

**Intersectional Encounters
Representative Bureaucracy and the Routine Traffic Stop
Policy Studies Journal, 2020**

On-Line Appendix

This appendix has two parts: Part A assesses the robustness of the findings by excluding stops associated with less discretionary searches: “investigatory” and “driving while intoxicated” stop purposes. Part B explores in more detail the combinations of intersectional identities apparent in Tables 3 and 4 and Figure 5 in the main text.

Part A. Robustness Tests

We present two sets of robustness tests here. First, to assess a concern that some stops and searches are not as discretionary as others, we replicate our analysis while omitting all stops where the purpose was classified as “investigation” or “driving while intoxicated.” As Table A-1 shows, these stops have very high rates of search, which may not reflect the same degree of discretion on the part of the officer. Indeed, these two stop purposes generate the highest search rates, by far.

Table A-1. Search Rates by Stop Purpose.

Stop Purpose	Traffic Stops	Percent Leading to Search
Speeding	23,039	1.32
Stop Light/Sign	9,063	3.33
Safe Movement	5,650	3.93
Check Point	311	4.50
Vehicle Regulatory	34,801	4.93
Vehicle Equipment	10,078	6.84
Other	2,061	7.57
Seat Belt	931	8.70
Investigation	2,001	16.74
Driving While Impaired	121	50.41
Total	88,056	4.41

Tables A-2 to A-5 and Figures A-1 to A-5 replicate the analysis from each of the tables and figures in the main text while excluding the 2,122 stops associated with Investigations and DWI stops.¹ In a second test, we assess the effect of including non-discretionary searches in the analysis. The 2016-17 CMPD database used in the main article does not give information about the type of search. Therefore, we rely on the 2002-2016 database collected by Baumgartner et al. (2018), which allows us to focus on probable cause and consent searches only. Table A-6 shows the results of a standard regression replicating the spirit of the analysis presented in the main text with all available data for the CMPD, then eliminates years before 2016, then eliminates all searches other than consent and probable cause searches.

In all cases, results confirm those shown in the main text. In fact, the odds ratios for Black male drivers increase as the filters are progressively applied. If anything, therefore, the analysis presented in the main text under- rather than over-estimates any apparent bias that could come from including non-discretionary searches or stops. It is impossible to replicate the analysis completely because the 2002—2016 database does not include information about officers. The key point therefore is whether the results change when the non-discretionary stops and searches are excluded, and we confirm that they remain substantively powerful, or even increase in strength.

¹ Note: In the paper we refer to “investigatory” stops, borrowing language from Epp et al. 2014, distinguishing moving violations (speeding, stop light / sign, safe movement, and DWI) from all other types of stops, most of which are equipment or regulatory. “Investigation” stops refer to cases where officers are looking for a specific suspect or person / car fitting a description of a criminal suspect, and are one of ten stop purposes specified in the state form that North Carolina mandates after a traffic stop. These stops, therefore, have low discretion and are perhaps better considered criminal investigations rather than traffic stops. For these reasons, we exclude them here and replicate our analyses.

Table A-2. Robustness test for Table 1.

	Traffic Stops	Searches	Percent Searched
Overall	85,934	3,485	4.06
Driver Characteristics			
White	26,699	392	1.47
Black	47,476	2,791	5.88
Hispanic	8,458	272	3.22
Other	3,301	30	0.91
Male	50,219	2,899	5.77
Female	35,715	586	1.64
Less than 35 years old	45,772	2,621	5.73
35 years old or older	40,162	864	2.15
Investigatory stop	48,182	2,657	5.51
Safety stop	37,752	828	2.19
Officer Characteristics			
White	61,150	2,823	4.62
Black	15,509	325	2.24
Hispanic	3,760	154	4.10
Asian-American	5,041	115	2.28
Other or unknown race	1,474	68	4.61
Male	78,556	3,265	4.16
Female	7,378	220	2.98
White male	55,350	2,647	4.78
Black male	13,580	301	2.22
White female	5,800	176	3.02
Black female	929	24	2.58
Other or unknown race	10,275	337	3.33
Less than 5 years of service	26,937	1,565	5.81
Five to 13 years of service	29,973	1,615	5.39
14 or more years of service	29,024	305	1.05
Officer-Driver Combinations			
White officer, White driver	19,092	317	1.66
White officer, Black driver	33,864	2,289	6.76
White officer, Other race driver	8,194	217	2.65
Black officer, White driver	4,532	29	0.64
Black officer, Black driver	8,078	263	3.26

Patrol Districts

Central	4,133	162	3.92
Eastway	8,874	301	3.39
Freedom	3,983	231	5.80
Hickory Grove	7,176	407	5.67
Independence	5,358	234	4.37
Metro	3,979	467	11.74
North	7,157	135	1.89
North Tryon	6,758	488	7.22
Providence	10,131	155	1.53
South	9,254	92	0.99
Steele Creek	5,804	203	3.50
University City	5,500	147	2.67
Westover	6,635	424	6.39
Missing	1,192	39	3.27

Table A-3. Robustness test for Table 2. Predicting the Likelihood of Search, Arrest, and Fruitless Search.

	Search		Arrest		Fruitless Search	
	Odds- Ratio		Odds- Ratio		Odds- Ratio	
	(SE)	Prob.	(SE)	Prob.	(SE)	Prob.
Officer is White Male	1.89 (.08)	.000	1.43 (.09)	.000	1.96 (.10)	.000
Officer years of service	0.93 (.00)	.000	0.96 (.00)	.000	0.92 (.00)	.000
Investigatory stop purpose	1.55 (.07)	.000	1.25 (.08)	.000	1.67 (.09)	.000
Driver is less than 35 years old	2.47 (.10)	.000	1.94 (.11)	.000	2.52 (.12)	.000
Driver is Black female	1.38 (.15)	.004	0.94 (.13)	.659	1.50 (.20)	.003
Driver is Hispanic female	0.88 (.18)	.516	0.51 (.15)	.024	1.03 (.24)	.916
Driver is female of another race	0.97 (.33)	.934	0.90 (.36)	.791	1.02 (.41)	.953
Driver is White male	1.98 (.23)	.000	1.41 (.20)	.014	1.91 (.27)	.000
Driver is Black male	5.54 (.57)	.000	3.00 (.36)	.000	5.67 (.71)	.000
Driver is Hispanic male	2.85 (.34)	.000	1.96 (.29)	.000	2.81 (.41)	.000
Driver is male of another race	0.86 (.21)	.555	0.77 (.23)	.376	0.97 (.28)	.913
Patrol Districts						
Central	0.69 (.13)	.044	1.00 (.31)	.987	0.70 (.14)	.098
Eastway	0.69 (.12)	.037	1.06 (.31)	.839	0.65 (.14)	.041
Freedom	1.11 (.20)	.559	1.73 (.52)	.066	1.02 (.22)	.936
Hickory Grove	0.99 (.17)	.935	1.48 (.43)	.182	0.89 (.18)	.583
Independence	1.01 (.18)	.958	1.85 (.54)	.037	0.91 (.19)	.649
Metro	1.99 (.34)	.000	1.80 (.53)	.046	2.07 (.42)	.000
North	0.38 (.07)	.000	0.69 (.21)	.232	0.40 (.09)	.000
North Tryon	1.09 (.19)	.636	1.52 (.44)	.148	1.02 (.21)	.905

Providence	0.49 (.09)	.000	0.75 (.23)	.351	0.46 (.10)	.000
South	0.35 (.07)	.000	0.58 (.18)	.086	0.33 (.08)	.000
Steele Creek	0.87 (.159)	.440	1.14 (.34)	.670	0.86 (.18)	.469
University City	0.45 (.08)	.000	0.83 (.25)	.550	0.44 (.10)	.000
Westover	1.20 (.21)	.292	2.12 (.61)	.010	1.04 (.21)	.839
Constant	0.009 (.002)	.000	0.005 (0.002)	.000	0.006 (.001)	.000
N		85,934		85,934		85,934
Log Likelihood		-12236		-6813		-9533
LR Chi-2	(24)	4695	(24)	1168	(24)	3624
Pseudo-R2		.1610		.0790		.1597

Note: Omitted categories, or baselines, are: Officer Race, “other than White male”; Driver race-gender: “White female”; Patrol District, “missing”.

Table A-4. Robustness test for Table 3.

Category			Search Rates		N
Driver Race	White	Black	1.47	5.88	74,175
Driver Sex	Female	Male	1.64	5.77	85,934
Driver Age	Old	Young	2.20	5.84	85,934
Officer is White Male	No	Yes	2.74	4.78	85,934
Officer Years of Service	High	Low	2.14	5.96	85,934
Safety v. Investigatory Stop	Safety	Investigatory	2.19	5.51	85,934
Low Search Neighborhood	Yes	No	1.44	5.22	85,934
High Search Neighborhood	No	Yes	3.68	11.74	85,934

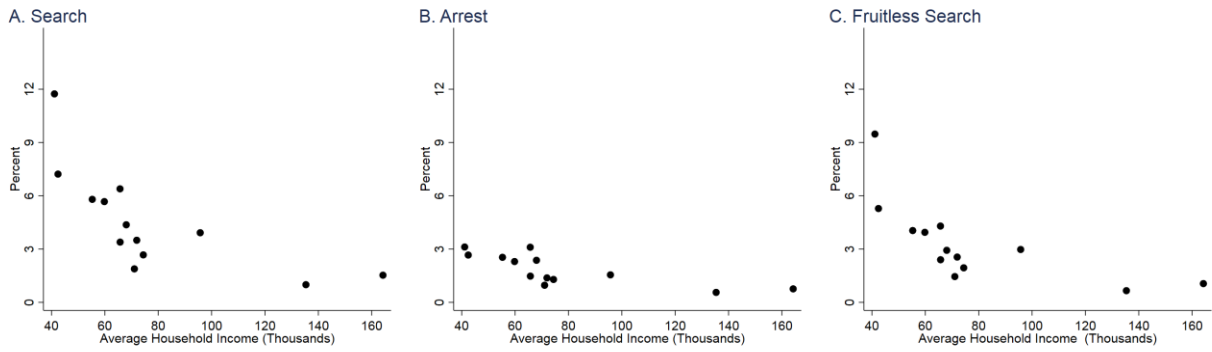
Note: Figures show the observed percent of drivers searched. Age is split at its median: 33 years old and younger are “young”; those 34 and older are “old.” Officer years of service is similarly split at its median: 8 years and less is “low”; 9 years and more is “high.” Low search neighborhoods are the patrol districts of North, Providence, and South. Metro is the only high search neighborhood.

Table A-5. Robustness test for Table 4.

Number of Targeted Characteristics	N	Percent Searched
None	185	0.00
One	2,751	0.18
Two	8,475	0.33
Three	13,795	0.90
Four	17,029	1.75
Five	16,283	4.54
Six	11,097	9.68
Seven	4,209	18.79
Eight	351	33.33
Total	74,175	4.29

The number of targeted characteristics is the count of such characteristics from Table A-4.

Figure A-1. Robustness Test for Figure 1.



Correlations as reported in the text with income: $-.70$, $-.75$, $-.67$.

Figure A-2. Robustness test for Figure 2.

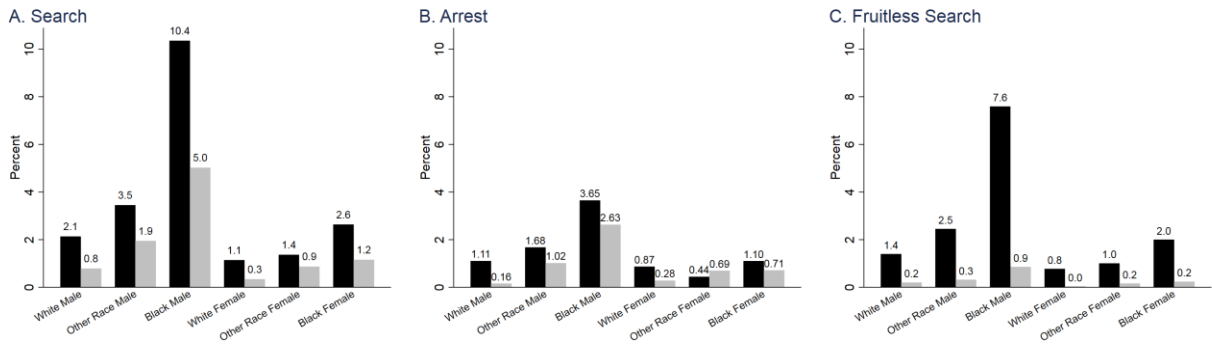


Figure A-3. Robustness test for Figure 3.

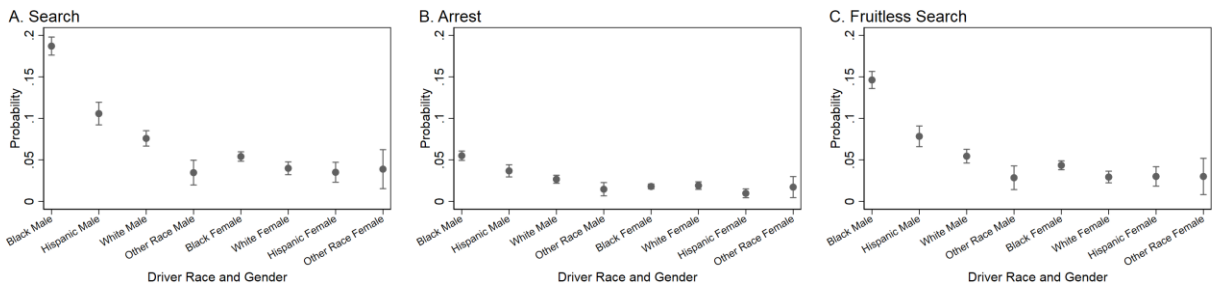


Figure A-4. Robustness test for Figure 4.

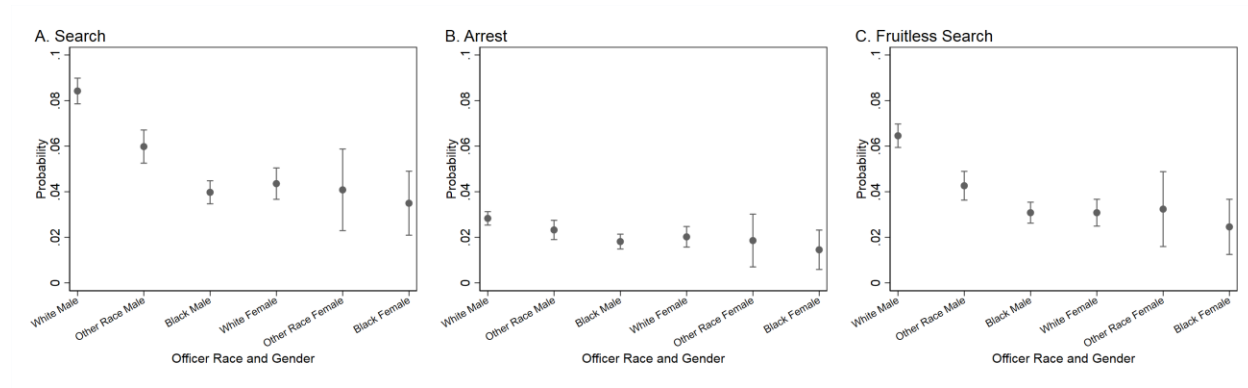


Figure A-5. Robustness test for Figure 5.

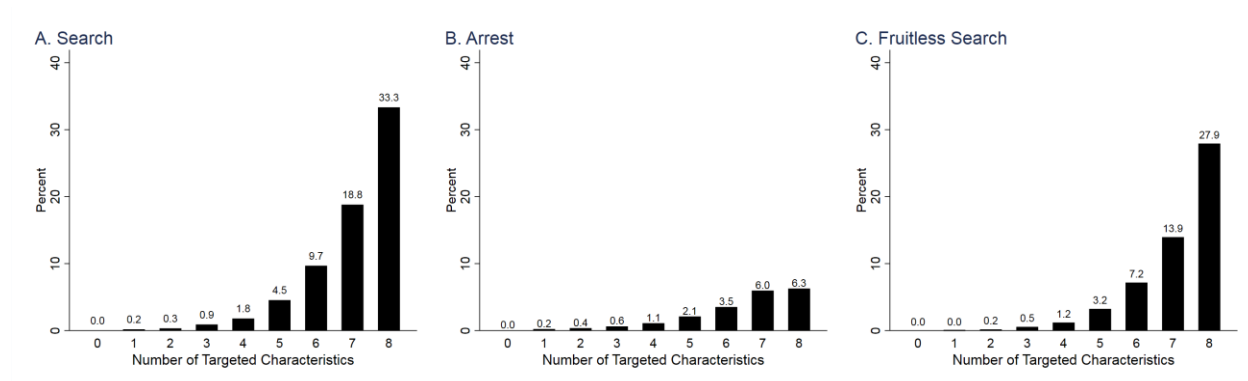


Table A-6. Regressions predicting a search following a traffic stop.

Driver characteristics	Model 1	Model 2	Model 3	Model 4
Black female	1.19 (.02)	1.61 (.14)	1.70 (.16)	1.79 (.18)
Hispanic female	0.49 (.02)	0.70 (.13)*	0.83 (.15)++	0.83 (.17)++
Other race female	0.40 (.03)	0.53 (.18)+	0.67 (.22)++	0.80 (.27)++
White male	2.15 (.03)	2.34 (.20)	2.27 (.21)	2.35 (.24)
Black male	5.52 (.08)	6.87 (.54)	7.25 (.61)	7.83 (.72)
Hispanic male	2.31 (.04)	2.65 (.25)	2.95 (.30)	2.77 (.31)
Other race male	1.35 (.04)	1.05 (.18)++	0.96 (.19)++	0.84 (.19)++
Age (in years)	0.96 (.00)	0.95 (.00)	0.95 (.00)	0.95 (.00)
Stop purpose	Included	Included	Included	Included
Hour of day	Included	Included	Included	Included
Constant	0.059 (.001)	0.085 (.010)	0.85 (.010)	0.68 (0.01)
N	1,704,765	86,138	83,604	83,076
Log Likelihood	-383,492	-16,180	-14,829	-13,494
LR Chi-2	(39) 155,034	(39) 8,475	(37) 6,987	(37) 6,659
Pseudo-R2	.168	.208	.191	.198

Note: Entries are logistic odds ratios, with standard errors in parentheses. All coefficients

are significant at .000 unless otherwise indicated. * prob. < .05; + prob. < .10; ++, n.s. Model 1:

CMPD, 2002–2016; Model 2 includes only 2016; model 3 further excludes DWI and

Investigation stops; Model 4 further excludes searches other than probable cause and consent.

The omitted (baseline) category for driver race and gender is White female.

Part B. Explorations of Intersectional Identities from Tables 3 and 4, and Figure 5.

Here we provide further detail associated with Tables 3 and 4, as well as Figure 5. First, we present the data from Table 3, restricted to Arrests and Fruitless Searches; the main text table presents only Searches. Results confirm the main findings. Then, we explore in greater detail the different combinations of additional targeted characteristics for individuals with different intersectional identities. These results show the correlations among targeted characteristics; those with certain identities are more likely to have additional identities or characteristics making them more vulnerable to police oversight. This exploration highlights the reasons why an intersectional approach is warranted.

Table 3-A. Observed Rates of Arrest by Targeted v. Non-Targeted Characteristics.

Category			Arrest Rates		N
Driver Race	White	Black	1.14	2.63	75,776
Driver Sex	Female	Male	1.02	2.76	88,056
Driver Age	Old	Young	1.37	2.69	88,056
Officer is White Male	No	Yes	1.58	2.30	88,056
Officer Years of Service	High	Low	1.44	2.64	88,056
Safety v. Investigatory Stop	Safety	Investigatory	1.38	2.54	88,056
Low Search Neighborhood	Yes	No	0.91	2.65	88,056
High Search Neighborhood	No	Yes	1.96	3.72	88,056

Note: See Table 3 in the main text.

Table 3-B. Observed Rates of Fruitless Search by Targeted v. Non-Targeted Characteristics.

Category			Fruitless Search Rates		N
Driver Race	White	Black	1.04	4.46	75,776
Driver Sex	Female	Male	1.27	4.29	88,056
Driver Age	Old	Young	1.61	4.40	88,056
Officer is White Male	No	Yes	2.00	3.61	88,056
Officer Years of Service	High	Low	1.50	4.56	88,056
Safety v. Investigatory Stop	Safety	Investigatory	1.46	4.23	88,056
Low Search Neighborhood	Yes	No	1.11	3.89	88,056
High Search Neighborhood	No	Yes	2.72	9.52	88,056

Note: See Table 3 in the main text.

Table 4 and Figure 5 in the manuscript present evidence relating searches, fruitless searches, and arrests to the total number of accumulated risk factors associated with each driver. One could question whether the factors themselves are associated with additional risk. Table 4-A shows, for each of the eight risk factors identified in the article, the average number of additional risk factors for drivers with the given characteristic. It also shows the difference between the low- and high-risk group. For example, White drivers have an average of 3.06 risk factors and Black drivers have an additional 3.82, not counting race. Therefore, the average Black driver is disadvantaged in an encounter with the police by more than only their race; they have 0.76 additional risk factors, in addition to the one associated with race. The table shows that race, stop type, and location are the risk factors most strongly associated with higher numbers of additional risk factors. Sex, age, and officer characteristics, on the other hand, are not associated with highly elevated additional risk factors.

Table 4-A. Average Number of Additional Targeted Characteristics, by Group.

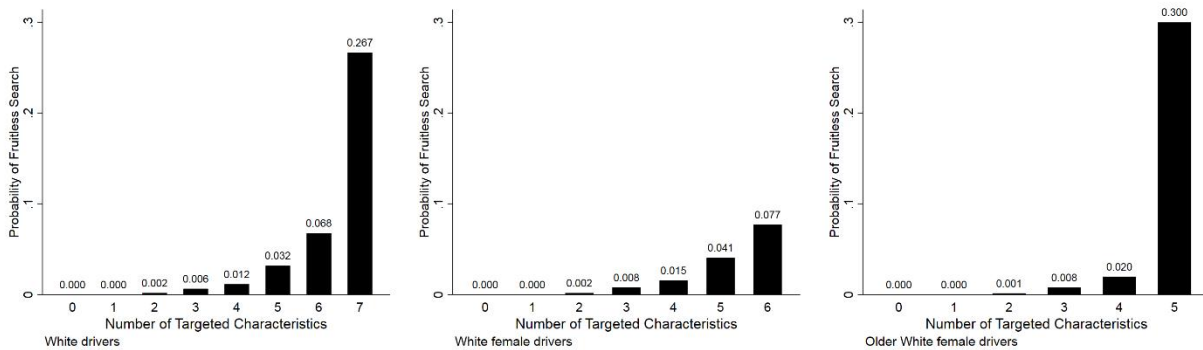
Category	Non-Targeted Category	Targeted Category	Average Number of Additional Targets		Difference
Driver Race	White	Black	3.06	3.82	.76
Driver Sex	Female	Male	3.55	3.67	.12
Driver Age	Old	Young	3.54	3.83	.29
Officer is White Male	No	Yes	3.65	3.49	-.14
Officer Years of Service	High	Low	3.49	3.87	.38
Safety v. Investigatory Stop	Safety	Investigatory	3.26	3.86	.60
Low Search Neighborhood	Yes	No	3.01	3.73	.72
High Search Neighborhood	No	Yes	4.10	4.94	.84

Note: From Table 3, the average number of targets is 4.19, based on a scale of 0 to 8. The scale here is 0 to 7, since each category includes a targeted group scoring 1 on the more complete scale. Note also that the difference does not count the risk factor associated with the characteristic in question, which by definition is 1. So, for example, those stopped in a high-search neighborhood have 1.84 more risk factors, on average, than those stopped in other areas

of the city, and those stopped in the Metro district have an additional 1.72 risk factors, on average, than those stopped in the four districts associated with the lowest chance of search. Thus, the total average difference between those stopped in the lowest and highest search neighborhoods of the city is very large: $1.84 + 1.72 = 3.56$.

Figures 5-A and 5-B explore different combinations of identities, showing the search rates for individuals of a given characteristic (e.g., race, sex, age group) or set of characteristics (e.g., black males, white females), controlling for the number of additional risk factors they exhibit. Note that for the non-targeted groups, targeted characteristics range from zero to higher numbers (7 for single characteristics, 6 if two characteristics are considered, 5 if three, and so on), but for targeted groups, the number of risk factors starts at 1, 2, or 3 and goes to 8. Figure 5-C compares additional risk factors for those stopped in low- and high-search neighborhoods.

Figure 5-A. White drivers, white female, and older white female drivers.²



² Note: the spike in search rates for older white female drivers results from 3 of 10 such drivers being stopped in the Metro district by white male officers for investigatory purposes. There were, however, only 10 such stops.

Figure 5-B. Black drivers with different numbers of additional risk factors.

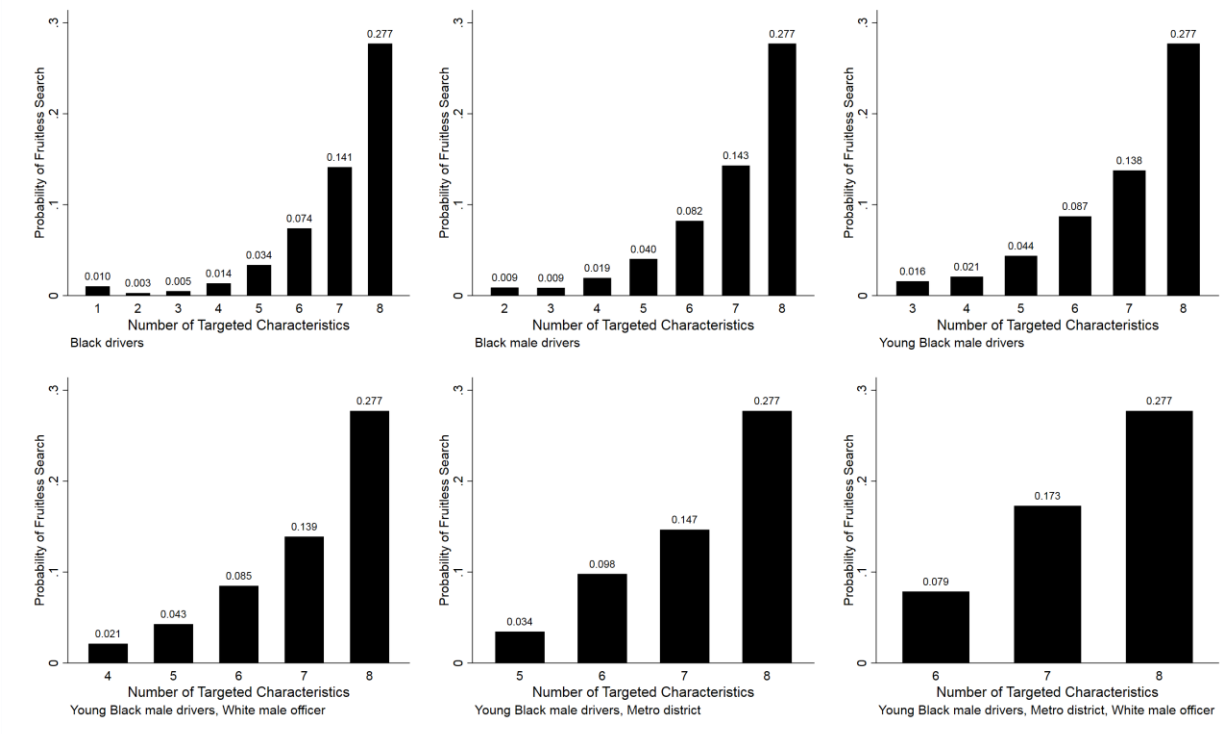


Figure 5-C. Fruitless search rates for those stopped in low and high search neighborhoods, based on targeted characteristics.

