World Happiness Report Explorer

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Background: Why Happiness Data, and from where ?

The World Happiness Report aggregates data from over 150 countries and quantifies well-being based on economic, social, and health indicators; these indicator metrics include:

- GDP per capita
- Social support
- Healthy life expectancy
- Freedom to make life choices
- Generosity
- Perceptions of corruption

This datasets allows for comparisons between nationalities in order to obtain socio-economic information regarding metrics of happiness, and how it presents all across the world, allowing for the utilization of informic graphics that aptly investigates the datas insights .
The dataset comes from the World Happiness Report, and was acquired through Kaggle. It ranks countries based on survey responses to life evaluation and key indicators including GDP per capita, social support, healthy life expectancy, freedom, generosity, and perceptions of corruption. The data is compiled from sources such as the Gallup World Poll and official national statistics.
https://www.kaggle.com/datasets/unsdsn/world-happiness

Application Objective

By Utilizing Shiny + Flexdashboard, this application:

- Visualizes happiness rankings across countries and regions
- Allows users to explore relationships between GDP, health, and happiness
- Applies PCA to uncover latent structures in well-being indicators
- Enables filtering and interactivity with regional focus

Target audience: Academics, policymakers, and public data users.

Application Features

The app provides:

- Region filter to isolate groups of countries
- A toggle to show/hide legends
- Tabbed visual interface for:
  - Top 10 happiest countries
  - GDP vs. Happiness Score (interactive scatterplot)
  - Principal Component Analysis (PCA) plot
  - Full interactive data table with export options

Built using R with tidyverse, plotly, DT, and FactoMineR and extras.

Insight 1: Who Are the Happiest?

Observation:

- Western European countries dominate the top happiness rankings.
- Social support and GDP per capita appear strongly correlated with happiness.

Implication:

- Policies that prioritize economic stability and community welfare may improve national well-being.

Insight 2: Money Can Buy Happiness?

Observation:

- There is a positive but nonlinear relationship between GDP and happiness.
- Beyond a certain income level, additional wealth adds diminishing returns.

Implication:

- GDP is necessary but not sufficient—social, health, and freedom factors also matter.

Insight 3: What Drives Happiness?

Using Principal Component Analysis (PCA):

- dimensionality of the data is reduced to explore hidden insights.
- Countries cluster based on shared socio-economic profiles.
- PC1 often relates to GDP and health; PC2 captures freedom and generosity; found through analysis conducted prior to the application's development.

Useful for identifying latent dimensions of well-being.

Data Narrative

The World Happiness Report captures a nation's well-being through multiple dimensions- not just economic wealth, but also social, health, and political trust metrics. Each row in the dataset represents a country, and each column quantifies aspects of national life that influence happiness.

To make sense of such multidimensional data, Principal Component Analysis (PCA) was applied to reduce complexity and highlight the underlying structure. This allowed for insights to be obtained regarding the question of: What factors group countries together? What drives happiness beyond money?

By combining interactive visualizations, PCA clustering, and GDP/happiness correlations, the app transforms raw global data into an exploratory tool for comparing nations and uncovering patterns.

From this what was able to be uncovered was that GDP wasn't the sole driver of happiness, metrics like social support played a significant role as well. Along with this nationality groups seem to clump together in plots comparing their metrics, indicating that a factor related to culture and nationality plays a significant role in the determination of a country's happiness.

What to Expect from the App

Intuitive navigation with sidebar filters
Insightful and interactive visualizations

Region-specific insights and rankings
Easy data export and discrimination

PCA plots to reveal underlying structure in complex variables

Conclusion and Future Work

The dashboard allows Analysts to explore global well-being dynamically.

It demonstrates how economic and social indicators interact with happiness.

Future work could integrate temporal trends and a more intensive graphical interface to compare analytic insights.

Repository:

https://github.com/ArjunMandakath/HappinessDashboardFinal