My title*

My subtitle if needed

First author Another author

March 3, 2024

First sentence. Second sentence. Third sentence. Fourth sentence.

1 Introduction

You can and should cross-reference sections and sub-sections. We use R Core Team (2023) and Wickham et al. (2019).

The remainder of this paper is structured as follows. Section 2....

2 Data

2.1 Data Source

The dataset utilized is derived from the 2022 Cooperative Election Study, comprising a nationally representative sample of 60,000 American adults.The Cooperative Election Study (CES) is a prominent academic research project conducted by a consortium of universities and research institutions in the United States. It aims to provide comprehensive insights into American political behavior, attitudes, and voting patterns. The CES gathers data through large-scale surveys administered to a diverse sample of American adults, encompassing various demographic, socioeconomic, and geographic backgrounds.

*Code and data are available at: LINK.

2.2 Data Measurment

The data collection process for CES 2022 involved a systematic sampling approach utilizing questionnaire surveys. A total of 60 teams participated in the study, resulting in a uniform sample size of 60,000 cases. Recruitment of study participants took place in the autumn of 2022.

Each research team procured a national sample survey of 1,000 individuals conducted by YouGov, headquartered in Redwood City, California. The survey interviews for the 2022 cycle occurred in two phases. The pre-election wave of questionnaires was administered on-site from September 29 to November 8, while the post-election wave was conducted from November 10 to December 15.

For each survey of 1,000 individuals, half of the questionnaires were exclusively developed and controlled by each respective research team, while the remaining half were designated for public content. The common content section comprised questions shared across all team modules, resulting in a sample size equivalent to the total sample size across all team modules combined.

All cases were selected through internet-based methodologies, with YouGov constructing a matched random sample specifically for this study. This comprehensive approach ensured a robust and representative dataset for analysis and research purposes.

2.3 Variables of Interest

Some of our data is of penguins (Figure 1), from Horst, Hill, and Gorman (2020).

Talk more about it.

And also planes (Figure 2). (You can change the height and width, but don't worry about doing that until you have finished every other aspect of the paper - Quarto will try to make it look nice and the defaults usually work well once you have enough text.)

Talk way more about it.

3 Model

The goal of our modelling strategy is twofold. Firstly,...

Here we briefly describe the Bayesian analysis model used to investigate... Background details and diagnostics are included in Appendix B.

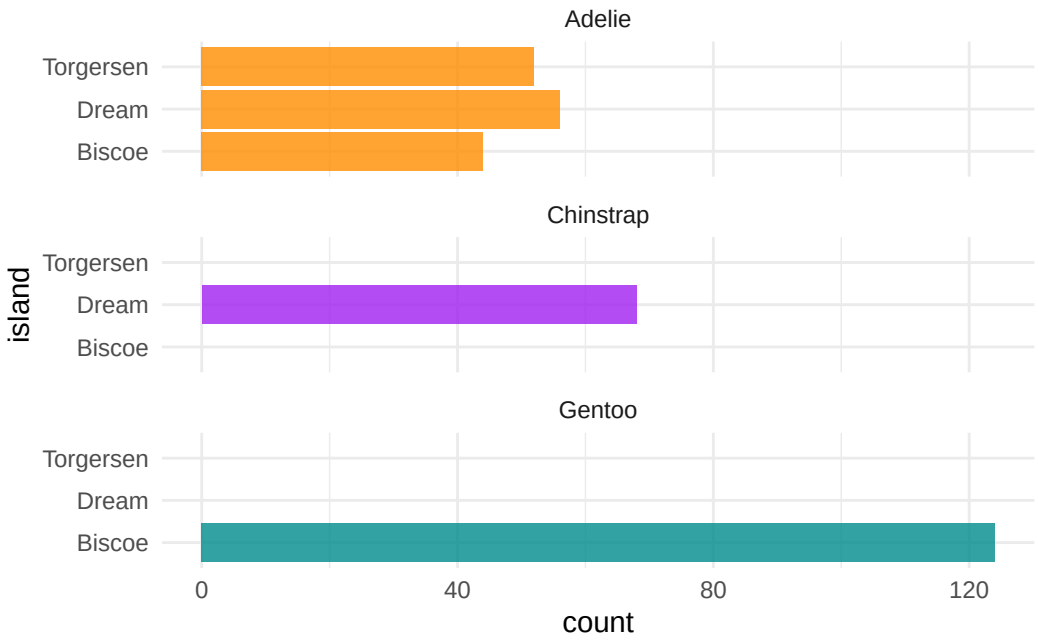


Figure 1: Bills of penguins

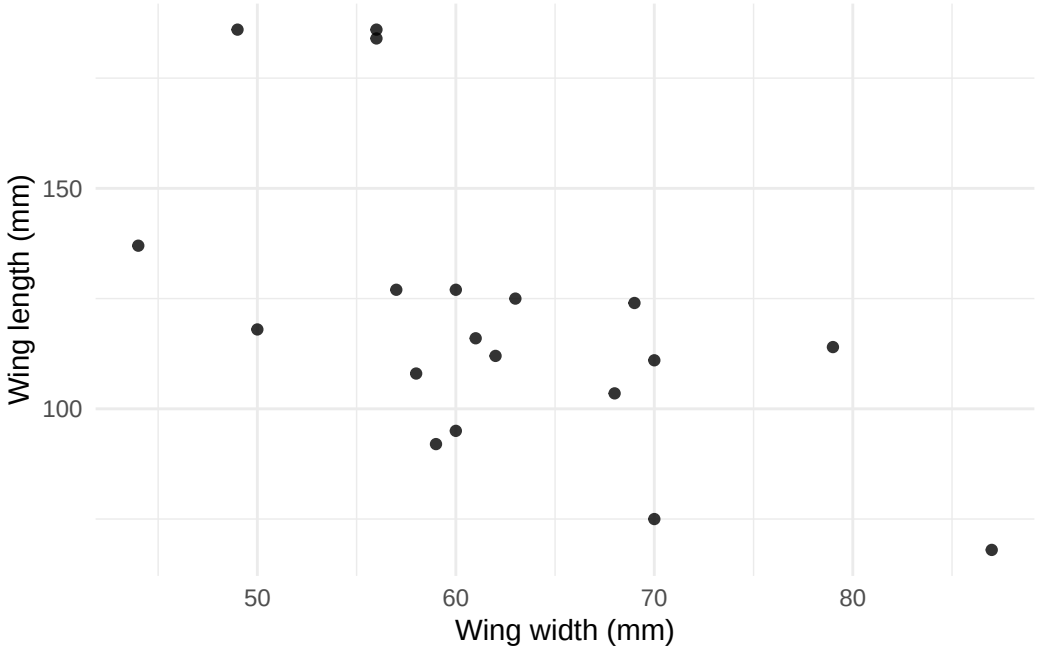


Figure 2: Relationship between wing length and width

3.1 Model set-up

Define y_i as the number of seconds that the plane remained aloft. Then β_i is the wing width and γ_i is the wing length, both measured in millimeters.

$$y_i|\mu_i, \sigma \sim \text{Normal}(\mu_i, \sigma) \tag{1}$$
$$\mu_i = \alpha + \beta_i + \gamma_i \tag{2}$$
$$\alpha \sim \text{Normal}(0, 2.5) \tag{3}$$
$$\beta \sim \text{Normal}(0, 2.5) \tag{4}$$
$$\gamma \sim \text{Normal}(0, 2.5) \tag{5}$$
$$\sigma \sim \text{Exponential}(1) \tag{6}$$

We run the model in R (R Core Team 2023) using the `rstanarm` package of Goodrich et al. (2022). We use the default priors from `rstanarm`.

3.1.1 Model justification

We expect a positive relationship between the size of the wings and time spent aloft. In particular...

We can use maths by including latex between dollar signs, for instance θ.

4 Results

Our results are summarized in Table 1.

5 Discussion

5.1 First discussion point

If my paper were 10 pages, then should be be at least 2.5 pages. The discussion is a chance to show off what you know and what you learnt from all this.

Table 1: Explanatory models of flight time based on wing width and wing length

	Support Dem
(Intercept)	1.461
	(1.209)
genderMale	0.728
	(0.148)
education4-year	−0.802
	(0.272)
educationHigh school graduate	0.240
	(0.282)
educationNo HS	0.351
	(0.675)
educationPost-grad	−1.048
	(0.290)
educationSome college	−0.365
	(0.285)
raceBlack	−4.500
	(1.299)
raceHispanic	−1.751
	(1.245)
raceMiddle Eastern	−0.874
	(1.329)
raceNative American	−0.190
	(1.413)
raceOther	−0.955
	(2.077)
raceTwo or more races	0.087
	(1.329)
raceWhite	−1.258
	(1.204)
Num.Obs.	1000
R2	0.172
Log.Lik.	−600.075
ELPD	−618.1
ELPD s.e.	12.9
LOOIC	1236.3
LOOIC s.e.	25.8
WAIC	1232.4
RMSE	0.46

5.2 Second discussion point

5.3 Third discussion point

5.4 Weaknesses and next steps

Weaknesses and next steps should also be included.

Appendix

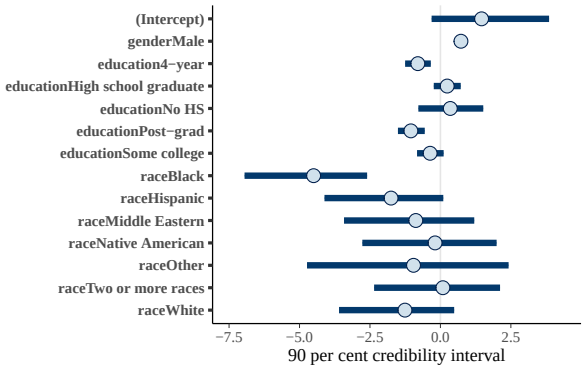
A Additional data details

B Model details

B.1 Posterior predictive check

In **?@fig-ppcheckandposteriorvsprior-1** we implement a posterior predictive check. This shows...

In **?@fig-ppcheckandposteriorvsprior-2** we compare the posterior with the prior. This shows...



(a) Posterior prediction check

Figure 3: Examining how the model fits, and is affected by, the data

B.2 Diagnostics

?@fig-stanareyouokay-1 is a trace plot. It shows... This suggests...

References

Goodrich, Ben, Jonah Gabry, Imad Ali, and Sam Brilleman. 2022. "Rstanarm: Bayesian Applied Regression Modeling via Stan." https://mc-stan.org/rstanarm/.

Horst, Allison Marie, Alison Presmanes Hill, and Kristen B Gorman. 2020. *Palmerpenguins: Palmer Archipelago (Antarctica) Penguin Data*. https://doi.org/10.5281/zenodo.3960218.

R Core Team. 2023. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.

Wickham, Hadley, Mara Averick, Jennifer Bryan, Winston Chang, Lucy D'Agostino McGowan, Romain François, Garrett Grolemund, et al. 2019. "Welcome to the tidyverse." *Journal of Open Source Software* 4 (43): 1686. https://doi.org/10.21105/joss.01686.