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Dietzel, A. and Maynard, D. (Submitted: 2015) *Climate Change: A Chance for Political Re-Engagement?* In: 65th PSA Annual International Conference, 30 March - 1 April 2015, Sheffield, UK. (Unpublished)

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Climate Change: A Chance for Political Re-Engagement?

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PSA Annual Conference 2015*

Introduction

Climate change is one of the most pressing problems facing humanity today. As scientific evidence continues to accumulate, it is becoming increasingly apparent that climate change constitutes a dangerous threat to present and future generations and requires an urgent global response. The growing acceptance of this reality has arguably resulted in a shift in global consciousness. Individuals around the world commonly display concern about climate change along with a desire to help avoid climate catastrophe. Individuals seem to be more and more aware of the global consequences of their actions, and feel increasingly responsible for these actions as a result. Interestingly, recent studies indicate that this not only results in changes in individual consumption behavior, but also results in individuals engaging with politics in order to instigate the change they believe is necessary in the face of climate change. In a world where political disengagement is pervasive, this presents an interesting phenomenon.

In this paper, we aim to explore why climate change is seemingly resulting in engaged citizens when so many other issues seem to leave the public cold and apathetic. Beginning with an overview of public engagement with politics, we will comment on the current trend of political disengagement. Following this, we will argue that climate change may be distinct from other political problems in that it encourages, rather than discourages, political engagement. We will put forward that climate change is a truly global problem which can be affected by every individual on the planet. This arguably creates a sense of global community which is absent in many other current political issues including security and austerity, where individuals do not share the same sense of responsibility for their individual actions. We will argue that the ability to affect the problem, along with the sense of global community created by climate change, offers an important opportunity for reengagement with politics in a world of political apathy.

In order to provide evidence for this assumption, we will discuss results from social media analysis we recently conducted. Our analysis focuses on the interaction of UK members of parliament (MPs), election candidates and members of the public on Twitter. This analysis reveals that climate change and related topics have a high level of engagement by the public, as shown by the number of retweets and replies, and by the incidence of sentiment and optimism, as well as by the proportion of URLs found in tweets concerning climate change compared with other topics. In the conclusion of

the paper, we will provide an overview of what has been argued, and make the case that public engagement with climate change should be encouraged.

An Overview of Public Engagement

This paper concerns public engagement with climate change, and why it differs from public engagement with other contemporary issues. In order to properly discuss this matter, public engagement with politics must first be defined. This is not a straightforward task, because the concept of engagement can encompass a myriad of activities and actions. For example, Gerry Stoker defines political engagement as ‘political acts broadly,’ and includes activities such as contacting a politician, working in a political party, signing petitions, taking part in lawful or illegal public demonstrations, boycotting products, buying products for ethical or environmental reasons, donating money to political organizations, or being a member of a political party under the umbrella of political engagement.¹ These broad examples of political engagement are indicative of the increasingly popular perception that political engagement does not simply encompass traditional acts such as voting or joining a political party. A broad conception of political engagement is becoming more common amongst scholars because the nature of how people engage with politics is evolving over time.² Advances in technology and the increased availability of information have expanded the manner in which individuals engage with politics.

In a recent paper, Jan van Deth attempts to develop a framework which is able to capture the changing nature of political engagement. He sees this as a particularly important task because the notion of an engaged citizen is dependent upon on how the concept of engagement is defined. Van Deth explains that those who hold a restrictive and conventional definition of political participation argue that political engagement has declined, and those with a broader conception argue that there has been a change in the mode of political participation.³ For this reason, he advocates for a broad conception of political engagement, which is able to capture newer, ‘creative,’ ‘personalized,’ ‘individualized,’ or ‘conscious’ modes of participation such as street parties, volunteering, guerrilla gardening, boycotting, and even suicide protest.⁴ To build his framework, he develops a ‘set of decision rules to answer the question whether we depict a specific phenomenon as political participation.’⁵ He defines four main rules: that the activity must not be passive, that the activity should be voluntary, that the activity is conducted by citizens, and that the activity is located in the

¹Stoker, G. *Why Politics Matters* (Basingstoke: Palgrave MacMillan, 2006), p. 90

²Dalton, R. J. *Citizen Politics: Public Opinion and Political Parties in Advanced Industrial Democracies* (Washington DC: CQ Press, 2014), p. 10

³Van Deth, J. W., ‘A Conceptual Map of Political Participation’ in *Acta Politica*, 49 (2014), p. 350

⁴*Ibid.*, p. 351

⁵*Ibid.*, p. 353

sphere of government/state/politics.⁶ According to van Deth, these four rules constitute a minimalist definition of political engagement, but van Deth aims to go beyond a minimal conception in order to capture the evolving nature of political engagement.

Van Deth therefore defines three additional rules to capture a broader spectrum of activity. His fifth rule is that the activity should be targeted at the sphere of government/state/politics, even if it does not take place in this sphere.⁷ If the engagement activity is not aimed at this sphere, but aimed at solving collective or community problems then it is still engagement according to his sixth rule.⁸ Finally, Van Deth's seventh rule explains that if the activity is not aimed at the sphere of government/state/politics or aiming to solve community problems, it is still political engagement if it is used to express political aims and intentions of participants of the activity.⁹ These three additional rules capture a wider array of activity, especially outside the political sphere. By defining seven rules, van Deth attempts to provide a conceptual map of political engagement which encompasses traditional and new modes of engagement.¹⁰ From the above, it seems that political engagement is a complex concept which cannot be adequately defined in the space of this paper.

For this reason, we will simply state that political engagement can encompass a range of activities which have a political aim, broadly defined. Under this conception, political engagement can include using social media. Engagement through social networking sites has become an increasingly important facet of political and civic life, and research has shown that social media users are more civically and politically active than non-users.¹¹ It seems social media is often used to express political ideas, or for a political aim. Furthermore, those who use social media to participate in civic and political life are more socio-economically diverse than those who use traditional methods of participation such as signing petitions or taking part in demonstrations.¹² This suggests that social media presents an important platform for political engagement for individuals who do not typically engage. Importantly, according to Van Deth's rules, interacting with politicians via social media (whether following, retweeting or directly corresponding with them) could be considered political engagement because it is targeted at the sphere of government/state/politics (rule five) and is used to express political aims and intentions of participants of the activity (rule seven). For these reasons,

⁶ Van Deth, J. W., 'A Conceptual Map of Political Participation' in *Acta Politica*, 49 (2014), p. 356

⁷ *Ibid.*, p. 357

⁸ *Ibid.*

⁹ *Ibid.*, p. 359

¹⁰ *Ibid.*, p. 363

¹¹ Hampton, K., et. al. 'Social Networking Sites and Our Lives' <http://www.pewinternet.org/2011/06/16/social-networking-sites-and-our-lives/> [accessed 27.02.2015]

¹² Smith, A., et. al., 'The Internet and Civic Engagement' <http://www.pewinternet.org/2009/09/01/the-internet-and-civic-engagement/> [accessed 27.02.2015]

interaction with politicians on twitter will be used as an example of political engagement with climate change in this paper. Now that an overview of political engagement has been provided, we will comment on the current trend of political disengagement below.

The Current Trend – Political Disengagement

Although the manner in which citizens engage politically is evolving over time, as explained above, this is within a broader context of political disengagement. Political disengagement is especially pervasive in Western democracies, which have seen a drop in political engagement over the past decades. Gerry Stoker explains this phenomenon of disengagement may be linked to a global disenchantment with governmental processes, parties and the whole political system.¹³ It seems that dissatisfaction with politics has resulted in a decline in political engagement. Political parties have lost loyal voters and grassroots members, while electoral turnout has fallen and public disaffection has spread.¹⁴ People appear to be more disengaged with politics than ever before, and political processes are seen as wasteful and inefficient.¹⁵

Disaffection and disengagement with politics is problematic because an active citizenship is considered one of the key features of democratic governance.¹⁶ Public engagement provides a crucial feedback loop, which is important because democratic decision making requires knowledge of the interest of the people.¹⁷ In addition, public engagement arguably serves to cement the relationship between citizens and their commitment to the democratic political process.¹⁸ According to Stoker, political engagement will do much more to sustain a civic arena than a formal school-based civic education.¹⁹ In other words, engagement is a vital part of politics. Although some may think that politics should be 'left up to the professionals,' this is often perceived as a narrow view which rests in fear and distrust of the public and creates a very limited version of democracy.²⁰ For this reason, it is more commonly assumed that political engagement is important, and that an engaged citizenship is worth cultivating and supporting. Although we agree with this sentiment, in the case of climate change, political engagement is important for another reason, namely to ensure that climate change is adequately addressed. As will be explained below, individuals can affect climate change, and it is therefore very important that they are engaged with the issue. In addition,

¹³ Stoker, G. *Why Politics Matters* (Basingstoke: Palgrave MacMillan, 2006), p. 33

¹⁴ Norris, P. *Democratic Deficit: Critical Citizens Revisited* (Cambridge: Cambridge University Press, 2013), p. 1

¹⁵ Stoker, G. *Why Politics Matters* (Basingstoke: Palgrave MacMillan, 2006), p. 33

¹⁶ Norris, P. *Democratic Deficit: Critical Citizens Revisited* (Cambridge: Cambridge University Press, 2013), p. 219

¹⁷ Stoker, G. *Why Politics Matters* (Basingstoke: Palgrave MacMillan, 2006), p. 151

¹⁸ *Ibid.*, p. 150

¹⁹ *Ibid.*, p. 200

²⁰ *Ibid.*, p. 151

political engagement with climate change seemingly motivates politicians to act, as will be explained in the conclusion of the paper. Public engagement with climate change is therefore important not only for an active citizenship, but also for ensuring that individuals and governments are motivated to act.

Climate Change: A Chance for Political Re-Engagement?

In the face of the current trend of political disengagement, we now turn to the topic of climate change, which arguably represents a chance for re-engagement with politics. We aim to illustrate that climate change is distinct from other political problems in that it is likely to encourage, rather than discourage, political engagement. As will be explained below, climate change is a truly global problem which can affect and be affected by every individual on the planet, which creates a sense of global community. Recent studies indicate that these features of the climate change problem not only result in individuals changing their consumption behavior, but also result in individuals engaging with politics in order to instigate the change they believe is necessary in the face of climate change. In the section which follows, we will present evidence from social media analysis which seems to indicate that there is a high level of political engagement with climate change compared with a number of other political issues. First, we will make the case that climate change is a truly global problem which can be affected by every individual on the planet, and that this creates a sense of global community below.

Climate Change Affects Every Individual

The Intergovernmental Panel on Climate Change (IPCC), the body of scientists charged with informing the world about climate science, claim that climate change will affect, either directly or indirectly, almost every sector of society.²¹ More specifically, climate change will affect all humans, no matter their nationality, gender, level of wealth, or place of birth. Climate change will have several key consequences, including heavy precipitation, floods, droughts and heat waves.²² These weather patterns will have knock on effects. For example, agriculture and livestock will be negatively affected by floods and droughts, meaning that there will be less food available globally. In addition, rising sea levels, floods, and wildfires will threaten homes, displacing hundreds of thousands of people. Climate change will also affect the availability of water, because flooding and increased precipitation are predicted to contaminate water sources. At the same time, there will be increased

²¹ Intergovernmental Panel on Climate Change, *IPCC First Assessment Report*, https://www.ipcc.ch/ipccreports/1992%20IPCC%20Supplement/IPCC_1990_and_1992_Assessments/English/ipcc_90_92_assessments_far_overview.pdf [accessed 12.02.2013], p. 60

²² Intergovernmental Panel on Climate Change, *IPCC Fourth Assessment Report: Summary for Policy Makers, 2007* https://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf [accessed 12.02.2013], p. 53

demand for water as temperatures rise. Finally, diseases are predicted to flourish and spread under the extreme weather conditions caused by climate change. The health status of millions of people is projected to be affected through, for example, increases in malnutrition, increased burden of diarrheal diseases, increased frequency of cardio-respiratory diseases, and the increase and spread of some infectious diseases, including malaria.²³

Although climate change effects will not be evenly distributed across the globe, because climate change will hit less developed countries hardest due to their geographical location, individuals will be affected by climate change regardless of the country they live in.²⁴ Climate change will cause economic and political problems, as food and water scarcity increase, conflict over resources becomes more likely, and climate refugees and migrants seek assistance. In this way, climate change will affect individuals across the globe, either directly through predicted weather patterns, or indirectly through knock-on effects on the economy or global politics. This makes climate change different from other political problems, which may only be relevant for certain sectors of society, such as taxation, unemployment, tuition fees, or immigration.

Every Individuals Can Affect Climate Change

In addition to being affected by climate change, every individual on the planet has the potential to affect climate change. The IPCC is, as of 2014, virtually certain that humans are the primary cause of climate change. The 2014 report states that it is *extremely likely* (95% chance) that human influence has been the dominant cause of the observed warming since the mid-20th century.²⁵ The significance of this high level of certainty is considerable as it reflects the views of over 9,000 scientific peer reviewed papers. Therefore, it can be assumed with reasonable certainty that humans are the main cause for climate change. Humans cause climate change by increasing the atmospheric concentration of carbon dioxide, methane, chlorofluorocarbons and nitrous oxide, referred to under the umbrella term of greenhouse gases (GHGs).²⁶ The human induced atmospheric increase of these gases enhances the greenhouse gas effect, resulting in an additional warming of the earth's

²³ Intergovernmental Panel on Climate Change, *IPCC Fourth Assessment Report: Summary for Policy Makers, 2007* https://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf [accessed 12.02.2013], p. 13

²⁴ Harris, P., *World Ethics and Climate Change: From International to Global Justice* (Edinburgh: Edinburgh University Press, 2010), p. 25

²⁵ Intergovernmental Panel on Climate Change, *IPCC Fifth Assessment Report Working Group I: Summary for Policy Makers, 2014* http://www.climatechange2013.org/images/report/WG1AR5_SPM_FINAL.pdf [accessed 30.09.2013], p. 5

²⁶ Intergovernmental Panel on Climate Change, *IPCC First Assessment Report*, https://www.ipcc.ch/ipccreports/1992%20IPCC%20Supplement/IPCC_1990_and_1992_Assessments/English/ipcc_90_92_assessments_far_overview.pdf [accessed 12.02.2013], p. 37

surface.²⁷ As the concentration of GHGs increases, their greenhouse effect increases. Eventually, the atmospheric concentrations of GHGs lead to irreversible changes in the climate.²⁸ Put more simply, over time, increased GHGs emitted by humans cause climate change.

GHGs are emitted through human activities, including individual activities. Individual behavior, from eating meat, to travelling, to heating/cooling homes, to buying global products, results in GHG emissions. At the same time, reducing the consumption of meat, travelling by bike or on foot, keeping homes at a slightly lower temperature in winter and higher temperature in the summer, or buying locally all reduce individual GHG emissions levels. In this way, individuals, and in particular rich individuals who consume meat, travel, and buy global products, have a significant effect on climate change. As Paul Harris puts it, 'affluence is the primary and disproportionate cause of global environmental degradation.'²⁹ In this way, climate change is distinct from other political problems which individuals have no direct effect on. For example, individuals cannot have a direct effect on the privatization of the NHS, the state of the global economy, or the levels of poverty within their nation. Climate change is different, because an individual can have a direct effect on GHG levels in the atmosphere through their actions.

Climate Change Creates a Global Community

Climate change is a truly global problem: it affects individuals and is caused by individuals across the globe, because GHG emissions cannot be confined within states. These empirical conditions arguably create a sense of global community among individuals. Steven Vanderheiden explains that individuals across the world are interdependent because they all depend on a global scheme of cooperation for their continued access to the vital conditions provided by climatic stability.³⁰ While such interdependence does not arise among individuals in other ways, for example through a common global economy, climate change is different.³¹ Climate change places 'everyone, everywhere' in a situation of mutual dependency.³² This mutual dependency arguably creates a sense of global community, because individuals from one part of the world can directly affect individuals in another part of the world. Individuals are mutually dependent on one another, and

²⁷ Intergovernmental Panel on Climate Change, *IPCC First Assessment Report*, https://www.ipcc.ch/ipccreports/1992%20IPCC%20Supplement/IPCC_1990_and_1992_Assessments/English/ipcc_90_92_assessments_far_overview.pdf [accessed 12.02.2013], p. 37

²⁸ *Ibid.*, p. 53

²⁹ Harris, P., *World Ethics and Climate Change: From International to Global Justice* (Edinburgh: Edinburgh University Press, 2010), p. 130

³⁰ Vanderheiden, S., *Atmospheric Justice – a Political Theory of Climate Change* (Oxford: Oxford University Press, 2008), p. 105

³¹ *Ibid.*

³² Harris, P., *World Ethics and Climate Change: From International to Global Justice* (Edinburgh: Edinburgh University Press, 2010), p. 153

furthermore on a global solution to the climate change problem. Now that it has been explained that individuals affect and can be affected by climate change, and that this creates a sense of global community, we turn to explaining what this implies for potential political engagement with climate change.

Climate Change and Political Engagement

The three points discussed above arguably play a role in encouraging political engagement. First, individuals have a stake in the issue, because they will be affected by climate change, directly or indirectly. This may motivate individuals to act, in order to protect themselves and those around them. Second, individuals can be part of the solution to climate change through their everyday actions. This ability may motivate individuals, who have little control over other political problems such as economic decline or poverty. Third, individuals may be aware that they depend on other individuals, and that there are individuals depending on them to act on climate change. This may motivate individuals to act in order to encourage global action, and in order to protect other individuals along with themselves. In other words, individuals may feel a sense of responsibility to others, which is not found in other political problems, for example security or austerity, where individuals do not depend on one another's cooperation to the same extent. Considering these three factors which may motivate individuals, it seems that climate change is likely to encourage, rather than discourage, political engagement.

Interestingly, recent studies indicate that a majority of individuals (75%) in the United States and the United Kingdom care about climate change and are fearful of its effects.³³ In addition, studies indicate that many individuals are motivated to take pro-environmental action at a personal and household level and that there is a strong desire to make individual contributions to combating climate change.³⁴ This is in line with what has been argued³⁵ above, namely that individuals are likely to be motivated to engage with the climate change problem. However, although individuals are motivated to change their behavior, recent studies have also found that individuals feel that their actions are not enough, because governments can have more of an effect on the climate change problem.³⁵ This sentiment is arguably important in terms of political engagement, because dissatisfaction with government action can potentially lead to political engagement. Pippa Norris argues that 'symptoms of disaffection' among individuals may spark progressive reform movements

³³ Kent, J., 'Individualized Responsibility and Climate Change: If Climate Protection Becomes Everyone's Responsibility, Does It End Up Being No-One's?' in *Cosmopolitan Civil Societies Journal*, 1 (2009) p. 142

³⁴ *Ibid.*, p. 135

³⁵ *Ibid.*, p. 143

and catalyze citizen activism.³⁶ If individuals are motivated to act on climate change, but find that their own individual actions are not reflected within their government's policies, then these individuals may be motivated to instigate the change they believe is necessary in the face of climate change. A recent example of four hundred Australian citizens burying their heads in the sand in public protest ahead of the G20 summit, at which Tony Abbott refused to put climate change on the agenda, is indicative of citizen engagement in the face of government inaction.³⁷ Of course, there are also more traditional types of engagement occurring alongside these protest actors. In the UK, for example, there has recently been a surge in Green Party membership.³⁸ This may be indicative of public engagement with climate change, because the Green Party emphasizes action on climate change. In order to further explore whether climate change encourages rather than discourages political engagement, we now turn to evidence from social media analysis we have recently conducted.

Evidence from Social Media Analysis

As was explained above, the manner in which individuals engage politically is constantly evolving. One relatively new way of engaging with politics is through social media. In this final section of the paper, we will outline our methods and explore the results of our analysis of public engagement with UK members of parliament (MPs) and election candidates on Twitter, to illustrate how engagement with climate change differs from engagement with other political issues. As will be discussed below, the results from our analysis indicate that climate change shows a high level of political engagement when compared with other political topics.

Methods

We performed an analysis of recent tweets in the run-up to the UK elections, comparing tweets from MPs and election candidates relating to climate change with those related to other political topics such as immigration, economy, Europe etc., and investigating public (individual) engagement with these tweets. The data collection and linguistic analysis were both performed in the context of the Political Futures Tracker project funded by Nesta.³⁹ We first created a collection of approximately 1.8 million tweets, downloading the tweets in real-time using Twitter's streaming API. We obtained a list

³⁶ Norris, P. *Democratic Deficit: Critical Citizens Revisited* (Cambridge: Cambridge University Press, 2013), p. 3

³⁷ Wihntall, A., 'G20: Australians Bury Their Heads in the Sand'

<http://www.independent.co.uk/news/world/australasia/g20-latest-australians-literally-bury-their-heads-in-the-sand-over-tony-abbotts-refusal-to-put-climate-change-on-the-agenda-9859269.html> [accessed 19.02.14]

³⁸ Harrabin, R., 'Party leaders Make Joint Climate Commitment' <http://www.bbc.co.uk/news/science-environment-31456161> [accessed 24.02.2015]

³⁹ <http://www.nesta.org.uk/blog/introducing-political-futures-tracker>

of all current MPs⁴⁰ and all currently known election candidates⁴¹ who have Twitter accounts (506 MPs and 1811 candidates, of which 444 MPs are also candidates) and collected every tweet by any of these users, and every retweet and reply (by anyone) between 24 October 2014 and 13 February 2015 (1.8 million tweets, of which approximately 100k are original tweets, 700k are replies, and 1 million are retweets). Candidate-authored tweets were only collected from 13 January onwards, as sufficient information about candidates was unknown prior to this date.

The tweets were analyzed using a set of Natural Language Processing (NLP) tools developed in the GATE framework⁴² and customized for the Nesta project. The analyzed data was then indexed using GATE Mimir⁴³ enabling us to perform complex queries over the data. For example, it enables us to perform reasoning-based queries about things which are not directly mentioned in the text (such as which party an MP represents, or which topic a word is linked to), based on the prior analysis and linking of information to external knowledge bases such as Wikipedia. The analysis included both our standard linguistic pre-processing for tweets (using the TwitIE tool)⁴⁴ and the following customized analysis:

- Named Entity Recognition (identifying Persons, Places, Organizations etc.) and Linking (mapping these to their respective URIs in Wikipedia or other web-based knowledge sources)
- Topic Detection (detecting mentions in the text of major topics and subtopics, e.g. environment, immigration etc. in various lexical forms, e.g. “fossil fuels” are an indicator of an “environment” topic)
- MP and Candidate recognition (detecting mentions of MPs and election candidates in the tweet - by name or twitter handle - and linking them to their respective URI)
- Author recognition (detecting who the author of the tweet is, and linking them to the relevant URI in DBpedia).
- Sentiment Analysis (detecting whether the tweets convey sentiment and if so, whether positive or negative, the strength of this sentiment, and whether the statement is sarcastic or not; detecting also who is holding the opinion and what topic the opinion is about, e.g. David Cameron (holder) is being positive (sentiment) about the environment (opinion topic)).

⁴⁰ From a list made publicly available by BBC News Labs, which we cleaned and verified, and have now made available at <https://gist.github.com/greenwoodma/>

⁴¹ List of candidates taken from <https://yournextmp.com>

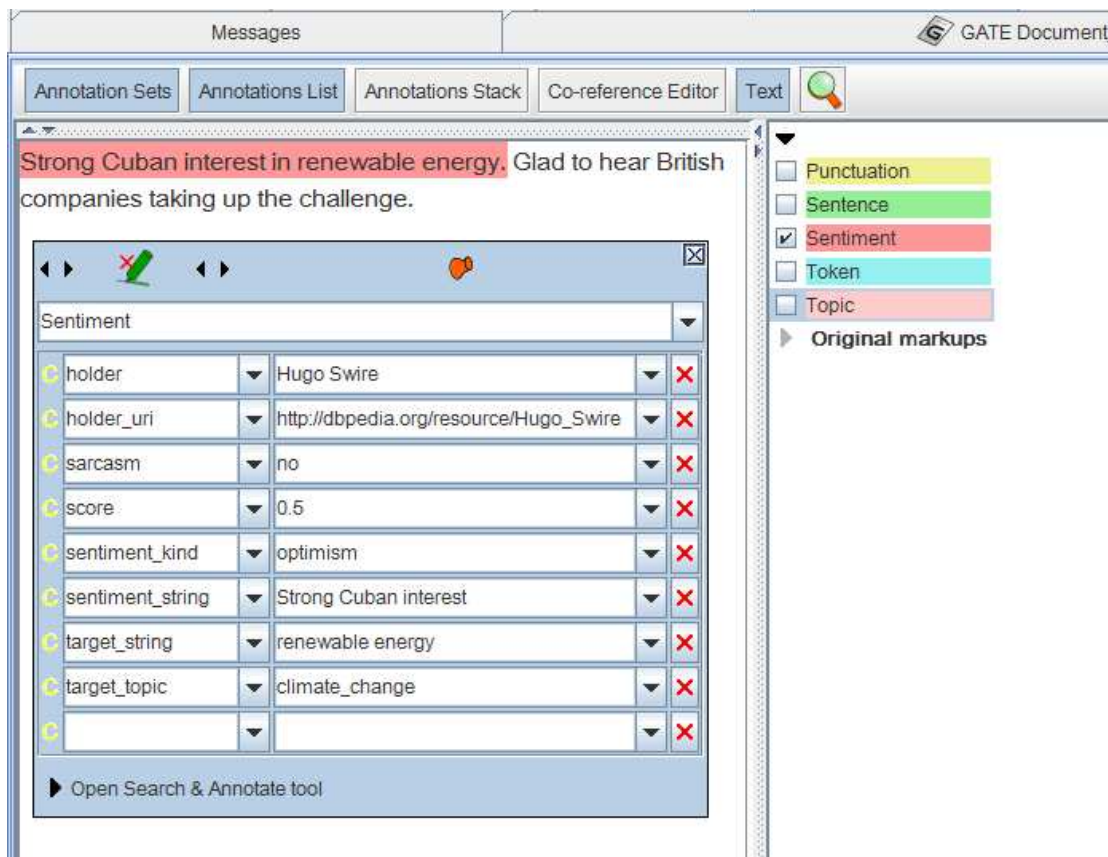
⁴² Cunningham, H., Maynard, D., Bontcheva, K., and Tablan, V., ‘GATE: A Framework and Graphical Development Environment for Robust NLP Tools and Applications’ *Proceedings of the 40th Anniversary Meeting of the Association for Computational Linguistics* (2002)

⁴³ Tablan, V., Bontcheva, K., Roberts, I., and Cunningham, H., ‘Mimir: An Open-Source Semantic Search Framework for Interactive Information Seeking And Discovery’ in *Journal of Web Semantics: Science, Services and Agents on the World Wide Web*, 30 (2015)

⁴⁴ Bontcheva, K., Derczynski, L., Funk, A., Greenwood M.A., Maynard, D., and Aswani N., ‘TwitIE: An Open-Source Information Extraction Pipeline for Microblog Text’ *Proceedings of the International Conference on Recent Advances in Natural Language Processing* (2013), pp. 83 – 90

Figure 1, below, shows an example of a tweet automatically annotated by our system. The highlighted sentence has been found to be opinionated, showing positive (optimistic) sentiment expressed by the MP Hugo Swire about climate change (represented in the text by the term “renewable energy”). We also see other information represented (the sentiment was not sarcastic, and we have a link to the URI of Hugo Swire, so we can find more information about him later in our query, e.g. that he is a member of the Conservative Party and a Minister of State for the Foreign and Commonwealth Office).

Figure 1: An Opinionated Tweet Annotated in GATE



We divided our corpus automatically into the following topics based on the previous analysis step, in order to form the comparison:

- climate change / environment
- national security and immigration
- employment
- tax and economy
- housing
- Europe
- crime and policing
- UK economy
- public health
- media and communications
- business and enterprise
- transport
- community and society
- schools

Measuring Engagement

We measured engagement with the above topics in four ways. First, we looked at retweets. On Twitter there are two main ways in which engagement with tweets is typically measured: retweets and favorites.⁴⁵ The problem with the favorite button, according to Florian Meier et al., is that it is used for a variety of different purposes, not just as a means of showing support.⁴⁶ In their study, only 65% of study participants knew it existed, and of these only 73.5% ever used it. Retweeting is generally a better way to measure engagement, for a number of reasons. According to Danah Boyd et al., as with favoriting, people retweet for a number of reasons, including both self-gain and philanthropy.⁴⁷ By its nature, retweeting constitutes a stronger form of engagement in that it disseminates a tweet to a wider audience and thus propagates a message faster and more globally. Favoriting, on the other hand, is a more private form of approval, since it is a form of interpersonal rather than mass non-verbal communication. Also, on a practical level, if one is collecting tweets via the Twitter streaming API, then one cannot collect favorites as this information is unknown at the time of tweeting. Retweets, on the other hand, can be collected as they count as individual tweets, whereas favorite information is only registered as a count on the original tweet and does not constitute a new tweet. Retweeting is also considered a social action - people typically think explicitly about their followers when tweeting and retweeting. Even though users more than one step away will be unknown to them, they usually have some idea in mind of what kind of people will be in these networks and what their interests will be. Retweeting can thus be seen as a kind of crowdsourcing mechanism. However, this works best when the author is highly influential, for example, a politician, pop star, or other famous person.

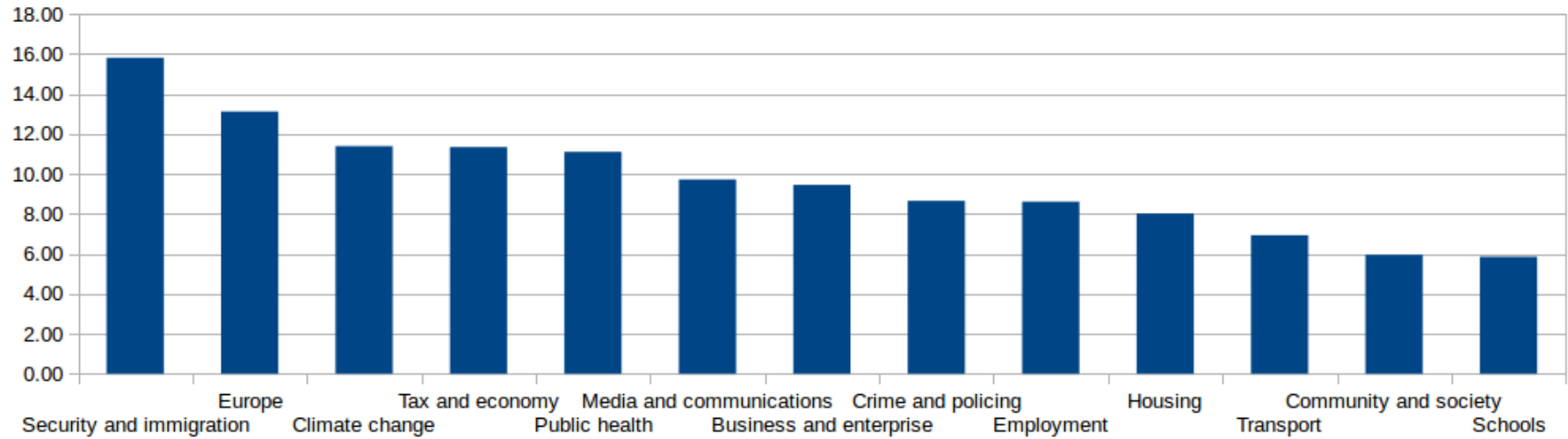
We found a high number of climate change related retweets, which indicates a high level of engagement according to the criteria discussed above. 64.48% of the climate change tweets in our dataset were retweets, and 94.3% of them were either retweets or replies. On the other hand, the percentage was much higher than for many other topics such as schools (57% retweets, and 90% retweets and replies). Figure 2 on the next page shows the average number of retweets per original tweet for all topics, with climate change having the third highest score, after security and immigration, and Europe.

⁴⁵ Meili, C., Hess, R., Fernandez, M., and Burel, G. 'DecarboNet deliverable' *Earth Hour Report D6.2.1* (2014)

⁴⁶ Meier, F., Elsweiler, D., and Wilson, M. L. 'More Than Liking and Bookmarking? Towards Understanding Twitter Favoriting Behaviour' In *Proceedings of the International AAAI Conference on Weblogs and Social Media* (2014)

⁴⁷ Boyd, D., Golder, S., and Lotan, G., 'Tweet, Rweet, Retweet: Conversational Aspects of Retweeting on Twitter' in *System Sciences HICSS-43 International Conference on IEEE* (2010)

Figure 2: Average Number of Retweets per Original Tweet, For Each Topic



Second, we looked at sentiment, because it has been shown that sentiment is a good indicator of engagement.⁴⁸ Figure 3 on the next page illustrates the percentage of opinionated tweets for each topic. Here we see that climate change is the second highest, after only Europe. We also investigated what percentage of retweets were opinionated (3rd highest), what percentage of opinionated tweets were retweeted (5th highest), what percentage of opinionated tweets were retweets or replies (3rd highest), what percentage of optimistic tweets were retweeted (4th highest, with 'Employment' being top) and what percentage of opinionated retweets were optimistic as opposed to pessimistic (2nd highest after 'Schools'). This high level of sentiment filled tweets and retweets about climate change in comparison to other political issues is an indication of a high level of engagement.

Third, we looked at how many tweets contained a mention of another user, since this has also proven to be a good indicator of engagement.⁴⁹ Again, climate change scored 3rd highest (after 'business and enterprise' and 'schools'). Fourth and finally, we investigated the number of URLs found in climate change tweets. In Danah Boyd's study of random tweets, 52% of retweets contained a URL.⁵⁰ This is important because it tells us something about the nature of tweets that engage people (i.e. original tweets containing a URL are more likely to be retweeted). In our corpus, tweets about climate change had the highest percentage of URLs (62%) with the next highest being the topic of schools (56%). Interestingly, 51.4% of climate change retweets contained a URL, while only 45% of retweets about schools contained a URL.

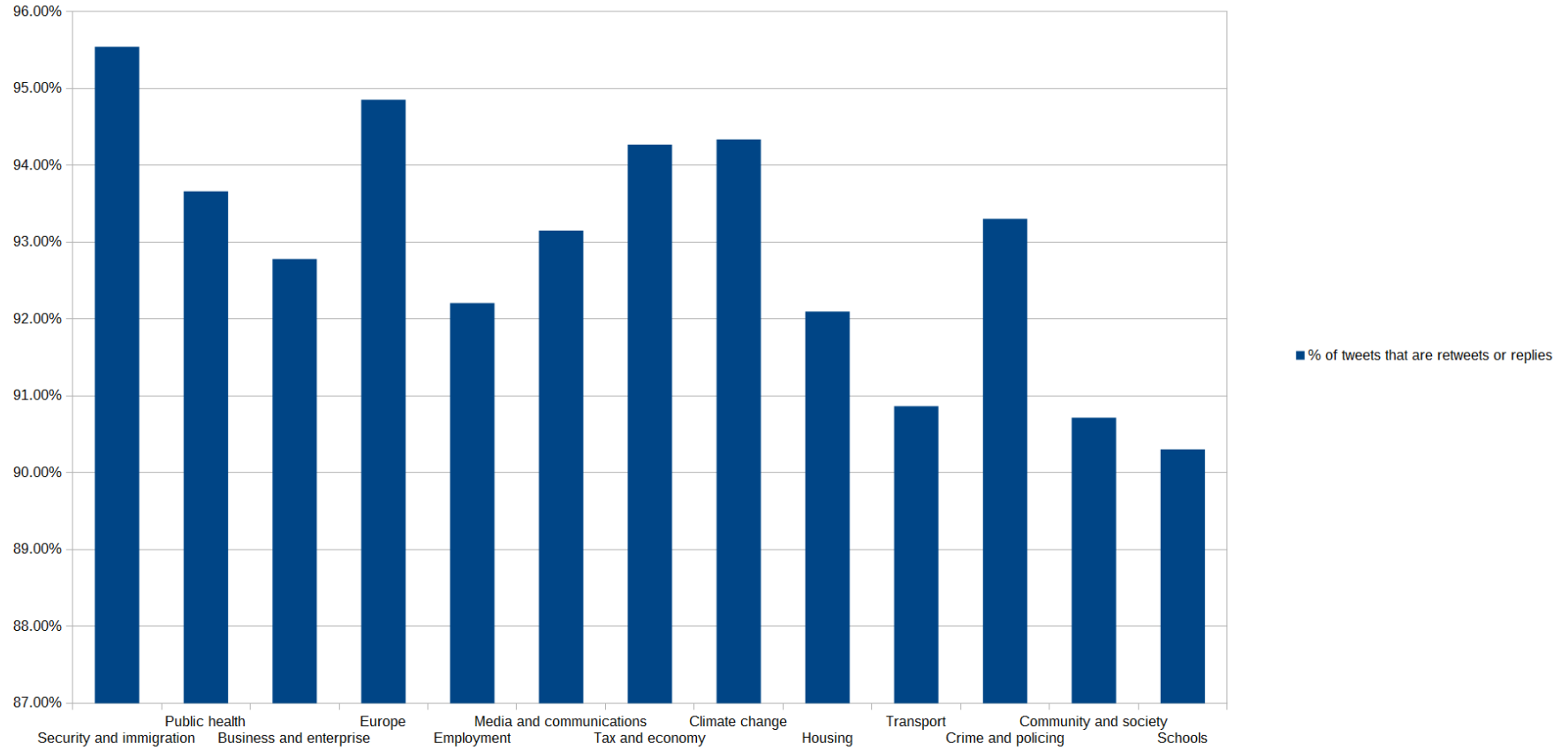
In sum, our analysis revealed that climate change and related topics, while not mentioned frequently by politicians other than by the Green Party and UKIP candidates, have a high level of engagement by the public, as shown by the number of retweets and replies, by the incidence of sentiment and optimism, and by tweets containing the mention of another user. Although climate change still has a slightly lower engagement rate than topics such as Europe and the economy, engagement with climate change still ranks very highly, mostly residing in the top three of most engaged topics. Interestingly, climate change tweets contain the highest proportion of URLs compared with other topics. This arguably reveals something about the nature of the engagement: if individuals retweet or reply to such posts, it can be assumed that most of these individuals will further engage by following the link and reading material around the subject of climate change. This further indicates that climate change has some of the highest public engagement levels out of the topics in the study.

⁴⁸ Rowe, M., and Alani, H., 'Mining and Comparing Engagement Dynamics Across Multiple Social Media Platforms' in *Proceedings of the 2014 ACM Conference on Web Science*, (2014)

⁴⁹ Meili, C., Hess, R., Fernandez, M., and Burel, G. 'DecarboNet deliverable' *Earth Hour Report D6.2.1* (2014)

⁵⁰ Boyd, D., Golder, S., and Lotan, G., 'Tweet, Rweet, Retweet: Conversational Aspects of Retweeting on Twitter' in *System Sciences HICSS-43 International Conference on IEEE* (2010)

Figure 3: Percentage of Opinionated Tweets for Each Topic



Conclusion

This paper has explored why climate change is arguably resulting in engaged citizens when so many other issues seem to leave the public cold and apathetic. We outlined the concept of political engagement and commented on the current trend of political disengagement. Following this, we argued that climate change may be unique to other political problems in that it encourages, rather than discourages political engagement. We put forward that climate change is a truly global problem which can be affected by every individual on the planet, which arguably creates a sense of global community which is absent in other current political issues where individuals do not share the same sense of responsibility for their individual actions. We then illustrated that recent studies indicate that individuals are not only motivated to change their own behavior, but are engaging with politics in order to instigate the change they believe is necessary in the face of climate change.

In order to provide further evidence for the idea that climate change encourages, rather than discourages political engagement, we discussed results from social media analysis we recently conducted. This analysis revealed that climate change and related topics have a high level of engagement by the public, as shown by the number of retweets and replies, by the incidence of sentiment and optimism, by tweets containing the mention of another user and by the number of URLs contained in tweets. Although climate change still has a slightly lower engagement rate than topics such as Europe and the economy, engagement with climate change still ranks very highly, mostly residing in the top three of most engaged topics. Although this is only one study of public engagement, the results seem to be in line with the assumption that climate change may be able to offer the chance for political re-engagement.

On a final note, public engagement with climate change is important, not just in terms of bucking the trend of political disengagement, but also because public engagement is arguably required for policy action. As was explained in the overview of political disengagement, engagement provides an important feedback loop for politicians, who ideally base their actions on the interest of the people. According to Matthew Nisbet, this feedback loop is especially important in the case of climate change, because politicians will depend on widespread public support in order to act on climate change, since it is currently seen as a controversial issue.⁵¹ For this reason, it is important to encourage political engagement to ensure that climate change is adequately addressed. Interestingly, public engagement with climate change may already be having an effect in the UK. The recent

⁵¹ Nisbet, M. C., 'Communicating Climate Change: Why Frames Matter to Public Engagement' in *Environment*, 51 (2009), p. 14

pledge made by the Labour and Conservative Parties to combat climate change⁵² may be indicative that increased public engagement with climate change is influencing the policy direction of these parties. As the effects of climate change set in, the study of public engagement with climate change will no doubt continue to be an interesting and important pursuit.

Acknowledgements

This work was partially supported by the European Union under grant agreements No. 610829 DecarboNet⁵³ and by the Nesta-funded Political Futures Tracker project.

⁵² Mason, R., 'Green Membership Surge Take Party past Lib Dems and UKIP'
<http://www.theguardian.com/politics/2015/jan/15/green-party-membership-surge-leaders-debates> [accessed 24.02.15]

⁵³ <http://www.decarbonet.eu>

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