Data Science Seminar - MSAI 339

Checkpoint 3

November 9th, 2021

Professor
Jennie Rogers

Students
Anery Patel
Chukwueloka Obi
Ana Cheyre

Interactive Visualization

1. Interactive bubble chart that shows the evolution over time of the number of unsustained allegations by area

Our project theme is to study the unsustained allegation and its relation with different variables. This bubble chart can be used to identify police units with the most unsustained allegations. This can help hint at interesting areas to investigate.

It can be seen in the evolution over time of the graph, that if we review for example the year 1970, there are certain areas that are significantly larger than others. Moving forward to 1990, we see that more areas are added and the difference increases even more, and finally, in 2017 they increase even more areas and the gap increases even more. It seems that we have a diversity of ranges for the entire graph it seems and this leads to our disparity. In the 1970 graph we have the number of unsustained allegations that range from 1-20. This includes virtually every neighborhood in the Chicago area. This is also in high crime rate areas and low crime rate areas as well as this better helps to ascertain a certain evolutionary relationship between our numeric variables. This garners us a special insight on how the police forces relationship in certain areas and neighborhoods over time based on the different variables impact on the total results of the outcomes. The same behavior that was appearing in many of the old neighborhoods is now included in many of the new neighborhoods. With this the old neighborhoods are not increasing by truly impactful amounts. With the bubble chart, the disparity is able to be shown sharper and with a greater visual impact. We see that the disparity grows even greater in our bubble chart as we go to 1990 and then to 2017. We can see that the evolution is so great merely on the fact that we have included more areas, but at the same time there has been an even greater impact from our variables we accounted for in the bubble chart.

This could generate the following questions, is it possible that the amount of unsustained allegations is something that begins to spread because an officer changes from one area to another?

Figure 1: Bubble chart for year 1970

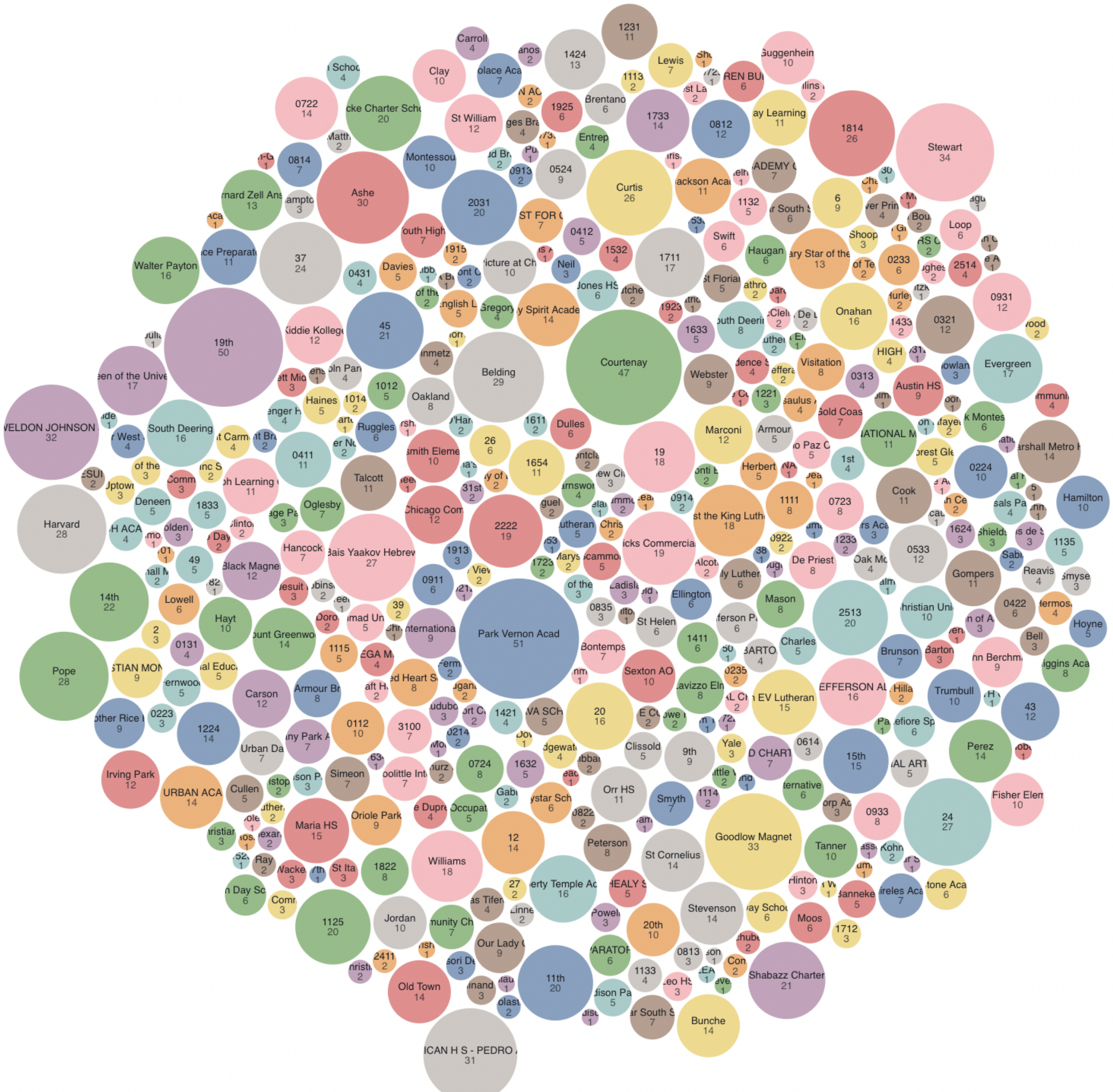

Figure 2: Bubble chart for year 1990

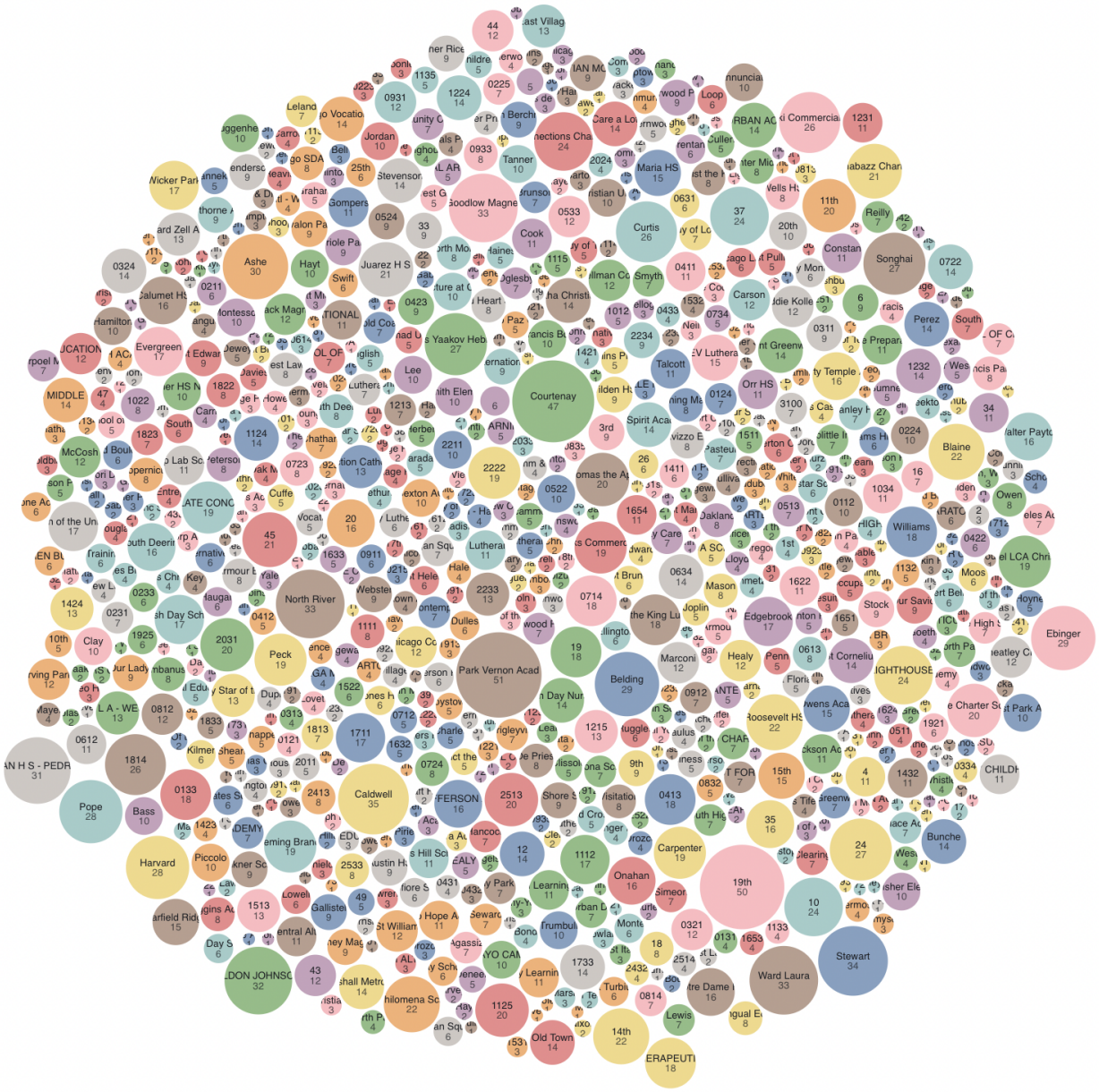

Figure 3: Bubble chart for year 2017

2. Interactive pie charts that represent how the rank of officers, years in the force, salary and race contribute to unsustained (specifically three categories: exonerated, unfounded and not sustained).

The pie chart shows and represents how three different variables had an impact on the three unsustained categories of exonerated, unfounded and not sustained. The interactive pie chart

creates a greater visual representational standout as we are able to see how different groups of officers based on the four variables rank of officers, years in the force, salary, and race. These variables had quite an apparent impact on the different veteran groups and show the group that has the most complaints. The specific variable of the amount of years on the force is directly shown in this graph. From the graph it seems that the veterans who have served for 20-30 years on the force have the most unsustained allegations against them based on the three categories of exonerated, unfounded, and not sustained. We see that there is a great disparity between 50-60 years because many of the people on the force have been there the longest and have been set in their ways and specific behaviors for a great amount of time. Many of these veterans are generally still active and out in the field just like the police officers who have served from 1-10 years. There is a slither in our graph for 50-60 year veterans surprisingly. The reason that we potentially see this in our graph is that there may not be as much data on 50-60 year officers and also the 50-60 year officers are probably not as active and out in the field like most of the other officer groups. Officers who have been on the force for so long have spent more time doing behind the scenes and off-field work that has been recorded than work that has actually been in the field. This pie chart is able to show how data has been collected in the

modern era but it may not totally show how data has been obtained in today's era.

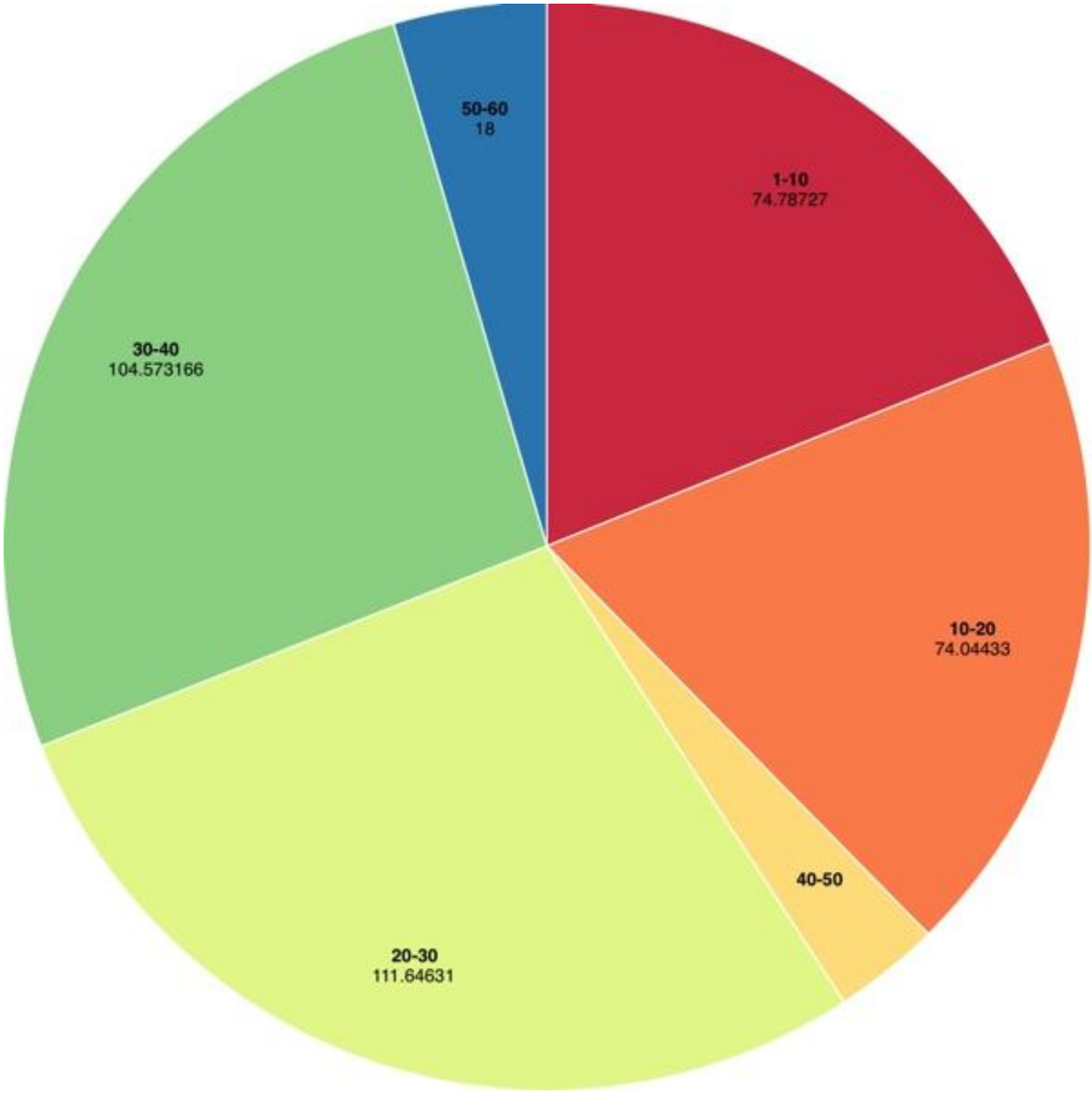

Figure 4: Pie chart showing impact of number of years on the force

This graph shows the impact of the number of awards on unsustained allegations. We see that those with 0-20 awards made up the greater size of the chart on those who received the most unsustained allegations. The reason for this could be that many of those with low amounts of awards are often bad police who commit a lot of infractions and garner a lot of unsustained allegations. Many of these police are not endeared by their community and they often may be seen as nuisances in the areas and neighborhoods that they patrol. It would logically make sense that police officers with the lowest amount of awards have the most unsustained allegations against them. These officers are not of good quality and are probably inept and nefarious with their police handling. At the same time we also see that officers with

120 awards above have the second highest unsustained allegations charged towards them. Does this have to do mostly with officers who in the past may have not been reprimanded for their past mistakes and were allowed to keep on committing violations but at the same time were cops that were quite good at their job. In the past police misconduct may not have been seen as misconduct but rather “tough policing”. Police misconduct was just a part of the institution of policing as we know it today.

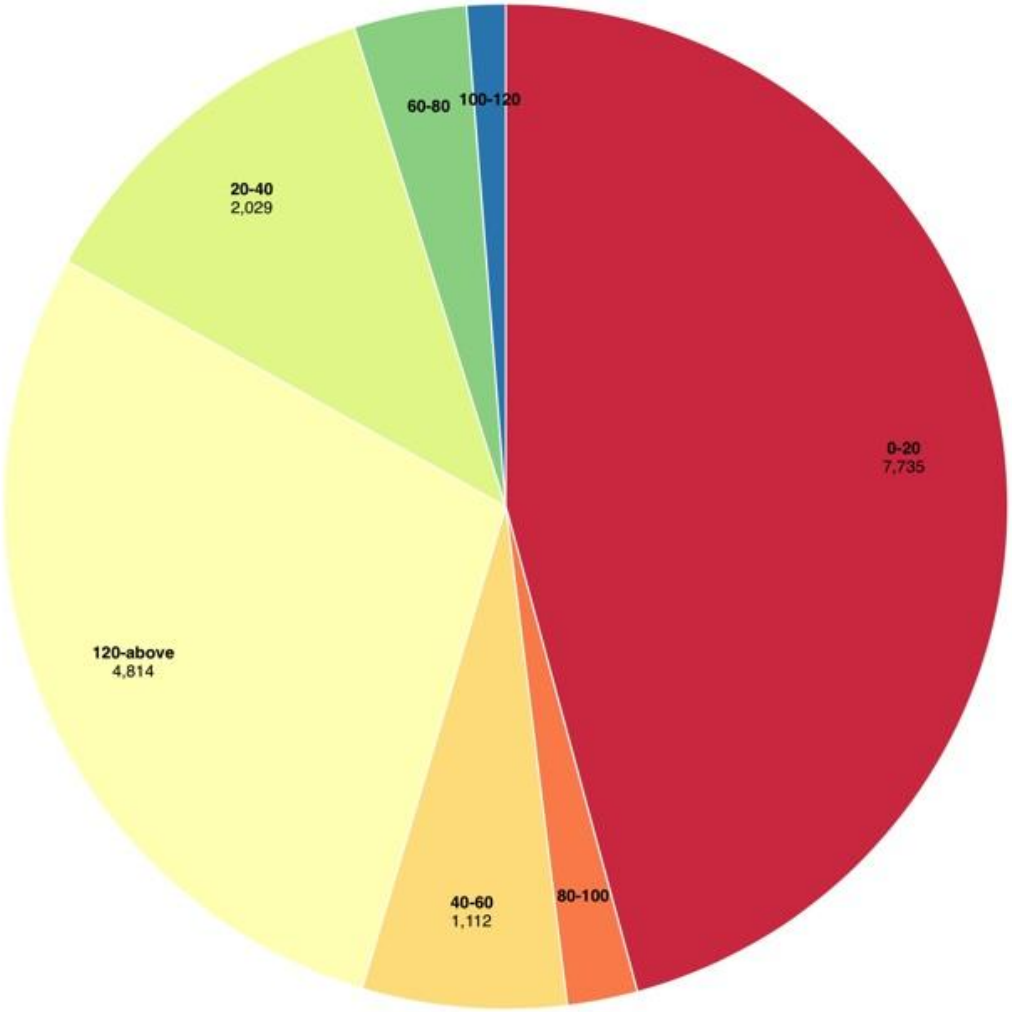

Figure 5: Pie chart showing shared impact of number of awards

The graph below shows the impact of salary on unsustained allegations. Salary is a variable that could be deemed as important in this study because salary often corresponds with level of hierarchy and rank. We are indirectly asking if it is lower level officers or higher level officers who have many of these unsustained allegations against them. In this chart, officers who make 70-90k have the highest amount of unsustained allegations against them. This may be because most officers generally will fall into this category and stay in this category throughout their entire career. Most officers unless they are readily promoted and stay on the force for a long time will probably not make more than 90k a year at the most. Most of the higher ranking officers usually get 6 figure salaries because of experience mostly. Salary may not be

the most accurate and best variable to use for unsustained allegations because most officers fall within a specific rank so obviously the more officers in a category the most unsustained allegations will be matched with them.

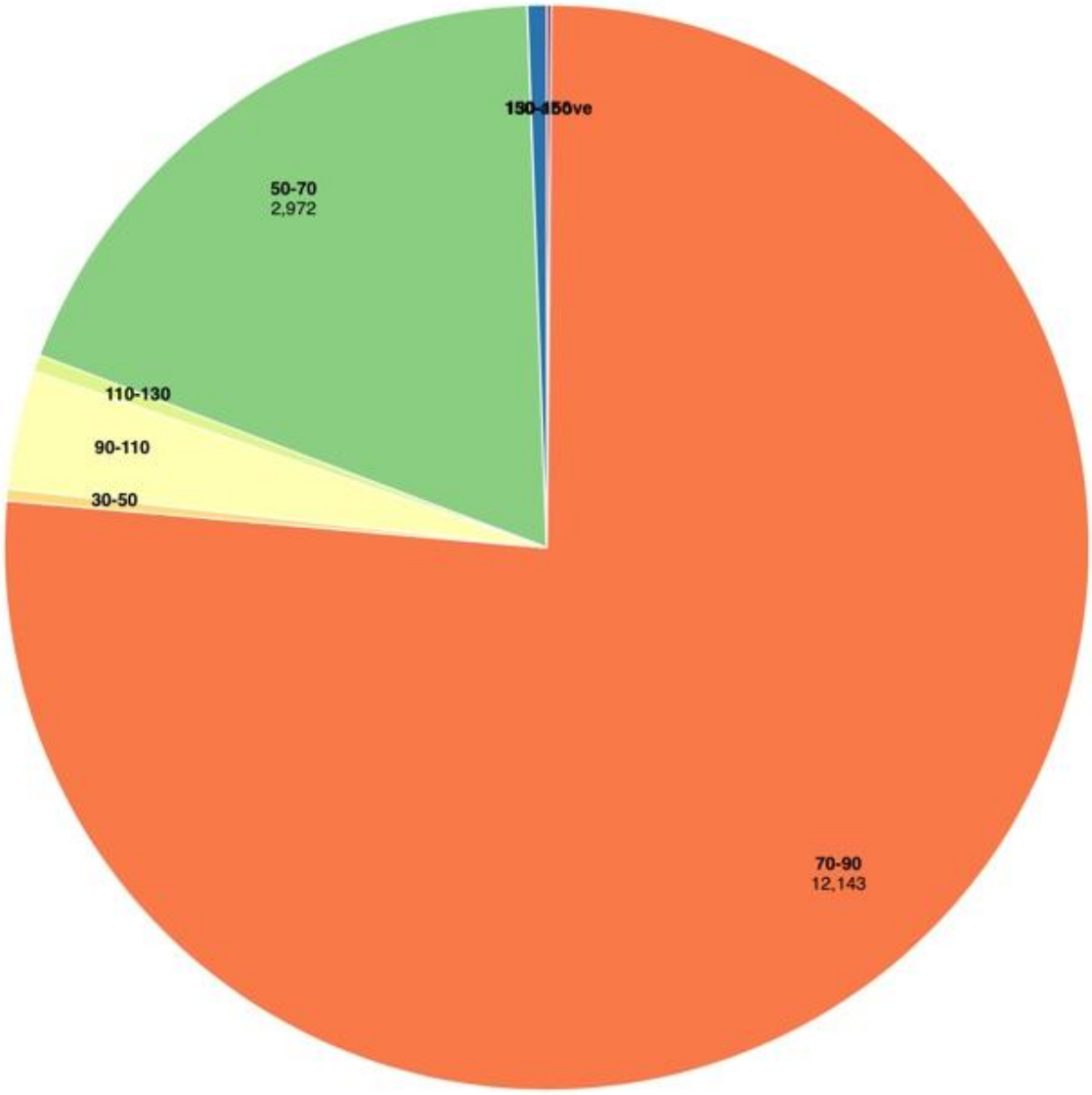

Figure 6: Pie chart showing impact of salary on unsustained allegations

The chart below shows the impact of officer race on unsustained allegations. This variable was used because many believed that an officer that looked more like the community he or she is patrolling would be less likely to have as many unsustained allegations against them. Many believe that a white officer is more attuned to police a white area compared to a

black cop policing a white area and vice versa. In this chart we see that white officers have the most unsustained allegations against them but this may not be down to white officers just being more brutal enforcers but this could be down to white being the majority race on the police force compared to black, hispanic, and asian and native american officers. Race may be a more accurate variable when it comes to how certain races of cops police certain racial areas. Are there more unsustained allegations with a white officer in a predominantly black area compared to a black officer? These questions are more pertinent to talk about then talking about purely officer race on unsustained allegations.

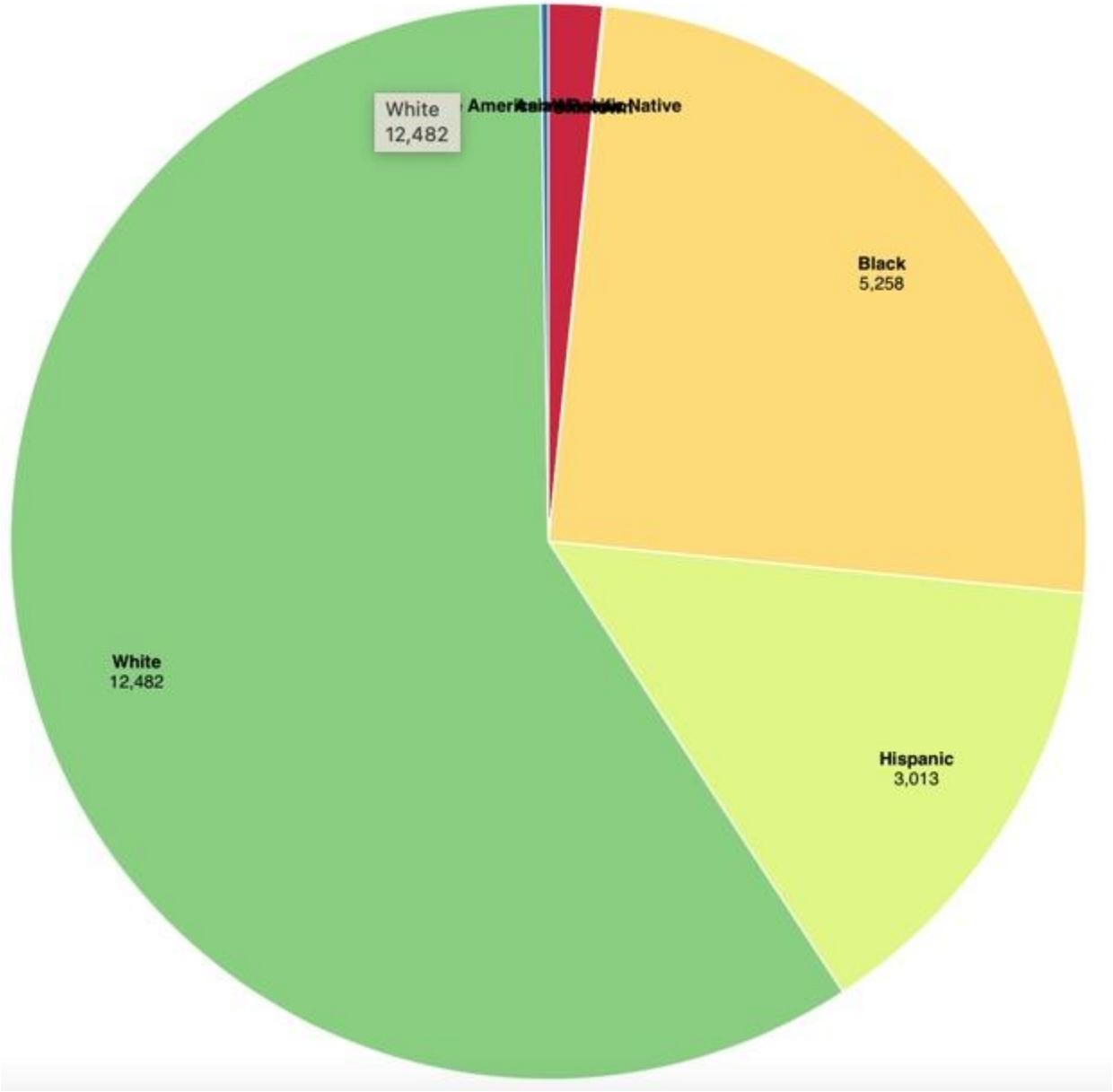

Figure 7: Pie chart showing impact of officer race on unsustained allegations

Conclusion:

From this analysis, we see that not all variables may not seem like what they are. Variables like salary and officer race are distributed the way they are on pie chart visualizations because of sheer numbers and population sizes of certain groups in the analysis of these variables. Variables like number of years on the force and awards may give us accurate analysis on unsustained allegations but these variables may not seem like what they really are because of the amount of accurate and relevant data we have accessible to use. It seems that many of our variables can be used differently throughout our analysis.