



Twitter and Public Opinion

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Pew Research Center's
Project for Excellence in Journalism

September 16, 2013



1. Does sentiment on Twitter reflect public opinion?
2. Challenges with Automated Sentiment Analysis



IF TWITTER USERS RAN THE ELECTION...



PRESIDENT RON PAUL





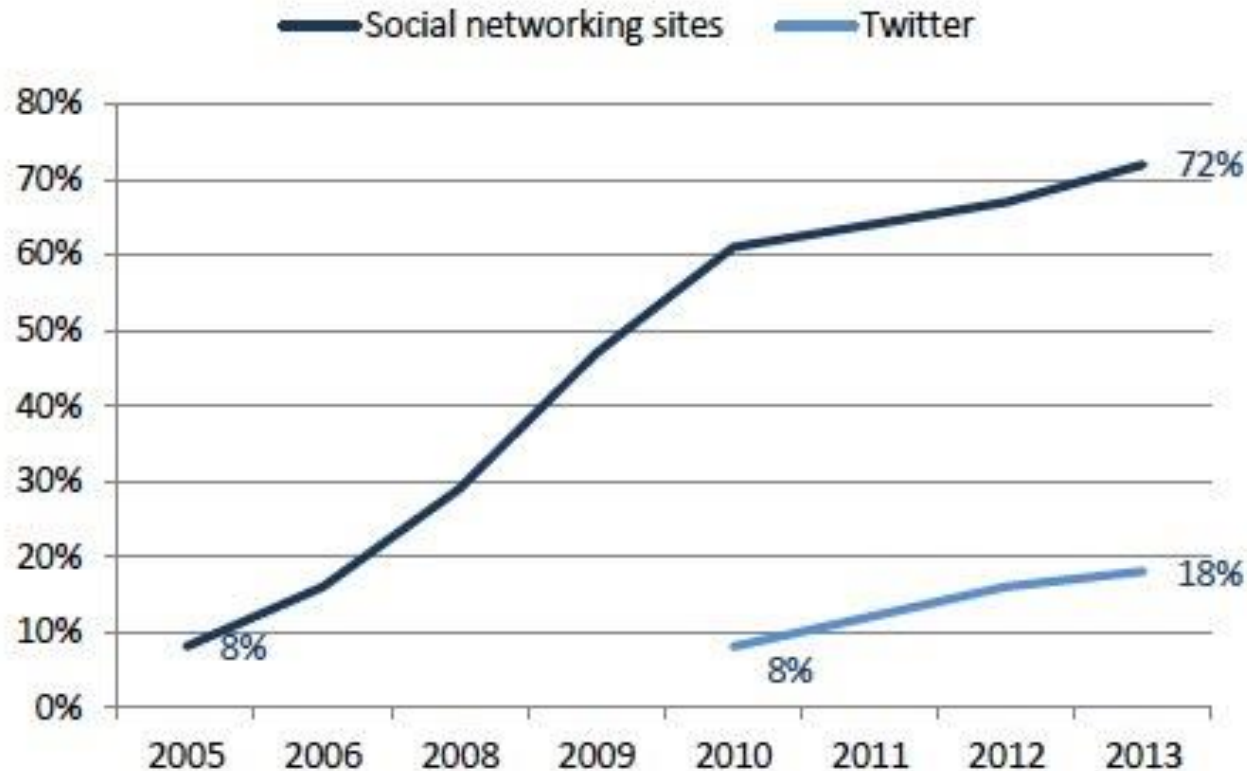
MAIN PEW RESEARCH FINDINGS ABOUT TWITTER

- Sentiment on Twitter often does not track with public opinion surveys
- Sentiment on Twitter changes in its own unique ways
- Twitter users are a subset of the overall public
- Social media users are an active and engaged public with growing influence



Adult use of social networking sites and Twitter—change over time

% of adult internet users who use social networking sites or Twitter, over time



Source: Pew Research Center's Internet & American Life Project tracking surveys 2005-2013. Spring Tracking Survey, April 17 – May 19, 2013. N=1,895 adult internet users ages 18+. Interviews were conducted in English and Spanish and on landline and cell phones. The margin of error for results based on all internet users is +/- 2.5 percentage points.



Who uses Twitter

% of Internet users in each group

All internet users (n=1,895)		18%
a	Men (n=874)	18
b	Women (n=1,021)	17
Race/ethnicity		
a	White, Non-Hispanic (n=1,331)	14
b	Black, Non-Hispanic (n=207)	27 ^a
c	Hispanic (n=196)	28 ^a
Age		
a	18-29 (n=395)	30 ^{bcd}
b	30-49 (n=542)	17 ^d
c	50-64 (n=553)	13 ^d
d	65+ (n=356)	5
Education attainment		
a	Less than high school (n=99)	16
b	High school grad (n=473)	15
c	Some College (n=517)	20 ^b
d	College + (n=790)	19
Household income		
a	Less than \$30,000/yr (n=417)	15
b	\$30,000-\$49,999 (n=320)	16
c	\$50,000-\$74,999 (n=279)	20
d	\$75,000+ (n=559)	22 ^a

Pew Research Center's
Internet & American Life
Project, August 2013



To analyze the conversation on Twitter,

Pew Research combined:

- automated sentiment analysis and traditional human coding
- technology from Crimson Hexagon





crimson hexagon

- Closest application to human coding
- Pew Research spent a year testing
- Doesn't just use keywords – uses relationships of words
- Access to the full Twitter “Firehose”

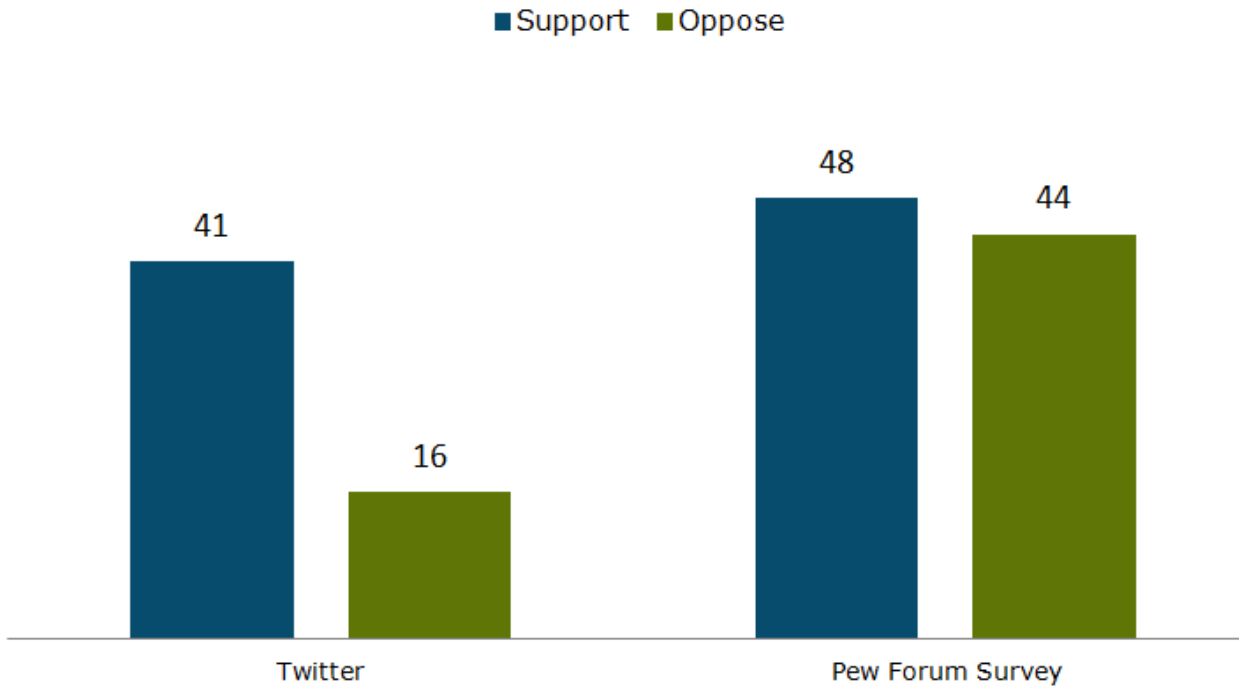


WHAT DID WE FIND?



Support for Same-sex Marriage, May 2012

Percentage of assertions compared to a poll from the Pew Forum on Religion & Public Life



Note: Pew Forum's survey did not include neutral assertions.
PEJ analysis using Crimson Hexagon technology

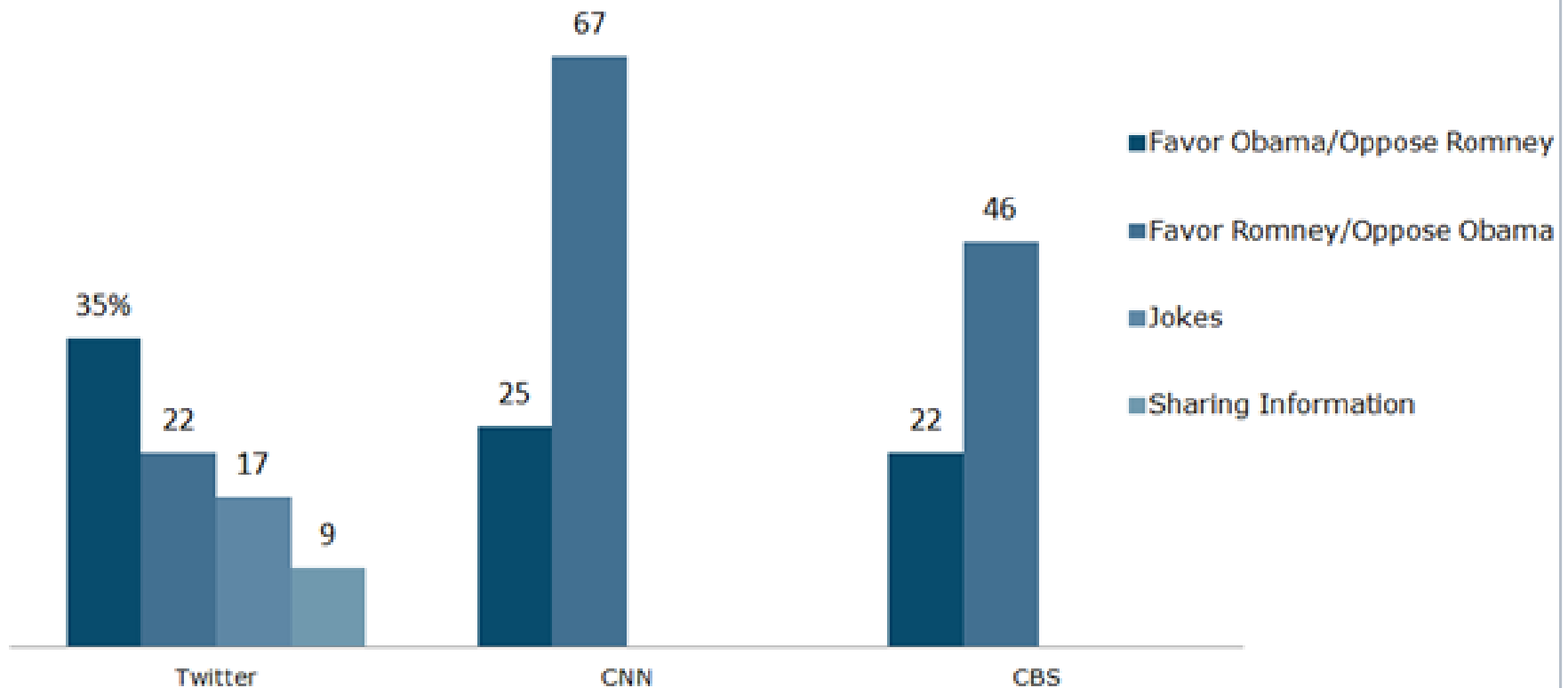
PEW RESEARCH CENTER'S PROJECT FOR EXCELLENCE IN JOURNALISM



THE FIRST DEBATE: REACTION ON TWITTER IN THE FIRST 12 HOURS

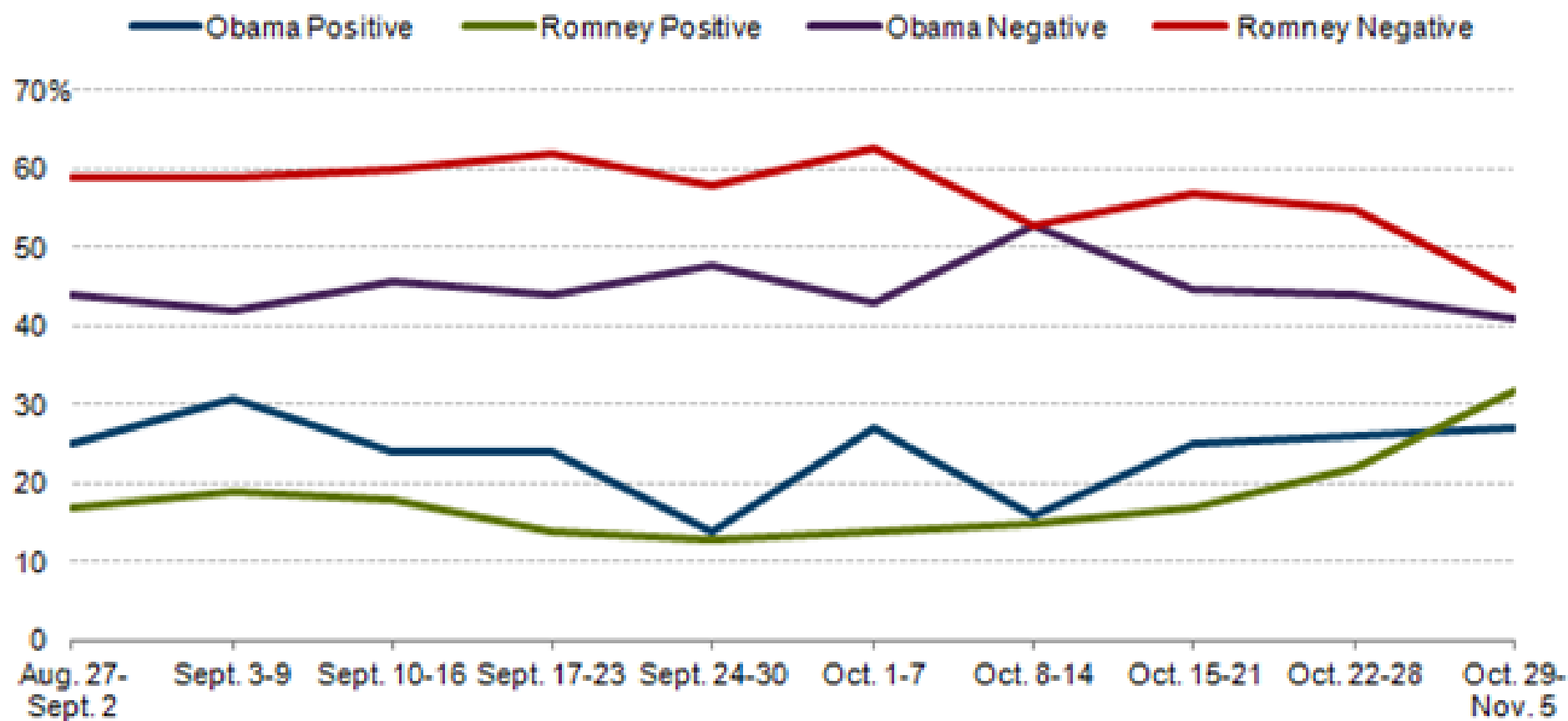
Response to the First Debate

Percentage of assertions compared to CNN and CBS polls of debate watchers



Tone of Conversation about Candidates on Twitter

Percent of assertions



The GOP Primary Candidates on Twitter

Percentage of assertions

Candidate	Positive	Neutral	Negative	Pos./Neg. Difference
R. Paul	55%	30%	15%	40
Huntsman	30	46	24	6
Cain	34	31	35	-1
Gingrich	21	38	40	-19
Romney	19	40	41	-22
Perry	15	29	55	-40
Santorum	11	37	52	-41
Bachmann	12	25	63	-51
Obama	17	33	51	-34

Date Range: May 2- Nov 27, 2011

PEJ analysis using Crimson Hexagon Technology

PEW RESEARCH CENTER'S PROJECT FOR EXCELLENCE IN JOURNALISM

When Twitter Reaction Was More Liberal than Public Opinion

Obama's reelection (Nov 2012)

<i>Public opinion</i>	%	<i>Twitter</i>	%
Happy	52	Positive	77
Unhappy	45	Negative	23

Better job in the first presidential debate (Oct 2012)

<i>Public opinion</i>	%	<i>Twitter</i>	%
Obama	20	Obama support	59
Romney	66	Romney support	40

California same-sex marriage ruling (Feb 2012)

<i>Public opinion</i>	%	<i>Twitter</i>	%
Positive	33	Positive	46
Negative	44	Negative	8
None (Vol.)	15	Neutral	46

PEW RESEARCH CENTER Public opinion from Pew Research Center surveys; Reactions to Obama's reelection based on voters; better job in first debate based on RVs; Supreme Court health care ruling based on general public; California same-sex marriage ruling based on those who heard about ruling. See methodology for information on how Twitter reactions were derived.

When Twitter Reaction Was More Conservative than Public Opinion

Obama's second inaugural speech (Jan 2013)

<i>Public opinion</i>	%	<i>Twitter</i>	%
Positive	48	Positive	13
Negative	22	Negative	21
Neither/DK (Vol.)	29	Neutral	65

Opinion of John Kerry post-nomination (Dec 2012)

<i>Public opinion*</i>	%	<i>Twitter</i>	%
Favorable	39	Positive	6
Unfavorable	36	Negative	32
No opinion/DK (Vol.)	26	Neutral	62

State of the Union address (Jan 2012)

<i>Public opinion</i>	%	<i>Twitter</i>	%
Positive	42	Positive	21
Negative	27	Negative	40
Neither/DK (Vol.)	31	Neutral	39

PEW RESEARCH CENTER. Public opinion from Pew Research Center surveys; based on general public. The survey measuring favorable and unfavorable opinions of John Kerry was conducted Jan. 9-13, 2013. See methodology for information on how Twitter reactions were derived.

When Twitter Conversation Was Similar to Public Opinion

Supreme Court health care ruling (June 2012)

<i>Public opinion</i>	%	<i>Twitter</i>	%
Approve	36	Positive	52
Disapprove	40	Negative	48

Mitt Romney's choice of Paul Ryan (Aug 2012)

<i>Public opinion</i>	%	<i>Twitter</i>	%
Excellent/Good	28	Positive	28
Only fair/Poor	46	Negative	43
Don't know	26	Neutral	30

PEW RESEARCH CENTER. Public opinion from Pew Research Center surveys; based on general public. See methodology for information on how Twitter reactions were derived.

REASONS TWITTER RESEARCH IS *NOT* LIKE CONDUCTING A SURVEY

- Multiple tweets from the same person
- Neutral/factual/mixed responses
- Tweets don't respond to questions
- Tweets often need interpretation



Challenges with Automated Sentiment Analysis

A number of different software platforms
that vary in cost and complexity



EXAMPLES OF NEGATIVE STATEMENTS



“Romney’s approval numbers have fallen in the last week.”

“I believe Obama’s tax plan will not work.”

ds ✓ Categories✓ Training✓ RunSave✓ Ready to run.Train from Oct 28, 2012 to Nov 5, 2012

Use the keyboard to assign a category to this post.

99 ●87 ●119 ●27 ●3,652**Title:**

RT @BarackObama: RT if you're supporting the candidate in this election who's fighting for the middle class: President Obama.

Date:

Nov 5, 2012 1:00 PM GMT

Location:

<http://twitter.com/mch7576/status/265438512352985088>

Site:

twitter.com

RT @BarackObama: RT if you're supporting the candidate in this election who's fighting for the middle class: President **Obama**.

ds ✓ Categories✓ Training✓ RunSave✓ Ready to run.Train from Oct 28, 2012 to Nov 5, 2012

Use the keyboard to assign a category to this post.

99 ●

87 ●

119 ●

27 ●

3,652

Title:

@kcstock That revenge remark really disturbed me more than anything else during this campaign. Obama is divisive and scary.

Date:

Nov 4, 2012 7:10 PM GMT

Location:

<http://twitter.com/DawnRiseth/status/265169073791442945>

Site:

twitter.com

@kcstock That revenge remark really disturbed me more than anything else during this campaign. **Obama** is divisive and scary.

- “Mitt Romney knows how to be Mitt Romney, better than any of us know how to be Mitt Romney”
- “Obama says it's up to us to do great things this year... Yes, Mr. President, we a agree :) This fall we will do great things!”
- “Obama wears Crocs”



Problems with predefined lists of words to determine tone/sentiment

- Inflexible meanings
- Cannot account for sarcasm, quotes, etc.
- Words like “intelligence,” “death,” and “postponed” cause problems



With big data, we'll often be satisfied with a sense of general direction rather than knowing a phenomenon down to the inch, the penny, the atom. We don't give up on exactitude entirely; we only give up our devotion to it. What we lose in accuracy at the micro level we gain in insight at the macro level.

- *Big Data: A Revolution that will Transform How We Live, Work, and Think* by Viktor Mayer-Schonberger and Kenneth Cukier



WHY SHOULD WE CARE ABOUT RESEARCHING OPINIONS EXPRESSED ON TWITTER AND SOCIAL MEDIA?



- Topics that spur conversation
- Fast-moving and instant
- Interested, engaged public



SOCIAL MEDIA USERS ARE POLITICALLY ENGAGED

- 30% of registered voters have been encouraged to vote for Obama or Romney by family and friends via posts on social media
- 20% of registered voters have encouraged others to vote by posting on a social networking site
 - November 2012 survey by the Pew Research Center's Internet & American Life Project



WHY CARE ABOUT TWITTER OPINION?

- Proven to be a power in influencing public and private sector policy
 - Susan G. Komen for the Cure foundation/Planned Parenthood controversy
 - Congressional online privacy legislation (SOPA and PIPA)



- “This [SOPA/PIPA legislation] is the first real test of the political strength of the Web, and regardless of how things go, they are no longer a pushover...The Web taking a stand against one of the most powerful lobbyists and seeming to get somewhere is definitely a first.”

- Columbia Professor Tim Wu in the New York Times

January 2012



For more information, go to
pewresearch.org or journalism.org

Questions?

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