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## Overreading the Poll Leaves

This campaign season, *The New York Times* is publishing the results of a series of local and state-wide polls by the *Times* and Siena College in real time on its website. As each phone survey takes place, the *Times* shows changes in polling results and the corresponding decreases in the poll's margin of error. The *Times* further breaks down how turnout models and demographic weightings could impact results. The takeaway should be how fundamentally uncertain and assumption-driven the poll numbers are. But I doubt that even such detailed framing of the issues is enough to temper the quick conclusions we instinctively draw from top-line poll numbers.

Let's look at one race pitting a Republican incumbent (Steve Knight) versus a Democrat challenger(Katie Hill) in southern California (see online results here ). We'll start with the margin of error—the ubiquitous "plus or minus three (or some other number) percentage points" you always here about.

For most people, that translates into something like "the poll will predict actual results to within three percentage points." In scientific terms, it means that if we sample the same population twenty times, the results will be within three percentage points 95 percent of the time.

But the caveats even at this point are substantial. For example, what if some distinct slices of the target population refuses to participate? In the case of the southern California race, the *Times* needed 36,667 calls to get 504 respondents. It's not clear how many of those calls were multiple attempts to reach the same person, but it is likely that the response rate was in the single digits. Post-survey weighting of the sample can try to correct for this, but it may not capture the true intentions—and intensity levels—of missing sub groups. This is called nonresponse bias.

But there's another important point that the *Times* calls out. The southern California survey has a margin of error of plus or minus 4.8 points. But the potential error in the *difference* between the candidates' numbers is close to twice that—nine percentage points. While Republican Knight is up four points in the poll (48% to 44%), this lead doesn't look as good when a nine-point window is layered on top of it. The four-point Knight lead could be as much as a 13-point lead—or even a five-point loss. But how many people think to nearly double the margin of error when looking at differences between the candidates' numbers?

Those are the top-line numbers and margins of error. The *Times* next looks at different turnout models. While Republican Knight is up four points under the *Times'* assumptions, that lead might be as little as two points if turnout looks like 2016 (the past presidential election year), or as much as nine points if it looks like 2014 (the last midterm election).

Next, we have demographics. The *Times* shows Knight's lead decreasing by one point if they do not weight by education but

increasing by one point if they do not weight by party registration. They could tweak the base model by many other factors (e.g., age or religion). Clearly, the combined effects of different weightings could add or subtract a few points from Knight's lead.

Finally, what to do about undecided voters? In this case, they represent eight percent of the sample. As the *Times* notes, if they broke very sharply for the Democrat, that alone would be enough to tip things in Hill's direction.

And so we go from a four-point top-line lead with a reported 4.8-point margin of error to one that:

— Has a margin of error of nine points when the difference between the two candidates is measured.

— But might be a 2-point or 9-point lead based on turnout assumptions.

— Plus or minus a few points based on weighting assumptions.

— Plus or minus a few points depending on the break of undecided voters.

That's a lot of uncertainty, piled on top of uncertainty. I'd rather have a four-point poll lead than not, but I would be far from 95% confident in it.