

# **Analysis of Black-White Differences in Traffic Stops and Searches in Matthews, NC, 2002-2013**

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Table 1. Overview of the Data-done

Data Subsets	Observations
Total stops	87,862
-2014	769
-Passengers	1,214
-Checkpoint stops	259
Total number of cases deleted	2,224
Stops for analysis	85,638
Searches	3,098
Percent of stops leading to search (search rate)	3.62%

Figure 1. Number of Traffic Stops per Year

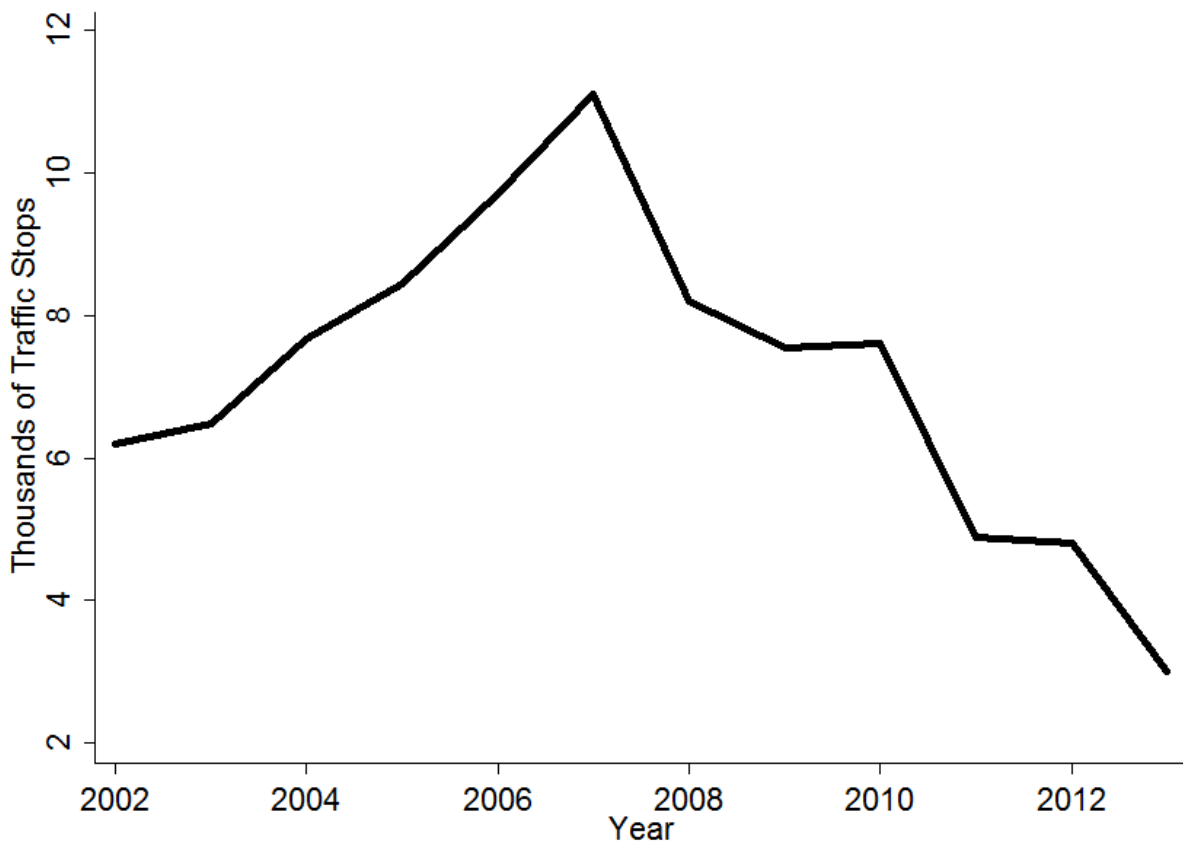


Figure 2. Racial Composition of Traffic Stops by Year

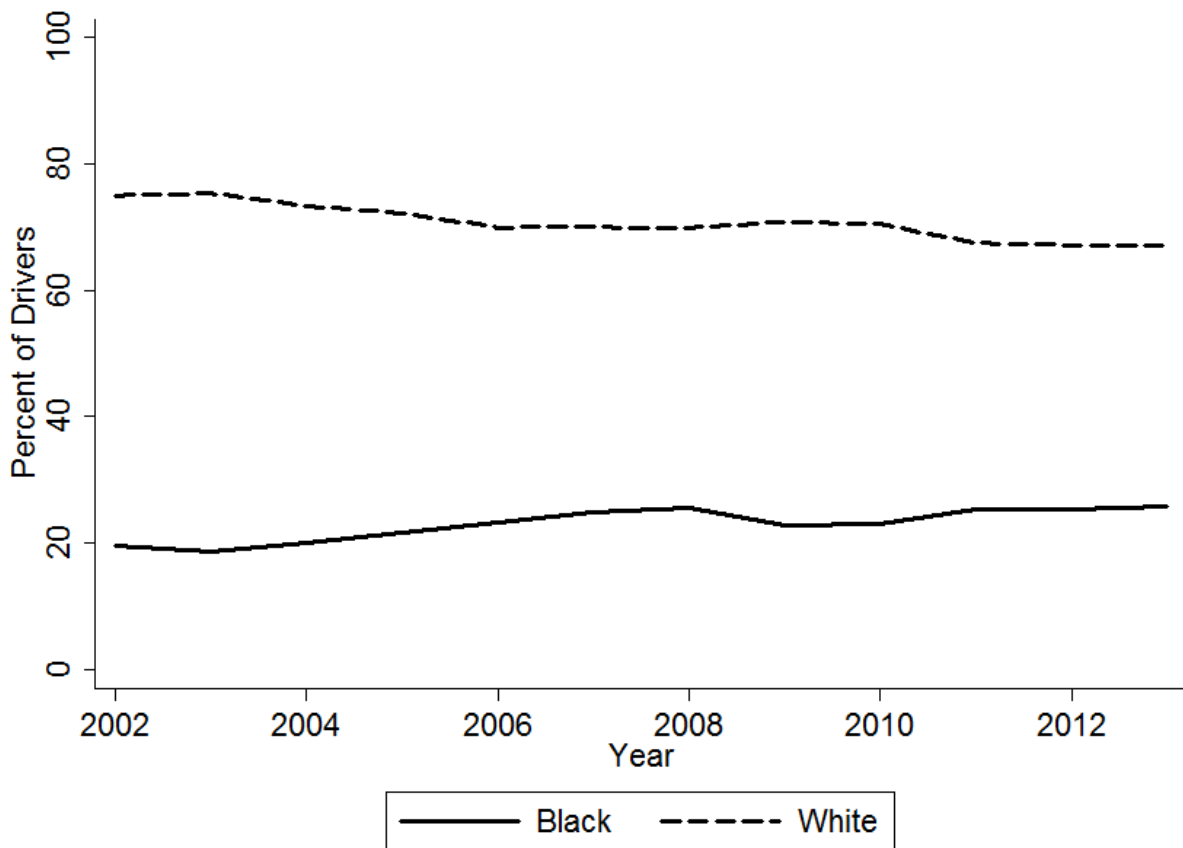


Table 2. Racial Composition of Traffic Stops by Purpose, Drivers

Purpose	Number	Percent	
		White	Black
Total Stops	85,638	71.00	22.91
Speed Limit	35,205	69.05	24.77
Stop Light/Sign	6,891	77.01	16.44
Driving Impaired	734	81.74	12.67
Safe Movement	4,784	73.24	20.46
Vehicle Equipment	5,996	65.96	27.22
Vehicle Regulatory	23,055	73.04	22.06
Seat Belt	2,864	77.27	16.41
Investigation	3,295	66.34	24.19
Other Vehicle	2,814	67.27	25.34

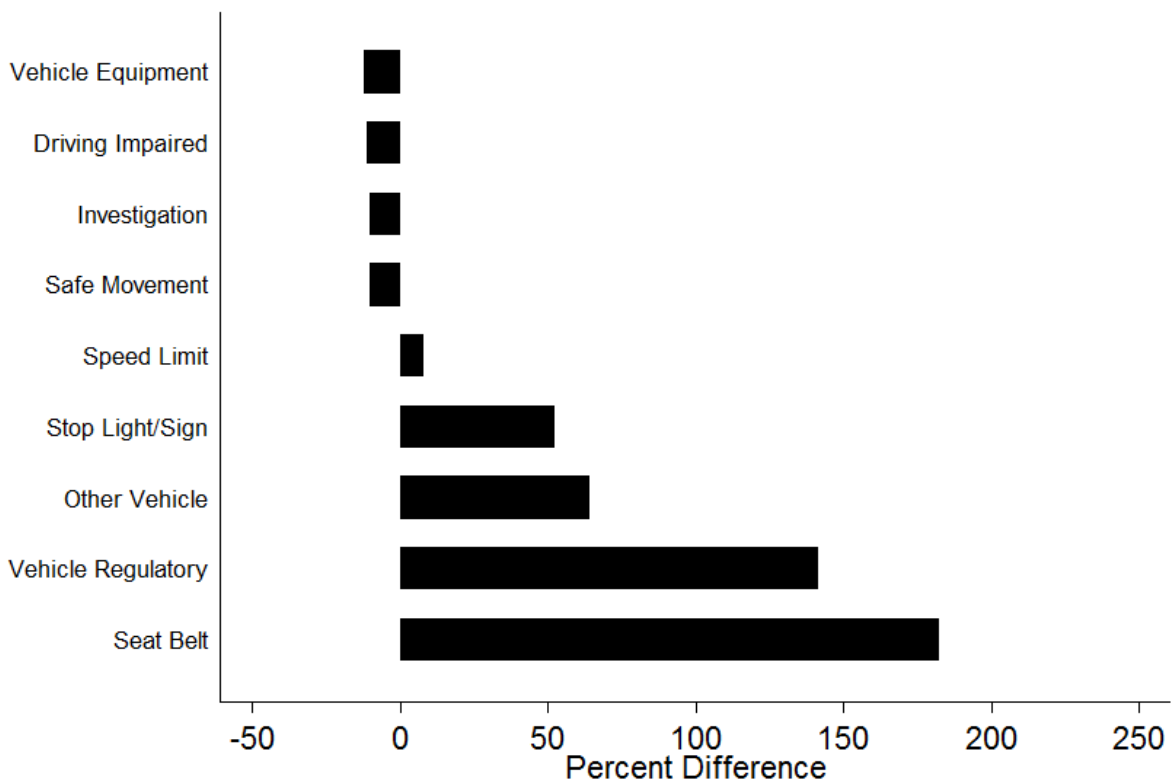
Note: Includes only drivers. Excludes 259 checkpoint stops. Excludes 1,214 passengers.

Table 3. Percent Searched by Race and Purpose of Stop-done

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	85,638	-	71.00	22.91	-
Total Searches	3,098	3.62	3.53	4.10	1.16
Speed Limit	35,205	2.51	2.49	2.69	1.08
Stop Light/Sign	6,891	1.65	1.51	2.29	1.52
Driving Impaired	734	65.26	66.50	59.14	0.89
Safe Movement	4,784	4.62	4.77	4.29	0.90
Vehicle Equipment	5,996	3.99	4.25	3.74	0.88
Vehicle Regulatory	23,055	1.70	1.29	3.13	2.43
Seat Belt	2,864	3.46	2.71	7.66	2.83
Investigation	3,295	12.66	13.72	12.30	0.90
Other Vehicle	2,814	9.03	7.87	12.90	1.64

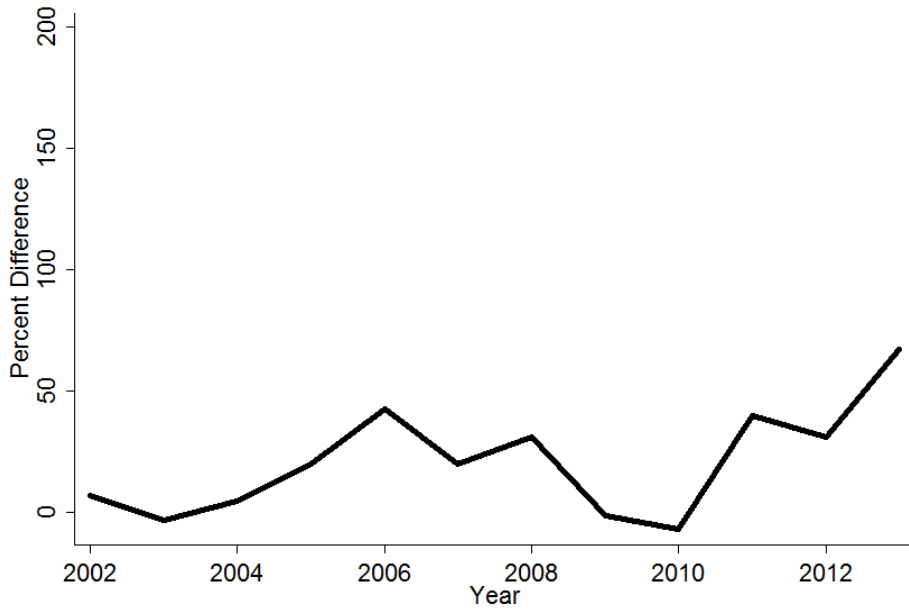
Note: See the appendix for this same table broken down for Men and Women.

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



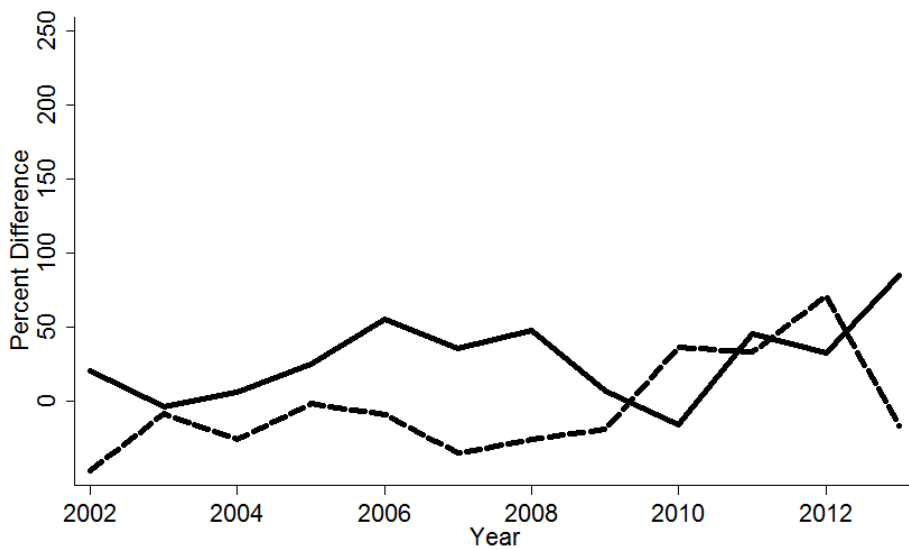
The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites by purpose of stop.

Figure 4. Racial Differences in the Likelihood of Search



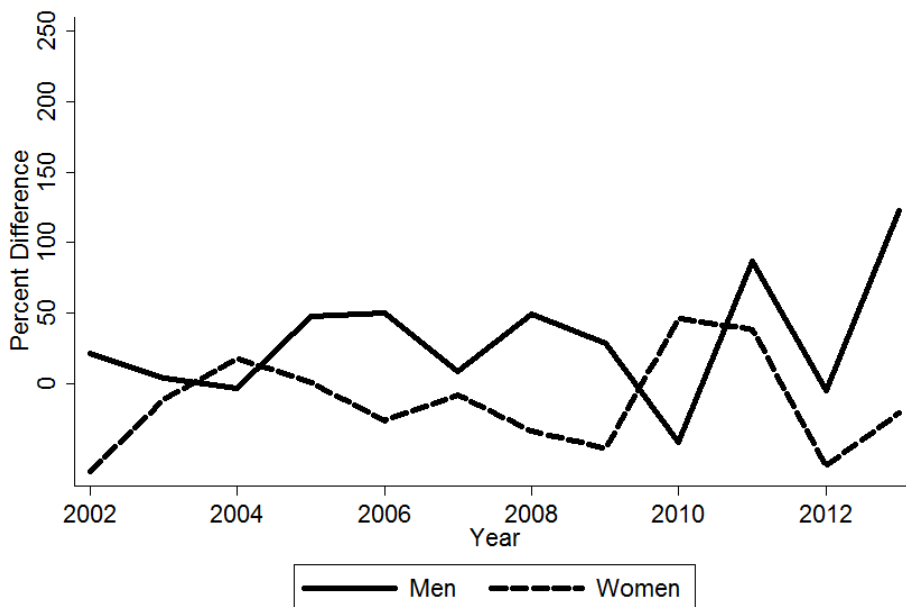
The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites.

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



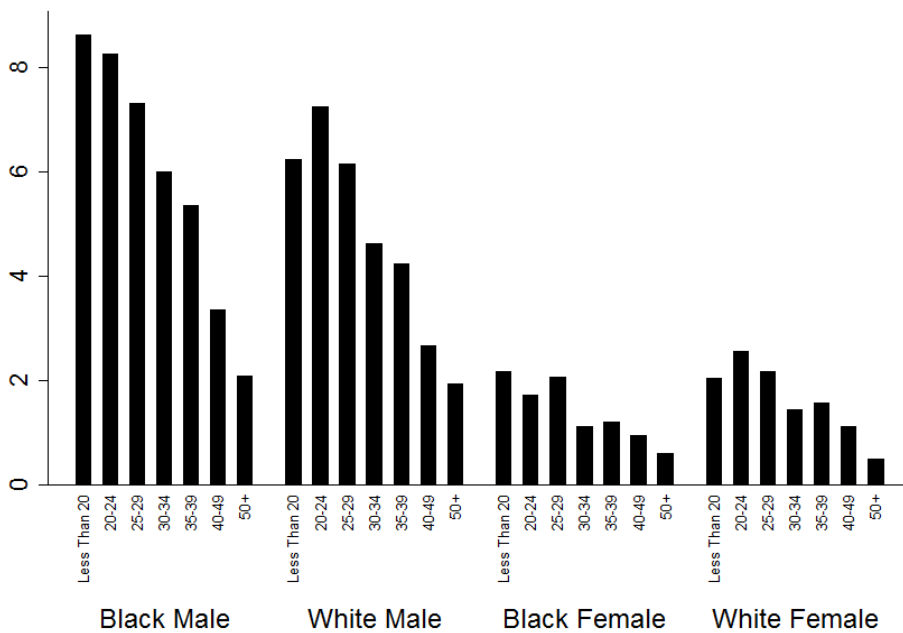
The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites by gender.

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 85,638 traffic stops from 2002 through 2013, and 3,098 searches. Overall rate of search: 3.62 percent.

Black men under the age of 30 are searched at rates of about 8 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

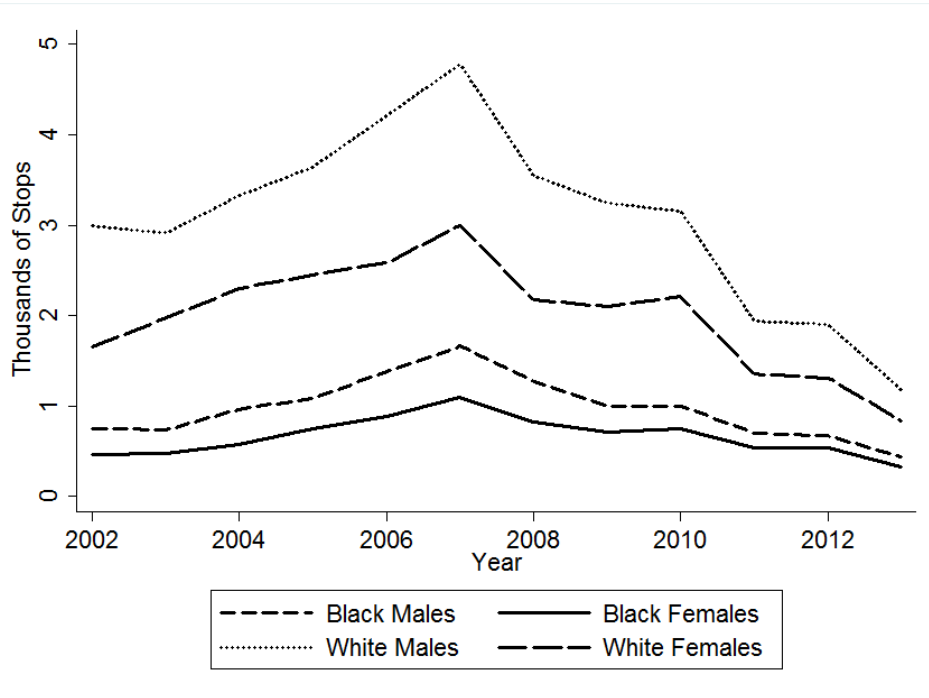


Figure 9. Percent of Stops Resulting in a Search, by Race and Gender

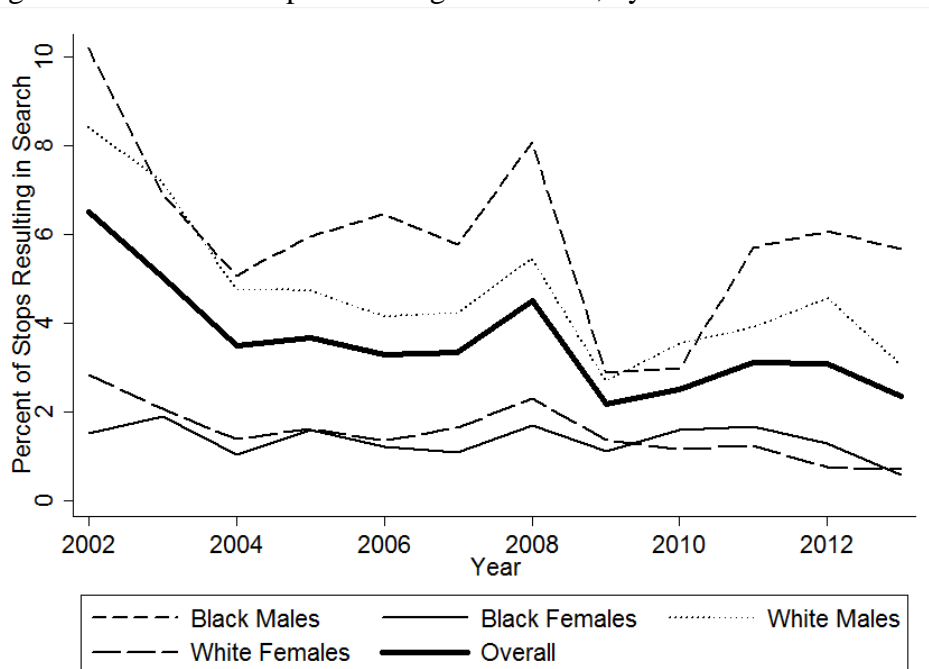


Table 4. Type of Search by Race

Search Type	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	85,638	-	71.00	22.91	-
Total Searches	3,098	3.62	3.53	4.10	1.16
Consent	835	0.98	0.89	1.37	1.54
Search Warrant	6	0.01	0.01	0.01	1.00
Probable Cause	524	0.61	0.58	0.78	1.34
Incident to Arrest	1,662	1.94	1.98	1.81	0.91
Protective Frisk	71	0.08	0.07	0.13	1.86

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	659	55.94	55.94	0.77	0.77
2 – 10	306	25.98	81.92	1.23	2.00
11 - 100	114	9.68	91.60	4.76	6.76
101 – 1,000	69	5.86	97.45	25.38	32.14
1,001 +	30	2.55	100.00	67.86	100.00
Total	1,178	100	-	100	-



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

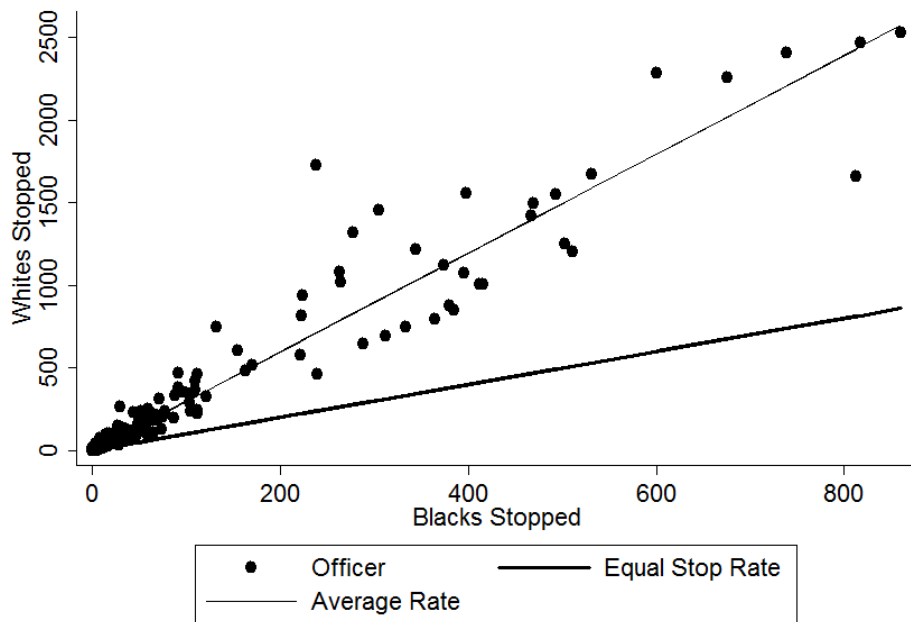


Figure 11. Number of Black and White Motorists Searched, by Officer

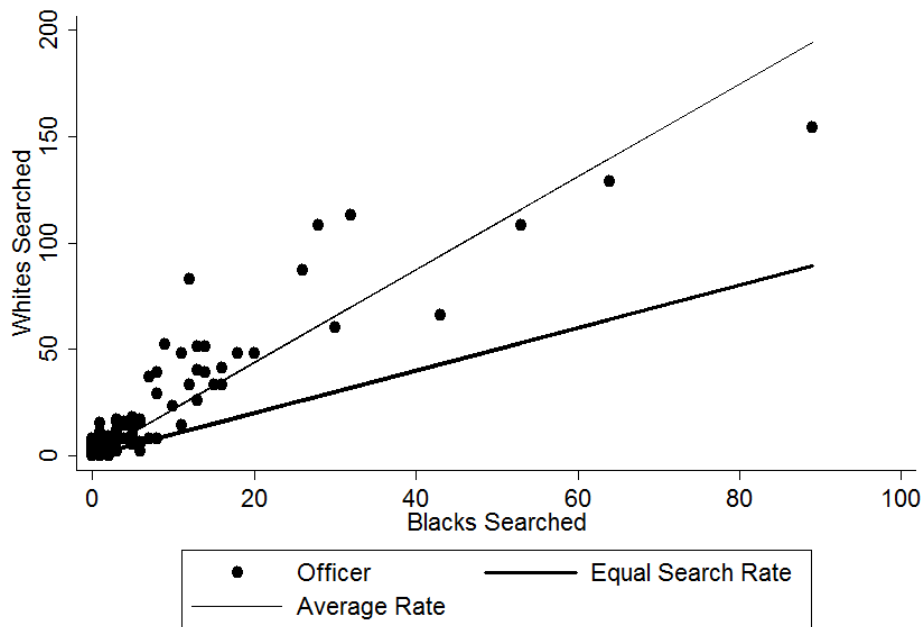
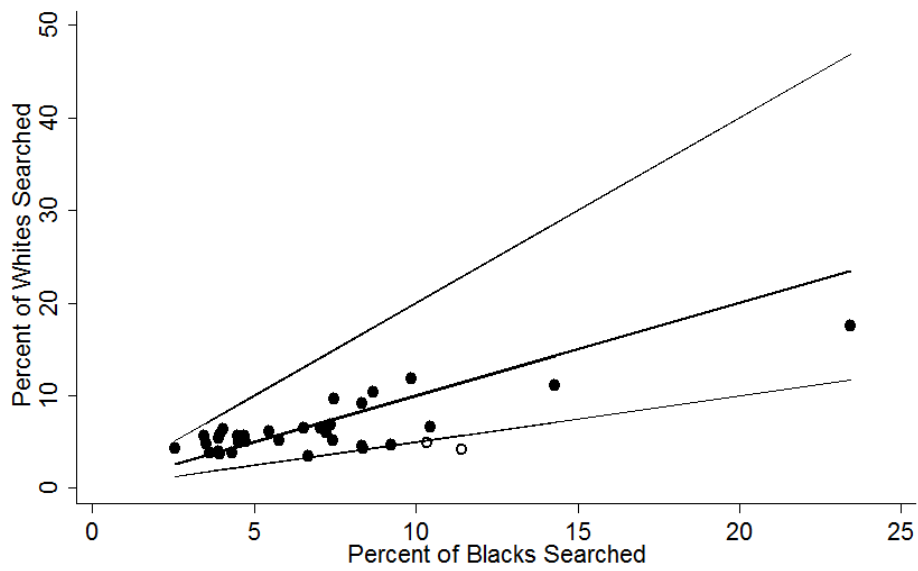


Figure 12. Percent of White and Black Drivers Searched, by Officer



Includes 36 officers with a minimum of 50 White stops, 50 Black stops, and a search rate above the department average of 3.62. The hollow circles indicate high disparity officers. 0 officers search Whites at more than twice the rate that they search Blacks. 2 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
<b>Demographics</b>					
Race	1.34*(0.06)	1.32*(0.06)	1.41*(0.07)	1.41*(0.07)	1.26*(0.06)
Hispanic	1.70*(0.11)	1.53*(0.10)	1.22*(0.09)	1.21*(0.09)	1.23*(0.09)
Age	-	0.96*(0.00)	0.96*(0.00)	0.96*(0.00)	0.97*(0.00)
<b>Stop Purpose</b>					
Speed Limit	-	-	-	-	-
Stop Light	-	-	0.78*(0.09)	0.78*(0.09)	0.93(0.10)
Impaired	-	-	64.82*(6.76)	63.60*(6.65)	44.64*(4.83)
Movement	-	-	1.92*(0.17)	1.92*(0.17)	2.22*(0.20)
Equipment	-	-	1.47*(0.12)	1.46*(0.12)	1.29*(0.11)
Regulatory	-	-	0.75*(0.05)	0.75*(0.05)	0.97(0.07)
Seat Belt	-	-	1.43*(0.17)	1.43*(0.17)	2.14*(0.26)
Investigation	-	-	4.91*(0.35)	4.87*(0.35)	4.18*(0.31)
Other	-	-	3.38*(0.28)	3.37*(0.28)	3.69*(0.32)
<b>Officer Type</b>					
Black Disparity <sup>†</sup>	-	-	-	1.34(0.31)	1.16(0.28)
White Disparity <sup>†</sup>	-	-	-	Omitted	Omitted
<b>Time</b>					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
<b>Constant</b>	0.05*(0.00)	0.15*(0.01)	0.10*(0.01)	0.10*(0.01)	0.15*(0.02)
<b>N</b>	48,538	48,538	48,538	48,358	48,051
<b>Pseudo R<sup>2</sup></b>	0.00	0.03	0.14	0.14	0.17

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
<b>Demographics</b>					
Race	0.85(0.09)	0.83(0.09)	0.89(0.10)	0.89(0.10)	0.76*(0.09)
Hispanic	0.74(0.20)	0.69(0.19)	0.55*(0.16)	0.55*(0.16)	0.49*(0.15)
Age	-	0.97*(0.00)	0.96*(0.00)	0.97*(0.00)	0.98*(0.00)
<b>Stop Purpose</b>					
Speed Limit	-	-	-	-	-
Stop Light	-	-	0.36*(0.12)	0.36*(0.12)	0.53(0.18)
Impaired	-	-	149.51*(27.25)	147.42*(26.97)	85.14*(16.59)
Movement	-	-	2.28*(0.44)	2.29*(0.45)	3.05*(0.61)
Equipment	-	-	1.44(0.30)	1.42(0.30)	1.13(0.24)
Regulatory	-	-	0.89(0.13)	0.89(0.13)	1.41*(0.21)
Seat Belt	-	-	0.94(0.33)	0.94(0.33)	1.95(0.69)
Investigation	-	-	8.10*(1.26)	7.96*(1.24)	5.63*(0.90)
Other	-	-	3.69*(0.77)	3.66*(0.76)	4.23*(0.91)
<b>Officer Type</b>					
Black Disparity <sup>†</sup>	-	-	-	1.13(0.67)	0.84(0.50)
White Disparity <sup>†</sup>	-	-	-	Omitted	Omitted
<b>Time</b>					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
<b>Constant</b>	0.02*(0.00)	0.05*(0.01)	0.03*(0.01)	0.04*(0.01)	0.04*(0.01)
<b>N</b>	31,891	31,891	31,891	31,891	31,593
<b>Pseudo R<sup>2</sup></b>	0.00	0.02	0.18	0.18	0.24

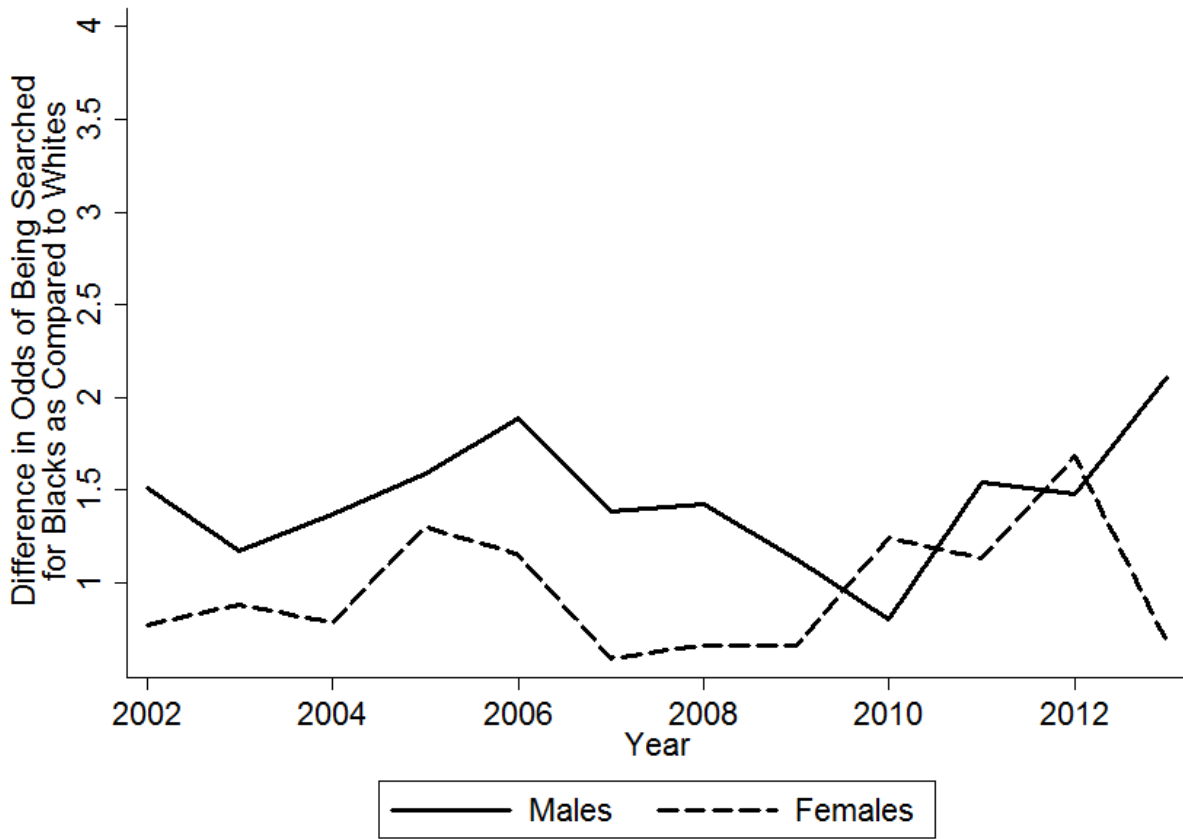
Note: Entries are odds-ratios, with standard errors in parenthesis.

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	1,214	65.82	31.55
Speed Limit	318	60.38	36.48
Stop Light/Sign	50	72.00	22.00
Driving Impaired	88	80.68	11.36
Safe Movement	83	77.11	20.48
Vehicle Equipment	133	69.92	27.07
Vehicle Regulatory	134	61.94	38.06
Seat Belt	53	52.83	41.51
Investigation	226	67.26	31.42
Other Vehicle	119	60.50	39.50

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

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	52,174	-	70.63	22.40	-
Total Searches	2,594	4.97	4.79	5.95	1.24
Speed Limit	21,196	3.51	3.38	4.13	1.22
Stop Light/Sign	4,065	2.56	2.33	3.70	1.59
Driving Impaired	554	68.05	68.50	62.69	0.92
Safe Movement	3,029	6.11	6.26	5.92	0.95
Vehicle Equipment	3,997	5.25	5.47	5.45	1.00
Vehicle Regulatory	13,065	2.38	1.80	4.50	2.50
Seat Belt	1,931	4.66	3.62	10.33	2.85
Investigation	2,373	14.75	16.10	14.26	0.89
Other Vehicle	1,964	11.35	9.90	16.47	1.66

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

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	33,464	-	71.59	23.71	-
Total Searches	504	1.51	1.60	1.37	0.86
Speed Limit	14,009	0.99	1.15	0.67	0.58
Stop Light/Sign	2,826	0.35	0.32	0.41	1.28
Driving Impaired	180	56.67	60.27	50.00	0.83
Safe Movement	1,755	2.05	2.13	1.80	0.85
Vehicle Equipment	1,999	1.45	1.87	0.53	0.28
Vehicle Regulatory	9,990	0.82	0.64	1.44	2.25
Seat Belt	933	0.96	0.94	1.42	1.51
Investigation	922	7.27	7.73	7.63	0.99
Other Vehicle	850	3.65	3.61	3.55	0.98

Table A4. Type of Search by Race: Men

Search Type	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	52,174	-	70.63	22.40	-
Total Searches	2,594	4.97	4.79	5.95	1.24
Consent	731	1.40	1.27	2.06	1.62
Search Warrant	6	0.01	0.01	0.02	2.00
Probable Cause	441	0.85	0.80	1.10	1.38
Incident to Arrest	1,351	2.59	2.60	2.57	0.99
Protective Frisk	65	0.12	0.11	0.20	1.82

Table A5. Type of Search by Race: Women

Search Type	Number	% Total	% White	% Black	Ratio Black:White
Total Stops	33,464	-	71.59	23.71	-
Total Searches	504	1.51	1.60	1.37	0.86
Consent	104	0.31	0.32	0.34	1.06
Search Warrant	0	-	-	-	-
Probable Cause	83	0.25	0.24	0.30	1.25
Incident to Arrest	311	0.93	1.03	0.69	0.67
Protective Frisk	6	0.02	0.01	0.04	4.00

Figure A6. Stops by Day of the Week

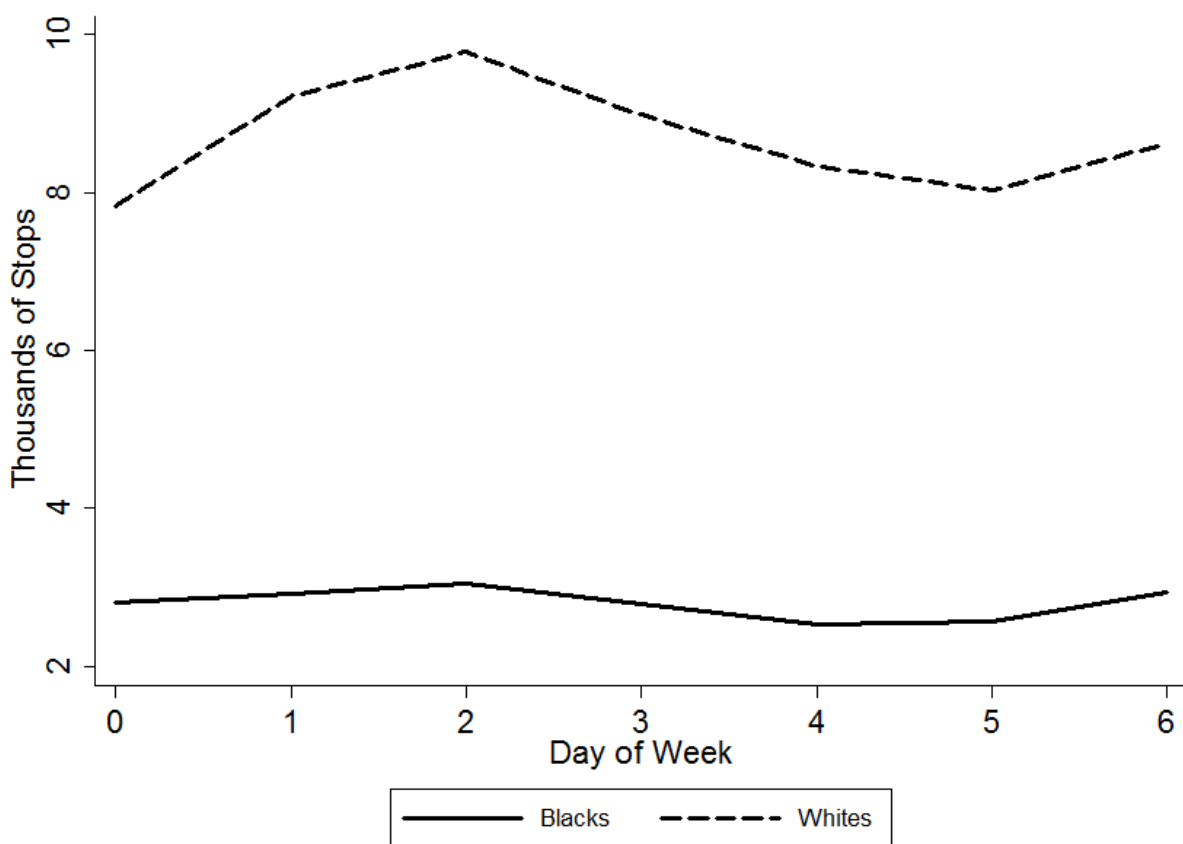




Figure A7. Searches by Day of the Week

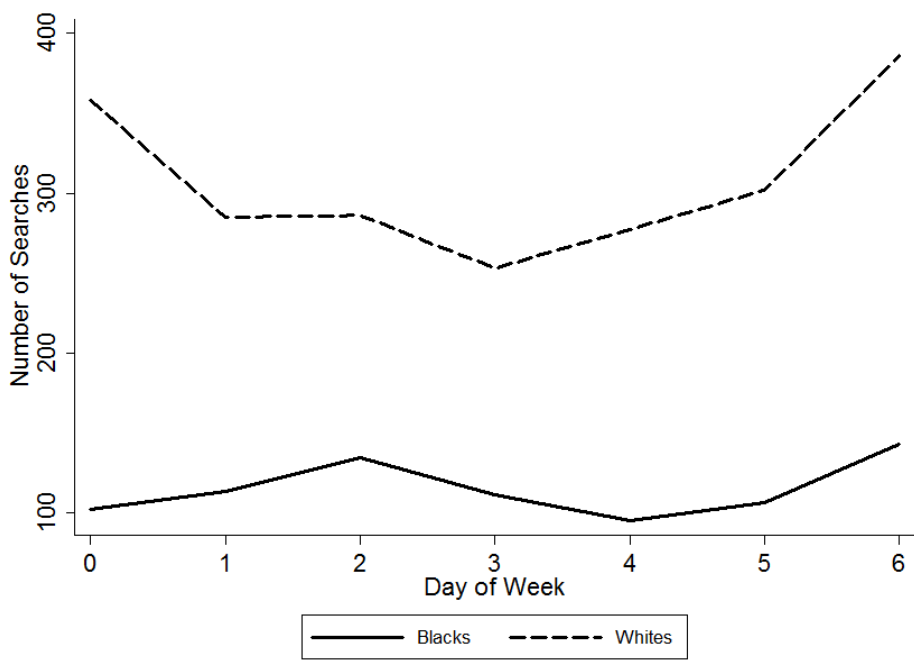
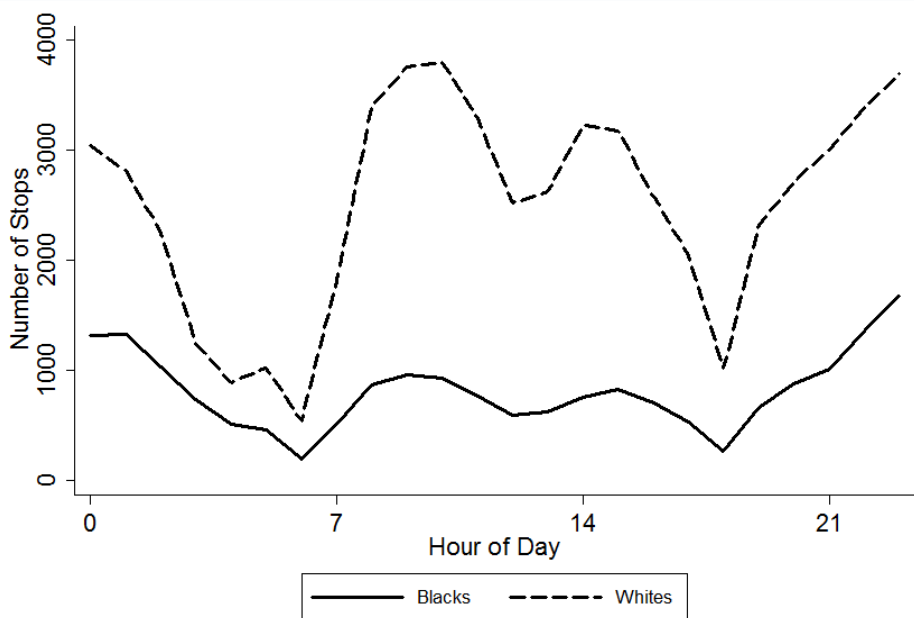
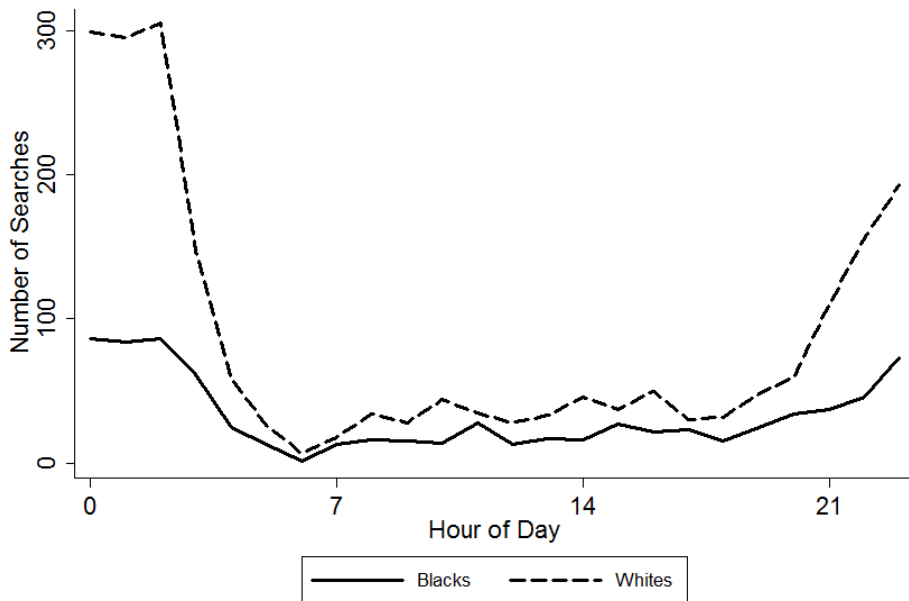


Figure A8. Stops by Hour of the Day



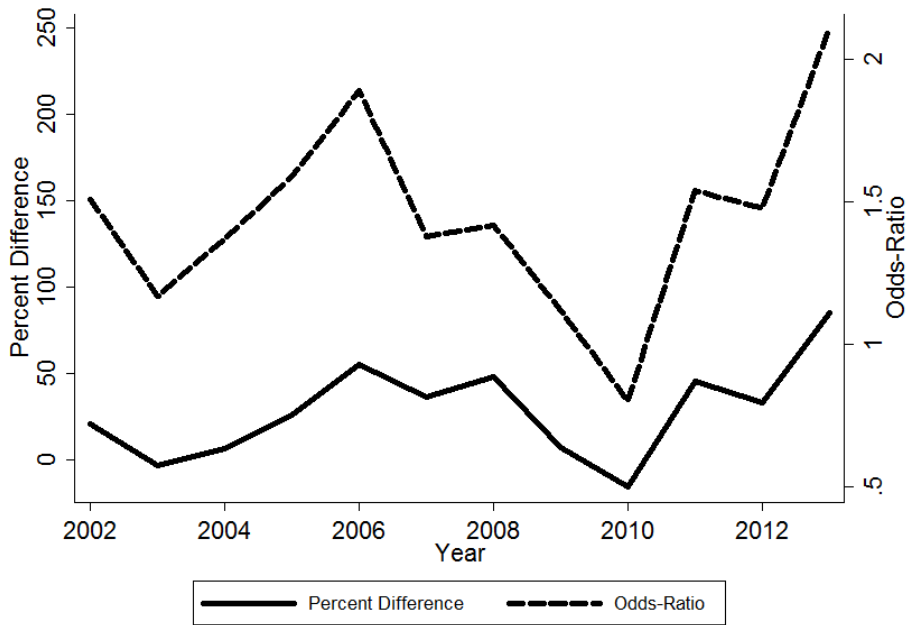
The figure excludes cases where the hour and minute was exactly 0:00. These cases were presumed to be missing data.

Figure A9. Searches by Hour of the Day



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: 0.906

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

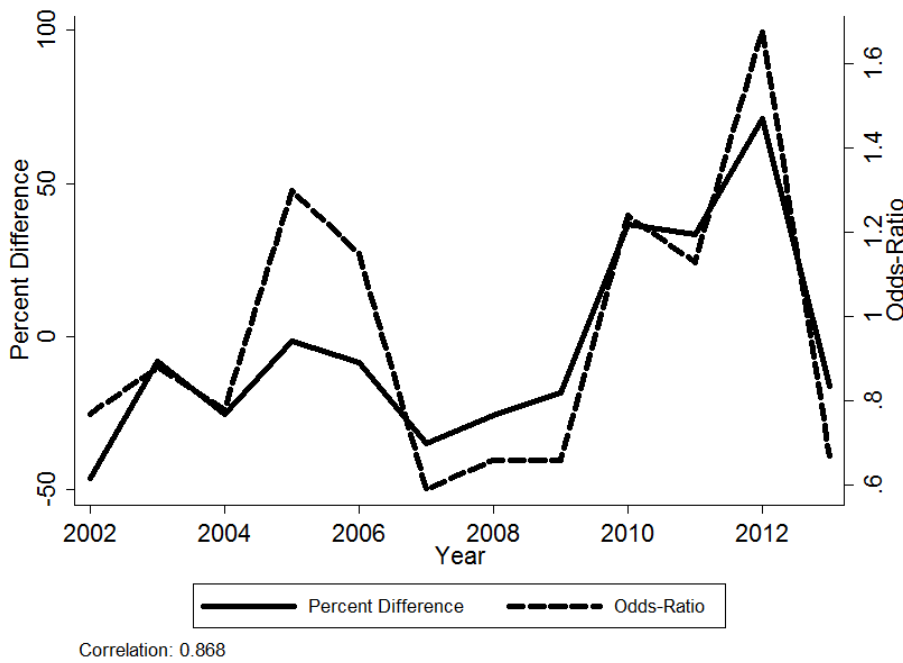


Figure A12. Racial Differences in the Likelihood of Search: Consent Searches Only

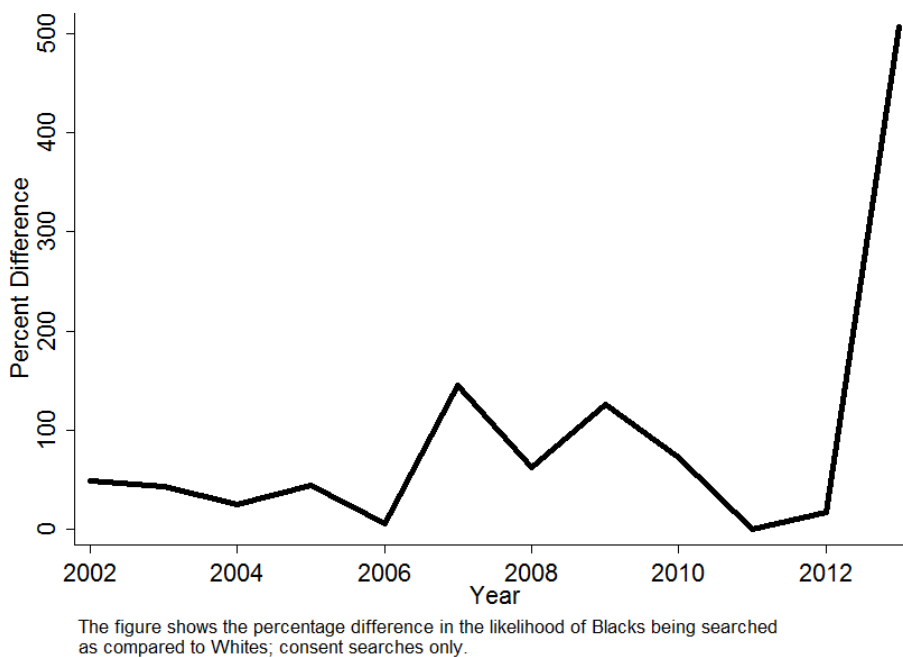


Table A6. Likelihood of Finding Contraband Given a Search, by Race

Contraband	Number	% Total	% White	% Black
Yes	757	24.44	25.01	24.75
No	2,341	75.56	74.99	75.25
Total	3,098	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	58,660	3.68	8.82	17.31	69.48	0.71	100.0
Black	No	18,818	3.53	8.23	16.12	71.40	0.72	100.0
Total	No	82,540	3.62	8.58	16.77	70.31	0.73	100.0
White	Yes	2,147	1.07	2.19	2.70	30.09	63.95	100.0
Black	Yes	804	1.49	1.24	3.36	39.18	54.73	100.0
Total	Yes	3,098	1.16	2.00	2.78	32.12	61.94	100.0