140 Final Project: Bar Plot & Scatter Plot

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2024-11-24

```r
# Install and load necessary packages
# install.packages("readxl")
# install.packages("dplyr")
# install.packages("ggplot2")
# install.packages("tidyr")
library(readxl)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

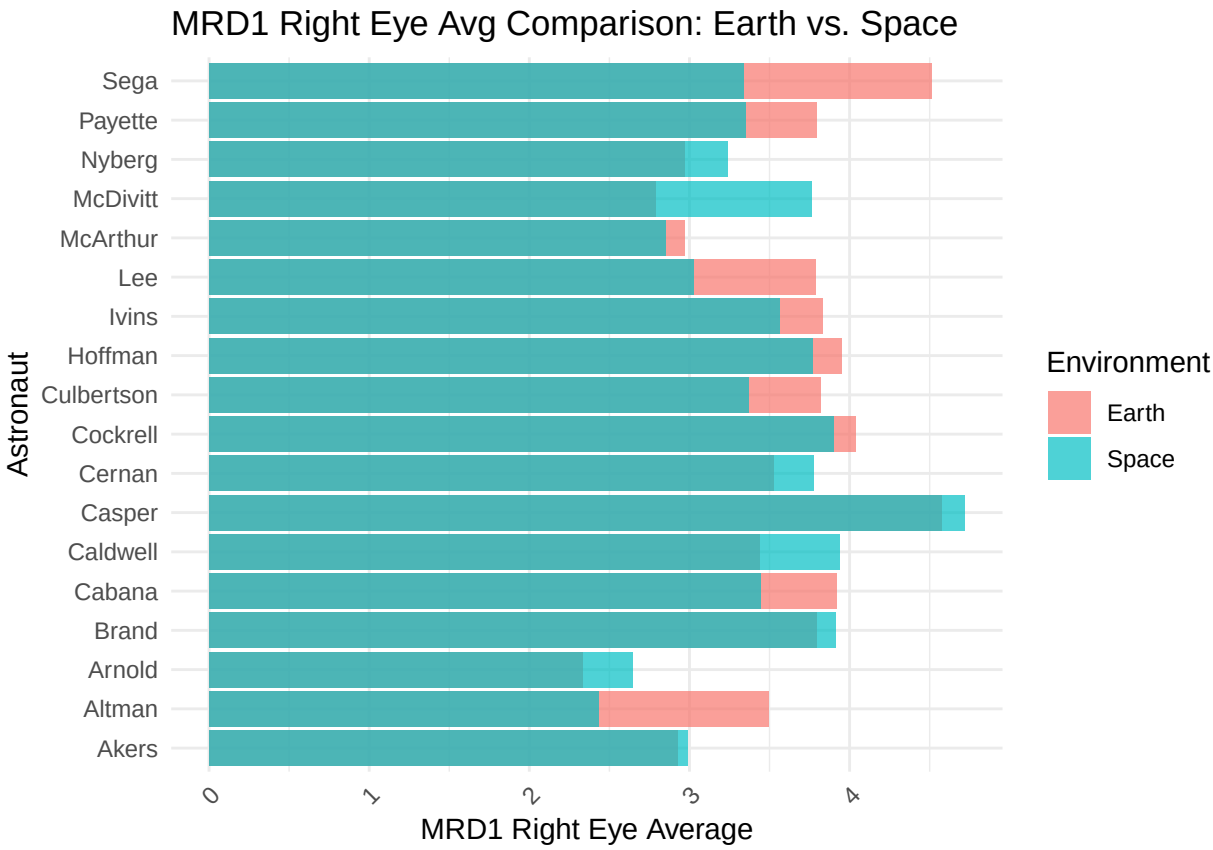
```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```r
library(ggplot2)
library(tidyr)

# Load the data
data <- read_excel("/Users/ala/Desktop/NASA_Astronaut2-6-2020.xlsx", sheet = 2)
# head(data)
colnames(data)
```

```
## [1] "Astronaut"       "MRD1- R Avg (E)" "MRD1- R Avg (S)" "MRD1- L Avg (E)"
## [5] "MRD1- L Avg (S)" "PTB R (E) Avg"   "PTB R (S) Avg"   "PTB L (E) Avg"
## [9] "PTB L (S) Avg"
```

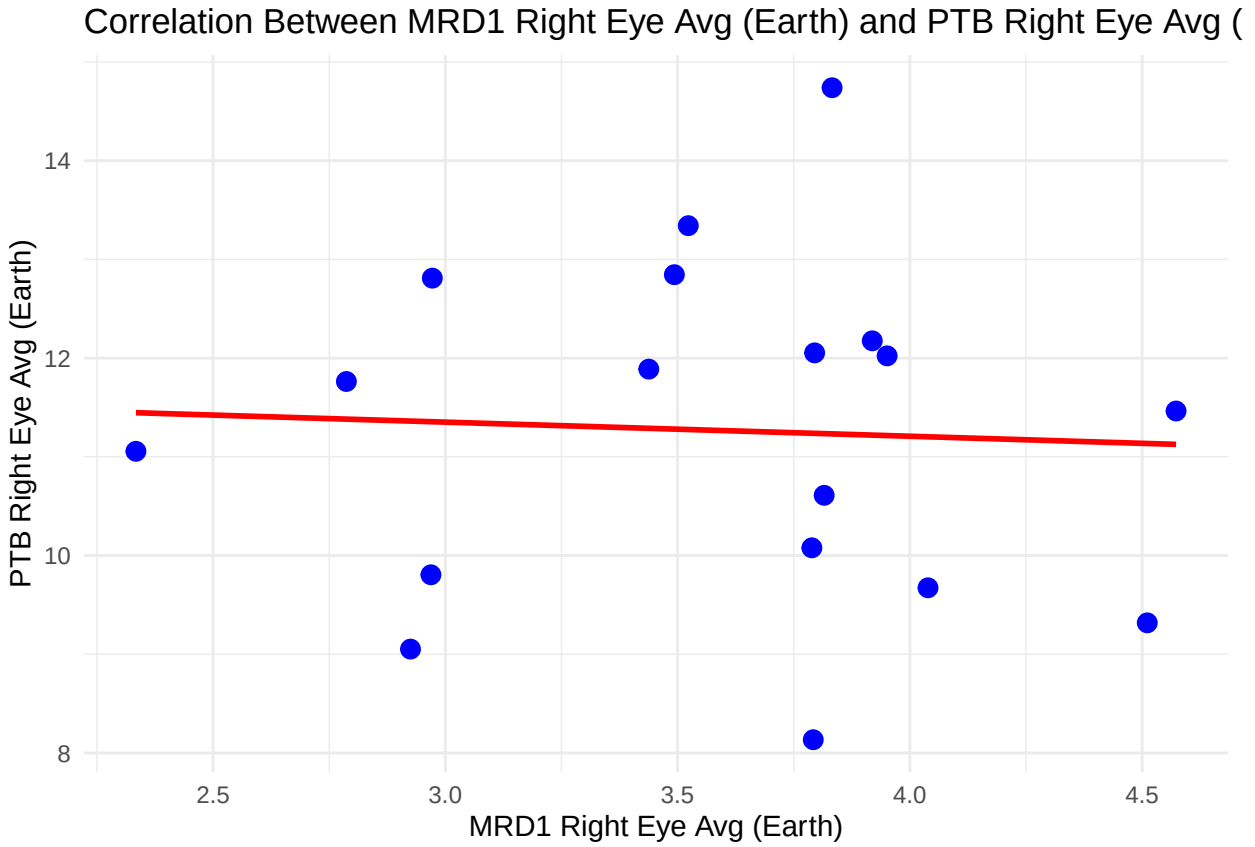
```r
# Bar Plot for MRD1 Right Eye Avg (Earth vs. Space)
ggplot(data) +
  geom_bar(aes(x = Astronaut, y = `MRD1- R Avg (E)`, fill = "Earth"),
           stat = "identity", position = "dodge", alpha = 0.7) +
  geom_bar(aes(x = Astronaut, y = `MRD1- R Avg (S)`, fill = "Space"),
           stat = "identity", position = "dodge", alpha = 0.7) +
  labs(title = "MRD1 Right Eye Avg Comparison: Earth vs. Space",
       x = "Astronaut",
       y = "MRD1 Right Eye Average",
       fill = "Environment") +
  theme_minimal() +
  theme(axis.text.x = element_text(angle = 45, hjust = 1)) +
  coord_flip()
```



The bar plot effectively illustrates the differences in MRD1 Right Eye Average between Earth and Space for various astronauts, revealing individual variability in response to microgravity. This suggests that while some astronauts may experience swelling or changes in the eye region in space, others may not.

```r
# Scatter Plot for MRD1-R Avg (Earth) vs PTB R Avg (Earth)
ggplot(data, aes(x = `MRD1- R Avg (E)`, y = `PTB R (E) Avg`)) +
  geom_point(color = "blue", size = 3) +
  geom_smooth(method = "lm", se = FALSE, color = "red") +
  labs(title = "Correlation Between MRD1 Right Eye Avg (Earth) and PTB Right Eye Avg (Earth)",
       x = "MRD1 Right Eye Avg (Earth)",
       y = "PTB Right Eye Avg (Earth)") +
  theme_minimal()
```

```
## `geom_smooth()` using formula = 'y ~ x'
```



This scatter plot analysis indicates that there is no strong linear relationship between MRD1 Right Eye Avg and PTB Right Eye Avg on Earth, as reflected by the flat regression line. This lack of correlation implies that the eyelid (MRD1) and eyebrow (PTB) heights are largely independent in Earth's gravitational environment.