NAACP Media Research Project
CS 506 - Spark! Project
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I. Summary and Problem Statement

The National Association for the Advancement of Colored People (NAACP) is the country's largest and most widely-recognized civil rights organization, founded in 1909 with the goal of addressing racial disparities in the US and ensuring equality of political, educational, and economic rights. Our client was the Boston chapter of the NAACP.

For this project, the client was interested in analyzing racial bias and race-based discrimination in media coverage by media outlets in Boston. The intention was to use the results of this project and present them at the NAACP annual meeting which was supposed to take place in Boston later this year.

The goal of this project was to continue building on the work that was conducted by last semester's teams to gain a better understanding of media coverage of Black and African-American communities in the Boston area, using articles from the Boston Globe from 2014 to 2018 and focusing on three main areas:

1. Analyzing coverage of neighborhoods and sub-neighborhoods with a higher percentage of Black residents relative to coverage of other neighborhoods using sentiment analysis and noting any differences or disparities in this coverage
2. Analyzing coverage of Black homicides by comparing the volume of coverage relative to white homicides and conducting sentiment analysis
3. Examining articles that explicitly mention race, using keywords for Black such as "African-American" or "Haitian-American" and determining the common topics and themes of those articles

II. Methodology and Algorithms

- **Coverage of neighborhoods and sub-neighborhoods:**

  <u>Define Neighborhoods and Sub-Neighborhoods:</u>

  Suffolk county, which encompasses the greater Boston area, has 23 official neighborhoods. Last semester's team conducted their analysis using these

neighborhoods. However, this semester, we were asked to also include an analysis of sub-neighborhoods, since some neighborhoods might have their minority population concentrated within a certain part of the neighborhood, and taking this into consideration would make the analysis more robust.

In order to define the neighborhoods and sub-neighborhoods, we downloaded US Census Tract data as well as the demographic information for all of the census tracts in Suffolk County. Our team collected the first have of the census tract demographic data and the second team collected the second half. This is what the spreadsheet looked like:

Census Tract Number	Percent Male	Percent Female	Total Population	One Race							
				White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some other race	Total Population	White and Black or African American
Census Tract 1	50.30%	49.70%	4,668	2,693	274	0	1,044	0	599		9
Census Tract 2.01	46%	54%	3,857	3,120	198	0	393	0	73		33
Census Tract 2.02	50.10%	49.90%	3,982	2,769	336	0	470	0	372	35	5
Census Tract 3.01	58.20%	41.80%	2,905	2,069	170	0	434	0	223	9	0
Census Tract 3.02	48.90%	51.10%	3,385	2258	387	0	533	61	107	39	1
Census Tract 4.01	43.40%	56.60%	5,112	3,626	66	0	1,238	0	31	151	80
Census Tract 4.02	49.90%	50.10%	3,431	2,575	93	0	556	0	10	197	37
Census Tract 5.02	45.20%	54.80%	5,881	4,921	126	11	623	0	45	155	22
Census Tract 5.03	51.60%	48.40%	2,123	1,704	40	15	153	0	39	172	0
Census Tract 5.04	41.60%	58.40%	4,449	3,491	106	78	570	0	29	175	79
Census Tract 6.01	52.30%	47.70%	3,800	2,641	123	14	737	0	190	95	37
Census Tract 6.02	39.30%	60.70%	3,896	2,089	425	11	755	0	524	92	11
Census Tract 7.01	49.20%	50.80%	4,296	2,884	350	64	832	39	21	106	0
Census Tract 7.03	49.70%	50.30%	1,926	1,129	101	0	615	0	49	32	1
Census Tract 7.04	53.80%	46.20%	4,582	2,273	425	6	1,339	0	423	116	12
Census Tract 8.02	52.90%	47.10%	6598	4,211	353	16	1,039	0	793	186	33
Census Tract 8.03	42.00%	58.00%	6257	4,074	553	7	1,241	0	113	269	38
Census Tract 101.03	43.20%	56.80%	3714	2,229	144	1	983	0	110	247	57
Census Tract 101.04	44.50%	55.50%	4891	3,435	110	0	850	0	184	312	96
Census Tract 102.03	52.00%	48.00%	5174	3,632	98	0	1,160	0	215	69	33

The other team then downloaded the list of sub-neighborhoods and used latitude and longitude measurements to match census tract numbers to sub-neighborhoods so that they can carry out the analysis of media coverage differences across sub-neighborhoods with different demographics.

- **Coverage of Homicides**

  Initially, we were asked to look at the Boston Herald findings performed by last semester's team and evaluate whether it can be used for analyzing races in respect to sub neighborhoods. But since last year's team findings were completely based on neighborhoods, we couldn't use that directly. So to analyze sub neighborhoods, we decided to scrape the data from the Boston Herald website. We were asked to use the Wayback machine for scraping data from the website, but even after several attempts and changes we couldn't make the script work. Around this same time, we moved classes completely online and were asked to leave the dorms. Because of this chaos, it was difficult to coordinate and reach out to people for help. Due to the delays and disruptions caused by the transition, after discussions with Spark members we decided to move forward with Boston Globe data as it was already scraped and ready to use.

Data Collection and Preprocessing:

To analyze the coverage of homicides with respect to black and white communities, we used articles from the Boston Globe between 2014 and 2018. Scraping of the data was done by the Fall 2019 team. Along with the news articles, we were also provided a separate list of people who were killed each year, including their name, race, age, and gender.

Data scraped by the last semester's team did not specifically contain only the homicide news. So in order to specifically look at homicide coverage, we first created a subset of articles from the larger pool of data, which specifically covered homicide news. To approach this problem we decided to look for articles containing words with specific words like homicide, murder, crime. To get the better coverage we included other similar words as well in the list, for searching for the homicide sub dataset.

The first thing we did was pre-process the JSON files that contained the raw data for the Boston Globe articles. We converted the JSON files into CSV format for better readability in python code. After this our next step was to find the words similar to words "homicide", "murder", and "crime" in the articles present in the data file. For this we first tokenized the complete dataset and removed the stop words using NLTK library and then applied word2vec model from gensim library. Using the 'most_similar' method of the word2vec model we took the top 5 similar words for each of 3 words defined above for every data file. After that, we took the most relevant similar words to homicide returned by word2vec and added them in the list, which we used to scrape the sub dataset of articles for analyzing homicide coverage. We also wanted to check if a particular race or gender is getting associated with these 3 defined words and get the total count of articles mentioning these similar words. For this we wrote the code to search the word across all the articles in each year. While creating a list of keywords for creating the homicide dataset we gave importance to the similarity of word to homicide rather than its larger number of occurrences. Once we got the list of keywords relevant for homicide coverage specific to a particular year, we created a subset of articles for that year containing these keywords. Once this pre-processing was done we had the articles specific to homicide coverage from 2014-2018.

After this, we had to count the number of explicit mentions of a person's name in the homicide dataset. Since all the keywords which were used to create a subset of the homicide dataset were single words, we were able to easily check them without using any specific library to match the keywords. But to check the implicit mention of names we had to match the phrase of 2 words (First Name Last Name). To do this we didn't tokenize the homicide data as it would have created separate tokens for first name and last name. Instead we used PhraseMatcher of spacy library to match the exact name of the person in the homicide dataset. This code gave us the number of articles a particular person is mentioned explicitly by name.

Sentiment Analysis:

For homicide data when we took the top 5 similar words for homicide, murder, and crime. One of our intentions was to check if a particular race or gender is getting associated with these 3 defined words. But for the given dataset we didn't find any race or gender in the top 5 associated words with these keywords.

Though when we checked the number of articles mentioning the name explicitly we observed that explicit occurence of black person's name in the articles is far more prevalent than a white person's name.

- **Explicit coverage of Black People:**

  Data Collection and preprocessing:

  We used the same Boston Globe dataset for analyzing the explicit coverage of black people which we used for coverage of homicides. Our initial preprocessing for this part is the same as that of homicides where we converted data into csv and used the spacy's PhraseMatcher. To check the explicit mention of race in the articles we passed the list of keywords related to race in Phrasematcher.

  We used the following key words which were approved by Tanisha Sullivan, the president of the Boston chapter of the NAACP and take into consideration demographic trends that are specific to the Boston area, such as the presence of a sizable Haitian community:

  > [Black, Afro Latino, Afro Latina, Cape Verdean, Haitian, Haitian-American, African, African-American,Caribbean, Jamaican, Haitian, Dominican, West Indian]

  We searched for these keywords on their own, as well as the keywords alongside any of the following words:

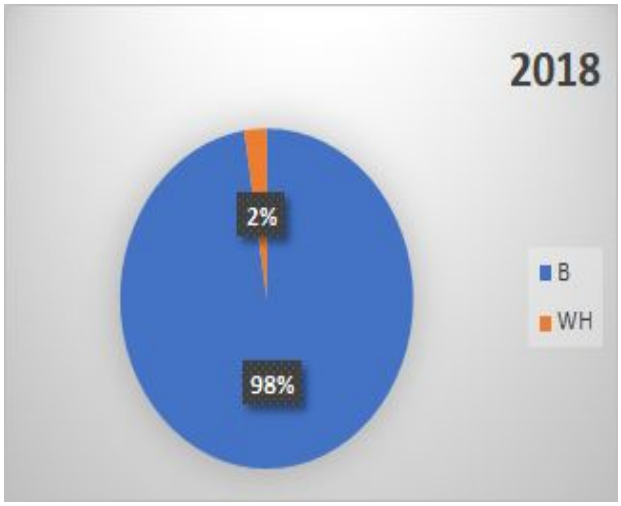
  > [people, male, female, man, men, woman, women, child, kid, youth, community, neighborhood, business, company]

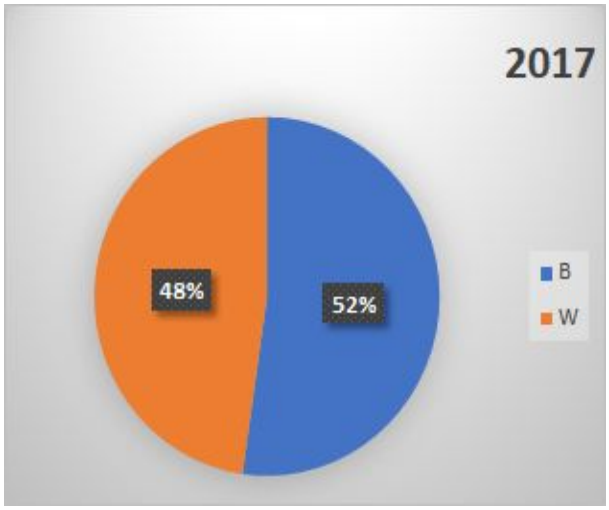
  While implementing this part we not only took the count of articles mentioning the race explicitly, we also created the separate dataset of these articles in the corresponding years. We will be using these subsets of articles for sentiment analysis.

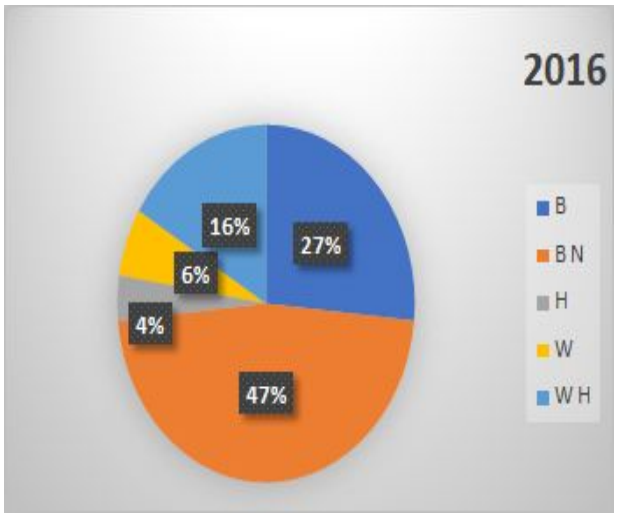
III. Findings & Observations & Results:

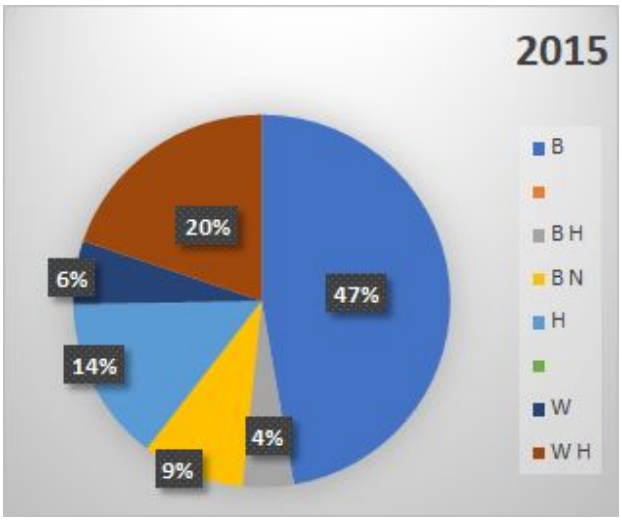
- **Coverage of Homicides**

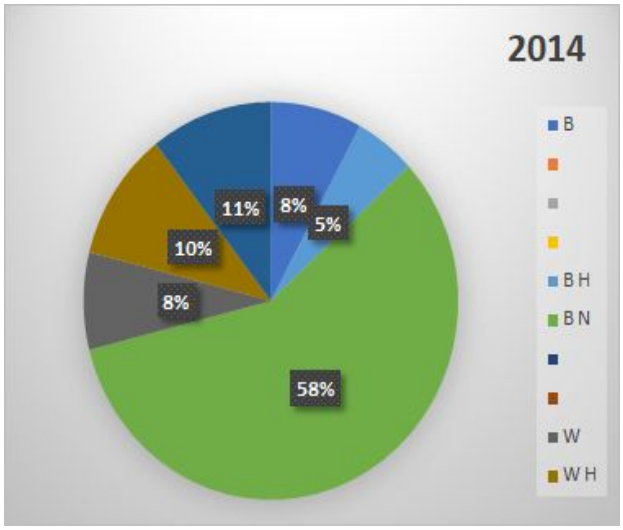
  After comparing the number of articles covering black and white communities we observed that most of the names explicitly mentioned are of the black community members. Out of different non-white races, such as Black and Hispanic, Black people were more likely to be explicitly mentioned in the articles.





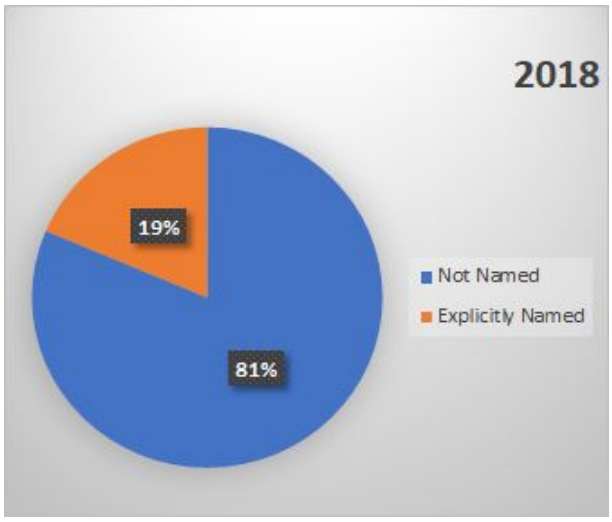


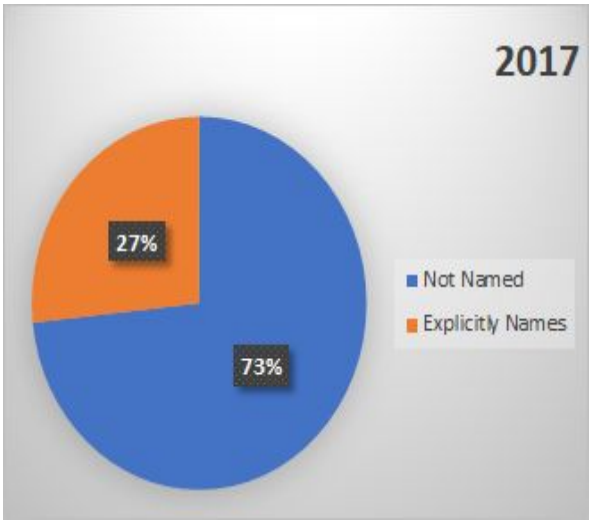


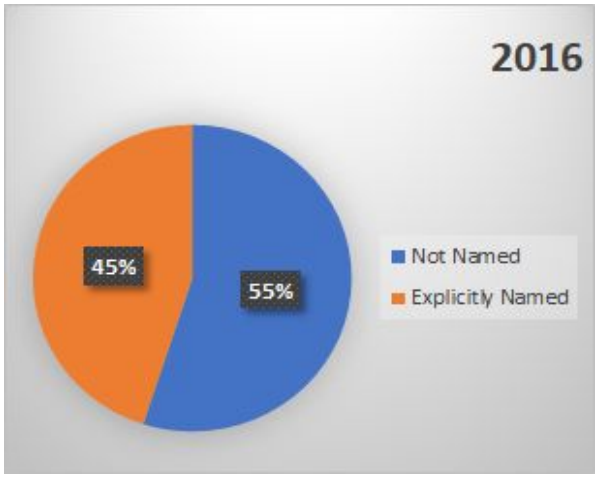


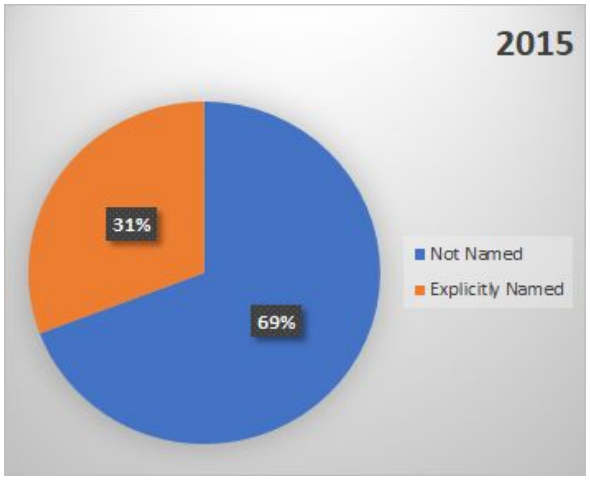
Results of comparing mentioning of explicit name of black and white community

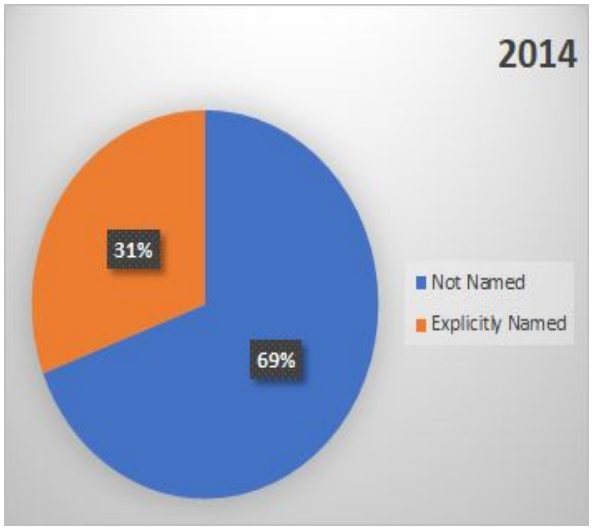
We also observed that among black people which were provided in the list only less than 50% names were actually explicitly mentioned in the articles.











Results for Black people explicitly name vs Black people not named

- **Explicit Coverage of Black People:**
  Below is the result for the volume of a few of the explicit race mentions in 2014 and 2017. The columns indicate the year of coverage. The cells indicate the number of articles in that year that contain the race mentioned in the first cell of that row. For example, in 2017, there were 202 articles that included the phrase “black people”.
  It is worth noting that the volume of race mentions in 2017 is generally larger than in 2014, and this is something that needs to be investigated further using topic analysis and sentiment analysis of the articles with race mentions. In addition, it is worth mentioning that our list of keywords for “Black” and for people/individuals is not exhaustive. For instance, there could be mentions of “black doctors” or “black actors” that would count as coverage of Black individuals but might not necessarily be detected by this algorithm since those words are not in the approved list that was provided to us.

Race Mention	2014	2017
black people	19	202
black male	4	23
black female	2	46
black man	14	223
black men	15	139
black woman	21	101
black women	7	110
black child	1	5

IV. Conclusion

Through this project we got the opportunity to investigate the media coverage of the Boston Globe with regards to different racial groups. We tried to help our client by providing a better understanding of the difference in coverage of homicides in the case of the black community and white community along with providing analysis on explicit mention of the Black race. For homicides, we analyzed volume of coverage as well as the percentage of named and unnamed mentions in articles, and for explicit mentions of race we tried to analyze the topics most commonly present in those articles

This information could be very useful for the NAACP in its mission to fight for social justice and achieve racial equity because it sheds light on some of the disparities experienced by the Black community in terms of media coverage.