



## Introduction

- Group differences in eye gaze have been studied mostly for static scenes (Hall et al., 2014; Lykins et al., 2008; Rupp & Wallen, 2007; Maynard et al., 2014).
- Dynamic scenes (videos) may be avoided due to labour-intensive analysis (definition of ROIs).
- Important ROIs are not always clear when group comparisons are made.
- We here propose a data-driven method to identify stimuli and sections of stimuli with large group differences.
- We test this method on a comparison between left and right wing viewers watching videos of left and right wing politicians.

## Method

### Participants

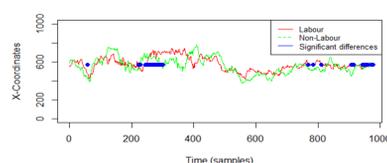
- 37 female / 8 male
- Aged 18 – 38 (mean: 21)
- Normal or corrected-to-normal vision
- 21 were affiliated to labour party, 24 other

### Stimuli

- 80 video clips, each around 16 seconds, various contexts (speech, one to one interviews, rallies):
  - 20 UK, left wing (Corbyn)
  - 20 UK, right wing (May)
  - 20 US, left wing (Obama)
  - 20 US, right wing (Trump)
- Set of questionnaires, including (1) a socio-demographic questionnaire (gender, age, nationality, political affiliation), (2) The Political Attitudes Scale (PAS), (3) Ontological Insecurities Scale (OIS), and (4) Right-Wing Authoritarianism Scale (RWAS).

### Design

- Order of politicians randomized for each participant
- Same order of videos within politician



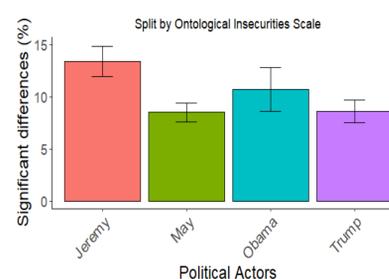
a) Statistical comparison of horizontal and vertical coordinates for each video frame



c) Identification of video clips with significant differences



b) Identification of frames with significant differences



d) Comparison of video types

### Task

- Watch video clips (eye tracking)
- Fill in questionnaires (pen + paper)

### Data Analyses

- Automatic detection of frames with significant ( $p=0.05$ , uncorrected) horizontal or vertical gaze difference between groups (e.g., labour vs conservative, Figure 1a).
- Detection of videos with many or few significant differences (Figure 1b).
- Detection of sections of videos with significant differences (Figure 1c).
- The percentage of frames with a significant difference can be used to compare different types of video clips based on various splits of the sample (Figure 1d).

Figure 1. Illustration of the method

## Results

### Split by Party Affiliation

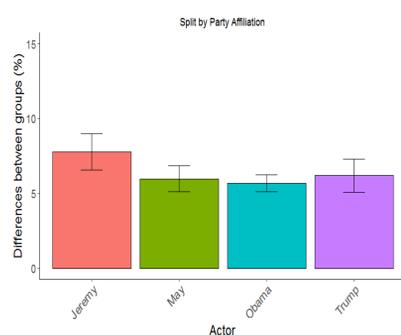


Figure 2

### PAS Split

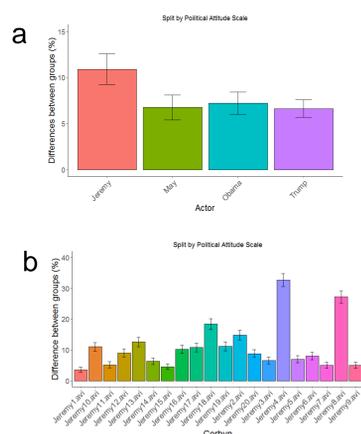


Figure 3

### OIS Split

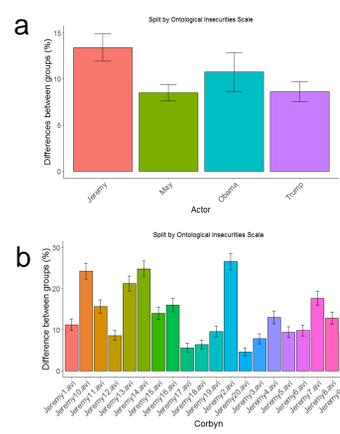


Figure 4

### RWAS Split

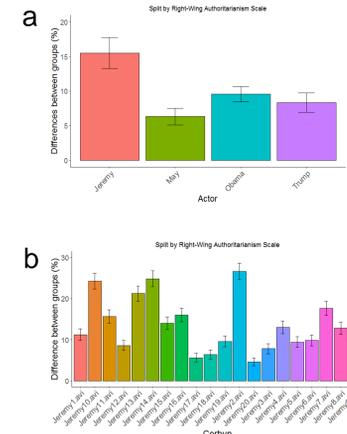


Figure 5

- No significant group differences for splits based on party affiliation (labour and non-labour, Figure 2).
- Significantly larger group differences based on PAS split for Corbyn videos (Figure 3a). Certain sections of these videos showed particularly large group differences (Figure 3b).
- Similar results for OIS split (Figure 4a) and the sections of the video associated with such difference (Figure 4b).
- Large group differences also found for Corbyn videos on a split based on Right-Wing Authoritarianism Scale (RWAS) (Figure 5b).

## Discussion and Conclusion

- Our method is feasible (not labour intensive) and yields interesting group differences (points towards relevant stimuli and sections).
- Current method does not distinguish between horizontal and vertical differences and inflates type I error.
- Future work could use a single measure for group gaze differences and search for sequences of differences.
- The method could provide a new means of measuring group differences in information encoding and is suited for analysis of moving clips.

## References

- Hall, C. L., Hogue, T. E., & Guo, K. (2014). Gaze patterns to child figures reflect deviant sexual preference in child sex offenders: A first glance. *Journal of Sexual Aggression*(ahead-of-print), 1–15.
- Lykins, A.D., Meana, M., & Strauss, G.P. (2008). Sex differences in visual attention to erotic and non-erotic stimuli. *Archives of Sexual Behavior*, 37(2), 219–228.
- Maynard, O. M. et al. (2014). Avoidance of cigarette pack health warnings among regular cigarette smokers. *Drug and Alcohol Dependency*, 136, 170–174. doi:10.1016/j.drugalcdep.2014.01.001.
- Rupp, H. A., & Wallen, K. (2007). Sex differences in viewing sexual stimuli: An eye-tracking study in men and women. *Hormones and Behavior*, 51 (4), 524–533.