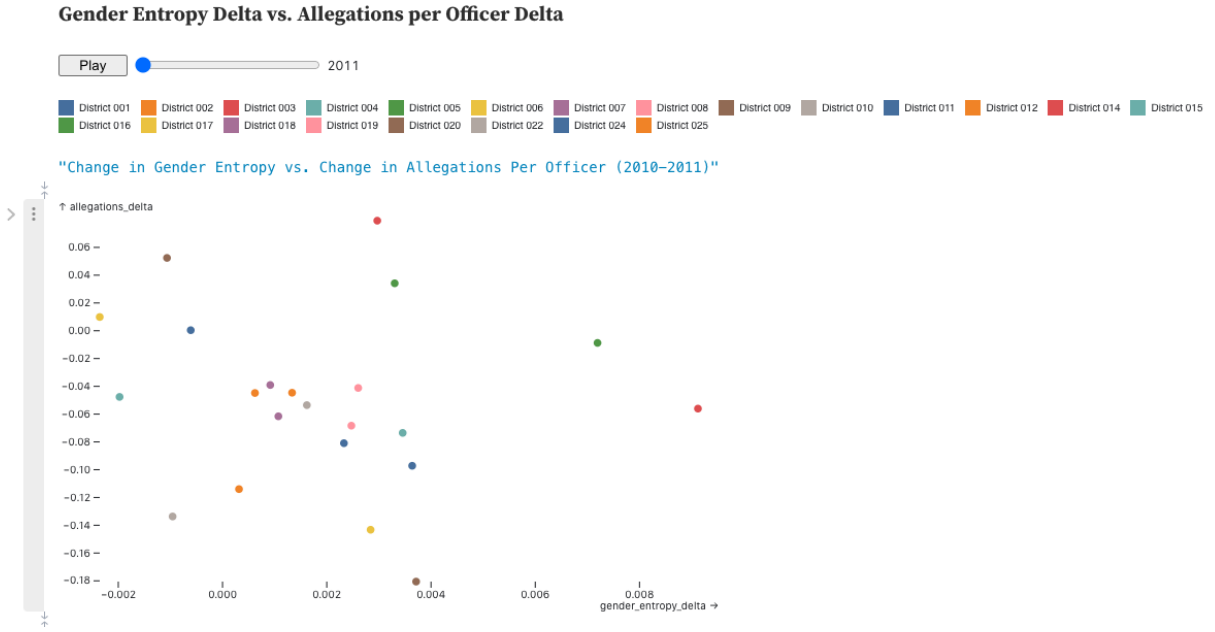
Visualizations from (revised) Proposal

- Dot plots of changes in unit compositions between years compared to changes in allegation rates per year. Specifically, changes in gender and racial entropy vs. allegation rates per officer for each unit. Adjusting a sliding bar allows users to select the year they want to see compared to the prior year.
- Dot plots of changes in unit compositions between years compared to changes in trr rates per year. Specifically, changes in gender and racial entropy vs. trr rates per officer for each unit. Adjusting a sliding bar allows users to select the year they want to see compared to the prior year.

Created Visualizations Analysis

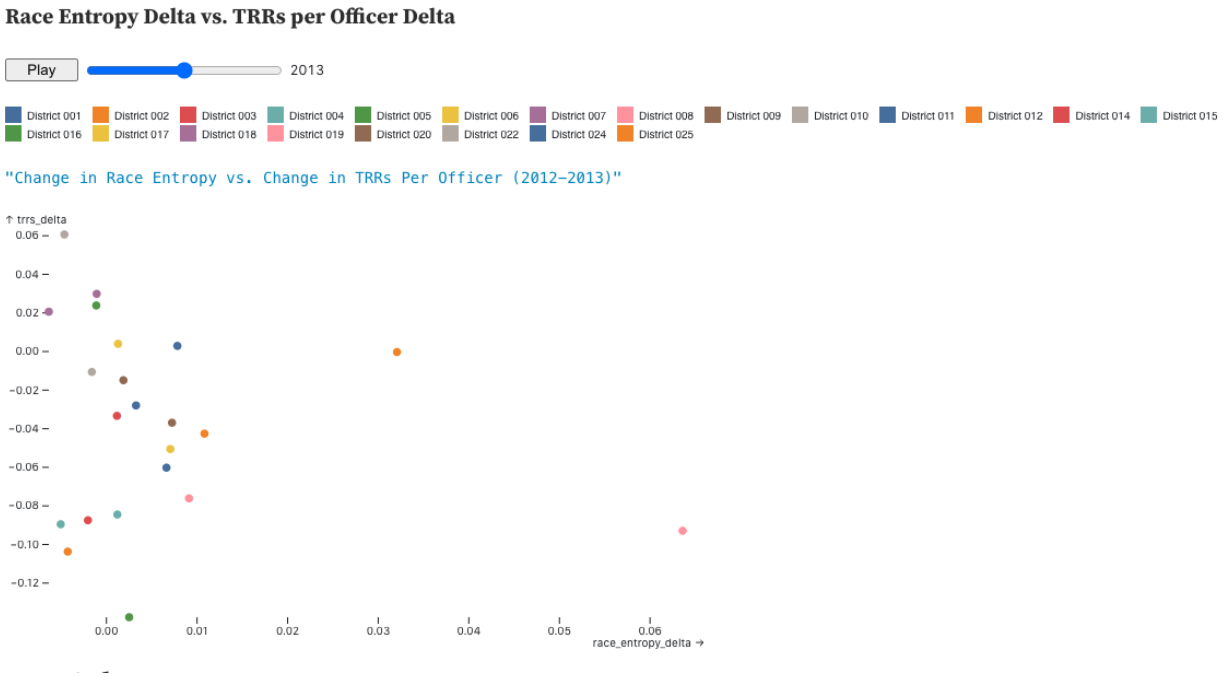
Example Chart: Gender Entropy vs. Allegation Rate per Officer based on differences between 2011 and 2010



In the above chart, we are able to investigate the relationship between the change in gender entropy year over and change in allegation rate per officer. Ideally, we would see a very negative relationship, as entropy increases, allegation rate decreases. While there appears to be somewhat or a negative correlation (at least in the year displayed above), inspection of the chart across all years showed that is varies greatly from unit to unit and year to year. Another thing to keep in mind, is that the overall allegation rate per officer decreased consistently from 2010 – 2015 (aside from 2013-2014) while the average gender entropy per unit remained fairly constant, which can be seen in the first two static charts in the Observable notebook. Without being able to control for confounding variables, other reasons why allegation rates may have declined, it will be difficult to conclude that more gender entropy in units is correlated with lower rates of allegation. In 2011 (above) and 2013, we see the majority of data points in the fourth quadrant (indicating increased gender entropy and decreased allegation rates), however, in the other years, we see a mix of data points in all the quadrants, further supporting the idea

that there are other confounding variables leading to the decrease in allegation rates per officer.

Second Example: Racial Entropy vs. TRR Rate per Officer based on differences between 2013 and 2012



The analysis for the TRRs (example shown above) follows very similar to that of the allegations. While we do see some negative correlations, such as in the example above, there are still confounding variables that need to be accounted for. While the above chart shows a promising relationship between increases and racial entropy and decreases in TRR rate per officer, it is difficult to conclude that there is causation.

These charts tie into my overall theme of trying to relate unit composition to allegation and trr rates by showing that, although we witness cases where the correlation holds true, there are clearly other factors at play. One thing, I believe, that we may be able to conclude, is that increased racial and gender entropy does not result in increases in allegation rates, as data points appearing in the first quadrant about 14% of the time for gender entropy vs. allegation rate and only about 11% of the time for racial entropy vs. allegation rate, based on manually inspection across all years included. However, we see data appear in the first quadrant about 22% of the time for gender entropy vs. TRR rate and about 25% of time, also based on manual inspection.

Future lines of inquiry could potentially focus in on only a few units and try to see exactly what changes occurred in the composition in the unit, and compare changes to the rates of allegations and TRRs per officer unit said unit to the overall changes in all units, in order to establish a baseline. While outside the scope of this project, doing so may allow researchers to isolate specific entropy variables' effects on allegation and TRR rates per officer.