World Happiness Report 2023

Coursework

"Since then, more and more people have come to believe that our success as countries should be judged by the happiness of our people", *World Happiness Report*.

In recent years, happiness, as well as physical and mental health, have emerged as significant topics in our daily lives. But how does happiness vary across different countries and regions?

The purpose of this report is to illustrate how countries compare in terms of the happiness and well-being of their populations. We will carry out a Multidimensional Scaling analysis on a dataset.

Since ten years, the *World Happiness Report*, a partnership of Gallup, the Oxford Wellbeing Research Centre, the UN Sustainable Development Solutions Network, and the WHR's Editorial Board, publishes yearly report about world happiness. The dataset for 2023 that we will use can be found at 'DataForFigure2.1WHR2023.xls'. Let's prepare the dataset by only keeping the following features: "Country", "Happiness score", "Logged GDP per capita", "Social support", "Healthy life expectancy", "Freedom to make life choices", "Generosity" and "Perceptions of corruption". We also add a column "Region" to categorize each country by its geographical area in the world (e.g. Western Europe, East Asia, ...) Figure:1. In the dataset, the countries are in decreasing order of happiness score with a total of 137 countries.

First of all, a simple interesting analysis is examining the correlations between the features mentioned above Figure:2. We notice strong positive correlations between Happiness and Social Support (0.84), Happiness and GDP per capita (0.78), Happiness and Healthy life expectancy (0.75). Conversely, there is a negative correlation between Happiness and Perceptions of corruption (-0.47). These findings align with our expectations and provide a first idea of what will the MDS look like considering what we already know about the characteristics of each country.

Then, let's conduct the Multidimensional Scaling analysis on our dataset, as shown in Figure:3. Notice this is a non-metric MDS, as the values for each feature are indices derived from: Cantril ladder collected through surveys involving "more than 100,000 people in 130 countries". As a first general observation, we notice that countries are mostly grouped according to their region. Indeed, on the right-hand side, there is a concentration of Sub-Saharan African countries, in the middle, we see Middle East/North African and Asian countries, and on the left-hand side, mostly European and East Asian countries. In addition, European countries are especially close to each other which indicates a high level of similarity among them. These observations align with real-world dynamics, where for example European countries tend to manifest more similarities with each other compared to Sub-Saharan African countries (e.g. politically, economically, historically).

Nevertheless, the most interesting aspect to observe is the presence of exceptional cases such as: Israel #4; Singapore #25; Mongolia #61; Hong Kong S.A.R. of China #82; Venezuela #88; Lebanon #136 and Afghanistan #137. Let's try to explain these exceptional cases by identifying the potential causes of their differences from their respective region.

The case of Israel is particularly 'special' as it may heavily influenced by the period of the year where the survey took place. Indeed, we know that a deadly conflict arose in October 2023 between Israel and Hamas, which must have had a significant impact on the features we are analysing. Next, Singapore is renowned for its remarkable progress in a relatively short period, transforming from a developing nation to a highly developed one. Especially, the country has a strong economy, efficient infrastructure, and a high standard of living. In the dataset, Singapore is ranked at #25 significantly higher than the second-ranked country in Southeast Asia: Malaysia #55. Similarly, Hong Kong shares some similarities in a few points: being a high developed country with a strong economy. However, with recent political issues has raised concerns, which may have affected factors such as "Freedom to make life choices" and "Perceptions of corruption". In both cases Singapore and Hong Kong stand out as cities that excel in many aspects compared to their neighbouring countries, as demonstrated by the MDS.
A final interesting case is Lebanon #136. As observed on the MDS, this country appears to distinct from other countries in its region. When looking at the dataset, Lebanon has the second-lowest happiness score, much lower than the preceding Middle East and North African country: Ethiopia. This can be explained by the country's geographical situation, surrounded by territories in conflict, leading to a volatile and unpredictable situation. Moreover, the tragic explosion in Beirut in 2020 had significant negative consequences physically, psychologically and economically for its population. These factors may contribute to Lebanon's surprising position in the dataset.

Next, another interesting analysis would be to simply plot the happiness score by region, as shown in Figure:4. We observe that European and North American people tend to report higher levels of happiness, while South Asian and Sub-Saharan African people tend to report lower ones. Additionally, happiness score varies a lot among Middle East and North African countries, as the box is large. Again, we observe some exceptional cases. There are some strong similarities with Figure:3 indicating a strong pattern in how regions are positioned among each other.

Then, another interesting analysis involves performing a MDS only on the features 'Freedom to make life choices' and 'Perceptions of corruption', Figure:5. These two factors can vary significantly between countries, especially with different political backgrounds and may play affect a lot its happiness score. Here, the distinction between regions is way less precise. Nevertheless, we can still observe a 'clustering' of European countries, indicating similarities in these two factors. However, the other regions are more mixed together. Again, there are still some notable exceptional cases such as: Singapore #25; Estonia #31; Greece #58; Hong Kong S.A.R. of China #82 and Afghanistan #137.

In conclusion, this analysis has revealed that countries within the same region of the world tend to have similar characteristics in term of happiness. Furthermore, individuals from countries with a strong economy, strong social support, high levels of freedom and low perceptions of corruption (in more general trust in the authorities) usually report higher happiness. Finally, there are some exceptional cases which stand out of their respective region. The cases which stand out positively are often city-state or territories with unique socio-economic dynamics. Conversely, the cases which stand out negatively are often countries knowing important political, economic and armed conflict challenges.

	Country	Region	Happiness_score	Logged_GDP_per_capita	Social_support	Healthy_life_expectancy	Freedom_to_make_life_choices	Generosity	Perceptions_of_corruption
1	Finland	Western Europe	7.8042	10.792010	0.9687696	71.14999	0.9614079	-0.0188241657	0.181744
2	Denmark	Western Europe	7.5864	10.962164	0.9541122	71.25014	0.9335328	0.1342421621	0.195813
3	Iceland	Western Europe	7.5296	10.895531	0.9825331	72.05002	0.9363492	0.2109865397	0.667847
4	Israel	Middle East and North Africa	7.4729	10.638705	0.9433440	72.69720	0.8088658	-0.0230800509	0.708093
5	Netherlands	Western Europe	7.4030	10.942279	0.9304993	71.55002	0.8868751	0.2126861513	0.378929
6	Sweden	Western Europe	7.3952	10.882823	0.9392487	72.15015	0.9479710	0.1647885740	0.202448
7	Norway	Western Europe	7.3155	11.087730	0.9434766	71.50002	0.9466164	0.1406360567	0.282744
8	Switzerland	Western Europe	7.2401	11.164027	0.9204392	72.89996	0.8910744	0.0266864188	0.266347
9	Luxembourg	Western Europe	7.2279	11.659949	0.8785008	71.67500	0.9149384	0.0239496231	0.344978
10	New Zealand	North America and ANZ	7.1229	10.661865	0.9523984	70.35005	0.8865743	0.1748282313	0.271205
11	Austria	Western Europe	7.0973	10.898906	0.8884358	71.15005	0.8547373	0.1016044691	0.496774
12	Australia	North America and ANZ	7.0946	10.821049	0.9338704	71.04994	0.8901996	0.1975610703	0.495915
13	Canada	North America and ANZ	6.9607	10.772655	0.9287933	71.40004	0.8744681	0.1525465101	0.420211
14	Ireland	Western Europe	6.9108	11.527362	0.9053684	71.29996	0.8743811	0.0916595235	0.357952
15	United States	North America and ANZ	6.8937	11.048249	0.9191622	65.85025	0.8004881	0.1365049034	0.688594
16	Germany	Western Europe	6.8918	10.878610	0.8959548	71.29984	0.8458515	0.0300377291	0.419564
17	Belgium	Western Europe	6.8591	10.843587	0.9148710	70.89909	0.8252285	0.0014193851	0.548573
18	Czechia	Central and Eastern Europe	6.8452	10.611020	0.9525779	69.04974	0.9025149	0.0397630818	0.858949
19	United Kingdom	Western Europe	6.7956	10.704245	0.8822047	70.30000	0.8521916	0.2533075213	0.454079
20	Lithuania	Central and Eastern Europe	6.7630	10.567839	0.9393466	67.39700	0.7478520	-0.1452128291	0.805086
21	France	Western Europe	6.6613	10.700735	0.9088038	72.30006	0.8187304	-0.1002898514	0.552618
22	Slovenia	Central and Eastern Europe	6.6499	10.588291	0.9505247	71.05185	0.9132805	0.0144006377	0.771246

Figure 1: Dataset

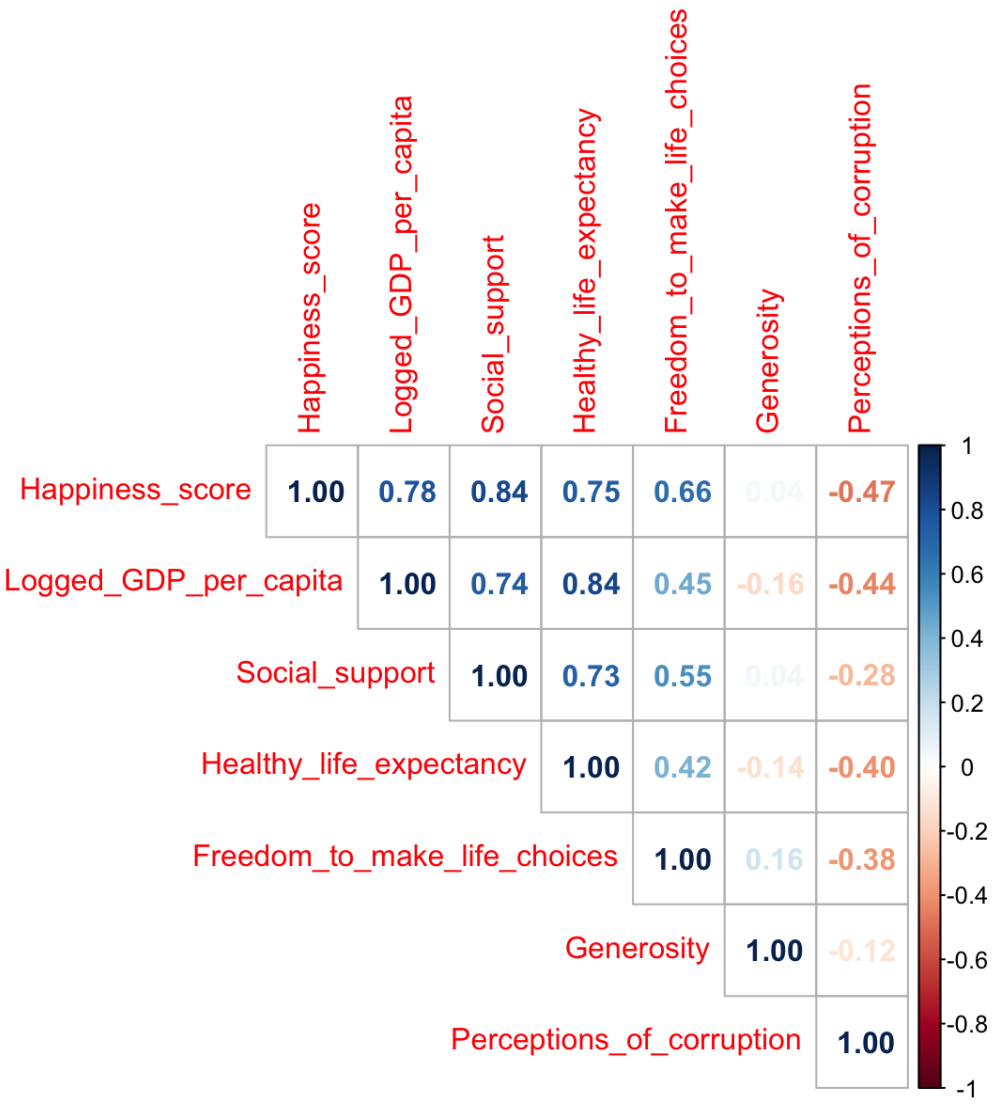

Figure 2: Correlation Matrix of the features

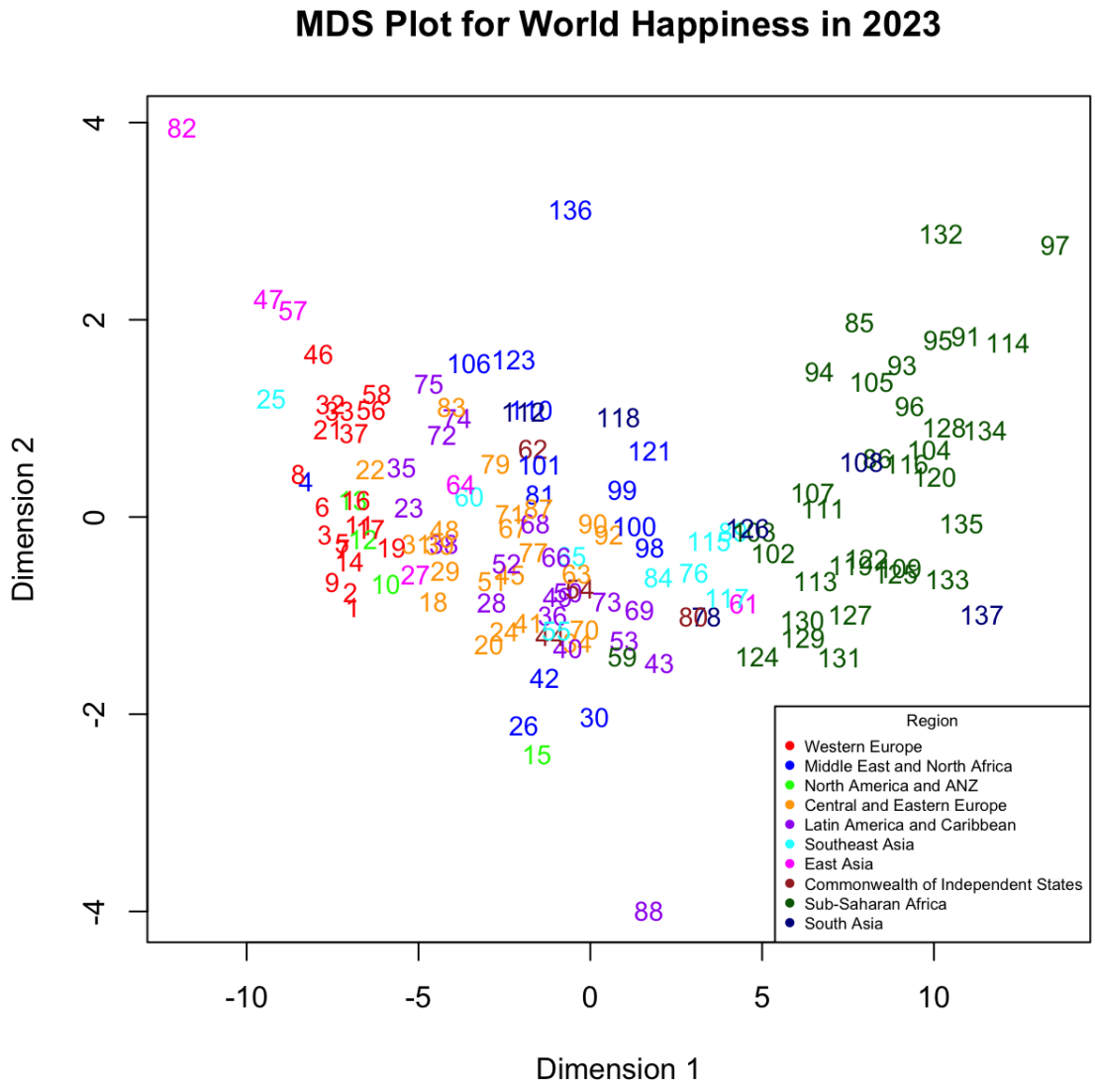

Figure 3: MDS Happiness

Figure 4: Boxplot of Happiness by region

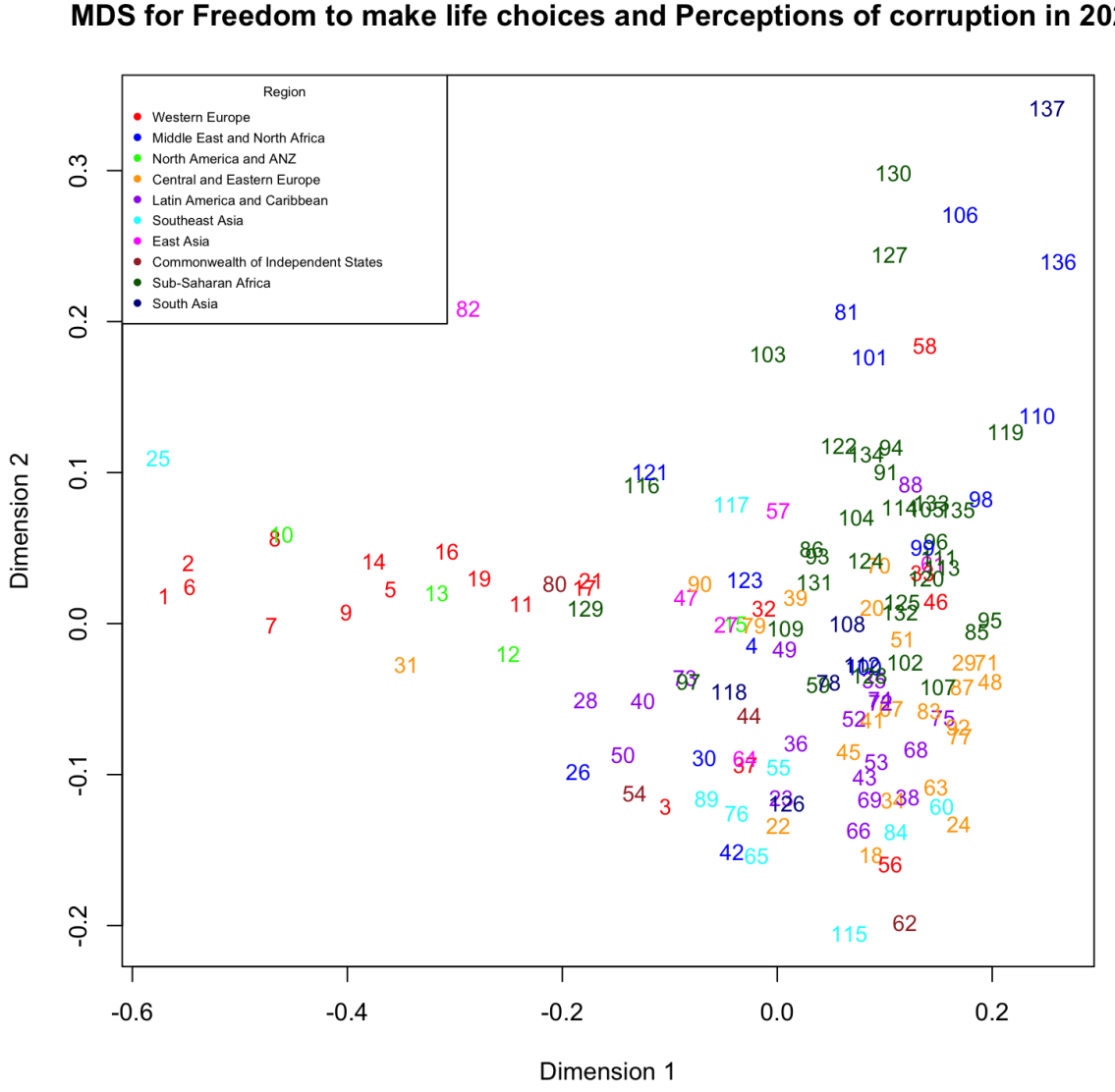

Figure 5: MDS Freedom to make life decisions and Perceptions of corruption