INTRODUCTION

[…] We predict that both car weight and the number of cylinders will be independent predictors of fuel economy.

[…] We used linear regression to predict fuel economy from weight and number of engine cylinders. We compared alternative models using a Bayes Factor. […]

RESULTS

Fuel economy data were obtained for 32 cars. Car weights ranged from 686 to 2460kg (mean = 1459, SD=443), and models in this sample had between 4 and 8 cylinders. Fuel economy ranged from 10 to 34mpg (mean = 20, SD=6).

[…] Figure 2 suggests that both cylinders and weight were related to fuel economy.

To test whether cylinders and weight were independent predictors of fuel economy, and to estimate the strength of these relationships, we ran two linear regression models. Model A included only weight as a predictor; Model B included both weight and the number of cylinders. Results are presented in Table X. Both additional weight and additional cylinders exerted a substantial negative influence on fuel economy. Given these data—model B was 22 times more probable than model A, suggesting weight and cylinders are independent predictors of economy. Diagnostic plots for model B did not indicate any problems with model fit or violations of assumptions.

*Table X. Results for models A and B*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Model A* |  |  |  | *Model B\** |  |  |
| Coefficient | Estimate | 95% CI | β |  | Estimate | 95% CI | β |
| Intercept | 37.287 | [33.452, 41.122] |  |  | 39.687 | [36.179, 43.195] |  |
| Weight | -0.012 | [-0.014, -0.009] | -10.46 |  | -0.007 | [-0.010, -0.004] | -6.25 |
| Cylinders | — | — |  |  | -1.508 | [-2.356, -0.659] | -5.39 |
| *R*2adjusted | 0.75 |  |  |  | 0.82 |  |  |

\* Bayes Factor in favour of Model B (vs Model A) = 22.7

DISCUSSION

As expected, we found strong evidence that both car weight and number of cylinders were independent predictors of fuel economy. […]