The Role of Late-Night Infotainment Comedy in Communicating Climate Change Consensus

Edward J. R. Clarke[a*], A. Klas[b], J. Stevenson[c] & E. J. Kothe[b]

[a] *School of Health and Life Sciences, Federation University, Berwick, Vic. 3806, Australia*

[b] *School of Psychology, Deakin University, Geelong, Vic. 3220, Australia*

[c] *School of Psychology, Monash University, Clayton, Vic. 3800, Australia*

[*]Corresponding author.

Email address: ej.clarke@federation.edu.au (E.J.R. Clarke)

The Role of Late-Night Infotainment Comedy in Communicating Climate Change Consensus

Abstract

Climate change is a politically-polarised issue, with conservatives less likely than liberals to perceive it as human-caused and consequential. Furthermore, they are less likely to support mitigation and adaptation policies needed to reduce its impacts. This study aimed to examine whether John Oliver's "A Mathematically Representative Climate Change Debate" clip on his program *Last Week Tonight* polarised or depolarised a politically-diverse audience on climate policy support and behavioural intentions. One hundred and fifty-nine participants, recruited via Amazon MTurk (94 female, 64 male, one gender unspecified, *Mage* = 51.07, *SDage* = 16.35), were presented with either John Oliver's climate change consensus clip, or a humorous video unrelated to climate change. Although the climate change consensus clip did not reduce polarisation (or increase it) relative to a control on mitigation policy support, it resulted in hyperpolarisation on support for adaptation policies and increased climate action intentions among liberals but not conservatives.

Keywords: motivated reasoning, political polarisation, humour, climate change communication, climate change policy support

Introduction

Despite near scientific consensus that climate change is real and caused by human activity (Masson-Delmotte et al., 2018), many people in Western liberal democratic nations such as the United States, the United Kingdom, and Australia remain doubtful of its existence and/or impact (Dunlap, McCright, & Yarosh, 2016; Leviston & Walker, 2012; Poortinga, Spence, Whitmarsh, Capstick, & Pidgeon, 2011). In particular, right-wing adherents and those who affiliate or identify with conservative political parties are more likely to deny climate change than their left-wing counterparts (Hornsey, Harris, Bain, & Fielding, 2016). As such, climate change is a politically-polarised issue in these nations, which affects development and implementation of effective government policy (Whitmarsh & Corner, 2017). The challenge for science and policy communicators is to find climate change messages and delivery methods that increase support for climate change policy across the political spectrum, while simultaneously limiting further political polarisation (Benjamin, Por, & Budescu, 2016). Furthermore, given the existence of different climate change communication approaches, specifically found in popular media, it is also important to understand the effects of these media representations of climate change.

Climate change information has been presented in humorous ways via late-night political 'infotainment' television programs (Brewer & McKnight, 2015, 2017; Skurka, Niederdeppe, & Nabi, 2019; Skurka, Niederdeppe, Romero-Canyas, & Acup, 2018). Comedians such as Stephen Colbert, Jimmy Kimmel and John Oliver use political satire and humorous comedy skits to highlight the need for action on climate change. These satirical climate change presentations could have differential effects on people's beliefs about the scientific consensus on climate change and their support for climate policies, depending on key elements of the presentation. For instance, perceived motives of the communicator (Druckman & McGrath, 2019), the content of the message (Lewandowsky, Gignac, &

Vaughan, 2013), the type of humour (Young, Bagozzi, Goldring, Poulsen, & Drouin, 2019), and the polarisation of the audience (Hart & Feldman, 2018; LaMarre, Landreville, & Beam, 2009) can all impact the level of individual attitude change.

Yet research thus far suggests that climate change content delivered by these popular political 'infotainment' television programs generally do not reduce or increase climate change polarization (e.g. Brewer & McKnight, 2017). However, past research has been limited by the sample used, experimental design elements, and the range of climate-related outcomes examined. For these reasons, the current study partially replicates and extends upon a component of a study by Brewer and McKnight (2017), who examined whether the effect of a climate change consensus clip from the television program *Last Week Tonight with John Oliver* on climate change beliefs was moderated by political orientation. This was done to further explore whether this clip increased or decreased political polarisation on climate change in a more politically-representative sample, and specifically whether this clip results in polarisation in support for climate change mitigation and adaptation policies, and pro-climate action intentions.

Political infotainment: A potential for depolarisation or hyperpolarisation in climate change communication?

Political satire 'infotainment' television programs are a form of communication in which the aim is to simultaneously entertain and educate audience members, with humour often used as the way in which entertainment and education are combined within the medium. Late night comedy shows such as *The Daily Show*, *Full Frontal with Samantha Bee*, and *Last Week Tonight* use political satire to deliver political news and commentary, and they are an increasingly popular way for people to obtain news and political information (e.g. Bode & Becker, 2018). Given the proliferation of late-night comedy shows and their propensity to

tackle serious issues such as climate change in a satirical manner, it is important to understand their effects on climate change political polarisation.

Research on the effects of communication on climate change polarisation suggests that, depending on the source of the communication and their perceived motives (Druckman & McGrath, 2019), and the political orientation of the audience (Hart & Feldman, 2018), presentation of climate change content in the aforementioned infotainment programs could lead to increased polarisation and a 'backfire' effect (Hart & Nisbet, 2012). This may be a function of politically-motivated reasoning, where a person's ideological beliefs and partisan groupings affect their responses to information when that information is not aligned with their prior beliefs or those of their political groups (e.g. Bolsen, Druckman, & Cook, 2015; Taber & Lodge, 2006), although this account is contested (Druckman & McGrath, 2019). Nonetheless, if the communicator of the climate change message is perceived to have an ulterior motive, by right-wing adherents, then the message could be ineffective at best and polarising at worst due to this politically-motivated reasoning. However, if the message references scientific consensus on climate change, then this could increase belief in anthropogenic climate change regardless of political orientation. Research suggests that climate change consensus messages can be effective in reducing polarisation (Cook & Lewandowsky, 2016; Lewandowsky et al., 2013). This suggests that a clip such as the climate change consensus message delivered by comedian John Oliver on his program *Last Week Tonight* could potentially depolarise. In short, this message appears to possess qualities that could either increase or decrease climate change polarisation.

One other concern specifically pertinent to communication is the type of humour used in these comedy clips. Satire is a form of humour that attacks an object, whether it be a person, a group, behaviours, or beliefs (Holbert, Hmielowski, Jain, Lather, & Morey, 2011). Satire is commonly used on late-night political comedy shows, often by attacking or deriding

politicians (Baumgartner & Morris, 2006). Therefore, the use of satire to mock politicians could result in differential audience effects depending on the political beliefs and affiliations of the audience. For instance, an audience member could react negatively to attacks against a candidate from their political party, but positively to attacks against candidates from the opposition party. Furthermore, satire is preferred more by liberals than conservatives (Young et al., 2019), which could mean that conservatives will not engage with the content of a satirical message on climate change to the same extent as liberals. Nonetheless, research into the effects of satirical climate change humour communication suggests that one-sided messages using irony might increase climate change engagement (Anderson & Becker, 2018), although a possible moderating effect of political orientation was not explored.

Of the research conducted on the effect of climate change messages via the late-night comedy medium, political variables do not interact with the humorous climate change message (when compared to a control message) to manifest in increased (or decreased) polarisation on climate change-related beliefs and behaviours. In a study on the effects of late-night comedy shows (specifically *The Daily Show* and *The Colbert Report*) on participants' beliefs about the existence of global warming, Brewer and McKnight (2015) found no interaction effect of political ideology on the effects of clips from these shows (and a control condition) on perceptions that global warming is occurring. Put simply, viewing these shows did not appear to yield a polarisation or depolarisation effect. In line with this, a study by Skurka, Niederdeppe and Nabi (2019) found that a humorous climate change consensus presentation on *Jimmy Kimmel Live!* (a late-night infotainment comedy show), did not reduce mean differences in climate change risk perception among Democratic and Republican affiliates relative to a control condition (a Jimmy Kimmel clip discussing silly names for baby products). Furthermore, there was no interaction of condition and political affiliation for climate activism intentions or mitigation behavioural intentions.

More specifically to the current study, Brewer and McKnight (2017) examined the effect of a clip from comedian John Oliver's late night comedy program *Last Week Tonight*. In this clip, John Oliver satirises the presentation of the climate change debate by cable television outlets, highlighting that despite that 97% of climate scientists agree that climate change is human-induced, equal weighting is given to scientists and climate deniers on cable television. There was no moderation effect of party identification, or political orientation, on the effect of the John Oliver climate change consensus video on participants' climate change beliefs, in this study. This suggests that this video is not polarising or depolarising, consistent with Brewer and McKnight's (2015) findings regarding the effects of *The Daily Show* and *Colbert Report* climate change videos, as well Skurka et al.'s (2019) findings testing satirical climate change messages from *Jimmy Kimmel Live!*.

However, Brewer and McKnight's (2017) study is limited by their sample. They relied on recruitment through undergraduate students, which resulted in a "disproportionately young" (p. 177) sample that were "likely to identify as Democrats or independents" (p. 177). The authors acknowledge that a more representative sample, and likely more politically representative, is needed to examine polarisation effects in this domain. Additionally, the authors used a John Oliver video for their control condition, which was on the subject of net neutrality. Although the use of a humorous video of the same author likely helped to control for source effects and differential effects of humour type, the subject matter of net neutrality is a public policy and political issue with varying degrees of support in congress (Lee, 2017), and therefore might itself affect climate-related outcomes in some participants through priming adjacent political beliefs and identities. On the other hand, the Skurka et al. (2019) study used an apolitical Jimmy Kimmel video, potentially providing a more suitable control condition as it holds both source and humour type relatively constant while not risking priming any political beliefs and identities relevant to climate change.

The Present Study

This study extends on the work of Brewer and McKnight (2017) in three ways. The current study's participant sample is older and more politically-balanced, both ideologically and based on party affiliation. Furthermore, this study compares responses to the John Oliver consensus video with responses from those who viewed an unrelated John Oliver video about regifting, an apolitical topic which allows us to control for possible political information priming effects in the control condition while keeping source and humour type similar across the two conditions. As mentioned, Brewer and McKnight's control condition was a John Oliver clip on net neutrality, which like climate change is a politicized issue (albeit not to the same extent). This may have inadvertently primed relevant political affiliations and beliefs and therefore affected responses to climate change items. Finally, we examine the effects of this John Oliver climate change consensus video on a different set of outcomes to Brewer and McKnight – climate change mitigation support, climate change adaptation support, and pro-climate action intentions.

Aims and Hypotheses

The aim of the study was to explore the effect of watching a video of a John Oliver comedy sketch highlighting the percentage of the scientific consensus regarding human-induced climate change on support for climate change mitigation and adaptation policies, and intention to act in a pro-climate manner. We also sought to investigate whether the effect would be moderated by participants' political orientation.

We hypothesised that:

1) Political orientation (liberal to conservative) would negatively predict: a. climate change mitigation support; b. climate change adaptation support, and; c. climate action intentions.

2) Political orientation would moderate the relative effect of the John Oliver climate change consensus video on: a. climate change mitigation support; b. climate change adaptation support, and; c. climate action intentions.

Past studies have not found a polarisation (or depolarisation) effect for satirical climate change humour, despite theory and evidence suggesting that this climate change communication could potentially increase polarisation (as climate change messages can sometimes increase polarisation; Hart & Feldman, 2018) or even decrease polarisation (due to the message being a climate change consensus message; Lewandowsky et al., 2013). Therefore, the moderation hypotheses were non-directional. However, we planned to conduct exploratory follow-up tests on significant interactions to determine whether the clip led to polarisation or depolarisation. A polarisation effect would be demonstrated via a moderation such that those on the liberal end of the orientation spectrum would be significantly more supportive of climate change policy and climate action intentions than liberals in the control condition, *and* those on the conservative end of the orientation spectrum would be significantly less supportive and show lower climate action intention, than conservatives in the control condition. A depolarisation effect would be demonstrated by those at the conservative end of the spectrum in the consensus condition showing significantly more support and climate action intention compared to conservatives in the control condition, and that level of support and climate action intention being roughly equal to liberals' levels.

Method

Participants

A sample of 159 United States residents (94 female, 64 male, one not specified, *Mage* = 51.07, *SDage* = 16.35, range = 18-76 years) were recruited online via Amazon Mechanical Turk (MTurk). MTurk was used for the recruitment in this study as it not only allowed

efficient recruitment of U.S. participants, but provided the ability to obtain a U.S. sample that was politically balanced. Samples of MTurk workers have been shown to be more demographically diverse than college samples (Buhrmester, Talaifar, & Gosling, 2018) and are fairly representative of the broader U.S. population on underlying psychological variables pertaining to political ideology (Clifford, Jewell, & Waggoner, 2015). Indeed, the mean for political orientation was just above the midpoint of the 11 point scale at 6.48 for the entire sample, indicating that our sample was politically balanced on this key moderator variable.

Forty-eight participants (30.2%) indicated that they considered themselves a Republican, while 51 (32.1%) considered themselves a Democrat, 59 (37.1%) considered themselves independent. These figures are broadly representative of recent trends in party affiliation in the U.S. (Gallup, 2019).

Materials

Political Orientation. Political orientation was assessed with a single self-report item, asking participants to indicate where their political beliefs lie on an 11-point Likert scale. This scale ranged from extremely liberal (1) to extremely conservative (11).

Experimental Intervention. Participants in both the treatment and control groups were presented with a humorous YouTube video clip of comedian John Oliver, from the television show *Last Week Tonight*. Eighty-one participants in the control condition were presented with a video of John Oliver discussing the act of regifting[1] (i.e. giving a previously received and unwanted gift to someone else as a gift). This clip did not contain any overtly political content, and was three minutes, 37 seconds in duration. Seventy-eight participants in the experimental condition were presented with the climate change consensus video[2], which was

---

[1] Link to Last Week Tonight's 'Regifting' video (control) - https://www.youtube.com/watch?v=GjatG8QFoOk
[2] Link to Last Week Tonight's climate change consensus video -
https://www.youtube.com/watch?v=cjuGCJJUGsg

a video of John Oliver highlighting the manner in which many television media programs in the U.S. had previously represented climate science as a debate between two equally scientifically-legitimate perspectives, equally represented in number. This video was 4 minutes, 27 seconds in duration. Access links to both videos are provided in the footnotes.

Climate Change Mitigation Support. This seven-item scale measures support for strategies to reduce society's carbon footprint, based on a scale developed by Bateman & O'Connor (2016). Participants indicated their level of support for each strategy on a seven-point Likert scale from "strongly disagree" to "strongly agree" after being asked "To what extent do you support these climate change mitigation strategies?". We added the following item to the original scale "Subsidies for companies and households to install solar panels" to measure support for government subsidies to solar panel installation in private property. This scale showed strong internal consistency ($\alpha = .91$, $\Omega = .93$).

Climate Change Adaptation Support. This is a five-item scale that measures support for strategies that seek to reduce the environmental impacts of climate change that largely affect humans and society (Bateman & O'Connor, 2016). Similar to the mitigation support scale, participants indicated their level of support for each strategy on a seven-point Likert scale from "strongly disagree" to "strongly agree" after being asked "To what extent do you support these climate change adaptation strategies?". This scale also showed good internal consistency ($\alpha = .90$, $\Omega = .92$).

Climate Action Intentions. The climate action intentions scale is an 11-item scale that measures pro-climate behavioural intentions, such as intending to "vote for politicians who want to protect us against climate change" (Bateman & O'Connor, 2016). Reponses were measured on a seven-point Likert scale from "strongly disagree" to "strongly agree", and the scale demonstrated good reliability ($\alpha = .96$, $\Omega = .97$).

Procedure

Once participants entered into the study via MTurk, they first completed demographic items and an item measuring political orientation. Participants were then randomly presented with one of two embedded YouTube clips. Prior to watching the video, they were given a written message that read "On the next page you will be shown a video from a late-night television comedy program. Please view the video in its entirety. Please also check that your volume is set to a comfortable level for hearing". They were then able to continue on to the next page to access the embedded video. To start the video, participants had to press the play button, in the same manner for a typical YouTube video. Participants could not leave the page with the embedded video for at least 217 seconds (the length of the 'regifting' clip, which was the shortest of the two clips) to increase the likelihood that participants would watch the video and not skip through to the next part of the questionnaire without having watched it. After this, participants completed the climate change mitigation and adaptation support measures, as well as the climate action intention measure.

Analytic Strategy

Three moderated multiple regression analyses tested both sets of hypotheses by examining the main effect of political orientation and the interaction effect of condition (dichotomous predictor) and political orientation (continuous moderator) on the three continuous outcome variables. Follow-up post-hoc analyses were conducted on significant interactions.

Results

Descriptive statistics for the sample, as well as by experimental condition, and bivariate correlations for key variables are provided in the tables below.

Descriptive Statistics and Bivariate Correlations of the entire sample

[Table 1 about here]

As shown in Table 2, political orientation was significantly negatively associated to all three outcome variables at the zero-order level.

[Table 2 about here]

[Table 3 about here]

A series of Welch Two Sample t-tests were conducted to examine whether there were significant differences in participants' political orientation, mitigation support, adaptation support, and climate action intentions across the two experimental conditions. There were no statistically significant differences in political orientation, or the three outcome variables of interest, between the two conditions. Therefore, the consensus video did not impact our climate change outcome variables relative to the control condition. Results of these t-tests, as well as means and standard deviations of the variables, are reported in Table 4 below.

[Table 4 about here]

Regression Analyses

Climate Change Mitigation Support

Conservative-leaning participants were less likely to support climate change mitigation than liberal-leaners ($\beta = -.44$, $p < .001$). However, there was no significant moderation effect (see Table 5 below).

Climate Change Adaptation Support

Political orientation significantly moderated the effect of experimental condition on adaptation support ($\beta = .25$, $p = .029$; see Table 5 below). A main effect of orientation

remained, such that conservative-learning participants were less likely to support climate change mitigation than liberal-leaners, regardless of experimental condition (β = -.36, p = .001).

A Johnson-Neyman follow-up analysis failed to find statistically significant effects at the p <.05 level for the consensus condition at any level of the orientation moderator, despite the significant interaction. Although this appears to suggest a trend in the data consistent with a polarisation effect (see Figure 1 below), group differences at all levels of the moderator are non-significant.

[Figure 1 about here]

Climate Action Intentions

Orientation significantly moderated the effect of experimental condition on climate action intentions (β = .24, p = .025; see Table 5 below). A main effect of political orientation remained, such that conservative-learning participants were less likely to intend to engage in pro-climate action than liberal-leaners, regardless of experimental condition (β = -.60, p < .001).

A Johnson-Neyman follow-up analysis found that those in the experimental condition had significantly higher intentions at the liberal end of the orientation moderator than those in the control condition, however the clip did not result in significantly lower intentions at the conservative end of the moderator. Specifically, the difference between the two conditions was significant (at p <.05) at scores of 3.5 or lower on the orientation item (which ranges from 1 - extremely liberal to 11 – extremely conservative; see Figure 2 below).

[Figure 2 about here]

[Table 5 about here]

Discussion

The aim of the study was to determine whether the presentation of the John Oliver climate change consensus video increased or decreased political polarisation in climate policy support and climate action intentions in a politically-diverse sample. As expected, and irrespective of experimental condition, conservative-leaning participants were less likely to support mitigation and adaptation policy, and had lower pro-climate action intentions, than liberal-leaning participants. This is broadly consistent with the literature indicating that conservatives show less support for pro-climate policy (Drews & van den Bergh, 2016; McCright, Charters, Dentzman, & Dietz, 2016) and less willingness to engage in pro-climate behaviour than liberals (Wolsko, Ariceaga, & Seiden, 2016). Although we found no interaction effect for condition and political orientation on climate change mitigation support, there were significant interactions on both adaptation support and climate action intentions, supporting hypotheses 2b and 2c. The latter two findings differ from Brewer and McKnight (2017), who did not find a moderating effect of political orientation on the effect of the same video on climate-related outcomes. The results of this study are explained in more detail below, with each dependent variable discussed separately.

Climate Change Mitigation Support

The climate change consensus video failed to produce a depolarisation effect in audiences on support for climate change mitigation policies, when compared to the control, however it did not exacerbate existing polarisation either. Although this is the first study to examine the effects of infotainment on climate mitigation policy support, this finding is broadly consistent with Brewer and McKnight's (2017) findings, in that the effect of the John Oliver climate change consensus video on climate-related outcomes was not moderated by political affiliation or orientation. It is also consistent with findings from Skurka et al. (2019), who

found that political affiliation did not moderate the effect of a Jimmy Kimmel climate change humour clip (when compared to a control) on personal mitigation behavioural intentions.

The lack of a polarisation or depolarisation effect on mitigation support by the climate change consensus video could reflect the fact that liberals and conservatives are already entrenched in their positions on mitigation policy (Benjamin et al., 2016). This may be due to the consistent political discourse and debate which has existed regarding how the government should act on mitigating climate change (McCright & Dunlap, 2011), especially specific mitigation policies such as carbon taxes. Therefore, a humorous presentation of the climate change consensus may not be enough to move people, whether liberal or conservative, to increase support for these types of policies.

Climate Change Adaptation Support

While climate change mitigation policies focus on abating the causes of climate change, climate change adaptation policies refer to strategies to reduce the impacts of climate change on humans. There was a significant interaction effect for climate change adaptation support, differing from past findings that did not find an interaction of political variables and humorous climate change presentations relative to a control (Brewer & McKnight, 2017; Skurka et al., 2019). However, post-hoc testing suggests that there was no significant difference between the experimental conditions at any point of the political orientation moderator. This may be due to low statistical power to detect small effects at different points of the moderator. Although a post-hoc power analysis indicated that to have 90% power to detect a small moderation effect (R^2 = .03) at an alpha level of .05 we would only need a sample size of 64, this is in reference to the overall interaction effect. Samples taken at each point of a seven-point moderator are much smaller, therefore the post-hoc analysis may miss a statistically significant effect at either end of the distribution of data. As such, while the

interaction effect broadly demonstrates a possible polarisation effect (see Figure 1), we are unable to confirm the nature of this effect with our data.

Nonetheless, the pattern of data appears different to responses to mitigation policy support, possibly because support for climate change adaptation is not as polarised to begin with (Bateman & O'Connor, 2016). In support of this, the bivariate correlation between political orientation and adaptation support in our data was smaller than the correlations between political orientation and our other outcome variables. This may be because these types of policies do not propose drastically altering the existing socio-economic system when compared to some of the suggested mitigation policies in the climate change mitigation support variable such as shifting to clean energy sources, which conservatives can perceive as more threatening (Campbell & Kay, 2014; Clarke, Ling, Kothe, Klas, & Richardson, 2019; Feygina, Jost, & Goldsmith, 2010). From a position of practical caution, it is worth considering the possibility that such infotainment presentations could lead to political polarisation on this specific policy set where less polarisation exists to begin with.

Climate Action Intentions

Climate action intentions were higher in liberal participants in the consensus condition, relative to those in the control condition, and did not significantly affect conservative participants, again relative to those in the control condition. As with the interaction effect on adaptation support, we found that political orientation can moderate the effect of this John Oliver consensus clip, contrary to past findings, although the moderation effect only occurred at the liberal end of the orientation moderator and not at the conservative end.

These findings could demonstrate a "rally-the-base" effect, where liberals, who already have higher climate action intentions than conservatives, are significantly more likely to intend to engage in pro-climate actions than liberals who did not view the John Oliver

message. This may provide qualified support for climate consensus messaging (Cook & Lewandowsky, 2016), at least for its effect on behavioural intentions, in that consensus messaging may be more effective for audiences that are already leaning towards positive climate action. From a pragmatic perspective there is utility in keeping those who are more likely to have higher pro-climate intentions, and indeed may behave to some extent in a pro-climate way, active and engaged on the issue. Given the need for political activism and collective action to apply pressure on governments to act urgently on climate change, this should not be discounted and likely has real value. However, such an approach to climate change communication appears unlikely to move right-wing adherents to action.

Limitations and Future Directions

A potential concern regarding the methodology is the use of a likely well-known liberal comedian in John Oliver, who may have elicited reactions in polarised audiences irrespective of the content of the segment. However, we controlled for source effects by using a John Oliver video in the control condition. Therefore, when comparing across conditions we argue that any main effects of source are accounted for. Furthermore, as John Oliver is a popular late-night comedian with a reasonably large audience, testing the effect he has on political outcomes as they pertain to climate change strengthens external validity. In addition, using humorous videos in both conditions, with the same source and humour type but an apolitical control message, also allows us to control for any generalised humour type and source effects on our dependent variables. Irrespective of this particular design limitation, it is possible that conservatives in either condition may have disengaged or indeed adopted an adversarial stance when responding to the outcome measures regardless of the content of the message, as a function of the source alone. Extending from this, a similar issue with this consensus clip is that former president Barack Obama is seen and mentioned toward the beginning of the

segment, which may have also elicited more positive reactions from liberals and negative reactions from conservatives prior to the climate change content.

Conclusion

We provide evidence that the John Oliver climate change consensus video interacts with political orientation to affect adaptation policy support and pro-climate intentions, but not mitigation policy support. This extension on previous work exploring the possibility of political polarisation via late-night 'infotainment' humour paints a more nuanced picture in two ways. The interaction of orientation and humorous consensus message may be a function of the outcome variables measured. Furthermore, as we only detected a significant difference in post-hoc analyses at the liberal end of the orientation moderator for one of our outcomes, we cannot conclude that we have witnessed a strict polarisation effect. Instead, the clip rallied some liberals to a cause that they already generally support, and did not necessarily cause backfire among conservatives. In sum, while such humorous approaches to communicating the scientific consensus may not reduce political polarisation regarding climate change, it may at least result in a net gain in terms of increased pro-climate behavioural intentions in liberals, and it is indeed possible that John Oliver has such an effect on his audience. Climate organisers could consider utilising similar types of approaches to climate change communication, if not using the John Oliver video itself, to potentially increase activism among liberals who care about the issue but have not yet engaged in pro-climate civic behaviours.

References

Anderson, A. A., & Becker, A. B. (2018). Not Just Funny After All: Sarcasm as a Catalyst for Public Engagement With Climate Change. *40*(4), 524-540. doi:10.1177/1075547018786560

Bateman, T. S., & O'Connor, K. (2016). Felt responsibility and climate engagement: Distinguishing adaptation from mitigation. *Global Environmental Change, 41*, 206-215. doi:https://doi.org/10.1016/j.gloenvcha.2016.11.001

Baumgartner, J. C., & Morris, J. S. (2006). The Daily Show Effect: Candidate Evaluations, Efficacy, and American Youth. *American Politics Research, 34*(3), 341-367. doi:10.1177/1532673X05280074

Benjamin, D., Por, H.-H., & Budescu, D. (2016). Climate Change Versus Global Warming: Who Is Susceptible to the Framing of Climate Change? *Environment and Behavior, 49*(7), 745-770. doi:10.1177/0013916516664382

Bode, L., & Becker, A. B. (2018). Go Fix It: Comedy as an Agent of Political Activation*. *Social Science Quarterly, 99*(5), 1572-1584. doi:10.1111/ssqu.12521

Bolsen, T., Druckman, J. N., & Cook, F. L. (2015). Citizens', Scientists', and Policy Advisors' Beliefs about Global Warming. *658*(1), 271-295. doi:10.1177/0002716214558393

Brewer, P. R., & McKnight, J. (2015). Climate as Comedy:The Effects of Satirical Television News on Climate Change Perceptions. *Science Communication, 37*(5), 635-657. doi:10.1177/1075547015597911

Brewer, P. R., & McKnight, J. (2017). "A Statistically Representative Climate Change Debate": Satirical Television News, Scientific Consensus, and Public Perceptions of Global Warming. *Atlantic Journal of Communication, 25*(3), 166-180. doi:10.1080/15456870.2017.1324453

Buhrmester, M. D., Talaifar, S., & Gosling, S. D. (2018). An Evaluation of Amazon's Mechanical Turk, Its Rapid Rise, and Its Effective Use. *Perspectives on Psychological Science, 13*(2), 149-154. doi:10.1177/1745691617706516

Campbell, T. H., & Kay, A. C. (2014). Solution aversion: On the relation between ideology and motivated disbelief. *Journal of Personality and Social Psychology, 107*(5), 809-824. doi:10.1037/a0037963

Clarke, E. J. R., Ling, M., Kothe, E. J., Klas, A., & Richardson, B. (2019). Mitigation system threat partially mediates the effects of right-wing ideologies on climate change beliefs. *Journal of Applied Social Psychology, 49*(6), 349-360. doi:10.1111/jasp.12585

Clifford, S., Jewell, R. M., & Waggoner, P. D. (2015). Are samples drawn from Mechanical Turk valid for research on political ideology? *Research & Politics, 2*(4).

Cook, J., & Lewandowsky, S. (2016). Rational Irrationality: Modeling Climate Change Belief Polarization Using Bayesian Networks. *Topics in Cognitive Science, 8*(1), 160-179. doi:10.1111/tops.12186

Drews, S., & van den Bergh, J. C. J. M. (2016). What explains public support for climate policies? A review of empirical and experimental studies. *Climate Policy, 16*(7), 855-876. doi:10.1080/14693062.2015.1058240

Druckman, J. N., & McGrath, M. C. (2019). The evidence for motivated reasoning in climate change preference formation. *Nature Climate Change, 9*(2), 111-119. doi:DOI: 10.1038/s41558-018-0360-1.

Dunlap, R. E., McCright, A. M., & Yarosh, J. H. (2016). The Political Divide on Climate Change: Partisan Polarization Widens in the U.S. *Environment: Science and Policy for Sustainable Development, 58*(5), 4-23. doi:10.1080/00139157.2016.1208995

Feygina, I., Jost, J. T., & Goldsmith, R. E. (2010). System justification, the denial of global warming, and the possibility of "system-sanctioned change". *Personality and Social Psychology Bulletin, 36*(3), 326-338.

Gallup. (2019). Party Affiliation. Retrieved from https://news.gallup.com/poll/15370/party-affiliation.aspx

Hart, P. S., & Feldman, L. (2018). Would it be better to not talk about climate change? The impact of climate change and air pollution frames on support for regulating power plant emissions. *Journal of Environmental Psychology, 60*, 1-8. doi:https://doi.org/10.1016/j.jenvp.2018.08.013

Hart, P. S., & Nisbet, E. C. (2012). Boomerang Effects in Science Communication: How Motivated Reasoning and Identity Cues Amplify Opinion Polarization About Climate Mitigation Policies. *Communication Research, 39*(6), 701-723. doi:10.1177/0093650211416646

Holbert, R. L., Hmielowski, J., Jain, P., Lather, J., & Morey, A. (2011). Adding Nuance to the Study of Political Humor Effects: Experimental Research on Juvenalian Satire Versus Horatian Satire. *55*(3), 187-211. doi:10.1177/0002764210392156

Hornsey, M. J., Harris, E. A., Bain, P. G., & Fielding, K. S. (2016). Meta-analyses of the determinants and outcomes of belief in climate change. *Nature Clim. Change, advance online publication*. doi:10.1038/nclimate2943

http://www.nature.com/nclimate/journal/vaop/ncurrent/abs/nclimate2943.html#supplementary-information

LaMarre, H. L., Landreville, K. D., & Beam, M. A. (2009). The Irony of Satire:Political Ideology and the Motivation to See What You Want to See in The Colbert Report. *14*(2), 212-231. doi:10.1177/1940161208330904

Lee, T. B. (2017). It's official: The FCC has started rolling back net neutrality protections. Retrieved from https://www.vox.com/new-money/2017/5/18/15658926/fcc-vote-net-neutrality

Leviston, Z., & Walker, I. (2012). Beliefs and Denials About Climate Change: An Australian

    Perspective. *Ecopsychology, 4*(4), 277-285. doi:10.1089/eco.2012.0051

Lewandowsky, S., Gignac, G. E., & Vaughan, S. (2013). The pivotal role of perceived

    scientific consensus in acceptance of science. *Nature Clim. Change, 3*(4), 399-404.

    doi:http://www.nature.com/nclimate/journal/v3/n4/abs/nclimate1720.html#supplemen

    tary-information

Masson-Delmotte, V., P. , Zhai, H.-O., Pörtner, D., Roberts, J., Skea, P. R., Shukla, A., . . .

    Waterfield, a. T. (2018). *IPCC, 2018: Summary for Policymakers. In: Global*

    Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of

    1.5°C above pre-industrial levels and related global greenhouse gas emission

    pathways, in the context of strengthening the global response to the threat of climate

    change, sustainable development, and efforts to eradicate poverty. Retrieved from

    https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-

    on-global-warming-of-1-5c-approved-by-governments/

McCright, A. M., Charters, M., Dentzman, K., & Dietz, T. (2016). Examining the

    Effectiveness of Climate Change Frames in the Face of a Climate Change Denial

    Counter-Frame. *Topics in Cognitive Science, 8*(1), 76-97. doi:10.1111/tops.12171

McCright, A. M., & Dunlap, R. E. (2011). The Politicization Of Climate Change And

    Polarization In The American Public's Views Of Global Warming, 2001-2010.

    Sociological Quarterly, 52(2), 155-194.

Poortinga, W., Spence, A., Whitmarsh, L., Capstick, S., & Pidgeon, N. F. (2011). Uncertain

    climate: An investigation into public scepticism about anthropogenic climate change.

    Global Environmental Change, 21(3), 1015-1024.

Skurka, C., Niederdeppe, J., & Nabi, R. (2019). Kimmel on Climate: Disentangling the

 Emotional Ingredients of a Satirical Monologue. *Science Communication, 41*(4), 394-

 421. doi:10.1177/1075547019853837

Skurka, C., Niederdeppe, J., Romero-Canyas, R., & Acup, D. (2018). Pathways of Influence

 in Emotional Appeals: Benefits and Tradeoffs of Using Fear or Humor to Promote

 Climate Change-Related Intentions and Risk Perceptions. *Journal of Communication,

 68*(1), 169-193. doi:10.1093/joc/jqx008

Taber, C. S., & Lodge, M. (2006). Motivated Skepticism in the Evaluation of Political

 Beliefs. *American Journal of Political Science, 50*(3), 755-769. doi:10.1111/j.1540-

 5907.2006.00214.x

Whitmarsh, L., & Corner, A. (2017). Tools for a new climate conversation: A mixed-methods

 study of language for public engagement across the political spectrum. *Global

 Environmental Change, 42*, 122-135.

 doi:https://doi.org/10.1016/j.gloenvcha.2016.12.008

Wolsko, C., Ariceaga, H., & Seiden, J. (2016). Red, white, and blue enough to be green:

 Effects of moral framing on climate change attitudes and conservation behaviors.

 Journal of Experimental Social Psychology, 65, 7-19.

 doi:https://doi.org/10.1016/j.jesp.2016.02.005

Young, D. G., Bagozzi, B. E., Goldring, A., Poulsen, S., & Drouin, E. (2019). Psychology,

 political ideology, and humor appreciation: Why is satire so liberal? *Psychology of

 Popular Media Culture, 8*(2), 134-147. doi:10.1037/ppm0000157

10.1037/ppm0000157.supp (Supplemental)

Tables

Table 1. Demographic characteristics of the sample

N	159
Age (Mean (*SD*))	51.07 (16.35)
Political Orientation (Mean (*SD*))	6.48 (2.81)
Gender (%)	
Female	94 (59.1)
Male	64 (40.3)
Prefer not to answer	1 (0.6)
Party Affiliation (%)	
Democrat	51 (32.1)
Independent	59 (37.1)
Republican	48 (30.2)
Other	1 (0.6)

Table 2. Bivariate correlations of key variables

	1	2	3	Range	M	SD
1. Political Orientation				1-11	6.48	2.81
2. MS	-.34			1-7	5.45	1.06
3. AS	-.19	.75		1-7	5.44	1.12
4. CAI	-.42	.65	.59	1-7	4.50	1.46

Note. MS = Climate Change Mitigation Support, AS = Climate Change Adaptation Support, CAI = Climate Action Intentions.
All correlations are significant at *p*<.05

Table 3. Demographic characteristics of sample by experimental group

	Climate Change Consensus	Control
N	78	81
Age (Mean (*SD*))	51.65 (16.12)	50.51 (16.66)
Political Orientation (Mean (*SD*))	6.74 (2.81)	6.23 (2.81)
Gender (%)		
Female	38 (48.7)	56 (69.1)
Male	40 (51.3)	24 (29.6)
Prefer not to answer	0 (0.0)	1 (1.2)
Party Affiliation (%)		
Democrat	20 (25.6)	31 (38.3)

Independent	30 (38.5)	29 (35.8)
Republican	27 (34.6)	21 (25.9)
Other	1 (1.3)	0 (0.0)

Table 4. Means and standard deviations (in parentheses) for key variables by condition, and independent samples t-tests for key variables across condition

	Climate Change Consensus	Control	t-test results
N	78	81	
Orientation	6.74 (2.81)	6.23 (2.81)	$t(156.75) = 1.142, p = .255$
Mitigation Support	5.45 (1.06)	5.46 (1.07)	$t(149.79) = -.057, p = .954$
Adaptation Support	5.41 (1.09)	5.47 (1.16)	$t(150.65) = -.335, p = .738$
Climate Action Intentions	4.52 (1.50)	4.48 (1.43)	$t(142.40) = .185, p = .854$

Table 5. Moderated Multiple Regression Results for Climate Change Mitigation Support, Climate Change Adaptation Support, and Climate Action Intentions

Dependent Variable	Predictor Variables	B	S.E.	β	t	p
Climate Change Mitigation Support ($R^2 = .11$, $F(3,148) = 6.92$, $p < .001$)						
	Political Orientation	-.17	.04	-.44	-3.96	<.001
	Condition	-.05	.16	-.02	-.28	.781
	Orientation x Condition	.08	.06	.14	1.30	.195
Climate Change Adaptation Support ($R^2 = .05$, $F(3, 150) = 3.49$, $p = .017$)						
	Political Orientation	-.14	.04	-.36	-3.21	.001
	Condition	.02	.18	.01	.13	.896
	Orientation x Condition	.13	.06	.25	2.21	.029
Climate Action Intentions ($R^2 = .19$, $F(3, 142) = 12.48$, $p < .001$)						
	Political Orientation	-.31	.06	-.60	-5.61	<.001
	Condition	-.13	.22	-.05	-.61	.540
	Orientation x Condition	.17	.08	.24	2.27	.025