Women in Politics

COMP 6234 Coursework

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I. Data Story Summary

The Topic for Analysis is "Women in Politics". In this report, the trends in the participation of women in politics over a period spanning two decades (1997 – 2017 are analysed. As per United Nations, world-wide average of women participation in politics is a mere 23.4% which makes us wonder why. The following questions are addressed in this report:

1) Which Country/Region has shown progress over the years?

2) What are the countries with lowest participation and highest participation from women?

3) What are the factors influencing the entry of women in politics?

In order to answer these questions, the women participation is first analysed by region and then by country from 1997 to 2017. The top 5 and Bottom 5 countries in terms of progress in women's participation in politics are found and closely examined for further analysis. Then, the factors that influenced the women's participation in these top and bottom countries are analysed and how much each factor changed and influenced the participation over the period of time is analysed. Irrespective of numerous factors influencing women participation, the most important factor is gender quota which is analysed to arrive at a conclusion.

II. Dataset Summary

The dataset used for this analysis includes "Women's Representation in National Parliaments" from Finnish Social Science Data Archive" [1] Life Expectancy at Birth", "Fertility Rate", Female Self – Employed Rate", "Female Labour Rate" from World Bank [2] and "Effective Quota" from "Quota Adoption and Reform Over Time" [3]. The countries where the data was missing for considerable amount of time were removed and finally 112 countries were selected for analysis. Each Country was mapped to a Region and an Income Group. All the features are expressed in terms of percentage. The time period considered for this analysis is 1997 to 2017.

III. Visualisations

A. Women in Politics – Region wise – 1997 to 2017

The average participation of women in politics for every Region from 1997 to 2017 is show in the Figure below. The numbers are in percentage.

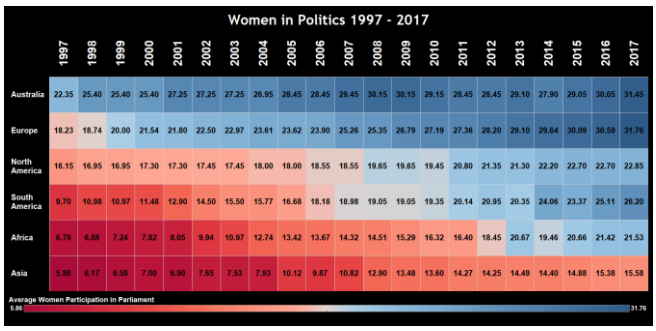

Figure 1 – Highlights Table Chart – Women in Politics 1997 – 2017

1) *Description*

Used Highlights table to show how the average participation of women in all the countries grouped by Region for the years changed from 1997 to 2017. The legend shows the range of the women participation is from 0 to 31.76% which is the maximum recorded average women participation in a given region for a particular year.

2) *Justification*

Used Highlights table because it is easy to compare each regions' participation by rows and columns. It clearly presents the key findings behind the visualization which is to show the progress of each region and also helpful to compare the rate between the regions. The goal of this visualization is to help the readers understand the minute changes in the women's participation over time which is very well portrayed which cannot be achieved by using a pie chart or bar chart

3) Narrative Design Patterns

Used "Red-Blue Diverging" Palette as a visual cue to represent the diverging spectrum of the average participation of women with dark red indicting lower progress and dark blue indicating higher progress. Used isorhythmic concept - Lightness and colour to convey the spectrum of the average women participation. The number inside each highlight table cell is the average of women participation in all the countries belonging to that particular region. A grey border is added around the marks to provide separation of each cell.

4) *Strengths and Weaknesses*

Strength: Due to colour variation, a quick glance of this chart will show the high and low values. Easy to spot

outliers. Easy to show small changes over time which is usually lost in case of other types of charts.

Weakness: It is not very useful when you have small data. Human perception and cognitive skills are not proficient in detecting small changes in brightness or saturation of the colour.

5) Improvements

First used a tree map with size based on the average but that did not distinctively show the difference in the percentage. The visualization is conveying the information intended to share which is to show the progress in women participation over the two decades.

B. Average Women Participation in 1997 vs 2017

Comparison of the women participation in 1997 and 2017 country wise.

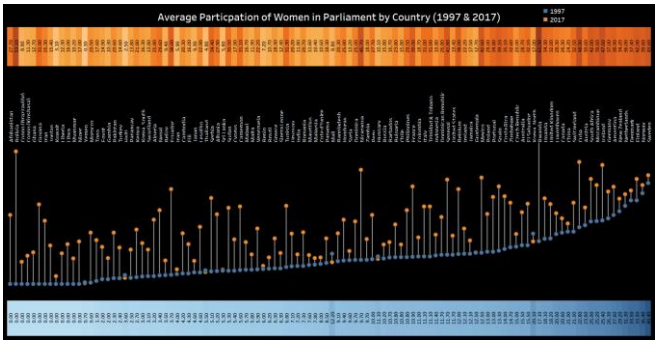

Figure 2 – Dumbells Chart – Women in Politics 1997 vs 2017

1) Description

It is a combination of highlights table and dumbbells chart. Dumbbells chart is chosen to show the year-over-year comparison of women participation per country. Visual lengths are used to show the relative positions between two points in time.

2) Justification

The dumbbells chart is used because its best suited to represent time series data. It is easy to quickly spot the outliers where the orange spot (2017) is below the blue spot (1997) for certain countries. If line chart were used, then all the lines for each country would have overlapped and it would have been hard to see how each country progressed.

3) Narrative Design Patterns

Used Dual Axis with mark type as circle for 1997 and 2017 and used a line as connector with a vertical orientation. Visual encoding is used, Blue colour is selected to denote the bottom year 1997 and orange colour is selected to denote the top year 2017. The data is sorted be ascending order of the women participation in each country for the year 1997.

4) Strengths and Weaknesses

Strengths: We can see the percentage of participation in 1997 and 2017 for all the countries in one chart along with the progress made over two decades. A huge amount of information is presented in a perceivable way for human brain to comprehend without much strain.

Weakness: Difficult to interpret the dumbbells with statistically small difference and this problem is compounded if two lines of same height lie next to each other.

5) Improvements

It can be made as a tribell chart with 2017 in centre and predict the next twenty years.

C. Top 5 and Bottom 5 Countries

5 countries which made the most progress between 1997 and 2017 and 5 countries which made the least progress between 1997 and 2017 are closely examined in this visualization.

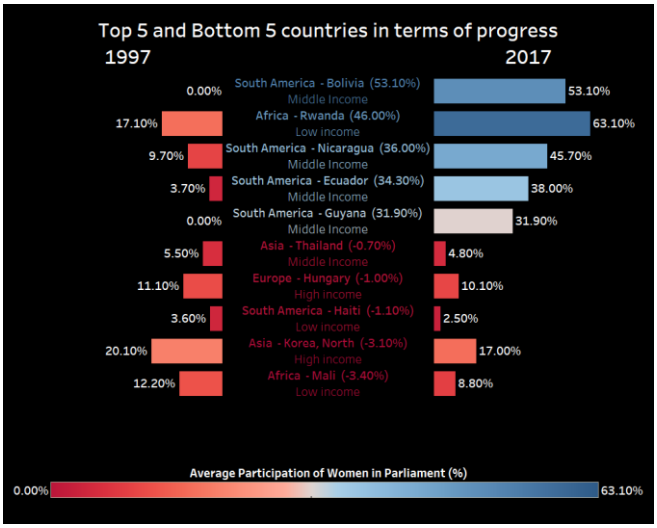

Figure 3 – Top and Bootm of 5 countries

1) Description

Used Butterfly Charts to show the top and bottom 5 countries with changes in women participation in politics since 1997. The top 5 and bottom 5 countries' women participation for 1997 is shown on the left side and the same for 2017 is shown on the right side of the butterfly chart. The name of the Region, Country, Income Group and the difference in participation between the years 1997 and 2017 are shown in the middle of the wings of the butterfly chart.

2) Justification

Used Butterfly charts because they show the participation in 1997 and 2017 side by side for the same set of countries. The main objective of this visualization is to highlight the fact that few countries have shown tremendous progress since 1997 and few countries retrogressed from what percentage they had in 1997.

3) Narrative Design Patterns

Used "Red-Blue Diverging" Palette to represent the diverging spectrum of the average participation of women with dark red indicting lower progress and dark blue indicating higher progress. The numerical axes for this bar chart start from zero since humans are good at perceiving length and if the bar chart does not start at zero then the data will be distorted. The data is sorted in the descending order of the difference in women participation between 1997 and 2017.

4) Strengths and Weaknesses

Strength: Humans have excellent perceptual acuity to notice the difference in the length, width, height and other alignments of a bar. Easy to compare individual bars against each other.

Weakness: If the difference in the length of each bar in the butterfly chart are significantly small then it is easy to lose the crux of the data trying to be conveyed. If a number of bar charts are placed next to each other, then the width of the plot increases.

5) Improvements

The objective of the visualization which is to show the top and bottom 5 countries in terms of their progress in 1997 and 2017 along with the information about the participation rate in 1997 and 2017 which is perfectly conveyed and is clairvoyant to any user and requires no improvement.

D. Factors Influencing Women Participatoin in Politics

Life Expectancy, Fertility, Female Labour Percentage, Female Self- Employment, % of Female Population were considered as factors that influenced women participation in Politics.

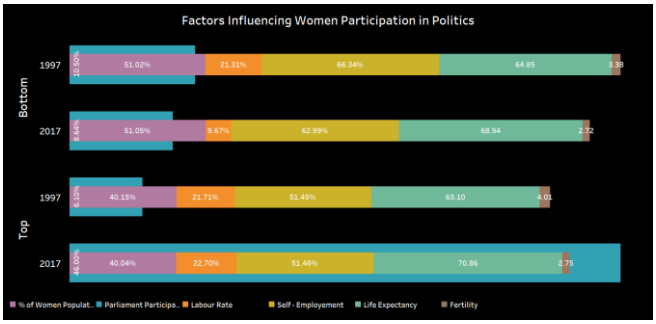

Figure 4 – Factors Influencing Women Participation

1) Description

Used Combination charts to show how each factor influenced women participation in top 5 and bottom 5 countries. Compared the percentage of each factor in the year 1997 and 2017 for the top and bottom countries.

2) Justification

Used Horizontal bars stacked upon each other as it is easy to show how the values changed between 1997 and 2017. The different factors are first grouped by Category (Top or Bottom) and within each category they are grouped by year and we can easily see which factor has influenced women participation more by the changes in the percentage for 1997 and 2017.

3) Narrative Design Patterns

Each factor is colour coded with soothing colours at the same time they are distinct enough to show the difference.

4) Strengths and Weaknesses

Strength: Easy to stack them in ascending or descending order.

Weakness: When the percentage of the one factor is very huge compared to another factor, the bar displays it tiny and it is blindsided. Suitable only when the number of categories is small.

5) Improvements

If the data regarding the percentage of Women turnout or the percentage of registered women voter's data had been available, it would have added more weightage.

E. Gender Quota

The below figure shows the Gender Quota implementation worldwide in the year 2015. If Gender Quota is implemented in a country, then it is denoted by 1 and if it is not implemented then it is denoted by 0. The size of each block is the percentage of the women representation in politics. Within each block, the country's name, Gender Quota Implementation detail and percentage of women participation in politics is displayed.

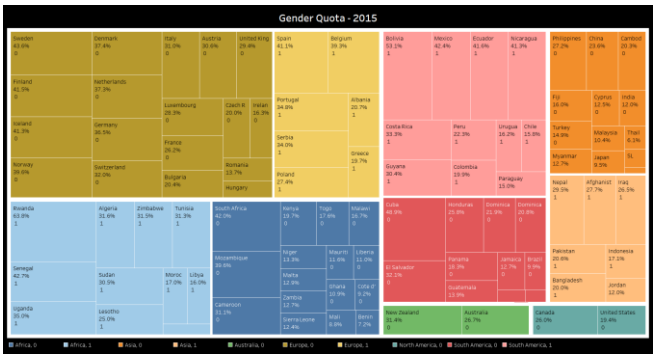

Figure 5 – Gender Quota implementation around the world

1) Description

Used Hierarchical Data Tree Map to represent the gender quota implementation in the countries [4]. It depicts the

quota implementation in various regions which are then broken down by country.

2) Justification

Tree Maps organizes the data hierarchically in form of rectangles starting from the largest to smallest and is helpful in visualizing the part-to-whole relationship. It is especially usefule when we have groupings within a group. Here, first the countries are grouped by region and within each region, the countries are grouped by gender quota implementation and ordered hierarchically in terms of average women participation in politics. It clearly brings to limelight how still half the world countries have not yet implemented a gender quota with its colour coded rectangles. With the help of large rectangles, it is easy to see that there are countries where average women participation is more than the global average of 23.4% but still the gender quota is not implemented.

3) Narrative Design Patterns

Used Darker and Lighter shades combo to show gender quota for countries within each region. The darker shade is chosen to represent countries where gender quota is not implemented, and lighter shade is chosen to represent countries where gender quota is implemented. A white border is chosen to shown clear distinction between each country and region acting like negative space thereby highlighting each rectangle.

4) Strengths and Weaknesses

Strength: It is suitable when you have a lot of categories to compare and show all of them in one small area. You would need several bar charts to display the same amount of information displayed in a hierarchical tree map.

Weakness: It will be difficult to make accurate comparison between the area of the rectangles if the categories do not differ much and not have a common scale. Small rectangles are sometimes reduced to a microscopic size and the information given by them is lost.

5) Improvements

If the information about the percentage of quota in each country is known, then that information could also be displayed inside each rectangle.

IV. Conclusion

The data story is participation of women in politics is very less which is the claim as per Toulmin method. In order to support that claim, the first warrant was the low women participation when analysed region and the second warrant is the country wise participation between 1997 and 2017 has not changed much. The evidence to the first warrant is provided by Highlights table of participation of women in politics region wise. The evidence to the second warrant is provided by the country wise comparison of the participation between 1997 and 2017 using dumbbells chart. The rebuttal to the claim is visualized using the butterfly chart of the top and bottom 5 countries in terms of progress where we can see Rwanda which had very little progress in 1997 emerging as the top country in terms of women participation and Bolivia which had zero participation in 1997 and has managed to end up in the top 5 list in 2017. The combination chart showing the factors that influenced women participation in these countries between 1997 and 2017 increased as the women participation increased for top countries and decreased as the women participation decreased for bottom countries thereby showing that the claim is not always true. The Qualifier is provided by the hierarchical tree map of gender quota implementation in each country grouped by region thereby proving that irrespective of numerous factors influencing women participation in politics, the first and foremost factor is the recognition which is given to women and acknowledging that she is also entitled to play a role in politics. From the design perspective, colour differences between content and background helps to focus attention on the content. Having done this project, I am confident I have mastered the art of choosing the coherent colour schemes and chart graphics applicable to the type of data and the story to be conveyed.

[1] Women's Representation in National Parliaments 1970-2017 - Vanhanen, Tatu: Women's Representation in National Parliaments 1970-2010 [dataset]. Version 4.0 (2011-06-22). Finnish Social Science Data Archive [distributor]. http://urn.fi/urn:nbn:fi:fsd:T-FSD2183

[2] Life Expectancy at Birth - female (years), Fertility Rate, Total (births per woman), Self-employed female (% of female employment) (modeled ILO estimate) – World Bank.

[3] Hughes, M. M., Paxton, P., Clayton, A., & Zetterberg, P. (2017). Quota Adoption and Reform Over Time (QAROT), 1947-2015: QAROTCodebook_HughesPaxtonClaytonZetterberg__August2017.pdf [Data set]. Inter-university Consortium for Political and Social Research [distributor]. https://doi.org/10.3886/E4707V1

[4] B. Johnson and B. Shneiderman, "Tree-maps: a space-filling approach to the visualization of hierarchical information structures," *Proceeding Visualization '91*, San Diego, CA, USA, 1991, pp. 284-291.