

Article

Is Twitter Indicating a Change in MP's Views on Climate Change?

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Abstract: Following the release of the Intergovernmental Panel on Climate Change (IPCC) 1.5 °C Special Report in October 2018, there has been a surge in public concern about climate change and demands for greater government action. We analyse the discourse of Members of Parliament (MPs) on climate change on Twitter to examine the extent to which these recent public climate-related events have influenced political agenda-setting. We argue that these events have had two, linked, effects: increased political discourse on climate change, and an increasing use of ‘urgent’ climate language. However, the language style used between political parties differs. Additionally, while the youth strikes and Greta Thunberg, who initiated these strikes, appear to have the greatest influence on MPs’ discourse, the overall relative impact is low, with responses predominately from left- and centrist-political parties. This indicates a clear difference between parties. However, Twitter may not be a suitable platform for investigating Conservative discourse. Further work to explore agenda-setting on Conservative policymaking is required.

Keywords: agenda-setting; climate change; climate politics; Twitter; youth strikes; Extinction Rebellion

1. Introduction: A Growing Climate Crisis; Limited Political Response

‘Right now, we are facing a man-made disaster of global scale. Our greatest threat in thousands of years: climate change. If we don’t take action, the collapse of our civilisations and the extinction of much of the natural world is on the horizon.’ Sir David Attenborough, 2018.

Throughout 2018 and 2019, climate change discourse in the UK media was widespread. David Attenborough’s very public intervention followed the publication, in October 2018, of the Intergovernmental Panel on Climate Change (IPCC) Special Report: Global Warming of 1.5 °C [1]. The IPCC’s assessment was that emissions of greenhouse gases must decrease steeply, reducing to net-zero by 2050, in order to limit global warming to 1.5 °C, and the impact and likelihood of runaway climate change and species extinction. The IPCC state that global emission levels must decrease by 45% within 12 years of 2018 to reduce the likelihood of irreversible climate change. Achieving this will require greater effort than the pledges already made by signatories to the Paris Agreement [2].

Following the IPCC report, there has been an upswell in protest and campaigning, calling on governments to act decisively on climate. Greta Thunberg, who protested governments’ climate inaction through striking from school [3], was invited to speak at the COP24 climate talks in Katowice, Poland [4]. Her words, condemning world leaders for historical inaction on climate change, have initiated a global movement of young people to also strike from school under the banners ‘#FridaysforFuture’ and ‘#SchoolStrike4Climate’ [3]. Subsequently, global youth strikes have seen over 1.4 million young people protesting, while Thunberg has become an international public figure, addressing the Davos World Economic Forum [5], EU [6] and UK Parliaments [7].

In parallel, other movements, including the grassroots organisation Extinction Rebellion [8], have also staged international protests against governments' climate inaction. In the UK, this peaked in October 2019 when over 1400 people were arrested across eight days of demonstrations in London [9]. Public support for climate action was also illustrated through the 2019 European elections, which saw an increase in Green Parties seats across Europe [10]. Alongside increased protest, there is evidence of growing concern among the general public. For example, a government-commissioned poll showed the highest levels of concern in the UK since the polling began in 2013, with 80% 'very concerned' or 'fairly concerned' [11,12].

However, despite this growing public concern, government action has not matched the level of ambition that the IPCC and the Paris Agreement state are necessary [13]. In the UK, there is a relatively strong legislative framework for climate action. The 2008 Climate Change Act set statutory targets on carbon reduction, amended in 2019 to a target of net-zero emissions of greenhouse gases by 2050 [14]. Under the Act, the government is required to set interim targets and action plans to achieve this target. However, in the ten years following this Act, UK political parties did not focus attention on the issue [15,16] and nor have policies kept pace with the ambition levels set by the Act. The Committee on Climate Change, independent advisers to the government established under the same Act, have repeatedly criticized the government for a 'policy gap', meaning that the government's plan to reach its interim and 2050 targets is not credible [17,18].

In summary, the public protest and media interest in climate change may be having an effect on the political climate discourse. To explore this, we formulate three research questions.

1. Have the events of 2018–19 resulted in a stronger political agenda for climate change in the UK Parliament?
2. Are there different responses from different political groupings within Parliament?
3. What impact do independent political-climate influencers have in promoting government policymaking?

Before introducing our empirical work, we explore the notion of a political 'narrative' and introduce agenda setting theory as our theoretical basis.

2. Political Narratives on Climate Change in the UK Parliament

Previous research has indicated that Members of Parliament (MPs) have struggled to raise climate change onto the political agenda due to institutional barriers within Parliament. MPs are sensitive to social and cultural constraints, worrying that speaking out on climate will jeopardise their reputation and credibility and constrain their influence [19]. Nor have MPs seen climate as an issue of interest to their constituents, leaving them worried that the electorate may not support far-reaching climate action. Subsequently, it was infrequently discussed [20].

Has anything changed in UK politics, following the IPCC 1.5 °C Special Report, increasing attention to climate among the general public, and grassroots protests? Two significant events would suggest that it has: firstly, in May 2019, Parliament passed a motion to declare a 'climate emergency', a clear statement of its concern about climate change. Secondly, the following month, Parliament passed an amendment to the Climate Change Act referenced above, ratcheting up the UK's 2050 target from an 80% reduction in GHG emissions by 2050 (from a 1990 baseline), to a new target of net-zero emissions.

Yet as described above, there has long been a gap between rhetorical commitment to climate targets and meaningful plans of action. It is important to develop a deeper understanding of politicians' motivations, and the extent to which they are influenced by outside interests. Below, we combine two theories from political science: agenda-setting theory of McCombs and Shaw [21] and John Kingdon's 'multiple streams framework' [22], to develop a theoretical approach to this question. We then add evidence from MPs' statements on Twitter to test the impact of recent events on politicians' statements on climate change and discuss what these mean for future climate politics.

2.1. Agenda-Setting Theory

Agenda-setting theory explores both the effect that a group of influencers have on the agenda of a population, or ‘first level’ agenda setting [23]; and the effect that a group of influencers have on the perception of specific topics within agendas by a population, or ‘second level’ agenda setting [24]. Agenda-setting is partly due to the psychological effects of orientation, in which individuals need to relate and orientate to their environment [21]. Individual opinions are formed through agenda melding, in which information from multiple sources is combined and organised to match personal experiences and preferences [24]. Narrative formation through agenda melding is influenced by information from civic community, information from personal communities and personal preferences [24].

As can be seen in Figure 1, McCombs et al. developed a theoretical model in which an individual’s preferences start in a stable social system (left side of the figure indicated as ‘Dominant Stability’). Yet as a new, alternative community’s influence increases its power, there is a transitional period of uncertainty before a new regime stability around the agenda of this alternative community is established (‘Alternative Stability’) [24]. Thus, MPs in Parliament may respond to agenda-setting by external influencers within the civic community, such as the youth strikes, who set an alternative agenda which could induce a transition in MPs’ personal perceptions on climate change (Figure 1) [24].

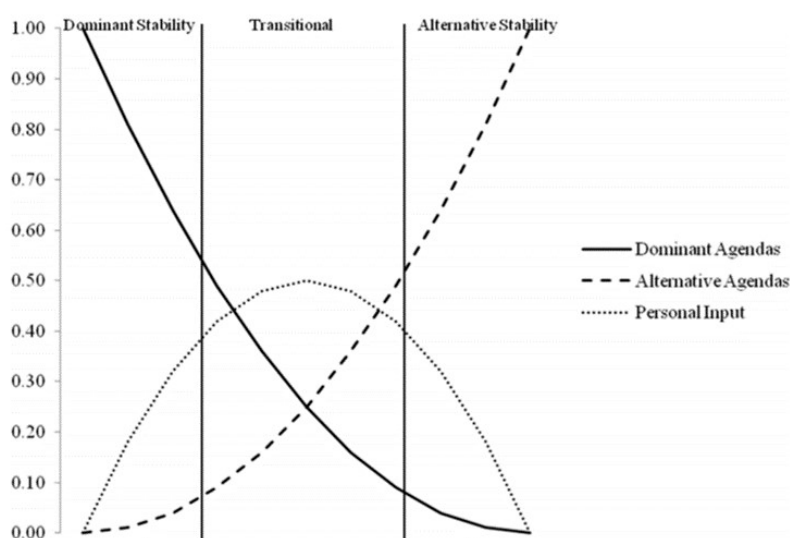


Figure 1. McCombs et al.’s model correlating the dynamics of agenda-setting in the civic community and agendamelding.

The model in Figure 1 is a simplification, assuming linear relationships and not accounting for multiple, potentially conflicting influences on an individual, which create uncertainty. Within Parliament, opposing influences could also mean an individual would act contrary to their own opinions, for example, by following a political-party whip on voting preferences. Nevertheless, it does provide a basis for understanding influences on MPs’ preferences in the UK, and an explanation for changing political narratives.

In the literature, agenda-setting theory has widely been applied to the influence of journalists on public opinion [25–27]. We instead explore how agenda-setting by climate-related events and political-climate influencers stimulate discussions by MPs around climate change. Given the previous reluctance of politicians to raise the climate issue in Parliament [19], agenda-setting by the public and prominent independent influencers could provide a way of changing this picture.

2.2. The Multiple Streams Framework

Agenda setting theory, described above, helps to explain how an issue becomes understood in the political sphere. We now turn to the question of how such attention may turn to meaningful outcomes, such as specific legislation, policy action, or regulatory reform.

Kingdon [22] argues that an issue only becomes a “political” (or ‘politicians’) issue when three ‘streams’ converge. First, there must be a well-defined problem, or definition of the issue—the ‘problem stream’. Second, it should be clear what the potential solutions are, or what policies could be enacted—the ‘policy stream’. Third, there should be political support for the issue—the ‘political stream’. Meaningful outcomes, in the form of legislation or significant action, come about when all three streams converge, creating what Kingdon calls a ‘policy window’. Convergence of streams may come about by chance, though it can also be engineered by ‘policy entrepreneurs’ who may be politicians, interest groups or representative organisations such as industry bodies.

Carter and Jacobs [28] apply the model directly to climate change in the UK, to explain the success of the 2008 Climate Change Act. In the mid-2000s, climate change had been successfully explained as a ‘problem’, both through the work of the IPCC and a number of ‘focussing events’, to use Kingdon’s terminology, including the Stern Review on the economics of climate change [29] and Al Gore’s film, *An Inconvenient Truth*. The ‘political stream’ shifted through a combination of pressure from interest groups, particularly Friends of the Earth’s ‘Big Ask’ campaign; and David Cameron’s support for the issue as part of his efforts to ‘detoxify’ the Conservative brand. These influences worked as a virtuous circle, to increase the political salience of climate change. Last, looking at the policy stream, Carter and Jacobs point to the development of workable solutions, including the Climate Change Bill, proposed by Friends of the Earth and gaining cross-party political support, and EU policy, particularly the EU Emissions Trading Scheme. Having examined the three strands, Carter and Jacobs conclude that the three ‘streams’ converged in the late 2000s, to put climate change firmly on the agenda, resulting in Parliament passing the Climate Change Act in 2008 and establishing statutory emissions reduction targets.

Turning to the present day, it could be argued that there is currently a heightened receptivity to influence policymaking through the alignment of: the publication of the IPCC 1.5 °C Special Report (2018) (problem stream); grassroot protests through the youth strikes and Extinction Rebellion demonstrating public interest for climate action (political stream); and the Committee on Climate Change’s Net-Zero report proposing a technically and financially feasible solution [30] (policy stream). The combination of these factors may have led to the government’s announcement of the net-zero emissions legislation as a solution [14].

However, a policy window may close if any of these three streams change or the problem is perceived to have been ‘solved’ [22]. Therefore, there is a risk that further climate policymaking opportunities may close, for example, if the government judges that merely announcing the net-zero target is enough of a ‘solution’; or if public protests die down or no longer attract the same level of media attention. Yet further, more far-reaching climate policies are required to increase the UK’s emission reduction actions and put the UK on track to the net-zero target [30].

Below, we deepen the understanding of recent events through analysing MPs’ views expressed on Twitter, in order to judge whether or not recent events have constituted a milestone in the agenda setting around climate change and whether the discourse analysed suggests any of the streams under analysis have shifted throughout 2018–2019.

3. Methods: Using MPs’ Twitter Activity to Investigate the Changing Political Agenda of Climate Change

Previous research has used MPs’ statements on the social networking site, Twitter, to investigate agenda-setting theory on discourse [25,31]. Twitter is a micro-blogging social media platform where individuals express personal opinions around topics of interest. It can therefore provide a proxy for public opinion [32]. Twitter has also reportedly played an increasingly significant role in political

communication [31,33], and so provides a platform for political discussions. If MPs raise climate topics on Twitter, they are likely to also engage with them in Parliament. We therefore used Twitter as a platform to infer the political dynamics and agendas within Parliament.

3.1. Data Collection

Twitter data were collected using the R package, 'rtweet', in conjunction with a verified Twitter application programming interface (API) account. Tweets from the public Twitter accounts of 577 MPs were collected on 17 June 2019, with political party membership correct as of 4 June 2019 [34]: 71 MPs (11%) had no Twitter account, one seat was vacant, and the then Speaker of the House of Commons, John Bercow, was not included due to his impartial role in Parliament.

Data were subsequently filtered to exclude any tweets before 1 September 2018, approximately one month prior to the release of the IPCC 1.5 °C Special Report and following the Parliamentary summer recess, to provide a baseline-level of Twitter activity. Tweets were filtered using key search terms (Table 1), aiming to identify different types of engagement in climate issues. The search terms were designed to identify MPs' patterns of language use, both in terms of awareness of climate change as a problem and the use of 'urgency' vocabulary. The search included mentions of the 'Green New Deal' as a recent political strategy linking climate change and social justice, and proposed mainly by Labour and Green politicians [35,36]; the ecological crisis [37]; and any discussion of net-zero emissions and 'clean growth', which indirectly refer to climate change as well as relating directly to relevant legislation, The 'Clean Growth Strategy' [38] and net-zero legislation [14].

Table 1. Key search terms on Members of Parliament's (MPs') Twitter accounts.

Search Category	Key Term Searches
Climate Change Awareness	'Climate Change'
Urgent Climate Language	'Climate Emergency' 'Climate Breakdown' 'Climate Catastrophe' 'Climate Crisis'
Ecological Crisis	'Ecological' 'Biodiversity'
Green New Deal	'Green New Deal' 'Just Transition' 'Green Jobs'
Climate Solution Claims	'Clean Growth' 'Net-Zero'
Political-Climate Influencers	
Youth Strikes	'YouthForClimate' 'YouthStrike4Climate' 'YouthStrike' 'SchoolStrike4Climate' 'Strike4Youth' 'Fridays4Future' 'FridaysforFuture'
Extinction Rebellion	'Extinction Rebellion'
Greta Thunberg	'Greta Thunberg'
Alexandria Ocasio-Cortez	'Alexandria Ocasio-Cortez' '@AOC'
IPCC	'IPCC'
Committee on Climate Change	'Committee on Climate Change' '@CCCUK'

We also searched for mentions of political-climate influencers, reflecting the range of types of independent influences on Parliament, including two grassroots movements, the youth strikes and Extinction Rebellion; two prominent climate change action advocates, Greta Thunberg and Alexandria Ocasio-Cortez, a prominent American Congresswoman advocating for a Green New Deal in the US on behalf of a US grassroots movement, Sunrise Movement; and two scientific advisory bodies, the IPCC and Committee on Climate Change.

All combinations of key terms, such as 'net zero', 'net-zero' and 'netzero', were searched with any repeating tweets manually removed. Searches were not case sensitive. Re-tweets and tweets in all languages were included, however tweets immediately translated into a second language were removed as this does not constitute a new engagement. Any irrelevant tweets were also manually removed. Post filtering, 3866 tweets referencing climate change topics and 1165 tweets referring to political-climate influencers were collected.

This data collection facilitates exploration of first-level agenda-setting on the impact of climate-related events and influencers on MPs' discussions around climate change.

3.2. Assumptions

While any relevant tweets not referencing the key search terms will have been missed by the study, terms were chosen based on their adoption in the media [39], which have since been widely used on Twitter. Consequently, the number of missed tweets is estimated to be low. However, there may have been other discussions of climate issues which were not caught in the searches, particularly so-called 'surrogate claims' [19], when politicians talk about policies which they privately understand will contribute to climate action, though they judge that explicitly linking their proposals to climate or carbon reduction could backfire. An example of a surrogate claim is a politician supporting proposals for public transport as a way of easing congestion, even when privately they may support the proposals as a means of carbon reduction [19]. Such 'surrogate claims' can only be identified through detailed research, such as anonymous interviews, as by definition they will not appear in searches for climate-related tweets.

Many MPs have staff who tweet on their behalf, following agreed protocols, which will vary in each case. However, we assumed that tweets in an MP's name would be aligned with that MP's position, so tweets on MPs' public accounts would not contradict personal views.

4. Results and Discussion

Below, we use Twitter data to analyse the three research questions set: first, have the events of 2018–2019 resulted in a stronger political agenda for climate change in the UK Parliament? Second, are there different responses from different political groupings within Parliament? And third: What impact do independent political-climate influencers have in promoting government policymaking?

4.1. Has a Stronger Climate Agenda Been Established in the UK Parliament?

Since 1 September 2018, there has been an increase in the number of discussions around climate change (Figure 2), from a mean of 1.0 tweet per day by Parliament in September 2018 to 7.8 tweets in May 2019. Peaks in Twitter activity by MPs correlate with climate-related events, demonstrating that these events are inducing first-level agenda-setting among MPs. This was verified by checking that tweet content relates to these events. Consequently, it appears that climate change is less likely to constitute a politically unpopular topic [20].

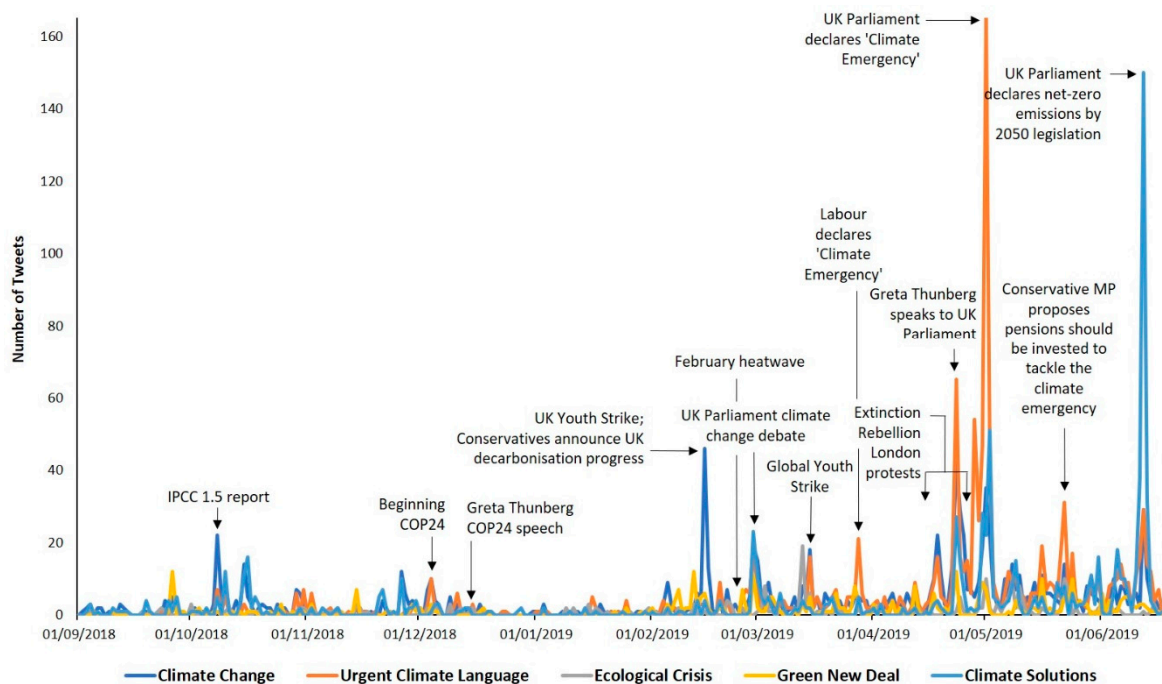


Figure 2. Parliaments' Twitter activity referencing climate change topics.

As Figure 2 shows, there was an increase in mentions of climate change overall over the research period, spiking in response to particular events such as the release of the IPCC report in October 2018, Greta Thunberg's speech to the UK Parliament, the youth strikes and the Extinction Rebellion protests. The top three types of claim used (see Table 1 for full description) are general 'climate change awareness' language; 'urgency' language, and 'climate solutions' claims. As we discussed in Section 2.2, the 2018 IPCC report can be seen as the 'problem stream' in Kingdon's multiple stream framework [22]. The fact that the report gained recognition with MPs indicates that the 'problem' has been established. Following this framework, the 'political stream' and 'policy stream' must also be established, and converge, to create a 'policy window'.

Looking at the cumulative data (Figure 3), tweets referencing general 'climate change awareness' were the most prevalent, until a steep rise in 'urgency' language, with the mean number of daily tweets rising from 0.1 in September 2018 to 14.4 in May 2019. This is particularly apparent in response to Greta Thunberg's speech to the UK Parliament on 23 April 2019. Thunberg has constantly used the language of urgency [39], and it seems that MPs have responded.

What is particularly notable from Figure 3 is the increasing rate, over a number of months, of MPs referencing climate change, using climate emergency language and discussions on climate solutions after the period of Greta Thunberg's speech to the UK Parliament and the UK Parliament 'climate emergency' declaration on 23 April and 1 May 2019, respectively. This implies that these two events have had a significant impact on the changing the personal agendas of MPs: a transition has occurred from a previous dominant stability, in which climate change was a challenging topic to discuss in Parliament [19,20], to an alternative stability around this new, alternative civic community created by Greta Thunberg, to use the language of McCombs et al. [24]. As such, it could be argued that this is the establishment of the 'political stream' of Kingdon's multiple streams framework [22]. It is as yet unclear whether the influence of these events will be sustained beyond this period.

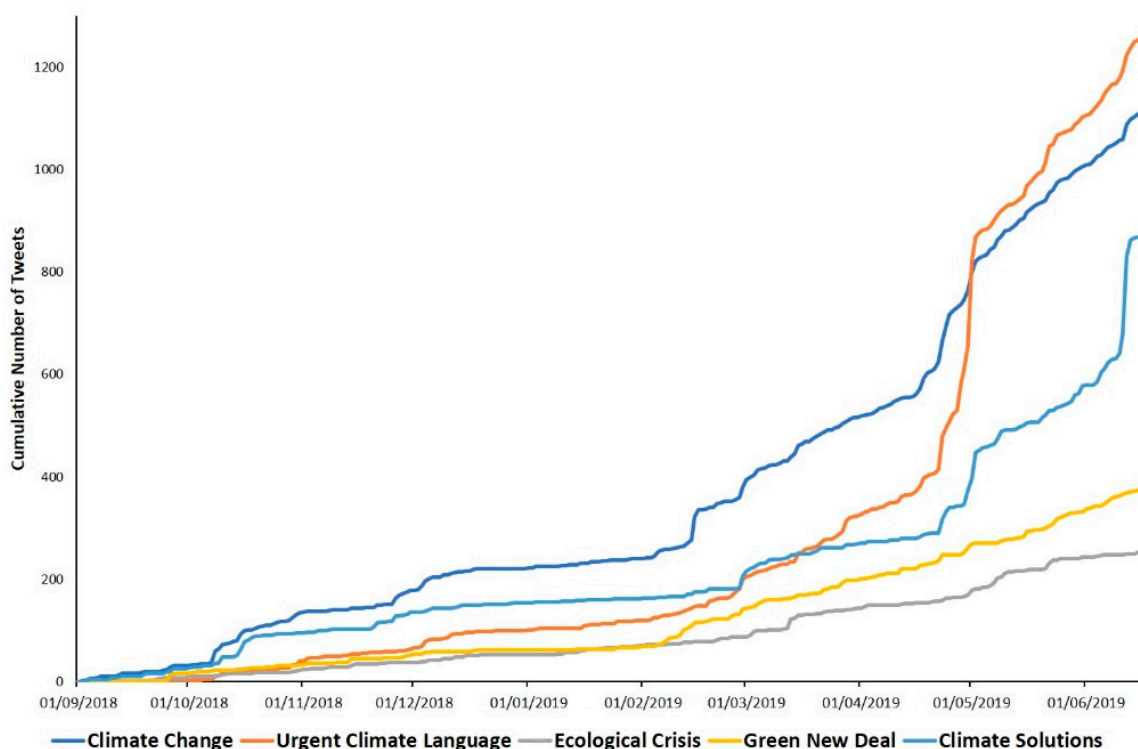


Figure 3. The cumulative Twitter discussions by MPs on climate topics.

In total, 42% of MPs used urgent climate language on Twitter, culminating in the Parliament declaring a ‘climate emergency’ on 1 May 2019. As discussed below, opposition parties, particularly Labour and the Liberal Democrats, were most likely to use such language. Even though MPs in the governing Conservative Party were far less inclined to use such language, opposition parties secured the ‘climate emergency’ debate.

Other outside influences in agenda-setting, including ‘climate emergency’ declarations by the Labour party, Welsh Assembly, Scottish Parliament and many local Councils, may well have had a bearing on the UK Parliament’s declaration. It is not clear from Twitter data whether the successful motion was due to internal pressure from MPs, or the external influence of the other public declarations.

However, it is clear that the ‘climate emergency’ motion was in part a result of very particular political circumstances in 2019, namely the absence of a government majority, and a consequent strengthening of Parliament’s legislative abilities, as shown, too, in the legislative process around leaving the European Union. With the Conservatives’ convincing victory in December 2019, and an eighty-seat majority, conditions are now very different. Such motions would, in all likelihood, only be voted through with formal backing from the governing party.

‘Climate solution’ claims, which focus on reducing emissions and clean growth, represent the third most widely discussed topic (Figure 3) and showed a steadier pattern of use. These inform the ‘policy stream’ of Kingdon’s framework [22]. As such, the mirrored increase in discussion of climate solutions ‘policy stream’, with climate change awareness and urgent climate language, ‘the political stream’, with the prior establishment of the ‘problem stream’ with the 2018 IPCC report, means that this changing agenda does appear to meet the criteria of Kingdon’s theory and suggests that 2019 did bring about political change, manifested in the new legislation for the net-zero emissions target.

However, tweets about the Green New Deal, an alternative Green-Labour strategy and the ecological crisis are much lower (Figure 3): the mean number of Parliamentary tweets only rose from 0.6 and 0.3, respectively in September 2018 to 2.2 and 2.4 in May 2019. Additionally, only 17% of MPs are discussing either Green New Deal or the ecological crisis (Table 2). This implies that, at the time of

this research, a Green New Deal and other environmental concerns through the ecological crisis were still not on the wider political agenda.

Table 2. Percentage of MPs surveyed engaging in climate topics by political party.

Political Parties	Number of MPs with Twitter	% of Party Surveyed	Climate Change Aware	Urgent Climate Language	Ecological Crisis	Green New Deal	Climate Solution Claims
Change UK	11	100	100	100	9	0	73
Conservative	261	83	29	16	18	3	43
DUP	10	100	10	0	0	0	0
Green Party	1	100	100	100	100	100	100
Independent	8	80	50	25	0	13	13
Labour	231	94	20	61	16	34	36
LibDem	11	100	100	91	18	18	73
Plaid Cymru	3	75	100	100	67	100	67
Sinn Fein	7	100	43	14	29	14	0
SNP	34	97	88	79	15	18	53
% of Parliament:	-	89	32	42	17	17	41

4.2. Are There Different Responses from Different Political Groupings within Parliament?

Our data show clear differences in the use of climate language between political parties. As Table 2 shows, there is a clear difference in the use of ‘urgency’ language. The Northern Irish parties, Independent MPs and Conservatives rarely used such language. For example, only 16% of Conservatives surveyed used such terms. In contrast, it was used widely by Labour, Liberal Democrat and Scottish National Party MPs, and the sole Green Party MP.

‘Climate solutions’ claims were the most popular topic for Conservative MPs, with 43% surveyed referencing ‘clean growth’ and ‘net-zero’ solutions (Table 2). This could be because politicians representing the governing party are more likely to defend the current policy agenda, in this case the net-zero target, whereas opposition MPs are more likely to state their opposition through use of heightened ‘threat’ language, to claim that the government’s response is not adequate.

Overall, we note the difference of language and strategies used between political parties. The Conservatives’ proposed solutions to the climate emergency of ‘clean growth’ and net-zero emissions legislation are engaging MPs from across the political parties. However, the offer of a ‘Green New Deal’ appears to be more partisan, appealing to Labour and Green MPs but not supported by Conservatives.

While the proportion of Conservative Twitter-users is high, Conservatives also have the largest number of non-Twitter-users among the political parties (Table 2). This could be due to the mismatch between the age of UK Twitter users, predominantly 15–30-year-olds [40], and the age profile of Conservative voters: 61% of over 65s vote Conservative [41]. Therefore, Twitter might not constitute an important platform for Conservatives to communicate with their voters, and consequently may not provide the best platform for researching agenda-setting among Conservative MPs.

4.3. What Impact do Independent Political-Climate Influencers Have in Promoting Government Policymaking?

Political-climate influencers have elicited varying responses from MPs on Twitter. Figure 4 shows that while the release of the IPCC 1.5 °C report created a significant increase in Twitter discussions sustained over 10 days, the greatest number of responses related to the youth strike protests and Greta Thunberg on the day she spoke to the UK Parliament. This demonstrates first-level agenda-setting. However, the response to these events were shorter-lived than those to the IPCC report, and each youth strike protest elicited a diminishing response by MPs. Comparing across protest movements, cumulatively, both the youth strikes and Thunberg have created around a 40% greater increase in discourse than Extinction Rebellion, the third largest influencer (Figure 5). Consequently, it could

be argued that both the youth strikes and Thunberg have most significantly raised the climate political agenda.

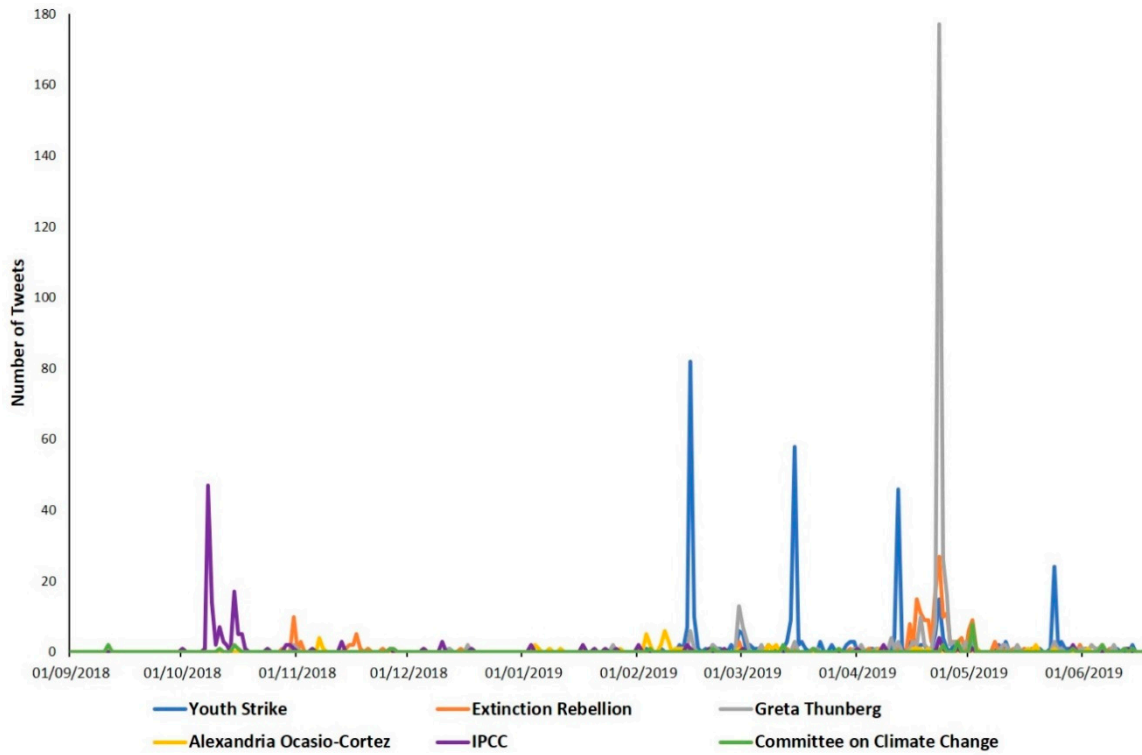


Figure 4. The number of Parliamentary tweets referencing political-climate influencers.

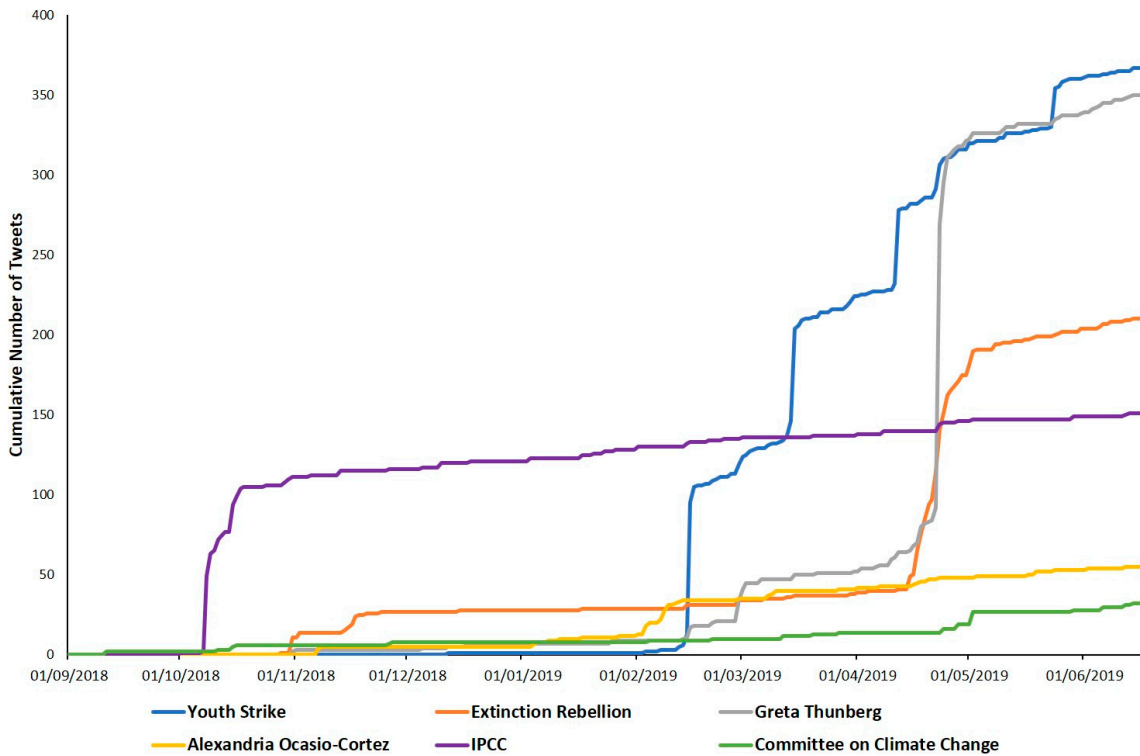


Figure 5. The cumulative number of Parliamentary tweets referencing political-climate influencers.

However, given Kingdon's [22] conditions for influencing policymaking, it is unclear whether the responses would have been as significant without the IPCC 1.5 °C report initially raising climate change

as a problem, even though the report did not elicit as much Twitter discourse as the youth strikes or Thunberg (Figure 5). Following this theory, the IPCC provided the ‘problem stream’, converging with the protests as the ‘political stream’, and together creating better conditions for climate action.

Further, second-level agenda-setting through discourse analysis is needed to establish the sentiment of MPs tweets towards grassroots movements of the youth strikes and Extinction Rebellion, as political opinions on their protests have been divisive [42]. Alternatively, given Willis’ [20] reports that MPs were previously reluctant to discuss climate change due to a perceived lack of interest among their constituents, it could be construed that the grassroots protests have removed this barrier.

In addition, there has been relatively little Twitter response to the Committee on Climate Change’s Net-Zero report on 2 May 2019 (Figure 5). This is despite the Conservative Government initially commissioning the report from them [30], and subsequently legislating based on its recommendations [14]. This lack of Twitter response could be ascribed to the relatively technical nature of this debate. MPs might deem tweets about protest, climate ‘urgency’ and so on to be meaningful, seizing people’s attention. In contrast, they may not believe that more technical debates about legislation and proposed policies have the same appeal. It could also be that this lack of response supports the hypothesis that Twitter may not provide the best platform to research Conservative discourse. If so, further research would be required to determine the full impact of influencers on the government’s policymaking. Such research could include investigation of other social media platforms such as Facebook; analysis of government ministers’ speeches or government policy documents; or interviews with Conservative Ministers, MPs, party members and voters.

The overall proportion of MPs engaging with political-climate influencers is low, with Thunberg only referenced by 25% of MPs surveyed (Table 3). This demonstrates the limited capability of these climate-influencers to impact agenda-setting with respect to MPs, and therefore influence government policymaking.

Table 3. The percentage of MPs discussing political-climate influencers on Twitter.

Political Parties	Youth Strike	Extinction Rebellion	Greta Thunberg	Alexandria Ocasio-Cortez	IPCC	Committee on Climate Change
Change UK	9	0	9	0	0	9
Conservatives	12	10	9	0	7	1
DUP	0	0	0	0	0	0
Green Party	100	100	100	100	100	100
Independent	38	0	0	38	13	0
Labour	30	24	38	12	21	3
LibDem	36	27	91	0	27	9
Plaid Cymru	100	33	67	0	33	0
Sinn Fein	14	0	14	14	0	0
SNP	41	21	50	9	9	9
% of Parliament	22	16	25	6	13	3

Again, political parties also differ in their engagement with political-climate influencers. More centrist and left-wing party MPs responded to grassroots movements and Thunberg than right-wing parties (Table 3). Consequently, when considering approaches to increasing political ambition and subsequent impactful policies on climate action, even the most effective influencers, the youth strikes and Thunberg, are limited in their effects. They appear to have made a much less significant impact, based on the lack of Twitter discourse from the Conservative Government. However, as previously highlighted, it is unclear how these influencers might affect offline discourse and policymaking, and therefore a wider understanding on the influences on Conservative Government policymaking is required. If either central or left-wing political parties were to form a government in future, then Thunberg and the youth strikes may invoke greater influence.

5. Conclusions

Given the speed and ambition of climate action needed, according to the recent IPCC 1.5 °C Special Report recommendations, climate change needs to be prioritised on the political agenda.

Returning to our research questions, firstly, our data do indeed show that the events of 2018–2019 resulted in a stronger political agenda for climate change in the UK Parliament. The instances of MP mentions of climate, in all forms of the ‘claim’, increased in direct response to external events, such as the IPCC report, the youth strikes and the Extinction Rebellion protests.

We have demonstrated that climate-related events have increased the political salience of climate change through first-level agenda-setting, inducing discourse and increasing use of ‘urgent’ climate change language amongst MPs on Twitter since the IPCC report in October 2018. ‘Climate solution’ claims, which have been focused on current government strategies in clean growth and the net-zero emissions legislation, currently support the highest level of cross-party engagement, demonstrating that there has been an increase in cross-party discussions around climate action. However, the ecological crisis still appears low on the political agenda, and therefore support for wider environmental concerns may be less forthcoming.

Secondly, differences between parties are clear, with Conservatives much less likely to use ‘urgency’ language, referencing instead other ‘climate solution’ claims. It is unclear, from this work, whether they do so because they are convinced that the solutions put forward are the right ones, or whether they are trying to close down debate about the problem. Opposition politicians are more likely to use ‘urgency’ language, respond to political-climate influencers, and propose Green New Deal solutions.

Third, the youth strikes and Thunberg have been identified as the most significant political-climate influencers on Parliament, however the overall agenda-setting impact on MPs’ discourse is low. Furthermore, MPs engaging with these influencers are predominately from left and centrist parties, and not the current right-wing government. However, Twitter does not appear to constitute as important a platform for Conservative communication, and therefore further offline research is required: second-level agenda-setting could explore the opinions on political-climate influencers by government, and subsequently investigate their influential impact on Conservative policymaking.

Based on the data collected, it is clear that the events of 2018–2019 resulted in an increase in political activity on climate, but it is difficult to say whether this will be sustained. It may be that politicians adjust to a ‘new normal’ where protest on climate is commonplace—the decreasing attention paid to the youth strikes over time could indicate this. Conversely, it could be that the combination of events and pressure from outside keeps the ‘policy window’, to use Kingdon’s phrase, open, even potentially increasing the feasibility of more radical action.

We looked solely at MPs’ mentions of climate, or climate-related language, on Twitter. It would be useful to investigate the relative prominence of climate language, compared to other political priorities, such as Brexit or economic issues, to get a clearer picture of the place of climate on the general political agenda. It would also be useful to supplement publicly available data with more qualitative understandings of different politicians’, or parties’, approaches to climate. Whereas good longitudinal data exist on public attitudes to climate change [11], no similar dataset exists for MPs, making it difficult to compare across time.

Furthermore, the long-term effect of these Twitter discussions could be investigated through an extended time-series dataset of MP Twitter discussions after the climate events reported here. Despite the Green New Deal appearing to elicit very low levels of discussions among MPs during our study period, Prime Minister Boris Johnson has since announced funding for a green recovery following the COVID-19 pandemic [43]. Whether this second dramatic change in rhetoric one year after our study period is due to the long-term influences from this initial change in political agenda we have identified on Twitter, or other external factors, should be investigated to further bridge the gap in uncertainty regarding Conservative policy making.

The analysis presented here, and the further research we have proposed, could be of use to outside influencers, including the science community, environmental NGOs, protest movements and others.

It could enable them to work with politicians to craft politically workable climate strategies, appealing to the values and concerns of each party. It is clear that greater political effort on climate will be needed in the years ahead. Creating the best conditions outside of Parliament, in order to support efforts for greater climate ambition within Parliament, will undoubtedly be central to achieving this.

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References

1. Intergovernmental Panel on Climate Change. 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. 2018. Available online: https://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf (accessed on 10 June 2019).
2. United Nations Framework Convention on Climate Change. Paris Agreement. 2015. Available online: https://unfccc.int/sites/default/files/english_paris_agreement.pdf (accessed on 10 June 2019).
3. Taylor, M. Latest Global School Climate Strikes Expected to Beat Turnout Record. *The Guardian*. 24 May 2019. Available online: <https://www.theguardian.com/environment/2019/may/24/latest-global-school-climate-strikes-expected-to-beat-turnout-record> (accessed on 10 June 2019).
4. Thunberg, G. In Proceedings of the Greta Thunberg Full Speech at UN Climate Change COP24 Conference, Plenary Session. 2018, COP24, Katowice, Poland. 12 December 2018. Available online: https://www.fridaysforfuture.org/greta-speeches#greta_speech_dec12_2018 (accessed on 4 June 2019).
5. Thunberg, G. Our House is on Fire. 25 January, World Economic Forum, Davos. 2019. Available online: https://www.fridaysforfuture.org/greta-speeches#greta_speech_jan25_2019 (accessed on 10 June 2019).
6. Thunberg, G. In Proceedings of the Greta Thunberg Full Speech at the EU Parliament in Strasbourg, Strasbourg, France. 16 April 2019. Available online: https://www.fridaysforfuture.org/greta-speeches#greta_speech_apr16_2019 (accessed on 10 June 2019).
7. Thunberg, G. In Proceedings of the Greta Thunberg's Full Speech to MPs, London, UK. 23 April 2019. Available online: <https://www.theguardian.com/environment/2019/apr/23/greta-thunberg-full-speech-to-mps-you-did-not-act-in-time> (accessed on 10 June 2019).
8. Extinction Rebellion. Local Groups. 2019. Available online: <https://rebellion.earth/act-now/local-groups/> (accessed on 11 June 2019).
9. Gayle, D. Police ban Extinction Rebellion protests from whole of London, *The Guardian*. 2019. Available online: <https://www.theguardian.com/environment/2019/oct/14/police-ban-extinction-rebellion-protests-from-whole-of-london> (accessed on 23 December 2019).
10. European Parliament. 2019 European Election Results: Comparative Tool. 2019. Available online: <https://election-results.eu/tools/comparative-tool/> (accessed on 11 June 2019).
11. Barasi, L. Polls Reveal Surge in Concern in UK about Climate Change, *Carbon Brief*, Guest Post. 2019. Available online: <https://www.carbonbrief.org/guest-post-rolls-reveal-surge-in-concern-in-uk-about-climate-change> (accessed on 5 November 2020).
12. Steentjes, K.; Demski, C.; Seabrook, A.; Corner, A.; Pidgeon, N. British Public Perceptions of Climate Risk, Adaptation Options and Resilience (RESiL RISK): Topline Findings of a GB Survey Conducted in October 2019. Cardiff: Cardiff University. 2020. Available online: <http://orca.cf.ac.uk/129452/> (accessed on 5 November 2020).

13. Höhne, N.; den Elzen, M.; Rogelj, J.; Metz, B.; Fransen, T.; Kuramochi, T.; Olhoff, A.; Alcamo, J.; Winkler, H.; Fu, S.; et al. Emissions: World has four times the work or one-third of the time. *Nature* **2020**, *579*, 25–28. [CrossRef]
14. UK Government. PM Theresa May: We Will End UK Contribution to Climate Change (Press release). 2019. Available online: <https://www.gov.uk/government/news/pm-theresa-may-we-will-end-uk-contribution-to-climate-change-by-2050> (accessed on 12 June 2019).
15. Carter, N.; Clements, B. From ‘greenest government ever’ to ‘get rid of all the green crap’: David Cameron, the Conservatives and the environment. *Br. Politics* **2015**, *10*, 204–225. [CrossRef]
16. Farstad, F.M. What explains variation in parties’ climate change salience? *Party Politics* **2018**, *24*, 698–707. [CrossRef]
17. Committee on Climate Change. Progress in Preparing for Climate Change 2017 Report to Parliament. 2017. Available online: <https://www.theccc.org.uk/publication/2017-report-to-parliament-progress-in-preparing-for-climate-change/> (accessed on 5 November 2020).
18. Committee on Climate Change. Progress in Preparing for Climate Change 2019 Report to Parliament. 2019. Available online: <https://www.theccc.org.uk/publication/progress-in-preparing-for-climate-change-2019-progress-report-to-parliament/> (accessed on 5 November 2020).
19. Willis, R. How Members of Parliament Understand and Respond to Climate Change. *Sociol. Rev.* **2018**, *66*, 475–491. [CrossRef]
20. Willis, R. Constructing a ‘Representative Claim’ for Action on Climate Change: Evidence from Interviews with Politicians. *Political Stud.* **2018**, *66*, 940–958. [CrossRef]
21. McCombs, M.; Weaver, D. Voters’ Need for Orientation and Use of Mass Communication. In Proceedings of the Annual Meeting of the International Communication Association, Montreal, QC, Canada, 25–28 April 1973.
22. Kingdon, J. *Agendas, Alternatives, and Public Policies*, 2nd ed.; Longman: New York, NY, USA, 1995.
23. Keskitalo, E.C.H.; Westerhoff, L.; Juhola, S. Agenda-setting on the environment: The development of climate change adaptation as an issue in European states. *Environ. Policy Gov.* **2012**, *22*, 381–394. [CrossRef]
24. McCombs, M.E.; Shaw, D.L.; Weaver, D.H. New directions in agenda-setting theory and research. *Mass Commun. Soc.* **2014**, *17*, 781–802. [CrossRef]
25. Ceron, A.; Curini, L.; Iacus, S.M. First-and second-level agenda setting in the Twittersphere: An application to the Italian political debate. *J. Inf. Technol. Politics* **2016**, *13*, 159–174. [CrossRef]
26. Cushion, S.; Kilby, A.; Thomas, R.; Morani, M.; Sambrook, R. Newspapers, impartiality and television news: Intermedia agenda-setting during the 2015 UK general election campaign. *J. Stud.* **2018**, *19*, 162–181. [CrossRef]
27. Shapiro, M.A.; Hemphill, L. Politicians and the policy agenda: Does use of Twitter by the US Congress direct New York Times content? *Policy Internet* **2017**, *9*, 109–132. [CrossRef]
28. Carter, N.; Jacobs, M. Explaining radical policy change: The case of climate change and energy policy under the British Labour government 2006–2010. *Public Adm.* **2014**, *92*, 125–141. [CrossRef]
29. Stern, N.; Stern, N.H. *The Economics of Climate Change: The Stern Review*; Cambridge University Press: Cambridge, UK, 2007.
30. Committee on Climate Change. Net Zero: The UK’s Contribution to Stopping Global Warming. 2019. Available online: <https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/> (accessed on 7 June 2019).
31. Conway, B.A.; Kenski, K.; Wang, D. The rise of Twitter in the political campaign: Searching for intermedia agenda-setting effects in the presidential primary. *J. Comput. Mediat. Commun.* **2015**, *20*, 363–380. [CrossRef]
32. O’Connor, B.; Balasubramanian, R.; Routledge, B.R.; Smith, N.A. From tweets to polls: Linking text sentiment to public opinion time series. In Proceedings of the Fourth International AAAI Conference on Weblogs and Social Media, Washington, DC, USA, 23–26 May 2010.
33. Bode, L.; Dalrymple, K.E. Politics in 140 characters or less: Campaign communication, network interaction, and political participation on Twitter. *J. Political Mark.* **2016**, *15*, 311–332. [CrossRef]
34. Parliament. MPs. 2019. Available online: <https://www.parliament.uk/mps-lords-and-offices/mps/#top> (accessed on 4 June 2019).
35. Green New Deal: MPs Table UK Bill to Drive ‘Radical’ Climate Action. Available online: <https://www.businessgreen.com/bg/news-analysis/3073153/green-new-deal-mps-table-uk-bill-for-radical-climate-action> (accessed on 27 May 2019).

36. Roberts, D. The Green New Deal, Explained. Vox. 2018. Available online: <https://www.vox.com/energy-and-environment/2018/12/21/18144138/green-new-deal-alexandria-ocasio-cortez> (accessed on 7 June 2019).
37. Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. 2019. Available online: https://www.ipbes.net/sites/default/files/downloads/spm_unedited_advance_for_posting_htn.pdf (accessed on 26 May 2019).
38. HM Government. Clean Growth Strategy: Leading the Way to a Low Carbon Future. 2017. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/700496/clean-growth-strategy-correction-april-2018.pdf (accessed on 22 July 2019).
39. Why the Guardian is Changing the Language it Uses about the Environment. Available online: <https://www.theguardian.com/environment/2019/may/17/why-the-guardian-is-changing-the-language-it-uses-about-the-environment> (accessed on 23 July 2019).
40. Sloan, L.; Morgan, J.; Burnap, P.; Williams, M. Who tweets? Deriving the demographic characteristics of age, occupation and social class from Twitter user meta-data. *PLoS ONE* **2015**, *10*, e0115545. [CrossRef]
41. Apostolova, V.; Audickas, L.; Baker, C.; Bate, C.; Cracknell, R.; Dempsey, N.; Hawkins, O.; McInnes, R.; Rutherford, T.; Uberoi, E. General Election 2017: Results and Analysis, Second Edition. 2019. Available online: <https://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-7979> (accessed on 24 July 2019).
42. Watts, J. Theresa May Criticises Schoolchildren Protesting Against Looming Climate Disaster for Wasting Lesson Time. *The Independent*. 2019. Available online: <https://www.independent.co.uk/news/uk/politics/theresa-may-climate-change-school-pupils-protest-lesson-time-teachers-a8781046.html> (accessed on 26 July 2019).
43. PM Commits £350 Million to Fuel Green Recovery. 2020. Available online: <https://www.gov.uk/government/news/pm-commits-350-million-to-fuel-green-recovery> (accessed on 4 December 2020).

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