Regression Analysis - Revisions

Corrrelation Matrix

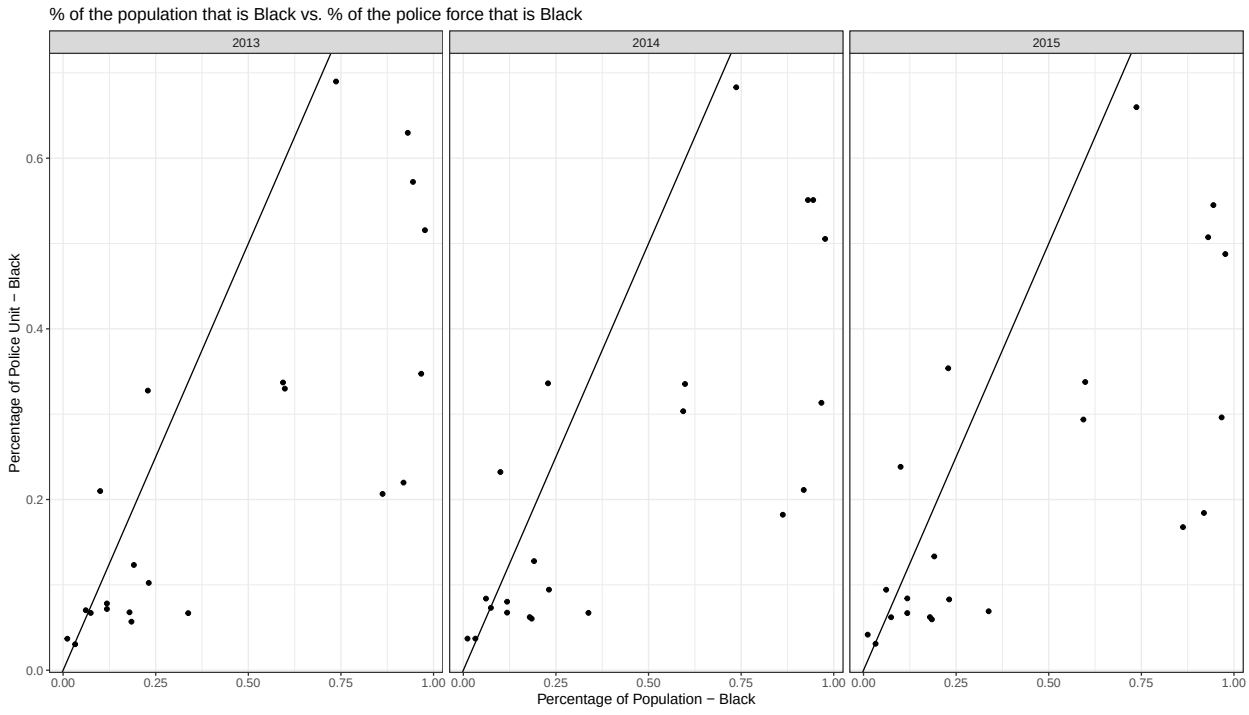
The new way of measuring experience and racial congruence are no longer correlated.

Table 1: Summary Statistics Across All Units Over All Years

Variable	N	Mean	Std. Dev.	Min	25th	Median	75th	Max
Total Number of Stops	792	1402.902	789.189	189	822	1288.5	1812.25	4665
Stops of Black Civilians	792	926.659	812.262	27	305.75	724	1268.25	4346
Stops of Black Civilians Per 10,000	792	243.598	126.299	57	144	216	315	690
Stops of White Civilians Per 10,000	792	187.992	303.376	7	34	65	203	2459
Stops of Hispanic Civilians Per 10,000	792	167.366	250.91	1	10	71.5	217.25	1864
Total Number of Officers	792	390.662	78.204	237	317	408	445.25	534
Total Number of Black Officers	792	95.965	88.96	6	25	67	137.25	352
Percent of Officers - Black	792	0.228	0.195	0.023	0.068	0.152	0.336	0.694
Total Population	792	120793.955	52189.454	55232	75501	109828	146656	245944
Black Population	792	39522.636	27159.15	2264	12494	36467.5	62487	94929
Percent of Population - Black	792	0.427	0.36	0.011	0.118	0.23	0.862	0.977
Black Racial Congruence	792	0.824	0.75	0.172	0.359	0.572	0.933	3.969
Years Worked In Unit (Mean)	792	8.45	1.217	6.137	7.34	8.545	9.458	11.212
Violent Crime Per 10,000 individuals	792	9.039	6.602	0.648	3.876	6.644	13.382	30.786
Property Crime Per 10,000 individuals	792	32.085	16.486	9.143	19.55	28.97	40.458	106.779

Summary Table

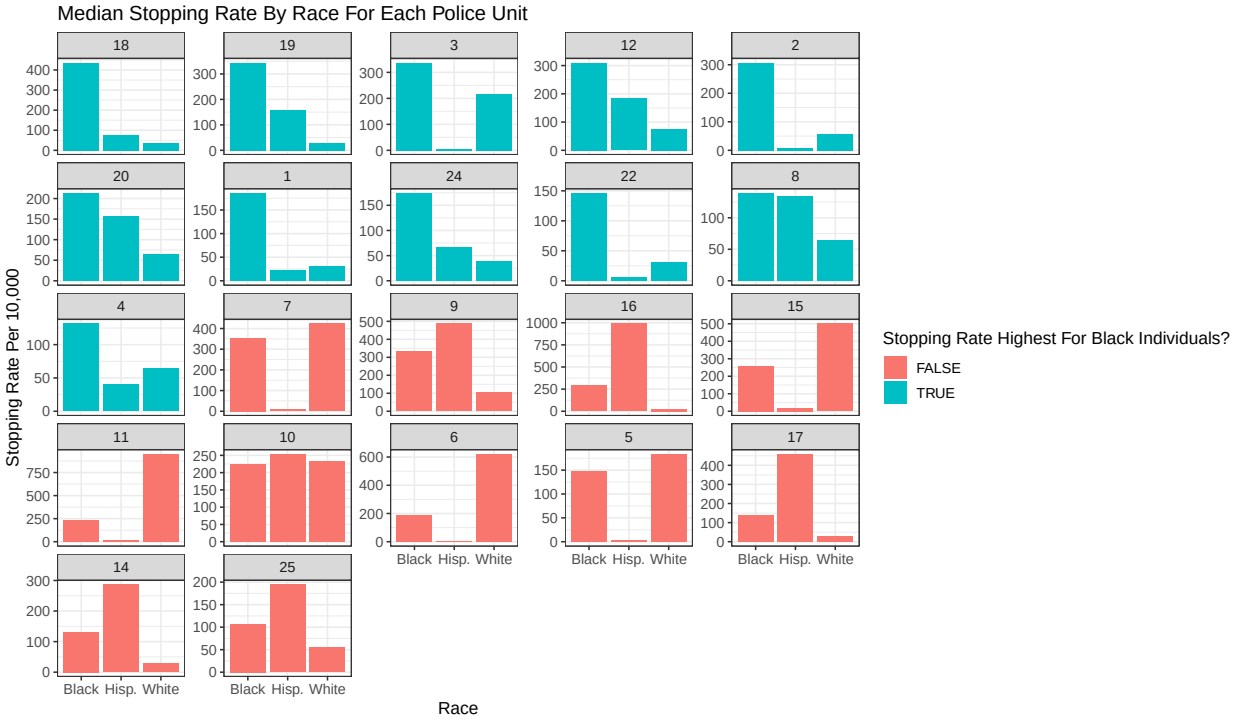
Black Individuals are Underrepresented in Nearly Every Police Unit



	Stops of Black Civilians	Stops of Black Civilians
	Model A1	Model A2
Black Racial Congruence - Between Unit	0.437 (0.065)***	1.153 (0.094)+
Black Racial Congruence - Within Unit	0.336 (0.095)***	0.369 (0.111)***
year2014	1.219 (0.083)**	1.144 (0.092)+
year2015	0.975 (0.051)	0.912 (0.069)
Num.Obs.	792	792
Offset - Black Pop.	No	Yes
R2 Pseudo	0.025	0.094
AIC	12 087.3	11 232.0
BIC	12 110.6	11 255.4
Log.Lik.	−6038.628	−5611.017
Std.Errors	by: unit	by: unit

P-values are denoted by symbols: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001
Standard Errors in parentheses. Coefficients are incident rate ratios.

The Median Stopping Rate is Highest for Black Individuals In Half of All Units

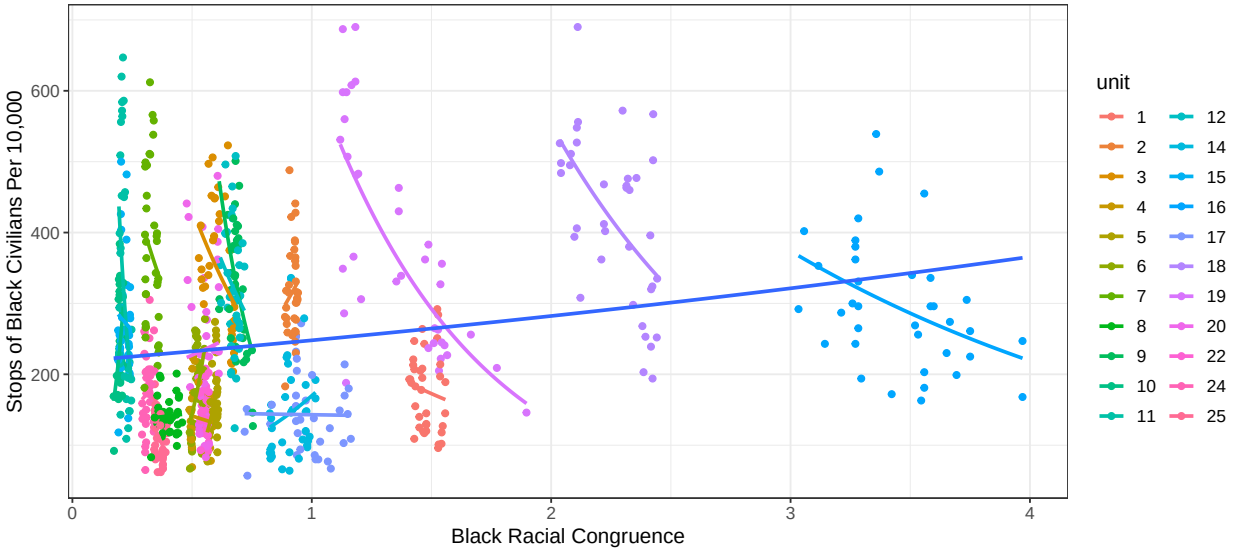


	Stops of Black Civilians	Stops of Black Civilians	Stops of Black Civilians	Stops of Black Civilians
	Model 1	Model 2	Model 3	Model 4
Black Racial Congruence	0.499 (0.131)**		0.455 (0.116)**	
Percentage of Officers Who Are Black		0.023 (0.029)**		0.046 (0.077)+
Years Worked In Unit (Mean)			0.763 (0.047)***	0.836 (0.081)+
Violent Crime Per 10,000	0.995 (0.009)	0.992 (0.008)	0.992 (0.008)	0.991 (0.008)
Property Crime Per 10,000	0.994 (0.002)**	0.995 (0.002)*	0.995 (0.002)*	0.995 (0.002)+
Log of the Total Number of Officers	3.413 (2.686)	2.693 (2.060)	0.414 (0.386)	0.745 (0.782)
Num.Obs.	792	792	792	792
R2 Pseudo	0.156	0.155	0.158	0.156
Offset - Black Pop.	Yes	Yes	Yes	Yes
AIC	10 516.3	10 518.6	10 492.8	10 510.2
BIC	10 647.2	10 649.5	10 628.3	10 645.8
Log.Lik.	−5230.137	−5231.319	−5217.383	−5226.103
Std.Errors	by: unit	by: unit	by: unit	by: unit
FE: unit	X	X	X	X

P-values are denoted by symbols: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001
Standard Errors in parentheses. Coefficients are incident rate ratios.

Between vs. Within

Plotting Racial Congruence Vs. Rate of Stops



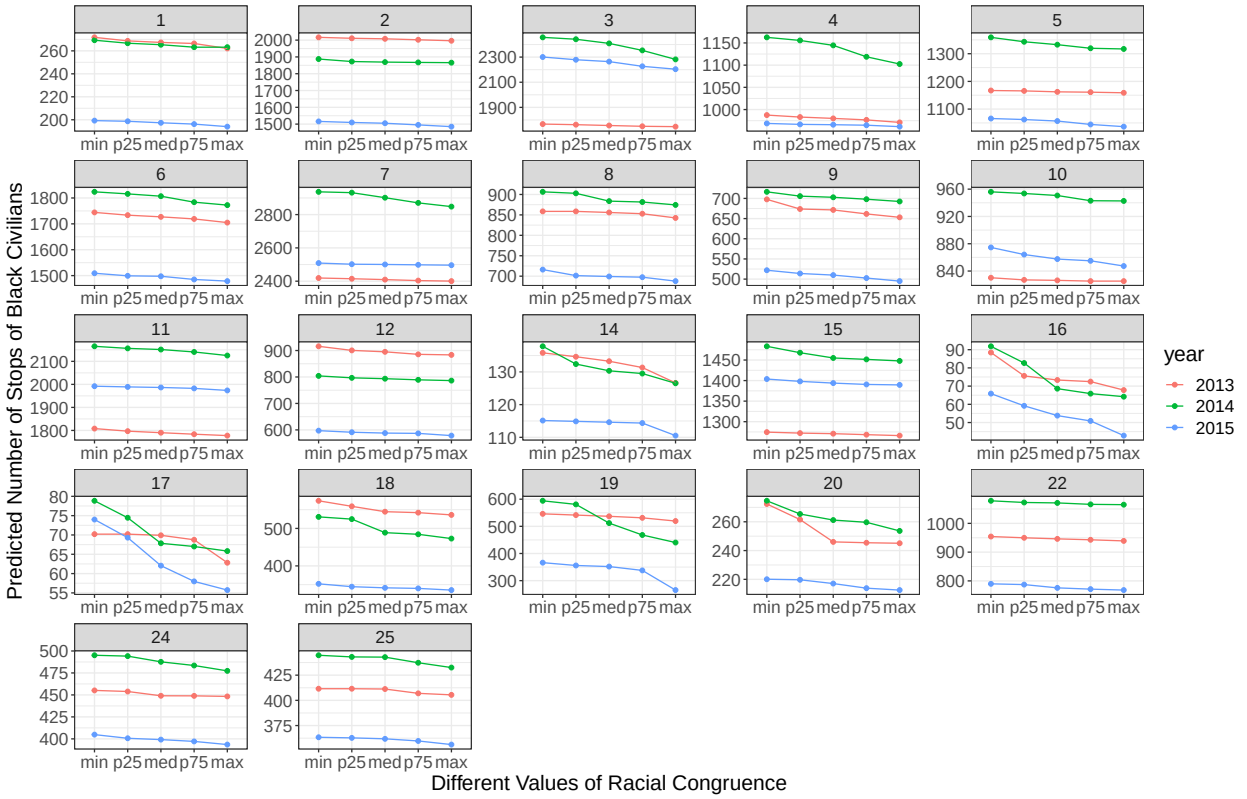
Regression Models

Predictions To Aid In Interpretation of Coefficients

- Standardized coefficients do not make much sense to use in aiding in the interpretation of panel regressions. Should one standardize using the **total** mean and standard deviation? Within time unit mean and standard deviation? Within police unit? Within police unit crossed by time unit? Furthermore such interpretations in the context of a fixed effects regression remain unclear.
- To aid in the interpretation of the regression models, I systematically vary the value of the Black Racial Congruence variable (e.g. using maximum and minimum observed values for each unit within each year) while holding all other variables constant at their mean. I then do the same for the Years Worked In Unit (Mean) as a comparison point.

The effect of moving from the least amount of racial congruence to the most for each year for each unit

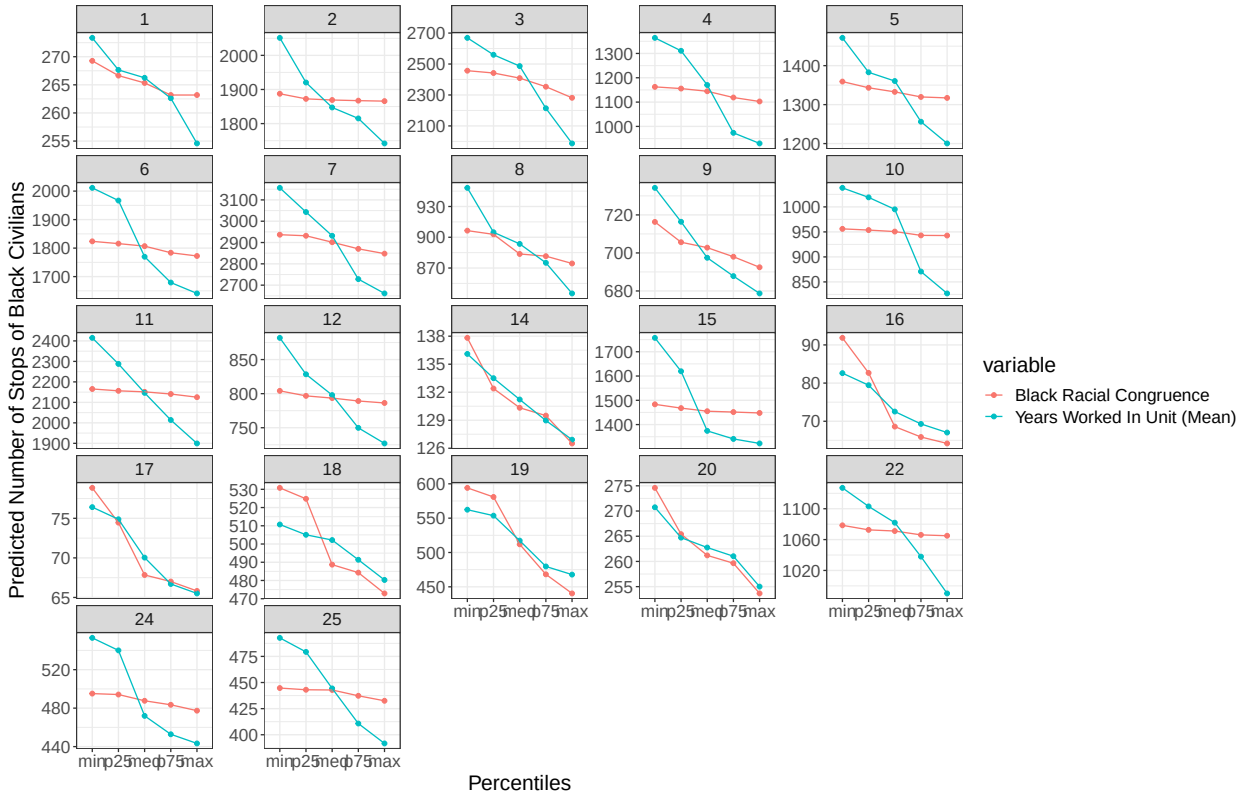
As mentioned above, I hold all other values constant at their means (for each unit in each year). I then systematically vary the value of Black racial congruence using the minimum value (for that unit in that year), the 25th percentile, the median, the 75th percentile, and the maximum value.



Here is a table trying to link together changes in racial congruence, the predicted number of stops of Black civilians, and changes in the absolute number of Black officers.

Unit	Change - Pred. Black Stops	Min to Max, Racial Con.	Change - Black Officers	Diff - Stops	Diff - Officers
1	269 to 263	1.45 to 1.48	117 to 119	6	2
2	1887 to 1866	0.92 to 0.93	310 to 317	22	7
3	2457 to 2282	0.59 to 0.68	260 to 277	175	17
4	1163 to 1103	0.49 to 0.56	139 to 137	60	-2
5	1359 to 1317	0.56 to 0.6	216 to 217	42	1
6	1824 to 1772	0.52 to 0.55	234 to 232	51	-2
7	2937 to 2848	0.31 to 0.35	157 to 166	89	9
8	906 to 874	0.37 to 0.42	38 to 42	32	4
9	716 to 692	0.66 to 0.7	33 to 35	24	2
10	956 to 943	0.19 to 0.21	24 to 27	13	3
11	2165 to 2125	0.2 to 0.23	87 to 91	40	4
12	804 to 786	0.66 to 0.69	58 to 66	18	8
14	138 to 127	0.91 to 1.02	20 to 23	11	3
15	1483 to 1448	0.2 to 0.23	77 to 81	36	4
16	92 to 64	3.14 to 3.6	10 to 11	28	1
17	79 to 66	0.93 to 1.16	8 to 10	13	2
18	531 to 473	2.21 to 2.36	94 to 100	58	6
19	594 to 440	1.17 to 1.55	29 to 40	154	11
20	275 to 254	0.49 to 0.59	15 to 18	21	3
22	1078 to 1065	0.55 to 0.57	107 to 106	13	-1
24	495 to 477	0.3 to 0.35	17 to 20	18	3
25	445 to 433	0.34 to 0.38	26 to 27	12	1

Comparing Experience to Racial Congruence



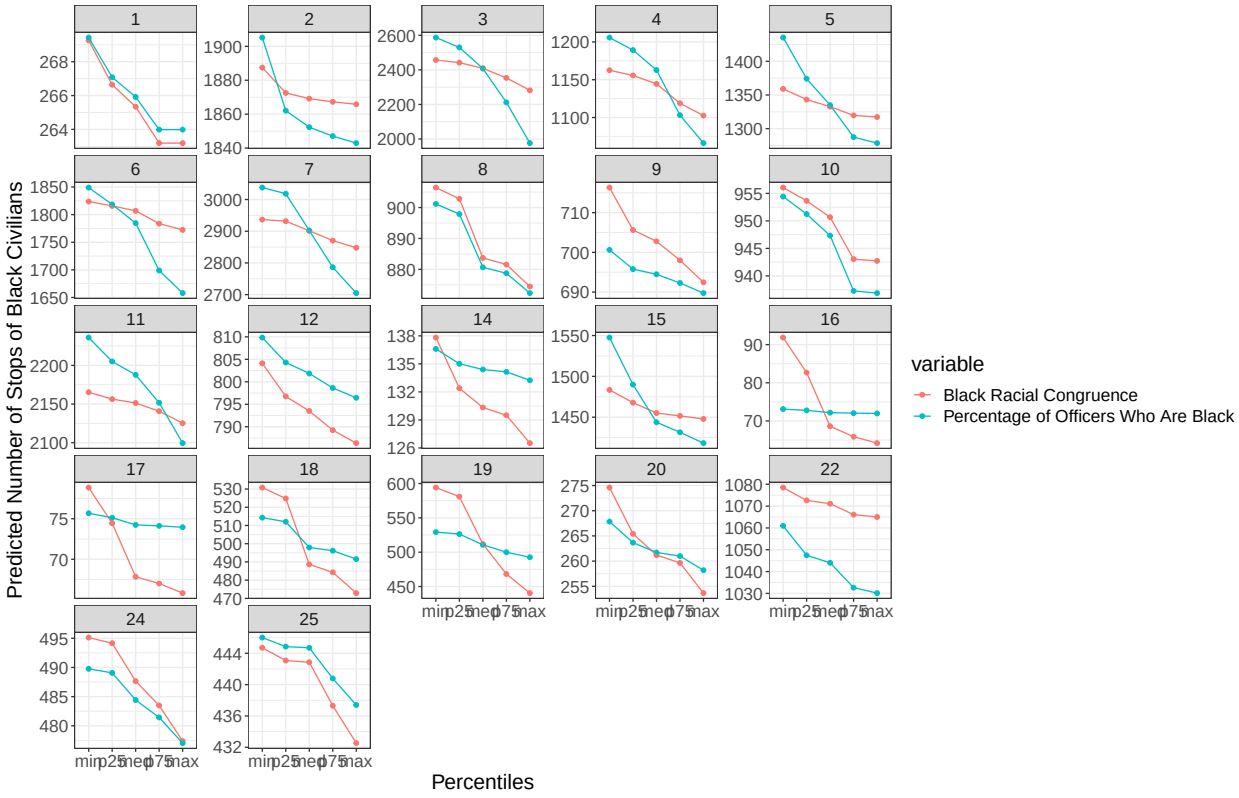
Demonstrates how racial congruence compares to the mean amount of experience in a police unit within a given year and how strongly associated each variable is with the decrease in the number of stops of Black civilians. Experience has the stronger association.

Comparing Percentage of Officers In Unit Who Are Black to Racial Congruence

- Percentage of officers who are Black **and** experience are marginally significant. Percentage of officers who are Black is significant when experience is not included.
- The coefficient is much larger for the percentage of officers who are Black, but that is due to scaling. It has values ranging from 0.02 to 0.69. Racial congruence, on the other hand, ranges from 0.17 to 3.97.
- Racial congruence and work experience in the unit are not strongly correlated (r = 0.3762079).
- Meanwhile, work experience in the unit and the percentage of the police force that is Black are moderately negatively correlated (r = -0.5048465).

Using Predicted Number of Black Stops To Contextualize Percentage of Officers Who Are Black vs. Racial Congruence

- For almost all units, the association goes in the same direction and the predicted number of Black stops are similar for percentage vs. racial congruence. However, an increasing percentage of the force that is Black seems to be associated with greater reductions in the number of stops of Black civilians as compared to racial congruence.



Dividing up the sample by Percentage of the Population That Is White

- First, divide up all units into 3 groups. High, medium, and low percentages of the civilian population that is White.
- Second, graph the relationship between racial congruence and the stopping rate of Black civilians for each of the 3 groups:

- For those units with a high and medium percentage of the civilian population that is White, increasing racial congruence is associated with a higher stopping rate between units.
- For those units with a low percentage of the civilian population that is White, increasing racial congruence is associated with a lower stopping rate between units.

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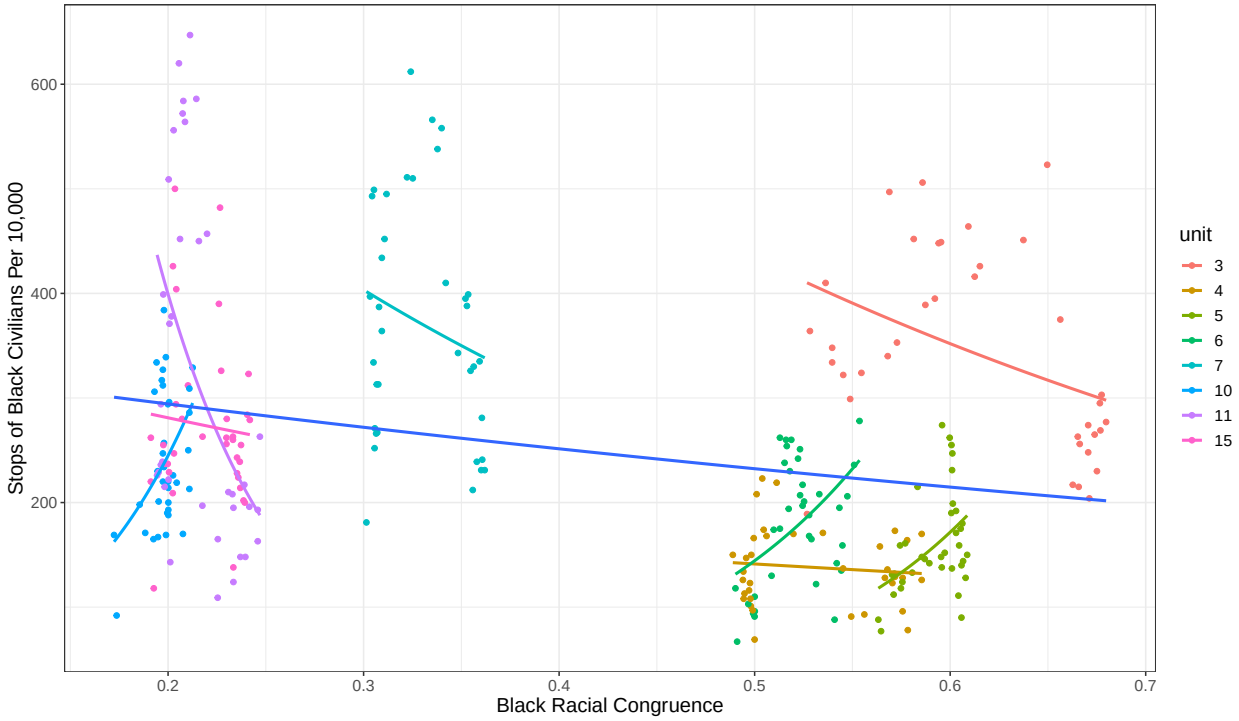


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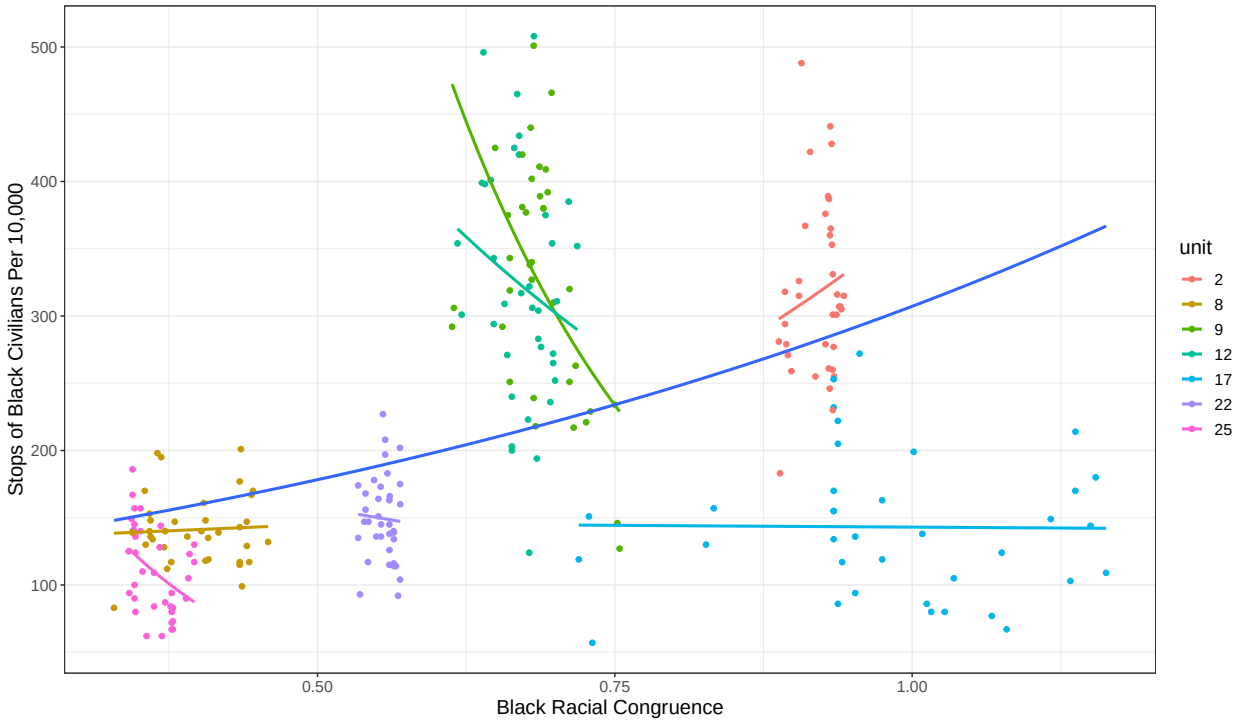


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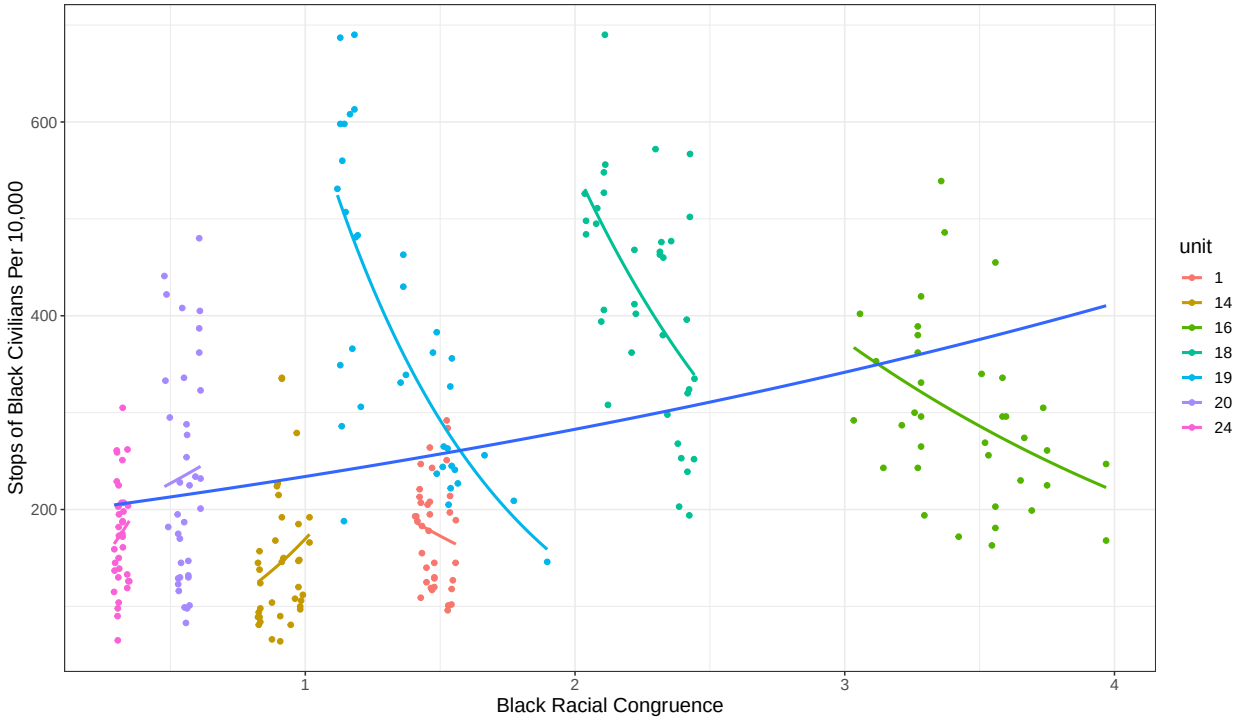

Run Regression Analyses on Each Group

- Suprisingly for units with a low percentage of the population that is White, there appears to be no relationship between racial congruence and the stopping rate of Black civilians within unit. The

	Stops of Black Civilians	Stops of Black Civilians	Stops of Black Civilians
	Low White Pop.	Medium White Pop.	High White Pop.
Black Racial Congruence	2.715 (3.322)	0.468 (0.184)+	0.886 (0.318)
Years Worked In Unit (Mean)	0.648 (0.099)**	0.761 (0.191)	0.812 (0.085)*
Violent Crime Per 10,000	0.989 (0.010)	1.002 (0.022)	1.004 (0.010)
Property Crime Per 10,000	0.996 (0.004)	0.994 (0.008)	0.993 (0.003)*
Log of the Total Number of Officers	0.246 (0.439)	0.248 (0.323)	9.716 (11.390)+
year2014	1.351 (0.076)***	1.095 (0.135)	0.769 (0.094)*
year2015	0.911 (0.068)	0.993 (0.208)	0.620 (0.088)***
Num.Obs.	288	252	252
Offset - Black Pop.	Yes	Yes	Yes
R2 Pseudo	0.071	0.162	0.141
AIC	4305.5	3230.1	2871.0
BIC	4360.4	3279.5	2920.4
Log.Lik.	−2137.747	−1601.033	−1421.501
Std.Errors	by: unit	by: unit	by: unit
FE: unit	X	X	X

P-values are denoted by symbols: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Standard Errors in parentheses. Coefficients are incident rate ratios.

standard error is so high relative to the estimate (which is also suprisingly very high) that there does not appear to be a relationship.

- In fact, there is no statistically significant relationship between racial congruence and the stopping rate of Black civilians in any of the groups. For areas with a medium percentage of the population that is White, there a negative, marginally significant relationship.
- Experience is negative and significant, though, in areas with low and high percentages of the population that is White. The relationship is negative but not significant in areas with a medium percentage of the population that is White.