Step 3 Final

**Introduction**

We all love dogs. Some more than others but all in all, a dog is man’s best friend. I think what we enjoy most about our furry companions is their ability to learn. From just being able to fetch a ball and bring it back to help the police locate missing persons to alerting their companions that they are about to have a seizure. Dogs are amazing animals.

**The problem statement you addressed**

With this analysis, I wanted to determine if a dog’s size really determines its intelligence level. Are big dogs smarter than smaller dogs? Are they faster at learning commands or is it based on something else?

**How I addressed the problem**

1. I looked at 3 datasets to help me determine if the size of a dog determines its intelligence level.
   1. AKC Breed Information: This dataset contained information such as breed, height and weight
   2. Dog Intelligence: This dataset contained information such as breed, classification of intelligence, obey percentage, and upper and lower repetitions a dog could handle
   3. Heterozygosity of 85 breeds: This dataset contained information about the breed and heterozygosity
   4. Heterozygosity x10\_4 of 60 breeds: This dataset contained information about the breed and heterozygosity x10\_4.
2. I combined all 4 datasets into 1 and began to clean up the data and create new variables for average weight and average height.
3. Did some descriptive statistics
   1. Full dataset

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Obey** | **Avg Weight** | **Avg Height** |
| **Min** | 0.3 | 8.0 | 8.5 |
| **Median** | 0.5 | 58.75 | 22.75 |
| **Mean** | 0.58 | 62.84 | 20.59 |
| **Max** | 0.95 | 182.5 | 28.5 |

* 1. By Classification

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Obey** | **Avg Weight** | **Avg Height** |
|  |  |  |  |
| **Brightest Dogs** |  |  |  |
| **Min** | 0.95 | 65 | 22.5 |
| **Median** | 0.95 | 67.5 | 22.5 |
| **Mean** | 0.95 | 77.5 | 23.17 |
| **Max** | 0.95 | 83.75 | 24.5 |
|  |  |  |  |
| **Excellent Working Dogs** |  |  |  |
| **Min** | 0.85 | 33.0 | 18.0 |
| **Median** | 0.85 | 65.0 | 23.5 |
| **Mean** | 0.85 | 65.17 | 22.17 |
| **Max** | 0.85 | 97.5 | 25 |
|  |  |  |  |
| **Above Avg Working Dog** |  |  |  |
| **Min** | 0.7 | 40 | 17.5 |
| **Median** | 0.7 | 65 | 26 |
| **Mean** | 0.7 | 76.67 | 23.5 |
| **Max** | 0.7 | 95 | 27.0 |
|  |  |  |  |
| **Average Working/Obedience Intelligence** |  |  |  |
| **Min** | 0.5 | 14 | 8.5 |
| **Median** | 0.5 | 41.75 | 19.75 |
| **Mean** | 0.5 | 76.44.45 | 25.5 |
| **Max** | 0.5 | 100 | 28.5 |
|  |  |  |  |
| **Fair Working/Obedience Intelligence** |  |  |  |
| **Min** | 0.3 | 8.0 | 11.5 |
| **Median** | 0.3 | 25.0 | 15.5 |
| **Mean** | 0.3 | 64.1 | 18.6 |
| **Max** | 0.3 | 150 | 26.5 |
|  |  |  |  |
| **Lowest Degree of Working/Obedience Intelligence** |  |  |  |
| **Min** | NA | 24.0 | 14.0 |
| **Median** | NA | 65.0 | 20.75 |
| **Mean** | NA | 84.12 | 21.0 |
| **Max** | NA | 182.5 | 28.5 |

* 1. Histograms of obey percentage, average weight, average height, Heterozygosity, and Heterozygosity x104
  2. Scatter plots along of obey percentage vs average weight and obey percentage vs Heterozygosity x10.4
  3. Correlations:
     1. Obey Percentage vs Average Weight:
        1. Correlation: 0.185; p-value: 0.387
     2. Obey Percentage vs Heterozygosity x10.4:
        1. Correlation: 0.09; p-value: 0.669
     3. Average Weight vs Heterozygosity x10.4:
        1. Correlation: -0.32; p-value: 0.869

1. Regression Models
   1. Obey Percentage with Average Weight + Average height + Heterozygosity x10.4:
      1. R squared: 0.08
      2. Adj R squared: -0.037
      3. F-statistic: 0.725
      4. P-value: 0.549

**Analysis**

My preliminary analysis on whether the size of a dog determines its intelligence is as follows:

1. Looking at the mean of each breed and their classification suggests dogs of all weights can fit into each classification of brightest down to lowest.
2. The scatterplot of Obey Percentage and Average Weight does show a slight upwards trend between a dog’s obey percentage and their average weight suggesting maybe their weight does play some role in their intelligence.
3. The correlations between the variables all suggested very low relationships between the various variables suggesting that the dog’s obey percentage isn’t influenced by its size or Heterozygosity.
4. Running a multiple linear regression model to see if average height, average weight, and Heterozygosity x10\_4 have any influence on the obey percentage of a dog suggests that all variables do not influence the obey percentage very much if at all.

**Implications**

As the size of a dog does not seem to influence how smart they are I do not see any evil scientist manipulating dog genetics to increase the size of dogs to make them smarter.

**Concluding Remarks**

With the limited initial research on if size influences a dog’s intelligence, more research would need to be done to find out what, if any, genetics or factors lead to a breeds intelligence level.