

# Tweeting about climate change

Blending data science and psychology to  
analyse social media

**Matthew Andreotta**<sup>1,2</sup>, Robertus Nugroho<sup>2,3</sup>, Mark Hurlstone<sup>3</sup>,  
Fabio Boschetti<sup>4</sup>, Simon Farrell<sup>1</sup>, Iain Walker<sup>5</sup>, & Cecile Paris<sup>2</sup>

---

[1] School of Psychological Science,  
University of Western Australia

[2] Data61, CSIRO

[3] Soegijapranata Catholic University

[4] Ocean & Atmosphere, CSIRO

[5] School of Psychology and Counselling,  
University of Canberra



<https://bit.ly/2m7wZqM>



<https://psyarxiv.com/bynz4/>



[matthew.andreotta@research.uwa.edu.au](mailto:matthew.andreotta@research.uwa.edu.au)



@MattAndreotta

# Public perceptions & social media

- Members of the public differ in their opinions of important policy issues
- Public commentary can influence policy agenda



***Large volume***

**+**

***Dynamic content***

**=**

***Large and diverse data***

**AIM** Identify the common commentary of Australian's tweets about climate change

**Thematic analysis** to identify themes

**DESIRED  
ANALYSIS**

**PROBLEM** Data set is exceeds the capabilities of traditional qualitative approaches

# Framework

1. Compile a corpus

2. Compress corpus along a dimension of relevance

3. Extract a subset of data (from relevant spaces)

4. Perform qualitative analysis subset of data



Malcolm Roberts 🇦🇺

@MRobertsQLD

The most profound change we are going to witness is the unceremonious dumping of climate change scams under a Trump Presidency #auspol

11:25 PM - 8 Nov 2016

1. Australian location
2. Posted in 2016
3. References climate change

**201,506 tweets**

# Framework

1. Compile a corpus

2. Compress corpus along a dimension of relevance

3. Extract a subset of data (from relevant spaces)

4. Perform qualitative analysis subset of data

- **Topics** are an abstract representations of semantically related words and concepts
- **Non-negative Matrix inter-joint Factorization (NMijF)**<sup>1</sup>
  - Word co-occurrence
  - Social and temporal co-occurrence
- 41 batches, 5 topics per batch
- **Topic alignment algorithm**<sup>2</sup> to detect & group similar topics
- 22 groups of similar topics
- 102 topics were rare (similar to  $\leq 1$  topic)

Prime Minister @TurnbullMalcolm, @JulieBishopMP and @JoshFrydenberg announce Australia has ratified Paris climate change agreement #auspol  
♡ 3 9:05 AM - Nov 10, 2016

pari ratify agreement govern time  
#parisagr serio storm amend action

[1] (Nugroho, Zhao, Yang, Paris, & Nepal, 2017)

[2] (Chuang et al., 2015)

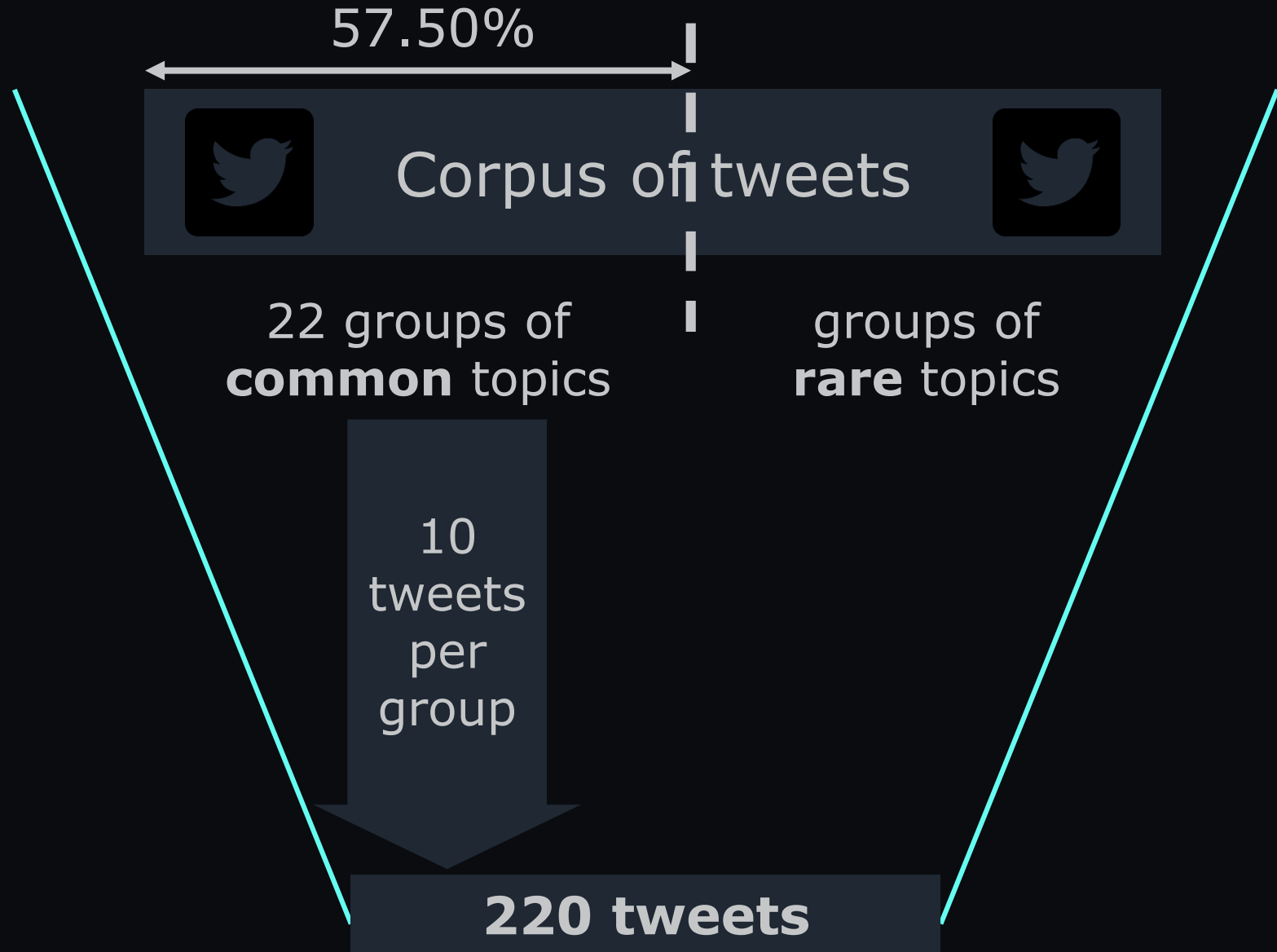
# Framework

1. Compile a corpus

2. Compress corpus along  
a dimension of relevance

3. Extract a subset of data  
(from relevant spaces)

4. Perform qualitative  
analysis subset of data



# Framework

1. Compile a corpus

2. Compress corpus along a dimension of relevance

3. Extract a subset of data (from relevant spaces)

4. Perform qualitative analysis subset of data



# Results

Climate change action

Yes! Let's start working together for real solutions on climate change #QandA

Consequences of climate change

Reefs of the future could look like this if we continue to ignore #climatechange

Conversations on climate change

not so gripping from No Principles Malcolm. Not one mention of climate change in his pitch.

Climate change deniers

According to Senator elect Malcolm Roberts, NASA fiddles the figures on Climate Change.

The legitimacy of climate change and climate science

Do we have an international convention on 'Cloud Seeding'? Or it comes under United Nation's climate change agreement?



# Conclusion

- Users want action on climate change
- Some users are engaged
  - Discussion of climate risks (e.g., biodiversity)
  - Discussion of discussions
- Need to:
  - Counter scepticism
  - Promote messages of self-efficacy and hope

*This research was supported by an Australian Government Research Training Program Scholarship from the University of Western Australia and a scholarship from the CSIRO Research Office and Data61*



<https://bit.ly/2m7wZqM>



<https://psyarxiv.com/bynz4/>



[matthew.andreotta@research.uwa.edu.au](mailto:matthew.andreotta@research.uwa.edu.au)



[@MattAndreotta](#)