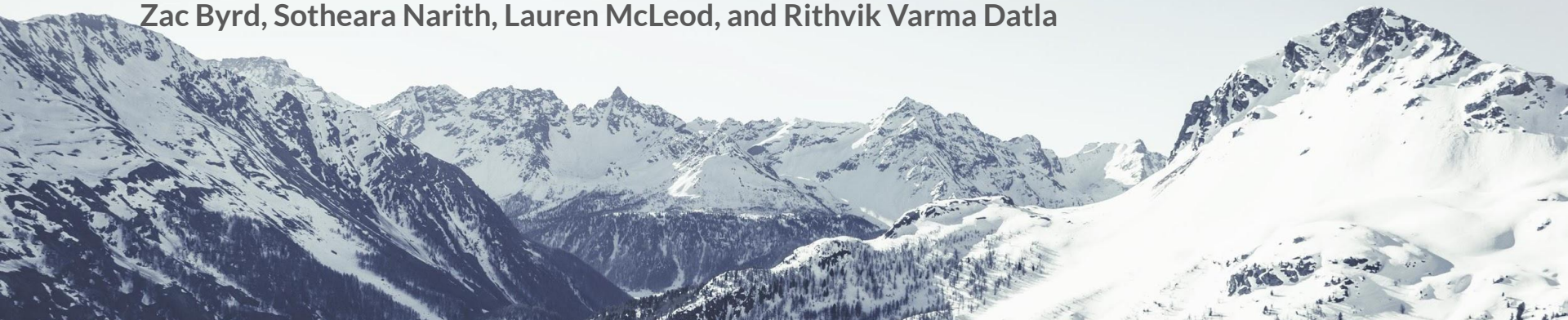




World Happiness

Zac Byrd, Sotheara Narith, Lauren McLeod, and Rithvik Varma Datla





Overview

- What factors influence a country's happiness
- How the global happiness scores have changed over 4 years
- Countries that ranked the highest and lowest



The Big Question



- What makes a country happy?
- Gallup World Happiness Survey, years 2015-2018
- Six categories:
 - economic production (GDP), social support, life expectancy, freedom, absence of corruption, and generosity



What is making people feel happiest?

1

Utilizing the Pearson correlation we took a comparison of the dataset for each year from 2015 through 2018.

3

Confirming and/or reaffirming the scatterplot with a correlation table.

2

Visually analyzing the data with a scatterplot.

Happiness Rank 100

	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Freedom	Trust (Government Corruption)	Generosity	Dystopia Residual
Happiness Rank	1.000000	-0.992105	0.158516	-0.785267	-0.733644	-0.735613	-0.556886	-0.372315	-0.160142	-0.521999
Happiness Score	-0.992105	1.000000	-0.177254	0.780966	0.740605	0.724200	0.568211	0.395199	0.180319	0.530474
Standard Error	0.158516	-0.177254	1.000000	-0.217651	-0.120728	-0.310287	-0.129773	-0.178325	-0.088439	0.083981
Economy (GDP per Capita)	-0.785267	0.780966	-0.217651	1.000000	0.645299	0.816478	0.370300	0.307885	-0.010465	0.040059
Family	-0.733644	0.740605	-0.120728	0.645299	1.000000	0.531104	0.441518	0.205605	0.087513	0.148117
Health (Life Expectancy)	-0.735613	0.724200	-0.310287	0.816478	0.531104	1.000000	0.360477	0.248335	0.108335	0.018979
Freedom	-0.556886	0.568211	-0.129773	0.370300	0.441518	0.360477	1.000000	0.493524	0.373916	0.062783
Trust (Government Corruption)	-0.372315	0.395199	-0.178325	0.307885	0.205605	0.248335	0.493524	1.000000	0.276123	-0.033105
Generosity	-0.160142	0.180319	-0.088439	-0.010465	0.087513	0.108335	0.373916	0.276123	1.000000	-0.101301
Dystopia Residual	-0.521999	0.530474	0.083981	0.040059	0.148117	0.018979	0.062783	-0.033105	-0.101301	1.000000

Econ

Heal

Trust (Gove

2015

Descriptive Statistics:

Happiness Score by Year

Happiness Score	
count	158.000000
mean	5.375734
std	1.145010
min	2.839000
25%	4.526000
50%	5.232500
75%	6.243750
max	7.587000

2015

Happiness Score	
count	157.000000
mean	5.382185
std	1.141674
min	2.905000
25%	4.404000
50%	5.314000
75%	6.269000
max	7.526000

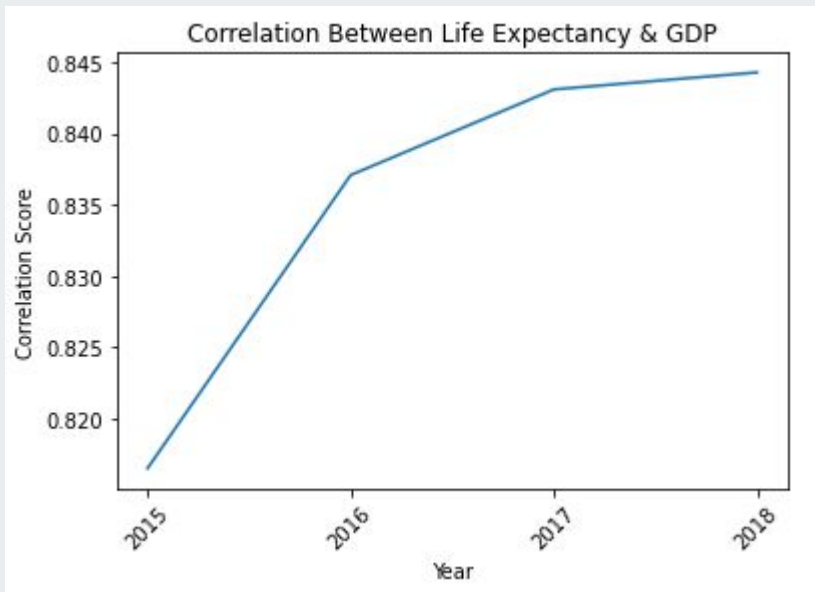
2016

Happiness.Score	
count	155.000000
mean	5.354019
std	1.131230
min	2.693000
25%	4.505500
50%	5.279000
75%	6.101500
max	7.537000

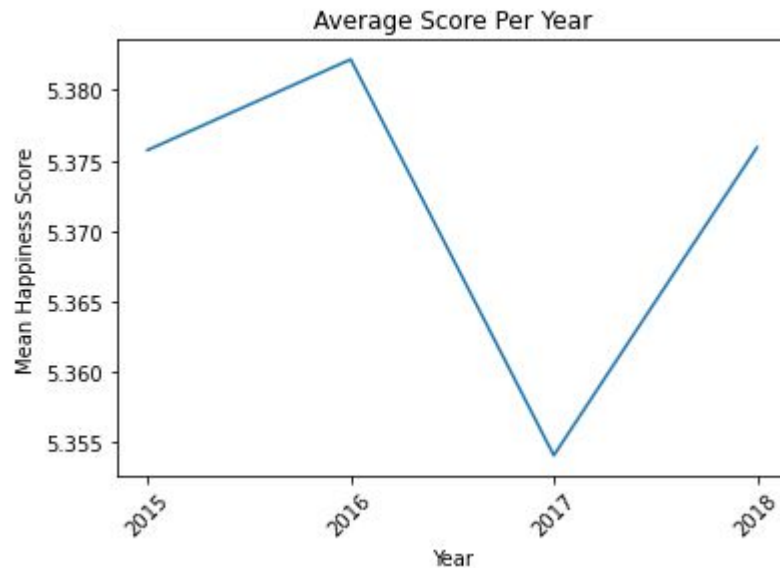
2017

Score	
count	156.000000
mean	5.375917
std	1.119506
min	2.905000
25%	4.453750
50%	5.378000
75%	6.168500
max	7.632000

2018



GDP & Life Expectancy Correlation



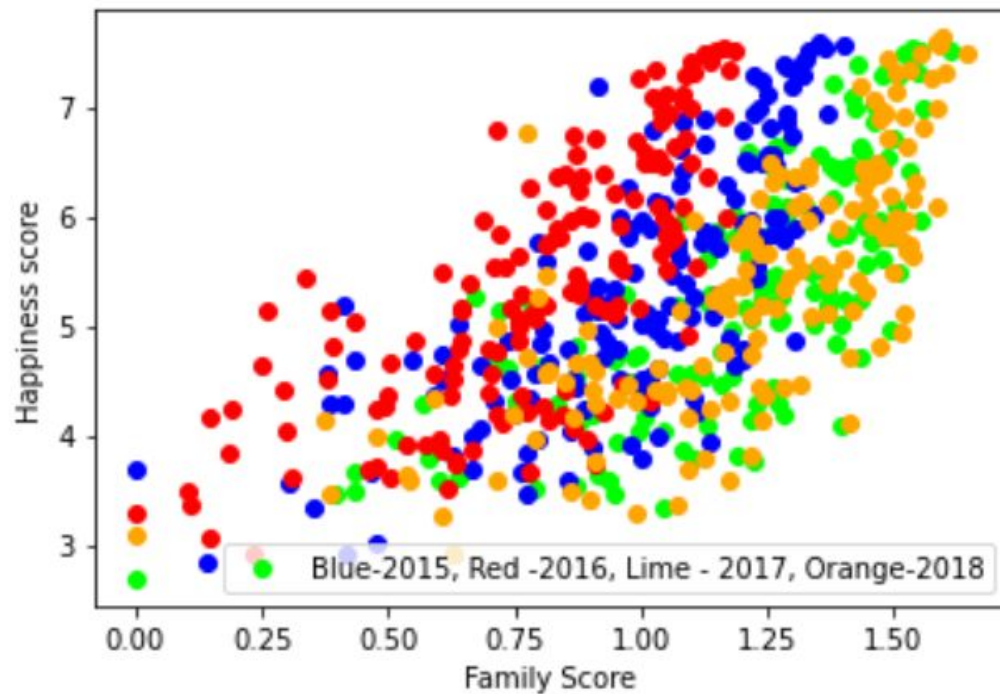
Happiness Score

Methodology



- When we first looked at the dataset, we wanted to know about the relationship between the happiness score and the different factors that it comprises. One of the best ways to do this is to find out the correlation between the factors
- We tried various methods on the data but eventually settled on the pearson correlation model
- The method has its pros and cons. A couple of pros are : The model gives us an exact extent of the correlation between variables and also lets us the direction of the correlation, i.e, positive or negative
- A couple of cons for this method are : Extreme values have a large influence on the results and the method is also based on a large number of assumptions, for example : linear relationships
- An alternative method we could have used was spearman's rank correlation.

Correlation between Happiness score and Family score



Factors for Top countries

	Country	Happiness.Rank	Happiness.Score	Whisker.high	Whisker.low	Economy..GDP.per.Capita.	Family	Health..Life.Expectancy.	Freedom	Genero
0	Norway	1	7.537	7.594445	7.479556	1.616463	1.533524	0.796667	0.635423	0.36201
1	Denmark	2	7.522	7.581728	7.462272	1.482383	1.551122	0.792566	0.626007	0.35528
2	Iceland	3	7.504	7.622030	7.385970	1.480633	1.610574	0.833552	0.627163	0.47554
3	Switzerland	4	7.494	7.561772	7.426227	1.564980	1.516912	0.858131	0.620071	0.29054
4	Finland	5	7.469	7.527542	7.410458	1.443572	1.540247	0.809158	0.617951	0.24548

- There is moderately strong correlation between the Happiness score and family support
- In countries higher in the rankings like Norway, there is a trend that happiness scores are high and this coincides with family also being higher on average.
- Norway also has a very strong economy which is a big factor in its high happiness score

Dystopian Factors

- Burundi is consistently at the bottom, or towards the bottom of the ranking list in all four years.
- Health (Life Expectancy) rate is much lower in comparison to the top countries through the four years we analyzed.
- Freedom of citizens is especially low in Burundi as well, which we expect to be a key factor in their ranking.

157	Togo	Sub-Saharan Africa	158	2.839	0.06727	0.20868	0.13995	0.28443	0.36453	0.10731	0.16681	1.56726
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bf.tail()

	Country	Region	Happiness Rank	Happiness Score	Lower Confidence Interval	Upper Confidence Interval	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Freedom	Trust (Government Corruption)	Generosity	Dystopia Residual
152	Benin	Sub-Saharan Africa	153	3.484	3.404	3.564	0.39499	0.10419	0.21028	0.39747	0.06681	0.20180	2.10812
153	Afghanistan	Southern Asia	154	3.360	3.288	3.432	0.38227	0.11037	0.17344	0.16430	0.07112	0.31268	2.14558
154	Togo	Sub-Saharan Africa	155	3.303	3.192	3.414	0.28123	0.00000	0.24811	0.34678	0.11587	0.17517	2.13540
155	Syria	Middle East and Northern Africa	156	3.069	2.936	3.202	0.74719	0.14866	0.62994	0.06912	0.17233	0.48397	0.81789
156	Burundi	Sub-Saharan Africa	157	2.905	2.732	3.078	0.06831	0.23442	0.15747	0.04320	0.09419	0.20290	2.10404

cf.tail()



Additional Analysis

- Some additional analyses we would have liked to factor into our final report is how the homeless rate of a country affects the happiness rank.
 - Specifically, if areas with a higher homeless population rank lower on the happiness scale.
- For this we would need additional data that would provide what city the respondents live in, or the IP address of where the answers were recorded.
 - For example, a happiness ranking of all the states in the United States, with emphasis on the major cities and capitals to determine whether homelessness has a major impact on a countries overall happiness score.

Conclusion



- To answer our original 'Big Question', we decided to use correlation models to determine how closely related the happiness rank was to social and economic factors.
- The two most correlated variables from the dataset (Health and GDP per Capita) steadily increased over the four years we analyzed them.
- There were also other mitigating factors that hurt a countries chances of ranking high like citizens feeling of freedom and trust in one's government.
- On the other end, factors we found that tend to result in a higher 'Happiness Score' ranking are the economy (GDP per capita), as well as health (life expectancy) and the family life of citizens.



Thank you!

