

# My title\*

My subtitle if needed

First author                  Another author

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

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\*Code and data are available at: [LINK](#).

## 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

The paper uses data collected from the US General Social Survey (GSS) from NORIC at the University of Chicago (**GSS?**). From the dataset, this paper focuses on the “number of hours worked last week” variable, from the years 1992 to 2022. This longitudinal approach allows us to compare labour dynamics across different economic downturns, including the 1998 Asian Financial Crisis, the 2008 Global Financial Crisis, and the COVID-19 pandemic in 2020.

For the analysis, we retrieved the following data as described in Table 1.

Table 1: Source data retrieved from GSS

Variable	New Name	Description	Example
sex	sex	Respondent’s gender	Female
age	age	Respondent’s age	25
HEALTH	health	Respondents’ health condition	Good
PHYSHLTH	Phys_days	Days of Respondents’ physical health being not good	15
MNTLHLTH	Ment_days	Days of Respondents’ mental health being not good	20
DEPRESS	depress	Whether respondents have been told having depression	Yes

### 2.1 Source Data

## 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 C.

### 3.1 Model set-up

Define  $y_i$  as the number of seconds that the plane remained aloft. Then  $\beta_i$  is the wing width and  $\gamma_i$  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  $\theta$ .

## 4 Results

Our results are summarized in `?@tbl-modelresults`.

## 5 Discussion

### 5.1 First discussion point

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

## **5.2 Second discussion point**

## **5.3 Third discussion point**

## **5.4 Weaknesses and next steps**

Weaknesses and next steps should also be included.

## A Appendix

### B Additional data details

### C Model details

#### C.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...

#### C.2 Diagnostics

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

`?@fig-stanareyouokay-2` is a Rhat 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/>.
- 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 Golemund, et al. 2019. “Welcome to the tidyverse.” *Journal of Open Source Software* 4 (43): 1686. <https://doi.org/10.21105/joss.01686>.