

Polling and Prediction in the 2016 Presidential Election

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In the wake of experts' failure to predict the outcome of the 2016 presidential election, a rigorous analysis of what went right and wrong is needed to improve future polling. Despite claims that "data is dead," low-tech factors such as sampling errors and inaccurate likely-voter models were probably most responsible.

Donald Trump was elected president of the United States on 8 November 2016. Within hours, TV pundits were declaring, "Data is dead." Is this a case of water everywhere but not a drop to drink? It appears so on the surface. More than 250 nationally representative voter-preference surveys were done after the Republicans selected Trump for president and Mike Pence for vice president and the

year leading up to the election. Trump was widely predicted to lose both the popular and Electoral College vote. Reputable experts gave Trump no greater than a 40 percent chance of victory,¹ and some gave Clinton an 85 percent chance.² Anonymous reports say even Trump campaign leaders thought their candidate would lose. Yet, the morning after the election, Trump had won the Electoral College by a comfortable, if still historically

Democrats selected Hillary Clinton for president and Tim Kaine for vice president. The primaries saw even more high-quality random digital and online surveys.

Perhaps more than 800,000 citizens were interviewed nationally, with tens of thousands more in key battleground state polls over

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modest, 74-vote margin. The preliminary figures were 306 to 232. Trump had lost the popular vote but won the election. The experts got it wrong.

Scientific polling, as the term is used here, is the effort to conduct carefully designed surveys of representative samples of citizens to predict the likely outcome of an election. Our focus is on the accuracy of this process in 2016. But why even bother? There are several good reasons. Political campaigns need predictions to make decisions about investing resources: where and when to campaign, how to advertise, how to mobilize the base versus target undecided voters, and so on. News organizations make predictions because elections are highly marketable to readers. Scholars often use these same data to test theories about the causal drivers of political behavior. Predictions in 2016 weren't as bad as some claim, but the outcome was a surprise to many. Improving future polling requires a rigorous analysis of what went right and wrong. Politicians often say "the only poll that counts is the vote itself," but the science of polling carries huge benefits within and beyond campaigns and elections. Data isn't dead in predicting election outcomes, despite the problems of 2016.

It's too early to cover all possible explanations for 2016, but we know the polls came close on the national popular-vote margin and failed to predict outcomes in key battleground states. Furthermore, errors in these state-level predictions were all in the same direction, underestimating support for Trump. Here we discuss several probable suspects, including failures in the "likely voter" models that predict who would vote on Election Day, a large number of citizens who turned out to vote but then skipped the choice for president, and events late in the campaign (including possible Russian interference in the election) that

shifted real voter preferences enough to affect the outcome.

HOW THE US PRESIDENTIAL ELECTION WORKS

The US Constitution dictates a presidential contest occur every four years, and now limits a given president to two full terms. Since the early 1970s, the two dominant political parties (Republican and Democratic) hold popular primary contests or in-person caucuses to determine their nominees for president

and vice president. The Constitution doesn't mandate the existence of parties or primaries, and party platforms and institutional influence shifts over time. Therefore, state primary rules vary, but most states and parties bind delegates to vote at the party convention for the presidential candidate they pledged to support before primary voting took place. There are differences between the parties in how they apportion delegates at the convention based on popular caucus and primary outcomes, but both use a long, drawn-out process to select nominees.

In the general election, the president is formally chosen not by the popular vote, but by the vote of the Electoral College's 538 members. There's one elector for each of a state's congressional representatives (at least one but allocated roughly proportional to population) plus the state's two senators. There are three electors for the District of Columbia (referred to for this purpose as the 51st state). Most states use a "winner take all" rule: the nominee with the most votes gets all

of that state's electoral votes. Voters in states with a smaller population can therefore exert more influence on the outcome per capita: Wyoming, with under 600,000 people and three Electoral College votes, has about 200,000 people per Electoral College vote; California, with more than 37 million people and 55 Electoral College votes, has about 680,000 people per Electoral College vote.³ On a per capita basis, in 2016 "blue" (Democratic dominated) states like California, New York, and Illinois

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were underrepresented, while "red" (Republican dominated) states such as Arkansas, Idaho, Mississippi, and Montana were overrepresented, giving red states an advantage.⁴ A simple majority of Electoral College votes (270 or more) determines the winner. The presidential election is therefore an aggregate of 51 separate contests that send electors to the Electoral College.

POLL INACCURACY IN 2016

Polling failures in 2016 or in any year can be due to common problems. Polling is an imperfect science. Random sampling error based on who happens to get drawn from even the best and most comprehensive voter lists can render predictions in close races no better than a coin flip. When households had a single landline telephone, phone numbers changed infrequently, and people generally responded when asked for their vote preference, it was easier to generate a national sampling frame. It's harder today when almost everyone uses mobile phones, phone numbers change often, and people are

reluctant to respond to polls. While significant, these obstacles are surmountable through use of increasingly effective quality sampling frames and estimates of population parameters including vote preferences.⁵ Sampling error is always present, and the 2016 race was predicted to be close. Nevertheless, the polls gave pretty clear signals in the aggregate that Clinton would win the popular vote,⁶ and she did. At least nationally, sampling error doesn't explain the failure of polling in 2016.

Election prediction is also challenging due to nonrandom measurement biases. Those willing to answer a pollster's call might not reveal their true vote preference: they might falsely claim "I don't know who I'll vote for," or otherwise give an answer they think the pollster wants to hear. Under such circumstances, no amount of data would render accurate predictions. There's some evidence that this type of error could have been higher in 2016 than in previous years. Polls from different firms using various polling methods showed that many voters were reluctant to state a preference for president throughout the race and even late in the campaign. Statistician and journalist Nate Silver⁷ documented that nearly 13 percent of voters nationally claimed to be undecided even in the week before the elec-

preferences. Many voters in Midwestern swing states had previously voted Democratic and lived in communities where expressing support for Trump was probably unpopular. This speculation requires more forensic investigation, and many political scientists are working on it. The other key observation is that Trump and Clinton were both widely disliked. Among Democrats, Clinton never convinced some Bernie Sanders supporters to vote for her. By election time, 82 percent of Sanders supporters said they would vote for Clinton, but this still left many disaffected Democrats who could have altered the outcome in battleground states.⁸

Despite failing to predict the outcome, the polling industry predicted the national popular vote accurately in 2016. In fact, the prediction was closer than in the Obama–Romney presidential race. In 2012, the RealClearPolitics⁹ late campaign polling average suggested Obama would beat Romney by 48.8 to 48.1 percent nationally; Obama won 51.1 to 47.2 percent. This 2012 error was sizeable, from a 0.7 percent predicted Obama lead to a relatively comfortable Obama victory of 3.9 percent. The 2016 polling put Clinton's lead at 46.8 to 43.6 percent, a difference of 3.2 percent, but the final outcome was 48.2 to 46.1 percent, a 2.1 percent difference in favor of Clinton.^{10,11}

in these states showed Clinton with a small but consistent lead throughout the campaign, yet she lost several of them and with them the Electoral College. For example, Clinton was polling ahead in Wisconsin by at least 6 percent throughout the summer, and by early November she maintained a lead of 46.4 to 40.3 percent,¹² yet she lost the state 47.2 to 46.5 percent. Note that the entire error in this prediction sprang from the underestimation of support for Trump. Other swing states, especially Clinton's "Blue Wall" of traditional Democratic states, showed similar patterns. Interestingly, polling errors were largest in states with many non-college educated, working-class white voters.⁶ Trump outperformed polls in Utah (by 8.5 percent), Ohio (by 6.6 percent), Wisconsin (by 6.4 percent), Pennsylvania (by 4.9 percent), and North Carolina (by 4.5 percent). Notably, there were state-level errors in 2016 in the other direction as well: Clinton outperformed polls in several places such as Illinois and Washington State.¹³ However, since she was expected to win those states anyway, they had no effect on the prediction's overall accuracy. The polling errors in 2012 were in the opposite direction: Obama won battleground states by substantially more than predicted. Again, since he was predicted to win, these errors weren't discussed much in the media. Experts are studying how these state-level predictions went wrong.

It's hard to predict voter turnout. Proprietary algorithms can make studying this problem difficult, but *The New York Times* ran an experiment that gave the same data from a Florida poll to five different researchers. The predictions ranged from Clinton winning by 4 percent to Trump winning by 1 percent. A spread of 5 percent is massive in a close election. Immediately after the election some pollsters claimed, questionably in our opinion, that black turnout was low. Elsewhere the *Times* compared black turnout in 2016 to the 2012 election. Obama catalyzed black turnout in 2012, so the

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tion, a rate about three times higher than in 2012. These "undecided" voters broke strongly for Trump in battleground states like Wisconsin, Florida, Pennsylvania, and Michigan. They might have truly been undecided until late, but it's also possible that they were unwilling to admit their real

The polls made some fairly large and glaring mistakes at the state level, which matters because of the Electoral College. Some states, like Utah, consistently vote Republican. Others, like Washington, DC, vote Democratic. The outcome is much less predictable over time in battleground states. Most polls

2004 election might be a better point of comparison. Black turnout in 2016 was higher than in 2004.^{14,15}

Pundits were surprised by the outcome because Clinton led in the popular vote by at least 3 percent. Such a large popular-vote lead has always been sufficient to win. Polling also showed Clinton ahead in several battleground states. This evidence taken together made a Trump victory unlikely. In the end, Trump won six states that Obama had carried. These states had voted Democratic recently, so analysts thought Trump wouldn't win. The warning signs are clearer in hindsight.

ASSESSING THE FAILURE

Likely-voter models are a leading suspect for the failure to accurately predict the 2016 election. These take the expressed preferences of poll respondents and weight them by the probability that others like that respondent will vote on Election Day. Less-educated, working-class white men from rural areas are usually down-weighted based on their long-run propensity to be less likely to vote. In 2016 they voted, and where there were more of them, the error was larger. Anti-immigrant sentiment and ethnocentrism in the Trump campaign might have mobilized such voters.¹⁶ Many Democrats who voted didn't cast ballots in the presidential race. This "underballot" behavior was unusually common in swing states that Clinton counted on. Experts didn't adjust their likely-voter models for lack of enthusiasm among Democrats most likely to vote. These voters might have told experts their preferences and showed up to vote, but never marked a preference for president. There were at least 90,000 underballots in Michigan alone, many from highly Democratic areas—about double the recent average.¹⁷ Clinton lost Michigan by some 10,000 votes. Underballots could easily account for this loss in Michigan, and also perhaps in Wisconsin. Experts might have mistakenly assumed that respondents who "preferred" Clinton

and had a long track record of voting would actually choose her in the voting booth. Many did not.

It's also possible that the experts weren't wrong in their polling. Voters might have changed their minds late in the campaign. If models can't pick up substantial, late-breaking movements, the predictions will be

press, possibly to benefit the Trump campaign. It seems unlikely that the interference went deeper, for example, hacking into voting machines or altering vote tallies. Still, intervention in elections by Russia or any other foreign power is a serious matter. There's also speculation that FBI Director James Comey's "October surprise"—

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wrong even if the experts aren't. A panel survey comparing preferences in October to votes in November found that the vast majority of voters didn't change their preferences, but 0.9 percent did, for about 1.2 million votes nationwide.¹⁸ The study also found many undecided voters late in the campaign, and most of these broke for Trump. This might be attributable to reporting bias, but evidence from exit polls suggests that many voters who decided close to the election supported Trump.¹⁹ If this had been known in advance, Clinton's apparent lead in battleground states would have been smaller or nonexistent weeks before the election. Undecided voters are typically thought to have less information than decided voters, but in the 2016 election some undecideds might have been strategic voters who preferred to vote otherwise (for example, for the Libertarian candidate) or not vote but knew from polling data that their vote might win the state for Trump, so they voted for Trump. Polling data don't identify voting behavior that shifts depending on how voters read the polls.

An elephant in the room is the effect of Russian interference in the election, which is under investigation at the time of this writing. US intelligence sources suggest that Russian agents illegally hacked into email servers and then selectively funneled results to the

the announcement just days before the election that the investigation into Clinton's possible illegal mishandling of classified documents while secretary of state was being reopened—might have marginally affected the outcome, perhaps by triggering some of the underballots discussed above. Certainly his comments were unprecedented, especially given that no charges were brought against Clinton. Still, it's hard to tell what effect these comments had without a control group who wasn't exposed to them.

Data might be lots of things, but dead isn't one. Models are tested on thousands of observations in a given election year, but there have only been 15 presidential elections since 1960 when large random samples and modern opinion measurement techniques became available. Many innovations and improvements have been made, but the field still deals with a small *N* problem. Contextual factors influence turnout, sampling, and measurement biases. Economic and cultural forces influence outcomes. Close elections are hard to predict, and surprises like 2016 still occur despite standard assumptions that have informed prediction models. This is an opportunity for the field to learn and improve.

Weather forecasting provides a useful point of comparison. Better sensing, modeling, and understanding of how weather works have improved forecasting incrementally over time. Weather systems provide frequent inputs, so models can be improved. Even rare weather events occur more often

scientific effort, is neither “free” nor fast, but it is occurring.

New technologies such as computer-enabled communications have enhanced candidates’ ability to directly reach their constituents, and also our ability to measure the public’s reactions in real time. Donald Trump was the

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than every four years. Progress is real but has taken time. In the 1950s it was impossible to predict the weather accurately beyond a day or two. Today, reasonably accurate predictions can be made out to 10 days ahead. If the climate is a vast machine, as some scientists have claimed,²⁰ weather should be predictable for even longer periods with enough data and computing power.

Election outcomes might be harder to predict than the weather, so progress could take longer. Elections involve human decision making and there might be more sources of variance than with weather. Measuring human intentions via survey questions is also more challenging than measuring variables in a weather system. Barometers seldom misrepresent atmospheric pressure, but people sometimes lie to pollsters to seem more responsible or attractive. Polling experts have begun to surmount these challenges, but progress takes time due to tradeoffs. For example, it’s known that interviewer race and gender influence responses to questions about policies related to social welfare, affirmative action, and the like. Allowing respondents to self-administer such questions can reduce bias, since there’s no interviewer to impress, but unfortunately it also removes the conversational rapport that improves the validity of other answers. Progress in election polling, as in any

first major candidate, and is the first president, to use Twitter almost daily to circumvent the mainstream press and directly address tens of millions of people. It’s too soon to tell what effect this will have on institutional legitimacy, public informedness, or citizen engagement, but those are big questions for political science. Similarly, it’s possible that people outside the US used the network to interfere with the 2016 presidential election. Social media, Internet-based sources, and the remarkable appearance of “fake news” suggest surprising and unpredictable consequences for our political process. Despite all that, we suspect most of the problems in forecasting the 2106 election were “low tech” factors, including sampling errors and inaccurate likely-voter models. ■

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