

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

March 23, 2015

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

Contact: [Frankb@unc.edu](mailto:Frankb@unc.edu)

---

<sup>1</sup> Baumgartner is the Richard J. Richardson Distinguished Professor of Political Science at UNC-Chapel Hill. Epp and Shoub are graduate students in political science. We thank UNC undergraduates Katherine B. Elliott, Amirah Jiwa, Morgan Herman, and Reena Gupta for assistance on the logistics of this project. We also acknowledge the assistance of the NC Department of Justice and State Bureau of Investigation for making available the official statistics on which this analysis relies, and for answering technical questions about the organization of this complex database.

Table 1. Overview of the Data

Data Subsets	Observations
Total stops	95,691
-2014	2,407
-Passengers	1,865
-Checkpoint stops	2,991
Total number of cases deleted	6,856
Stops for analysis	88,835
Searches	3,562
Percent of stops leading to search (search rate)	4.01%

Figure 1. Number of Traffic Stops per Year

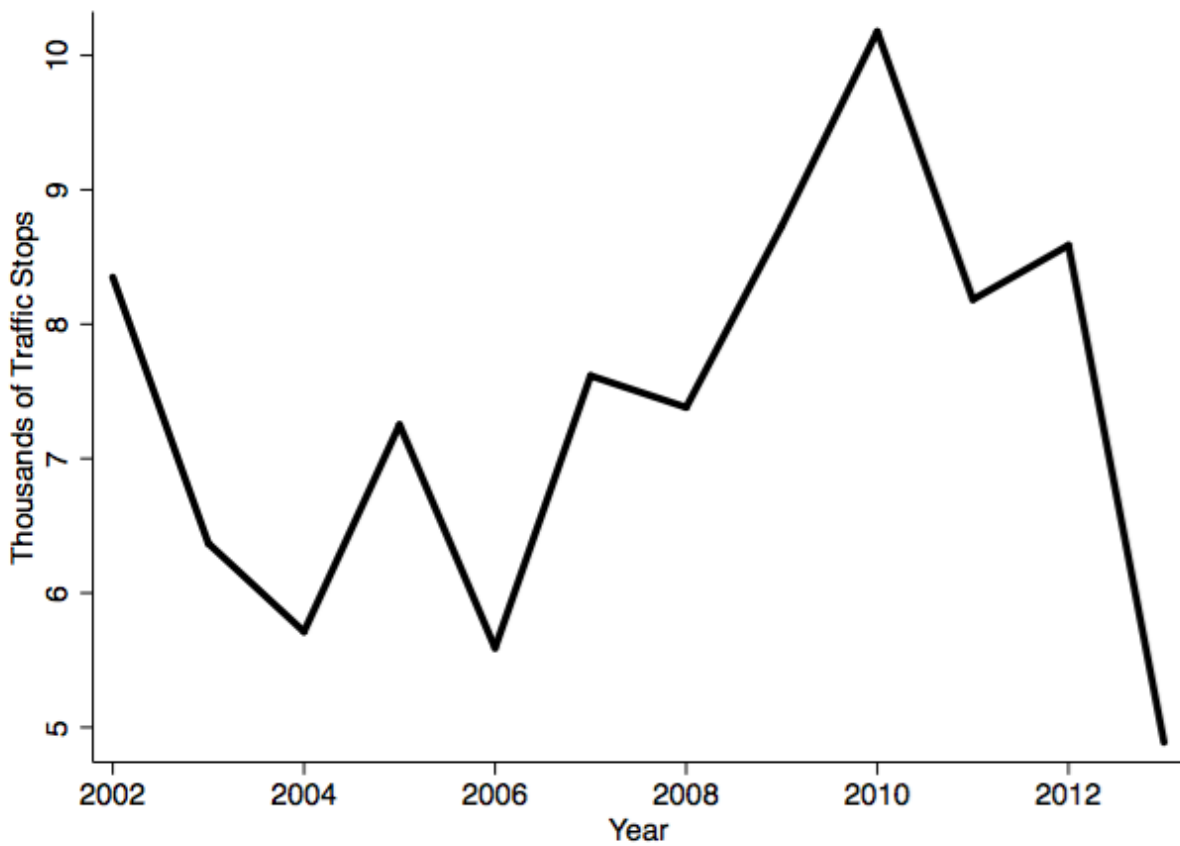


Figure 2. Racial Composition of Traffic Stops by Year

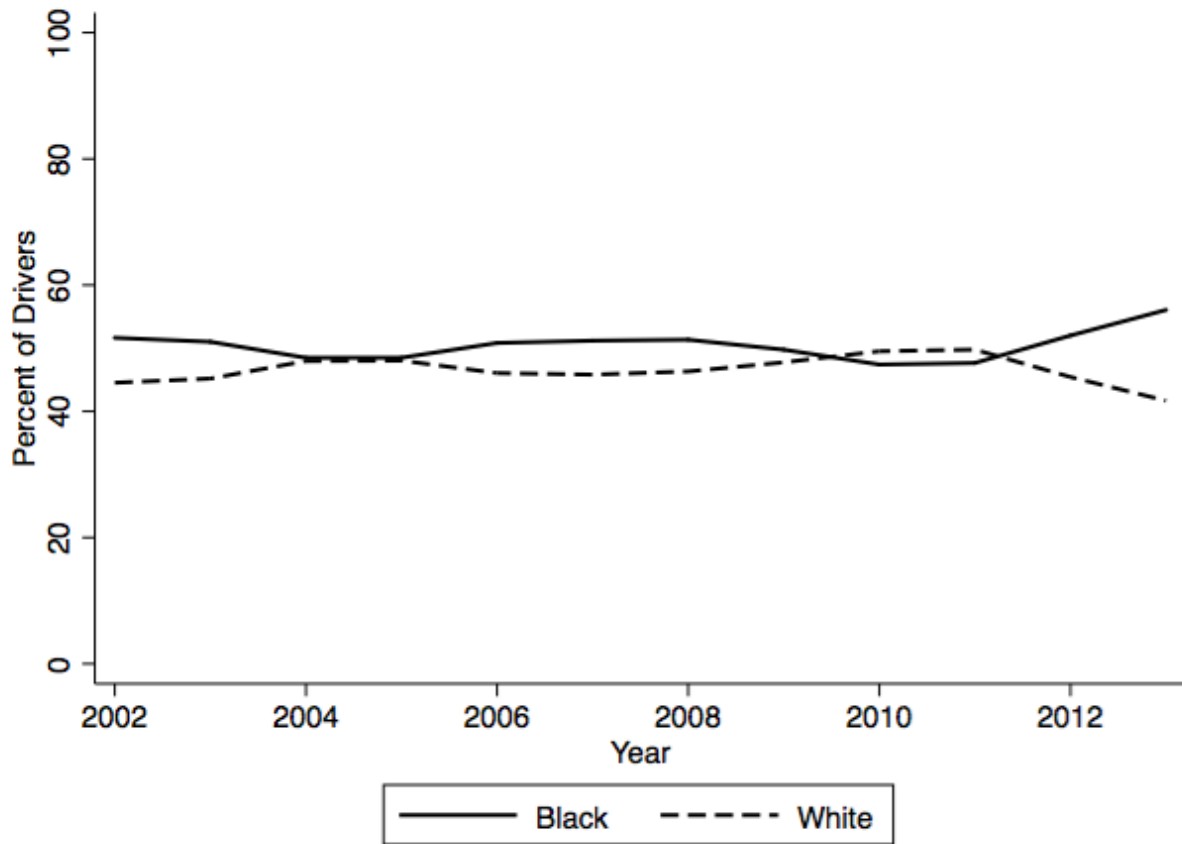


Table 2. Racial Composition of Traffic Stops by Purpose, Drivers

Purpose	Number	Percent	
		White	Black
Total Stops	88,835	46.74	50.27
Speed Limit	35,647	50.68	46.10
Stop Light/Sign	4,879	44.09	52.76
Driving Impaired	1,442	50.14	43.34
Safe Movement	4,180	47.27	48.52
Vehicle Equipment	8,409	34.88	62.80
Vehicle Regulatory	15,183	45.41	52.62
Seat Belt	9,838	51.27	46.36
Investigation	4,984	39.51	56.74
Other Vehicle	4,273	41.33	54.67

Note: Includes only drivers. Excludes 2,991 checkpoint stops. Excludes 1,865 passengers.

Table 3. Percent Searched by Race and Purpose of Stop

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	88,835	-	46.74	50.27	-
Total Searches	3,562	4.01	2.86	5.03	1.76
Speed Limit	35,647	2.13	1.57	2.76	1.76
Stop Light/Sign	4,879	3.48	1.95	4.86	2.49
Driving Impaired	1,442	21.71	22.27	21.44	0.96
Safe Movement	4,180	6.10	4.76	7.25	1.52
Vehicle Equipment	8,409	5.47	3.78	6.38	1.69
Vehicle Regulatory	15,183	3.47	2.19	4.59	2.10
Seat Belt	9,838	1.74	1.21	2.28	1.88
Investigation	4,984	13.52	10.92	14.99	1.37
Other Vehicle	4,273	5.41	3.79	6.59	1.74

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

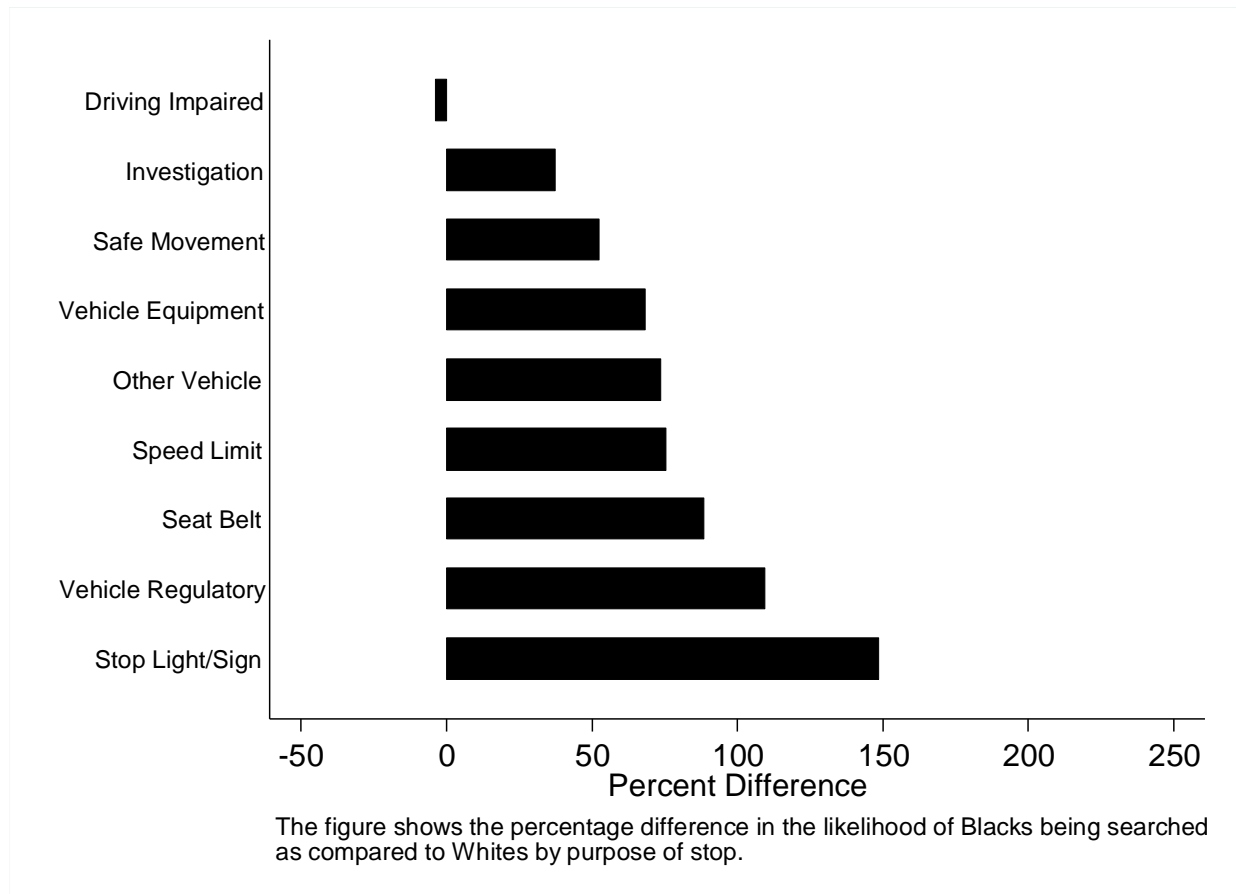
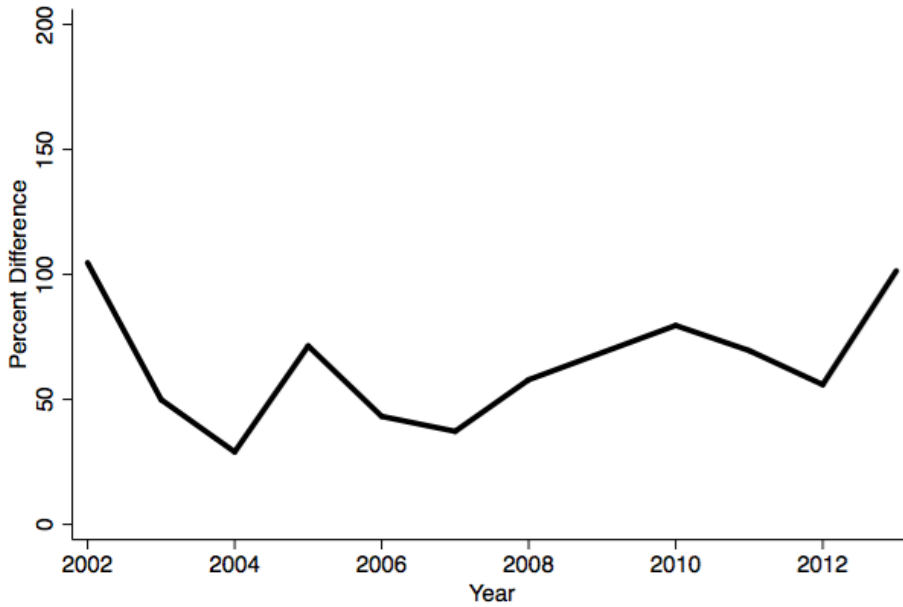
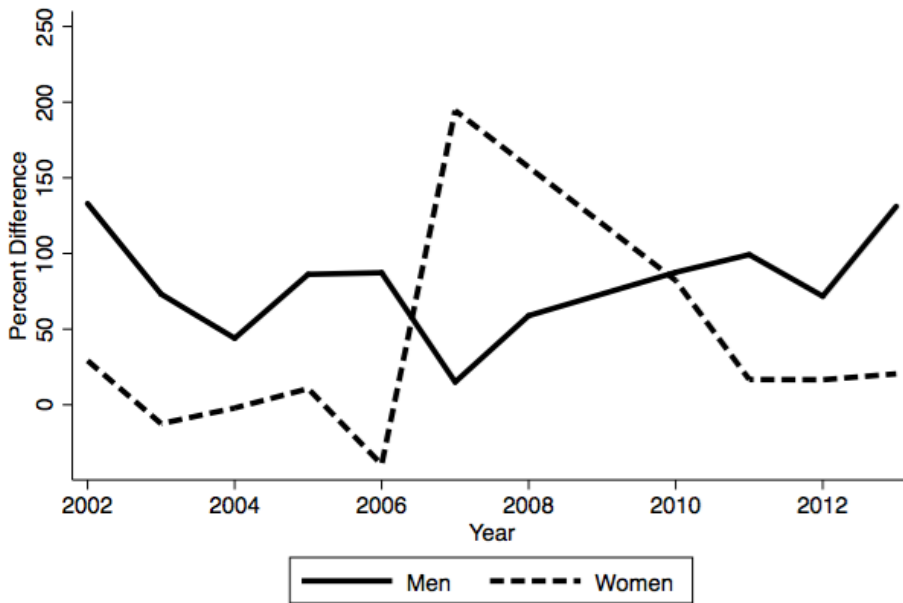


Figure 4. Racial Differences in the Likelihood of Search



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

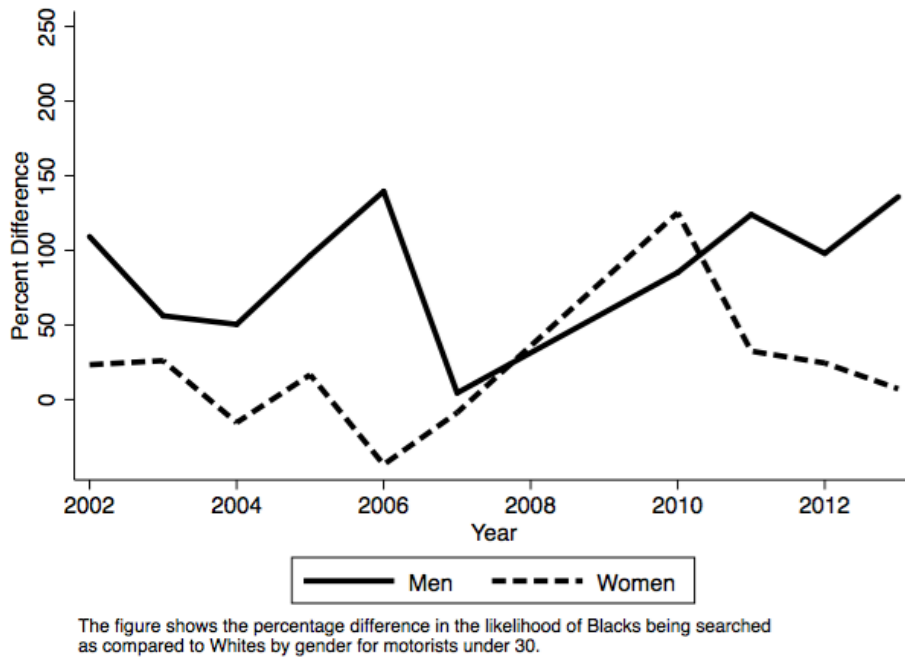
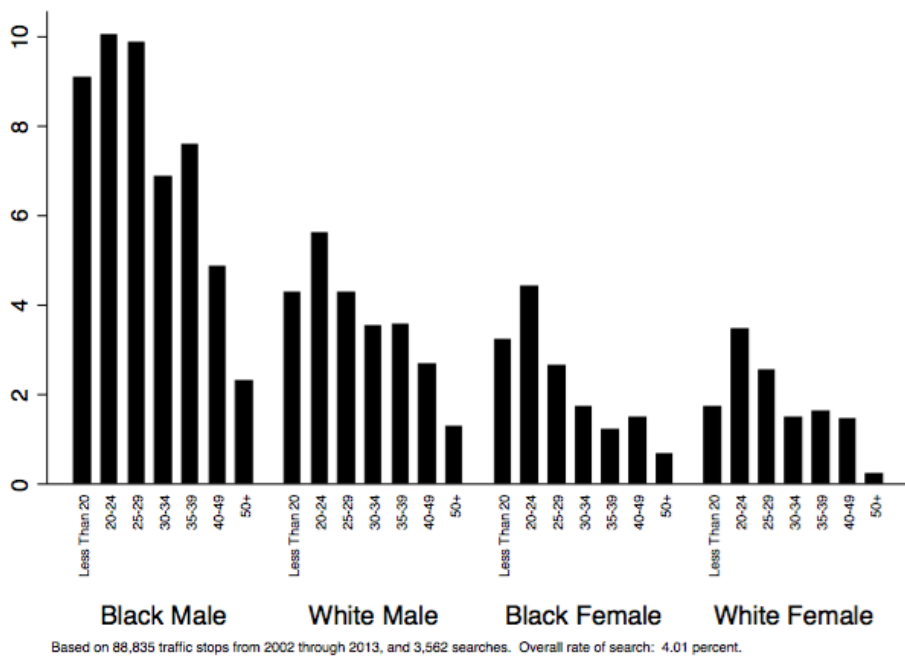


Figure 7. Search Rates by Race, Gender, and Age Group



Black men under the age of 30 are searched at rates of about 10 percent whereas white men of that age see rates of about 6 percent, and women in general are typically below 5 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

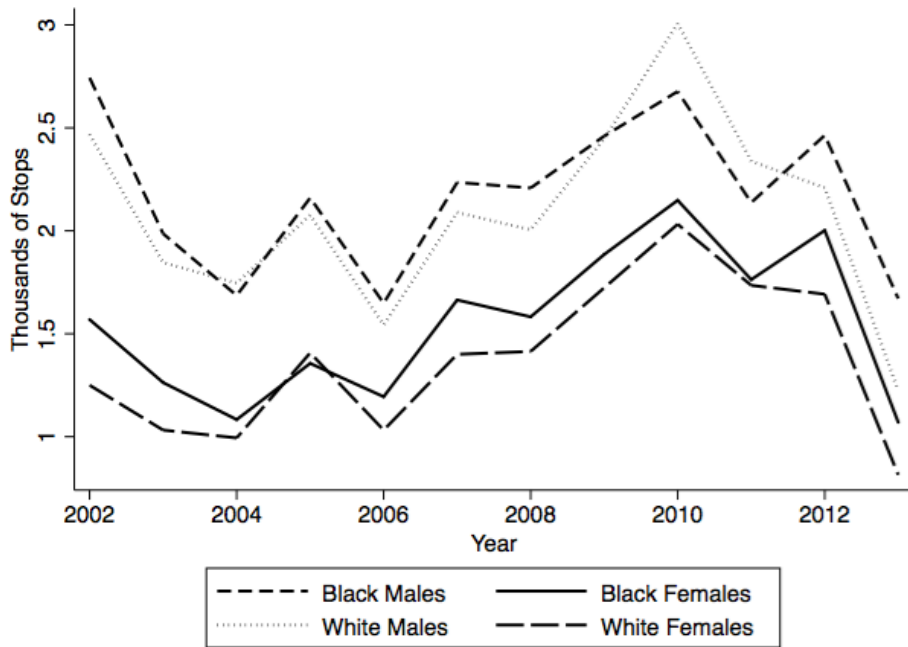


Figure 9. Percent of Stops Resulting in a Search, by Race and Gender

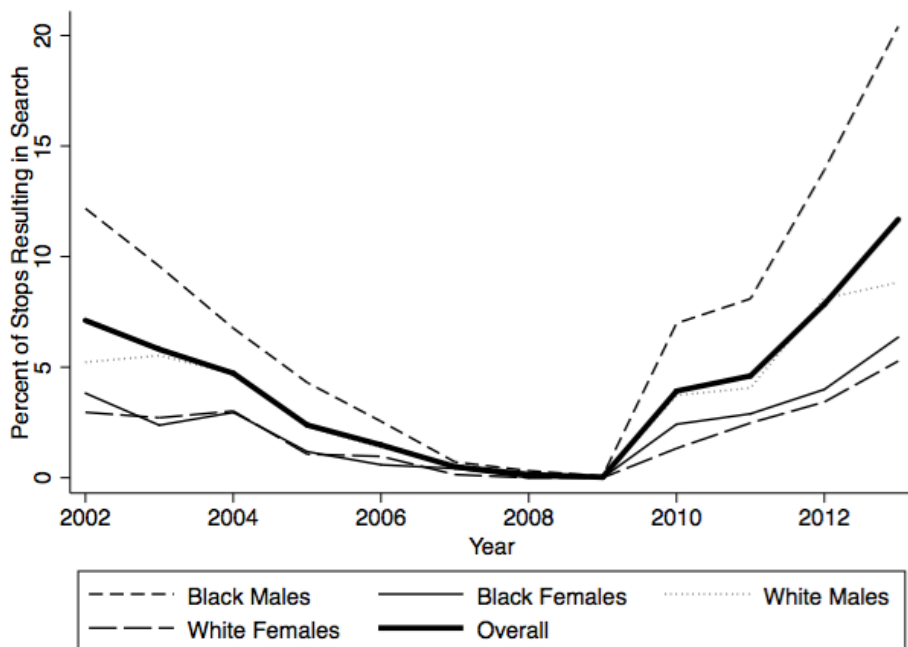


Table 4. Type of Search by Race

Search Type	Number	% Total	% White	% Black	Ratio Black:White
Total Stops	88,835	-	46.74	50.27	-
Total Searches	3,562	4.01	2.86	5.03	1.76
Consent	934	1.05	0.85	1.24	1.46
Search Warrant	20	0.02	0.01	0.03	3.00
Probable Cause	1,469	1.65	1.08	2.18	2.02
Incident to Arrest	1,043	1.17	0.85	1.43	1.68
Protective Frisk	96	0.11	0.06	0.15	2.50

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	123	28.28	28.28	0.14	0.14
2 – 10	114	26.21	54.48	0.60	0.74
11 - 100	74	17.01	71.49	3.07	3.81
101 – 1,000	102	23.45	94.94	47.14	50.95
1,001 +	22	5.06	100.00	49.05	100.00
Total		100	-	100	-



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

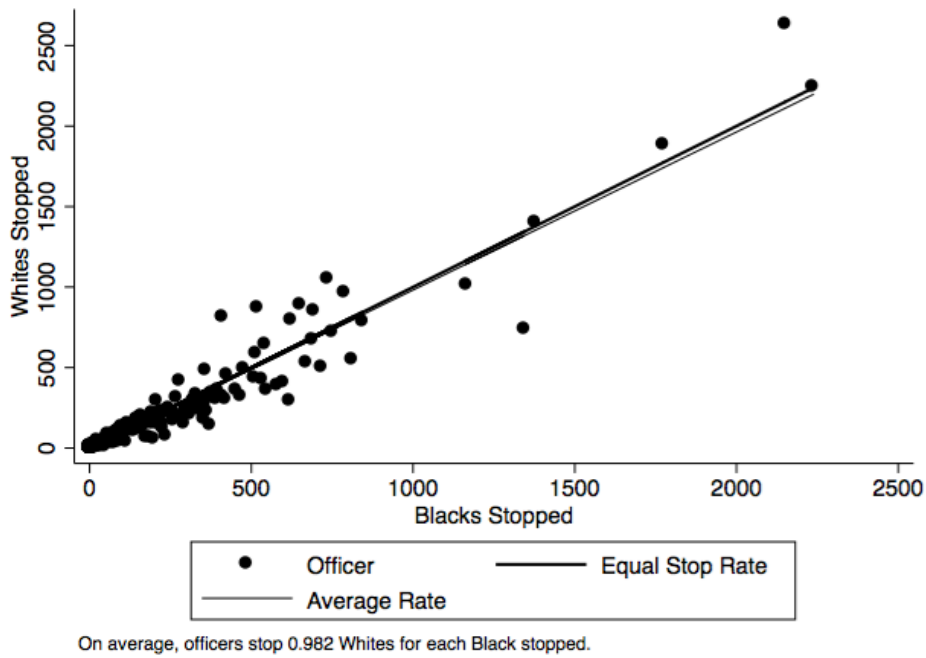


Figure 11. Number of Black and White Motorists Searched, by Officer

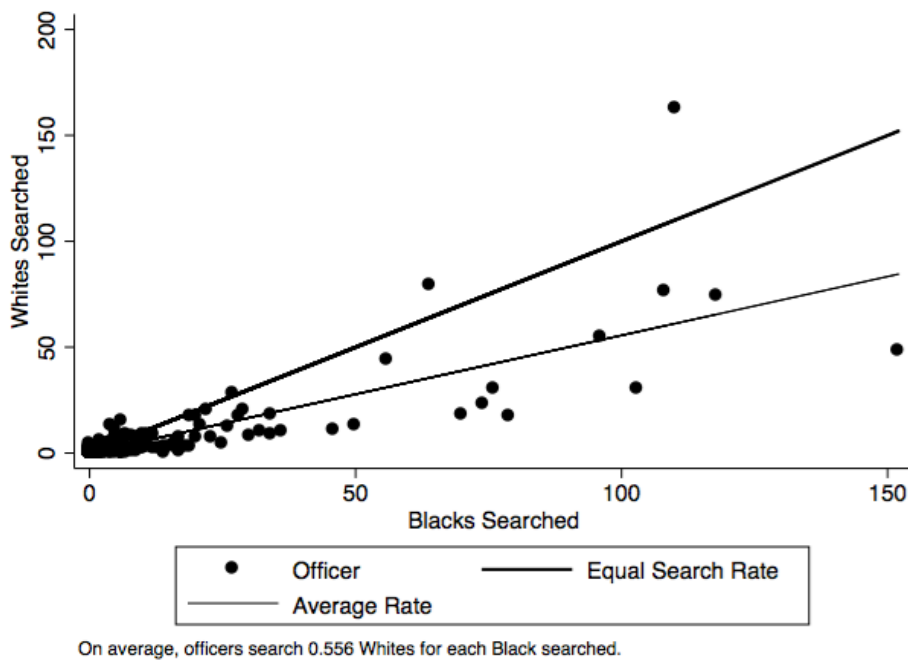
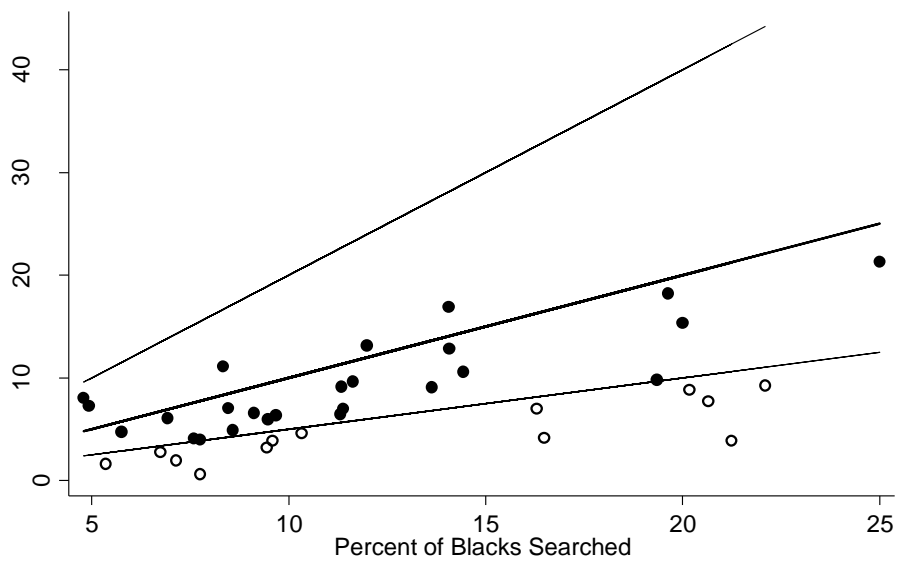


Figure 12. Percent of White and Black Drivers Searched, by Officer



Includes 38 officers with a minimum of 50 White stops, 50 Black stops, and a search rate above the department average of 4.01. The hollow circles indicate high disparity officers. 0 officers search Whites at more than twice the rate that they search Blacks. 13 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	1.21*(0.10)	2.21*(0.10)	2.03*(0.09)	1.97*(0.09)	2.06*(0.13)
Hispanic	1.86*(0.17)	1.66*(0.15)	1.45*(0.14)	1.43*(0.14)	1.36*(0.17)
Age	-	0.97*(0.00)	0.97*(0.00)	0.97*(0.00)	0.97*(0.00)
<b>Stop Purpose</b>					
Speed Limit	-	-	-	-	-
Stop Light	-	-	1.53*(0.15)	1.48*(0.14)	1.32*(0.17)
Impaired	-	-	9.46*(0.81)	9.44*(0.82)	16.26*(2.79)
Movement	-	-	2.35*(0.21)	2.35*(0.21)	2.34*(0.25)
Equipment	-	-	1.95*(0.14)	1.75*(0.12)	1.88*(0.19)
Regulatory	-	-	1.52*(0.10)	1.44*(0.10)	1.57*(0.14)
Seat Belt	-	-	0.68*(0.07)	0.69*(0.07)	1.45*(0.24)
Investigation	-	-	4.79*(0.31)	4.48*(0.29)	5.31*(0.47)
Other	-	-	1.96*(0.17)	1.95*(0.17)	1.98*(0.27)
<b>Officer Type</b>					
Black Disparity <sup>†</sup>	-	-	-	2.69*(0.15)	1.86*(0.15)
White Disparity <sup>†</sup>	-	-	-	Omitted	Omitted
<b>Time</b>					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
<b>Constant</b>	0.03*(0.00)	0.11*(0.01)	0.06*(0.00)	0.06*(0.00)	0.14*(0.02)
<b>N</b>	51,071	51,071	51,071	51,071	17,792
<b>Pseudo R<sup>2</sup></b>	0.017	0.040	0.092	0.105	0.160

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	1.20*(0.09)	1.22*(0.10)	1.20*(0.10)	1.16 (0.09)	1.24*(0.13)
Hispanic	0.59 (0.00)	0.51*(0.16)	0.48*(0.16)	0.46*(0.15)	0.40*(0.17)
Age	-	0.95*(0.00)	0.96*(0.00)	0.96*(0.00)	0.96*(0.00)
<b>Stop Purpose</b>					
Speed Limit	-	-	-	-	-
Stop Light	-	-	1.31 (0.28)	1.26 (0.26)	0.96 (0.27)
Impaired	-	-	17.11*(3.02)	17.56*(3.12)	47.85*(15.89)
Movement	-	-	3.39*(0.55)	3.39*(0.55)	3.12*(0.59)
Equipment	-	-	2.50*(0.34)	2.24*(0.31)	1.93*(0.39)
Regulatory	-	-	1.87*(0.22)	1.79*(0.21)	2.07*(0.30)
Seat Belt	-	-	0.90 (0.18)	0.91 (0.18)	1.46 (0.49)
Investigation	-	-	8.81*(1.10)	8.48*(1.06)	7.55*(1.26)
Other	-	-	2.54*(0.45)	2.48*(0.44)	1.65*(0.50)
<b>Officer Type</b>					
Black Disparity <sup>†</sup>	-	-	-	2.61*(0.28)	1.50*(0.24)
White Disparity <sup>†</sup>	-	-	-	Omitted	Omitted
<b>Time</b>					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
<b>Constant</b>	0.02*(0.00)	0.08*(0.01)	0.04*(0.01)	0.04*(0.01)	0.09*(0.03)
<b>N</b>	35,105	35,105	35,105	35,105	13,101
<b>Pseudo R<sup>2</sup></b>	0.002	0.031	0.093	0.102	0.183

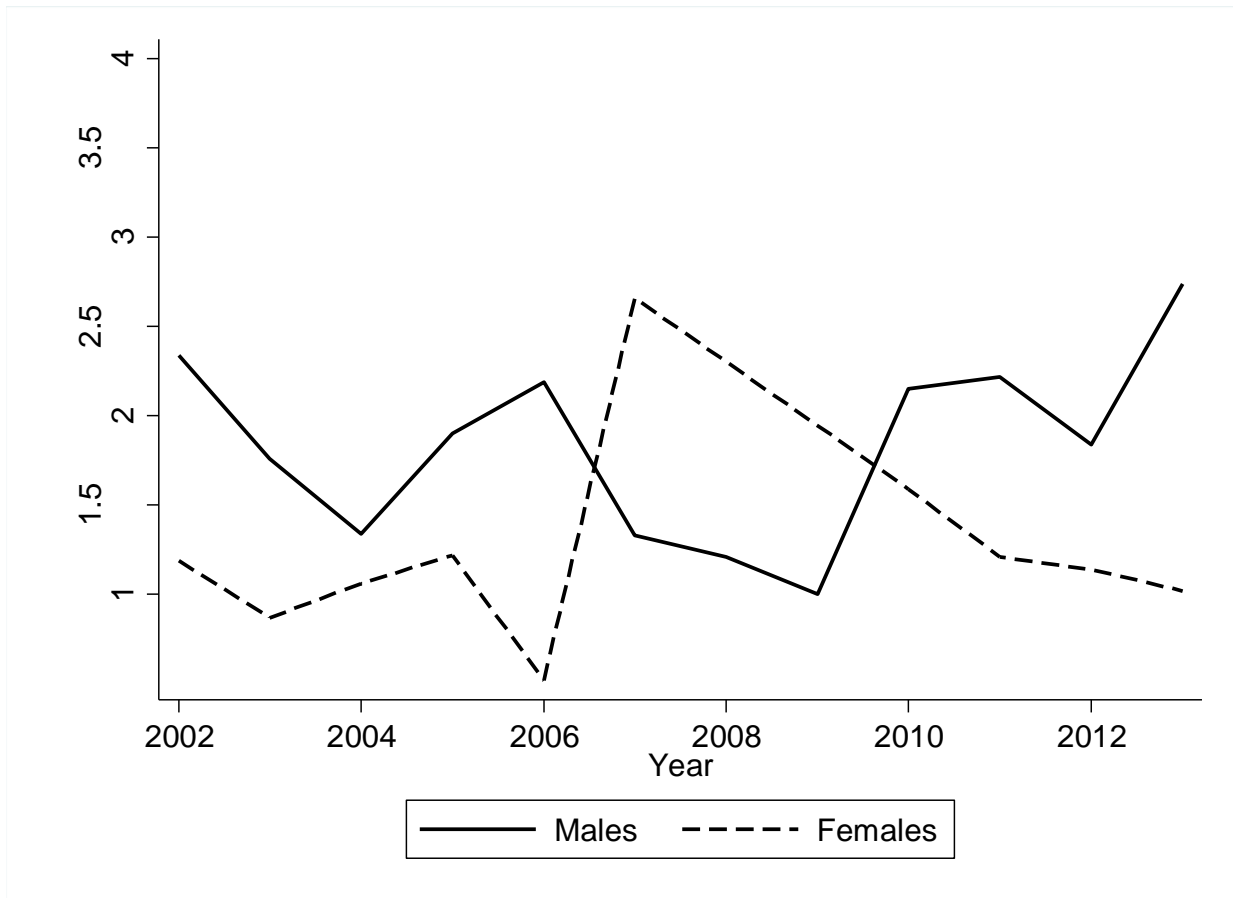
Note: Entries are odds-ratios, with standard errors in parenthesis.

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	1,865	27.29	69.60
Speed Limit	286	29.72	68.88
Stop Light/Sign	100	21.00	77.00
Driving Impaired	106	46.23	42.45
Safe Movement	77	22.08	76.62
Vehicle Equipment	294	18.71	79.25
Vehicle Regulatory	276	24.28	73.19
Seat Belt	103	33.98	58.25
Investigation	371	25.61	71.70
Other Vehicle	153	26.80	67.97

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

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	52,981	-	47.18	49.22	-
Total Searches	2,856	5.39	3.57	7.06	1.98
Speed Limit	19,219	3.08	2.01	4.41	2.19
Stop Light/Sign	2,914	4.87	2.73	6.98	2.56
Driving Impaired	1,131	23.25	23.63	23.35	0.99
Safe Movement	2,617	7.60	5.82	8.91	1.53
Vehicle Equipment	5,405	6.90	4.57	8.18	1.79
Vehicle Regulatory	8,484	4.71	2.83	6.36	2.25
Seat Belt	6,716	2.10	1.31	2.98	2.27
Investigation	3,619	15.28	11.52	17.19	1.49
Other Vehicle	2,822	6.73	4.68	8.28	1.77

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

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	35,854	-	46.09	51.82	-
Total Searches	706	1.97	1.77	2.17	1.23
Speed Limit	16,428	1.03	1.02	1.05	1.03
Stop Light/Sign	1,965	1.42	0.72	1.94	2.69
Driving Impaired	311	16.08	18.08	13.71	0.76
Safe Movement	1,509	3.45	2.98	4.20	1.41
Vehicle Equipment	3,004	2.90	2.38	3.20	1.34
Vehicle Regulatory	6,699	1.90	1.40	2.35	1.68
Seat Belt	3,122	0.96	0.95	0.99	1.04
Investigation	1,365	8.86	9.55	8.65	0.91
Other Vehicle	1,451	2.83	2.13	3.37	1.58

Table A4. Type of Search by Race: Men

Search Type	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	52,981	-	47.18	49.22	-
Total Searches	2,856	5.39	3.57	7.06	1.98
Consent	751	1.42	1.02	1.80	1.76
Search Warrant	17	0.03	0.02	0.04	2.00
Probable Cause	1,173	2.21	1.34	3.06	2.28
Incident to Arrest	848	1.60	1.12	1.99	1.78
Protective Frisk	67	0.13	0.07	0.18	2.57

Table A5. Type of Search by Race: Women

Search Type	Number	% Total	% White	% Black	Ratio Black:White
Total Stops	35,854	-	46.09	51.82	-
Total Searches	706	1.97	1.77	2.17	1.23
Consent	183	0.51	0.58	0.45	0.78
Search Warrant	3	0.01	0.01	0.01	1.00
Probable Cause	296	0.83	0.69	0.96	1.39
Incident to Arrest	195	0.54	0.45	0.64	1.42
Protective Frisk	29	0.08	0.05	0.11	2.20

Figure A6. Stops by Day of the Week

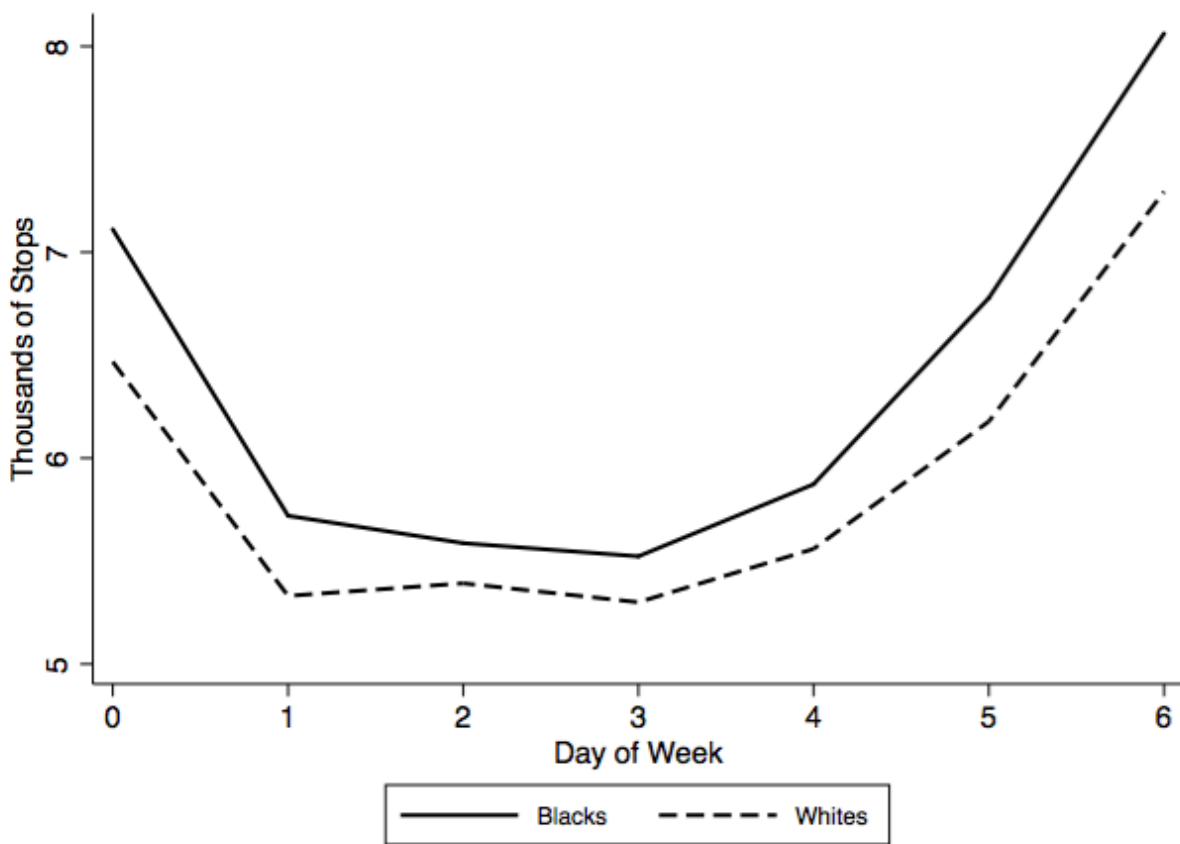




Figure A7. Searches by Day of the Week

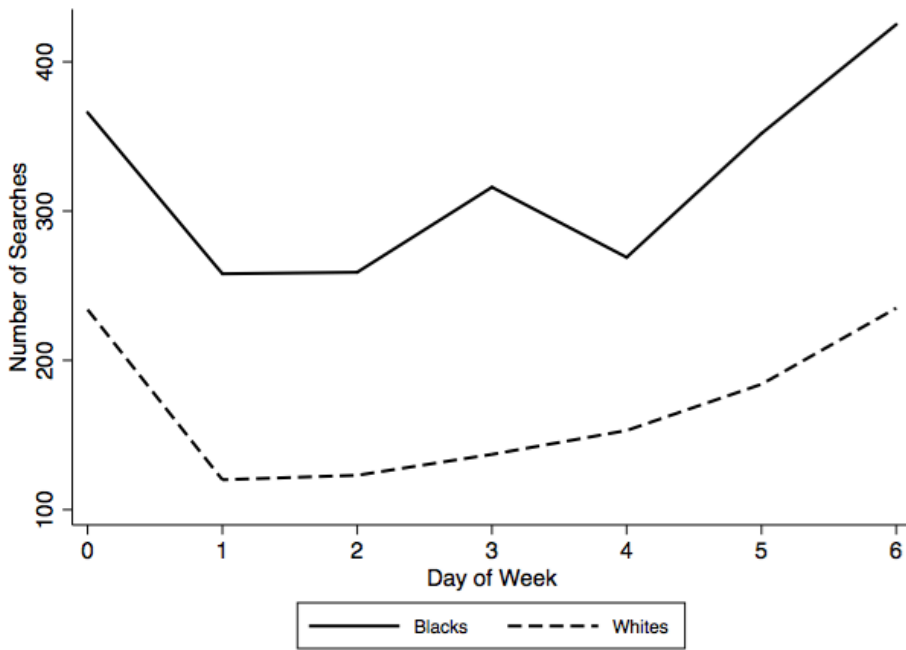
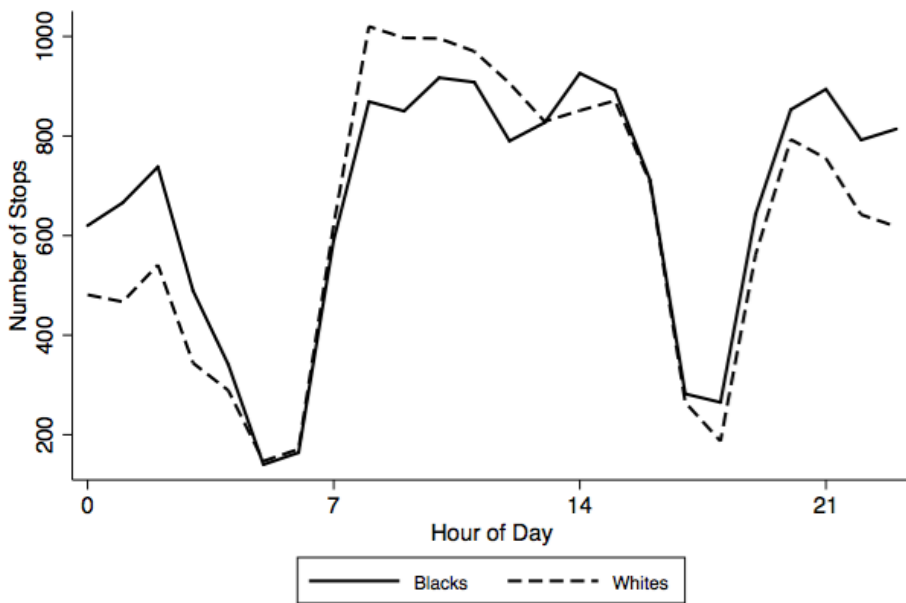


Figure A8. Stops by Hour of the Day



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

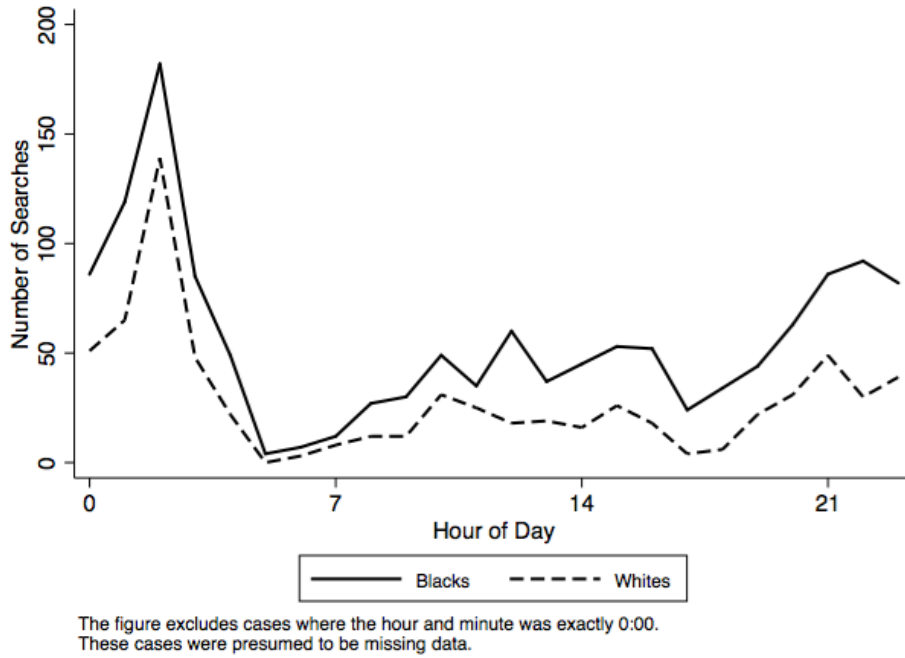


Figure A10. Correlation Between Percent Difference in Likelihood of Black Men being Searched as Compared to Whites and Odds-Ratios from Logistic Regression

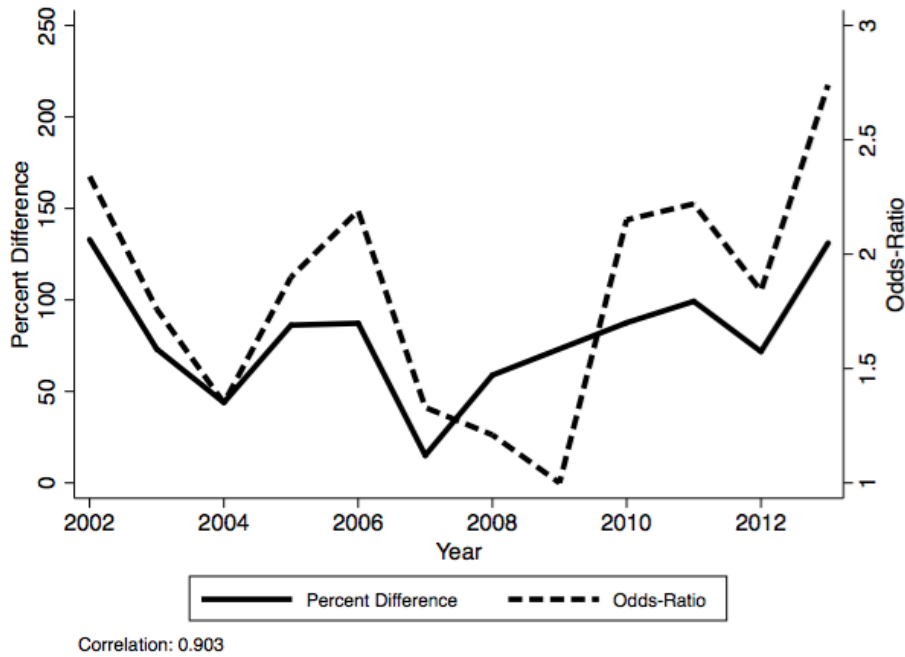


Figure A11. Correlation Between Percent Difference in Likelihood of Black Women being Searched as Compared to Whites and Odds-Ratios from Logistic Regression

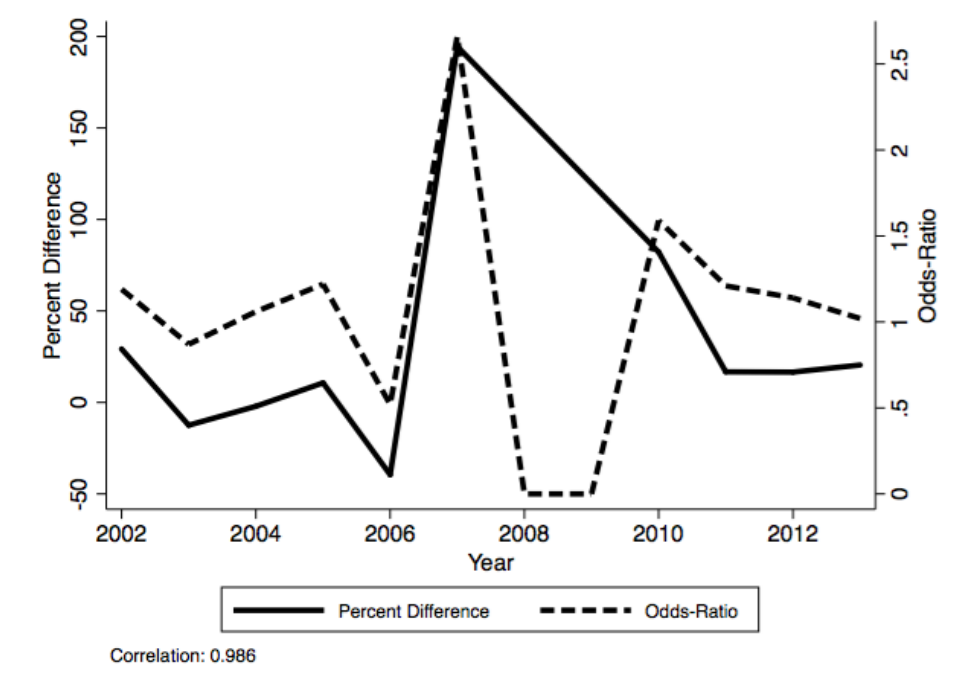


Figure A12. Racial Differences in the Likelihood of Search: Consent Searches Only

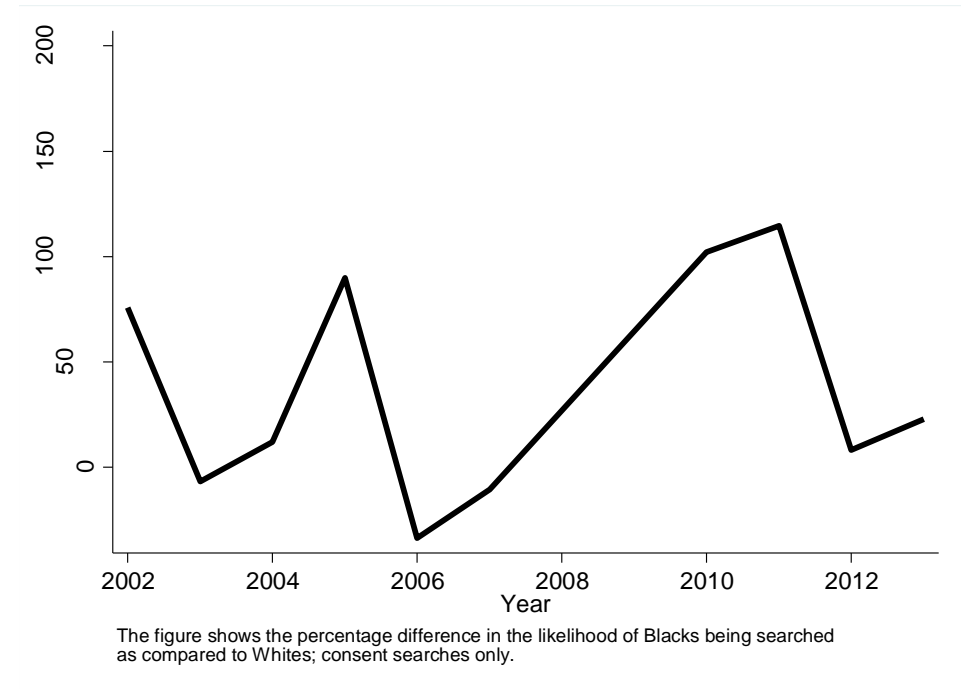


Table A6. Likelihood of Finding Contraband Given a Search, by Race

Contraband	Number	% Total	% White	% Black
Yes	779	21.87	19.39	23.52
No	2,783	78.13	80.61	76.48
Total	3,562	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	40,336	2.89	17.09	7.40	70.49	2.13	100.0
Black	No	42,409	3.24	19.22	7.13	67.20	3.21	100.0
Total	No	85,273	3.05	18.02	7.22	68.98	2.73	100.0
White	Yes	1,186	2.61	5.31	2.11	27.07	62.90	100.0
Black	Yes	2,245	2.49	7.48	2.05	30.73	57.24	100.0
Total	Yes	3,562	2.53	6.65	1.99	28.97	59.85	100.0