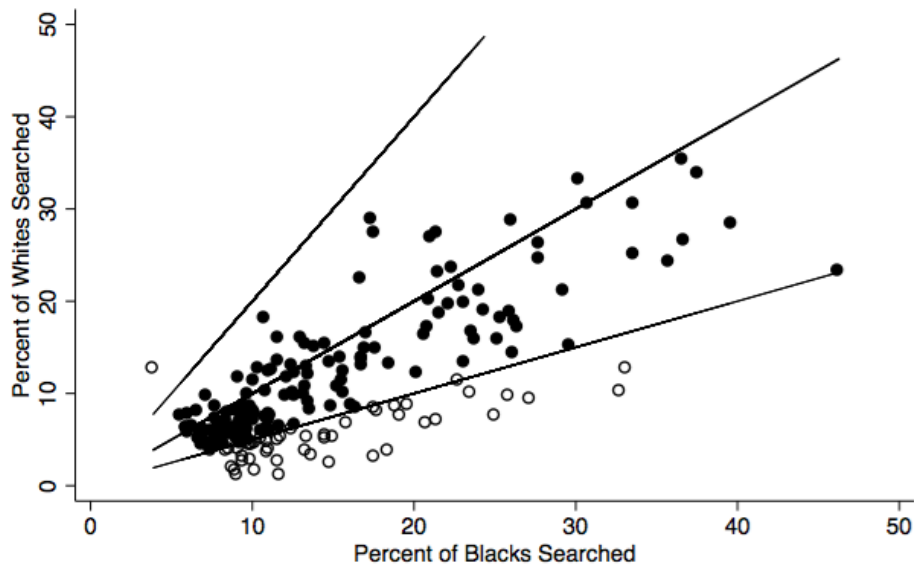Figure 12. Percent of White and Black Drivers Searched, by Officer

Includes 200 officers with a minimum of 50 White stops, 50 Black stops, and a search rate
above the department average of 5.94. The hollow circles indicate high disparity officers.
1 officers search Whites at more than twice the rate that they search Blacks.
48 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	2.08*(0.04)	2.10*(0.04)	1.93*(0.04)	1.89*(0.03)	1.85*(0.03)
Hispanic	0.99 (0.04)	0.93 (0.04)	0.91*(0.04)	0.91*(0.04)	0.92 (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	-	-	2.00*(0.08)	2.00*(0.08)	1.95*(0.08)
Impaired	-	-	15.51*(0.93)	15.69*(0.94)	12.65*(0.80)
Movement	-	-	3.42*(0.12)	3.42*(0.12)	3.12*(0.12)
Equipment	-	-	3.18*(0.09)	3.15*(0.09)	2.85*(0.08)
Regulatory	-	-	2.33*(0.06)	2.34*(0.06)	2.24*(0.06)
Seat Belt	-	-	3.72*(0.13)	3.64*(0.13)	3.64*(0.14)
Investigation	-	-	8.18*(0.26)	8.03*(0.26)	7.43*(0.25)
Other	-	-	3.06*(0.12)	3.04*(0.12)	2.85*(0.11)
Officer Type					
Black Disparity[†]	-	-	-	1.85*(0.04)	1.87*(0.05)
White Disparity[†]	-	-	-	1.08 (0.35)	1.08 (0.36)
Time					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
Constant	0.06*(0.00)	0.16*(0.00)	0.07*(0.00)	0.06*(0.00)	0.07*(0.00)
N	229,174	229,174	229,174	229,174	219,887
Pseudo R^2	0.015	0.035	0.079	0.084	0.091

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	1.19*(0.04)	1.19*(0.04)	1.11*(0.04)	1.10*(0.04)	1.10*(0.04)
Hispanic	0.65*(0.07)	0.62*(0.07)	0.60*(0.07)	0.60*(0.07)	0.62*(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	-	-	2.36*(0.20)	2.34*(0.20)	2.12*(0.18)
Impaired	-	-	40.31*(4.79)	40.26*(4.80)	21.89*(2.81)
Movement	-	-	4.35*(0.36)	4.32*(0.36)	3.36*(0.29)
Equipment	-	-	4.13*(0.26)	4.10*(0.25)	3.01*(0.20)
Regulatory	-	-	2.67*(0.16)	2.67*(0.16)	2.52*(0.15)
Seat Belt	-	-	4.25*(0.40)	4.15*(0.39)	4.31*(0.42)
Investigation	-	-	13.55*(0.94)	13.22*(0.92)	10.91*(0.79)
Other	-	-	4.18*(0.38)	4.14*(0.37)	3.62*(0.33)
Officer Type					
Black Disparity[†]	-	-	-	2.15*(0.11)	2.16*(0.11)
White Disparity[†]	-	-	-	1.01*(0.74)	0.56*(0.57)
Time					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
Constant	0.02*(0.00)	0.07*(0.00)	0.02*(0.00)	0.02*(0.00)	0.03*(0.00)
N	145,804	145,804	145,804	145,804	139,930
Pseudo R^2	0.002	0.016	0.073	0.078	0.090

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
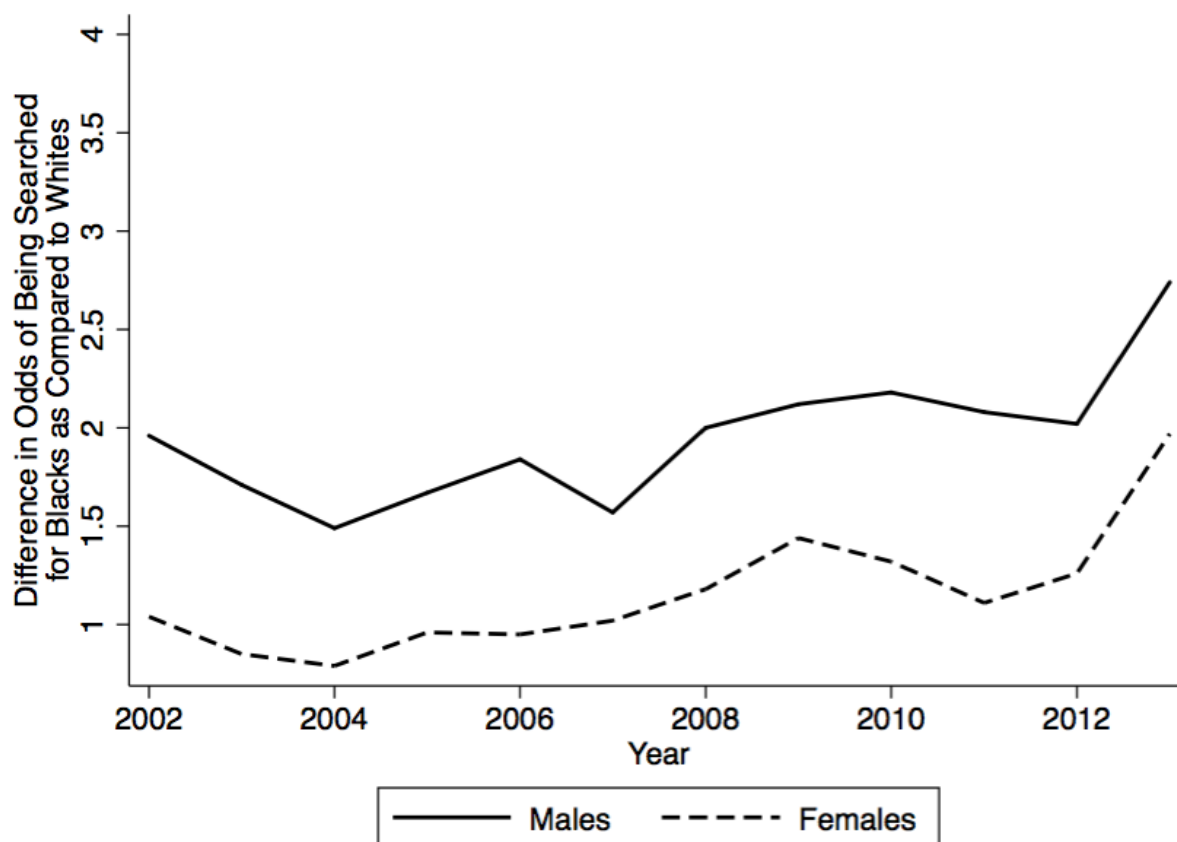
Appendix

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

		Percent	
Purpose	Number	White	Black
Total Stops	12,903	22.13	74.90
Speed Limit	1,237	23.36	73.81
Stop Light/Sign	710	23.80	73.52
Driving Impaired	149	36.91	52.35
Safe Movement	940	25.00	72.13
Vehicle Equipment	2,896	22.58	74.48
Vehicle Regulatory	3,134	20.93	75.88
Seat Belt	1,020	19.02	79.31
Investigation	1,987	22.95	74.13
Other Vehicle	819	17.83	78.88

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

					Ratio
Purpose	Number	% Total	% White	% Black	Black:White
Total Stops	238,450	-	39.23	56.88	-
Total Searches	19,525	8.19	5.26	10.34	1.97
Speed Limit	66,727	3.27	2.13	4.50	2.11
Stop Light/Sign	18,237	6.32	3.97	8.43	2.12
Driving Impaired	1,627	33.31	30.20	36.35	1.20
Safe Movement	14,212	10.67	8.16	12.75	1.56
Vehicle Equipment	37,551	10.59	7.70	12.19	1.58
Vehicle Regulatory	65,679	7.42	4.41	9.34	2.12
Seat Belt	12,018	12.71	7.38	15.93	2.16
Investigation	11,089	23.13	18.84	25.12	1.33
Other Vehicle	11,312	10.51	7.12	12.31	1.73

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

Purpose	Number	% Total	% White	% Black	Ratio Black:White
Total Stops	151,764	-	39.32	56.76	-
Total Searches	3,664	2.41	2.14	2.61	1.22
Speed Limit	51,002	0.84	0.77	0.93	1.21
Stop Light/Sign	11,591	1.99	1.61	2.27	1.41
Driving Impaired	472	26.27	29.96	21.76	0.73
Safe Movement	6,599	3.64	3.55	3.71	1.05
Vehicle Equipment	20,269	3.62	3.30	3.77	1.14
Vehicle Regulatory	47,644	2.23	1.87	2.45	1.31
Seat Belt	4,390	3.76	3.48	3.97	1.14
Investigation	4,478	10.79	11.45	10.50	0.92
Other Vehicle	5,319	3.65	3.84	3.48	0.91

Table A4. Type of Search by Race: Men

Search Type	Number	% Total	% White	% Black	Ratio Black:White
Total Stops	238,450	-	39.23	56.88	-
Total Searches	19,525	8.19	5.26	10.34	1.97
Consent	8,921	3.74	2.65	4.53	1.71
Search Warrant	37	0.02	0.01	0.02	-
Probable Cause	5,803	2.43	1.24	3.32	2.68
Incident to Arrest	3,751	1.57	1.12	1.89	1.69
Protective Frisk	1,013	0.42	0.24	0.57	2.38

Table A5. Type of Search by Race: Women

Search Type	Number	% Total	% White	% Black	Ratio Black:White
Total Stops	151,764	-	39.32	56.76	-
Total Searches	3,664	2.41	2.14	2.61	1.22
Consent	1,561	1.03	1.07	1.00	0.93
Search Warrant	15	-	-	-	-
Probable Cause	1,001	0.66	0.41	0.84	2.05
Incident to Arrest	973	0.64	0.60	0.66	1.10
Protective Frisk	114	0.08	0.05	0.09	1.80

Figure A6. Stops by Day of the Week
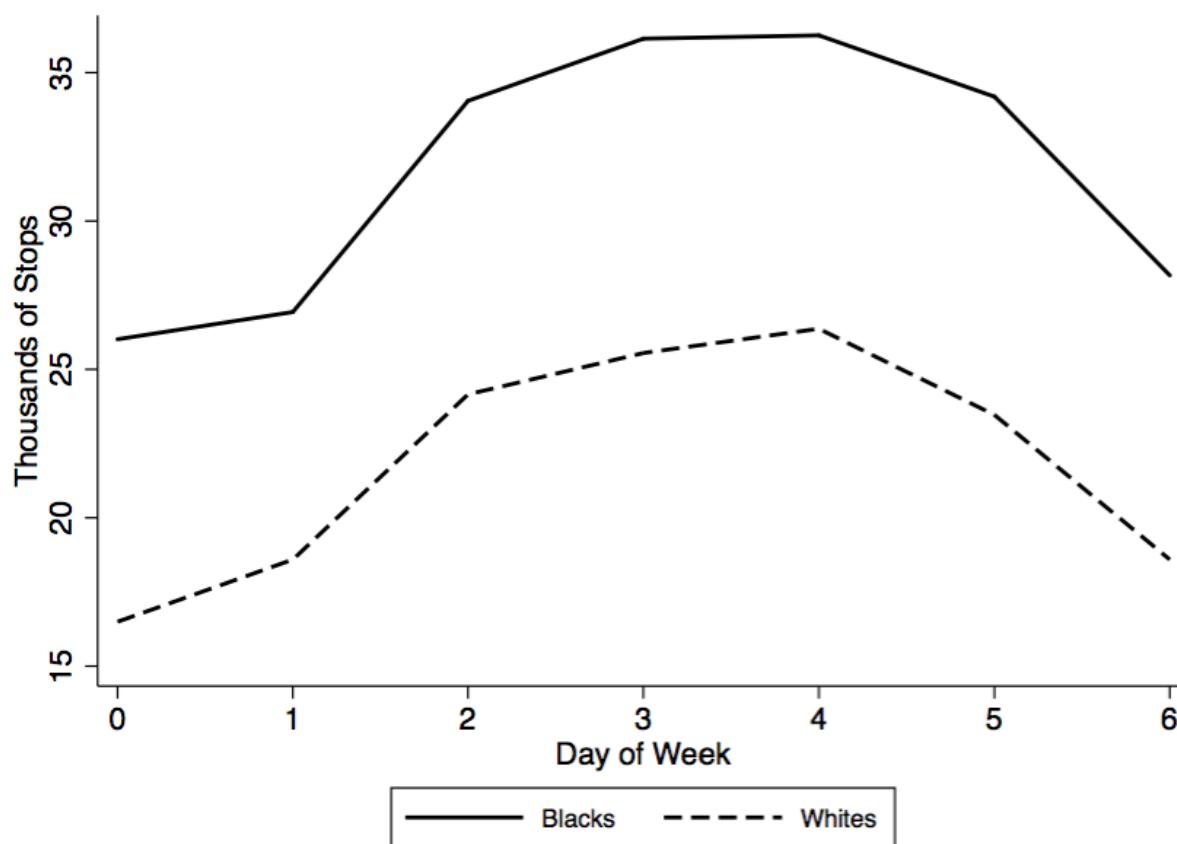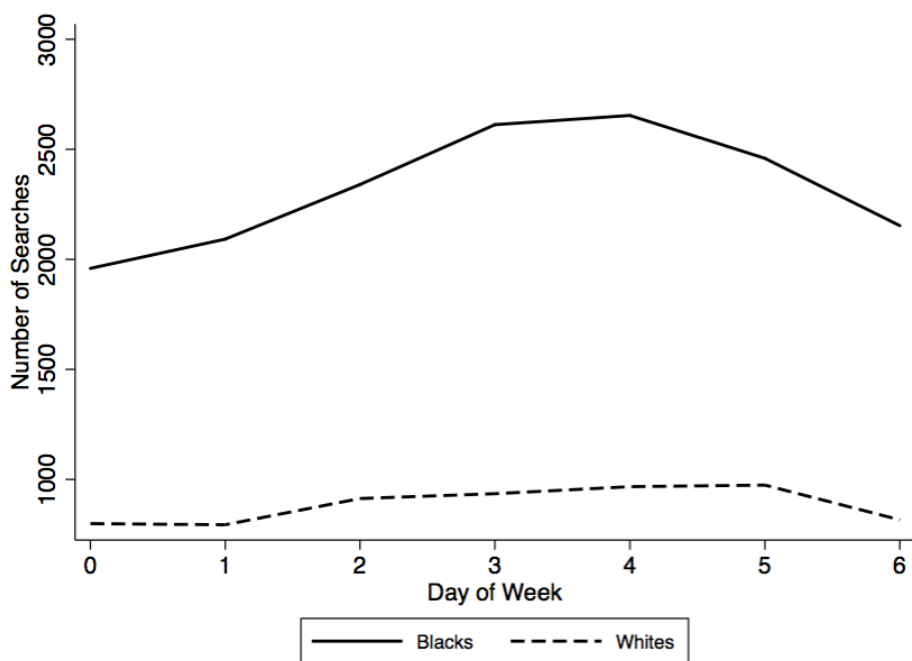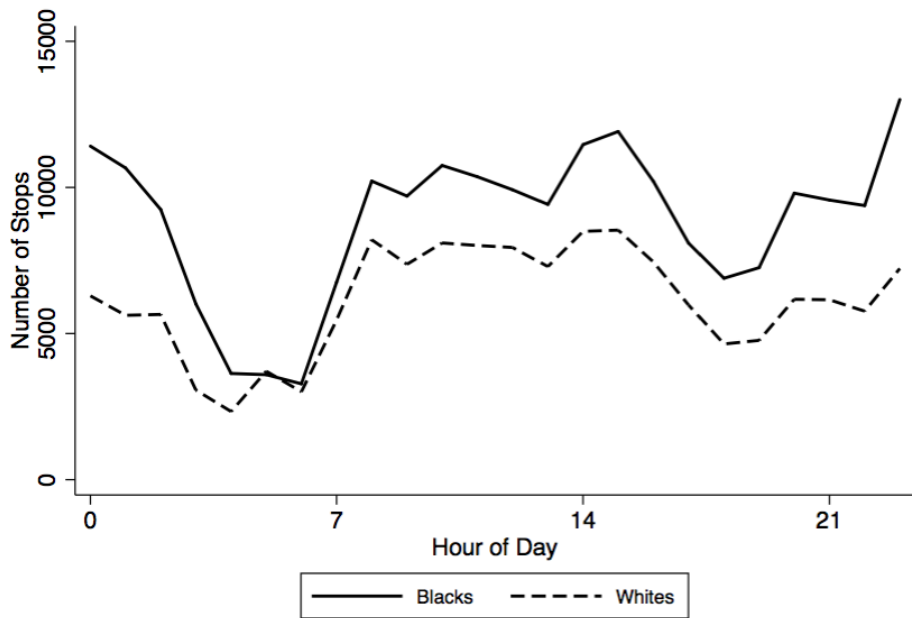
Figure A7. Searches by Day of the Week

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.
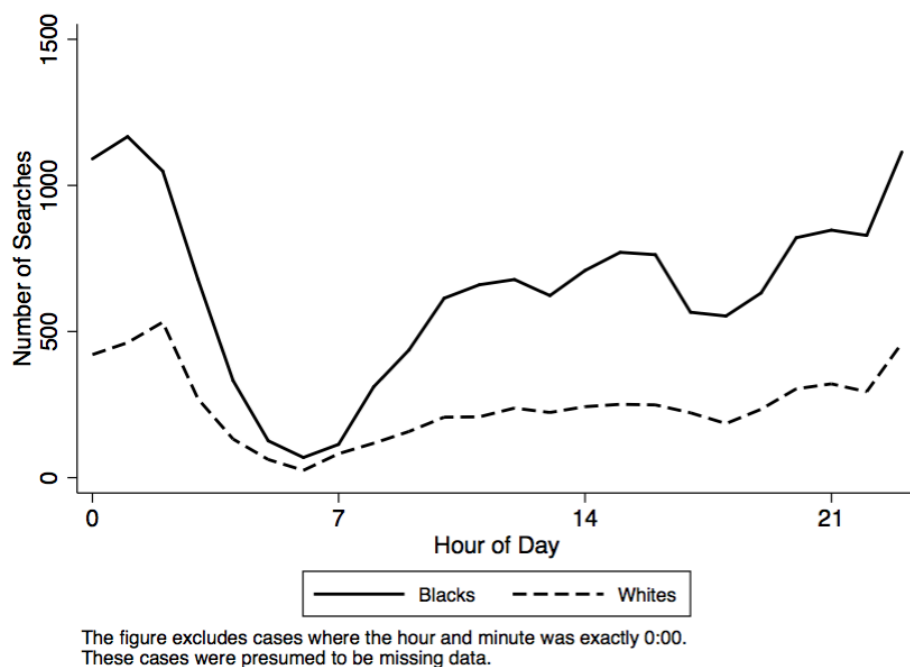These cases were presumed to be missing data.

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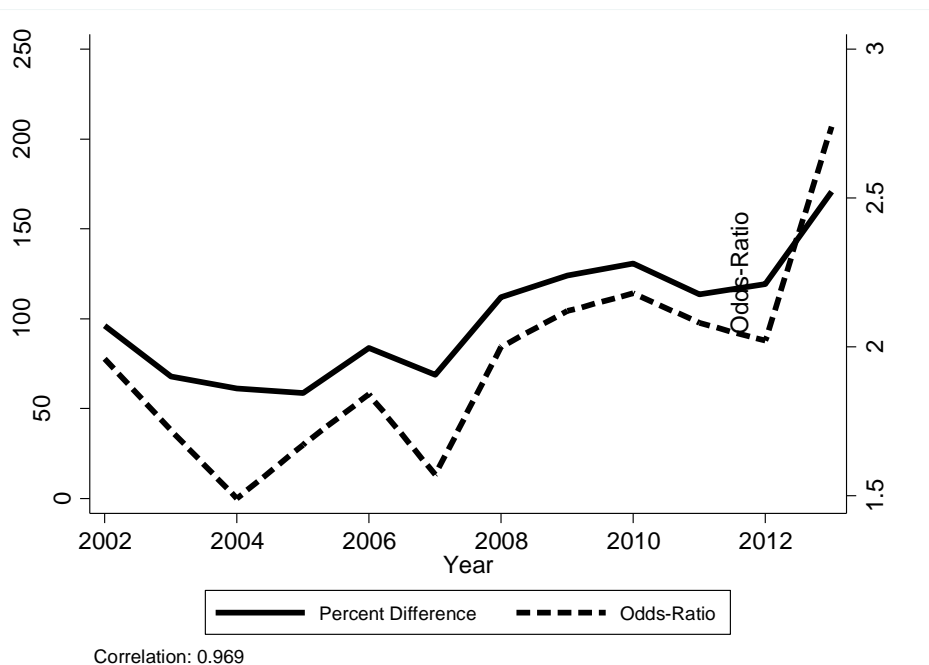

Correlation: 0.969

Figure A11. Correlation Between Percent Difference in Likelihood of Black Women being Searched as Compared to Whites and Odds-Ratios from Logistic Regression
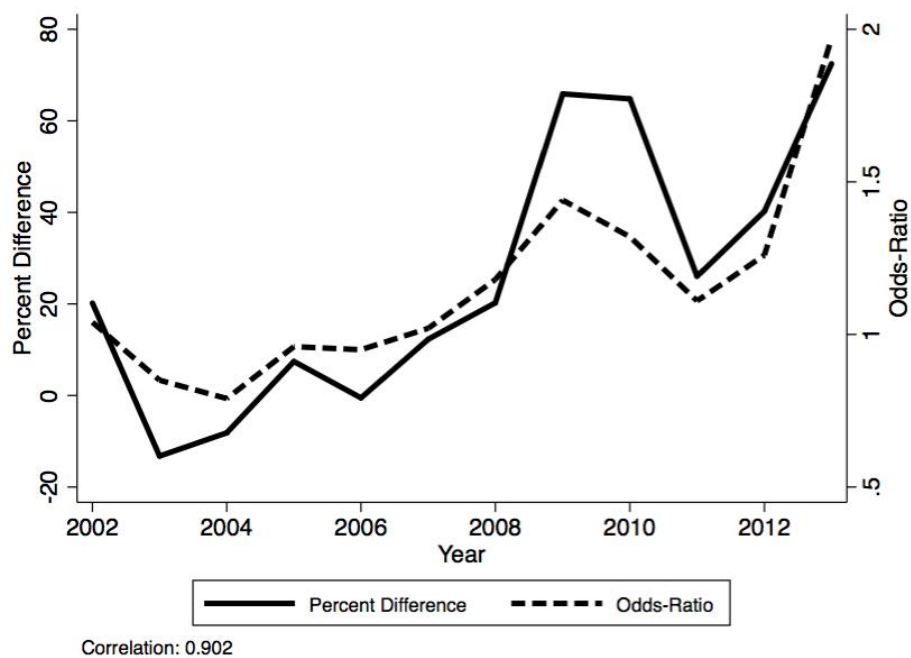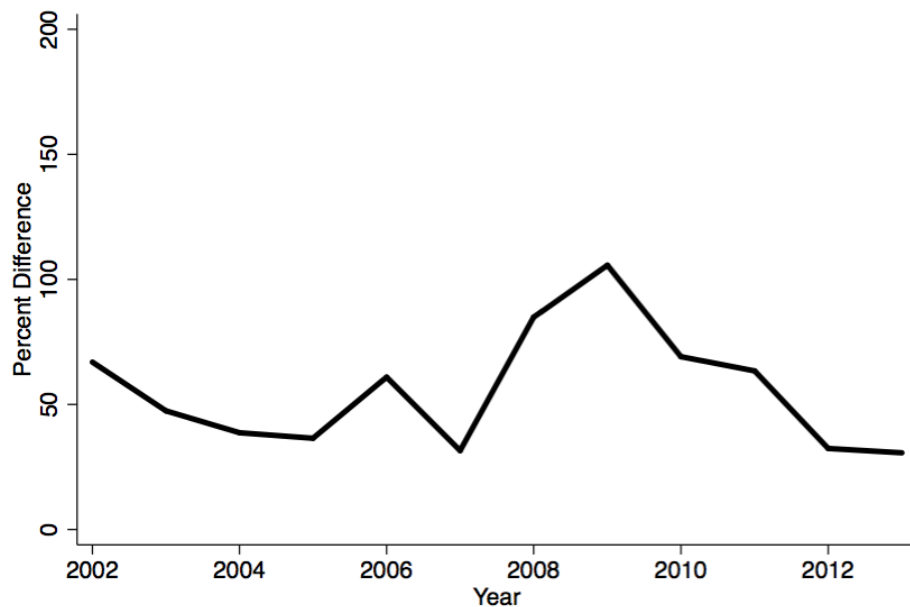
Figure A12. Racial Differences in the Likelihood of Search: Consent Searches Only

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	5,900	25.44	23.88	26.11
No	17,289	74.56	76.12	73.89
Total	23,189	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	147,023	2.64	0.53	32.58	63.50	0.75	100.0
Black	No	205,488	2.77	0.52	31.75	64.27	0.69	100.0
Total	No	367,025	2.70	0.53	31.97	64.08	0.72	100.0
White	Yes	6,198	2.69	0.60	19.55	52.23	24.93	100.0
Black	Yes	16,269	2.10	0.43	16.93	57.27	23.27	100.0
Total	Yes	23,189	2.26	0.50	17.61	55.90	23.74	100.0