



## INSTRUCTORS:

Joseph Casillas

 @jvcasill

Stefano Coretta

 @StefanoCoretta

Timo Roettger

 @TimoRoettger



Join the  
**SLACK**  
channel

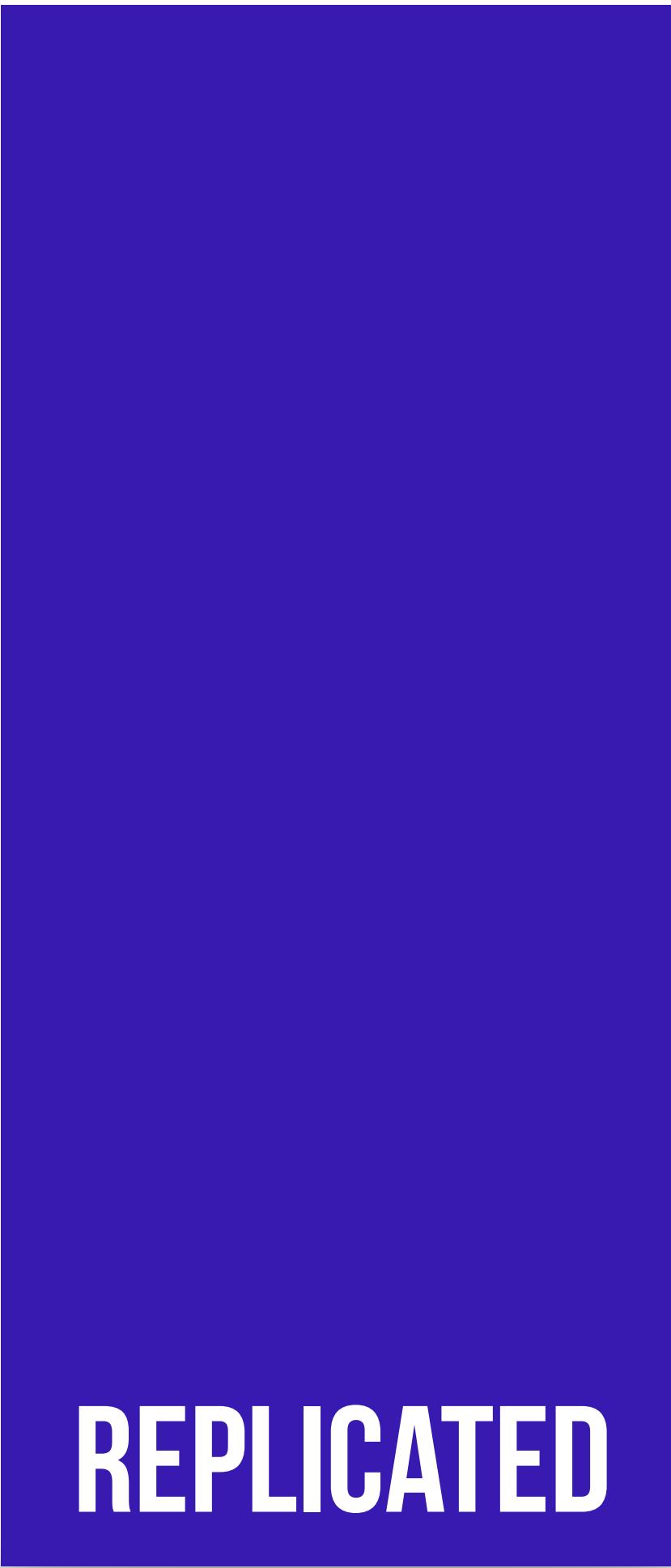


Visit our **website**

<https://learnb4ss.github.io/>

**WHY ARE WE  
HERE TODAY?**

**100%**



**0%**

---

# CRISIS IN CONFIDENCE

Open Science Collaboration (2015)

47%



REPLICATED

53%



NOT  
REPLICATED

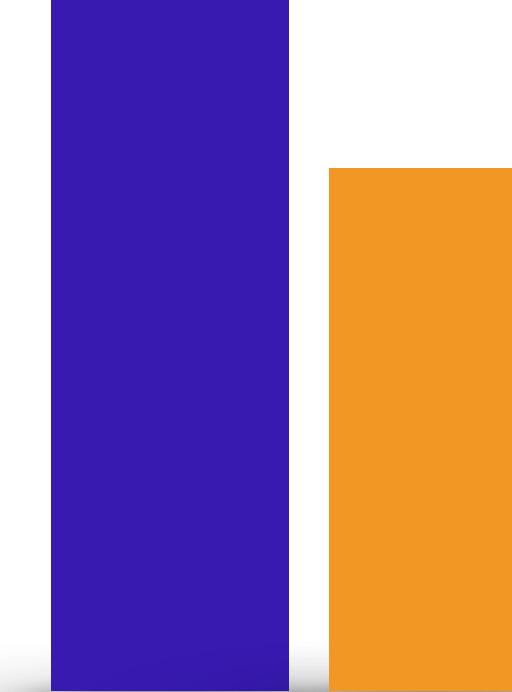
# CRISIS IN CONFIDENCE

Open Science Collaboration (2015)

47%



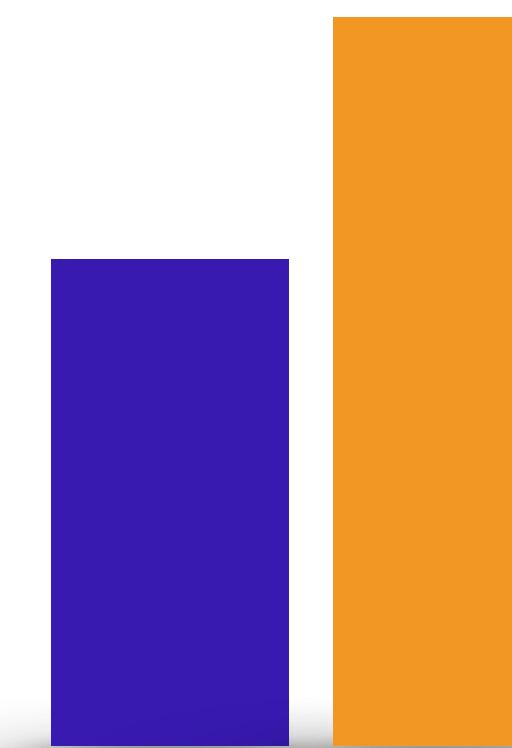
53%



39%

Economy

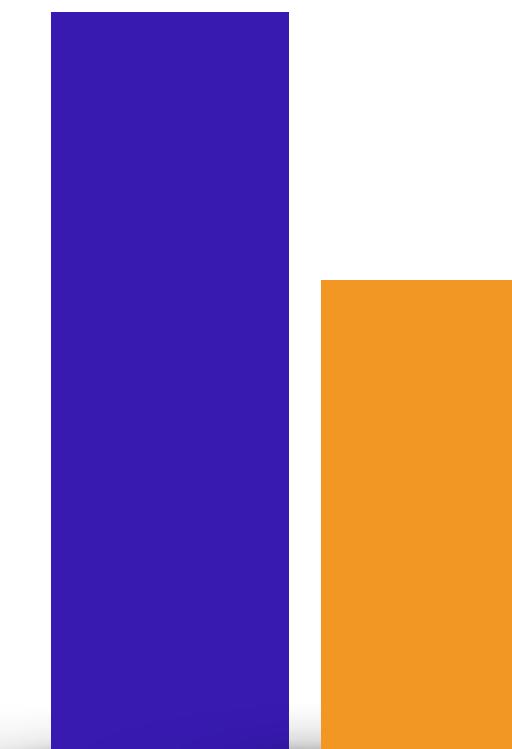
Camerer et al. (2016)



60%

Cancer Research

Nosek & Errington (2017)



43%

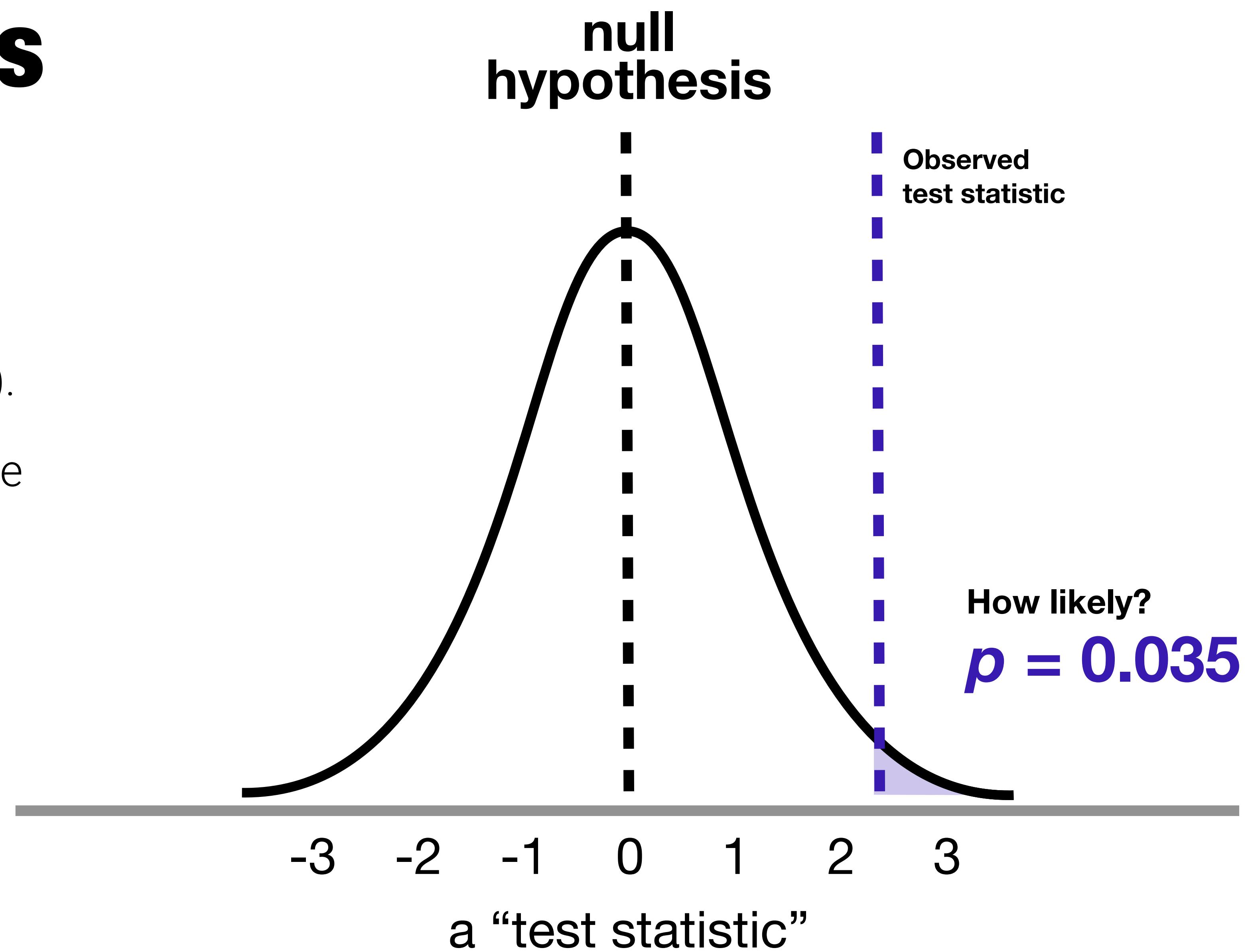
Social Sciences

Camerer et al. (2018)



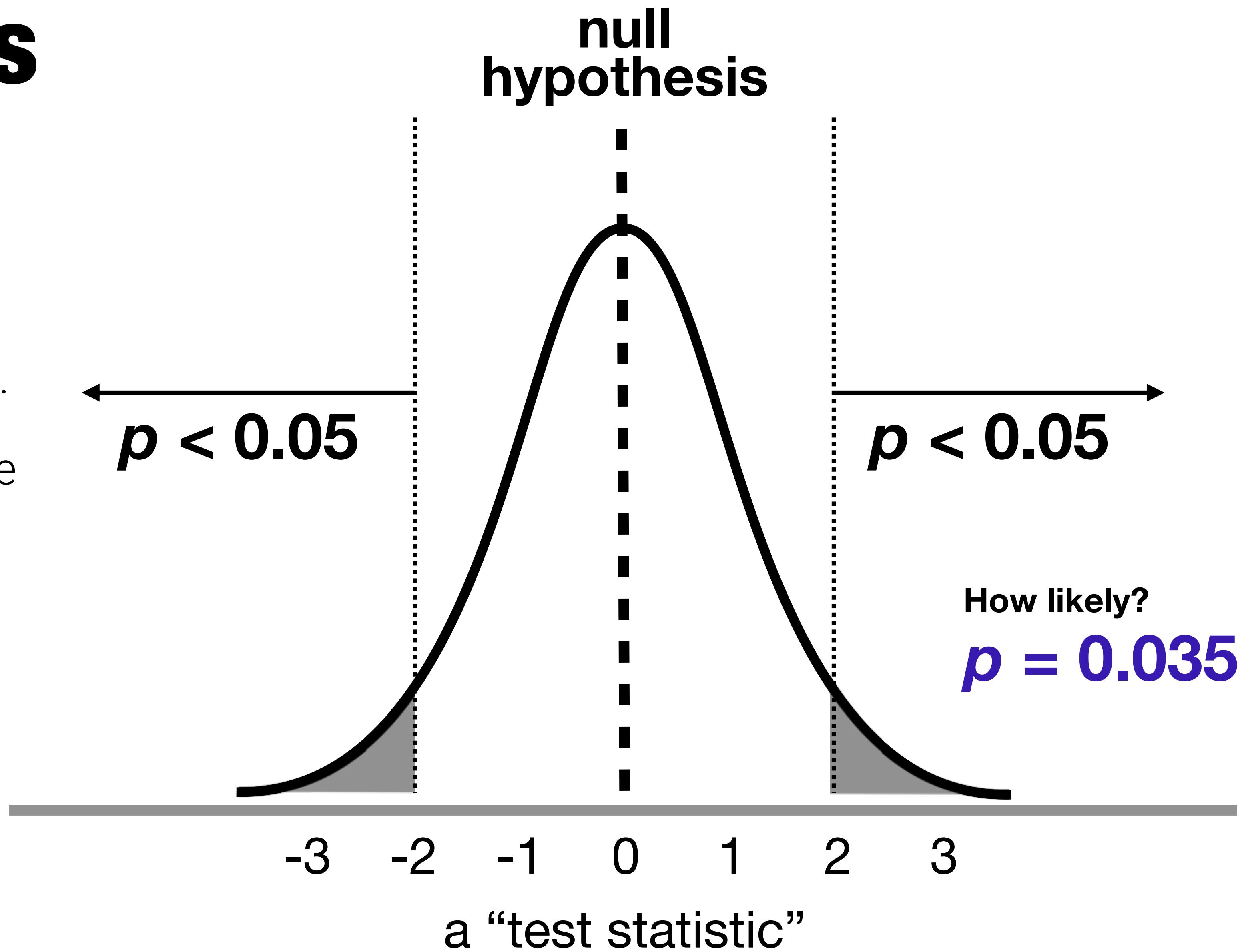
# Null hypothesis significance testing

1. Set up a Null-Hypothesis ( $H_0$ ).
2. Calculate the probability of the results under  $H_0$  (p value).



# Null hypothesis significance testing

1. Set up a Null-Hypothesis ( $H_0$ ).
2. Calculate the probability of the results under  $H_0$  (p value).
3. Reject  $H_0$  when  $p < 0.05$ , else don't reject.



# Null hypothesis significance testing

- ✖ often does **not** allow **appropriate** use,



Warning message:

```
In checkConv(attr(opt, "derivs")), opt$par, ctrl = control$checkConv, :  
  Model failed to converge with max|grad| = 0.0139723 (tol = 0.002, component 1)
```

# Null hypothesis significance testing

- ✖ often does **not** allow **appropriate** use,
- ✖ is **not intuitive**,

**89%**

of books that covered statistical significance defined or explained it incorrectly

Cassidy et al. (2019)



# Null hypothesis significance testing

- ✖ often does **not** allow **appropriate** use,
- ✖ is **not intuitive**,
- ✖ and **cannot** provide an **answer** to the **questions** we are interested in.





# Bayesian Inference

- ➊ robust inference
- ➋ intuitive
- ➌ flexible





Please keep yourself **muted**



Ask question either in **Zoom chat** or **Slack chat (#questions-and-answers)**, we will distill them and answer them in dedicated Q&A sections

# **EXPECTATIONS**

**What we will cover and what we won't cover**

# EXPECTATIONS

## What we will cover



The conceptual framework of Bayesian inference



How to run (generalized) linear models using brms



How to specify priors and interpret results



How to draw probabilistic inferences from results

## what we won't cover



Introduction to R / data carpentry in R



Introduction to (generalized) linear models

# GET THE MOST OUT OF IT

- 👉 Use the Slack channel
- 👉 Have your machine prepared for brms
- 👉 Relax! All materials (videos + Rmarkdowns) will be available

Join the  
**SLACK**  
channel



DON'T PANIC

# ROADMAP

