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Exploratory analysing on World Happiness Report

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Report for
ETC5513 Assignment 4

8 June 2020

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1 Happiness and Attribute Scores across the Globe

There is no formal definition of happiness, it is associated with an individual's state of mind, and we usually know it when we feel it. The happiness ranking and scores use data from the Gallup World Poll. Essentially, survey participants are asked, "from a score of 0-10, how happy are you"? (Sachs, Layard, Helliwell, et al., [2018](#))

In this section, six key criteria, which encompass socioeconomic factors of countries are aggregated and quantified to explain the variation of happiness across countries. These criteria include GDP per capita, social support, healthy life expectancy, freedom, generosity, and absence of corruption. This section critically analyses these six variables to determine if happiness does change, according to the quality of the society people live across the world.

1.1 Data, Design and Methodology

First, the happiness data from 2015 was utilised to retrieve the regions for each country, these regions are added to the 2018 and 2019 datasets. Countries with omitted regions are then manually inserted. Next, 3 countries with missing attribute scores are removed.

To construct the happiness score on a map, the world map data is taken from the maps package (code by Richard A. Becker, version by Ray Brownrigg. Enhancements by Thomas P Minka, & Deckmyn., [2018](#)) to create a base map and retrieve the geographic coordinates of all countries in the world. Subsequently, the happiness data is further wrangled to resolve conflicting country names between the happiness and the map data; Both datasets are then joined to build the world map with the happiness score of each country.

The attribute scores of the six criteria are evaluated across the various countries and regions. The estimates of population data are employed (Piburn, [2018](#)) to determine if population size affects happiness scores. Similar to the world map, conflicting country names are modified so countries in both datasets match. Consequently, the attribute scores of all countries in the happiness data set are laid out on a scatter plot.

1.2 Limitations

On top of the survey response bias, it should be noted that some limitations of this analysis include non-sampling errors such as defects in the selection of survey participants and population coverage limitations. Further, with a holistic approach in determining happiness scores of each country, minute details such as in each city or state within countries cannot be computed. Lastly, the happiness data is aggregated, thus evaluations such as comparisons between different genders or age groups may not be established.

1.3 Analysis 1: 2019 Happiness Scores on the World Map

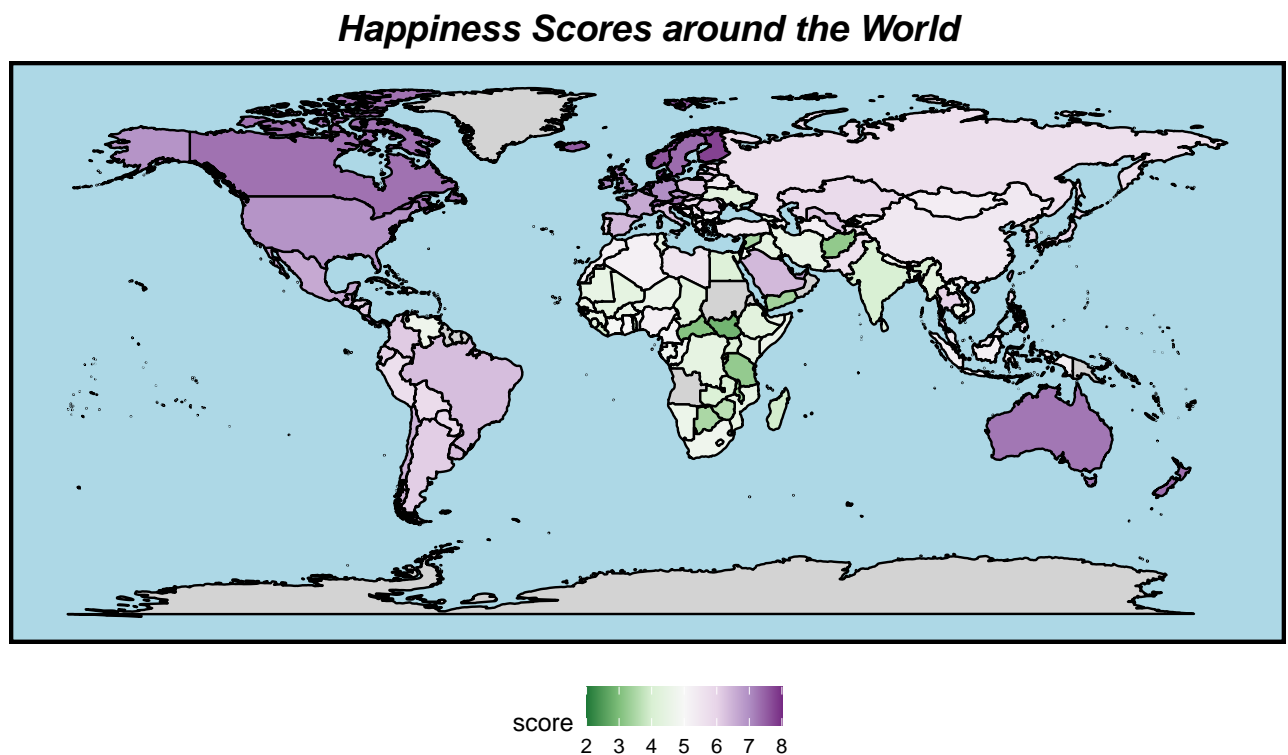


Figure 1: *Happiness Scores of Countries around the World*

Figure 1 depicts the happiness scores of each country on a world map. The x-axis and y-axis represent the longitude and latitude respectively. It is observed that happiness scores within continents or regions are analogous. For instance, happiness scores in Africa are relatively low compared to the rest of the world. It can be implied that these African countries may have poor happiness scores because of low economical levels or even associated with high political instability and reoccurring periodic outbreaks of armed conflict (Sachs, Layard, Helliwell, et al., 2018).

Comparatively, continents such as Europe, North America, and Australia have consistently high happiness scores in most countries. Moreover, the top 10 happiest countries are evidently dominated by Scandinavian countries such as Finland and Denmark. These figures can also be viewed on (Refer to Roger top 20 tables).

1.4 Analysis 2: Compare attribute scores across countries

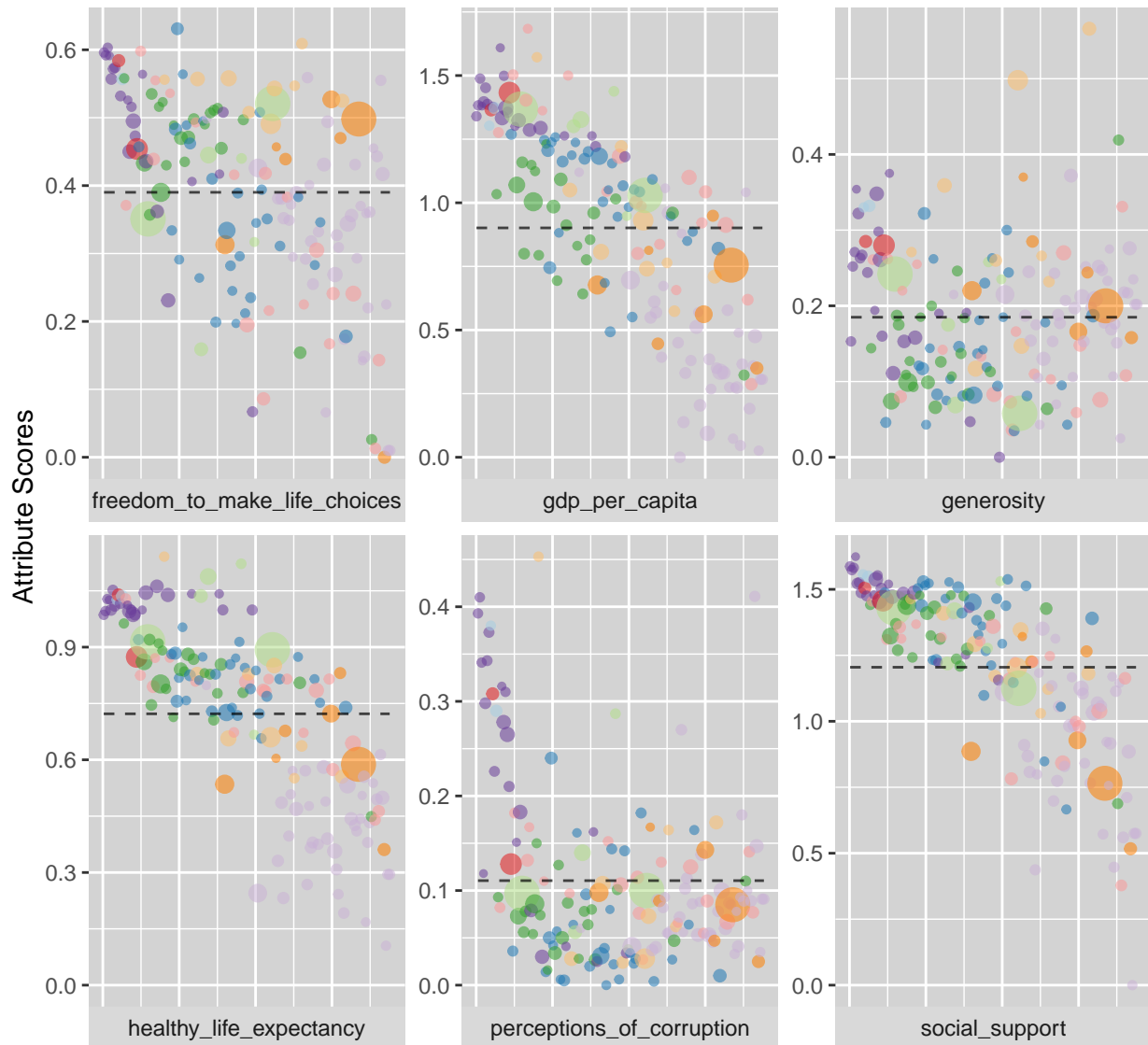


Figure 2: Attribute Scores of all Countries

The y-axis represents the attribute scores for a given attribute. Each dot symbolises a country's attribute score and the black dashed line represents the average attribute score across all countries for each specific attribute.

Of paramount importance, these factors do not have an impact on the happiness score reported for each country but is used to understand the sources of variations in happiness among countries.

Figure 2 shows large gaps between the top and bottom countries in each criterion. Like in figure 1, countries in the Scandinavian region has the highest scores while Africa had low attribute scores in most of the six attributes.

Next, large variations are illustrated within regions in most of the attributes except for 'healthy life expectancy'. For instance, in 'GDP per capita' and 'freedom', only approximately half of Central and Eastern Europe were above average. In contrary, a consistent pattern can be seen in healthy life expectancy across regions.

The next section of this report will investigate these key criteria to see if happiness scores can be accurately attributed or explained these variables of the different countries (**Double check this statement with Karen/Wei Hao**).

References

- code by Richard A. Becker, OS, version by Ray Brownrigg. Enhancements by Thomas P Minka, ARWR, & Deckmyn., A. (2018). *Maps: Draw geographical maps* [R package version 3.3.0]. <https://CRAN.R-project.org/package=maps>
- Piburn, J. (2018). *Wbstats: Programmatic access to the world bank api*. Oak Ridge National Laboratory. Oak Ridge, Tennessee. <https://www.ornl.gov/division/csed/gist>
- Sachs, JD, Layard, R, Helliwell, JF, et al. (2018). *World happiness report 2018* (tech. rep.).