

The Effect of Racial Demographics on Police Misconduct

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Initial Considerations

- Suspicion that Black communities may be more heavily policed
- Racial demographics may affect not only rate, but type of misconduct

Driving Question

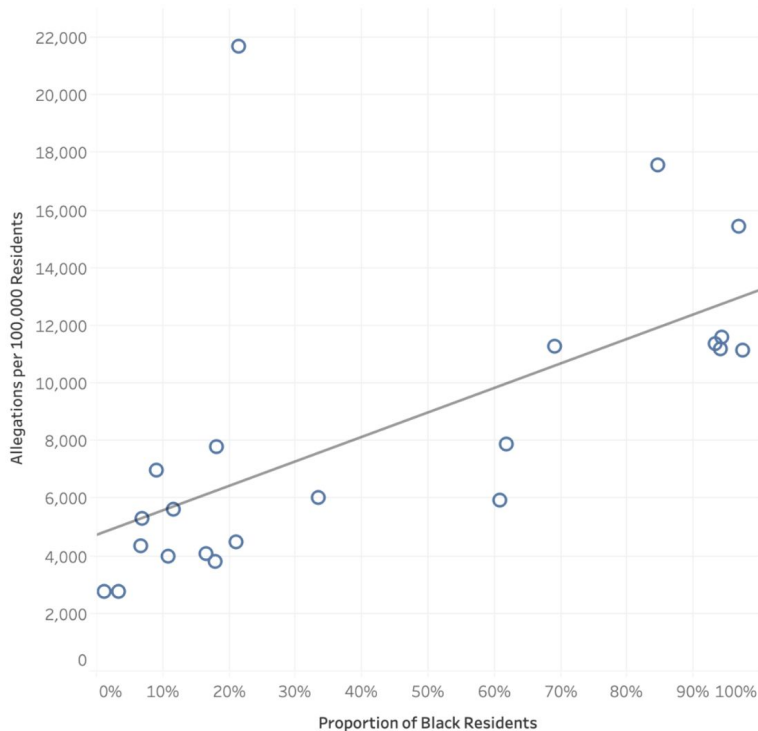
How do the racial demographics of a neighborhood influence police misconduct within that neighborhood?

Checkpoint 1: Relational Analytics

- What is the number of police officers per capita that are assigned to each police district?
 - Highest: 1546 (86.56 officers/100k residents), 1534 (61.91), 1535 (53.17), and 1549 (50.97))
 - Lowest: 1541 (17.73 officers/100k residents), 1542 (18.55), 1527 (18.74) 1543 (19), and 1531 (19.92)
- What is the number of complaints per capita per police district?
 - Highest: 1534 (0.289), 1546 (0.256), 1535 (0.182), 1537 (0.180), 1540 (0.157), and 1547 (0.152)
 - Lowest: 1531 (0.030), 1541 (0.037), 1542 (0.042), 1527 (0.047), and 1528 (0.054)
- What is the proportion of black residents in each police district?
 - Highest: 1537 (97.5% black), 1534 (96.8% black), 1535 (94.4% black), 1540 (94.2% black), 1547 (93.3% black)
 - Lowest: 1542 (1.0% black), 1527 (3.3% black), 1531 (6.6% black), 1533 (6.8% black), 1544 (9.1% black).
- Which type of complaint is most likely in each police beat?
 - Operation/personnel violation most common except in three beats

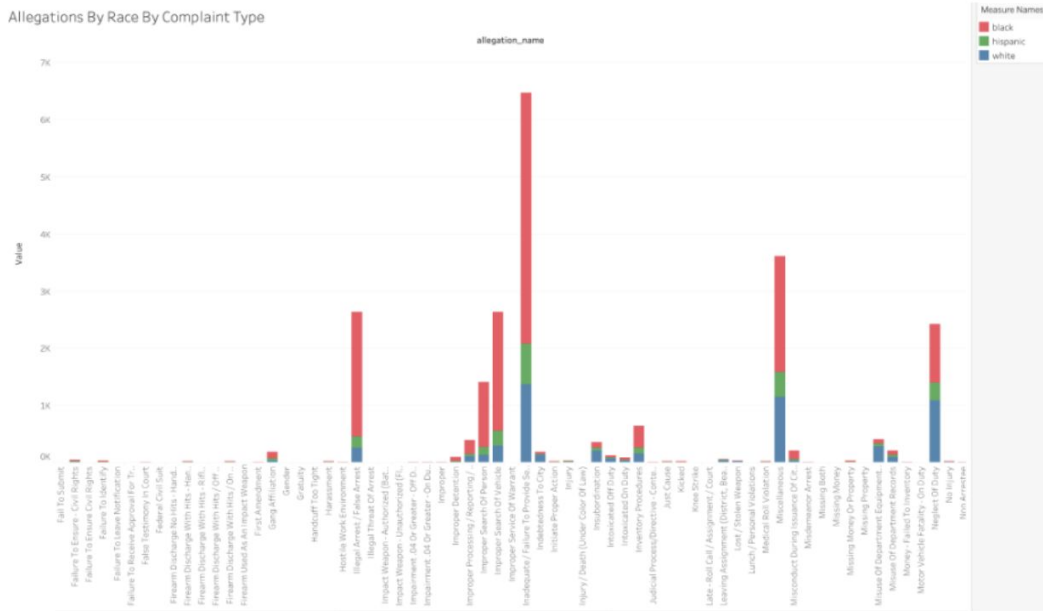
Checkpoint 2: Data Exploration

Do areas with a higher proportion of black residents have more allegations per resident?



- Extremely high correlation between proportion of black residents and allegations per residents
- Blacks have more allegations on average than whites
 - Unsure of whether this relationship extends to all residents, or if it is just because blacks have more allegations than whites on average

Checkpoint 2: Data Exploration



- Blacks constitute a higher proportion of all complaints
- Blacks comparatively more likely to submit certain types of complaints
 - Improper vehicle search
 - False Arrest
 - Less Likely: Association with a felon

Checkpoint 3: Interactive Visualization

- How do complaints vary across police districts
 - For all residents, the top six complaint types on average are, Operational/Personnel Violations, Use of Force, Verbal Abuse, Traffic, and Lockup Procedures.
 - For Black residents, the top five complaint types on average are Use of Force, Operational/Personnel Violations, Illegal Search, False Arrest, and Lockup Procedures.
- How do complaints between Black and non-Black residents compare
 - Higher Use of Force complaints
 - Indications of targeting behavior

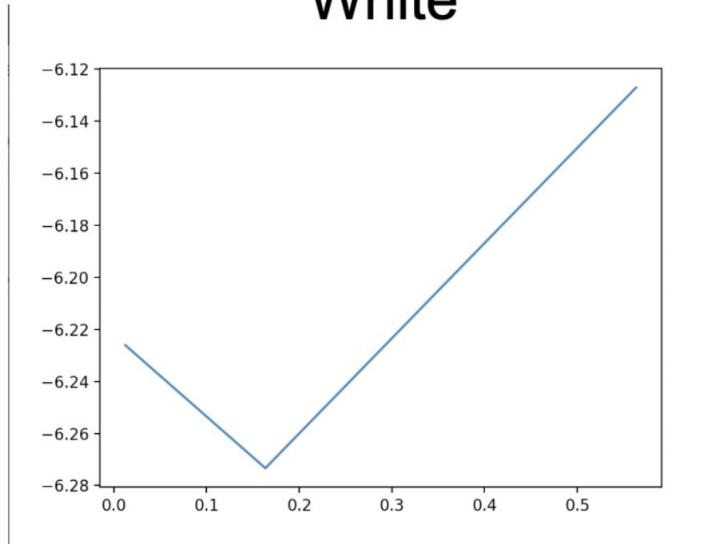
Checkpoint 4: Graph Analytics

- Are officers with more than one allegation against them more likely to commit misconduct in groups against Black residents than non-Black residents?
 - The districts with the top three highest clustering averages are 10th (0.48), 11th (0.44), and 15th (0.42). All three of these districts are majority Black with Black populations of 57%, 74%, and 85% respectively—all Black majority districts.
- Are officers who commit misconduct in multiple categories (implying each officer has at least two complaints against them) more likely to commit misconduct against Black residents than non-Black residents in specific categories?
 - White complainants have 104 edges between 19 allegations with an average clustering of 0.84
 - Black complainants have 132 edges between 19 allegations with an average clustering of 0.90
 - Hispanic complainants have 97 edges between 17 allegations with an average clustering of 0.82

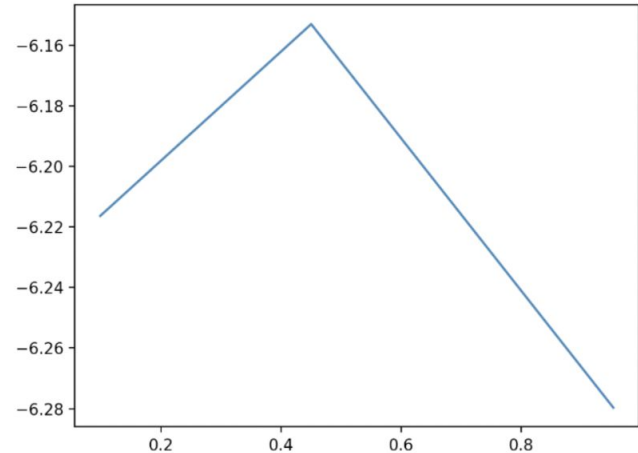
Checkpoint 5: Natural Language Processing

Question: Does any relationship exist between the proportion of black residents and the mean sentiment of reports from a district? What about other races?

White



Black



Checkpoint 5: Natural Language Processing

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Results of ANOVA with 3 Groups (low, medium, and high representation)

- White groups are statistically different with 99.6176% confidence, $p = 0.0038$
- Black groups are statistically different with 98.1203% confidence, $p = 0.0188$
- Hispanic groups are statistically different with 100.0% confidence, $p = 2.8692e-07$
- Asian groups are statistically different with 99.6411% confidence, $p = 0.0036$

Checkpoint 5: Natural Language Processing

Question: Does any relationship exist between the proportion of black residents and the mean sentiment of reports from a district? What about other races?

Results of ANOVA with 2 Groups (just low vs high)

- White groups are statistically different with 99.5425% confidence, $p = 0.0046$
- Black groups are statistically different with 98.8918% confidence, $p = 0.0111$
- Hispanic groups are statistically different with 43.8097% confidence, $p = 0.5619$
- Asian groups are statistically different with 100.0%(?) confidence, $p = 1.1027e-07$

General Conclusions

- There exists some clear disparity in the way different races are policed
- Racial demographics of a district do produce measurable, statistically significant differences in the way residents of those districts are policed.

(Assuming that our measures are effective proxies for ‘treatment’)