

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

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Frank R. Baumgartner, Derek Epp, and Kelsey Shoub¹
University of North Carolina at Chapel Hill
Department of Political Science
<http://www.unc.edu/~fbaum/traffic.htm>

Contact: Frankb@unc.edu

¹ 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	84,349
-2014	2,902
-Passengers	1,280
-Checkpoint stops	239
Total number of cases deleted	4,380
Stops for analysis	79,969
Searches	2,801
Percent of stops leading to search (search rate)	3.50%

Figure 1. Number of Traffic Stops per Year

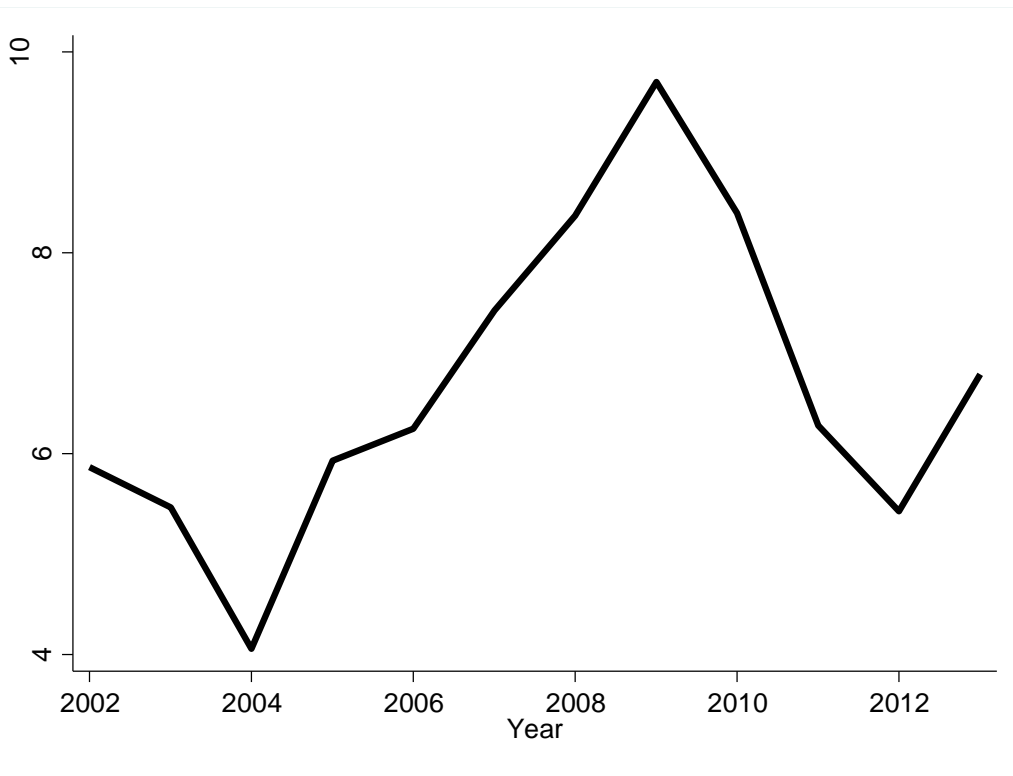


Figure 2. Racial Composition of Traffic Stops by Year

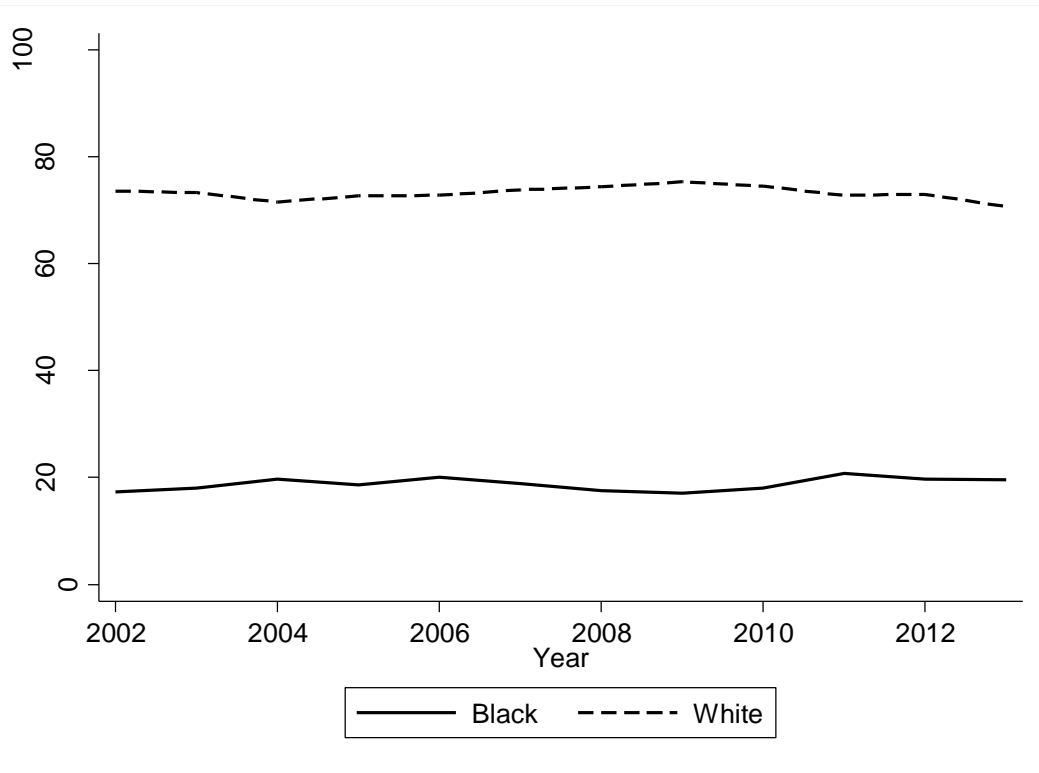


Table 2. Racial Composition of Traffic Stops by Purpose, Drivers

Purpose	Number	Percent	
		White	Black
Total Stops	79,969	73.42	18.63
Speed Limit	26,803	76.05	15.73
Stop Light/Sign	6,211	76.03	13.11
Driving Impaired	922	69.85	21.26
Safe Movement	5,797	71.73	19.32
Vehicle Equipment	8,297	65.84	26.26
Vehicle Regulatory	18,190	74.40	19.81
Seat Belt	6,198	76.12	17.34
Investigation	3,426	64.86	24.28
Other Vehicle	4,125	69.55	20.82

Note: Includes only drivers. Excludes 239 checkpoint stops. Excludes 1,280 passengers.

Table 3. Percent Searched by Race and Purpose of Stop

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	79,969	-	73.42	18.63	-
Total Searches	2,801	3.50	3.14	5.38	1.71
Speed Limit	26,803	1.47	1.30	2.54	1.95
Stop Light/Sign	6,211	1.48	1.42	2.46	1.73
Driving Impaired	922	39.15	43.48	25.51	0.59
Safe Movement	5,797	4.88	4.52	6.96	1.54
Vehicle Equipment	8,297	5.34	5.11	6.98	1.37
Vehicle Regulatory	18,190	2.52	1.98	4.80	2.42
Seat Belt	6,198	2.13	1.84	3.35	1.82
Investigation	3,426	13.16	12.83	16.47	1.28
Other Vehicle	4,125	4.51	4.32	5.70	1.32

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

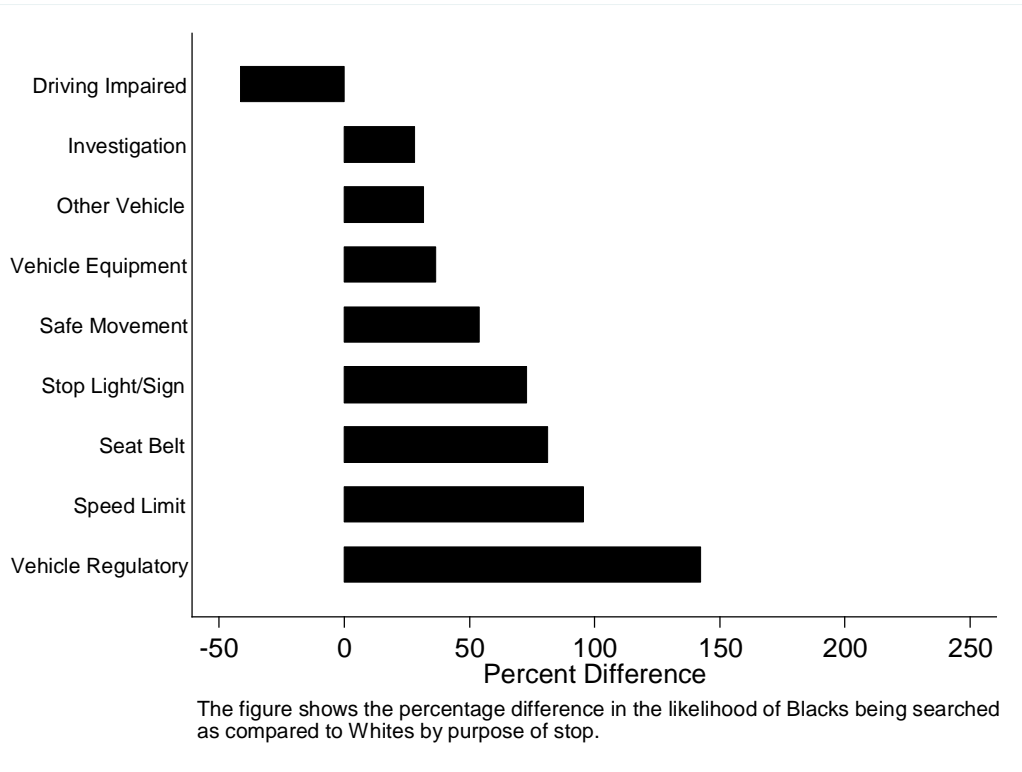


Figure 4. Racial Differences in the Likelihood of Search

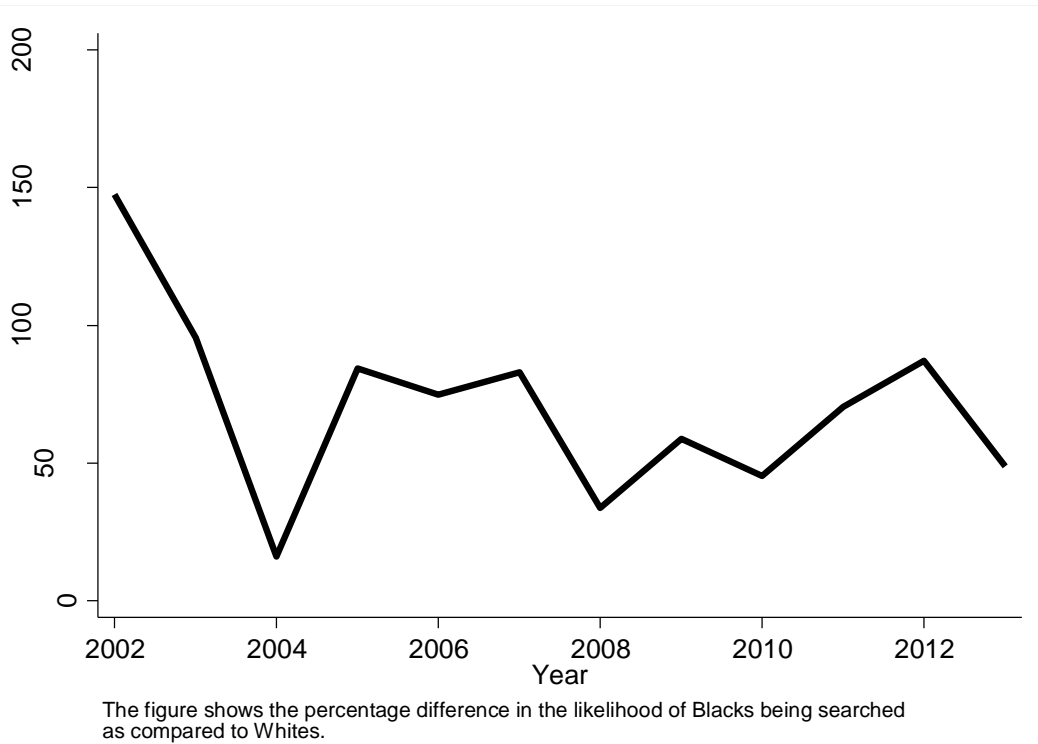


Figure 5. Racial Differences in the Likelihood of Search by Gender

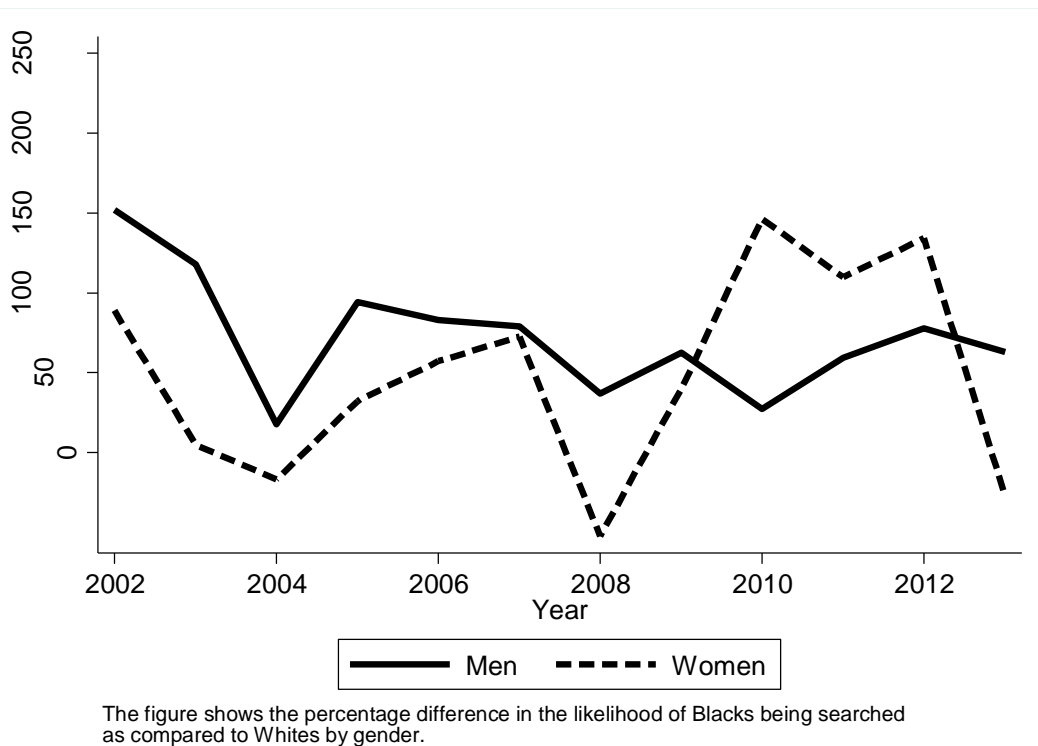
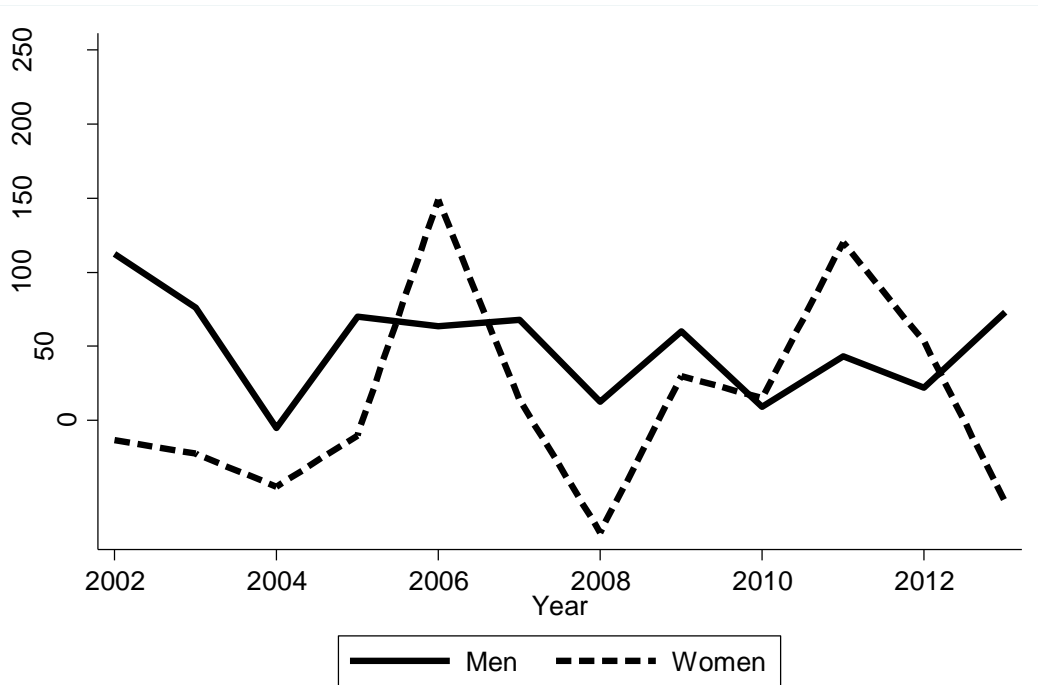


Figure 6. Racial Differences in the Likelihood of Search by Gender, for Drivers Under 30



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

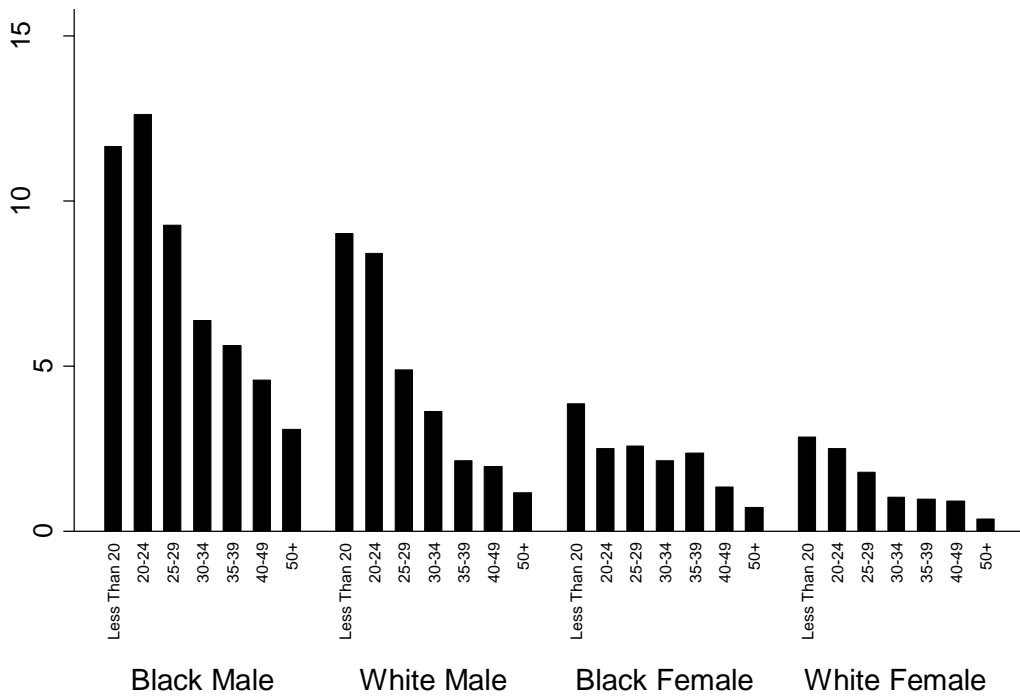


Figure 8. Number of Stops, by Race and Gender

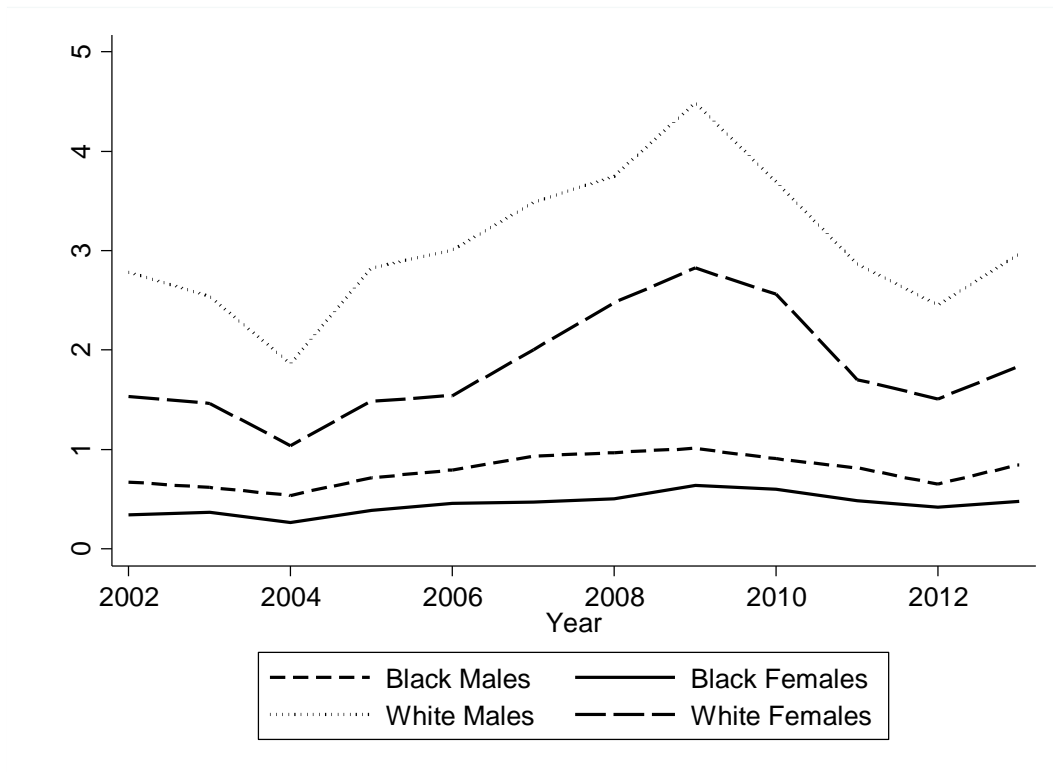


Figure 9. Percent of Stops Resulting in a Search, by Race and Gender

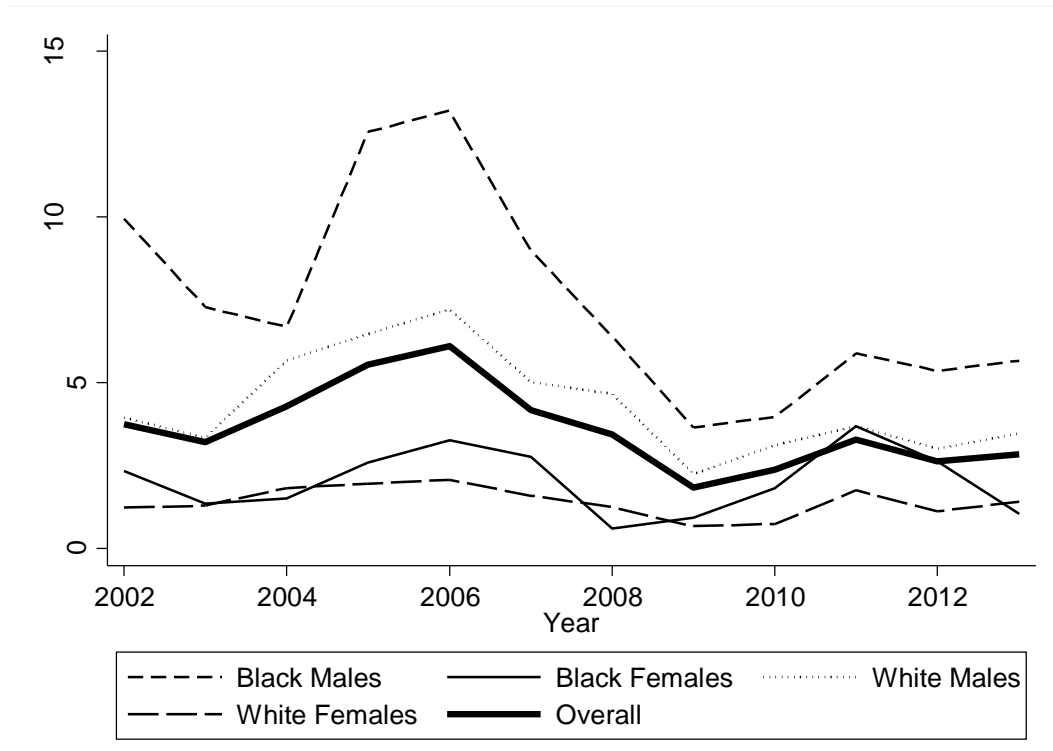


Table 4. Type of Search by Race

Search Type	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	79,969	-	73.42	18.63	-
Total Searches	2,801	3.50	3.14	5.38	1.71
Consent	1,343	1.68	1.47	2.81	1.91
Search Warrant	5	0.01	0.01	0.01	1.00
Probable Cause	533	0.67	0.58	1.08	1.86
Incident to Arrest	868	1.09	1.03	1.33	1.29
Protective Frisk	52	0.07	0.04	0.15	3.75

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	303	56.85	56.85	0.38	0.38
2 – 10	112	21.01	77.86	0.50	0.88
11 - 100	35	6.57	84.43	1.57	2.45
101 – 1,000	59	11.07	95.50	35.59	38.04
1,001 +	24	4.50	100.00	61.96	100.00
Total	533	100	-	100	-

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

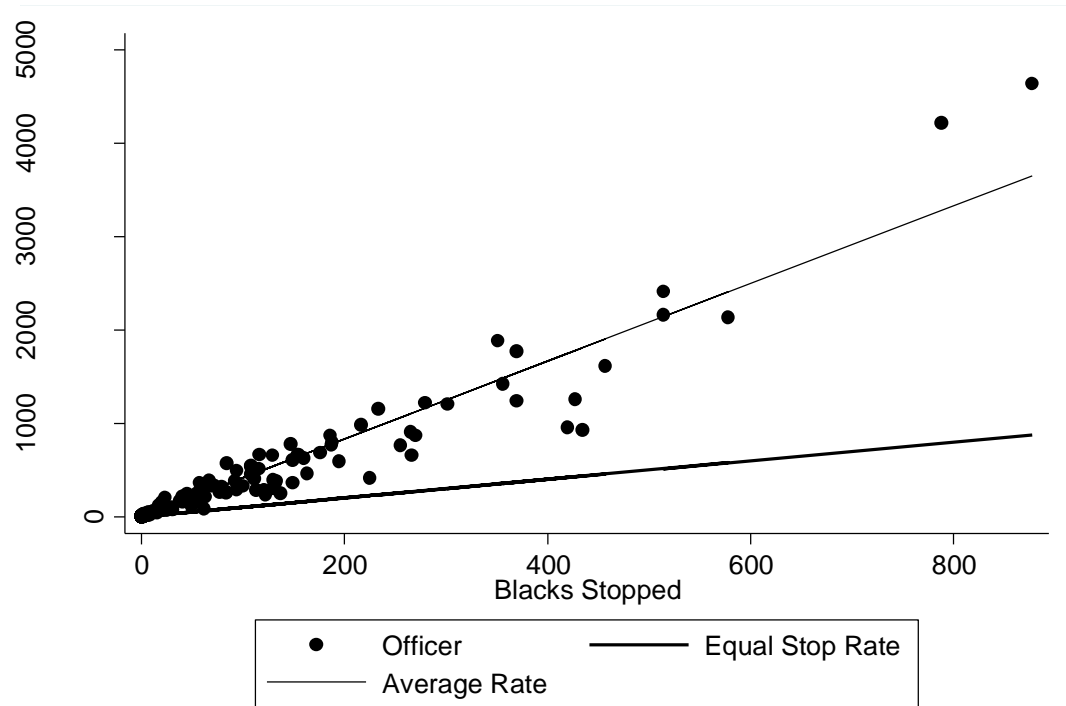


Figure 11. Number of Black and White Motorists Searched, by Officer

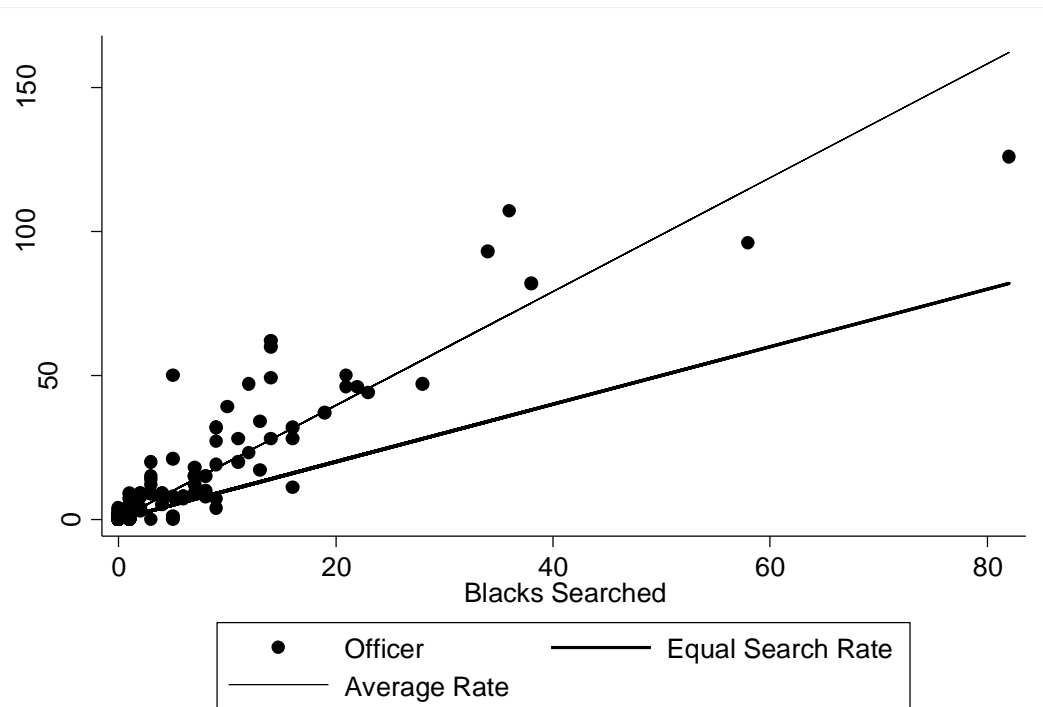
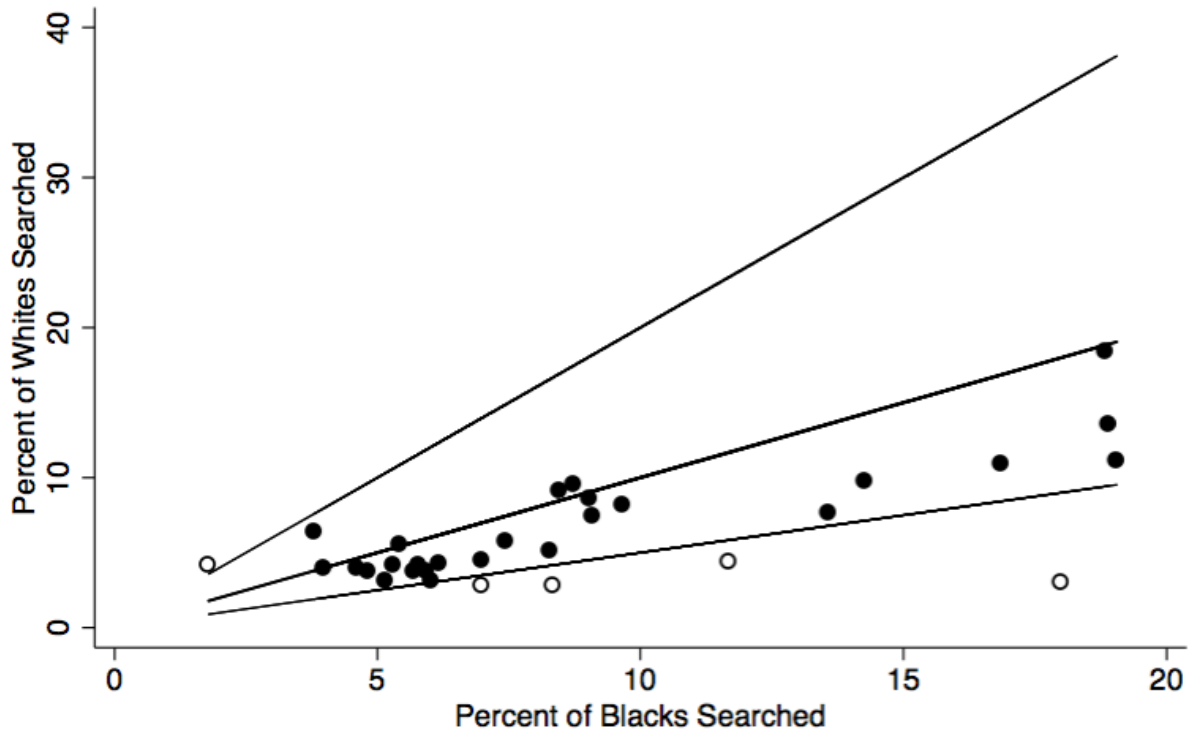


Figure 12. Percent of White and Black Drivers Searched, by Officer



Includes 31 officers with a minimum of 50 White stops, 50 Black stops, and a search rate above the department average of 3.50. The hollow circles indicate high disparity officers. 1 officer searches Whites at more than twice the rate that they search Blacks. 4 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	1.97*(0.10)	1.99*(0.10)	1.80*(0.10)	1.80*(0.09)	1.68*(0.09)
Hispanic	1.85*(0.12)	1.59*(0.10)	1.21*(0.08)	1.21*(0.08)	1.33*(0.09)
Age	-	0.94*(0.00)	0.94*(0.00)	0.94*(0.00)	0.95*(0.00)
Stop Purpose					
Speed Limit	-	-	-	-	-
Stop Light	-	-	1.05 (0.14)	1.05 (0.14)	1.03 (0.14)
Impaired	-	-	38.10*(3.97)	38.14*(3.97)	24.39*(2.64)
Movement	-	-	3.11*(0.28)	3.10*(0.28)	2.82*(0.26)
Equipment	-	-	2.70*(0.22)	2.70*(0.22)	2.12*(0.17)
Regulatory	-	-	1.74*(0.14)	1.75*(0.14)	1.88*(0.15)
Seat Belt	-	-	1.05 (0.12)	1.05 (0.12)	1.38*(0.16)
Investigation	-	-	7.16*(0.59)	7.19*(0.59)	5.85*(0.49)
Other	-	-	2.49*(0.26)	2.47*(0.26)	2.37*(0.25)
Officer Type					
Black Disparity [†]	-	-	-	0.97 (0.14)	0.89 (0.13)
White Disparity [†]	-	-	-	1.12 (0.17)	1.05 (0.16)
Time					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
Constant	0.04*(0.00)	0.25*(0.02)	0.12*(0.01)	0.12*(0.01)	0.17*(0.02)
N	46,201	46,201	46,201	46,201	46,031
Pseudo R²	0.01	0.06	0.15	0.15	0.16

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	1.54*(0.18)	1.52*(0.17)	1.28*(0.15)	1.28*(0.15)	1.20 (0.14)
Hispanic	1.23 (0.29)	1.11 (0.27)	0.75 (0.18)	0.75 (0.18)	0.78 (0.19)
Age	-	0.95*(0.00)	0.96*(0.00)	0.96*(0.00)	0.97*(0.00)
Stop Purpose					
Speed Limit	-	-	-	-	-
Stop Light	-	-	1.07 (0.36)	1.07 (0.36)	1.06 (0.36)
Impaired	-	-	79.66*(16.82)	79.66*(16.83)	32.67*(7.36)
Movement	-	-	4.41*(0.97)	4.40*(0.97)	3.36*(0.76)
Equipment	-	-	5.51*(1.02)	5.50*(1.02)	3.30*(0.64)
Regulatory	-	-	2.25*(0.41)	2.25*(0.41)	2.59*(0.48)
Seat Belt	-	-	2.28*(0.67)	2.28*(0.67)	3.37*(1.02)
Investigation	-	-	15.29*(2.99)	15.27*(2.99)	9.16*(1.86)
Other	-	-	4.36*(1.06)	4.34*(1.07)	3.71*(0.93)
Officer Type					
Black Disparity [†]	-	-	-	1.21 (0.41)	1.04 (0.35)
White Disparity [†]	-	-	-	1.04 (0.42)	1.01 (0.40)
Time					
Hour of Day	-	-	-	-	Included
Day of Week	-	-	-	-	Included
Constant	0.01*(0.00)	0.06*(0.01)	0.02*(0.00)	0.02*(0.00)	0.03*(0.03)
N	27,408	27,408	27,408	27,408	27,090
Pseudo R²	0.00	0.03	0.14	0.14	0.18

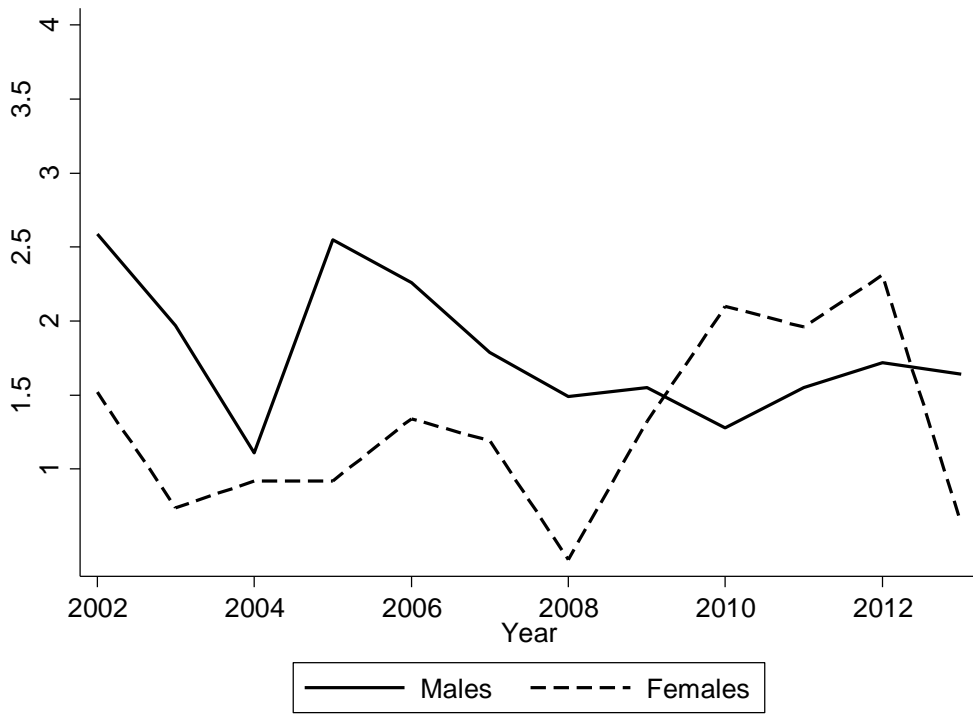
Note: Entries are odds-ratios, with standard errors in parenthesis.

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	1,280	58.75	35.78
Speed Limit	153	54.25	41.18
Stop Light/Sign	47	48.94	40.43
Driving Impaired	67	59.70	32.84
Safe Movement	151	56.29	35.76
Vehicle Equipment	215	65.58	31.16
Vehicle Regulatory	187	55.08	40.11
Seat Belt	87	63.22	34.48
Investigation	277	59.93	33.21
Other Vehicle	94	57.45	38.30

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

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	50,642	-	75.52	18.71	-
Total Searches	2,389	4.72	4.22	7.31	1.73
Speed Limit	15,368	2.21	1.97	3.82	1.94
Stop Light/Sign	3,829	2.12	2.04	3.46	1.70
Driving Impaired	694	43.52	47.38	30.67	0.65
Safe Movement	3,909	6.32	5.66	9.87	1.74
Vehicle Equipment	5,659	6.52	6.04	9.12	1.51
Vehicle Regulatory	10,982	3.51	2.88	6.23	2.16
Seat Belt	4,806	2.43	2.03	4.11	2.02
Investigation	2,573	15.12	14.62	19.52	1.34
Other Vehicle	2,822	5.63	5.47	7.07	1.29

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

Purpose	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	29,327	-	74.98	18.47	-
Total Searches	412	1.40	1.33	2.01	1.51
Speed Limit	11,435	0.48	0.43	0.78	1.81
Stop Light/Sign	2,382	0.46	0.44	0.93	2.11
Driving Impaired	228	25.88	32.34	8.70	0.27
Safe Movement	1,888	1.91	2.11	1.95	0.92
Vehicle Equipment	2,638	2.81	3.11	2.54	0.82
Vehicle Regulatory	7,208	1.01	0.64	2.56	4.00
Seat Belt	1,392	1.08	1.22	0.81	0.66
Investigation	853	7.27	7.67	7.55	0.98
Other Vehicle	1,303	2.07	1.94	2.87	1.48

Table A4. Type of Search by Race: Men

Search Type	Number	% Total	% White	% Black	Ratio
					Black:White
Total Stops	50,642	-	75.52	18.71	-
Total Searches	2,389	4.72	4.22	7.31	1.73
Consent	1,164	2.30	2.01	3.93	1.96
Search Warrant	4	0.01	0.01	0.01	1.00
Probable Cause	465	0.92	0.81	1.47	1.81
Incident to Arrest	714	1.41	1.33	1.73	1.30
Protective Frisk	42	0.08	0.06	0.18	3.00

Table A5. Type of Search by Race: Women

Search Type	Number	% Total	% White	% Black	Ratio Black:White
Total Stops	29,327	-	74.98	18.47	-
Total Searches	412	1.40	1.33	2.01	1.51
Consent	179	0.61	0.58	0.87	1.50
Search Warrant	1	-	-	-	-
Probable Cause	68	0.23	0.19	0.41	2.16
Incident to Arrest	154	0.53	0.54	0.63	1.17
Protective Frisk	10	0.03	0.02	0.11	5.50

Figure A6. Stops by Day of the Week

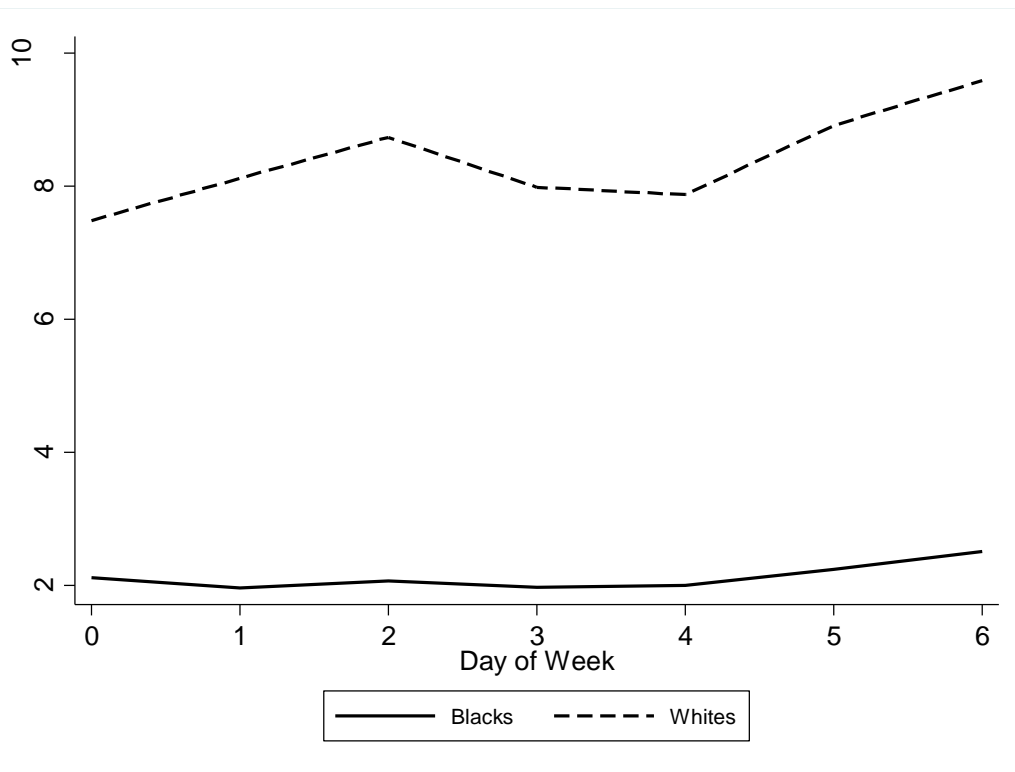


Figure A7. Searches by Day of the Week

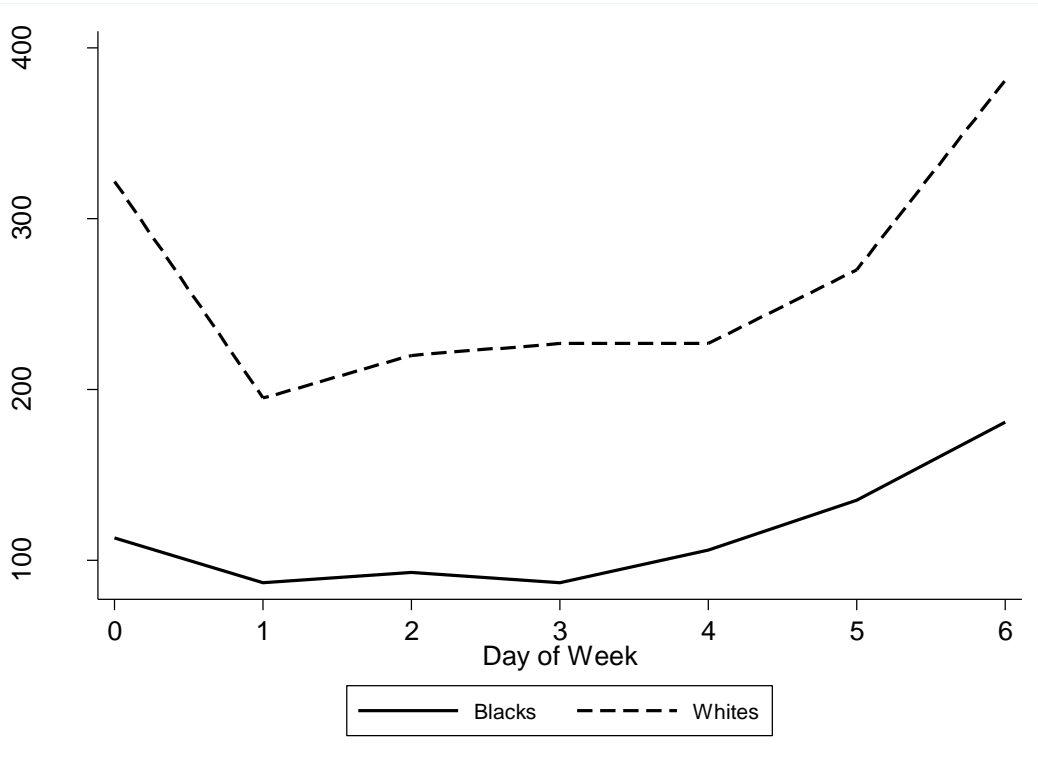
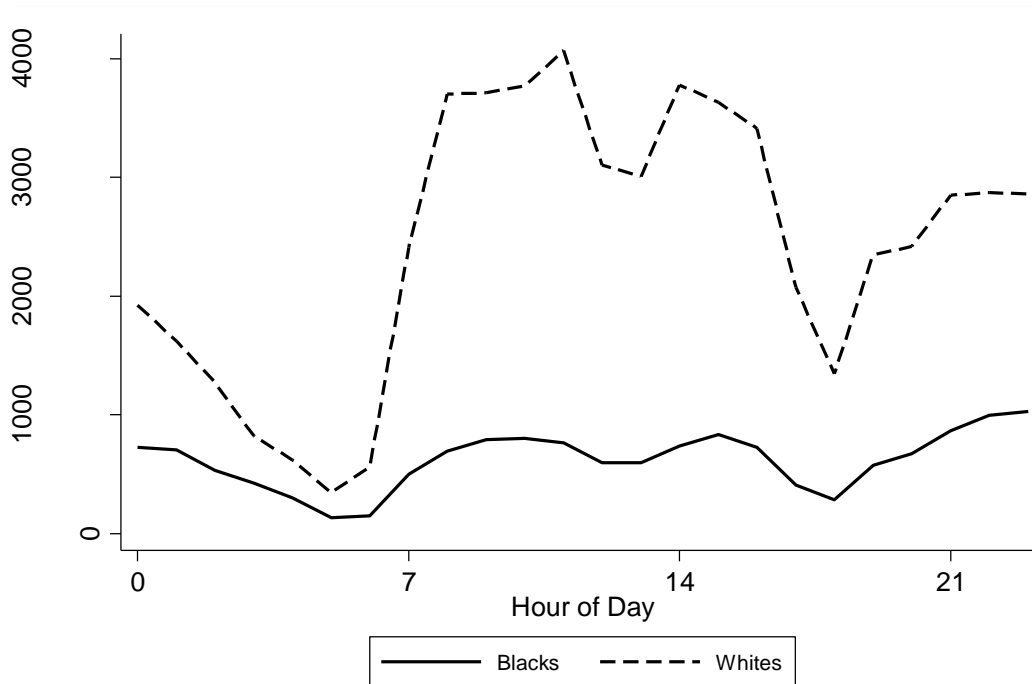


Figure A8. Stops by Hour of the Day



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

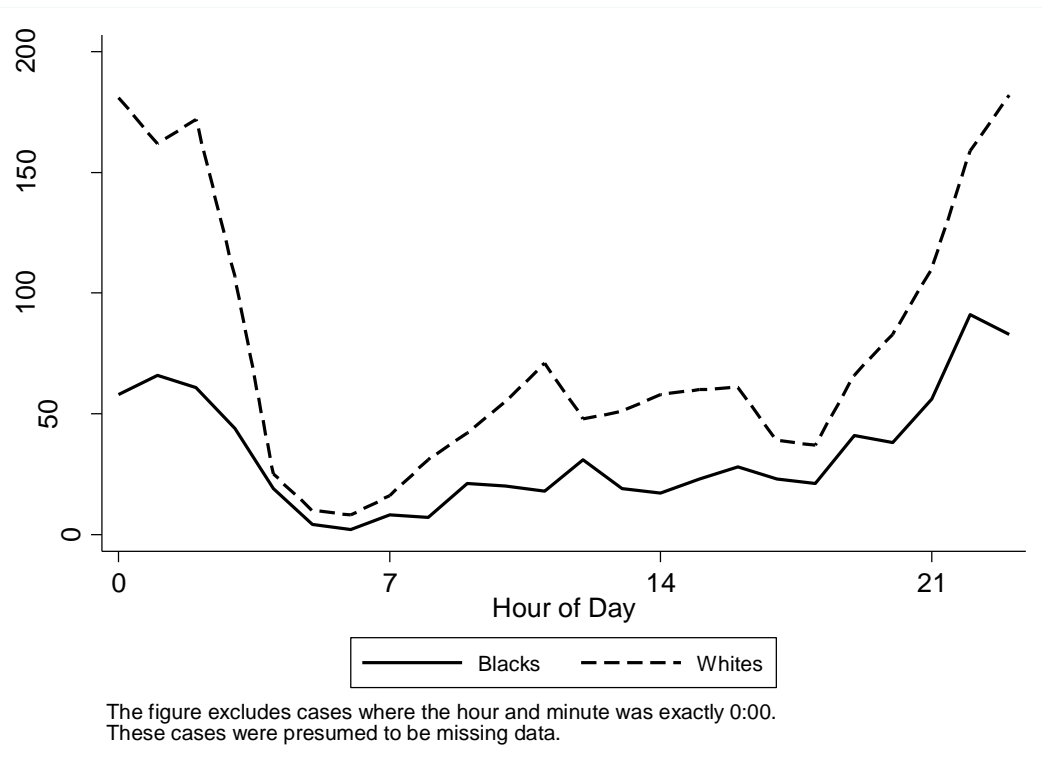


Figure A10. Correlation Between Percent Difference in Likelihood of Black Men being Searched as Compared to Whites and Odds-Ratios from Logistic Regression

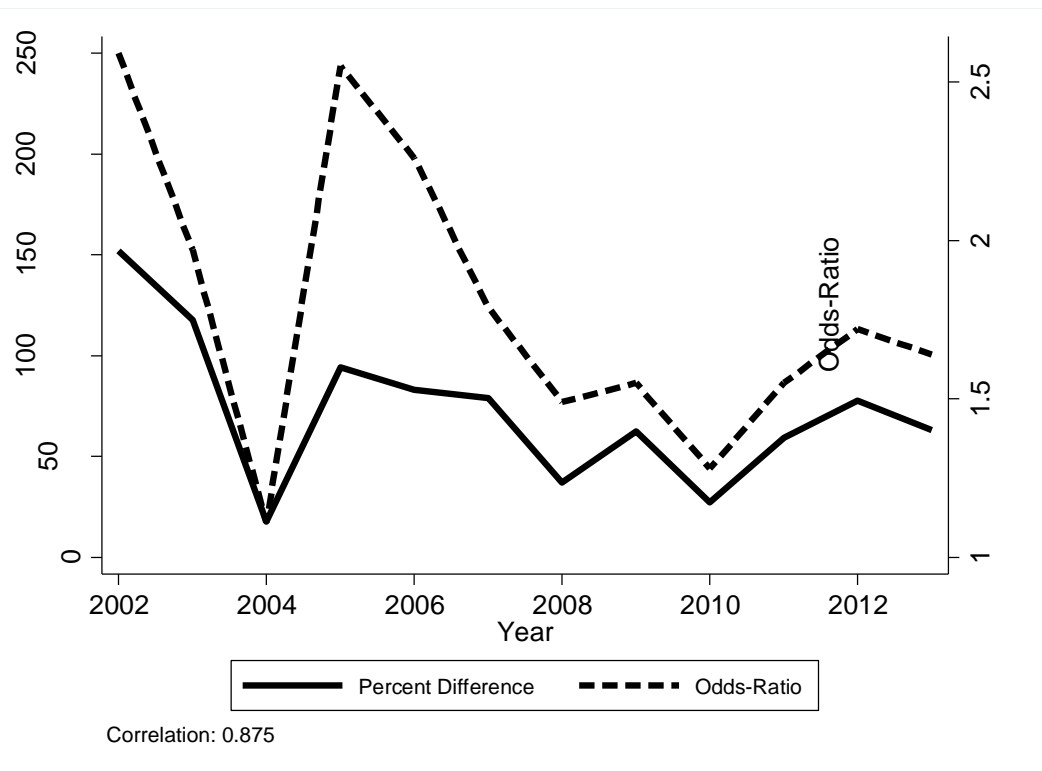


Figure A11. Correlation Between Percent Difference in Likelihood of Black Women being Searched as Compared to Whites and Odds-Ratios from Logistic Regression

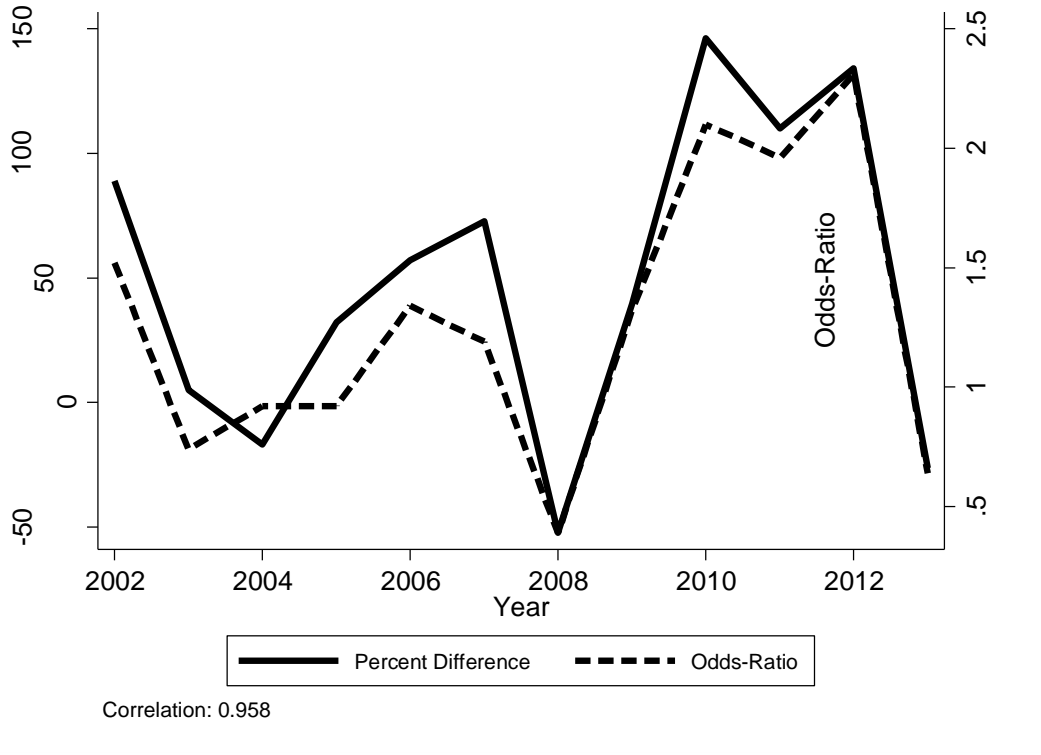


Figure A12. Racial Differences in the Likelihood of Search: Consent Searches Only

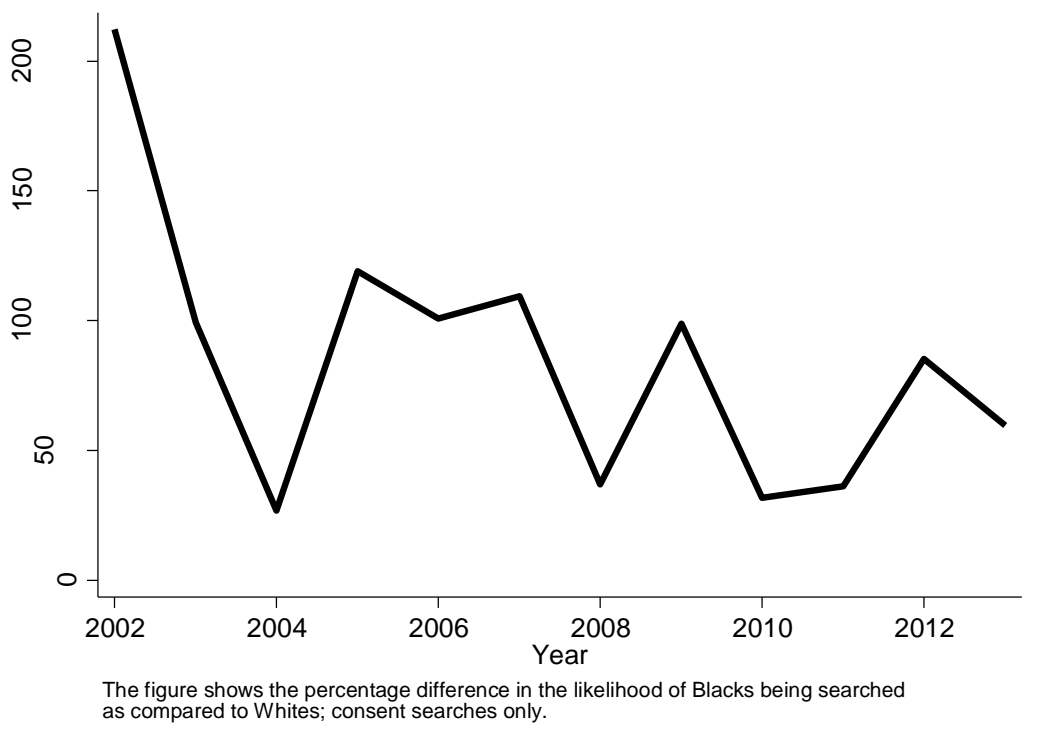


Table A6. Likelihood of Finding Contraband Given a Search, by Race

Contraband	Number	% Total	% White	% Black
Yes	799	28.53	29.70	26.56
No	2,002	71.47	70.30	73.44
Total	2,801	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	56,872	3.41	27.42	13.84	54.81	0.51	100.0
Black	No	14,093	5.07	33.02	12.10	48.98	0.82	100.0
Total	No	77,168	3.71	28.40	13.22	54.11	0.55	100.0
White	Yes	1,842	3.31	12.05	4.23	39.25	41.15	100.0
Black	Yes	802	4.49	16.21	3.49	42.02	33.79	100.0
Total	Yes	2,801	3.64	13.14	3.93	39.91	39.38	100.0