

Does Campaigning on Social Media Make a Difference? Evidence From Candidate Use of Twitter During the 2015 and 2017 UK Elections

The use of social media by individuals running for electoral office has become a core feature of electoral campaigns all around the world (Dimitrova & Matthes, 2018). Initially a niche pursuit, now candidates from parties of all sizes and political leanings are making heavy use of these tools (for some examples see Bode & Epstein, 2015; Grusell & Nord, 2016; Koc-Michalska et al., 2016; Lilleker et al., 2011). The consequences of this shift are, potentially, considerable, and run from the development of more responsive and interactive campaigning styles (Keller & Kleinen-von KönigsLöw, 2018) to the erosion of central party control over individual candidates and the increased personalisation of campaigns (Enli & Skogerbø, 2013). However, the extent to which these effects are fully realised will likely depend strongly on perceptions of whether social media can be effective as a vote winner (and if so how). Existing research on the effectiveness of social media campaigning has produced diverging claims. Some have argued that social media use can increase vote share (e.g., Kruikemeier, 2014; Bode & Epstein, 2015; LaMarre & Suzuki-Lambrecht, 2013; Bene, 2018; Vergeer, Hermans & Sams, 2011). Other studies have found no relationship (e.g., Baxter & Marcella, 2013, Kobayashi & Ichifuji, 2015).

This article contributes to this debate. Empirically, we improve on existing research by offering the first panel data measurement of candidate social media use and constituency level vote outcomes using data from two British general elections. Our data allow us to employ a first difference regression design that separates the effect of changing social media effort from unobserved confounding variables. We provide evidence that campaigning on social media does indeed make a difference, a finding that is robust to a wide range of different model specifications.

We also assess evidence in support of three potential mechanisms linking social media use to vote outcomes, drawn from the literature on local electoral campaigns (Holbrook & McClurg, 2005; Pattie, Johnston & Fieldhouse, 1995). We look at broadcast effects, which may come about through the local distribution of national party positions and campaign messages; interactivity effects, which may come about through direct interaction between candidates and voters; and name recognition effects, which come about through enhancing public recognition of individual candidates. Contradicting a wide range of existing literature we show that the broadcast style of communication is apparently most effective, with no evidence that interactivity or name recognition effects can be generated through social media. We conclude by discussing the significance of our findings for the wider debate about how social media is changing the process of political communication during elections.

Local Campaigning on Global Media: Theorising the Relationship between Candidate Twitter Activity and Vote Outcomes

Our study focusses on the effort individual political candidates put into social media during electoral campaigns: We seek to understand whether this effort translates into a vote dividend for that candidate in their constituency (above the average gain made by their party). In this section, we develop theoretical expectations for when the social media activity of individual candidates might improve their vote outcomes at the constituency level. We build on the study of campaign effects, which has a long history in political science (Schmitt-Beck & Farrell, 2002; Brady, Johnston & Sides, 2006). Within this literature, an important subfield examines how the campaign efforts of individual political candidates in geographically confined constituencies contribute to electoral outcomes. While the effectiveness of local campaigning varies by electoral system (Zittel, 2015; De Winter & Baudewyns, 2015), evidence from a variety of countries supports the idea that local level campaigns can be effective in turning out votes (see, *inter alia*, Caldeira et al., 1990; Huckfeldt & Sprague,

1992; Patterson & Caldeira, 1983; Denver, Hands & Fisher, 2003; Holbrook & McClurg, 2005; Pattie, Johnston & Fieldhouse, 1995). Within this literature, we identify three mechanisms through which local campaigns influence electoral outcomes: *broadcast effects*, whereby national party campaign communications are transmitted at a local level (see, e.g., Fisher, Denver & Hands, 2006); *interactivity effects*, whereby local voters build perceived intimacy with their representative (Lee, 2013); and *name recognition effects* (Broockman & Green, 2014). We will review each of these mechanisms in turn here, highlighting how they might play out over social media, before also considering potential moderating and confounding factors.

Broadcast Effects

One of the core functions of a local campaign is to broadcast messages from the national campaign effort at the local constituency level. Local campaigns have a variety of means at their disposal for achieving this: for example, leafleting, phone banks, holding local meetings, and door-to-door canvassing (Fisher, Denver & Hands, 2006). Simply by acting as this connector to voters, local campaigns may have an effect. Furthermore, while doing this broadcasting, these campaigns can insert local context into the election, for example by emphasising the closeness of the race in a given district (Huckfeldt, Carmines, Mondak & Zeemering, 2007) or connecting national politics to local issues (Fenno, 1977). They can also emphasise the extent of local support for a party, conferring a local-level viability on the campaign, or seek to ‘earn’ press coverage in local media outlets (see Gerber & Green, 2015, p.96). Finally, local campaigns can activate core supporters, making sure they vote and perhaps getting them involved in the campaign (Pattie, Johnston & Fieldhouse, 1995, p.973; McGhee & Sides, 2011)¹.

¹ A counter-point to this idea, however, is that these core supporters would be more likely to vote anyway, which would suggest Twitter ought to make less of a difference. The literature on the differential effects of social media has suggested that online political mobilisation is more likely amongst those who were already highly active and hence might have voted anyway (see the summary in Boulianne, 2015).

Technological innovations have always been crucial in enabling local level broadcasting activities (Fieldhouse & Cutts, 2009, p.369). For example, phone banks have allowed activists to contact more people, whilst detailed demographic data have allowed campaigns to be more sophisticated about where efforts are targeted (Nickerson & Rogers, 2014). There are reasons to suspect social media such as Twitter might be an extension of this trend (Aldrich et al., 2015). For example, Twitter use has been shown to be effective at generating press reaction (Murthy, 2015), which may allow campaigns to gain local media coverage (Knoll, Matthes, & Heiss, 2018, p.4). There is also evidence that Twitter is useful in reaching political partisans (Weaver et al., 2018; Bright, 2018), who may then go on to influence their own friends and social connections (Borge Bravo & Esteve del Valle, 2017; Gil de Zúñiga, Barnidge & Diehl, 2018; Weeks, Ardèvol-Abreu & Gil de Zúñiga, 2017; Barnidge, Ardèvol-Abreu & Gil de Zúñiga, 2018). Hence Twitter may be useful in activating networks of core supporters. And, Twitter lends itself to real-time updates from campaign events, so may be a good forum to build evidence of strong local support for a party (Graham, Broersma, Hazelhoff & van 't Haar, 2013, pp.703-704). These lines of thinking on broadcast communication lead us to our first hypothesis:

*H1: Politicians who make use of Twitter to broadcast campaign communications
will win more votes*

It is worth highlighting that we will not seek in this article to test the potential effectiveness of different types of broadcast messages (for example, by looking in detail at whether issue positions are being communicated or negative statements are being made about the opposition). These messages could take many forms, and the effectiveness of each one is likely to vary by region and party, and also over time. Rather, we will simply look at whether the volume of broadcast communications makes a difference. This approach is consistent with the method used in existing literature on local campaigning, where measures of

campaign ‘intensity’ (such as spending) are typically employed without articulating in detail how the campaign took place (see Denver, Hands & MacAllister, 2004; Fieldhouse & Cutts, 2009); it is also consistent with general models of social media effects on political participation (see, e.g., the models proposed by Cho et al., 2009; Knoll, Matthes, & Heiss, 2018).

Interactivity Effects

A second potential effect of local campaigning is its potential for generating direct interactions between politicians and voters. These interactions help to ‘personalise’ campaigns and allow voters to generate feelings of perceived intimacy with candidates that are impossible to form with a party (Lee, 2013) as well as the opportunity to empathise with them (Langer, 2010). It also allows politicians to illustrate national policy programmes with examples from their own life experience (Zillman & Brosius, 2000), and such interactivity may also increase perceptions of a politician’s responsiveness to public concerns. To the extent that voters feel that they know an individual politician on a personal level, they are more likely to cast a vote for them and by extension their party (Balmas & Sheafer, 2010).

There are good theoretical reasons to believe that social media such as Twitter are particularly capable of generating feelings of perceived intimacy, because they provide opportunities for interactive, two-way communication between voters and politicians (see Labrecque, 2014). Such a communication style allows voters to feel as if they are engaging with politicians on a personal level. While interactive campaigning is possible outside of social media (for example, in town hall meetings or direct door to door canvassing of potential voters), technologies such as Twitter allow interactivity to take place on an unprecedented scale, which Castells (2009) describes as “mass self-communication”. Hence it may be that this type of campaigning is at its most effective on social media.

There is also empirical evidence supporting this idea. Micro-level studies have shown that exposure to interactive social media messages can lead people to feel that they have established a more direct connection with a politician (Utz, 2009; Lee & Shin, 2012; Lee, 2013, Lyons & Veenstra, 2016). Such interaction may also lead to voters feeling more external efficacy, which in turn will boost their likelihood of voting (Halpern, Valenzuela & Katz, 2017). Macro-level studies have argued that using social media in an interactive fashion offers a ‘vote dividend’ (Koc-Michalska et al., 2016; Zeh, 2017), with some studies relating this to the stimulation of more participation on social media (Badak & Podobnik, 2018) and others connecting it to voters’ perceptions of political efficacy (Kobayashi, 2018). These lines of work on the potential impact of interactive messages and the variation in the extent of interactive engagement on Twitter, lead us to propose our next hypothesis:

*H2: Candidates who send more interactive tweets during an election period
will win more votes*

Despite the supporting evidence for the effectiveness of interactive engagements with social media, it is worth noting that empirical research on Twitter campaigning has consistently critiqued politicians for making little use of its interactive features and preferring “the broadcast communication model” (Bentivegna & Marchetti, 2017, p. 138). Indeed, Keller and Kleinen-von Königslöw (2018, pp.1-2) argue that, while politicians often pay lip service to the potential benefits of citizen interaction, this is merely “cyber rhetoric” and not followed through in practice (see also Boulianne, 2016). Larger political forces (Heiss, Schmuck & Matthes, 2018) and ‘populist’ parties (Jacobs & Spierings, 2018) are apparently even less likely to engage in interaction. We will return to this point in the conclusion.

Name Recognition Effects

A final potential effect of local campaigning is to increase the local candidate’s name recognition (Broockman & Green, 2014). Knowledge of a candidate’s name (as opposed to

just the name of their party) may be influential for voters because, all else equal, people have a preference for things with which they are familiar (see Zajonc, 2001). Such familiarity may also enhance perceptions of political ‘viability’, which could also drive vote choice.

Experimental work has shown good evidence that such name recognition effects are impactful at election time (Kam & Zechmeister, 2013). Name recognition is of course already enjoyed, to an extent at least, by incumbent candidates, something which has been used to explain why they are systematically favoured in elections (Fiva & Smith, 2018). It has also been advanced as an explanation for the emergence of political dynasties (Geys & Smith, 2017). Hence the use of local campaigning to build name recognition is particularly important for challenger candidates, especially from smaller parties (Jacobson, 1978; Cutts, 2006; Cutts & Shryane, 2006). Indeed, Kam and Zechmeister (2013) find that name recognition effects “disappear entirely” for incumbent candidates.

There is evidence demonstrating that name recognition effects can be generated through the use of social media (see Kobayashi & Ichifuji, 2015; Alhabash et al., 2016; Scott & White, 2016). In theoretical terms, there are also reasons to believe a forum such as Twitter is particularly useful for generating these effects. Part of the reason for this is that those following politicians on social media will receive information about the number of friends or followers a given candidate has, which may directly enhance their perceptions of viability. Research on Facebook has shown this to be politically powerful (Bond et al., 2012). Another factor is that, as Kobayashi and Ichifuji argue, messages from politicians on social platforms are mixed in with messages from other people that individuals have decided to follow, and the name recognition effect “is amplified when the focal stimuli are dispersed among other irrelevant stimuli” (Kobayashi & Ichifuji, 2015, p.578; see also Bornstein, 1989).

Name recognition effects are challenging to measure directly in an observational setting because they could be caused by exposure to any type of message which contains the

name of the political candidate (and Twitter messages display the name of the person sending them). Hence they can be confounded by the actual content of the message. However, we can make use of the fact that they should be larger for challengers and smaller parties to provide an indirect test of their existence. Therefore we propose a pair of hypotheses:

H3a: Incumbent candidates will receive less of a vote dividend from Twitter use than challenger candidates

H3b: Larger parties will receive less of a vote divided from Twitter use than smaller parties

Moderating and Confounding Effects

We will now move on to address potential moderating and confounding effects of the relationship between Twitter use and vote outcomes. An obvious one is the size of a candidate's potential audience on Twitter, which may relate to the extent to which Twitter is actually used amongst potential voters. Many elections, such as the ones we investigate here, are fought in geographically constrained areas called constituencies, which may well have demographic profiles that vary considerably from the country at large. Demographics are known to be drivers of differential use of Twitter, and, in the UK, users of the platform are younger than average, more likely to be male, more likely to have higher levels of educational qualification, and more likely to be economically better off (findings from Blank, 2017, pp. 683-686; see also Sloan, 2017). They may be more likely than the population as a whole to live in urban areas (Hecht & Stephens, 2014; Barberá & Rivero, 2014). These different demographic profiles of Twitter users mean that we might expect the penetration of Twitter to vary considerably from constituency to constituency. To the extent that Twitter use is effective because it stimulates direct connections with voters we would expect the impact of Twitter campaigning to be greater in areas with higher levels of Twitter use, leading us to our final hypothesis:

H4: Politicians will receive more of a benefit from Twitter use in areas of higher Twitter penetration

In addition to this moderating effect, we would also expect any potential social media effects to be confounded with a number of other factors, which we include as control variables. The most obvious of these is the amount of money spent on the campaign which, as Schmitt-Beck and Farrell say, is “a prominent indicator of a party’s organizational ‘strength’ ...in the district” (2002, p.18). Two types of spending are potential confounders: money for advertising, which may be effective in its own right and may also be correlated with Twitter use as the budget for spending on social media may be related to the overall advertising spend; and money for staff and campaign logistics, which again are likely to be important to the campaign and may also result in increasing Twitter use (as professional staff may run Twitter accounts on behalf of a candidate).

The party to which the politician belongs is also of obvious importance. Parties may well have centrally mandated social media strategies, and in UK elections many voters make decisions on party lines. Parties also run national campaigns, which may be locally effective. Hence, we include the overall, national performance of the candidate’s party as a control variable. Inclusion of this variable allows us to better isolate the effect of local campaigns over and above the effect of national party efforts. The status of a candidate as an incumbent is a further potential confounder: Incumbents may have built up larger and more developed social media presences during their years in power (and also might be more used to using Twitter for campaigning), and incumbents are also more successful in elections generally. Finally, the level of internet penetration in a constituency might have a confounding effect: Internet use is higher in areas which are more affluent, which also often have higher turnout (hence a candidate’s use of Twitter might simply be a signal that they campaign in a high turnout area).

Methods

Sample

Our study is based on data from the 2015 and 2017 UK national elections. We limit our scope to candidates who campaigned in these elections for one of the seven major parties² in one of the 631 electoral constituencies of England, Scotland, and Wales, each of which contains approximately 70,000 people who are registered to vote³. In total, our dataset contains almost 6,000 candidate observations. It should be noted that the 2017 election was comparatively unusual in recent British history, in that it was a sudden decision by then Prime Minister Theresa May called almost three years before the date when an election would have been legally required, meaning that preparations for the election were much shorter than usual, and candidates had less time to organise their campaigns (including their social media profiles).⁴

Measures

The dependent variable for our study is the absolute number of votes a candidate gained in their constituency. We use the absolute number rather than a candidate's percentage vote share as this is a more direct measure of the candidate's performance (whereas vote share in percentage terms is more strongly influenced by the performance of other candidates). However, in practice the two measures produce very similar results. Our main independent variables are based on patterns of candidate activity on Twitter, a social media platform that had approximately 14.8 million UK based users in 2015 and 16.4 million in 2017 (Statista, 2017); relatively large considering the UK had a population of around 65 million in this time period, of which around 45 million were eligible to vote (The Electoral Commission, 2016).

² We define 'major' parties as those which won at least one seat in either 2015 or 2017.

³ The exact number of voters varies slightly by constituency. For details, see: <https://www.ons.gov.uk/peoplepopulationandcommunity/elections/electoralregistration/bulletins/electoralstatisticsforuk/2014-05-01>

⁴ In response to this, in our analysis (in addition to models using all the data), we also produce separate cross sectional models from just 2015 and 2017 – the results are largely the same.

To address our hypotheses, we collected tweets generated by political candidates during our two election periods, making use of a list of Twitter usernames of political candidates released by the civic technology organisation *DemocracyClub*⁵. We conducted an independent verification of the data, which overall was found to be 93% accurate.⁶ For all candidates with an account, we collected tweets produced⁷ from the day after official candidate registration closed up to and including the day before each election.⁸

H1 and H2 are addressed in two ways. First, we divided candidate tweeting activity into three major types: replies, retweets, and ‘original’ tweets. We take the amount of replies and retweets as one indication of the amount of interaction a politician engages in, and use original tweets as one measure of broadcast behaviour. However, it is also possible that the original tweets have significant patterns of interactivity within them. Hence, as a second step, we fit unsupervised topic models on all original tweets using non-negative matrix factorization (Gillis, 2014) for each party in each wave of observation. We selected the number of topics for each party using the method proposed by Greene, O’Callaghan & Cunningham (2014). Two of the study’s authors coded each topic in each party as being related to either ‘broadcasting’ activity (H1) or ‘interacting’ (H2), based on the codebook developed by Graham et al. (2013). Percent agreement between the coders was found to be 88%, with a Krippendorff’s Alpha of 0.69. We then used our topic model to assign each tweet by each candidate into a topic, and hence calculate the amount of interactivity and

⁵ See: <https://democracyclub.org.uk>

⁶ The validation was based on a random sample of the data (116 observations). For each observation in the sample, one of the authors made use of both the Twitter search function and Google to determine if the candidate in question had a Twitter username, and if so to look at if it had been correctly recorded in the dataset.

⁷ In 2015, we collected the data using a commercial partner, Data Sift, which ensured that we did not encounter any rate limit issues. In 2017, we had elevated access to the Twitter Streaming API (Application Programming Interface) and again were able to collect the data without any rate limit issues.

⁸ In 2015 this ran from April 13th to May 6th, whilst in 2017 this ran from May 16th to June 7th.

broadcasting communication the candidate engaged in (a fuller explanation of this process is provided in appendix A1.2).

In terms of our moderator and control variables, we lack a means of estimating the number of Twitter users in a given constituency. Hence, as a proxy, we estimated the number of internet users, on the basis of data generated by Blank, Graham, and Calvino (2017). Because these figures were based on census data (which is only updated once every ten years) we only have one estimate of internet use per constituency (rather than different estimates for our 2015 and 2017 waves). Appendix A1.1 contains details of the estimation process. We also recorded the average vote share of each party in the electoral constituencies in which they competed as a control for party effects (though using a dummy for party membership also produced similar results). We use average share per constituency rather than total national vote share because regional parties such as the Scottish National Party performed well where they were competing but achieved only a fractional vote share overall.

Campaign spending data was made available by the UK Electoral Commission, a public body that monitors the conduct of elections⁹. Our spending data covers all money spent during the campaign period immediately before the election (it is worth noting that, at the time of writing, the 2017 spending data did not include a handful of candidates who had yet to finish their returns; these candidates are dropped from the analysis). The data is divided into spending on advertising and spending on campaign staff and logistics.

Analysis

The main method employed in this paper, consistent with a variety of other studies of the campaign effects of both digital technologies (e.g., Kruikemeier, 2014; Koc-Michalska et al., 2016; Van Noort et al., 2016; Zeh, 2017) and local campaigns (see the summary in

⁹ Available from: <https://www.electoralcommission.org.uk/find-information-by-subject/elections-and-referendums/past-elections-and-referendums/uk-general-elections/candidate-election-spending>

Fieldhouse & Cutts, 2009), is to observe the extent to which effort put into Twitter by candidates in a political campaign correlates with vote outcomes. We produce two types of model: a pooled time series model that includes all observations, and a first-difference model that includes the subset of politicians that campaigned in both elections and is based on changes in dependent and independent variables for those candidates. The first difference approach is a stronger test than a cross sectional study, not only because it focusses on covariance of factors over time, but also because time-invariant effects are ‘differenced’ out: Any independent variables that do not change over time cannot be responsible for a change in the dependent variable (see Wooldridge, 2012, p. 279; Allison, 2009, pp.7-10). First difference models have been used previously in studies of campaign effects as a way of eliminating time-invariant unobserved variables such as charisma which are of obvious importance and yet very difficult to measure (see, e.g., Levitt, 1994).

The method is not without weaknesses. Most importantly, it does not eliminate unobserved time-variant confounders. If candidates in our dataset changed something in a way that correlated with both Twitter use and electoral outcomes (for example, the makeup of their campaign staff) then this has the potential to confound our results. In this respect, it is worth noting that the relatively short time period between the two elections in our study (just over two years, whereas typically they occur at intervals of four or five years) mean that the changes to candidates and their staff are likely to have been less than usual. However, we do not know how great these changes were. Furthermore, it is worth noting that the subset of politicians who campaigned in both elections is biased towards those who are more successful: 52% of those who returned in 2017 had won their seat in 2015, whilst the rest typically scored much higher than the average candidate in the 2015 election. We do not think there is a reasonable way of correcting this bias, which means our first difference models are more reflective of the experience of candidates in major parties who have a

genuine chance of winning their seat, rather than all candidates. We therefore consider our pooled time series to be a more generalizable model, and the first difference to be a more robust check on this model. Having these diverse approaches testing the same theory is a way of strengthening the evidence base (Rosenbaum, 2017, pp.135-136).

Results

Our analytical exercise consists of a set of linear models of the relationship between Twitter use and vote outcomes, contained in Tables 1 and 2 (full summary statistics for all variables are available in appendix A2). All fitted models were analysed with standard goodness of fit diagnostic tests for OLS models. Coefficient estimates, measures of statistical significance and estimates of adjusted R^2 were all computed by bootstrapping ($R=5,000$). Notes on model diagnostics are available in appendix A3.

The models in Table 2 address our first two hypotheses: whether broadcasting campaign communications (H1) or interacting with voters (H2) generate a vote dividend. There are four models (M1.1 – M1.4), and each model has two versions: a pooled time series on all the data, and a first difference model on the subset of candidates who campaigned in both elections. Model 1.1 provides a baseline, which employs all of our main independent variables. This model already has a relatively high adjusted R^2 (0.811 for our pooled time series and 0.740 for our first difference model) showing that our control variables are reasonably comprehensive. Much of the explanatory power of the model derives from the term for the average vote share in the candidate's party.

[Table 1 about here]

Model 1.2 adds in a term for the volume of tweets sent during the campaign. We begin with this simple measure of intensity (before looking at different types of tweets) to establish if there is any evidence that Twitter use makes a difference to vote outcomes. Both

pooled time series and first difference models provide evidence for the idea that use of Twitter does indeed make a small difference: Increasing tweets sent by a factor of 10 increases the amount of votes received by just over 270, or a little over half a percentage point of vote share in an average turnout constituency¹⁰. There is a fractional increase in adjusted R^2 with respect to the baseline model. The consistency of the estimate between the pooled and first difference models (which have very different datasets and modelling strategies) is notable.

Models 1.3 and 1.4 address our hypotheses directly. Model 1.3 splits up tweets sent into two subcategories: original tweets and replies/retweets. There is evidence that the correlations from model 1.2 are based on original tweets: Increasing this type of Twitter activity by a factor of 10 increases votes by around 600 in both models. By contrast there is no evidence that replies and retweets make a difference. Hence there is initial support for H1 but no support for H2. Model 1.4 further splits these original tweets into ‘broadcast’ and ‘interactive’ categories, using the topic models described above. In both models broadcast tweets are the only ones with a statistically significant effect: by just over 400 votes in pooled time series and almost 500 in our first difference models. Hence overall we find support for H1 but no support for H2.

In Table 2 we address Hypotheses 3a and 3b (that Twitter use drives name recognition effects and hence will be more beneficial to smaller parties and challenger candidates). Model 2.1 tests Hypothesis 3a, by adding in an interaction term with the incumbency status of the candidate and the number of tweets sent (in the first difference context, the interaction considers whether the incumbency status changed between the 2015 and 2017 campaigns, and hence takes a value of either -1, 0 or 1). There is some evidence in support of the

¹⁰ Turnout was around 66% in 2015 and 68% in 2017, which would mean approximately 48,000 votes cast in the average constituency in our dataset.

hypothesis, though the picture is not complete: The interaction is significant in our pooled time series (and large enough to eliminate the effect of tweeting entirely). It is not significant in our first difference model, however. Model 2.2 addresses Hypothesis 3b, by adding an interaction term with the size of the party. There is no evidence in support of the hypothesis: the interaction term is actually positive in our pooled time series and is not significant in our first difference model. Because the first difference model is a stronger test, overall we find that there is little support for H3.

[Table 2 about here]

Model 2.3 tests Hypothesis 4, that Twitter effects are greater in areas of higher Twitter use (with our internet use variable being a proxy for Twitter use levels). There is strong support for this hypothesis in our pooled model: Indeed, if Twitter is used in a constituency with less than 71% internet penetration, then the results from using the platform are actually negative (for reference, the median constituency had an internet penetration of 78%, and 52 of the 631 constituencies in the study had a penetration level of less than 71%). However, we cannot address this hypothesis in a first difference context because we do not have separate measures of internet use for the 2015 and 2017 waves of our data¹¹.

Finally, it is worth addressing the size of the effects reported here. Our models are unanimous in suggesting that the impact of Twitter use is small in absolute terms, with increasing tweets sent by a factor of 10 increasing votes by around 270, or approximately half a percentage point in an average constituency. This effect is comparable in size with the effects found in work that has addressed whether social media messages change behaviour at

¹¹ Readers may want to know what the results of the first difference regression would be with the non-differenced internet use level variable included (which would be equivalent to assuming that internet penetration had a varying impact between 2015 and 2017). The interaction term is not significant in the model with all observations included; it is significant in the model which is limited to only those users with a Twitter account. All other results are unchanged.

the micro-level (see the review in Green & Gerber, 2015, pp.96-98), as well as the effects found in work looking at other campaign instruments, though Twitter would be at the smaller end of the scale, a little bit below the impact of live calls from commercial phone banks (Green, McGrath & Aronow, 2013, pp.32-33). The effect is also in the same range as campaign spending (increasing money spent on campaign logistics has about four times the effect of increasing Twitter activity in our pooled time series models), which is significant considering that Twitter is a relatively cheap platform to setup and run. However, as the effort of producing each new tweet is essentially the same, these results also suggest that the returns on Twitter activity diminish. Post-estimations from a semi-parametric version of Model 2.3 suggest that while increasing tweets sent from 10 to 100 provides a clear benefit, beyond that point the effects start to decrease (with the exact point of decrease depending on the internet penetration level of the constituency). According to the model, the ‘ideal’ number of tweets to send was just over 250 in an average constituency (more details of this estimate can be found in appendix A4).

Discussion

The results described above show considerable evidence that there is a connection between the Twitter campaigning activity of local political candidates and votes: A variety of different model specifications were tested with relevant control variables for spending and party performance on two waves of panel data (pooled time series and first difference models). In all of these, there is a positive, statistically significant correlation (albeit one of modest size). Indeed, despite the very different data and design, pooled time series and first difference models produced almost identical estimates. We tested three potential explanations for the link between Twitter use and voting outcomes: broadcast campaigning, interactive campaigning, and name recognition effects. Our evidence suggests that broadcast campaigning is the most likely explanatory mechanism; we show no evidence that interactive

campaigning or name recognition effects make a difference. We also showed some evidence that the size of effect may vary with the amount of internet users in a constituency.

It is worth concluding by reflecting on the theoretical consequences of these findings for electoral campaigns in general. Our results suggest that, considering its apparent effectiveness, broadcast communication on social media will remain a feature of local electoral campaigning; and this in turn raises the question of how politics itself might be changed by the practice. It seems possible that, just like other campaign technologies such as phone banks, Twitter may contribute to increasing patterns of localism within electoral politics, where national campaigns are reframed in different ways in response to local issues. Importantly, whereas in previous UK elections constituency-focussed campaigning had to be highly limited because it was so expensive (Denver, Hands & Henig, 1998), Twitter provides a platform for essentially any constituency campaign to become 'local'. One question for future research, which we did not address here, concerns the extent to which a local politician's broadcast behaviour actively deviates from national party lines, and, if so, whether these deviations are rewarded at the ballot box. A further point worth investigating is that the impact of Twitter might vary according to electoral system. It seems particularly likely to be effective in constituency-based systems, and less so in proportional representation and list-based systems. It might also matter more in electoral competitions where party identification is less important, for example, in primaries or in the allocation of preferential votes in certain list systems. In these electoral contexts, campaigns matter more in general (Bartels, 1987): social media campaigning may also make more of a difference.

The lack of any evidence that engaging in interactive campaigning improves vote outcomes is striking. A considerable volume of literature has highlighted the fact that politicians make little use of the interactive features of social media (see, for example, Keller & Kleinen-von Königslöw, 2018, pp.1-2; Tromble, 2016, pp.682-683; Jungherr, 2016, p. 76;

Ross & Bürger, 2014; Graham, Broersma, Hazelhoff & van 't Haar, 2013). The evidence presented here may explain this fact: Replying to messages, retweeting or engaging directly with the public does not seem to be a vote winner. We speculate that, even while experimental work has shown potential advantages to interactive behaviour (e.g., Lee & Shin, 2012), when considered at the scale of a campaign it is impossible to interact enough in order to make a meaningful difference, as individual interactions are by definition small scale. Of course, as Farrell and Schmitt-Beck highlight (2002, pp.13-15), there are many ways that campaigns can make a difference, and it may be that interactivity offers other more long-term dividends (perhaps by increasing external efficacy which may have knock on effects for turnout), but in the short term it doesn't seem to matter. Our results hence suggest that we are unlikely to see more interactive behaviour from politicians in the future.

A final theoretical point concerns the fact that there was little evidence for name recognition effects. Our models looking at incumbency produced diverging results. One way of explaining this is that the candidates in our first difference model are more likely to be career politicians who already have some level of name recognition (regardless of their actual incumbency status). However, even if this were the case, it is interesting to note that Twitter use is still significant in the first difference model (if Twitter was only useful for driving name recognition, then we would expect the results in our first difference model to be insignificant as all of the candidates in the model already have such recognition). And, of course, our models on party size produced no evidence of an effect in support of smaller parties. Our data hence point to two conclusions: First, contra Kobayashi & Ichifuji (2015), our data support the idea that Twitter effects are not only driven by name recognition (even if this may be part of the story), and, second, our data show that there are opportunities on social media for incumbents as well as challengers (even if the opportunities for challengers are potentially greater).

We should, finally, highlight the weaknesses in the study. First, we address only one social media platform. We do not know the extent to which the use of Twitter correlates with use of other types of social media (such as Facebook and Snapchat), hence we are unable to say to what extent it is Twitter itself that makes the difference, as compared to other platforms. Stier et al. (2018) have suggested that candidates divide their labour across social platforms and make use of Twitter more for strategic commentary on ongoing issues and less for campaign updates. Future work that studies whether these different strategies have different effects would be highly valuable. Second, we are not able to distinguish between different potential pathways through which Twitter effects take place: We do not know if they occur through direct connections with voters on the platform or are mediated through opinion leaders or news outlets. We also do not know if votes are stimulated amongst people already supporting the candidate (i.e., if it is largely about mobilisation) or whether actual conversion of voters from other candidates happens. Finally, we treat observations in our dataset as if they are the result of separate, independent electoral campaigns, but this is not the case. Candidates face each other in constituencies: Two brilliant campaigns might cancel each other out and hence produce no result in our data. Only a field experiment could truly address these deficiencies. Absent this, however, we believe that this study is the strongest treatment yet of the effect of political campaigning on social media.

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Tables

Table 1

OLS regressions of the relationship between Twitter use and vote share outcomes

	Pooled time series			
	M1.1	M1.2	M1.3	M1.4
Intercept	-11,962***	-11,788***	-13,787***	-14,278***
#Tweets (log ₁₀)		272***		
Original tweets (log ₁₀)			645***	
Replies & retweets (log ₁₀)			-222	
Broadcasting (log ₁₀)				402**
Interacting (log ₁₀)				146
Internet use	15,045***	14,480***	17056***	17,566***
Advertising (log ₁₀)	33	16	-119	-159*
Staff (log ₁₀)	1,102***	1,081***	1249***	1,292***
Incumbent MP	10,242***	10,216***	9678***	9,499***
Party vote share	318***	316***	323***	326***
2017 wave	119	228	352*	443**
Adjusted R ²	0.811	0.812	0.797	0.791
Observations	5,847	5,847	4,091	3,650

	First difference			
	M1.1	M1.2	M1.3	M1.4
Intercept	192*	251**	86	95
Δ Tweets (log ₁₀)		278**		
Δ Original tweets (log ₁₀)			605**	
Δ Replies & retweets (log ₁₀)			-97	
Δ Broadcasting (log ₁₀)				490***
Δ Interacting (log ₁₀)				108
Δ Advertising (log ₁₀)	14	14	-6	1
Δ Staff (log ₁₀)	33	25	71	66
Δ Incumbency	768**	783**	901**	899**
Δ Party vote share	629***	626***	650***	648***
Adjusted R ²	0.740	0.741	0.722	0.721
Observations	1027	1027	792	792

Note. Pooled time series models have absolute number of votes as a dependent variable. Difference in votes is the dependent variable for the first difference models. Coefficients, significance levels and R² calculated using bootstrapping (percentile method, 5,000 repetitions). P-values are indicated as follows: * p < 0.05 ; ** p < 0.01; *** p < 0.001

Table 2

Further OLS Models

	Pooled Time Series		
	M2.1	M2.2	M2.3
Intercept	-11,666***	-11,653***	-6,568***
#Tweets (log ₁₀)	381***	79	-3,893***
Internet use	14,205***	14,569***	7,678***
Incumbent MP	11,193***	10,209***	10,266***
Advertising (log ₁₀)	10	24	26
Staff (log ₁₀)	1,077***	1,078***	1,074***
Party vote share	315***	304***	317***
#Tweets (log ₁₀) * Incumbency	-623***		
#Tweets (log ₁₀) * Party vote share		10*	
#Tweets (log ₁₀) * Internet use			5,366***
2017 Wave	259*	218	213
Adjusted R ²	0.812	0.812	0.813
Observations	5,847	5,847	5,847

	First Difference	
	M2.1	M2.2
Intercept	251**	244**
Δ Tweets (log ₁₀)	259**	265*
Δ Incumbency	822**	772**
Δ Advertising (log ₁₀)	11	13
Δ Staff (log ₁₀)	25	27
Δ Party Vote Share	625***	628***
Δ Tweets (log ₁₀) * Δ Incumbency	148	
Δ Tweets (log ₁₀) * Δ Party vote share		7
Adjusted R ²	0.743	0.742
Observations	1,027	1,027

Note. Pooled time series models have absolute number of votes as a dependent variable. Difference in votes is the dependent variable for the first difference models. Coefficients, significance levels and R² calculated using bootstrapping (percentile method, 5,000 repetitions). P-values are indicated as follows: * p < 0.05 ; ** p < 0.01; *** p < 0.001