

# Prediction Error, Emotion, and Information-Seeking Behaviors in the Context of the 2020 U.S. Presidential Election



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## Background

### Prediction Error (PE)

- PE can be defined as the discrepancy between the anticipated and the actual outcome of an event
- In previous literature, PEs have been associated with experience-based learning, information-seeking behaviors, enhanced declarative memory, and the magnitude of emotional responses<sup>1,2</sup>
- Yet, the correlation between PE and real-life emotion and behaviors is undercharacterized
- We previously examined surprisal's correlation with emotion and memory following the 2016 American presidential election<sup>3</sup>
- We found that surprised individuals reported greater emotional responses compared to non-surprised individuals

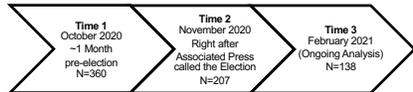
## Present Study: PE and the 2020 American Presidential Election

- Aims: building off of our work with the 2016 presidential election, to investigate the extent which PEs are associated with changes in emotion and media information-seeking behaviors following the 2020 American presidential election with more detail**

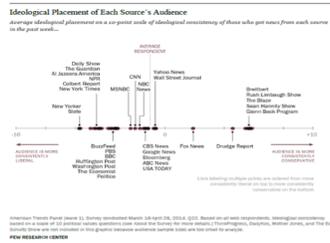
- Hypotheses:**
  - Increased PEs, both positive and negative, will be associated with:
    - Stronger emotional responses
    - Increases in information-seeking behavior through increased media consumption
  - Exploratory Hypothesis:** Increased PEs will be associated with increases in the partisanship of the media consumed

## Methods: General Study Design

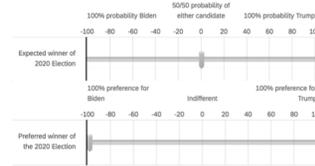
U.S.-based online participants (N = 360) from across the political spectrum recruited on Prolific.co to complete questionnaires at three timepoints:



At each timepoint, participants reported positive and negative affect about the election (PANAS<sup>4</sup>) and media information-seeking behaviors through number, frequency, and partisanship of sources consumed. (Partisanship scored quantified using Pew Research Center Media Bias Ratings<sup>5</sup>)



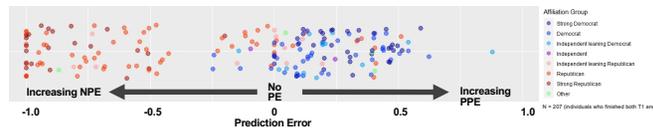
## Methods: Calculating Prediction Error (PE)



- At Wave 1, participants prospectively reported outcome expectancy and outcome preference
- Expectancy x Preference** used to calculate negative or positive prediction error (NPE or PPE respectively, PE range: -1 to +1) relative to the actual election outcome<sup>6</sup> in November 2020.

## Results

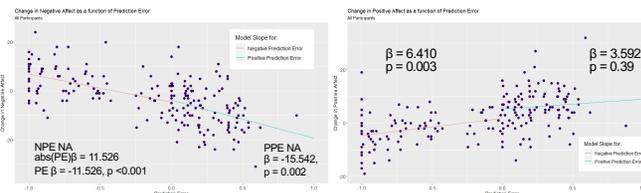
### Distribution of Prediction Error by Reported Party Affiliation



**Significant difference in PEs across Republicans and Democrats in magnitude and direction** Republicans tended to have negative PEs that were larger in magnitude than Democrats' average positive PEs:  $\bar{PE}_{Republican} = -0.509$ ;  $\bar{PE}_{Democrat} = 0.238$ ,  $t(133.49) = 15.078$ ,  $p < 0.01$

### PEs significantly predicted changes in affect

Using linear regression, PEs were related to changes in positive and negative affect regarding the 2020 election from T1 to T2 (pre-post outcome). Though a model comparison, we found PE is a **better predictor than election preference** for emotional response



**PEs significantly predicted changes in negative affect:**  
Increasing PPEs were associated with decreasing negative affect ( $\beta = -15.542$ ,  $p = 0.002$ )  
Increasing NPE magnitudes associated with increasing negative affect ( $\beta_{|NPE|} = 11.526$ ,  $p < 0.001$ )

**NPEs predicted decreasing positive affect:**  
( $\beta_{|NPE|} = -6.410$ ,  $p = 0.003$ )

### PE did not significantly predict changes in the number of media sources consumed nor the frequency of their consumption over the previous 30 days

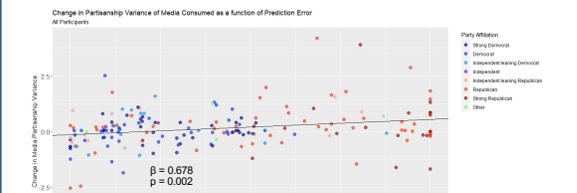
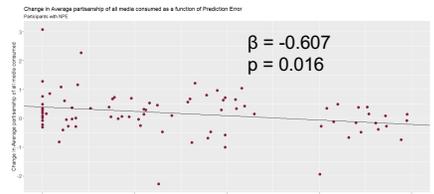
Using linear regression, PEs were related to changes in the number, frequency, and partisanship of media sources consumed (partisanship quantified by the Pew Research Center, 2014) from T1 to T2 (pre-post outcome).

- PEs did not significantly predict changes in:
  - Number of unique media sources consumed ( $\beta = .5017$ ,  $p = 0.539$ )
  - The frequency of media source consumption ( $\beta = 1.004$ ,  $p = 0.714$ )

## Results Continued

### PE significantly predicted change in the partisanship of media consumed

**Increasing NPEs were associated with a shift towards more conservative media sources post-election**  
( $\beta_{|NPE|} = 0.607$ ,  $p = 0.016$ ).



**Larger PEs were associated with increased partisanship variance** of the media consumed post-election ( $\beta = 0.678$ ,  $p = 0.002$ ), consistent with an account that increased PEs might drive information-seeking.

**Model comparison verified that these PE effects were significant over and above those related to election preference alone.**

## Conclusion

- Both positive and negative prediction errors may be associated with changes in emotional responses and aspects of media information-seeking behavior
- Moreover, negative prediction errors were associated with a shift towards consuming media sources with greater conservative partisanship

### Overall, these results:

- Tie observations of affective and behavioral consequences of prediction errors to a naturalistic human event
- Suggest a psychological mechanism that may contribute to increased partisanship following a disappointing political outcome.

## References

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