

At the Intersection: Race, Gender, and Discretion in Police Traffic Stop Outcomes

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Appendix A: Data Loss Description

This appendix shows the number of observations lost for each decision made in the data cleaning process.

Table A1: Data loss when dropping certain cases for men

Variable	CT	MD	IL	NC
Starting N	857,923	2,854,963	25,400,365	20,214,202
Males only	311,389	1,032,395	8,909,385	7,293,627
No Hispanics	71,832	172,797	2,180,729	1,195,504
No “other” races	32,613	125,766	567,751	424,446
Agency restrictions	-	-	1,641,148	548,000
Other missing variables	2,162	275,847	460,744	5,671,621
Final N	439,927	1,248,158	11,640,608	5,081,004

Table A2: Data loss when dropping certain cases for women

Variable	CT	MD	IL	NC
Starting N	857,923	2,854,963	25,400,365	20,214,202
Females only	546,534	1,822,568	16,490,980	12,920,575
No Hispanics	40,406	54,076	772,034	348,812
No “other” races	18,762	59,315	267,164	204,848
Agency restrictions	-	-	1,803,352	521,310
Other missing variables		173,951	147,805	3,091,637
Final N	252,221	745,053	5,919,030	3,127,020

Appendix B: North Carolina Model Specification Excluding Stop Time of Day

North Carolina presents a distinct problem with regards to the time of day variable as compared to the other states. In North Carolina, in over half of the observations, the time of day of the stop is missing, largely because the State Highway Patrol omits this variable from its reports. As a result, to examine whether the inclusion of this variable meaningfully effects the results, we refit the models and exclude the time of day variable. By excluding the hour variable, we gain 6,286,430 observations, over two times the number of observations in main model. As table B1 shows, this does not impact the general findings. Blacks are still searched more than whites. Drivers in investigatory stops are searched more than drivers in safety stops. The interaction is still positive and significant.

Table B1. Fixed Effect Male Search Logistic Regression without Hour of Day

	NC
Intercept	-2.34** (0.04)
Black Driver	0.60** (0.01)
Investigatory Stop	0.34** (0.00)
Black * Invest. Stop	0.16** (0.01)
Driver Age	-0.03** (0.00)
Black Disparity Officer	0.41** (0.00)
Agency Fixed Effects	Yes
Day of the Week Control	Yes
AIC	3,149,000
Number of Stops	10,746,688

Table B2 shows the same analysis but for women, which can be compared to table C3 in the online appendix. No variables change direction or significance as a result of the data lost due to the hour variable.

Table B2. Fixed Effect Female Search Logistic Regression without Hour of Day

	NC
Intercept	-3.30** (0.09)
Black Driver	-0.03** (0.01)
Investigatory Stop	0.54** (0.01)
Black * Invest. Stop	0.15** (0.01)
Driver Age	-0.03** (0.00)
Black Disparity Officer	0.35** (0.01)
Agency Fixed Effects	Yes
Day of the Week Control	Yes
AIC	846,500
Number of Stops	6,215,515

Table B3 replicates the contraband analysis for men without the hour variable, which can be compared to table 6 in the main text. No variables change direction or significance as a result of the data lost due to the hour variable.

Table B3. Fixed Effect Male Contraband Logistic Regression without Hour of Day

	NC
Intercept	-0.62** (0.02)
Black Driver	0.18** (0.02)
Investigatory Stop	0.21** (0.02)
Black * Invest. Stop	-0.26** (0.02)
Driver Age	-0.01** (0.00)
Black Disparity Officer	0.09** (0.01)
Agency Fixed Effects	Yes
Day of the Week Control	Yes
AIC	271,291
Number of Stops	233,429

Table B4 replicates the contraband analysis for women without the hour variable, which can be compared to table C4 in the online appendix. No variables change direction or significance as a result of the data lost due to the hour variable.

Table B4. Fixed Effect Female Contraband Logistic Regression without Hour of Day

	NC
Intercept	-0.72** (0.06)
Black Driver	0.17** (0.04)
Investigatory Stop	0.38** (0.04)
Black * Invest. Stop	-0.44** (0.05)
Driver Age	-0.01** (0.00)
Black Disparity Officer	0.15** (0.03)
Agency Fixed Effects	Yes
Day of the Week Control	Yes
AIC	37,984
Number of Stops	35,403

Appendix C: Race-Gender Model

In this appendix we replicate our analysis on males and females at the same time. In this model we use the same variables as the main analysis¹, except we expand our race coding to include 4 dummy variables: White men (WM, the reference group), White women (WW), Black men (BM), and Black women (BW). We interact these race-gender categories with the investigatory stop variables to investigate the search disparities between groups and across stop type. Table C1 shows the results of the logistic regression predicting whether a driver was searched. To summarize the results shortly, we find see similar patterns to our main analysis. Women tend to be searched less, and Blacks (especially men) tend to be searched more, especially in investigatory stops. We see mixed results for the effect of investigatory stops on White men. In CT and NC we see that WM are statistically more likely to be searched, in MD we see the opposite, and in IL we see no change. For safety stops we see that Black and White women are always less likely to be searched than White men (with the exception of Black women in IL where we see no difference). We also see that Black men are always more likely to be searched than their White counterparts. We see slightly more complicated results in investigatory stops. White and Black women in IL and NC are targeted more in investigatory stops than White men. We also see that Black men are targeted even more in investigatory stops than safety stops. This analysis is in line with our main findings. Black men tend to be searched more, and this is exacerbated in investigatory stops.

Table C2 reports the results for a logistic regression predicting whether contraband is found conditional on a search already having been performed, using the same race-gender categories.

¹ We had to raise the stop threshold for agencies in IL to 50,000 stops to account for the increased number of observations.

We find results consistent with those in the main text. Black male driver are less likely to be found with contraband, except in NC. Women are less likely to be found with contraband. In investigatory stops we see that Black men are less likely to be found with contraband as compared to safety stops, further highlighting the baseless nature of the searches targeted at the group.

Table C1. Logistic Regression Predicting Search with Race-Gender Categories

	CT	MD	IL	NC
Intercept	-2.30** (0.11)	-1.27** (0.06)	-2.97** (0.04)	-2.09** (0.04)
White-Female	-0.49** (0.03)	-0.57** (0.02)	-0.63** (0.01)	-0.79** (0.01)
Black-Male	0.45** (0.03)	0.31** (0.01)	1.00** (0.00)	0.61** (0.01)
Black-Female	-0.20** (0.05)	-0.72** (0.02)	-0.01 (0.01)	-0.87** (0.00)
Investigatory Stop	0.75** (0.02)	-0.22** (0.01)	0.00 (0.01)	0.10** (0.01)
WF * Invest. Stop	-0.09** (0.04)	0.00 (0.03)	0.12** (0.01)	0.15** (0.01)
BM * Invest. Stop	-0.06 (0.04)	0.29** (0.02)	0.12** (0.01)	0.13** (0.01)
BF * Invest. Stop	-0.34** (0.07)	0.32** (0.03)	0.30** (0.01)	0.23** (0.01)
Driver Age	-0.03** (0.00)	-0.04** (0.00)	-0.02** (0.00)	-0.03** (0.00)
Out of State Driver	0.42** (0.05)	0.00 (0.01)		
High Disparity Officer	0.89** (0.04)	0.63** (0.01)		0.39** (0.00)
Vehicle Age			0.04** (0.00)	
Agency Fixed Effects	Yes	Yes	Yes	Yes
Day of the Week Control	Yes	Yes	Yes	Yes
Hour of the Day Control	Yes	Yes	Yes	Yes
AIC	112,300	527,642	3,217,719	3,616,353
Number of Stops	478,318	1,993,211	12,375,256	8,644,420

Note: * $p < .05$. White male drivers are the reference category for the race-gender dummy variables.

Table C2. Logistic Regression Predicting Contraband with Race-Gender Categories

	CT	MD	IL	NC
Intercept	-0.55** (0.27)	-0.27** (0.06)	0.20 (0.14)	-0.24** (0.04)
White-Female	-0.16* (0.10)	-0.03 (0.04)	-0.04** (0.01)	-0.11** (0.02)
Black-Male	-0.12 (0.09)	-0.07** (0.02)	-0.10** (0.01)	0.14** (0.01)
Black-Female	-0.79** (0.21)	-0.16** (0.04)	-0.26** (0.01)	-0.00 (0.02)
Investigatory Stop	0.15** (0.06)	0.01 (0.02)	-0.08** (0.01)	0.13** (0.01)
WF * Invest. Stop	-0.04 (0.12)	-0.06 (0.06)	-0.07** (0.02)	0.09** (0.02)
BM * Invest. Stop	-0.17 (0.10)	-0.07 (0.04)	-0.16** (0.02)	-0.19** (0.01)
BF * Invest. Stop	-0.17 (0.25)	-0.12* (0.06)	0.31** (0.03)	-0.16** (0.02)
Driver Age	-0.04** (0.00)	-0.02** (0.00)	-0.02** (0.00)	-0.01** (0.00)
Out of State Driver	-0.28** (0.09)	0.12** (0.02)		
High Disparity Officer	-0.08 (0.08)	0.00 (0.03)		0.02** (0.00)
Vehicle Age			0.02** (0.00)	
Agency Fixed Effects	Yes	Yes	Yes	Yes
Day of the Week Control	Yes	Yes	Yes	Yes
Hour of the Day Control	Yes	Yes	Yes	Yes
AIC	14,192	79,541	549,169	538,776
Number of Stops	17,482	66,216	486,244	446,140

Note: * $p < .05$. White male drivers are the reference category for the race-gender dummy variables.

Appendix D: Predicting Searches and Contraband without Agency Fixed Effects.

In this appendix we replicate our analysis without agency stop thresholds. Table D1 shows the results of the logistic regression predicting whether a driver was searched, identical to our main analysis except only we do not impose an agency stop threshold. In order to make this possible it was necessary to drop agency fixed effects. Table D2 does the same for our contraband analysis. By dropping the agency stop thresholds we have a larger N in our IL and NC analysis. The results from this robustness check are similar to the findings in the main paper. We see that Blacks tend to be searched more, and tend to be found with contraband less, and that this relationship is highly gendered.

Table D1. Logistic Regression Predicting being Searched

	Male Drivers				Female Drivers			
	(1) CT	(2) MD	(3) IL	(4) NC	(5) CT	(6) MD	(7) IL	(8) NC
Intercept	-2.72* (0.05)	-1.50* (0.02)	-2.58* (0.00)	-1.82* (0.00)	-3.90* (0.09)	-1.94* (0.04)	-3.30* (0.01)	-2.43* (0.02)
Black Driver	1.05* (0.03)	0.27* (0.01)	0.91* (0.00)	0.54* (0.00)	1.10* (0.05)	-0.25* (0.02)	0.48* (0.00)	-0.15* (0.01)
Investigatory Stop	0.55* (0.02)	-0.22* (0.01)	0.01 (0.01)	0.40* (0.01)	0.49* (0.04)	-0.17* (0.02)	0.10* (0.01)	0.55* (0.01)
Black * Invest. Stop	-0.17* (0.04)	0.33* (0.02)	0.12* (0.01)	0.12* (0.01)	-0.37* (0.07)	0.33* (0.03)	0.25* (0.01)	0.07* (0.01)
Driver Age	-0.02* (0.00)	-0.04* (0.00)	-0.02* (0.00)	-0.03* (0.00)	-0.02* (0.00)	-0.04* (0.00)	-0.02* (0.00)	-0.03* (0.00)
Out of State Driver	-0.17* (0.03)	-0.05* (0.01)			0.21* (0.05)	0.06* (0.02)		
High Disparity Officer	0.48* (0.03)	0.55* (0.02)		0.46* (0.00)	-0.10* (0.09)	0.49* (0.03)		0.38* (0.01)
Vehicle Age			0.04** (0.00)				0.02* (0.00)	
Day of the Week Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hour of the Day Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AIC	101,143	403,454	4,461,885	2,739,344	171,189	134,951	,1548,150	792,951
Number of Stops	439,927	1,248,158	13,392,931	5,566,915	252,221	745,053	7,735,190	3,639,312

Note: * p<.05. White drivers are the reference category for black drivers.

Table D2. Logistic Regression Predicting Finding Contraband Given a Search has Occurred

	Male Drivers				Female Drivers			
	(1) CT	(2) MD	(3) IL	(4) NC	(5) CT	(6) MD	(7) IL	(8) NC
Intercept	-0.61*	-0.19*	-0.25*	-0.49*	-	0.08	-0.17*	-0.54*
	(0.11)	(0.05)	(0.02)	(0.02)	4.30*	(0.10)	(0.04)	(0.04)
Black Driver	-0.48*	-0.09*	-0.07*	0.09*	-	-0.15*	-0.21*	0.06*
	(0.07)	(0.03)	(0.01)	(0.01)	0.78*	(0.05)	(0.02)	(0.03)
Investigatory Stop	0.29*	-0.01	-0.06*	0.11*	0.25*	0.04	-0.13*	0.19*
	(0.05)	(0.03)	(0.01)	(0.01)	(0.09)	(0.05)	(0.02)	(0.02)
Black * Invest. Stop	-0.06	-0.14*	-0.14*	-0.19*	0.08	-0.29*	-0.25*	-0.26*
	(0.10)	(0.04)	(0.01)	(0.01)	(0.16)	(0.07)	(0.03)	(0.03)
Driver Age	-0.05*	-0.03*	-0.02*	-0.01*	-	-0.03*	-0.02*	-0.01*
	(0.00)	(0.00)	(0.00)	(0.00)	0.01*	(0.00)	(0.00)	(0.00)
Out of State Driver	-0.78*	0.10*			-	0.33*		
	(0.08)	(0.03)			0.95*	(0.05)		
High Disp. Officer	0.23*	0.09*		0.00	-0.21	0.23*		-0.00
	(0.08)	(0.03)		(0.00)	(0.19)	(0.06)		(0.02)
Vehicle Age			0.02*				0.03*	
			(0.00)				(0.00)	
Day of the Week Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hour of the Day Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AIC	13,568	64,324	489,581	508,273	9,562	18,011	121,633	108,841
Number of Stops	19,219	51,609	400,086	411,608	4,448	14,607	105,420	90,549