

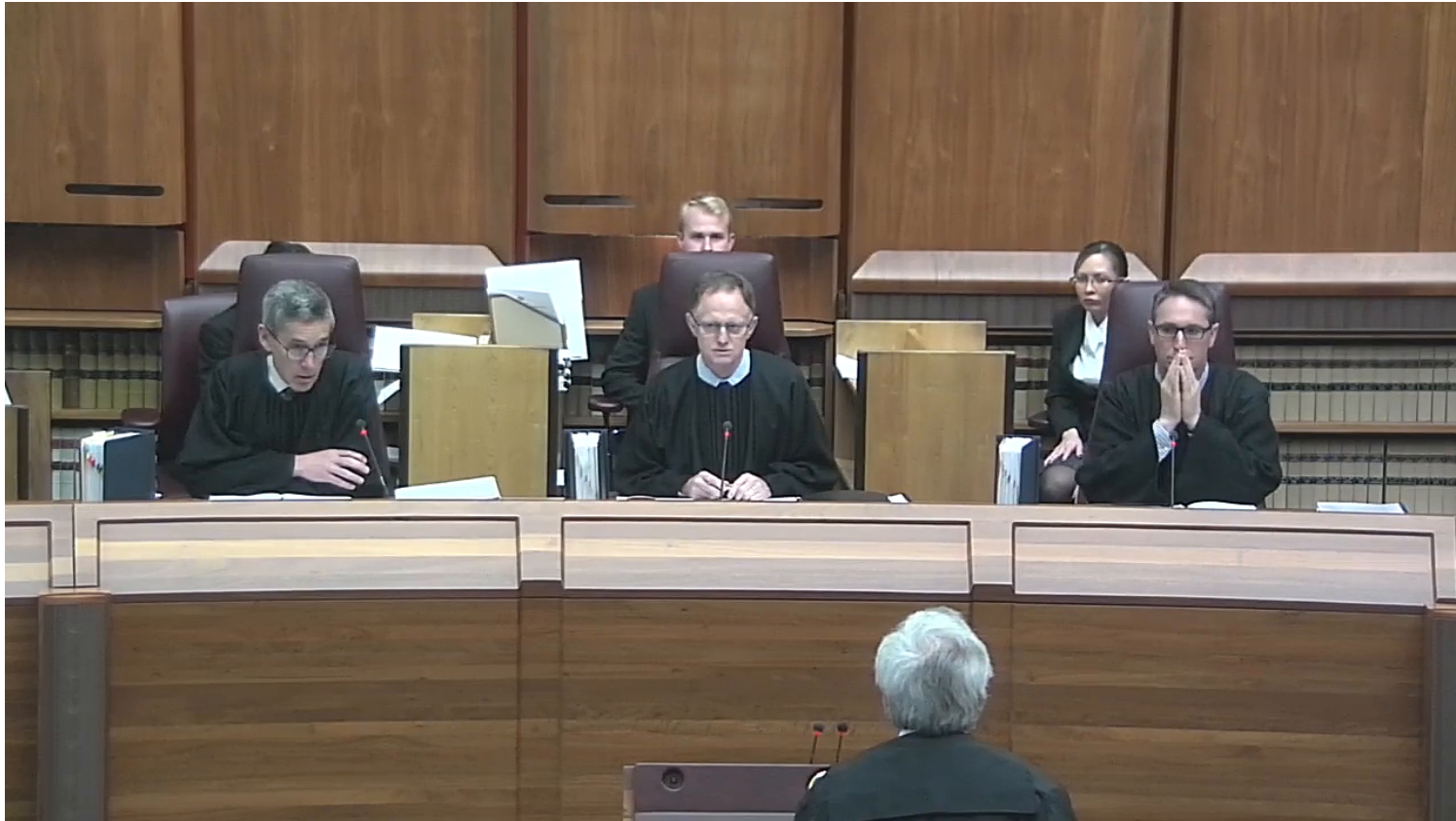
# Exploration of Judicial Facial Expression in Videos and Transcripts of Legal Proceedings

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**Can we predict the outcome of an appeal based on facial expressions on the Justices?**



# Background

# Recent legal studies on judicial behaviour

Judges are expected to be neutral in the courtroom, but they can be unaware they are making facial expressions.

- Chan (2018):
  - from video and audio recordings on the United States Supreme Court
  - used general image processing methods, but not face recognition
- Tutton et al. (2018):
  - from transcript and audiovisual recordings on Australian High Court
  - manually recorded Judicial expressions from videos and the corresponding transcript.

# Face Recognition

- **Paul Ekman** analysed facial actions and expressions, leading to the Facial Action Coding System (FACS)
- Decomposition of facial muscles

Example: AU\_2



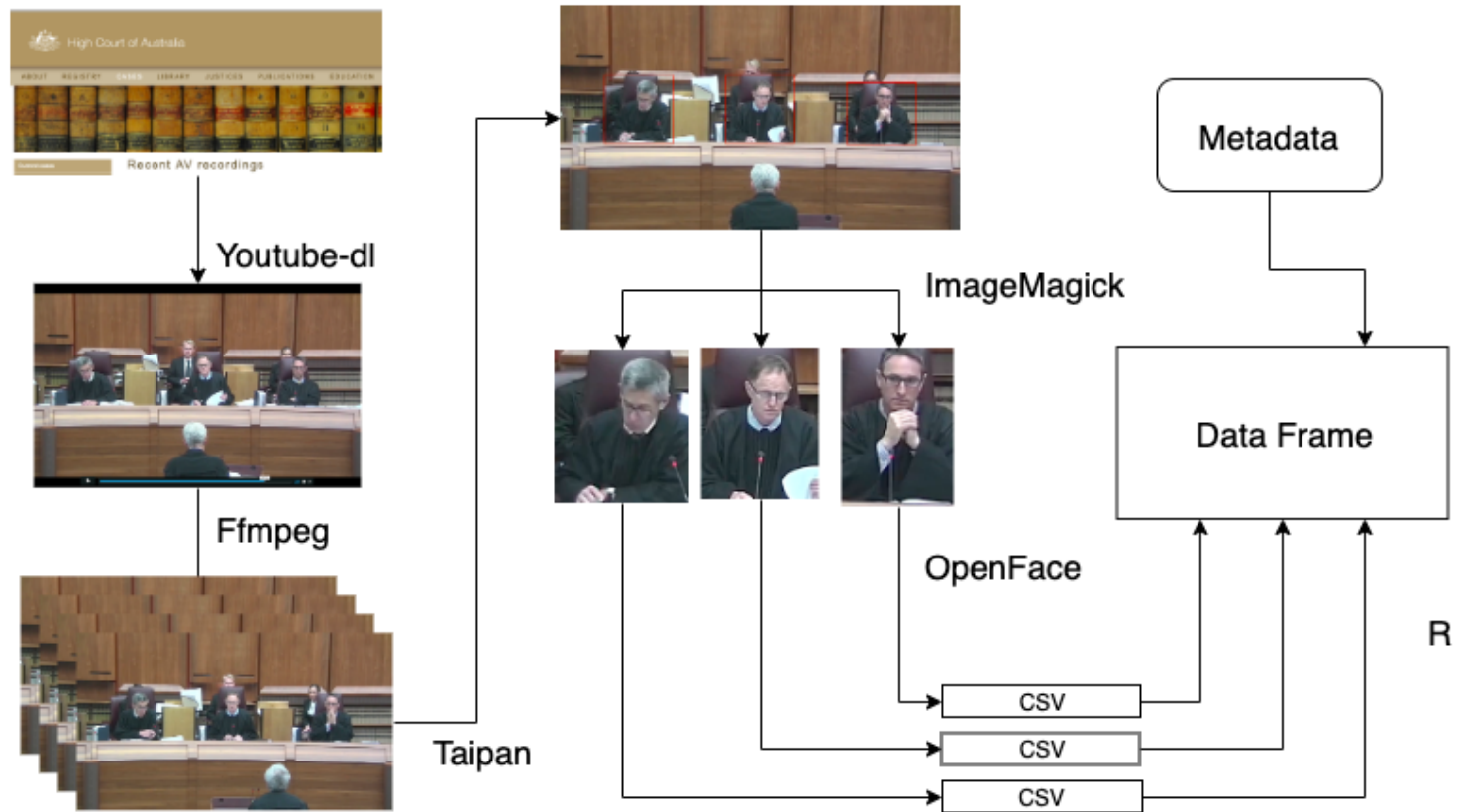
Example: AU\_15



- Kovalchik & Reid (2018) utilise OpenFace to study the emotion of professional tennis players in the Australian Open grand slam matches (OUR MOTIVATION)

# Data Collection

# Video Processing (I have done this)



**4601 faces and 711 facial variables!**

# Collected Data

Index variable			CSV	Meta data	
Video_id	Frame_id	Justice_id	Facial Variables	Speaker	Outcome
Nauru_a	1	Justice1		Appellent	Appellent
Nauru_a	2	Justice1		Appellent	Appellent
Nauru_a	3	Justice1		Appellent	Appellent
...	...	...			
Nauru_a	151	Justice1		Respondent	Appellent
Nauru_a	1	Justice2		Appellent	Appellent
Nauru_a	2	Justice2		Appellent	Appellent
Nauru_a	3	Justice2		Appellent	Appellent
...	...	...			
Nauru_a	151	Justice2		Respondent	Appellent
Nauru_a	1	Justice3		Appellent	Appellent
Nauru_a	2	Justice3		Appellent	Appellent
Nauru_a	3	Justice3		Appellent	Appellent
...	...	...			
Nauru_a	151	Justice3		Respondent	Appellent



# Preliminary results

confidence = 0.925



confidence = 0.425



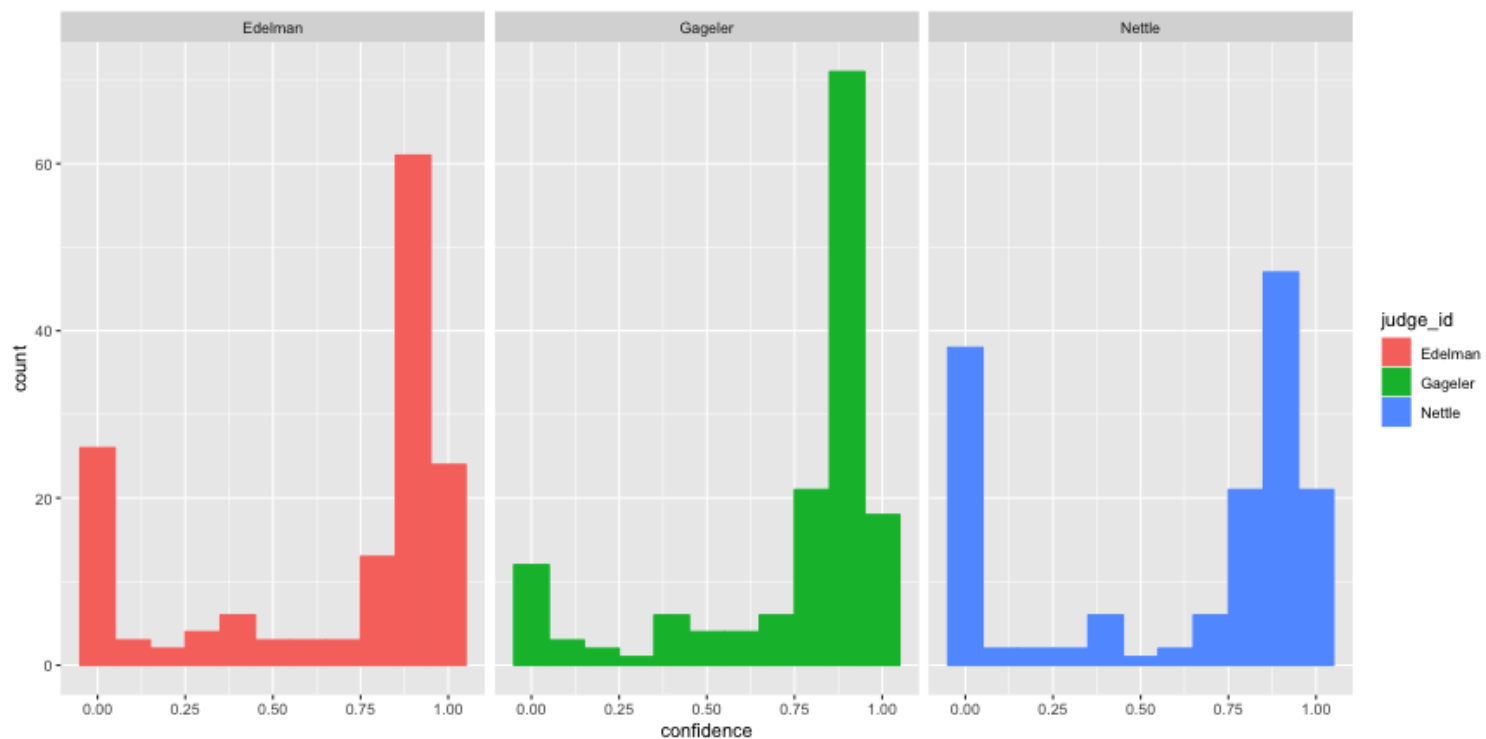
confidence = 0.775



confidence = 0.025

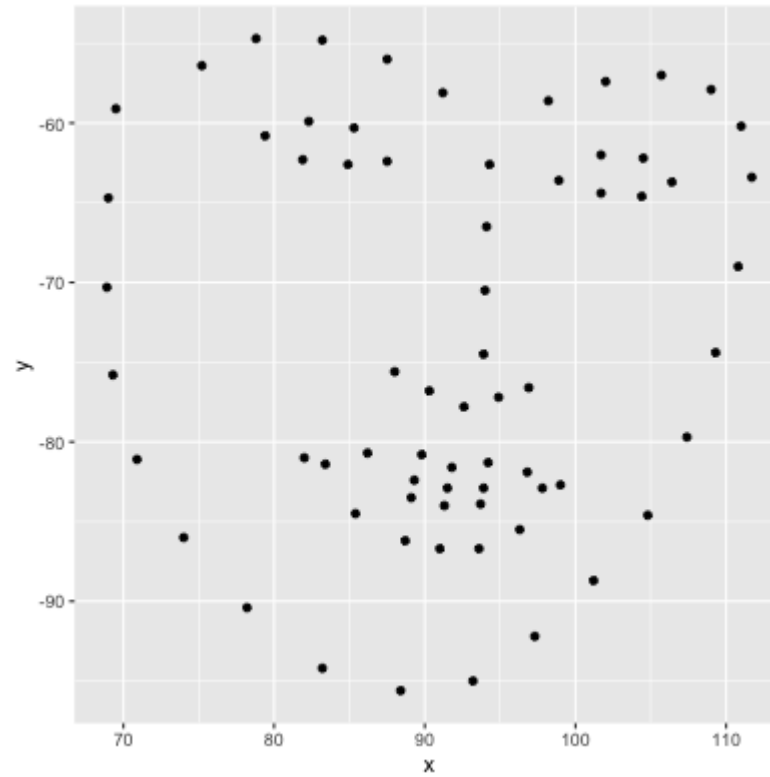


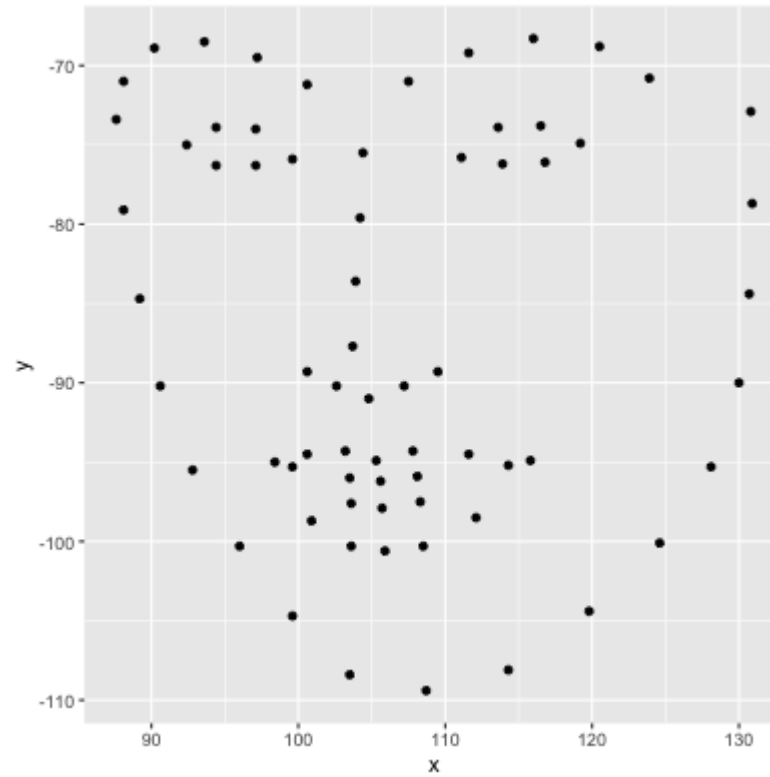
# Confidence of facial detection - one video



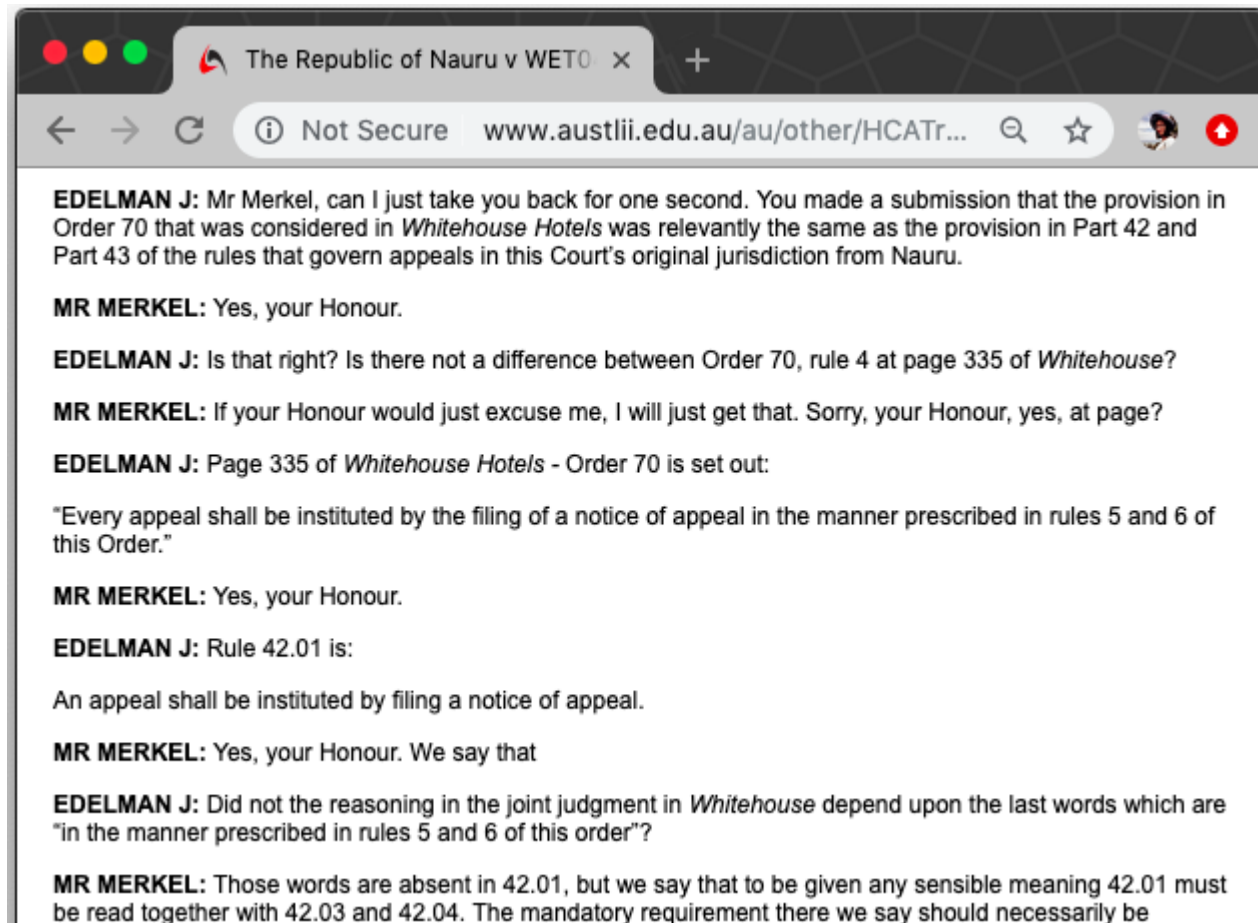
Low confidence could also be informative, indicating justice gaze is elsewhere

# Facial landmarking





# Transcript data



The Republic of Nauru v WETO

Not Secure www.austlii.edu.au/au/other/HCATr...

**EDELMAN J:** Mr Merkel, can I just take you back for one second. You made a submission that the provision in Order 70 that was considered in *Whitehouse Hotels* was relevantly the same as the provision in Part 42 and Part 43 of the rules that govern appeals in this Court's original jurisdiction from Nauru.

**MR MERKEL:** Yes, your Honour.

**EDELMAN J:** Is that right? Is there not a difference between Order 70, rule 4 at page 335 of *Whitehouse*?

**MR MERKEL:** If your Honour would just excuse me, I will just get that. Sorry, your Honour, yes, at page?

**EDELMAN J:** Page 335 of *Whitehouse Hotels* - Order 70 is set out:

"Every appeal shall be instituted by the filing of a notice of appeal in the manner prescribed in rules 5 and 6 of this Order."

**MR MERKEL:** Yes, your Honour.

**EDELMAN J:** Rule 42.01 is:

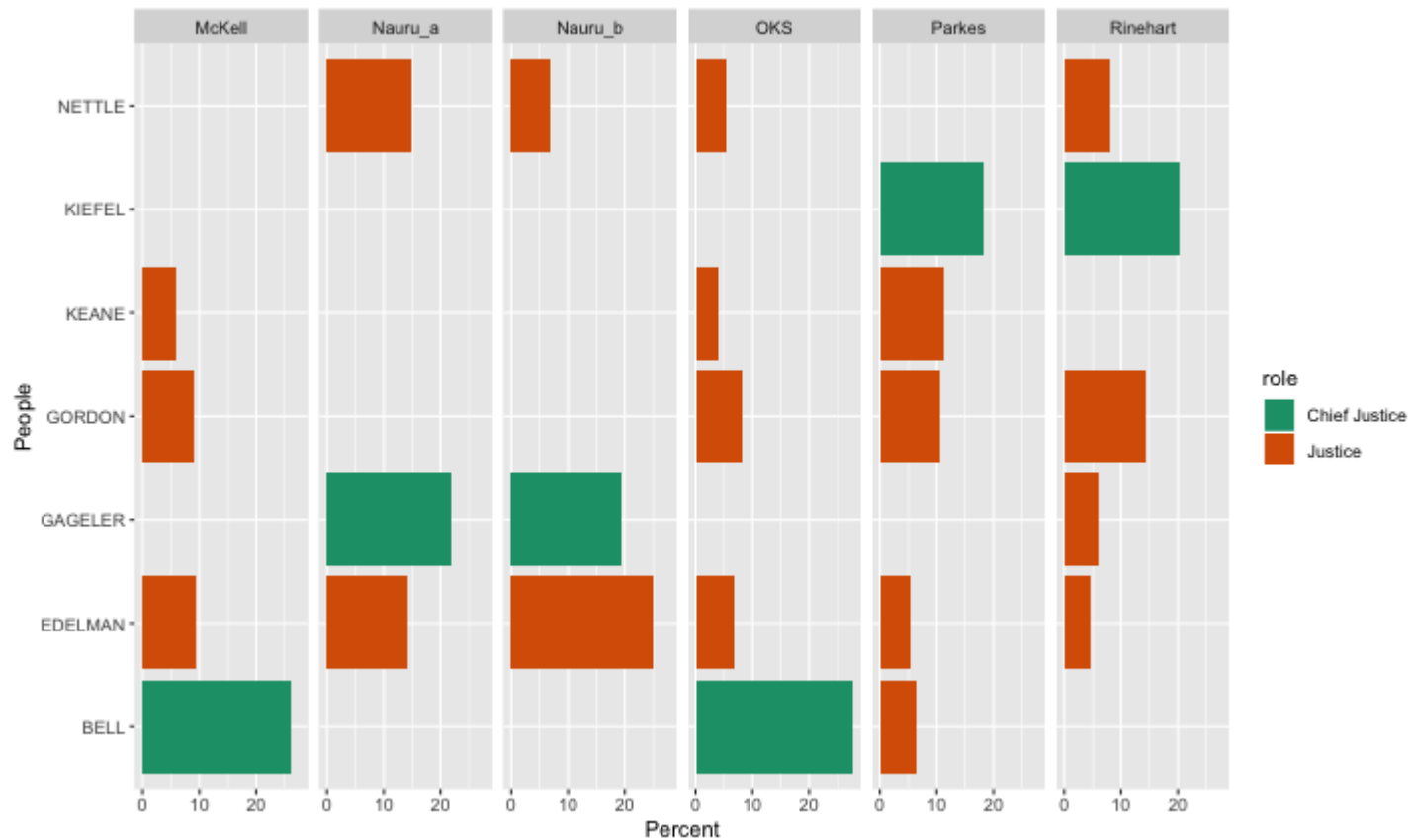
An appeal shall be instituted by filing a notice of appeal.

**MR MERKEL:** Yes, your Honour. We say that

**EDELMAN J:** Did not the reasoning in the joint judgment in *Whitehouse* depend upon the last words which are "in the manner prescribed in rules 5 and 6 of this order"?

**MR MERKEL:** Those words are absent in 42.01, but we say that to be given any sensible meaning 42.01 must be read together with 42.03 and 42.04. The mandatory requirement there we say should necessarily be

# Justices speaking percentage

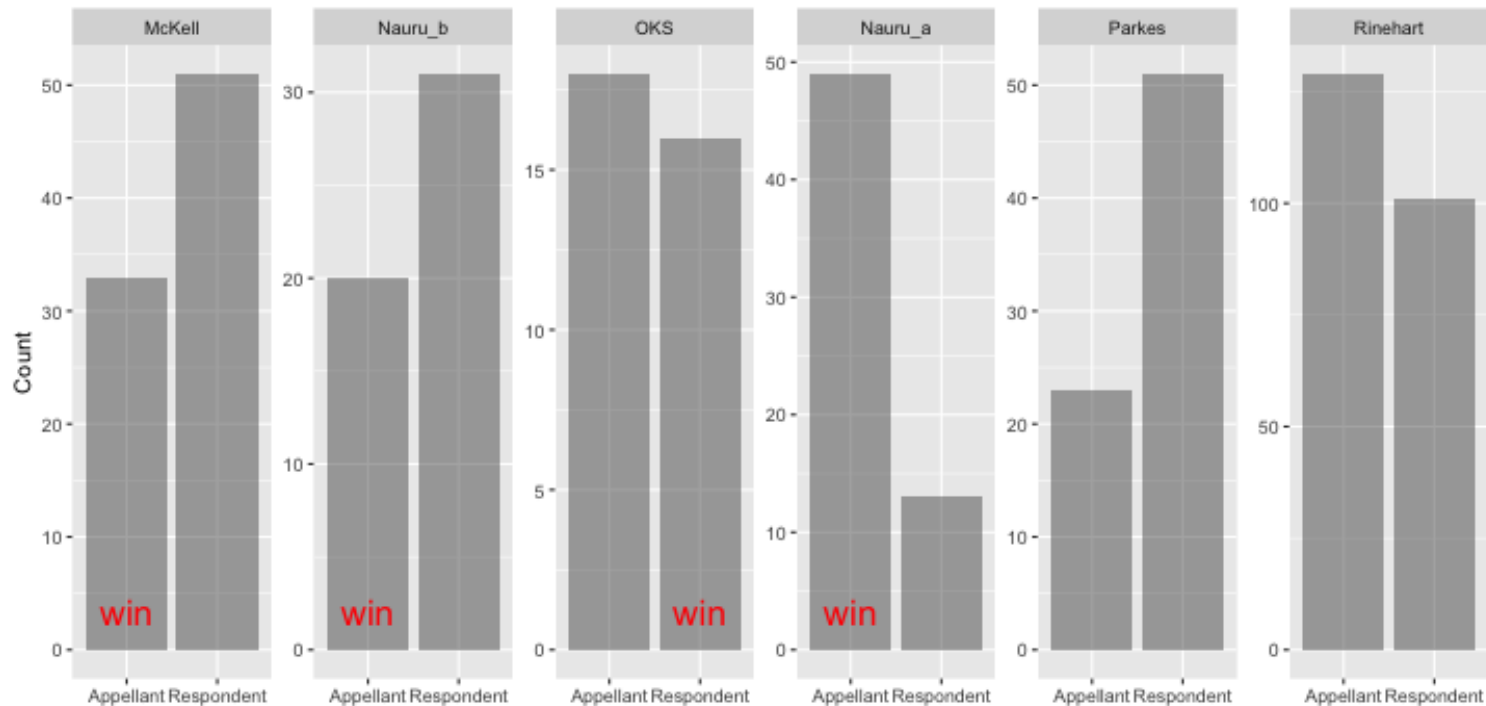


Chief Justices tend to interrupt the counsel more than other Justices



# The counsel speaking time

Less speaking time (from more interruptions by the judges) is related to higher odds of winning the case (Johnson et al., 2009).



Our data is consistent with this.

# Plan

Completed:

- Data: 6 observations (cases), 700 variables (facial characteristics and meta information), 7 groups (judges)
- Exploratory analysis of one video's data.

To do:

- Variable reduction: Examine Justices facial expressions
  - across the appeal, to determine normal characteristics for each judge.
  - when respondent or appellant speaks
- Face detection when more judges present generates missings, related to image resolution: Need to determine a solution to impute
- Model associations between outcomes and much reduced variable set, to find potential indicators of outcome by individual judges expressions.

# Acknowledgement

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Slides created via the R package **xaringan**.