This document contains a plan for a pilot study of an experiment on voters’ perceptions of uncertainty in the face of polling information.

1 Introduction and Rationale

Overview: This PAP introduces the design and analysis plan for a pilot study of the broader “Perceptions of Uncertainty” project. The pilot is a conjoint experiment fielded on a sample of University of Minnesota undergraduate students. At time of writing, data have not been collected and no analysis has been conducted. A previous pilot study was fielded on a nationally representative survey of voting-age adults in Wales, UK, thanks to collaboration with researchers at Cardiff University and Sky News.

Motivation: Recent years have seen an explosion in data-driven journalism and a corresponding growth in “horserace” coverage of polling ahead of elections. Now more than ever, voters are exposed to a steady stream of information about likely electoral outcomes, including sophisticated statistical forecasts. Perversely, however, recent studies have demonstrated that voters often fail to account for polling and forecast uncertainty. They instead form sharp expectations despite incomplete and conflicting information. Such overconfidence in electoral outcomes, these studies argue, can decrease turnout and even lead to surprise election results, such as the 2016 US presidential election and the 2016 Brexit referendum (Westwood, Messing, and Lelkes 2018).

Project contribution: This project tests the efficacy of various methods for communicating polling and forecast uncertainty to citizens. We vary the presentation of polling and forecast...
information about a hypothetical election to evaluate voters subjective feelings of uncertainty about the election outcome.

Aims:

• Estimate the impact of including a statement of uncertainty around a poll or forecast on voters’ certainty of the electoral outcome.
• Estimate the comparative certainty over electoral outcomes among voters induced by individual polls, averages of polls, and forecasts.
• Compare the efficacy of textual and graphical statements of uncertainty for inducing accurate understanding of electoral uncertainty among voters.

2 Survey design

• Overview: The Hubbard School of Journalism at the University of Minnesota maintains a student subject pool of current enrollees in journalism courses.
• Administration: Ben Toff (faculty at UMN) will lead the administration of the survey.
• Mode: Online only.
• Platform: Qualtrics.
• Expected timeline: Questions are being drafted for a field dates in April, 2019.
• Sample size: It is hard to forecast exactly how many students will take the survey, but Ben suspects that we may get around 200 respondents.
• Withdrawal criteria: Respondents may terminate their participation in the survey at any time and without consequence.

3 Experiment Design

Transition text: Respondents will first be shown the following prompt to transition them from the broader survey into the experiment.

We are interested in understanding how people interpret public opinion polls when they see such information in the media. Please read the following hypothetical election scenario and respond to the questions that follow.

Manipulations: Respondents will then be shown polling information that varies along multiple dimensions.

1. Poll or Average: [A recent poll/An average of recent polls] shows Candidate A with X~ of the vote compared to Y~ for Candidate B.
Figure 1: "Box Plot" for "Range" condition figure. Still working on labeling details.

2. **Margin:** the vote margin between Candidates A and B takes the values 2, 4, 6, 8, or 10 percentage points.

3. **Undecideds:** the amount of “undecided” voters varies between 0, 2, 4, 6, 8, 10, and 12 percent. Actual vote shares in each trial are determined by the combination of the margin and the number of undecideds. (Ex. A recent poll shows Candidate A with $X_\sim$ of the vote compared to $Y_\sim$ for Candidate B with the remaining $Z_\sim$ undecided.)

4. **Uncertainty:**
   - Control: *No mention of uncertainty*
   - MOE: A recent poll shows Candidate A with $X_\sim$ of the vote compared to $Y_\sim$ for Candidate B with a margin of error of +/- 3.4~.
   - Range: A recent poll shows Candidate A with $X_\sim$ of the vote compared to $Y_\sim$ for Candidate B. Statistical uncertainty suggests that Candidate A is therefore likely to receive between $X_l$ and $X_u$ of the vote compared to $Y_l$ to $Y_u$ for Candidate B.
   - Forecast: “A recent poll shows Candidate A with $X_\sim$ of the vote compared to $Y_\sim$ for Candidate B. A statistical analysis of this information shows Candidate A with a $p_A$ chance of winning compared to a $p_B$ chance for Candidate B.”

5. **Figure:**
   - Control: *No Figure*
   - Figure: If the uncertainty condition is “Range,” confidence interval values would be plotted as “boxes” (see below). If the uncertainty condition is “Forecast,” a distribution of forecasted vote shares is plotted as a histogram (also below).

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1. All MOEs are fixed to 3.4~.
2. Forecast probabilities are created by simulating 1 million normal variates for Candidate A’s vote share and then calculating B’s variates as $B = 1 - A - U$, where $U$ is given by the “Undecideds” treatment.
Outcome measure: We will measure respondents’ level of confidence in an election outcome on a (discrete? “real”-valued?) differential scale.

On a scale from “Totally certain that A will win” to “Totally certain that B will win,” how certain are you about who would win the election if it were held today?

Manipulation check: Finally, we will test whether respondents received and understood the information presented to them, by asking them to report back Candidate A’s vote share (as an integer between 0 and 100):

According to what you just read, what percentage was Candidate A receiving in the poll?

We aim for respondents to respond with ±3 percentage point accuracy.

Repeated measures: We plan to repeat the exposure ten times per participant. We intend to use this pilot to assess cross-trial dependency and determine an appropriate number of trials for the final study.

Assignment mechanism: Respondents will be assigned a random seed upon beginning the survey, which will determine the treatments they receive. Some combinations of treatments are excluded (e.g. the “range” uncertainty condition with a forecast histogram figure), but all valid combinations are assigned randomly with equal probability.
Control variables: Age, gender, and partisanship data will be collected as for randomization checks and potential controls.

4 Analysis

4.1 The issue of “calibrated uncertainty”

We are struggling with the issue of “well-calibrated uncertainty” in evaluating the polling information. Critics allege that election forecasts lead voters to be overconfident in election outcomes (Westwood, Messing, and Lelkes 2018). Our first pilot measured “certainty” about the outcome on a 0 – – 10 scale using only 5 treatment conditions. Results from this pilot are available in the other attached document (“Wales First Look”).

One question we have upon reviewing this evidence is whether it’s fair to characterize some respondents as “overly uncertain” to the point of being inaccurate. To that end, we have struggled to find a way to conceptualize the “correct” amount of uncertainty that a respondent should give, given the information presented. Past studies ask users to report a probability of candidate A’s success. Not only do we supply some respondents with this information, we are unsure if respondents are subjectively internalizing the uncertainty of (for example) a 30% probability event.

We have been debating the idea of mapping respondents subjective feelings of uncertainty into a probability space. This would be done by giving respondents a pre-treatment battery of items to classify on the certainty scale—how certain they are about the top card of a deck of cards being a spade, or how uncertain they would be about rolling a die and getting a 6. These items would then be used to regress individuals’ uncertainty perceptions on the true event probabilities, allowing us to make inferences about whether an individual’s uncertainty about election outcomes is “more correct” (in the sense that it reflects the true probability of an outcome) or if they are over- or underconfident about the outcome. This technique is known elsewhere as Aldrich-McKelvey scaling, and it has been used to correct heterogeneous interpretations of outcome scales in other political contexts and map across items with different underlying functional forms (Hare et al. 2015).

4.2 Exclusions

We will exclude individuals from the analysis who do not complete the outcome measurement question. We will also exclude individuals who cannot accurately recall Candidate A’s expected vote share within 3 percentage points.

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3 An MOE description of uncertainty, MOE plus box plot, a “range” description of uncertainty, and range plus box plot, with a final condition (control) containing no graphic or description of uncertainty.
If we perform the Aldrich-McKelvey scaling of the uncertainty outcome items, we will either want to set a minimum number of scaling items completed in order to estimate the mapping, or declare a missing data procedure which models unobserved data rather than ignoring all missing data.

4.3 Hypotheses

- “Overconfidence” hypothesis: individuals are more certain of election outcomes when they are expresses as forecast probabilities than not.
- “Information” hypothesis: forecast probabilities lead voters to express better calibrated uncertainty beliefs compared to MOEs and ranges.
- “Visuals” hypothesis: visuals lead voters to express better calibrated uncertainty beliefs compared to no figures.

4.4 Power Calculations

We had these for our initial pilot, but the conjoint setup makes this harder. Happy to get advice on best ways to do this. We are also happy to get advice on dealing with error concepts that are not strictly related to significance testing such as magnitude and sign errors (Gelman and Carlin 2014).

5 Ongoing questions

In addition to our deliberation over Aldrich-McKelvey scaling, we are also debating whether to manipulate the partisanship of Candidates A and B. It is likely the case that voter misperceptions of election uncertainty interact with partisan predispositions, but we are debating whether it is consistent with the “purpose” of our study to explore this angle.

References
