



# Understanding variations in user response to social media campaigns: A study of Facebook posts in the 2010 US elections

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**Michael A Xenos**

University of Wisconsin–Madison, USA

**Timothy Macafee**

Concordia University Wisconsin, USA

**Antoinette Pole**

Montclair State University, USA

## Abstract

Political candidates increasingly have incorporated social media tools like Facebook into their campaigns. Such tools enable supporters to interact directly and easily with campaigns, creating an immediate and relatively informal way for users to respond to candidate messages and publicly display their support. Previous research has explored how campaigns have used social media, or how the use of social media may be related to political engagement. In this study, we provide a systematic analysis of variations in user response to candidate messaging through Facebook. Our results shed new light on the dynamics of online campaigning through social media and engagement with supporters through digital media. Specifically, our findings show that variations in the tone, timing, and content of posts, as distinct from contextual factors, are significantly related to how users respond through “likes” and comments.

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## Corresponding author:

Michael A Xenos, Department of Communication Arts, University of Wisconsin–Madison, 6110 Vilas Hall, 821 University Ave., Madison, WI 53706, USA.

Email: [xenos@wisc.edu](mailto:xenos@wisc.edu)

## Keywords

Demand-side, negative campaigning, online campaigning, political engagement, social media, supply-side, user response

## Introduction

Social media tools have become commonplace in political campaigns around the world. One of the distinctive features of such tools is that they create an immediate and informal way for users to respond to candidate messages and publicly display their support. In some cases, this can be quite dramatic. For example, at the height of his re-election campaign in 2010, United States House of Representatives Speaker John Boehner garnered 3911 “likes” and 1163 comments in response to a simple post about fiscal responsibility, jobs, and repealing “ObamaCare.” In other cases, the responses are more anemic and draw less engagement than an average person might receive in response to a post about a new haircut or an unusually photogenic lunch. For instance, during the same week as Boehner’s post, Mark Reed’s unsuccessful campaign for California’s 27th congressional district posted an emphatic rallying call to supporters featuring exclamation points, copious capitalization, references to his television advertising blitz, and links to his campaign website. That post was “liked” by just four people and received one, solitary comment.

In this article, we explore factors that help explain what distinguishes these two examples and similar variations across many similar posts, in an effort to advance our understanding of the dynamics created by an increasingly interactive online campaign environment. Many of these factors are straightforward and have more to do with candidates and the context of their races than their decisions about what or when to post. In the above examples, for instance, one might explain the differences by citing Boehner’s significant visibility and incumbent advantage. In Reed’s case, one might note that despite having the resources to mount a paid advertising campaign, he had little chance of winning and finished the race with only 34.8% of the vote. How much these factors contribute to user response generally and whether factors such as the tone, timing, and content of posts may also substantially affect user response, however, remain open questions subject to much speculation but little empirical analysis.

To address these questions, we analyze user response patterns associated with variations in posting behavior among a representative sample of US House, Senate, and Gubernatorial candidates from the 2010 midterm elections. Our findings demonstrate the importance of attending to the dynamic relationships between how candidates and ordinary users interact in social media by showing that *how* candidates use digital media tools can significantly affect patterns of user response, even after controlling for contextual factors. By examining variations in campaign messaging through social media and their immediate consequences at a greater level of detail than previous studies, this article sheds light on specific ways in which candidates may actively shape how digital media affect contemporary democratic processes, focusing on the online engagement of supporters during election campaigns.

## Digital media, political campaigns, and user engagement

Research on digital media and political campaigns has developed mainly on two distinct tracks. The first focuses on the “supply-side” of online political communication as discussed by Gibson (2012) in her review of online campaigning research conducted in democracies around the world. This work addresses questions concerning whether and how campaigns use digital media, and has revealed which candidates are most likely to use particular online campaigning affordances or features in different circumstances (Bimber and Davis, 2003; Druckman et al., 2009; Foot and Schneider, 2006; Gulati and Williams, 2007; Vergeer, 2012; Xenos and Foot, 2005). The second track addresses what Fraefel (2012) has termed the “demand-side” of online campaigning in her research on Swiss political parties. Work in this vein explores the potential impact of online campaigning on vote shares, as well as relationships between attending to political information found online and various forms of participation in campaigns and elections among individuals (Bimber, 2003; Gibson and McAllister, 2011; Mossberger et al., 2007; Williams and Gulati, 2008; Xenos and Moy, 2007).

The diffusion of Web 2.0 technologies among political campaigns provides an opportunity for the integration of supply-side and demand-side research on the Internet and elections. Indeed, we contend that understanding the role of social media tools in contemporary campaigns requires such integration, through research designs that explicitly account for the ability of users (candidates and prospective voters alike) to interact easily through posts, comments, “likes,” and other common affordances. Although a wealth of research explores supply-side and demand-side perspectives individually, little work has focused directly on questions concerning how citizens and candidates directly interact in these relatively new platforms for online campaigning (for notable exceptions, see Nielsen and Vaccari, 2013; Vaccari and Nielsen, 2013).

Within the specific realm of social media and campaigns, one finds a similar pattern of supply-side and demand-side research. On the supply-side, researchers have explored the rise of social media as a campaign tool. Research in this vein has identified numerous contextual factors that explain candidate behaviors in social media. In their study of US campaigns in 2008, for example, Williams and Gulati (2009) found that non-incumbent candidates, those with more financing, and those in competitive races were most likely to update their social media pages, while incumbents showed the highest volume of posts. In their study of social media use among Members of Parliament (MPs) in New Zealand, Ross and Bürger (2014) point to more individualized factors, such as the personal backgrounds of MPs and their beliefs about the efficacy of social media campaigning.

On the demand-side, research has similarly mirrored earlier scholarship. That is, researchers have explored individual-level effects of social media use on political engagement, with generally consistent results. In their study of college students’ engagement with Facebook groups in the 2008 presidential election, for example, Fernandes et al. (2010) found that these online communities provided a space for political dialogue and engagement. Other researchers have found similar types of engagement with candidates in an online setting to be related to lower levels of political cynicism, and higher levels of offline political participation (Conroy et al., 2012; Hanson et al., 2010; Macafee

and De Simone, 2012). With a broader view, both conceptually and geographically, Loader et al. (2014) have examined relationships between general social media use and a host of traditional and non-traditional forms of political engagement, within the context of what they term the “networked young citizen.” Borrowing a term popularized by Facebook users involved in unusual romantic relationships, however, Vitak et al. (2011) argue that relationships between these variables may be more “complicated.” Indeed, although Vitak et al. (2011) found similar relationships between political activity on Facebook and offline participation, they also found a negative relationship between general Facebook use and political engagement.

Overall, we believe research in this area demonstrates the significance of interactions between candidates and their supporters within social media, but thus far leaves important dimensions of these interactions unexplored. An important limitation to this scholarship is the relatively general treatment of social media, which obscures important and substantial variations in social media campaign activity revealed by supply-side studies. Just as research on Internet use and political engagement has benefitted from distinguishing between different kinds of Internet use, users with differing socioeconomic backgrounds and interests (Shah et al., 2001), and even between specific sites users visit (Lupia and Philpot, 2008), research on social media in campaigns can benefit from exploring how variations in candidates’ use of these tools may directly affect how potential supporters engage candidates through social media.

Studies that have examined relationships between social media campaigning and vote shares attend somewhat to these dynamics, but suffer from other limitations. One limitation is that the measurement of Web 2.0 campaign inputs in these studies has been relatively narrow. Specifically, existing studies exploring candidate social media activity and vote shares in the United States and Australia typically have used simple binary variables indicating whether candidates provided or updated their profiles in social media, or used other kinds of Web 2.0 tools (e.g. Gibson and McAllister, 2011; Williams and Gulati, 2007). Another limitation is that by taking the candidate as the principal unit of analysis, existing studies implicitly examine the impact of a candidate’s overall social media style or approach, overlooking variations in individual posts (e.g. Vaccari and Nielsen, 2013; Williams and Gulati, 2008). For these reasons, we believe these studies provide a limited picture of the dynamics of candidate and supporter interaction and engagement enabled by social media campaigning.

In this study, we seek a more comprehensive integration of supply- and demand-side dynamics in online campaigning that addresses these limitations and better reflects the distinctly interactive nature of social media campaigning. Specifically, we model variations in user engagement through social media as a function of more precise indicators of social media campaigning, while controlling for contextual factors.

## **User response to social media campaigning**

Our primary outcome variable is user response to candidate activities within social media. Although references to “social media buzz” are commonplace, and a number of researchers have begun to explore social influence as “networked influence” (Gruzd and Wellman, 2014), precise concept explications of user response within scholarly accounts

are rare. We conceive of user response as observable activities directly connected to specific candidate communications within social media. User response thus includes general indicators such as friending or following a candidate, but places a sharper focus on dynamic phenomena such as “liking,” commenting on, or otherwise responding to *distinct* posts, tweets, or similar digital objects, which can display a wide variability in terms of factors such as content and timing. User response may be distinguished from concepts like “going viral,” in that it encompasses not only the extreme upper bounds of activity, but also the lower bounds and everything in between. To be sure, previous research has shown some forms of user activity to approximate power-law distributions, with a few candidates garnering very large levels of response and the rest “labor[ing] in relative obscurity” (Nielsen and Vaccari, 2013). The “in between” portion of such distributions is sparse. This does not discount the significance of user response, however, nor does it rule out the possibility that there are meaningful and observable relationships between candidate activities online and variations in user response.

For candidates, user response is both a resource, and an indicator of other resources. The “major conclusion” of Williams and Gulati’s (2008) study of US Facebook campaigning in 2008 was that such activities are considered “an important additional indicator of candidate viability” (p. 16). More directly, as noted earlier a number of studies have shown that engaging in activities such as “liking” and commenting on candidate posts in social media is significantly associated with political engagement among supporters (Conroy et al., 2012; Hanson et al., 2010; Macafee and De Simone, 2012). Considering that activities such as commenting on candidate Facebook pages also predict positive attitudes toward candidates (Sweetser and Lariscy, 2008), this relationship suggests that user response represents a tangible form of mobilization potential for candidates, identifying and further solidifying the commitment of supporters. Further evidence for the significance of user response for candidates lies in the growing number of studies examining the relationship between social media response and electoral fortunes. Conducted in Germany, New Zealand, and the United States, this research reveals relationships between rough indicators of user response and vote shares (Cameron et al., 2013; Tumasjan et al., 2010; Williams and Gulati, 2008). For these reasons, we believe greater understanding of user response to be of particular interest to candidates and their campaigns.

Apart from their practical significance to candidates and campaigns, questions concerning variation in user response also hold implications for broader theoretical discussions of digital media and political communication. Our specific questions focus on isolating variations based on factors that candidates directly control, after separately accounting for the influence of forces beyond their immediate control (i.e. factors such as party or incumbent status, and characteristics of the races and geographic spaces in which they occur). Such questions focus attention on relationships between *how* candidates use social media on the one hand, and observable political outcomes (such as increased activity from supporters) on the other, as opposed to familiar questions focused on variations in candidate adoption or citizen use of particular kinds of tools. By directly integrating both the supply- and demand-side dynamics of online campaigning, we believe focusing on variations in user response mirrors contemporary digital media practices in a Web 2.0 environment. More important, we believe that to the extent that

supply-side choices may be shown to predict demand-side variations, such work can help to further illuminate the ways in which political actors can actively shape how digital media affect contemporary democratic processes. Indeed, by connecting subtle variations in how candidates use social media to observable patterns of user response, we hope to shed new light on a variety of existing studies in both the supply- and demand-side literatures.

## Theory and hypotheses

Our consideration of user responses to candidate messaging in social media progresses in two stages. We begin by identifying contextual factors, largely beyond the control of individual campaigns, which might explain variations in user response. We then discuss how specific characteristics of individual posts may have distinct effects on levels of user response, controlling for these contextual factors.

In identifying contextual factors that may affect levels of user response independent of candidate posting behavior, we draw on previous research on campaigns and elections as well as online campaigning. First, the literature surrounding campaign intensity articulates a number of theoretical expectations regarding the relationship between the closeness, or intensity, of a given race and the overall amount of activity and engagement displayed by candidates and voters (Kahn and Kenney, 1999). Since more intense campaigns traditionally feature greater levels of offline citizen engagement, we expect a similar pattern within social media. The closer the contest, the greater effort all interested parties invest in attempts to secure victory by mobilizing or swaying decisive votes, and in our contemporary environment such activities regularly play out in social media. Second, based on the broader literature on campaigns and elections (Herrnson, 1995), and early work on web campaigning (Foot and Schneider, 2006), we expect that membership in a major party and incumbent status should also provide significant advantages to candidates in terms of responses to campaign messages posted in social media. Because the pool of individuals exposed to online campaign materials are typically “friends” or “fans” of the candidate, and further, because major party membership and incumbency correlate strongly with having a larger base of such supporters, we expect posts by major party candidates and incumbents to generate greater user response. Third, social media tools such as Facebook are of unique utility to campaigns that operate over larger amounts of physical space (Xenos and Pole, 2011). Therefore, we expect the territory covered by the campaign also will play a role in determining user response. Again, while we expect these factors to explain some of the variation in user responses to candidate posts, and it is necessary to control for such factors in our analyses, the relative explanatory power of these contextual variables is unknown. We thus pose the following research question:

*RQ1.* To what extent do contextual factors, such as race, candidate, and district or state characteristics, explain levels of user response to campaign messaging in social media?

Next, we turn to variables over which campaigns have considerably more control. An important example of this is negative campaigning. Although largely absent from

scholarship on online campaigning, research on negative campaigning is particularly relevant to understanding variations in user engagement through platforms such as Facebook. Initiated by the work of Ansolabehere and Iyengar (1994), which posited a demobilizing effect for negative campaign messages, this literature has been characterized by dramatic growth and a variety of findings. Indeed, in response to the claim that negative campaigning demobilizes citizens, researchers subsequently have contended that such messaging has no effect (e.g. Krasno and Green, 2008), or that its effect is actually positive (e.g. Martin, 2004). A thorough discussion of this literature is beyond the scope of our principal research goals. We believe, however, that it is reasonable to expect that levels of user response might be positively associated with negative campaigning through social media, in part because in contrast to broadcast media, communications in social media are generally between candidates and individuals with whom they already have some connection. Although the findings of research on the effects of negative campaigning on turnout are mixed, there are relatively consistent and positive findings regarding effects on cognitive engagement (Lau et al., 2007). Given these considerations, and that one of the distinctive features of social media campaigning is the relative ease with which individuals can register a response—in terms of “likes” this can be done with a single click—we predict that negative messaging in social media should be associated with greater levels of user engagement:

*H1.* User response will be positively associated with negative messaging in social media.

We derive a second hypothesis regarding user response to variations in social media campaigning from classic principles of web usability. As noted previously, although many candidates have adopted social media as a campaign tool, existing studies suggest there is significant variation in terms of the frequency with which candidates post to social media (Williams and Gulati, 2007, 2009). Basic tenets of usability research indicate a positive relationship between frequently updated web objects and user engagement (Tung et al., 2009). In addition, government websites that are frequently updated with timely information support greater levels of user-interaction (Wangpipatwong et al., 2005). Moreover, user response is fundamentally an interactive activity occasioned by candidate posting. Thus, we expect frequent posting behavior on the part of candidates to be positively related to user engagement:

*H2.* User response will be positively related to the frequency of candidate posts in social media.

Finally, as demonstrated in earlier research, the activity of candidates on platforms like Facebook can include different kinds of posts, which may also affect user response. For example, although they ultimately combined these into a single index of “Facebook activity,” Williams and Gulati (2009) documented a variety of different kinds of candidate wall posts. Similarly, our initial examination of the data confirmed what politically interested Facebook users likely already suspect, which is that candidates generally draw from a stable yet diverse set of post types. Endorsements, links to media coverage, and



thank-you messages are commonplace, but there are other common forms of posts as well, which we will discuss in the next section. Given the dearth of research directly examining variations in post content and user response, however, with respect to these variations we offer the following research question rather than a hypothesis:

*RQ2.* How do variations in the content of candidate posts in social media correspond to variations in user response?

## Data and methods

Our data come from US election campaigns in the fall of 2010. We began by drawing a random sample of all 511 House, Senate, and Gubernatorial elections held in 2010. The resulting sample included 100 races, of which 35 were rated as “lean” or “toss-up” by the Cook Political Report. Comparison with the full universe of races did not reveal significant differences with respect to the proportions of candidates seeking various offices, the proportions affiliated with different parties, or the proportion of competitive races.

With the sample of races determined, we turned to candidate identification and coding. Specifically, we identified the official candidates in each race, as well as their party and incumbency status. A total of 366 candidates competing in the 100 sampled races were identified. In all, 254 of these candidates created public Facebook accounts and used them in their campaigns. These pages were archived between 30 October and 1 November 2010, consistent with the archival strategies of previous research into social media campaigning (Sweetser and Lariscy, 2008; Williams and Gulati, 2007). To simulate what a prospective voter might encounter if they visited a candidate’s page the weekend before Election Day, we archived the “default view” of these pages, which provided a snapshot of the candidate’s wall (if provided by default), and up to 15 posts (9 on average). To keep the total number of posts manageable, while still gathering enough observations for our models, we then randomly selected half of those candidates with Facebook accounts for our detailed analysis of individual posts. The final dataset analyzed for this study included 128 candidates (97 of whom featured the “wall” as their default view), and 1162 posts.

We used human coders to generate post content and user response measures. After training the coders, we conducted inter-rater reliability (IRR) analysis using new subsamples for each IRR testing set. For each variable, we calculated a Krippendorff’s alpha and simple percent-agreement measures. This process generated IRR sets with 100% agreement for all of the coding variables used in this study except for three. In the discussion that follows, we only report reliability figures for those three measures.

Our principal dependent measures capture two forms of user engagement within Facebook. Specifically, for each post, we recorded the number of *likes* a post received, as well as the number of *comments* it received. The distributions of these variables are markedly skewed (*likes*:  $M=1.85$ ,  $SD=2.21$ ; *comments*:  $M=.45$ ,  $SD=2.25$ ).

We also collected data on relevant contextual variables. For each candidate, we recorded whether they belonged to a *major party*, and their *incumbency status*. To control for variations in the potential audience for each post introduced by the number of users who had a specific connection to the candidate through Facebook, we also



collected data on the number of *supporters* each candidate had as reflected by the number of users who have *liked* a candidate's page, or the number of *friends* for candidates using their personal account as a campaign tool. In addition, we also collected data on the final *vote margin* for each race (absolute value of Democratic vote share minus Republican vote share). The last measure is strongly and negatively correlated with campaign intensity (Kahn and Kenney, 1999), so we use vote margin to operationalize intensity in exploration of *RQ1*. Finally, we also recorded the physical area covered by the race in thousands of square miles (*area*). In US House races, this corresponds to the size of the district, while in Gubernatorial and Senate races this is a measure of each state's size.

To enable tests of *H1* and *H2*, we coded each post for *tone*, and *periodicity*. For tone, our coding techniques were adapted from studies of television advertising in campaigns, such as the Wisconsin Advertising Project (e.g. Ridout and Franz, 2008). Specifically, we asked coders to determine whether posts were best characterized as *promoting* the candidate, *attacking* the candidate's opponent, or *contrasting* the candidate and opponent. Coders could also indicate that a post was *none of the above*. As distinct from television ads, we found that a large majority of posts promoted the candidate (87%), while fewer were coded as attack (6%), contrast (4%), or none of the above (3%). We recoded this measure into a series of dummy variables, using *promote* as the reference group. To measure periodicity, we asked coders to compare each post to its immediate predecessor and examine the time-stamps. Specifically, coders indicated whether the time between posts was within *1 hour* (4), *1 day* (3), *1 week* (2), or a period *over 1 week* (1). Inter-coder agreement for this variable fell short of 100%, but the Krippendorff's alpha is still quite acceptable ( $\alpha = .94$ , calculated for an ordinal variable). The average duration between the majority of posts is just over 1 day ( $M = 2.809$ ;  $SD = .799$ ). Considering the total span of time covered for each candidate, or the amount of time between the newest and oldest posts, we observed a mean of 27 days, and a median of 10 days. In the results that follow, increasing values for periodicity indicate more frequent posting behavior.

Finally, to explore *RQ2* we examined whether each post included mentions of endorsements, photos, media mentions, references to campaign ads, calls to donate, calls to action, and messages of thanks (Yes = 1, No = 0). We found that calls to action (present in 35% of posts) and media mentions (32%) were the most common attributes, and photos (14%), thanks (11%), endorsement (8%), campaign ads (8%), and calls to donate (2%) were relatively less common. Among these variables, calls to action and thanks also fell short of perfect inter-rater agreement. The Krippendorff's alphas for the associated IRR tests were also somewhat lower than that achieved in coding periodicity (for calls to action,  $\alpha = .60$ ; for thanks,  $\alpha = .65$ ). However, simple agreement for these variables was reasonable (80% for calls to action and 97% for thanks).

## Analysis and results

To test our hypotheses and explore our research questions, we specified a series of regression models. We began with a baseline model in which user response was regressed on contextual variables, and then incorporated additional blocks of variables into the model representing the tone, timing, and content of posts, in each case testing the extent

to which these new variables increased explanatory leverage over user response. Because our outcome variables of interest are fundamentally counts of likes and comments, and considering the distribution of these variables (variance surpasses the mean in both cases), we chose to use negative binomial regression models (Hilbe, 2011). Such an approach enables us to test hypotheses and investigate research questions by examining specific coefficient estimates as well as testing the extent to which additional blocks of variables improve the fit of the overall model (Weber, 2014). The results of these analyses, including the assessment of Wald or likelihood ratio tests, and other goodness-of-fit measures taken upon the addition of each new block, are described below. Specifically, we begin with a description of the performance of each block of variables as they are added to the models and then provide a discussion of the findings relative to specific hypotheses and research questions. The results from the final models are summarized in Table 1.

In the analysis of likes associated with candidate posts, our baseline model included only contextual variables (i.e. major party, incumbent status, number of supporters, vote share margin, and area) and yielded significant results, as expected (Wald  $x^2=1026.33$ ,  $df=5$ ,  $p<.01$ ). Next, we added a series of binary variables for tone factors, examining *negative*, *contrast*, and *none of the above* posts against the reference category of *promote* postings. The Wald test indicates that the tone variables have additional and distinct influence over the contextual factors (Wald  $x^2=1063.07$ ,  $df=8$ ,  $p<.01$ ). In addition, both the Bayesian Information Criterion (BIC) and Akaike Information Criterion (AIC) register notable drops (from 8306.42 to 8274.05, and from 8271.69 to 8224.46, respectively) as we add the tone variables into the model. The third model accounts for the time elapsed between posts, and again, the Wald test suggests the frequency variable explains significant additional influence (Wald  $x^2=979.91$ ,  $df=9$ ,  $p<.01$ ). We also see strong increases in goodness-of-fit with the addition of this variable. Specifically, we see a decrease of 634.2 in the BIC and a decrease of 638.2 in the AIC, providing further evidence that periodicity makes a specific contribution to the overall model. The fourth and final model considers post content features and we find that these also explain additional variance, according to the Wald or likelihood ratio test (Wald  $x=1024.63$ ,  $df=16$ ,  $p<.01$ ). Interestingly, although the AIC decreases by 30.7 as we move from the third to the fourth model, the BIC actually increases slightly by 3.4, suggesting a mixed story regarding the contribution of content variations to explaining counts of likes for individual posts.

We employed the same modeling strategy in our analysis of comments, including only the contextual variables in model one, which provided results similar to those found with our analysis of likes (Wald  $x^2=594.67$ ,  $df=5$ ,  $p<.01$ ). As in the first model, the Wald or likelihood ratio test suggests that adding variations in tone to the model offers a significant explanatory power (Wald  $x^2=633.52$ ,  $df=8$ ,  $p<.01$ ). With respect to the goodness-of-fit measures, we see a BIC decrease of 27.7 and an AIC decrease of 42.6 with the inclusion of the tone variables. A Wald test evaluating the third model, which includes the periodicity variable, in comparison to the second model, yields a significant result (Wald  $x^2=603.45$ ,  $df=9$ ,  $p<.01$ ). Turning to the fit indices, the BIC value decreases by 500.1, while the AIC decreases by 504.1. Finally, with the inclusion of the content variables in the fourth model, we find a significant Wald test (Wald  $x^2=632.34$ ,  $df=16$ ,  $p<.01$ ), but a mixed picture on goodness-of-fit with the BIC increasing by 19.2 and the

**Table 1.** Explaining variation in “likes” and comments for candidate posts.

	Comments	Likes
<i>Campaign context</i>		
Major party	1.69 (.16)***	2.21 (.13)***
Incumbent	.81 (.14)***	.45 (.12)***
Supporters	.00 (.00)***	.00 (.00)***
Margin	-.00 (.00)**	-.02 (.00)***
Area	.01 (.00)***	.01 (.00)***
<i>Tone</i>		
Attack	.91 (.23)***	.61 (.19)***
Contrast	.43 (.25)#	.23 (.20)
Other	-1.23 (.35)***	-1.51 (.28)***
<i>Timing</i>		
Freshness	-.47 (.08)***	-.21 (.06)***
<i>Content</i>		
Endorsement	.00 (.19)	.55 (.16)***
Photo	-.52 (.18)**	-.23 (.15)
Media	.07 (.12)	-.02 (.10)
Ads	.35 (.20)#	.38 (.16)*
Donate	-1.13 (.45)**	-1.08 (.36)**
Action	-.32 (.12)**	-.27 (.10)**
Thanks	-.34 (.17)*	-.12 (.13)
Intercept	1.32 (.27)***	1.54 (.23)***
N	964	964

Cell entries are negative binomial regression coefficient estimates. Standard errors appear in parentheses. Dispersion parameter for “Likes” model = 1.52. Dispersion parameter for “Comments” model = 2.47. Final models include somewhat fewer cases owing to list-wise deletion of cases involving posts for which “immediately preceding” posts are unavailable (i.e. freshness).

# $p \leq .10$  \* $p \leq .05$ , \*\* $p \leq .01$ , \*\*\* $p \leq .001$ .

AIC decreasing by 14.9. Considering the extent to which election-specific contextual factors explain user response, we find these factors do matter, as illustrated by the significant Wald test for both of the first models.

Membership in a *major party* ( $B = 1.69$ ;  $p \leq .001$  for comments;  $B = 2.21$ ;  $p \leq .001$  for likes) status as an *incumbent* ( $B = .81$ ;  $p \leq .001$  for comments;  $B = .45$ ;  $p \leq .001$  for likes), and the greater the size of the area in which the election took place ( $B = .01$ ;  $p \leq .001$  for comments;  $B = .01$ ;  $p \leq .001$  for likes) are all positively and significantly associated with greater user response. Intuitively, these results make sense in that constituents are likely more familiar with major party and incumbent candidates, relative to their counterparts. In addition, consistent with the literature on campaign intensity, we find a small, but negative and significant relationship between vote share *margin* and *likes* ( $B = -.00$ ,  $p \leq .01$ ), as well as comments ( $B = -.02$ ,  $p \leq .001$ ). Finally, as expected, the number of supporters for each candidate is also significantly and positively associated with both comments and likes ( $p \leq .001$  in both cases) although the magnitude of these effects is such that noticeable differences only register at the scale of hundreds of thousands of supporters.

For negative posts, we find that these are significantly associated with more likes and comments ( $B = .91$ ;  $p \leq .001$  for comments;  $B = .61$ ;  $p \leq .001$  for likes). Contrasting posts, however, are only found to be positively related to comments at the marginal level of significance ( $B = .43$ ;  $p \leq .10$ ). Posts without a clear positioning relative to the campaign are associated with significantly less user engagement ( $B = -1.23$ ;  $p \leq .001$  for comments;  $B = -1.51$ ;  $p \leq .001$  for likes). These findings lend strong support to *H1*, which posits a positive relationship between negative social media messaging and user response.

Turning to the frequency of candidate posts, treated in *H2*, we find that the more recent the post is in relation to the preceding post, the less users respond ( $B = -.47$ ;  $p \leq .001$  for comments;  $B = -.21$ ;  $p \leq .001$  for likes). This finding is contrary to our hypothesis, which expects timeliness or freshness of posts to positively predict user response in the form of likes and comments. Instead, posts appear to garner more user response the longer they linger. We will return to the dynamics that might be responsible for this finding, and their implications, in our concluding discussion.

Lastly, *RQ2* asked whether variations in post content further explain patterns of user response. Altogether, the results suggest that content variations are indeed related to user response. These effects vary, however, by content type as well as their relationships to likes and comments. For example, our results suggest that posts about endorsements are positively related to likes ( $B = .55$ ;  $p \leq .001$ ). Photos, however, appear to be negatively related to user comments ( $B = -.52$ ;  $p \leq .01$ ). While posts involving media content appear unrelated to user response, posts involving advertisements are positively related to user response ( $B = .35$ ;  $p \leq .10$  for comments,  $B = .38$ ;  $p \leq .05$  for likes). Calls for donations are negatively related to both comments and likes ( $B = -1.13$ ;  $p \leq .01$  for comments,  $B = -1.08$ ;  $p \leq .01$  for likes). Similarly, calls to action are also negatively related to comments and likes although somewhat less so ( $B = -.32$ ;  $p \leq .01$  for comments,  $B = -.27$ ;  $p \leq .01$  for likes). Finally, expressions of thanks are negatively related to comments ( $B = -.34$ ;  $p \leq .05$ ). Despite these differences and variations in the magnitude of effects, the findings provide support for the general notion that the way candidates employ social media at the level of individual posts is significantly related to the rate at which such posts engage supporters in the social media arena, after controlling for contextual factors largely beyond their control.

## Discussion

In this article, we sought to explore the use of social media tools like Facebook in a way that integrates supply-side and demand-side research on digital media and politics more fully. In doing so, our work builds on studies that explore how different kinds of candidates and contextual factors (both online and offline) may affect the extent to which citizens engage politics through digital media tools (Nielsen and Vaccari, 2013; Vaccari and Nielsen, 2013). By taking the individual post as the unit of analysis, however, we illustrate the interactions between candidates and their supporters in these digital spaces with greater granularity than previous research. By focusing on individual posts, we are able to directly examine how key variations in online campaigning documented in supply-side research—such as those associated with the frequency, tone, and content of candidate posts—relate to user responses, while controlling for contextual factors. In doing so, we

shed new light on the dynamics of online campaigning in Web 2.0 applications by identifying factors beyond candidate attributes and contextual factors that have significant impacts on variations in user response.

Before discussing the implications of our findings for scholarship on Internet campaigning and candidates, it is important to note some limitations of our research. First, by focusing on the last few days of the campaign cycle, we may obscure some patterns of interaction between candidates and their online friends that emerge over the entire campaign season, or even multiple seasons. Although we believe our analysis is still able to reveal critically important dynamics of candidate and supporter interaction, and does not deviate from established archival practices in the field (Sweetser and Lariscy, 2008; Williams and Gulati, 2007), we acknowledge that a wider temporal window for data collection could yield even greater insights. Another limitation is that likes and comments are only part of a broader array of political activities users may take part in as they engage with candidates and the political process. These activities have been found to predict other forms of engagement, including offline participation (Conroy, et al., 2012; Macafee and De Simone, 2012; Vitak et al., 2011), but a broader array of outcome variables would help provide a more detailed picture of the dynamics explored in this study. Third, although social media have a global reach, our data are limited to US campaigns. Future research in this area should explore the extent to which our findings may be replicated in other contexts and electoral systems.

Finally, like all research on Internet politics, our study struggles with the continual innovation of software and hardware, and it is true that Facebook has introduced a number of feature changes since our data were collected. While some of these may affect the ways in which individuals encounter posts, none affect the basic dynamic of users responding to individual posts through likes and comments. Since we control for feed exposure in our analysis through the supporters variable, we do not believe subsequent changes to Facebook's features alter the fundamental patterns that animate our principal findings although future research should remain attentive to these issues. Thus despite these limitations, we believe this study provides an important first step toward future research on user response in political social media settings that might seek to address these issues.

Indeed, while the limitations described above may justify some caution in interpreting our results, we do not believe they prevent us from drawing a number of valuable conclusions and implications. The overarching implication of our findings is that the choices campaigns make about posting in social media matter, which lends new significance to research on the nuances of political communication in social media. It is not only the fact that candidates are using social media, but *how* they are using it that matters for understanding relationships between digital media and political engagement. Unsurprisingly, our exploration of *RQI* reveals that a reasonable amount of variation in user response is determined before campaigns even establish a social media presence or create their first post. However, after controlling for these factors, our results still reveal notable patterns regarding candidate and supporter interactions in social media.

Specifically, we believe our results provide a number of distinct insights into relationships between specific kinds of candidate messaging in social media and patterns of user response. First, as in other areas of campaigning, it appears that there is a tangible bump in user engagement when candidates go on the attack in social media. Although our data

suggest that negative campaigning within social media posts is relatively rare, our analysis confirms that attack messages may mobilize social media users to engage with campaigns through social media. Furthermore, as noted earlier, the difference in audiences between broadcast and social media (with social media audiences containing a higher proportion of supporters), may suggest that this dynamic is potentially simpler within the Web 2.0 environment as compared to traditional media. Given the linkages between online engagement of the kinds explored in our analysis and other forms of offline political participation, we believe this aspect of voter mobilization through social media may be of interest to those conducting research on negative campaigning. At the same time, we believe this also suggests that future research on Internet campaigning should pay attention to traditional scholarship on campaigns and elections, such as the voluminous literature on negative campaigning. Second, although some scholars and practitioners may question whether the use of social media to circulate messages and information from other media fully realizes the potential of tools like Facebook, these kinds of activities appear to be significantly related to user response. Indeed, attacking one's opponent, touting an endorsement, or highlighting a new television advertisement, all appear to be more effective for eliciting user response in social media than direct calls for action or requesting donations (which appear to specifically dampen user response).

These dynamics also suggest a third insight concerning the norms of social media interaction, which may center more on sharing and discussing (even in a confrontational manner at times) than direct requests for financial or other offline support. Indeed, candidates appear to garner user response to the extent that they engage in campaign versions of ordinary social media behaviors such as the expression of opinions and the sharing of information and links to other media. In contrast, despite the apparent success of some socially coordinated fundraising efforts, appeals for donations may appear inappropriate when coming directly from the candidate. Based on these results, we believe individual candidates might benefit from attending more closely to the broader currents of newly emerging forms of political engagement, as seen in the activities of networked young citizens and activist youth in a variety of countries (e.g. Loader et al., 2014).

A fourth insight comes from our findings related to the frequency with which candidates post. As noted earlier, our findings run contrary to our initial expectations, which were that more frequent posting should elicit greater user response, by creating more occasions for such response and priming user interaction. Rather than increasing user response, we found that the freshness of posts (as measured by smaller increments of time between that post and the one immediately preceding it) was significantly associated with less user response. This finding may be explained, however, by the fact that postings issued in rapid-fire format (which was not uncommon in the last days of the campaigns) simply do not afford users much time to register responses to posts before something new displaces them in newsfeeds, even if a positive relationship between overall frequency and aggregate response still holds. Conversely, the longer a post lingers the more opportunity users have to register responses. In other words, the predicted relationship may hold at the aggregate level, but not at the level of individual posts. Indeed, subsequent analyses of our data in which observations were aggregated to the candidate or campaign level confirm this suspicion. Although space limitations prevent us from reporting these findings in full, we can confirm that when analysis takes the



candidate as the unit of analysis, the regression coefficients for average post frequency are significant and run in the opposite (i.e. positive) direction. This suggests that individual posts may have an ideal window for engagement, with activity less likely at the earliest moments and tapering off after a certain period. Thus while the precise and likely nonlinear nature of relationships between periodicity and user response remain elusive, our results confirm that as in many other areas of life, timing matters in user response to campaign messages on social media.

Overall, we believe our findings illustrate the increasing importance of attending not only to the interrelationships between the supply- and demand-sides of online campaigning, but also to patterns of diversity and variation in each. As noted earlier, part of the inspiration for our study was the observation that research on the Internet and political engagement experienced appreciable benefits when researchers began to focus more on user choices such as of the kinds of content and specific sites they explored (e.g. Lupia and Philpot, 2008; Shah et al., 2001). Likewise, research on the dynamics of online campaigning could benefit from study designs that focus more specifically on *how* candidates use tools such as social media rather than simply *how much*. In our increasingly networked information environment, there are numerous opportunities for attending to these variations in ways that enable us to observe how they may affect political engagement directly, at levels of resolution more refined than those used in previous research. While such relationships may be complicated, we hope this study may contribute to future efforts to render and interpret them more clearly.

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## References

- Ansolabehere S and Iyengar S (1994) Does attack advertising demobilize the electorate? *American Political Science Review* 88(4): 829–838.
- Bimber B (2003) *Information and American Democracy: Technology in the Evolution of Political Power*. Cambridge: Cambridge University Press.
- Bimber B and Davis R (2003) *Campaigning Online: The Internet in U.S. Elections*. New York: Oxford University Press.
- Cameron MP, Barrett P and Stewardson B (2013) *Can social media predict election results? Evidence from New Zealand*. Working paper in economics 13/08. University of Waikato. Available at: <https://ideas.repec.org/p/wai/econwp/13-08.html> (accessed 17 September 2015).
- Conroy M, Feezell JT and Guerrero M (2012) Facebook and political engagement: a study of online political group membership and offline political engagement. *Computers in Human Behavior* 28(5): 1535–1546.
- Druckman JN, Kifer MJ and Parkin M (2009) Campaign communications in U.S. congressional elections. *American Political Science Review* 103(03): 343.
- Fernandes J, Giurcanu M, Bowers KW, et al. (2010) The writing on the wall: a content analysis of college students' Facebook groups for the 2008 presidential election. *Mass Communication & Society* 13: 653–675.
- Foot KA and Schneider SM (2006) *Web Campaigning*. Cambridge, MA: MIT Press.



- Fraefel M (2012) Mobilizing effects of online campaigning: Swiss parties' activities in e-campaigning and how the use of ICT contributes in engaging the party base as voters and volunteer campaigners. In: *CeDEM12: proceedings of the international conference for e-democracy and open government*. Available at: <http://www.scribd.com/doc/105460868/14/Mobilizing-Effects-of-Online-Campaigning> (accessed 17 September 2015).
- Gibson RK (2012) From brochureware to "MyBo": an overview of online elections and campaigning. *Politics* 32(2): 77–84.
- Gibson RK and McAllister I (2011) Do online election campaigns win votes? The 2007 Australian "YouTube" election. *Political Communication* 28(2): 227–244.
- Gruzd A and Wellman B (2014) Networked influence in social media: introduction to the special issue. *American Behavioral Scientist* 58(10): 1251–1259.
- Gulati GJ and Williams CB (2007) Closing the gap, raising the bar: candidate web site communication in the 2006 campaigns for congress. *Social Science Computer Review* 25(4): 443–465.
- Hanson G, Haridakis PM, Cunningham, et al. (2010) The 2008 presidential campaign: political cynicism in the age of Facebook, MySpace, and YouTube. *Mass Communication & Society* 13: 584–607.
- Herrnson PS (1995) *Congressional Elections: Campaigning at Home and in Washington*. Washington, DC: CQ Press.
- Hilbe JM (2011) *Negative Binomial Regression*. New York: Cambridge University Press.
- Kahn KF and Kenney PJ (1999) *The Spectacle of U.S. Senate Campaigns*. Princeton, NJ: Princeton University Press.
- Krasno JS and Green DP (2008) Do televised presidential ads increase voter turnout? Evidence from a natural experiment. *The Journal of Politics* 70(01): 245–261.
- Lau R, Sigelman L and Rovner I (2007) The effects of negative political campaigns: a meta-analytic reassessment. *Journal of Politics* 69(4): 1176–1209.
- Loader BD, Vromen A and Xenos MA (2014) The networked young citizen: social media, political participation and civic engagement. *Information, Communication & Society* 17(2): 143–150.
- Lupia A and Philpot TS (2008) Views from inside the net: how websites affect young adults' political interest. *The Journal of Politics* 67(4): 1122–1142.
- Macafee T and De Simone J (2012) Killing the bill online? Pathways to young people's protest engagement via social media. *Cyberpsychology, Behavior, and Social Networking* 15(11): 579–584.
- Martin P (2004) Inside the black box of negative campaign effects: three reasons why negative campaigns mobilize. *Political Psychology* 25(4): 545–562.
- Mossberger K, Tolbert CJ and McNeal RS (2007) *Digital Citizenship: The Internet, Society, and Participation*. Boston, MA: MIT Press.
- Nielsen RK and Vaccari C (2013) Do people "like" politicians on Facebook? Not really. Large-scale direct candidate-to-voter online communication as an outlier phenomenon. *International Journal of Communication* 7: 2333–2356.
- Ridout TN and Franz M (2008) Evaluating measures of campaign tone. *Political Communication* 25(2): 158–179.
- Ross K and Bürger T (2014) Face to face(book): social media, political campaigning and the unbearable lightness of being there. *Political Science* 66(1): 46–62.
- Shah D, Kwak N and Holbert RL (2001) "Connecting" and "disconnecting" with civic life: patterns of Internet use and the production of social capital. *Political Communication* 18(2): 37–41.
- Sweetser KD and Lariscy RW (2008) Candidates make good friends: an analysis of candidates' uses of Facebook. *International Journal of Strategic Communication* 2(3): 175–198.
- Tumasjan A, Sprenger TO, Sandner PG, et al. (2010) Predicting elections with Twitter: what 140 characters reveal about political sentiment. In: *Proceedings of the fourth international AAAI*

- conference on weblogs and social media, pp. 178–185. Available at: <http://www.aaai.org/ocs/index.php/ICWSM/ICWSM10/paper/viewFile/1441/1852> (accessed 17 September 2015).
- Tung LL, Xu Y and Tan FB (2009) Attributes of web site usability: a study of web users with the repertory grid technique. *International Journal of Electronic Commerce* 13(4): 97–126.
- Vaccari C and Nielsen RK (2013) What drives politicians' online popularity? An analysis of the 2010 U.S. midterm elections. *Journal of Information Technology & Politics* 10(2): 208–222.
- Vergeer M (2012) Politics, elections and online campaigning: past, present... and a peek into the future. *New Media & Society* 15(1):9–17.
- Vitak J, Zube P, Smock A, et al. (2011) It's complicated: Facebook users' political participation in the 2008 election. *Cyberpsychology, Behavior and Social Networking* 14(3): 107–114.
- Wangpipatwong S, Chutimaskul W and Papastratorn B (2005) Factors influencing the adoption of Thai eGovernment websites: information quality and system quality approach. In: *Proceedings of the fourth international conference on e-Business*, Bangkok, Thailand, 19–20 November 2005.
- Weber P (2014) Discussions in the comments section: factors influencing participation and interactivity in online newspapers' reader comments. *New Media & Society* 16(6): 941–957.
- Williams CB and Gulati G (2007) Social networks in political campaigns: Facebook and the 2006 midterm elections. *Annual meeting of the American Political Science Association*. Available at: <http://blogs.bentley.edu/politechmedia/wp-content/uploads/2007/09/apsa-2007-facebook1.pdf> (accessed 17 September 2015).
- Williams CB and Gulati G (2008) What is a social network worth? Facebook and vote share in the 2008 presidential primaries. Available at: <http://195.130.87.21:8080/dspace/handle/123456789/1021> (accessed 17 September 2015).
- Williams CB and Gulati G (2009) Facebook grows up: an empirical assessment of its role in the 2008 congressional elections. In: *Annual meeting: Midwest Political Science Association*. Available at: [http://blogs.bentley.edu/politechmedia/wp-content/uploads/2009/03/mpsa\\_2009\\_final8.pdf](http://blogs.bentley.edu/politechmedia/wp-content/uploads/2009/03/mpsa_2009_final8.pdf) (accessed 17 September 2015).
- Xenos MA and Foot KA (2005) Politics as usual, or politics unusual? Position taking and dialogue on campaign websites in the 2002 US Elections. *Journal of Communication* 55(1): 169–185.
- Xenos MA and Moy P (2007) Direct and differential effects of the Internet on political and civic engagement. *Journal of Communication* 57(4): 704–718.
- Xenos MA and Pole A (2011) Online campaigning revisited: toward a theory of digital media in campaigns and elections. *Paper presented at the American Political Science Association*, Seattle: WA, 3 September.

## Author biographies

Michael A Xenos is CAPs Professor and Chair of the Department of Communication Arts at the University of Wisconsin–Madison. His research and teaching interests focus on the extent to which political candidates, journalists, and other political actors adapt to changes in information and communication technologies, and how these adaptations affect broader dynamics of political communication and public deliberation.

Timothy Macafee (PhD University of Wisconsin-Madison) is an Assistant Professor of Communication at Concordia University Wisconsin and studies the relationships between individuals' political expression on social media and their political attitudes and participation.

Antoinette Pole is an Associate Professor of Political Science and Law at Montclair State University. Her research focuses on information technology and politics; state politics; and food and politics. She has published two books, and several peer-reviewed journal articles exploring theoretical questions related to representation, political participation, and community.