

Pre-Analysis Plan: Do leading images affect reader's opinion?

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1 Introduction

I experimentally test whether news leading pictures with different visual features influence readers’ opinion on the article’s topic. In particular, I test the following:

1. Whether images with different features produce different opinions in the general audience.
2. Whether readers react differently to images that confirm or dis-confirm their a priori political stance.
3. Whether the effect of images depends on respondents’ prior opinion on a given issue, and whether it affects polarization.
4. Whether images have a different effect on opinion formation and opinion consolidation (i.e. when respondents’ opinion on the news topic is “fresh” vs “established”), and whether the effect of images varies with the perceived saliency of the topic.

2 Research Strategy

I conduct an online survey experiment in the US to measure the influence of leading images in news articles.

I use articles covering topics broadly related to domestic policy, foreign politics, economics, as well as more specific topics such as coronavirus or BLM.¹

2.1 Experiment Structure

Each respondent will be exposed to news on five topics, displayed sequentially. Each topic will be presented following this structure:

1. First, I present readers with a very short summary of a piece of news. I then ask readers to evaluate their current knowledge of the topic by moving a graphic slider in a range from 0 to 100. Below the slider, a “move forward” button leads to the second question.

¹Note: the topics were derived from a previous and distinct analysis of a large number of news published by main US news sources between December 2019 and December 2020.

2. Second, I ask a question on the news topic to measure the respondent’s opinion. Below this question’s slider, I substitute the “move forward” button with a “read the news” one. The reader can only proceed by clicking on it.
3. At this point, the respondent accesses a page containing a piece of relevant news published on the topic. The news are truthful and generic (non partisan). The graphic rendering of this page (colors, font, etc.) resembles that of a Facebook post. Readers can scroll down the page (reading or skimming as they please) and then click on a “go back to survey” button.
4. At that point, they are presented with an identical copy of the page in the second step, namely the one displaying the question and the slider. They may modify their answer or send the response by clicking on a “confirm and send answer” button.

The experimental part of the study consists of changing the images that lead the news on each topic (I hold the texts, titles, and headlines constant, while I randomize the articles’ leading images.)

The experiments’ building blocks are the following:

- *News topics*– BLM, Coronavirus, domestic policy (Juneteenth), foreign politics (US-Iran nuclear deal), economy (Inflation).
- *News*–The news on each topic, which the respondent sees in step 3 above.
Each news piece appears in this format (from top to bottom): news summary, image, title, headline.
- *Treatment branch*– for each topic I produce three “visual narratives”, by employing visual features most distinctive of Republican-leaning coverage and Democrat-leaning coverage, or non-distinctive ones (coherent with non-partisan coverage)².

Each survey respondent is exposed to all the topics. For each one, she will be randomly assigned to a treatment branch (equally likely among pro-Dem/pro-Rep/neutral), determining her treatment status for that topic. Therefore, every individual is assigned to 3 different treatments, each treatment assignment being independent from others. The order of the topics is random.

The outcome variable of interest for each topic is the difference in the respondent’s opinion before and after being exposed to the news.

²Note: the partisan-loadings of the visual features are derived in a separate analysis, and taken as given in this experiment.

2.2 Sampling

The survey is conducted on a nationally representative sample of the US population, consisting of 2000 respondents proportionally distributed across geographic areas (north east, south east, west, midwest), age group, gender, employment status and educational attainment. The sampling is provided by the panelist company IPSOS. The eligible population of the study consists of US citizens between 18 and 65 years of age.

2.3 Randomization

Respondents are equally likely to be assigned to either of the three treatment branches. Treatment assignment is randomized at individual level, and treatment status for each topic is independent of the status in other topics.

2.4 Exclusion criteria

I exclude all survey respondents who do not pass an attention check placed at half survey (*“Please select answer 5. This is only to check that you are actively responding to the survey”*). I also discard respondents whose survey completion time is below the shortest length in simulations (6 minutes), and whose completion time exceeds 22 minutes (more than double the estimated completion time). I set a minimum news exposure time of 1 second, and measure the time spent on the news page. I discard single answers on news topics whose news page was visited by the respondent for (strictly) less than 5 seconds, i.e. the time just sufficient to load the page and immediately scroll down to the “next page” button.

3 Outcome variable

The primary outcome variable for this analysis is the post-pre treatment difference in the opinion related to each topic.

As a secondary outcome to inquire on the underlying mechanisms, I consider the time spent (in seconds) on a news page to assess whether images with different features induce different attention patterns to the news.

4 Empirical Analysis

I estimate through OLS the following specification:

$$Y_i = \beta_0 + \beta_1 TD_i + \beta_2 TR_i + \beta_3 X_i + \epsilon_i$$

where Y_i is the (post-pre treatment) difference in the opinion expressed by respondent i on a given topic. β_0 is the coefficient for exposure to news accompanied by “neutral” images, TD_i and TR_i are dummies indicating whether respondent i was exposed to news featuring Dem-leaning or Rep-leaning leading images, for the given topic. X is a vector of control variables uncorrelated with the treatment indicators, but which can aid in the precision of the estimates, such as info on the respondent’s device type (PC/mobile, screen resolution, browser name etc.), personal characteristics (gender, age, region, employment status, education, main source of political info, etc.) or info related to the survey compilation (hour of the day, date).

The main null hypothesis tests the significance of treatment coefficients as well as the equality between coefficients β_1 and β_2 .

I run the above specification for each news topic. I additionally construct an index that combines the outcome variables across topics, weighting by the inverse of the covariance between variables, as described in Anderson (2008).

4.1 Heterogeneous Effects (subgroups analysis)

I study the presence of heterogeneous treatment effects along the following dimensions:

- **Respondents’ political affiliation**

I study whether a given visual framing has a different impact on respondents from opposite sides of the political spectrum. More precisely, I test whether the effect of a visual frame significantly differs between Democrats and Republican respondents, and whether individuals react differently to images aligned or contrary to their political prior.

- **Respondents’ prior opinion**

I test whether images produce different effects on respondents’ holding extreme or average prior opinions (ie. in the 2nd tercile of the distribution), and have an impact on opinion polarization.

- **Respondents' (self reported) knowledge of the topic**

I study whether the effect of images varies between respondents whose prior knowledge and opinion is consolidated, and those whose knowledge is low and opinion weak (ie. “fresh” vs. “consolidated” opinion). Those are directly measured with a question before treatment takes place.

- **Topic salience**

I study whether the effect of images varies with perceived salience of the topic (high or low). This is directly measured with a question before treatment takes place.