Twitter Taunts and Tirades: Negative Campaigning in the Age of Trump

Justin H. Gross, *University of Massachusetts, Amherst*
Kaylee T. Johnson, *University of Massachusetts, Amherst*

ABSTRACT What drives candidates to "go negative" and against which opponents? Using a unique dataset consisting of all inter-candidate tweets by the 17 Republican presidential candidates in the 2016 primaries, we assess predictors of negative affect online. Twitter is a free platform, and candidates therefore face no resource limitations when using it; this makes Twitter a wellspring of information about campaign messaging, given a level playing-field. Moreover, Twitter's 140-character limit acts as a liberating constraint, leading candidates to issue sound bites ready for potential distribution not only online, but also through conventional media, as tweets become news. We find tweet negativity and overall rate of tweeting increases as the campaign season progresses. Unsurprisingly, the front-runner and eventual nominee, Donald Trump, sends and receives the most negative tweets and is more likely than his opponents to strike out against even those opponents who are polling poorly. However, candidates overwhelmingly "punch upwards" against those ahead of them in the polls, and this pattern goes beyond attacks against those near the top. Sixty of 136 dyads are characterized by lopsided negativity in one direction and only one of these 60 involves a clearly higher status candidate on the offensive.

In an age characterized by polarization in American politics and an expanding role for electronic media in campaigns, the time is ripe for an examination of candidate conflict conducted via social media. Scholars have previously sought to gauge the impact of "going negative," attacking opponents based on their personal traits, issue positions, or the political party to which they belong (Surlin and Gordon 1977; Skaperdas and Grofman 1995). As Peterson and Djupe (2005) note, most research of this sort has focused upon the effects of negative campaigning on *voter turnout* (Peterson and Djupe 2005; Djupe and Peterson 2002; Kahn and Kenney 1999; Ansolabehere et al. 1994) and *vote choice* (Lau et al. 2007; Kaid 1997). Relatively few studies have investigated driving factors of the choice to attack opponents; scholarship far more often treats campaign tone as an explanatory variable than as an outcome to be explained.

Justin H. Gross *is an assistant professor of political science at the University of Massachusetts, Amherst. He works on political communication, political network analysis, and measurement issues related to text and survey data. His current focus is on ideological diversity in US opinion media. He may be reached at jhgross@polsci.umass.edu.*

Kaylee T. Johnson *is a PhD candidate at the University of Massachusetts Amherst. Her work focuses on political communication and social class. She may be reached at ktjohnson@polsci.umass.edu.*

To be sure, these two types of questions are not unrelated: if candidates and their advisors believe negative messages are likely to be effective, they will be more likely to employ them (Lau and Rovner 2009). To the extent that such considerations are strategic, however, they are as likely to be driven by intuition and prior experience as by research. So the question of what drives negative campaigning is not reducible to the question of when such a strategy is likely to be effective.

Empirical work treating negative campaigning as a dependent variable has focused on press releases (Flowers, Haynes, and Crespin 2003; Haynes, Flowers, and Gurian 2002), campaign advertisements (Hale, Fox, and Farmer 1996; Kahn and Kenney 1999; Damore 2002), and news reports (Haynes and Rhine 1998; Djupe and Peterson 2002; Peterson and Djupe 2005). In the 2016 US presidential primary season, social media have emerged as an important weapon in the campaign messaging arsenal, with Twitter[1] taking center stage. When it comes to newsworthy events such as a presidential campaign, Twitter's audience is no longer limited to Twitter users; tweets themselves have become news and thus, essentially free advertising for candidates. For the first time, all candidates in a large field are active on Twitter and have used the platform to provide running commentary, allowing us to witness the emergence of negativity in real time.[2]

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We attempt to examine all tweets in which one of the 17 Republican presidential hopefuls in 2016 mentions another candidate, investigating the degree to which candidates' relative standing and stage of the campaign predict propensity to attack one another on Twitter. We anticipate increasing negativity among all candidates as primaries and caucuses approach (Damore 2002; Haynes and Rhine 1998; Lau and Pomper 2001), either due to the narrowing of the field (Haynes and Rhine 1998; Hale, Fox, and Farmer 1996; Lau and Pomper 2001; Druckman, Kifer, and Parkin 2010; Kahn and Kenney 2002) or because opportunities grow scarce as elections approach (Peterson and Djupe 2005; Haynes and Rhine 1998; Damore 2002). Alternatively, a field of many plausible contenders may promote negative campaigning early on as candidates struggle to separate from the pack (Peterson and Djupe 2005; Djupe and Peterson 2002).

Furthermore, we expect candidates to launch attacks primarily "upward" at those with better prospects, having less incentive to attack those deemed less of a threat (Skaperdas and Grofman 1995; Thielmann and Wilhite 1998; Lau and Pomper 2001; Damore 2002; Druckman, Kifer, and Parkin 2010; Haynes and Rhine 1998). One open question is whether candidates will focus their attacks upon their leading competitor (Skaperdas and Grofman 1995) or go negative against multiple competitors. And what of those struggling near the bottom of the polls? Skaperdas and Grofman (1995) suggest that long-shot candidates will run more positive campaigns, but we see evidence to the contrary. First, let us consider the data at hand.

TWITTER AS CAMPAIGN TOOL

In analyzing the relational dynamics of negative electoral campaigning, Twitter merits special interest for three reasons. First, it is fundamentally *social* in conception and design. While we may also examine social dynamics in a crowded field by coding advertisements or press releases, Twitter—with its hashtags and handles, followers and retweets—makes interpersonal connections central to its very identity. Second, the lack of budgetary constraints or external gatekeepers allows candidates to employ Twitter as an unfettered signaling device. Candidates may attack multiple candidates if they feel so inclined, regardless of funds on hand. Even televised debates—quintessentially social events—are heavily restricted by moderators, who nudge top candidates to challenge one another, but rarely provide such opportunities to those performing poorly in polls. Similarly, press coverage of public statements is mediated, with interactions among lower-tier candidates far less likely to be deemed noteworthy enough to print. Third, there may be special features of social media worthy of study in their own right as performing a new function in campaigns.

Why focus on Twitter, as opposed to other social media? The most relevant factor is wide adoption, of course; the fact that all candidates are using Twitter is essential. Furthermore, Twitter is becoming what we might call a *cross-over medium*, serving to link social and traditional media. Tweets are not particularly flexible conduits of meaning, due to the strict limit of 140 characters per tweet. And yet, this restriction brings its own opportunities in a crowded marketplace of messages. Their very brevity allows tweets to be widely disseminated. In recent decades, politicians, among others, have had to learn to talk in sound-bites in order to fit the changing nature of television and radio news. Terse quotes are far more likely to be picked up by newsrooms that rely upon conciseness for most common formats (Flowers et al. 2003; American Press Institute 2016) and tweets are structurally required to be concise. Twitter is therefore a sound-bite medium for the sound-bite media age. On the other hand, the fact that users have only a sentence or two to make a point—and appeal for attention in a marketplace of tweets—places a premium on novelty and even outrageousness.

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Twitter offers the opportunity for interactive, instantaneous, and autonomous give-and-take between candidates (Vergeer and Hermans 2013). In debates, certain candidates may not have ample opportunities; polling typically determines who is permitted to debate, the amount of attention one receives, and—during this campaign season—whether one appears in the "main" or less prominent "undercard" debate. Twitter removes the gatekeeper, promoting participation by all candidates, regardless of status and without the presence of a moderator (Graham et al. 2013; Conway, Kenski, and Wang 2013). While complementing traditional means of outreach, Twitter allows candidates to circumvent the constraints associated with the traditional media (Vergeer and Hermans 2013; Conway, Kenski, and Wang 2013). Attack advertisements take time to produce, as do potential rebuttal ads. On Twitter, by contrast, it is not uncommon for opponents to trade attacks over the course of a single day.

In short, Twitter is a free resource through which candidates can offer easily digested, potentially newsworthy content, as they engage with one another and with followers in real time. Additionally, tweets need not only be composed with candidates' own supporters in mind (i.e. to "rally the troops" or "preach to the converted"); they are also likely to reach followers of one's targets, undecided voters who follow multiple candidates, and even major news networks (Conway, Kenski, and Wang 2013). Subsequently, news media help to further disseminate tweets to program viewers as sound bites in news stories.[3] As but one example, CNN devoted two news stories to reporting on Donald Trump's tweets about Carly Fiorina, and published the stories online (with transcripts of the tweets).[4]

We have attempted to collect all candidate tweets mentioning at least one other candidate.[5] After dropping tweets with neutral or ambiguous tone, as well as retweets without explicit endorsement, we are left with a total of 1,523 tweets, including 1,069 during the primary period of study (November 18, 2014—May 4, 2016). We divide this campaign period under study into

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six *stages* to assess whether the rate of tweeting increases over the duration of the campaign. Though these stages vary in length, the measurement of tweets within each (rate of tweets per candidate and per directed dyad per week) is standardized; comparing rates of tweets across stages allows for comparison of tweet behavior across qualitatively meaningful stages of the campaign.

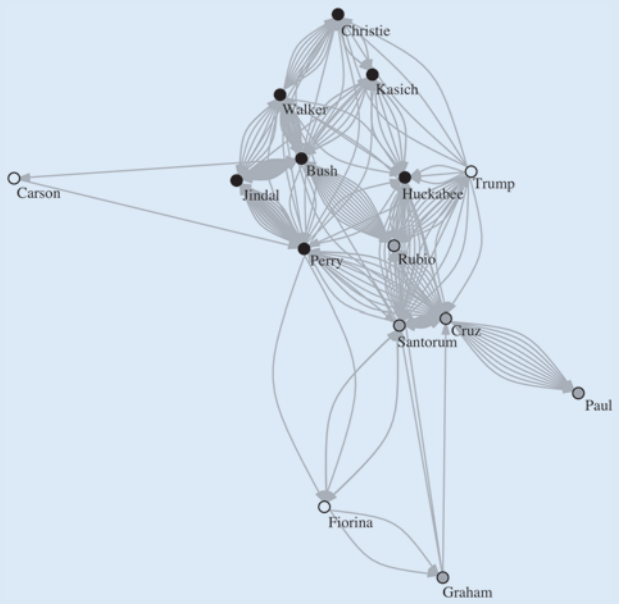
GROWING TWEET NEGATIVITY AND INTENSITY

We code candidates' tweet tone (or affect) as positive (praising the target), negative (criticizing or insulting the target), or neutral (unclear or lacking affect). We also code whether a tweet is policy-oriented or of a more personal nature. Prior to the start of the 2016 presidential election season, Twitter communication among eventual candidates, while limited, remained overwhelmingly amicable. Out of 454 collected tweets from this time (including retweets), just 45 reflect negative affect. In contrast to tweets during campaign season, in which twice as many tweets are personal as are policy-oriented, these pre-campaign tweets are more often policy-related (149 vs. 115 among those coded as one or the other).

In figure 1, we visualize the pre-campaign positive affect network, employing the common Fruchterman-Reingold network layout to automatically place sets of highly connected individuals close together and less connected nodes farther apart. Clustering based on edge-betweenness[6] indicates that governors and senators belong to separate clusters, with fellow Floridians Marco Rubio and Jeb Bush bridging the two groups.

Figure 1

Tweets Expressing Positive Affect Among Future Candidates Prior to Nov. 20, 2014



Each arc (directed tie) represents a tweet event by one eventual candidate making positive mention of another. (Gilmore and Pataki are both isolates in this network and have been dropped from the figure). Nodes are shaded according to most recent government office held (senators in gray, governors in black, those with no government experience in white).

The shift from mutual admiration to taunts and tirades is swift and unrelenting, interrupted only by brief moments of respite, primarily as newcomers are welcomed and dropouts are bid farewell (the troughs in figure 2). During the field's rapid shift into attack mode during the first two weeks of July 2015, Donald Trump emerges as the clear network negativity hub (figure 3b). The overall rise in negativity is accompanied by a dramatic increase in Trump's poll numbers.[7]

The rate at which candidates send these (mostly) negative messages to each other might also be expected to increase over time.

The shift from mutual admiration to taunts and tirades is swift and unrelenting, interrupted only by brief moments of respite, primarily as newcomers are welcomed and dropouts are bid farewell (the troughs in figure 2).

We measure this in terms of both average *tweets per candidate per week* and *tweets per directed dyad per week*[8] (ddw) in order to account appropriately for the dwindling candidate pool. Tweet intensity does indeed increase dramatically as the general election date approaches (table 1), rising monotonically over the six campaign stages. By the final stage, in which only five candidates remain, candidates are tweeting at a rate of 3.44 tweets per person per week (2.681 per ddw), or roughly 100 times the initial tweet per person rate and 1,300 times the initial tweet per ddw rate.

In sum, as the election date approaches and the field dwindles, candidates exhibit far stronger tendencies toward negativity when engaging their opponents on Twitter. Since the vast majority of tweets are negative during election season, this finding lends additional credibility to the prominent notion in previous literature and conventional wisdom that negative campaigning will increase as the end of a campaign season approaches.

"PUNCHING UPWARDS": ASYMMETRIC NEGATIVITY BY RELATIVE STANDING

Even a casual observer of the 2016 primaries will hardly be surprised that eventual nominee Donald Trump dominates the field as both author and target of negative tweets.[9] His legendary social media vitriol has even been immortalized in the *New York Times,*[10] which has published a "complete list" of "people, places, and things Trump has insulted on Twitter." And yet, despite issuing some of the more jaw-dropping tweets, Trump has in fact remained on the receiving end of more barbs than he doles out, consistent with our expectation that front-runners should be attacked more than they themselves attack opponents. All together, 72% of negative tweets are directed from a lower polling candidate toward a higher polling opponent.

Figure 3 provides visualization of the separate positive and negative aggregated tweet networks. The main attractors of positive tweets (figure 3a) are candidates who leave the race early and are praised on their way out (Perry, Walker, Jindal, and Santorum), and—to a lesser extent—those who eschew negative campaigning in the early stages (Fiorina, Cruz, and Kasich). The central hubs of activity in the negative tweet network (figure 3b)—other than

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Figure 2

Tweet Negativity. Incidence of Negative Affect in Previous 50 Tweets Connecting Any Two Candidates (March 2013–May 2016)

Table 1

Tweet Negativity By Campaign Stage

Stage	Tweets Per Candidate Per Week	Tweets Per Directed Dyad Week
Unofficial Campaign 11/18/14–3/22/15	0.036	0.002
Early Campaign 3/23/15–7/21/15	0.214	0.013
All Candidates Declared 7/22/15–9/13/15	1.469	0.092
Pre-Iowa Caucus 9/14/15–1/31/16	1.810	0.136
Early Primaries 2/1/16–2/23/16	1.825	0.222
Final Candidates 2/24/16–5/4/16	2.440	2.681

Trump, who dominates—include the poorest performers (Pataki and Gilmore), based entirely on their own negative tweets (out-ties).

Given the outsized role of Trump within the dataset—he is author or target of more than two-thirds of the collected tweets—we must ask whether the observed asymmetry is driven exclusively by the Trump factor. In fact, the opposite is true, with the pattern of asymmetry appearing nearly deterministic once Trump is dropped from the data (table 2). While Trump receives more Twitter-attacks than he launches, he still strikes back at poorly performing candidates with surprising alacrity for a front-runner. Excluding Trump's tweets, examples of downward strikes at poorer performers nearly disappear. Astoundingly, only 10 of 340 non-Trump-related tweets (3%) feature a negative tweet issued by a candidate who leads the recipient in the average of the previous five polls. Of these, all but two involve former allies: Cruz attacking Rubio and Rubio attacking Bush.[11]

In order to consider all 136 dyadic Twitter relationships among the 17 candidates in a parsimonious manner, we classify dyad histories into several types.[12] Because we are primarily interested in the conditions that predict asymmetry in negative affect, we emphasize these in our typology. Details are provided in table 3 and the online appendix. Dyadic histories characterized by lopsided negativity are separated into three types: *snipes* (a single negative tweet in one direction), *sticks-and-stones* (multiple negative tweets in one direction), and *asymmetric warfare* (attacks in both directions, but at least three times as many in one direction. In table 3, rows and columns are ordered from highest to lowest status candidate based on average polls[13] during each candidate's run; of the 60 dyadic histories characterized by lopsided negativity, all but four are in the predicted direction. (Cells in which the row candidate is the primary aggressor in one of these three types of relationships are shaded, and only four of these shaded cells fall above the diagonal). All but one of these four instances of "punching downward" involves opponents within 1% of one another in average polling, leaving only Trump's online bullying of Ben Carson (eight vs. one negative tweet[s]) as a dramatic departure from predicted hierarchical discipline. We perform a permutation test[14] to see how likely we would be to see so few instances of these asymmetric negative types in the "wrong" direction by chance and find the probability to be less than one in 100,000. The probability that at most one of 60 would involve a downward strike against someone more than 1% lower in average polling (as in the case of Trump vs. Carson) is less than one in a million.

Finally, note that the two poorest performers—Governors Gilmore and Pataki—are the sources of more asymmetric negative relationships than any others: 13 and 11, respectively. Such behavior by these apparent "spoilers" suggests that, at least in a low-cost environment such as Twitter, low-polling candidates may not fulfill previous predictions (Skaperdas and Grofman 1995) by keeping their messaging positive. An examination of the content of their tweets indicates that they are trying, albeit unsuccessfully, to establish legitimacy by attempting to draw other candidates into acknowledging their existence.

CONCLUSION

Twitter provides a new means for candidates to directly engage one another without a gatekeeper and for researchers to build our understanding of the social dynamics of campaigning such

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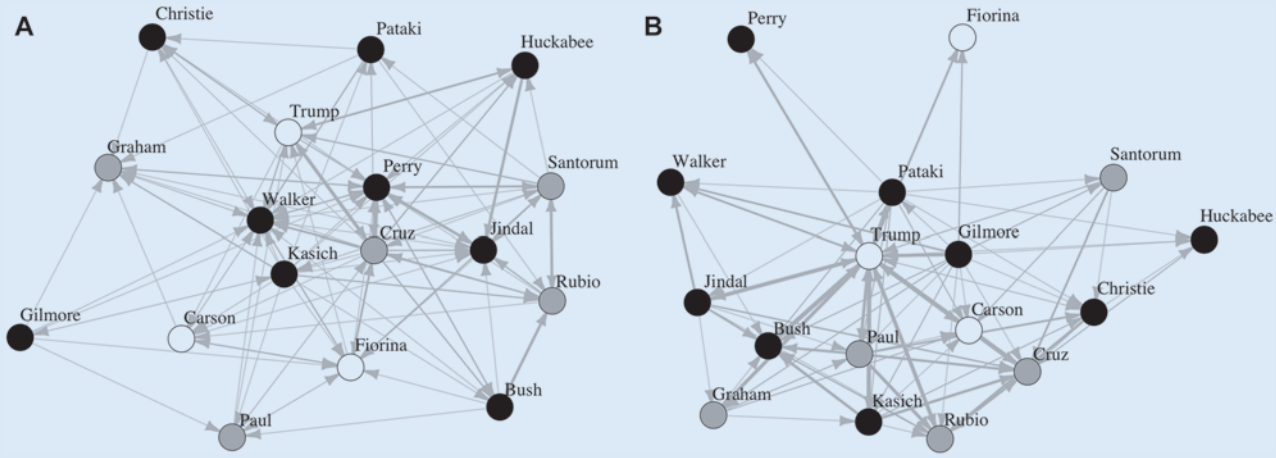
Figure 3

Positive (3a) and Negative (3b) Tweets From Nov. 20, 2014–May 4, 2016 Nodes Shaded According to Most Recent Government Office Held, as in Figure 1



Arc widths proportional to number of positive tweets.

Arc width roughly proportional to log of number of negative tweets plus one.

Table 2

Standing in Polls by Tweet Tone, Excluding Tweets Involving Trump

	Tweet *Author* Higher in Last 5 Polls	Tweet *Target* Higher in Last 5 Polls	Total
Tone Negative	10	197	207
	Pr(−) = 0.11	Pr(−) = 0.79	
Tone Positive	82	51	133
	Pr(+) = 0.89	Pr(+) = 0.21	
Total	92	248	340

as the choice to "go negative." In particular, Twitter allows us to witness campaign behavior under conditions of equal resources and unmediated, instantaneous response. By assessing the content of tweets, we have gained insight into potential drivers of social negativity among the 17 Republican presidential hopefuls in one such election. It remains to be seen how characteristic this cycle will prove to be, as social media become a typical part of the campaign arsenal.

Candidate behavior in the 2016 GOP nomination race, with an unusually large field of candidates, reinforces previous findings linking relative status and time remaining in an election season to the propensity to attack. Candidates grow increasingly negative and tweet more frequently as the field narrows and as voting progresses and opportunities dwindle. At each stage of the campaign, the network becomes more dense in the sense that all remaining channels between candidates are actively employed; the final rate of tweets per directed dyad per week is roughly 1,300 times the original rate in the large, sparse, communication network.

We also find that, in the 2016 GOP nomination contest, instances of lopsided negativity are nearly always directed from lower to higher status candidates. Better performers avoid "punching downwards," though Trump flouts this norm with brutal remarks aimed at even low-polling candidates.

In the future, we seek to explore the sort of interaction candidates might have with more qualitative depth, while also developing a relational event model to predict participation in specific types of temporal clusters we have observed (e.g. long tirades, tit-for-tat exchanges, ganging up, and tweet strafing, where a single candidate peppers multiple competitors with barbs). It will be especially instructive to examine future elections in order to distinguish idiosyncratic behavior by Trump from front-runner behavior in general. Finally, similar analyses might be conducted in countries that regularly have multicandidate elections, as these provide the best opportunity to witness complex dynamics of candidate interaction.

SUPPLEMENTARY MATERIAL

To view supplementary material for this article, please visit http://dx.doi.org/10.1017/S1049096516001700.* ■

NOTES

1. Twitter is a social media platform where users "tweet" (i.e. post) messages containing up to 140 characters of text.
2. In 2008, most presidential hopefuls were not tweeting at all. By 2012, Republican presidential candidates were utilizing the platform, but primarily to promote news stories about themselves, encourage voters to turn out, and criticize Obama as opposed to attacking their opponents. Please see the online Appendix (table A3) for more information).
3. A Lexis-Nexis search of coverage of Twitter on three top cable news channels (from 06/01/2015 through 05/04/2016) indicates that at least 504, 1158, and 626 televised news stories on CNN, FOX, and MSNBC, respectively, referenced "Twitter" "tweets," "tweeted," or "tweet." The vast majority of these Twitter-mentions—around 85%, based on review of a random sample of fifty—relate to elections.
4. Please see the online appendix for links to these articles.
5. For more information on the data collection and gathering process, please see the online appendix (table A1).
6. To generate the network, we used the R programming environment and Csardi and Nepusz's "igraph" package; edge-betweeness clustering was computed using the edge.betweenness.community function in this package.
7. For information on Donald Trump's poll numbers, see polls conducted on 6/22-7/12/15 by YouGov/Economist, Fox, Suffolk/USA Today, and Monmouth

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Table 3

Dyad History Types, By Candidate Ranking in Polls From November 18, 2014 Until Either Candidate Suspends Campaign

	Receiver																
Sender	**Trump**	**Cruz**	**Carson**	**Rubio**	**Walker**	**Bush**	**Kasich**	**Huckabee**	**Paul**	**Christie**	**Fiorina**	**Perry**	**Santorum**	**Jindal**	**Graham**	**Pataki**	**Gilmore**
Trump	#####	ME-BF (78:87)	AW (8:1)	ME (45:23)	AW (2:7)	AW (41:83)	ME (42:73)	MR (+2:+3)	**S&S (4:22)**	ME-BF (1:1)	ME (8:4)	**AW (4:12)**	**S&S (0:2)**	**AW (3:52)**	**AW (2:33)**	**AW (5:35)**	**S&S (0:25)**
Cruz	ME-BF (87:78)	#####	S&S (0:2)	ME (6:6)	MR (+3:0)	Snipe (0:1)	**S&S (0:15)**	**S&S (0:2)**	**S&S-BF (0:11)**	**Snipe (0:1)**	MR (+3:+1)	UL (0:+7)	**S&S (0:7)**	**S&S (0:4)**	n	MR (+1:+1)	**Snipe (0:1)**
Carson	AW (1:8)	S&S (2:0)	#####	n	MR (+1:+1)	n	**Snipe (0:1)**	n	**Snipe (0:1)**	n	MR (+2:+1)	n	**S&S (0:2)**	n	**S&S (0:2)**	**S&S (0:2)**	**Snipe (0:1)**
Rubio	ME (23:45)	ME (6:6)	n	#####	MR (+1:+1)	ME-BF (2:1)	**Snipe (0:1)**	n	**S&S (0:25)**	**S&S (0:16)**	n	n	MR (+1:+4)	**Snipe (0:1)**	n	n	**Snipe (0:1)**
Walker	AW (7:2)	MR (+0:+3)	MR (+1:+1)	MR (+1:+1)	#####	Snipe (1:0)	n	n	n	n	UL (+2:0)	MR (+2:+1)	n	**S&S (0:10)**	MR (+1:+1)	**Snipe (0:1)**	**S&S (0:6)**
Bush	ME (83:41)	Snipe (1:0)	n	ME-BF (1:2)	Snipe (0:1)	#####	**S&S (0:16)**	n	**S&S (0:12)**	n	n	MR (+2:+1)	n	**S&S (0:6)**	**Snipe (0:1)**	**S&S (0:2)**	**S&S (0:2)**
Kasich	ME (73:42)	S&S (15:0)	Snipe (1:0)	Snipe (1:0)	n	S&S (16:0)	#####	n	n	**S&S (2:0)**	n	n	MR (+1:+1)	n	**Snipe (0:1)**	**S&S (0:2)**	**S&S (0:2)**
Huckabee	MR (+3:+2)	S&S (2:0)	n	n	n	n	n	#####	n	n	n	n	n	UL (+4:0)	n	**Snipe (0:1)**	**Snipe (0:1)**
Paul	S&S (22:4)	S&S-BF (11:0)	Snipe (1:0)	S&S (25:0)	n	S&S (12:0)	n	n	#####	S&S (7:0)	MR (+1:+1)	n	n	**Snipe (0:1)**	**S&S (0:2)**	**S&S (0:2)**	**Snipe (0:1)**
Christie	ME-BF (1:1)	Snipe (1:0)	n	S&S (16:0)	n	n	S&S (0:2)	n	**S&S (0:7)**	#####	n	n	**Snipe (0:1)**	n	n	**Snipe (0:1)**	**Snipe (0:1)**
Fiorina	ME (4:8)	MR (+1:+3)	MR (+1:+2)	n	UL (0:+2)	n	n	n	MR (+1:+1)	n	#####	n	MR (+1:+2)	n	n	n	S&S (0:3)
Perry	AW (12:4)	UL (0:+7)	n	n	MR (+1:+2)	MR (+1:+2)	n	n	n	n	n	#####	MR (+1:+3)	MR (+1:+4)	MR (+1:+2)	**Snipe (0:1)**	n
Santorum	S&S (2:0)	S&S (7:0)	S&S (2:0)	MR (+4,+1)	n	n	MR (+1:+1)	n	n	Snipe (1:0)	MR (+2:+1)	MR (+3:+1)	#####	n	n	**Snipe (0:1)**	**S&S (0:2)**
Jindal	AW (52:3)	S&S (4:0)	n	Snipe (1:0)	S&S (10:0)	S&S (6:0)	n	UL (0:+4)	Snipe (1:0)	n	n	MR (+4:+1)	n	#####	Snipe (1:0)	**Snipe (0:1)**	n
Graham	AW (33:2)	n	S&S (2:0)	n	MR (+1:+1)	Snipe (1:0)	Snipe (1:0)	n	S&S (2:0)	n	n	MR (+2:+1)	n	**Snipe (0:1)**	#####	n	**S&S (0:2)**
Pataki	AW (35:5)	MR (+1:+1)	S&S (2:0)	n	Snipe (1:0)	S&S (2:0)	S&S (2:0)	Snipe (1:0)	S&S (2:0)	Snipe (1:0)	n	Snipe (1:0)	Snipe (1:0)	Snipe (1:0)	n	#####	**Snipe (0:1)**
Gilmore	S&S (25:0)	Snipe (1:0)	Snipe (1:0)	Snipe (1:0)	S&S (6:0)	S&S (2:0)	S&S (2:0)	Snipe (1:0)	Snipe (1:0)	Snipe (1:0)	S&S (3:0)	n	S&S (2:0)	n	S&S (2:0)	Snipe (1:0)	#####

Asymmetric dyad histories include *Sticks-and-Stones* (S&S), *Asymmetric Warfare* (AW), and *Snipe*; these cells are shaded if the candidate labeled "sender" is the main attacker and in bold type otherwise. Negative tweet count for "sender" vs. "receiver," respectively, appears in parentheses. More balanced types include *Mutual Enmity* (ME) and *Mutual Respect* (MR). *Negligible* contact (no tweets or single positive) is indicated by *n*. *Unrequited Love* (UL) consists of one candidate in a pair sending two or more unreciprocated positive tweets. Unless indicated by "+", all numbers are counts of negative tweets. Details on type coding appear in the appendix. If positive tweets are issued in both directions prior to any negativity beyond an isolated snipe, we append the *Broken Friendship* (BF) suffix.

University. More information is available at http://elections.huffingtonpost.com/pollster/2016-national-gop-primary, our source for all polls.

8. We define *directed dyad week* (ddw) as number of directed dyads connecting remaining candidates in a given week times the number of weeks in the stage during which both candidates remain active.
9. See figure A1 in the online appendix for rates of negative and positive tweets sent and received by each candidate.
10. This article may be found at http://www.nytimes.com/interactive/2016/01/28/upshot/donald-trump-twitter-insults.html.
11. All ten tweets are provided in the online appendix.
12. The peculiar temporal dependence structure and the nature of our research questions make ERGM network models and their generalizations inappropriate. Social sequence analysis and relational event models are more promising and would be worth pursuing in future analysis of these and similar data.
13. We also conducted analysis in which we had expert observers order candidates based on perceived status according to a subjective reading of polls, debate invitations, and delegate counts. The results were similar.
14. R code available on request.

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