

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

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Table 1. Overview of the Data

Data Subsets	Observations
Total stops	145,960
-2014	3,965
-Passengers	2,929
-Checkpoint stops	1,065
Total number of cases deleted	7,862
Stops for analysis	138,098
Searches	4,858
Percent of stops leading to search (search rate)	3.52%

Figure 1. Number of Traffic Stops per Year

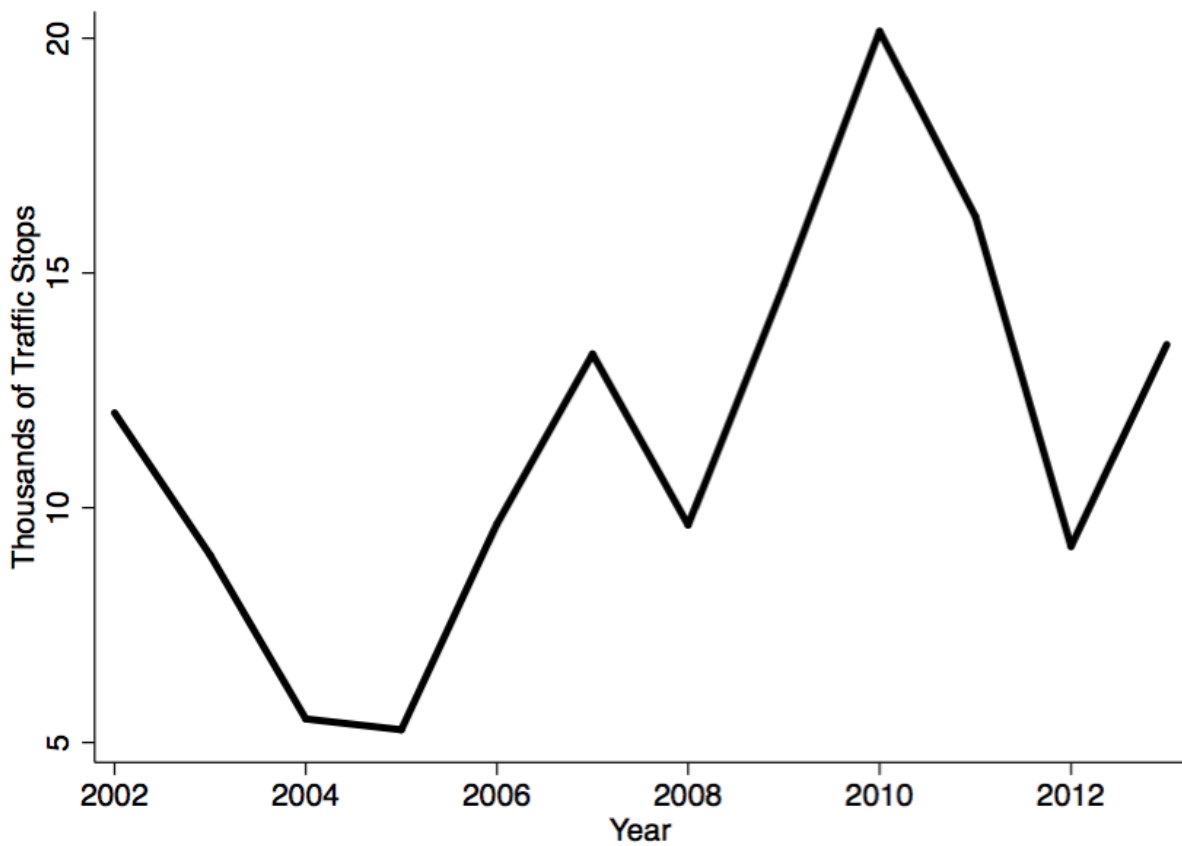


Figure 2. Racial Composition of Traffic Stops by Year

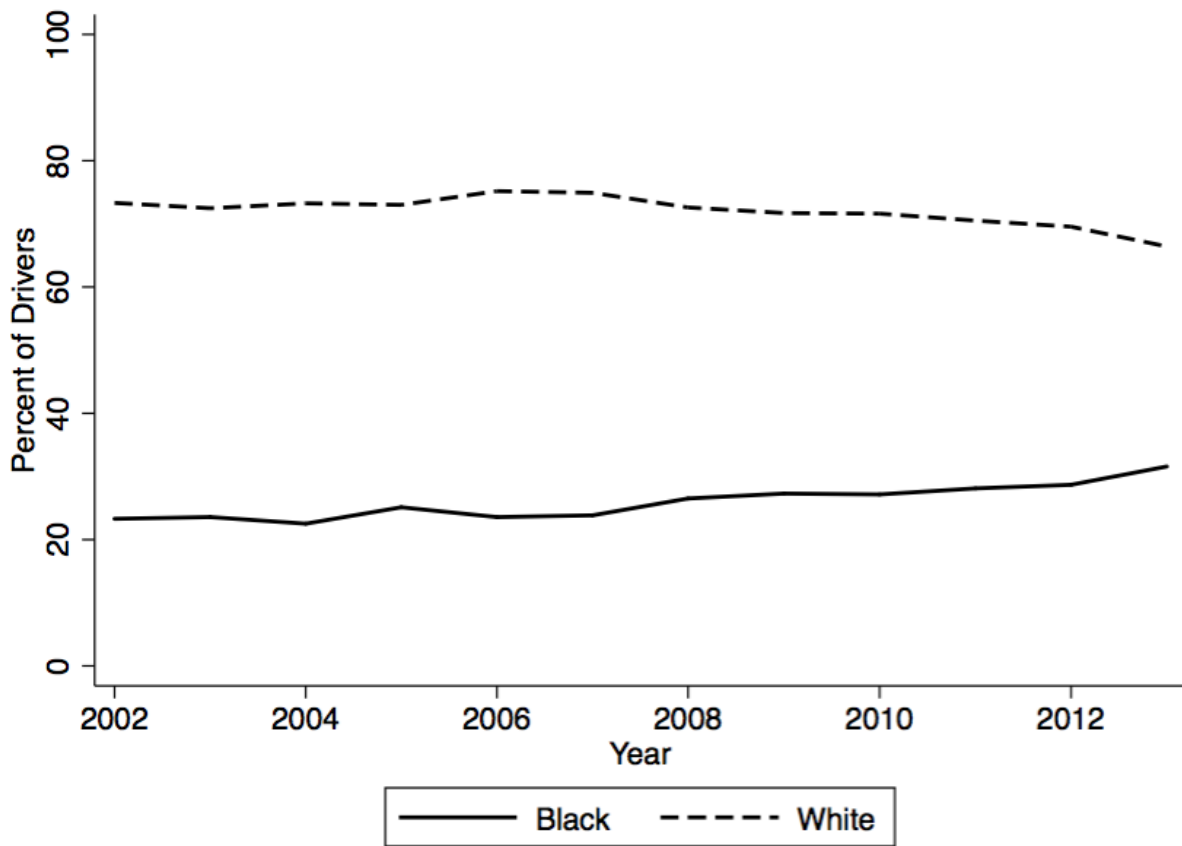


Table 2. Racial Composition of Traffic Stops by Purpose, Drivers

Purpose	Number	Percent	
		White	Black
Total Stops	138,098	71.81	26.37
Speed Limit	43,549	75.94	22.18
Stop Light/Sign	12,336	72.77	24.30
Driving Impaired	2,809	78.07	19.72
Safe Movement	15,540	71.81	26.17
Vehicle Equipment	22,400	67.26	31.16
Vehicle Regulatory	21,374	67.84	30.74
Seat Belt	6,167	73.73	25.02
Investigation	7,720	69.42	29.02
Other Vehicle	6,203	69.24	29.05

Note: Includes only drivers. Excludes 1,065 checkpoint stops. Excludes 2,929 passengers.

Table 3. Percent Searched by Race and Purpose of Stop

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	138,098	-	71.81	26.37	-
Total Searches	4,858	3.52	3.28	4.14	1.26
Speed Limit	43,549	1.39	1.18	2.13	1.81
Stop Light/Sign	12,336	1.81	1.57	2.57	1.64
Driving Impaired	2,809	32.15	34.52	21.66	0.63
Safe Movement	15,540	3.29	3.21	3.44	1.07
Vehicle Equipment	22,400	3.64	3.55	3.85	1.08
Vehicle Regulatory	21,374	2.69	2.49	3.11	1.25
Seat Belt	6,167	2.46	1.89	4.08	2.16
Investigation	7,720	10.51	9.05	14.15	1.56
Other Vehicle	6,203	4.24	3.31	6.22	1.88

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

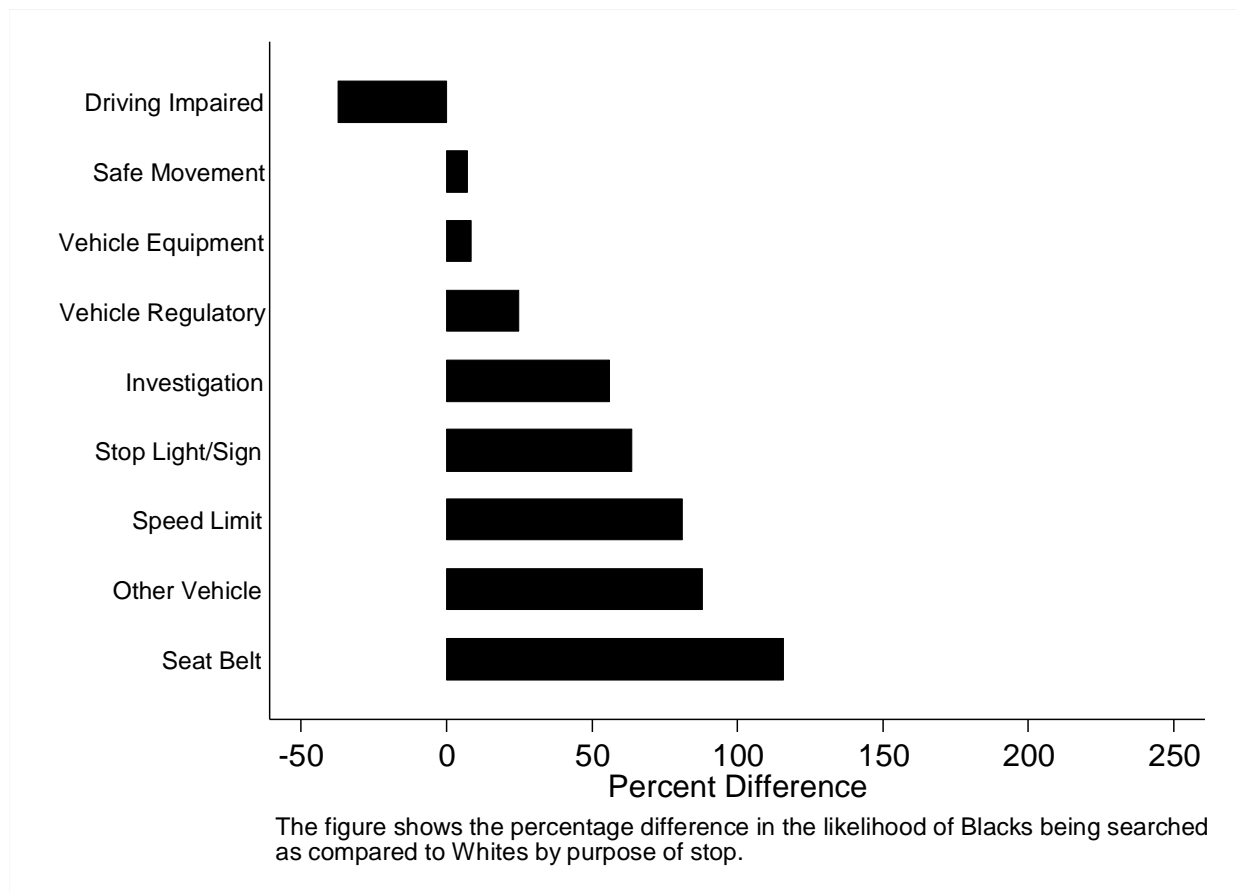
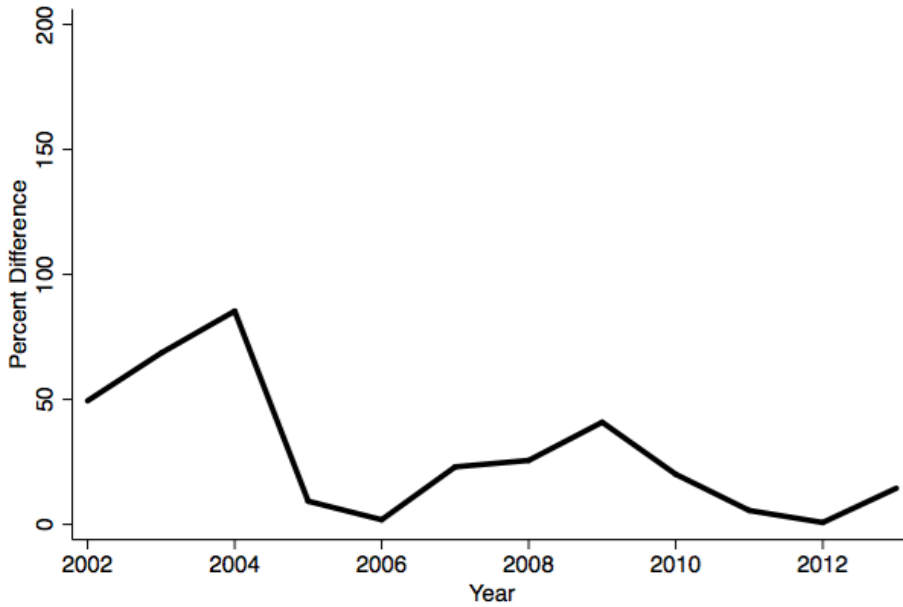
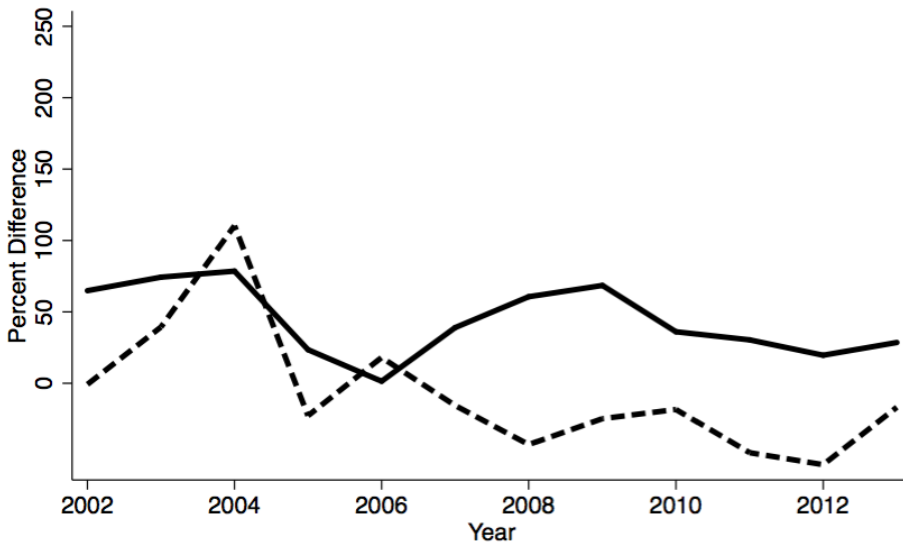


Figure 4. Racial Differences in the Likelihood of Search



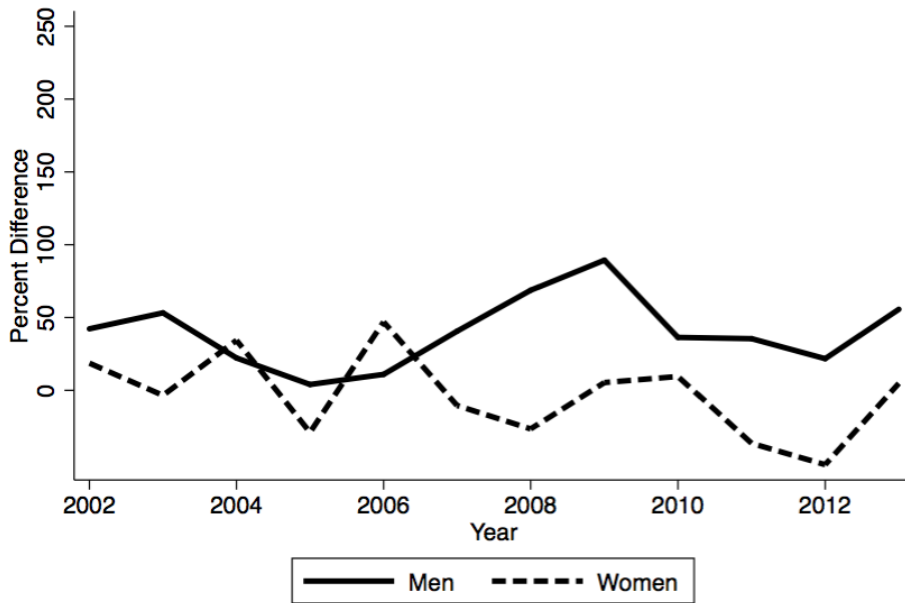
The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites.

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



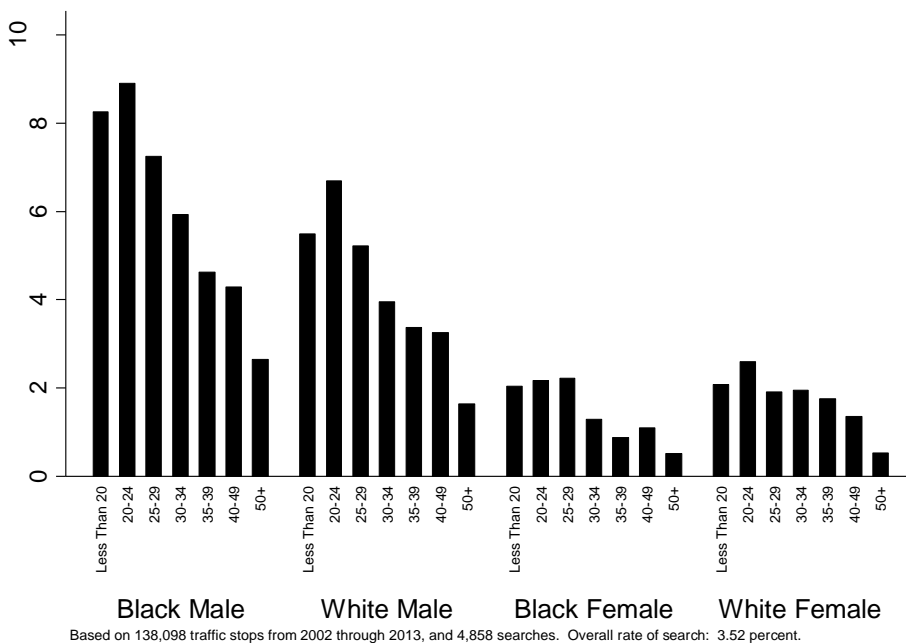
The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites by gender.

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



Black men under the age of 30 are searched at rates of about 9 percent whereas white men of that age see rates of about 7 percent, and women in general are typically below 3 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

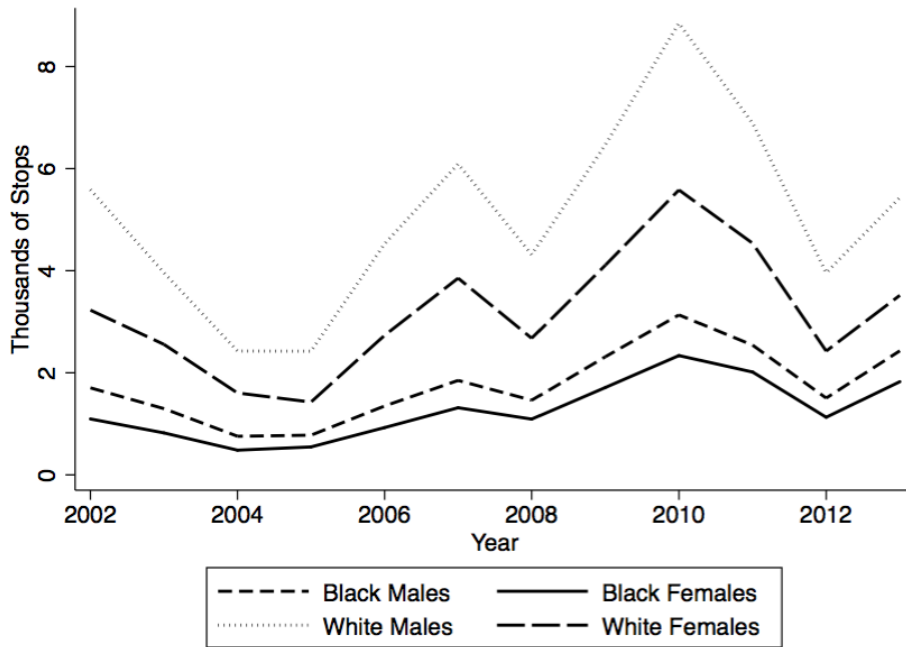


Figure 9. Percent of Stops Resulting in a Search, by Race and Gender

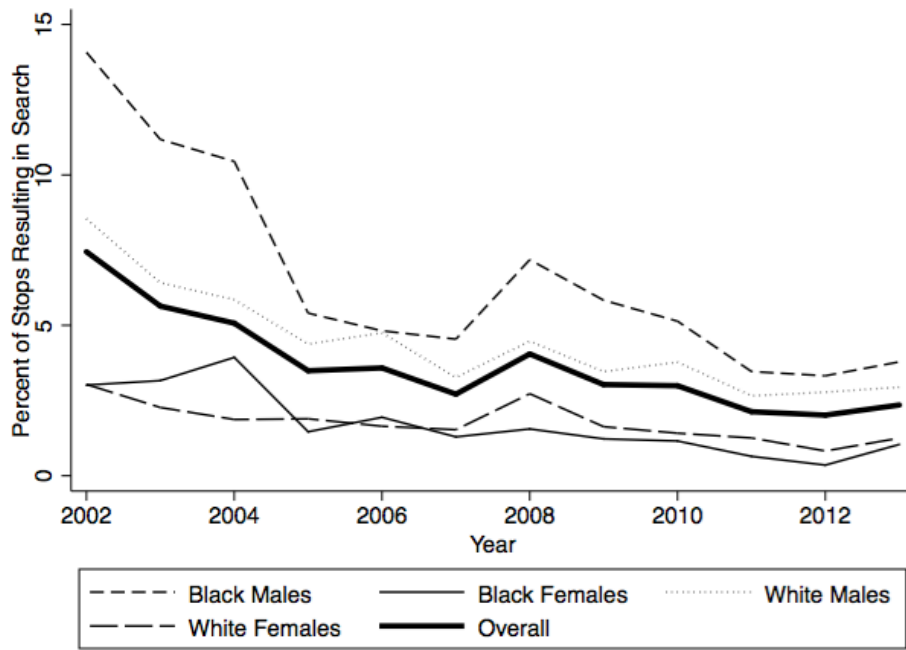


Table 4. Type of Search by Race

Search Type	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	138,098	-	71.81	26.37	-
Total Searches	4,858	3.52	3.28	4.14	1.26
Consent	2,299	1.66	1.58	1.94	1.23
Search Warrant	6	-	-	-	-
Probable Cause	520	0.38	0.28	0.66	2.36
Incident to Arrest	1,857	1.34	1.32	1.35	1.02
Protective Frisk	176	0.13	0.11	0.18	1.64

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	232	42.65	42.65	0.17	0.17
2 – 10	92	16.91	59.56	0.24	0.41
11 - 100	68	12.50	72.06	2.33	2.74
101 – 1,000	112	20.59	92.65	35.17	37.91
1,001 +	40	7.35	100.00	62.09	100.00
Total	544	100	-	100	-

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

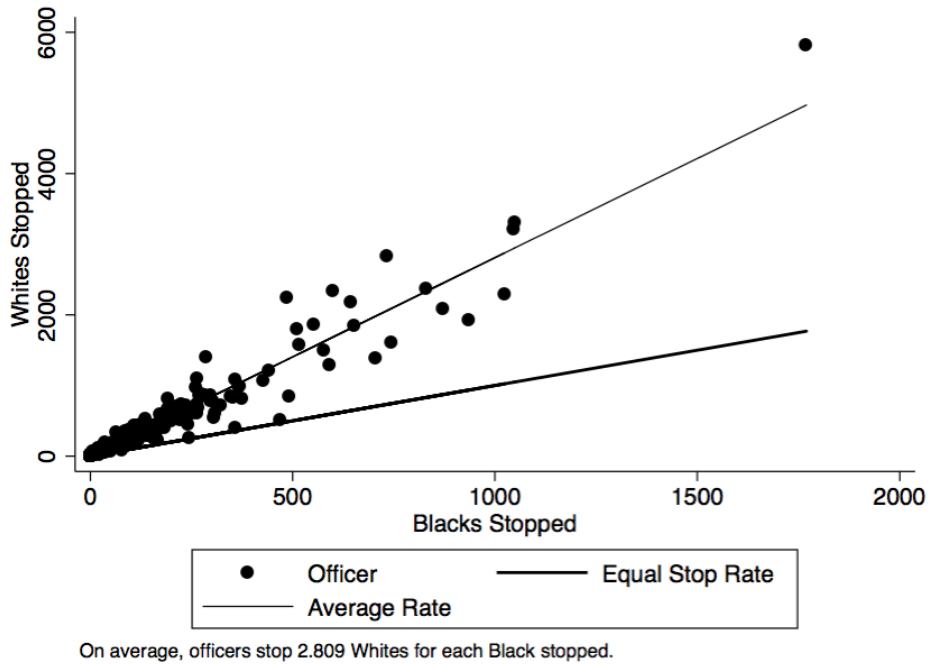


Figure 11. Number of Black and White Motorists Searched, by Officer

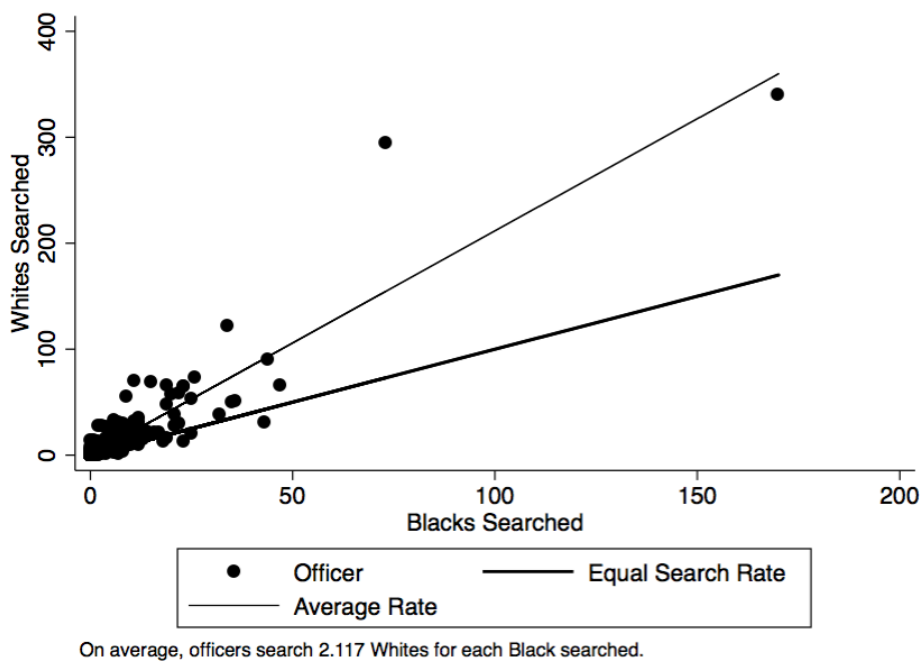
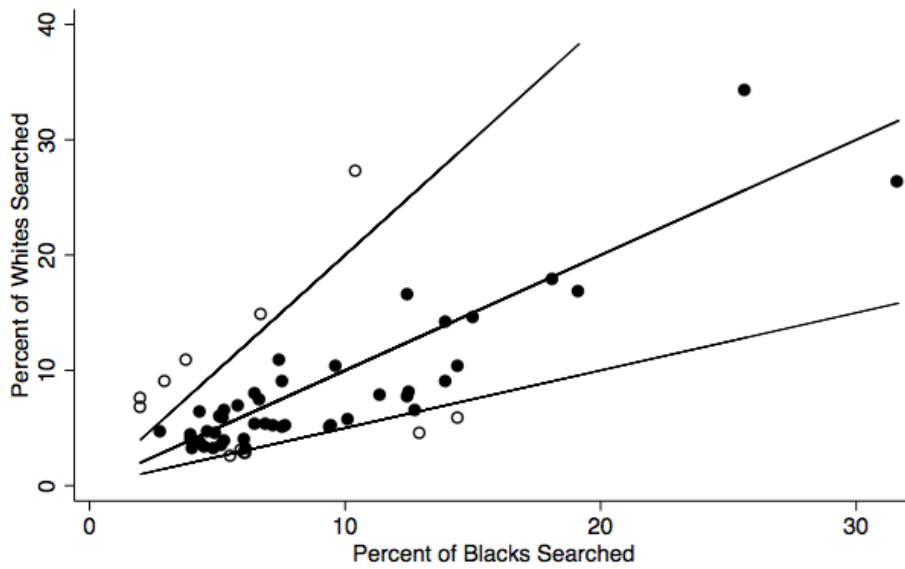


Figure 12. Percent of White and Black Drivers Searched, by Officer



Includes 56 officers with a minimum of 50 White stops, 50 Black stops, and a search rate above the department average of 3.52. The hollow circles indicate high disparity officers. 6 officers search Whites at more than twice the rate that they search Blacks. 6 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	1.62*(0.06)	1.57*(0.06)	1.56*(0.06)	1.58*(0.06)	1.53*(0.06)
Hispanic	1.78*(0.08)	1.58*(0.07)	1.19*(0.06)	1.20*(0.06)	1.22*(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	-	-	1.13 (0.10)	1.11 (0.10)	1.06 (0.10)
Impaired	-	-	27.52*(1.82)	27.24*(1.80)	20.05*(1.40)
Movement	-	-	1.96*(0.13)	1.94*(0.13)	1.68*(0.12)
Equipment	-	-	2.02*(0.12)	1.99*(0.12)	1.60*(0.10)
Regulatory	-	-	1.69*(0.11)	1.67*(0.11)	1.62*(0.11)
Seat Belt	-	-	1.29*(0.13)	1.28*(0.13)	1.47*(0.15)
Investigation	-	-	5.54*(0.35)	5.38*(0.34)	4.69*(0.30)
Other	-	-	2.34*(0.20)	2.32*(0.20)	2.11*(0.18)
Officer Type					
Black Disparity [†]	-	-	-	1.25*(0.12)	1.24*(0.12)
White Disparity [†]	-	-	-	2.73*(0.25)	2.69*(0.25)
Time					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
Constant	0.04*(0.00)	0.12*(0.01)	0.06*(0.00)	0.06*(0.00)	0.09*(0.01)
N	82,040	82,040	82,040	82,040	80,121
Pseudo R²	0.008	0.025	0.118	0.122	0.132

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	0.79*(0.06)	0.79*(0.06)	0.73*(0.06)	0.73*(0.06)	0.72*(0.06)
Hispanic	0.32*(0.07)	0.29*(0.07)	0.19*(0.04)	0.19*(0.04)	0.20*(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	-	-	2.28*(0.41)	2.24*(0.40)	2.14*(0.39)
Impaired	-	-	55.33*(7.83)	55.36*(7.85)	32.67*(5.02)
Movement	-	-	3.71*(0.56)	3.70*(0.56)	3.05*(0.47)
Equipment	-	-	3.86*(0.53)	3.85*(0.53)	2.77*(0.40)
Regulatory	-	-	2.90*(0.41)	2.91*(0.42)	2.69*(0.39)
Seat Belt	-	-	2.76*(0.67)	2.72*(0.67)	3.14*(0.77)
Investigation	-	-	19.22*(2.56)	18.58*(2.48)	13.81*(1.92)
Other	-	-	4.64*(0.89)	4.67*(0.89)	3.79*(0.74)
Officer Type					
Black Disparity [†]	-	-	-	1.01 (0.23)	0.96 (0.22)
White Disparity [†]	-	-	-	2.94*(0.53)	2.65*(0.49)
Time					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
Constant	0.02*(0.00)	0.06*(0.00)	0.01*(0.00)	0.01*(0.00)	0.02*(0.00)
N	53,542	53,542	53,542	53,542	52,437
Pseudo R²	0.005	0.020	0.138	0.141	0.157

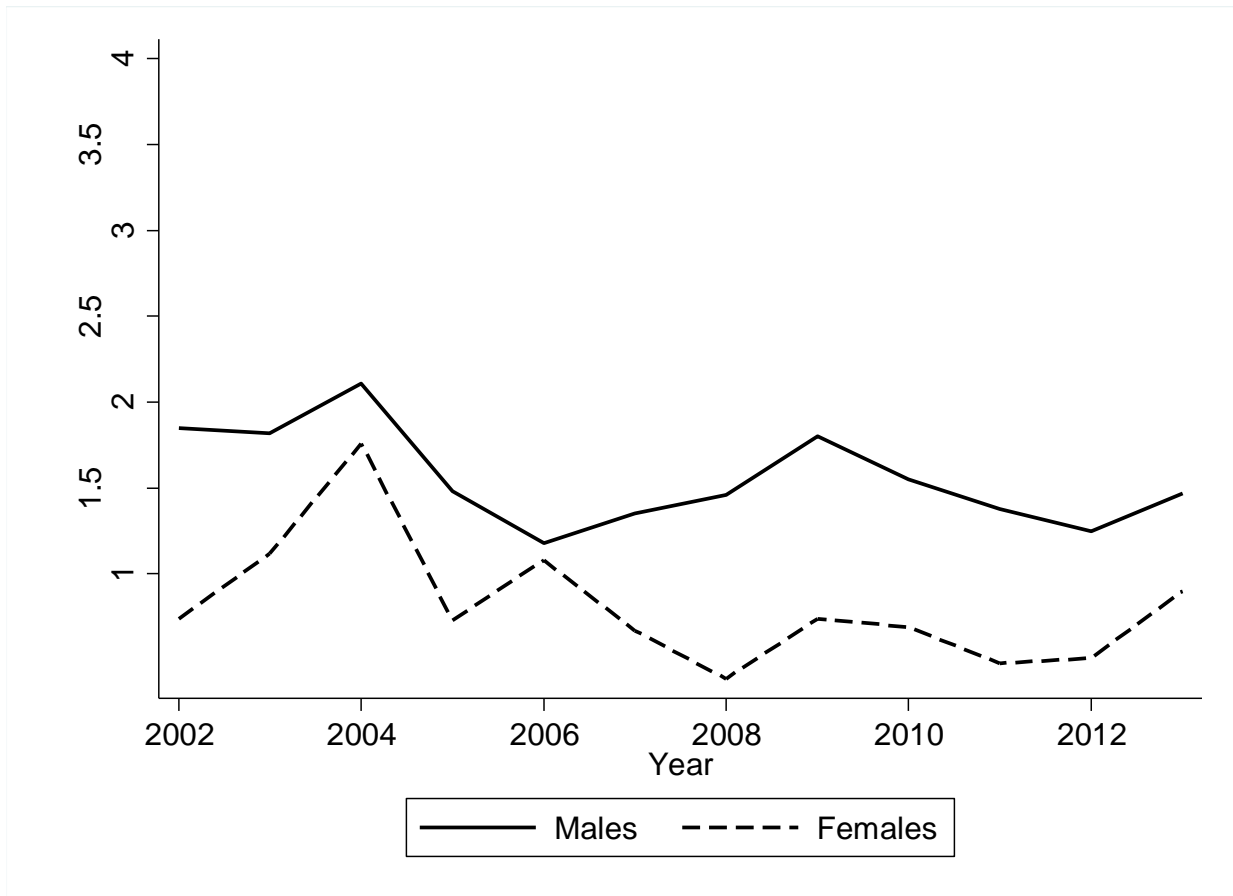
Note: Entries are odds-ratios, with standard errors in parenthesis.

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	2,929	60.16	38.17
Speed Limit	314	60.83	37.58
Stop Light/Sign	136	56.62	38.24
Driving Impaired	170	74.71	21.76
Safe Movement	374	64.17	35.29
Vehicle Equipment	613	61.99	36.22
Vehicle Regulatory	392	56.89	40.56
Seat Belt	101	58.42	39.60
Investigation	607	55.68	43.33
Other Vehicle	205	59.02	40.98

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

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	83,803	-	72.70	25.20	-
Total Searches	3,973	4.74	4.26	6.09	1.43
Speed Limit	24,068	2.15	1.78	3.49	1.96
Stop Light/Sign	7,351	2.35	1.96	3.71	1.89
Driving Impaired	2,052	36.55	38.63	26.90	0.70
Safe Movement	9,950	4.24	3.94	5.02	1.27
Vehicle Equipment	14,077	4.76	4.39	5.69	1.30
Vehicle Regulatory	12,448	3.70	3.33	4.56	1.37
Seat Belt	4,527	2.89	2.07	5.21	2.52
Investigation	5,245	11.97	9.75	17.55	1.80
Other Vehicle	4,085	5.41	4.05	8.49	2.10

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

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	54,294	-	70.44	28.17	-
Total Searches	885	1.63	1.72	1.45	0.84
Speed Limit	19,481	0.45	0.42	0.60	1.43
Stop Light/Sign	4,984	1.00	0.98	1.08	1.10
Driving Impaired	757	20.21	23.30	8.75	0.38
Safe Movement	5,590	1.59	1.82	1.15	0.63
Vehicle Equipment	8,323	1.74	2.04	1.25	0.61
Vehicle Regulatory	8,926	1.28	1.26	1.32	1.05
Seat Belt	1,640	1.28	1.41	0.97	0.69
Investigation	2,475	7.39	7.53	7.29	0.97
Other Vehicle	2,118	1.98	1.82	2.27	1.25

Table A4. Type of Search by Race: Men

Search Type	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	83,803	-	72.70	25.20	-
Total Searches	3,973	4.74	4.26	6.09	1.43
Consent	1,847	2.20	2.00	2.86	1.43
Search Warrant	5	-	-	-	-
Probable Cause	421	0.50	0.36	0.95	2.64
Incident to Arrest	1,532	1.83	1.74	1.97	1.13
Protective Frisk	168	0.20	0.16	0.29	1.81

Table A5. Type of Search by Race: Women

Search Type	Number	% Total	% White	% Black	Ratio Black:White
Total Stops	54,294	-	70.44	28.17	-
Total Searches	885	1.63	1.72	1.45	0.84
Consent	452	0.83	0.91	0.67	0.74
Search Warrant	1	-	-	-	-
Probable Cause	99	0.18	0.15	0.27	1.80
Incident to Arrest	325	0.60	0.64	0.50	0.78
Protective Frisk	8	0.01	0.02	0.01	0.50

Figure A6. Stops by Day of the Week

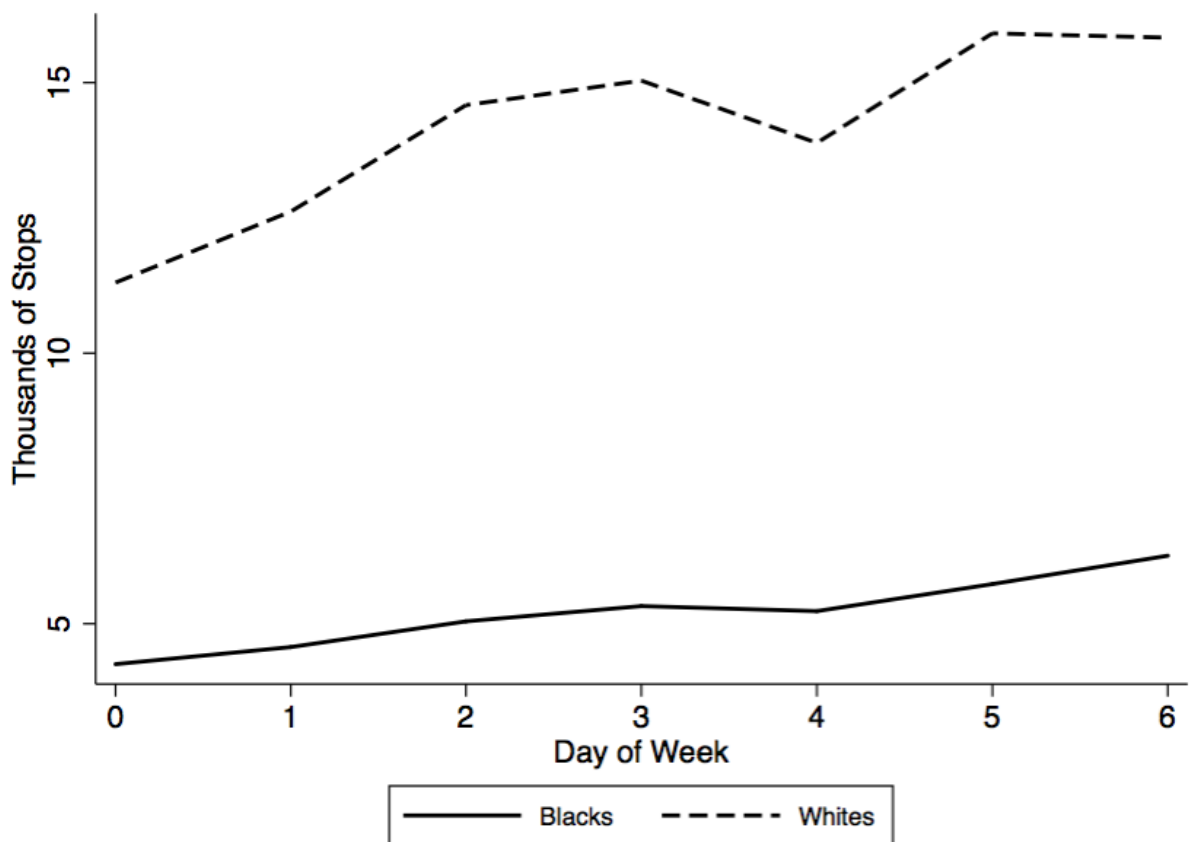


Figure A7. Searches by Day of the Week

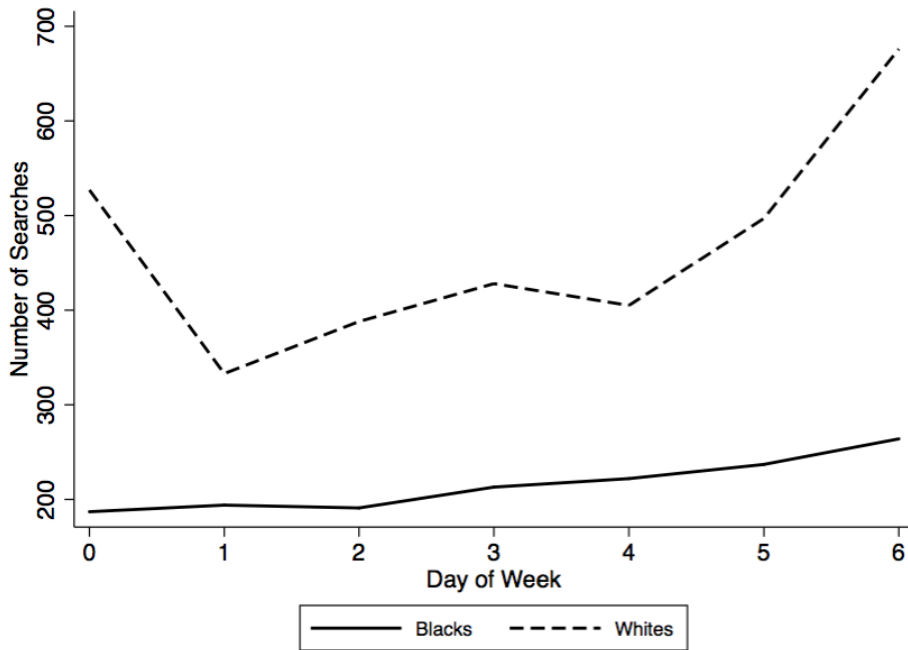
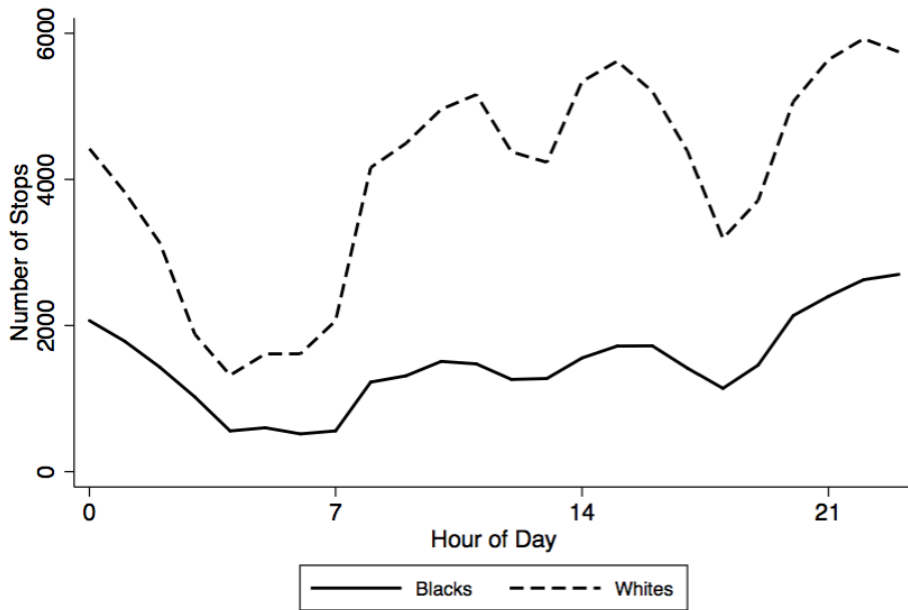
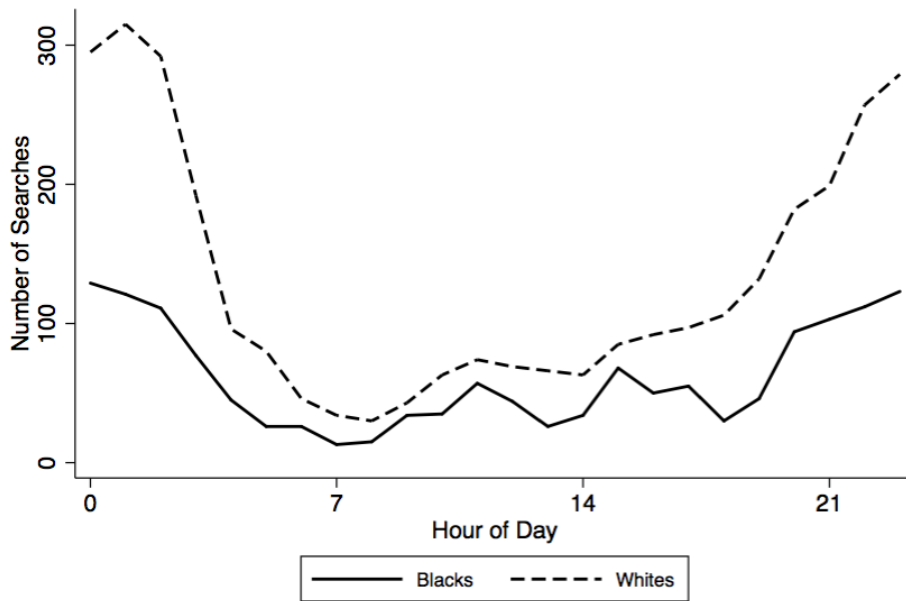


Figure A8. Stops by Hour of the Day



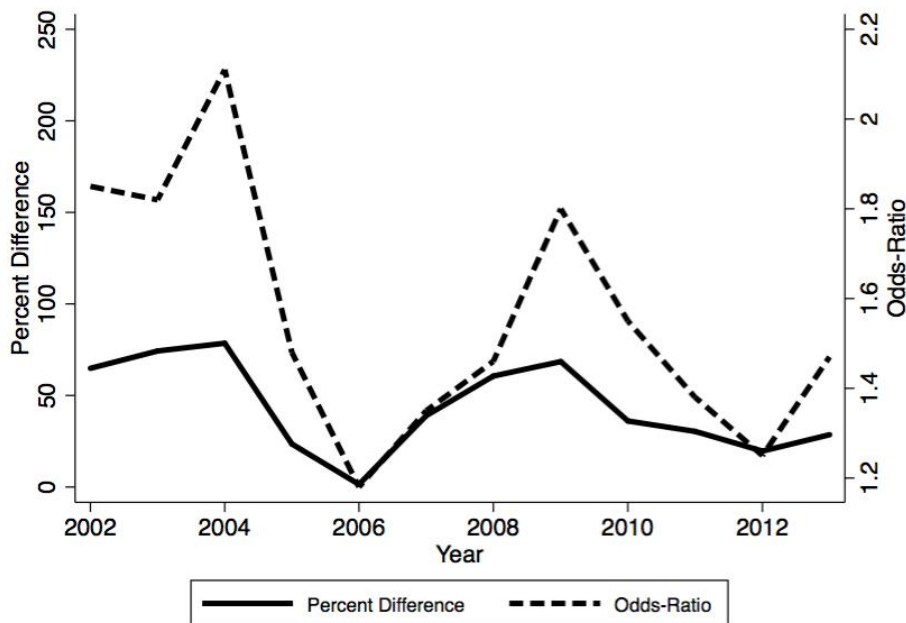
The figure excludes cases where the hour and minute was exactly 0:00. These cases were presumed to be missing data.

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



Correlation: 0.889

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

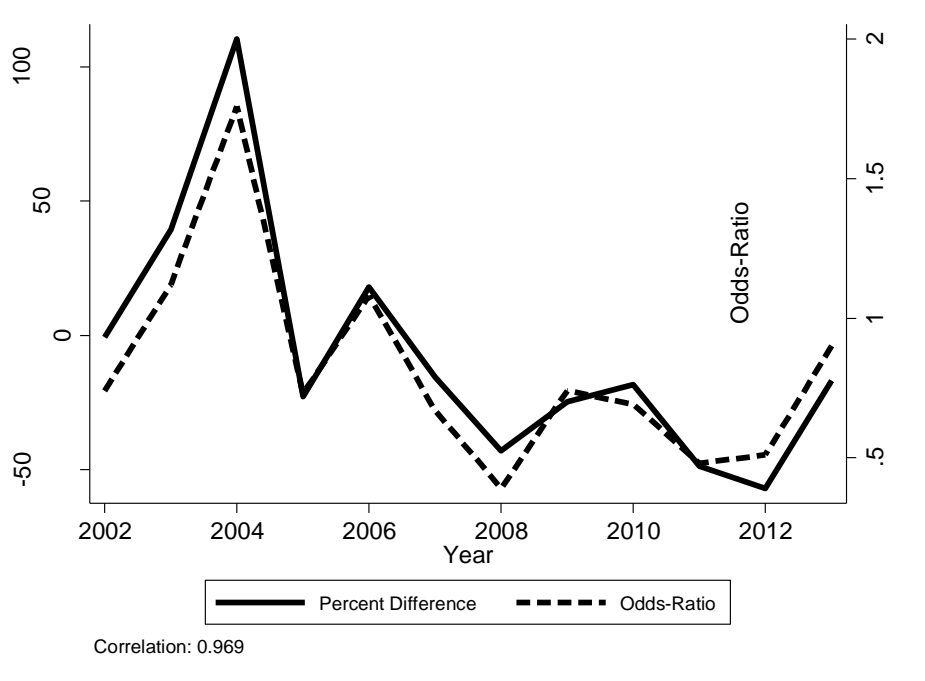


Figure A12. Racial Differences in the Likelihood of Search: Consent Searches Only

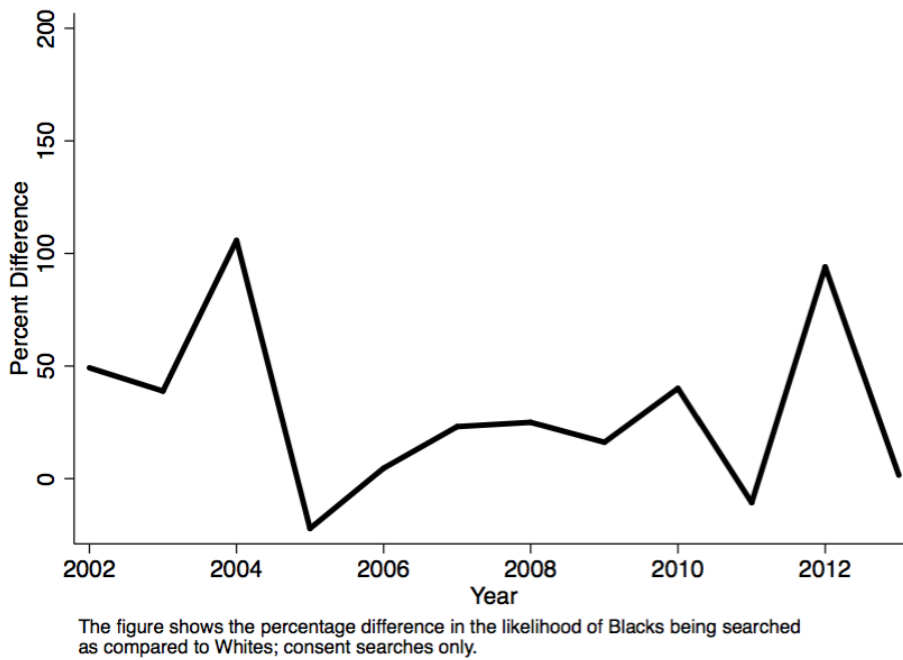


Table A6. Likelihood of Finding Contraband Given a Search, by Race

Contraband	Number	% Total	% White	% Black
Yes	1,148	23.63	22.43	26.59
No	3,710	76.37	77.57	73.41
Total	4,858	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	95,914	2.68	42.41	1.91	52.00	1.00	100.0
Black	No	34,906	3.18	48.38	1.60	45.82	1.01	100.0
Total	No	133,239	2.80	43.95	1.82	50.43	1.01	100.0
White	Yes	3,254	1.44	14.66	0.46	31.68	51.75	100.0
Black	Yes	1,508	0.99	15.85	0.46	36.87	45.82	100.0
Total	Yes	4,858	1.30	14.99	0.45	33.12	50.14	100.0