

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

March 24, 2015

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Table 1. Overview of the Data

Data Subsets	Observations
Total stops	86,280
-2014	5,034
-Passengers	1,142
-Checkpoint stops	429
Total number of cases deleted	6,463
Stops for analysis	79,817
Searches	2,085
Percent of stops leading to search (search rate)	2.61%

Figure 1. Number of Traffic Stops per Year

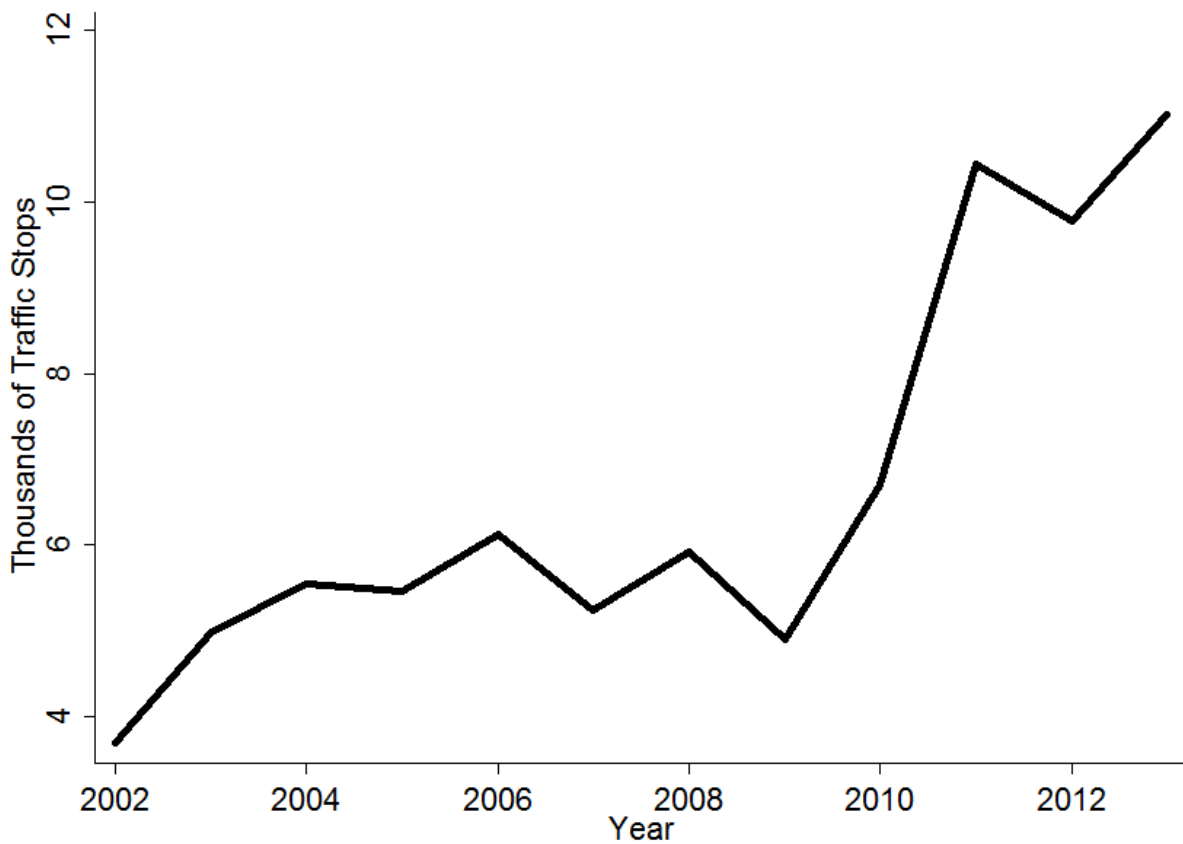


Figure 2. Racial Composition of Traffic Stops by Year

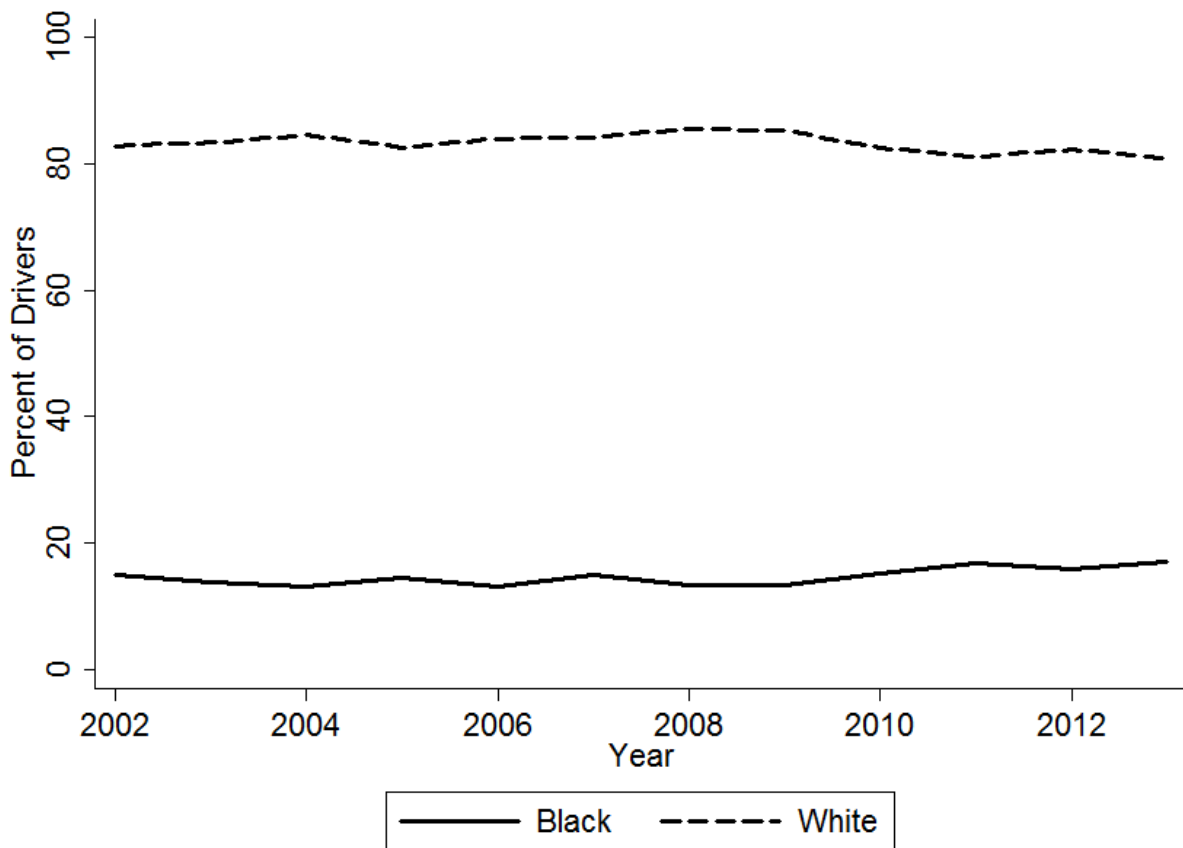


Table 2. Racial Composition of Traffic Stops by Purpose, Drivers

Purpose	Number	Percent	
		White	Black
Total Stops	79,817	82.96	15.02
Speed Limit	22,920	86.20	11.72
Stop Light/Sign	7,184	85.58	11.80
Driving Impaired	758	86.28	10.82
Safe Movement	5,281	85.06	12.42
Vehicle Equipment	9,562	78.15	19.76
Vehicle Regulatory	19,882	82.30	16.27
Seat Belt	4,757	81.14	16.27
Investigation	4,587	77.13	20.67
Other Vehicle	4,886	80.54	17.77

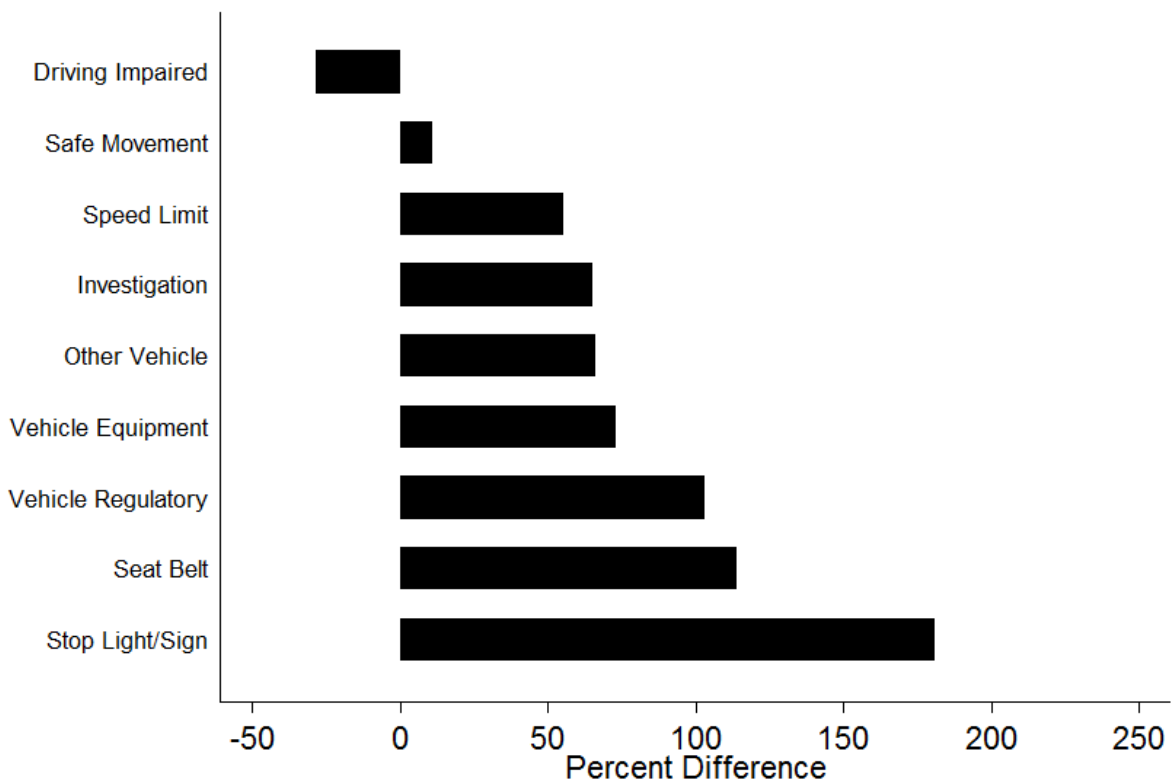
Note: Includes only drivers. Excludes 429 checkpoint stops. Excludes 1,142 passengers.

Table 3. Percent Searched by Race and Purpose of Stop

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	79,817	-	66,219	11,986	-
Total Searches	2,085	2.61	2.36	4.02	1.70
Speed Limit	22,920	1.33	1.25	1.94	1.55
Stop Light/Sign	7,184	1.57	1.30	3.66	2.82
Driving Impaired	758	31.27	32.42	23.17	0.72
Safe Movement	5,281	4.28	4.25	4.73	1.11
Vehicle Equipment	9,562	2.77	2.45	4.24	1.73
Vehicle Regulatory	19,882	1.79	1.52	3.09	2.03
Seat Belt	4,757	2.17	1.81	3.88	2.14
Investigation	4,587	6.87	6.08	10.02	1.65
Other Vehicle	4,886	3.40	3.05	5.07	1.66

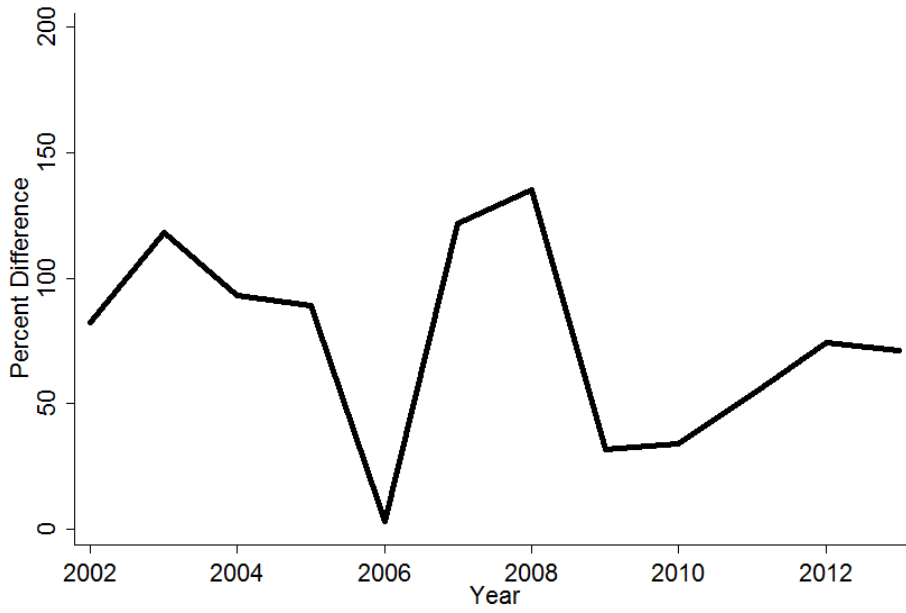
Note: See the appendix for this same table broken down for Men and Women.

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



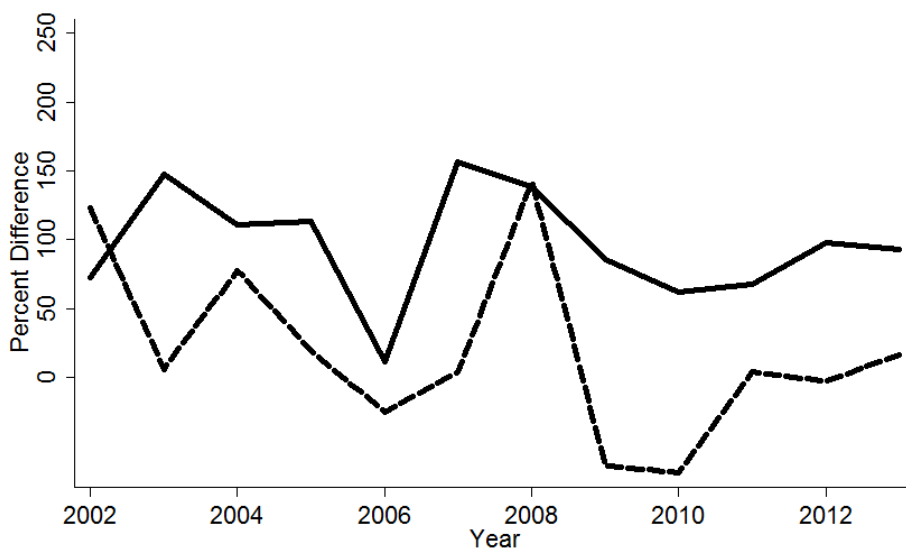
The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites by purpose of stop.

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.

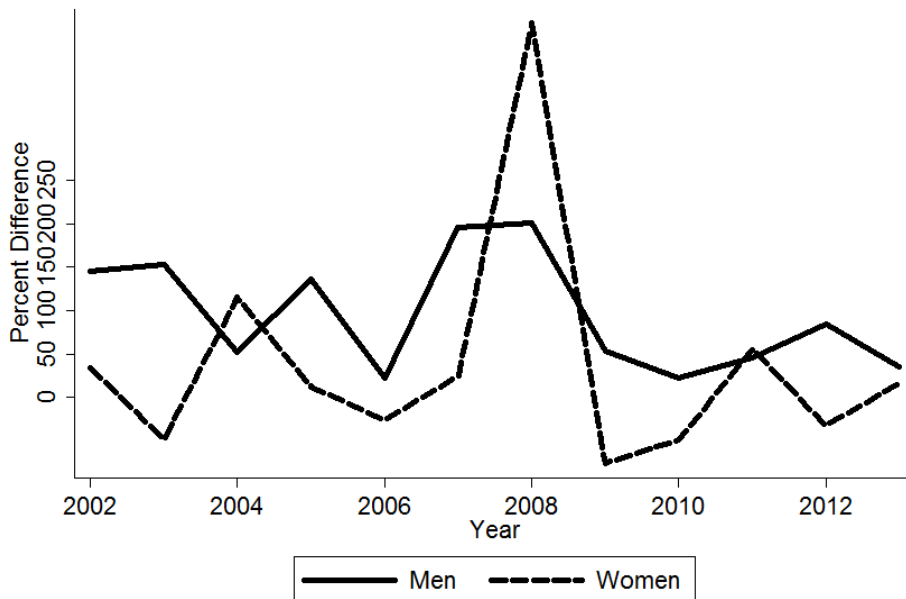
Figure 5. Racial Differences in the Likelihood of Search by Gender



— Men - - - - Women

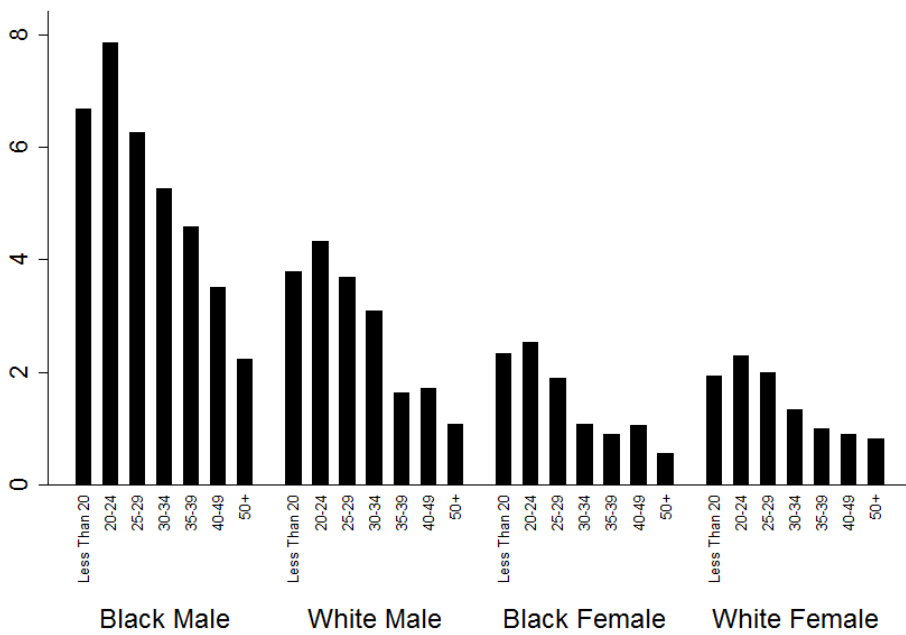
The figure shows the percentage difference in the likelihood of Blacks being searched as compared to Whites by gender.

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 79,817 traffic stops from 2002 through 2013, and 2,085 searches. Overall rate of search: 2.61 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 4 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

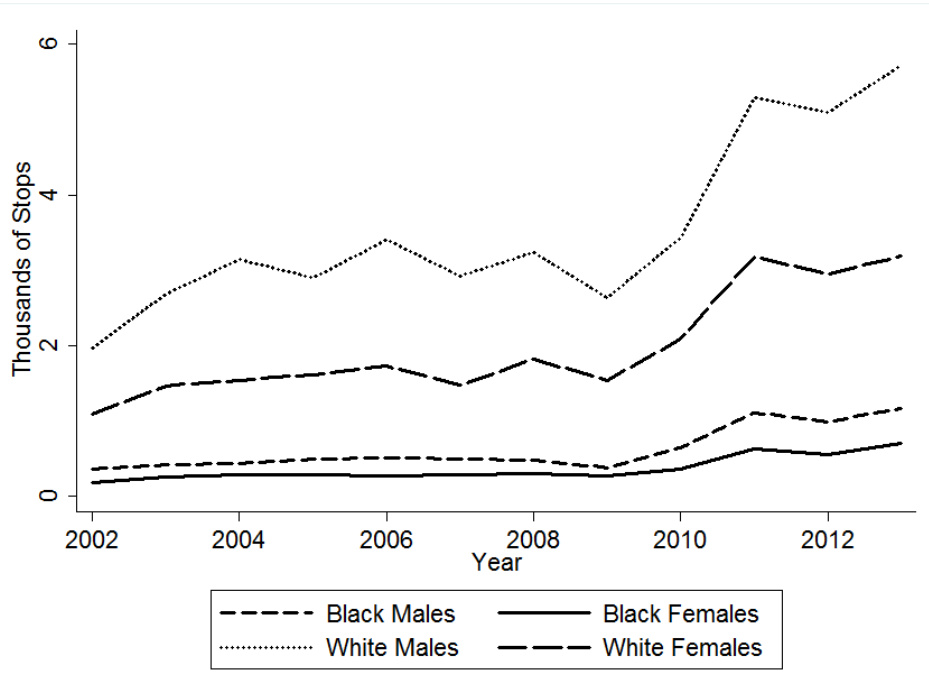


Figure 9. Percent of Stops Resulting in a Search, by Race and Gender

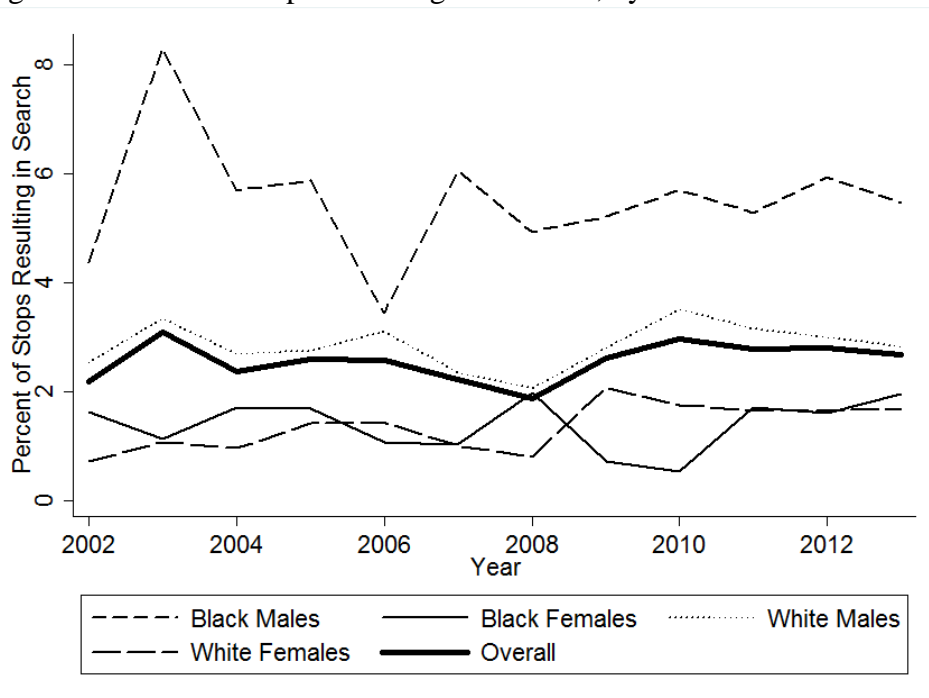


Table 4. Type of Search by Race

Search Type	Number	% Total	% White	% Black	Ratio Black:White
Total Stops	79,817	-	66,219	11,986	-
Total Searches	2,085	2.61	2.36	4.02	1.70
Consent	783	0.98	0.88	1.54	1.75
Search Warrant	9	0.01	0.01	0.00	-
Probable Cause	453	0.57	0.47	1.14	2.43
Incident to Arrest	796	1.00	0.95	1.25	1.32
Protective Frisk	44	0.06	0.05	0.08	1.60

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	193	51.88	51.88	0.24	0.24
2 – 10	48	12.90	64.78	0.20	0.44
11 - 100	32	8.60	73.39	1.75	2.19
101 – 1,000	73	19.62	93.01	40.00	42.19
1,001 +	26	6.99	100.00	57.81	100.00
Total	372	100	-	100	-

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

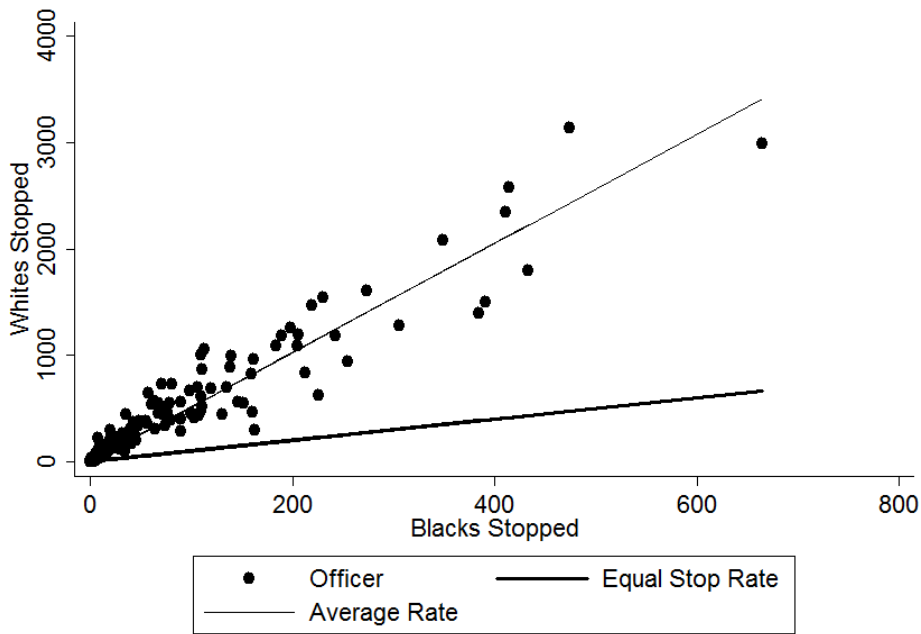


Figure 11. Number of Black and White Motorists Searched, by Officer

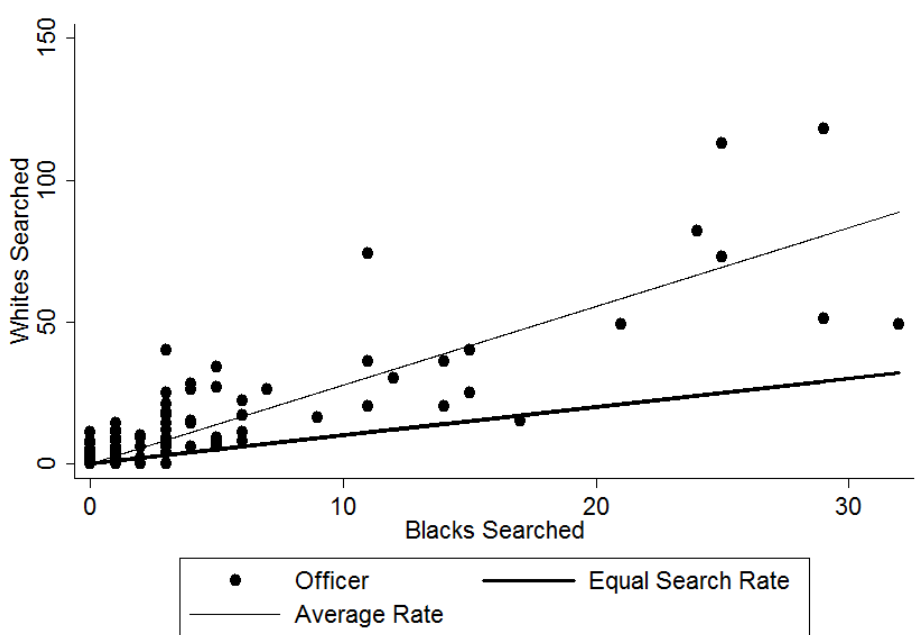
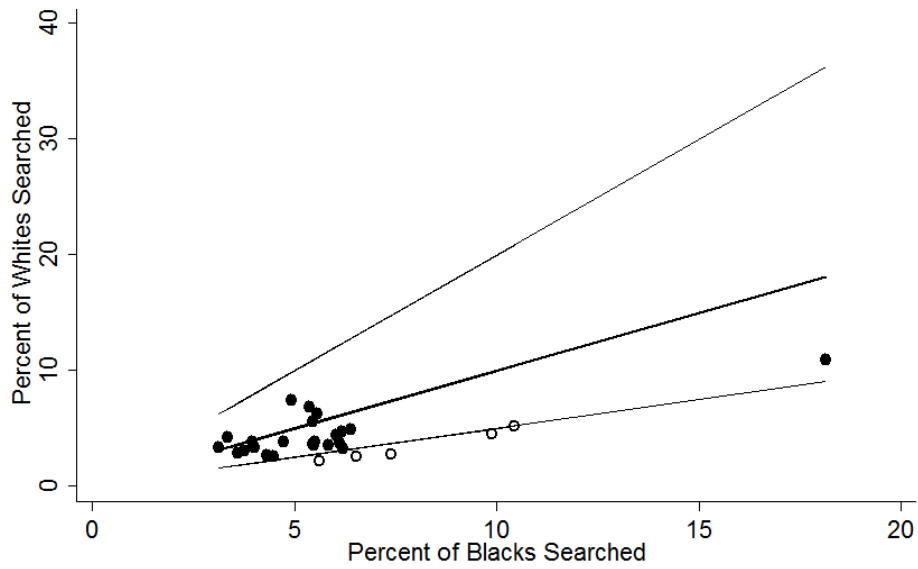


Figure 12. Percent of White and Black Drivers Searched, by Officer



Includes 28 officers with a minimum of 50 White stops, 50 Black stops, and a search rate above the department average of 2.61. The hollow circles indicate high disparity officers. 0 officers search Whites at more than twice the rate that they search Blacks. 5 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	2.01*(0.12)	1.99*(0.12)	1.92*(0.12)	1.88*(0.12)	1.74*(0.12)
Hispanic	1.24*(0.11)	1.20*(0.10)	0.92(0.08)	0.93(0.08)	1.02(0.10)
Age	-	0.96*(0.00)	0.96*(0.00)	0.97*(0.00)	0.97*(0.00)
Stop Purpose					
Speed Limit	-	-	-	-	-
Stop Light	-	-	1.16(0.14)	1.17(0.15)	1.23(0.17)
Impaired	-	-	29.18*(3.35)	28.22*(3.26)	23.15*(3.20)
Movement	-	-	2.99*(0.30)	3.05*(0.31)	2.91*(0.34)
Equipment	-	-	1.72*(0.17)	1.72*(0.16)	1.47*(0.16)
Regulatory	-	-	1.36*(0.12)	1.39*(0.12)	1.46*(0.15)
Seat Belt	-	-	1.23(0.16)	1.22(0.15)	1.38*(0.20)
Investigation	-	-	4.29*(0.41)	4.36*(0.42)	3.88*(0.42)
Other	-	-	2.20*(0.24)	2.23*(0.25)	2.33*(0.29)
Officer Type					
Black Disparity [†]	-	-	-	1.50*(0.13)	1.59*(0.15)
White Disparity [†]	-	-	-	Omitted	Omitted
Time					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
Constant	0.03*(0.00)	0.09*(0.01)	0.05*(0.00)	0.06*(0.01)	0.06*(0.01)
N	50,020	50,020	50,020	50,020	39,832
Pseudo R²	0.01	0.03	0.09	0.09	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.

* $p < 0.05$

† 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	1.02(0.14)	1.01(0.14)	0.97(0.13)	0.96(0.13)	0.99(0.15)
Hispanic	0.72(0.21)	0.69(0.20)	0.50*(0.15)	0.50*(0.15)	0.51*(0.17)
Age	-	0.97*(0.00)	0.97*(0.00)	0.97*(0.00)	0.98*(0.00)
Stop Purpose					
Speed Limit	-	-	-	-	-
Stop Light	-	-	1.22(0.31)	1.25(0.32)	1.23(0.34)
Impaired	-	-	55.43*(11.59)	51.29*(10.83)	30.42*(7.79)
Movement	-	-	4.16*(0.84)	4.24*(0.86)	3.78*(0.84)
Equipment	-	-	2.12*(0.42)	2.13*(0.42)	1.43(0.32)
Regulatory	-	-	1.42*(0.25)	1.46*(0.26)	1.60*(0.31)
Seat Belt	-	-	1.52(0.48)	1.54(0.49)	1.76(0.65)
Investigation	-	-	7.64*(1.38)	7.71*(1.40)	5.09*(1.06)
Other	-	-	2.84*(0.66)	2.89*(0.67)	2.87*(0.72)
Officer Type					
Black Disparity [†]	-	-	-	1.32(0.25)	1.41(0.30)
White Disparity [†]	-	-	-	Omitted	Omitted
Time					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
Constant	0.01*(0.00)	0.04*(0.01)	0.02*(0.00)	0.03*(0.01)	0.03*(0.01)
N	28,185	28,185	28,185	28,185	22,039
Pseudo R²	0.00	0.01	0.10	0.11	0.13

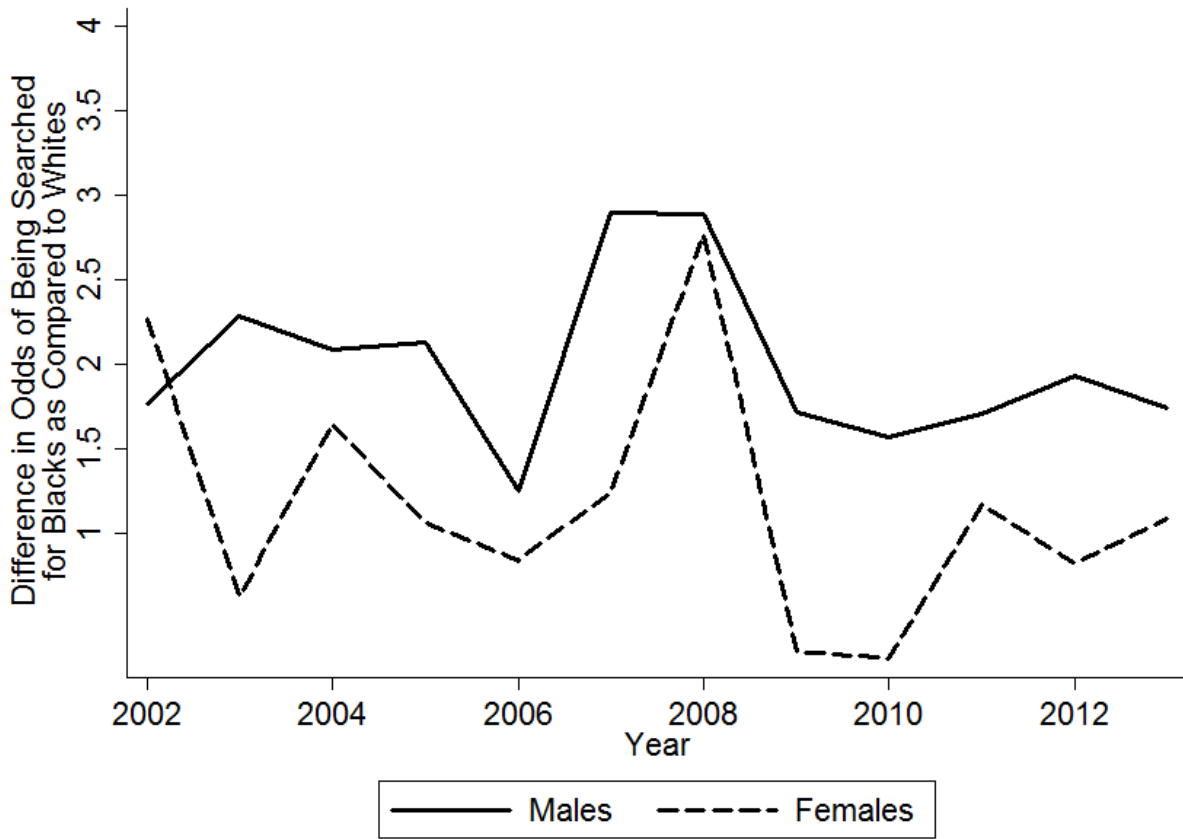
Note: Entries are odds-ratios, with standard errors in parenthesis.

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

* $p < 0.05$

† 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	1,142	66.11	32.92
Speed Limit	137	71.53	27.74
Stop Light/Sign	55	76.36	23.64
Driving Impaired	75	92.00	8.00
Safe Movement	126	73.02	25.40
Vehicle Equipment	165	56.36	43.64
Vehicle Regulatory	194	63.40	35.57
Seat Belt	78	56.41	38.46
Investigation	206	62.62	36.41
Other Vehicle	88	61.36	38.64

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

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	51,226	-	82.93	14.72	-
Total Searches	1,673	3.27	2.88	5.52	1.92
Speed Limit	14,007	1.75	1.60	2.87	1.79
Stop Light/Sign	4,592	2.00	1.62	5.19	3.20
Driving Impaired	552	33.33	33.76	30.65	0.91
Safe Movement	3,567	5.07	5.00	6.05	1.21
Vehicle Equipment	6,392	3.39	2.88	5.76	2.00
Vehicle Regulatory	11,962	2.37	1.97	4.36	2.21
Seat Belt	3,670	2.48	2.06	4.55	2.21
Investigation	3,147	7.69	6.62	12.31	1.86
Other Vehicle	3,337	4.14	3.58	6.61	1.85

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

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	28,591	-	83.03	15.55	-
Total Searches	412	1.44	1.44	1.48	1.03
Speed Limit	8,913	0.66	0.69	0.55	0.80
Stop Light/Sign	2,592	0.81	0.73	1.44	1.97
Driving Impaired	206	25.73	28.96	0.00	0.00
Safe Movement	1,714	2.63	2.72	1.90	0.70
Vehicle Equipment	3,170	1.51	1.58	1.37	0.87
Vehicle Regulatory	7,920	0.92	0.84	1.38	1.64
Seat Belt	1,087	1.10	1.01	1.66	1.64
Investigation	1,440	5.07	4.88	5.23	1.07
Other Vehicle	1,549	1.81	1.92	1.52	0.79

Table A4. Type of Search by Race: Men

Search Type	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	51,226	-	82.93	14.72	-
Total Searches	1,673	3.27	2.88	5.52	1.92
Consent	648	1.26	1.11	2.18	1.96
Search Warrant	8	0.02	0.01	0.00	0.00
Probable Cause	359	0.70	0.56	1.59	2.84
Incident to Arrest	618	1.21	1.13	1.63	1.44
Protective Frisk	40	0.08	0.07	0.12	1.71

Table A5. Type of Search by Race: Women

Search Type	Number	% Total	% White	% Black	Ratio Black:White
Total Stops	28,591	-	83.03	15.55	-
Total Searches	412	1.44	1.44	1.48	1.03
Consent	135	0.47	0.48	0.47	0.98
Search Warrant	1	0.00	0.00	0.00	n/a
Probable Cause	94	0.33	0.32	0.38	1.19
Incident to Arrest	178	0.62	0.63	0.61	0.97
Protective Frisk	4	0.01	0.01	0.02	2.00

Figure A6. Stops by Day of the Week

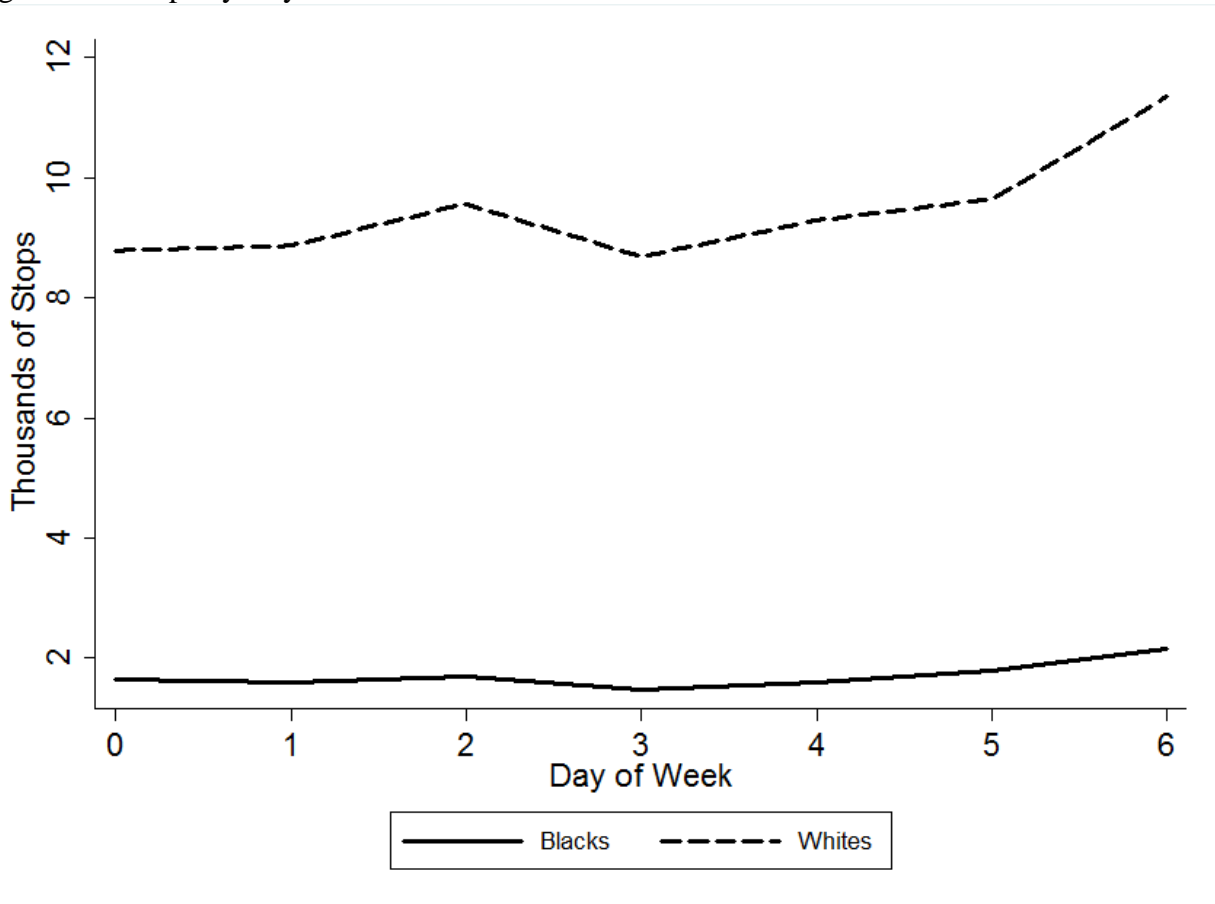


Figure A7. Searches by Day of the Week

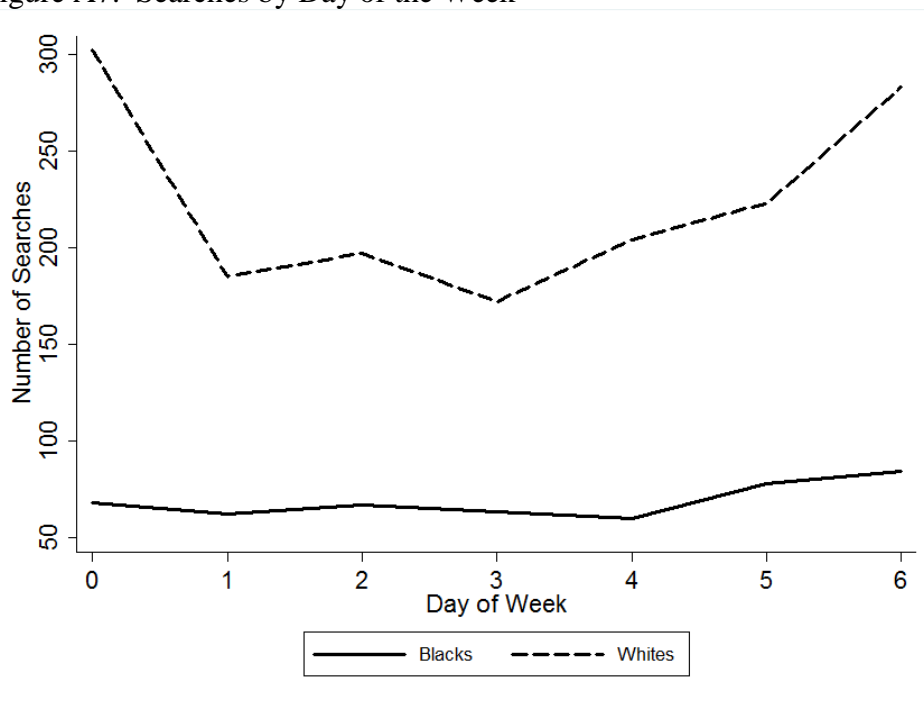
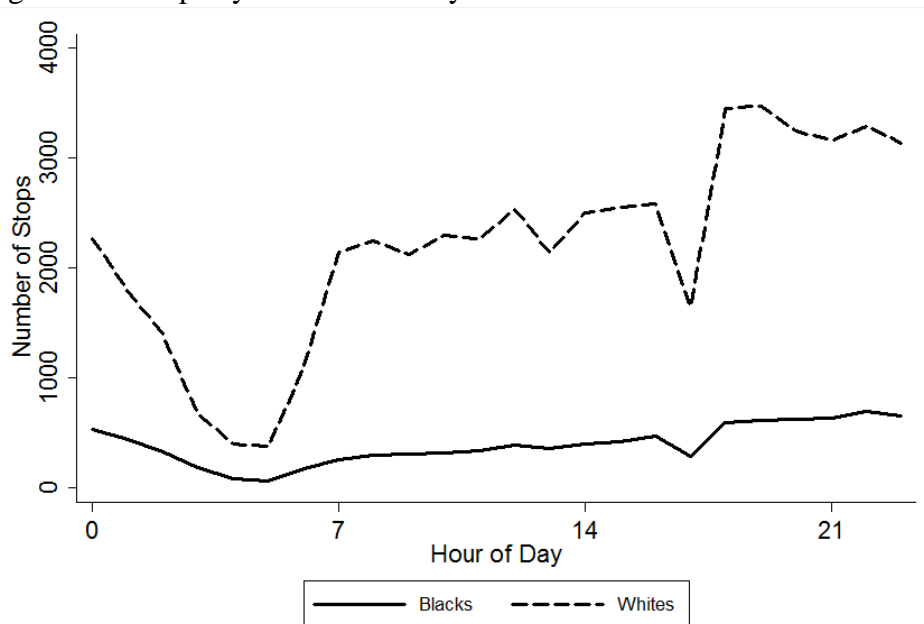
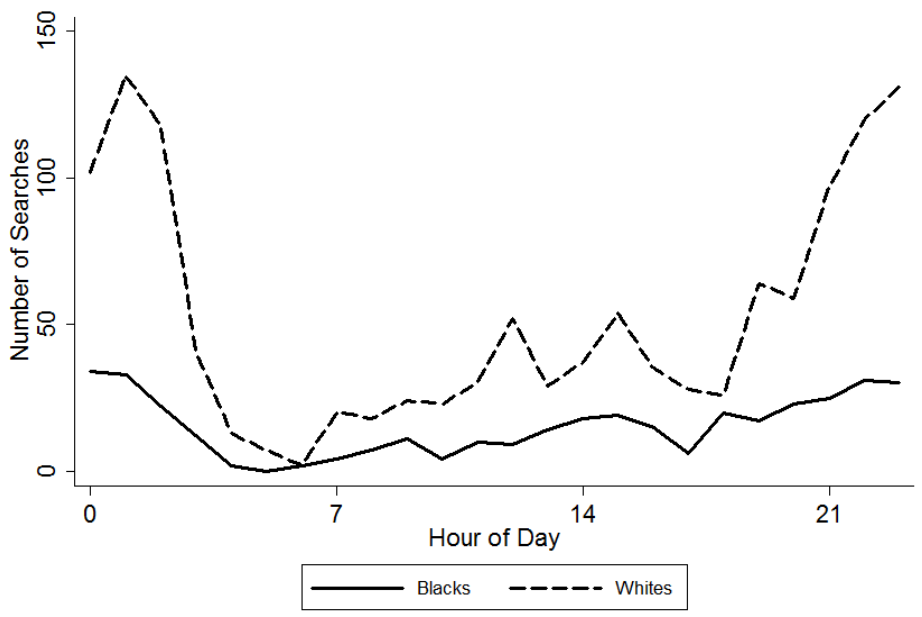


Figure A8. Stops by Hour of the Day



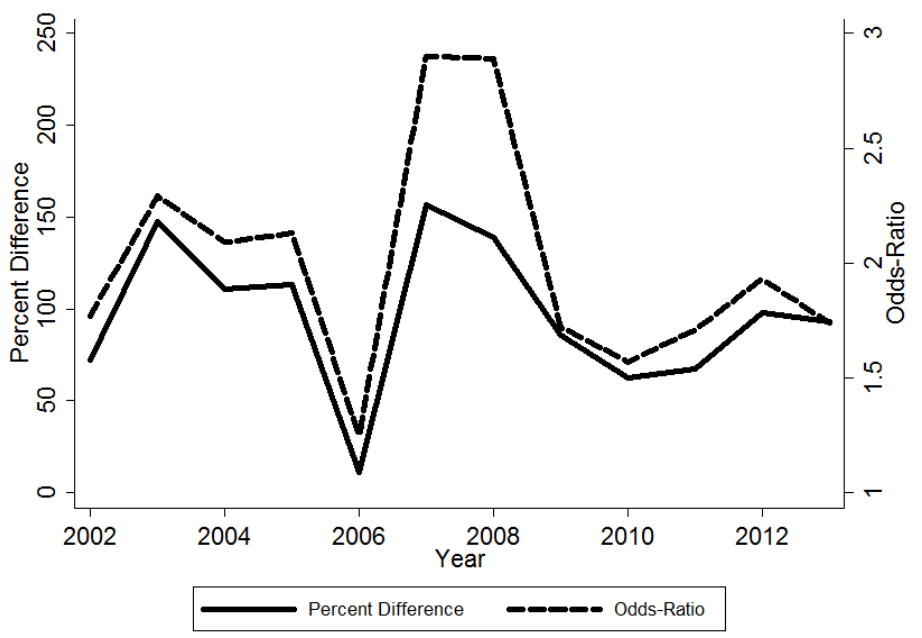
The figure excludes cases where the hour and minute was exactly 0:00. These cases were presumed to be missing data.

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: 0.917

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

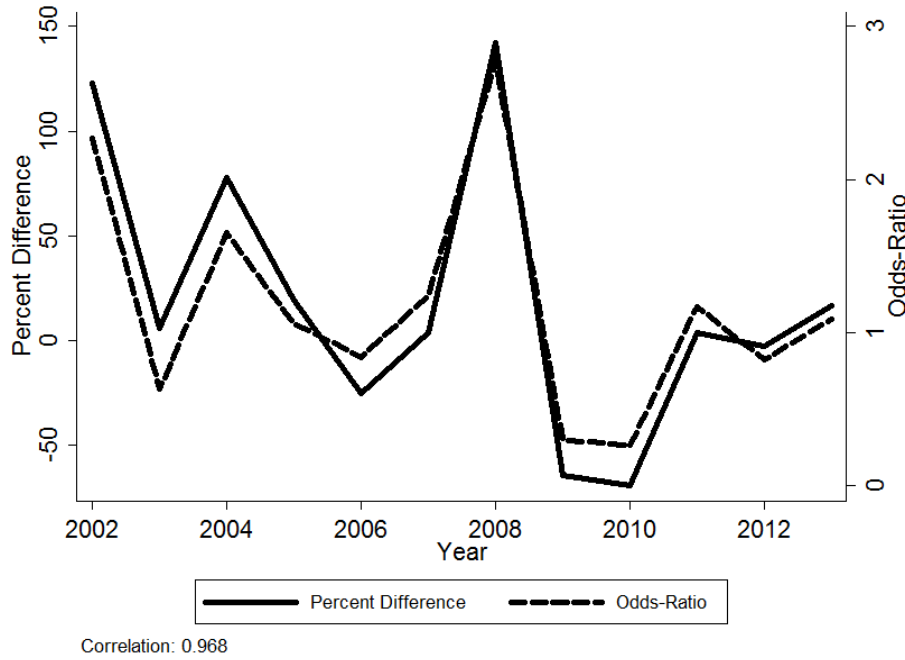


Figure A12. Racial Differences in the Likelihood of Search: Consent Searches Only

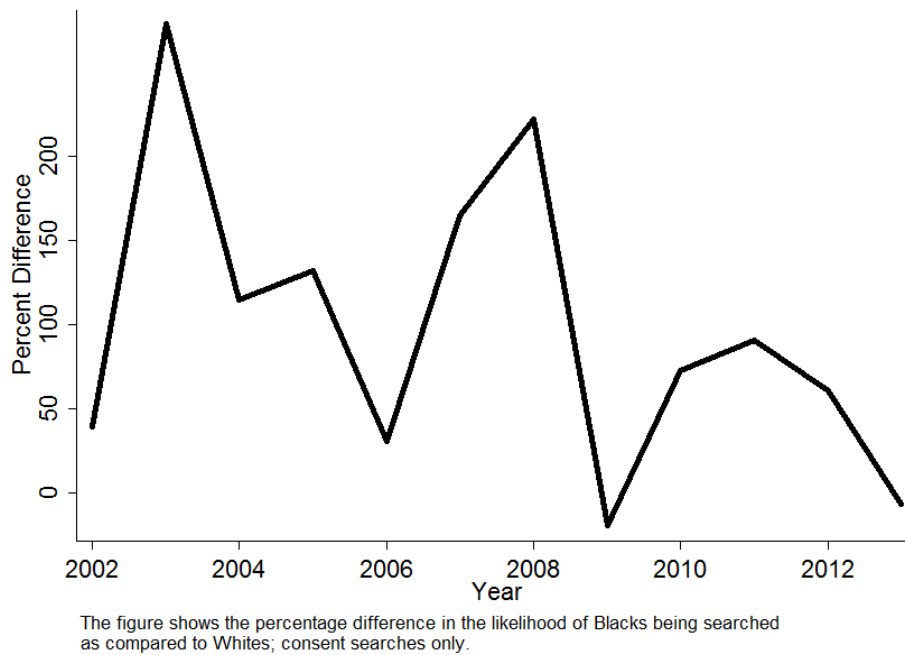


Table A6. Likelihood of Finding Contraband Given a Search, by Race

Contraband	Number	% Total	% White	% Black
Yes	586	28.11	29.18	24.90
No	1,499	71.89	70.82	75.10
Total	2,085	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	64,653	1,161	21,361	2,710	39,015	406	100.0
Black	No	11,504	300	4,286	387	6,446	85	100.0
Total	No	77,732	1,486	26,173	3,155	46,416	502	100.0
White	Yes	1,566	10	146	25	603	782	100.0
Black	Yes	482	8	46	13	207	208	100.0
Total	Yes	2,085	20	192	38	828	1,007	100.0