Ca' Foscari University of Venice

Department of Economics

Working Paper

Armenak Antinyan
Thomas Bassetti
Luca Corazzini
Filippo Pavesi

Narratives on COVID-19 and Policy Opinions: A Survey Experiment

ISSN: 1827-3580
No. 04/WP/2021

Working Papers
Department of Economics
Ca' Foscari University of Venice
No. 04/WP/2021
ISSN 1827-3580

Narratives on COVID-19 and Policy Opinions: A Survey Experiment

Armenak Antinyan
Wenlan School of Business, Zhongnan University of Economics and Law, China

Thomas Bassetti
Department of Economics and Management "Marco Fanno", University of Padua

Luca Corazzini
Department of Economics and Vera, Ca' Foscari University of Venice

Filippo Pavesi
School of Economics and Management, LIUC (Carlo Cattaneo University)

Abstract: Narratives impact people's opinions on relevant policy issues, and their political context may influence these effects. Indeed, some specific contexts may be more easily swayed by certain stories that provide explanations for current social and economic phenomena. We explore this issue by considering the ongoing COVID-19 pandemic as a natural experiment that creates the ideal conditions for existing narratives to gain momentum and spread. In particular, we run a survey experiment in the US by exposing subjects to two media-based popular explanations on the causes of the COVID-19 pandemic. The Lab narrative attributes the upstart of the pandemic to human error and scientific misconduct in a laboratory in China, while the Nature narrative describes the genetic and biological causes of the virus. We find evidence that subjects' beliefs on the origins of the disease are influenced by the narrative they are presented with. Moreover, the Lab narrative leads subjects living in Republican leaning states to express less favorable opinions about trade openness and the relevance of climate change relative to those living in Democratic leaning states. Thus, our findings provide support for the idea that recalling stories that are part of larger narratives can lead to divergence of opinions on crucial issues leading to an increase in policy polarization. Finally, we explore the underlying features of social contexts associated with US states' political orientation, that moderate the impact of narratives on policy opinions.

Keywords
Economic Narratives, COVID-19, Policy Issues, Survey Experiment

JEL Codes
D72, D83, C83, C99, P16, Z18

Address for correspondence:
Luca Corazzini
Department of Economics
Ca' Foscari University of Venice
Cannaregio 873, Fondamenta S.Giobbe
30121 Venezia - Italy
e-mail: luca.corazzini@unive.it

The Working Paper Series
is available only on line
(http://www.unive.it/pag/16882/)
For editorial correspondence, please contact:
wp.dse@unive.it

Department of Economics
Ca' Foscari University of Venice
Cannaregio 873, Fondamenta San Giobbe
30121 Venice Italy
Fax: ++39 041 2349210

Narratives on COVID-19 and Policy Opinions: A Survey Experiment

Armenak Antinyan[*], Thomas Bassetti[†], Luca Corazzini[‡], Filippo Pavesi[§]

January 2021

Abstract

Narratives impact people's opinions on relevant policy issues, and their political context may influence these effects. Indeed, some specific contexts may be more easily swayed by certain stories that provide explanations for current social and economic phenomena. We explore this issue by considering the ongoing COVID-19 pandemic as a natural experiment that creates the ideal conditions for existing narratives to gain momentum and spread. In particular, we run a survey experiment in the US by exposing subjects to two media-based popular explanations on the causes of the COVID-19 pandemic. The Lab narrative attributes the upstart of the pandemic to human error and scientific misconduct in a laboratory in China, while the Nature narrative describes the genetic and biological causes of the virus. We find evidence that subjects' beliefs on the origins of the disease are influenced by the narrative they are presented with. Moreover, the Lab narrative leads subjects living in Republican leaning states to express less favorable opinions about trade openness and the relevance of climate change relative to those living in Democratic leaning states. Thus, our findings provide support for the idea that recalling stories that are part of larger narratives can lead to divergence of opinions on crucial issues leading to an increase in policy polarization. Finally, we explore the underlying features of social contexts associated with US states' political orientation, that moderate the impact of narratives on policy opinions.

Keywords: Economic Narratives, COVID-19, Policy Issues, Survey Experiment.

JEL classification: D72, D83, C83, C99, P16, Z18.

[*]Wenlan School of Business, Zhongnan University of Economics and Law, China, antinyan.armenak@gmail.com

[†]Department of Economics and Management "Marco Fanno", University of Padua, Italy, thomas.bassetti@unipd.it

[‡]Department of Economic Sciences and VERA, University of Venice "Ca' Foscari", Italy, luca.corazzini@unive.it

[§]School of Economics and Management, LIUC (Carlo Cattaneo University), Italy, fpavesi@liuc.it

1 Introduction

The concept of the Rhine-Divide suggests that one of the main obstacles to the development of an integrated European Union is represented by the different views of how society works held by Germany and France (Brunnermeier et al., 2018).[1] Likewise, data on political beliefs in the United States shows that there has been an increase in the degree of polarization between Democrats and Republicans and that this could have a significant impact on the proper functioning of democratic institutions (Gentzkow et al., 2019). While these differences are persistent and rooted in cultural factors, they can also be influenced and reinforced by alternative narratives that provide different representations of reality. If this is the case, these factors should be accounted for when designing policies aiming to bridge these divides.

According to the Oxford English Dictionary a narrative is defined as: "A representation of a particular situation or process in such a way as to reflect or conform to an overarching set of aims or values." Narratives are not just simple explanations of single issues or phenomena but encompass a general view of society as a whole. Therefore, as suggested by Shiller (2017, 2019) and Akerlof and Snower (2016), narratives can play a role in shaping beliefs and opinions that have an impact on human behaviors. The recent empirical literature has shown that presenting stories that provide positive or negative views on specific issues can have an impact on people's opinions on these same issues. Examples of such causal studies can be found in relation to immigration (Kaufmann, 2019), climate change (Bolsen and Shapiro, 2018), as well as on health decisions (Niederdeppe et al., 2015; Bruine de Bruin et al., 2019). Unlike these studies, we go one step further and explore the impact of narratives in affecting policy opinions that are not explicitly related to the issue the narration seeks to explain, but are more broadly related to the general representation of the world that an apparently simple story carries with it.

We contribute to this open question by conducting a survey experiment on US nationals that relies on exposing different subjects to distinct stories (treatments) on the origin of the pandemic in order to assess whether these stories have an impact on both their beliefs about the causes of the pandemic and their opinions on relevant policy issues not directly related to COVID-19. Three aspects of the COVID-19 pandemic are relevant for the validity of our experimental investigation. First, it clearly represents an exogenous and unpredictable shock, with the beginning of the pandemic tracing back to December 2019 and rapidly spreading all over the world in the next months. Second, the health emergency was universally salient and, to some degree, impacted everyone's life through lockdown restrictions as well as its severe

[1] The authors argue that the French regard society as being guided and shaped by government policy, while the Germans see society as being governed by rules.

socio-economic and psychological consequences. Third, there is no consensus on the origin of the pandemic, nor is there clear-cut scientific evidence to test and compare alternative conjectures. These features are likely to have triggered a genuine demand for explanations leading to the emergence of different stories describing the origin of the pandemic.[2] Moreover, we argue that, if these explanations on the causes of the virus evoke a more general representation of reality, the resulting narratives may also succeed in influencing opinions on relevant policy issues.

The main treatments of our survey experiment are built upon two dominant alternative stories, or versions of the facts, on the origin of the COVID-19 pandemic, which identify two distinct existing narratives: the *Lab narrative* and the *Nature narrative*. The Lab narrative essentially suggests that the pandemic originated as a result of human error and scientific misconduct in laboratories in China, while the Nature narrative describes the biological and genetic origin of the disease without explicitly attributing its cause to human actions.

The reasons behind choosing these alternative stories are twofold. First, each of these stories represents a cue or a reminder of an existing narrative that is already part of the public debate. More specifically, the Lab narrative echoes a much larger Republican (or Trumpian) narrative about China's negative role on political and economic processes in the USA. In the same vein, the Nature narrative reflects a wider narrative suggesting that as humans we are often unaware of our limited understanding and control of how nature operates. Second, each story has been covered by well-established existing media networks on both sides of the US political spectrum. This implies that, although each story may be perceived as being related to a specific political ideology, it is reasonable to assume that subjects of either political orientation have been exposed to both, although possibly with different intensity. Our treatments, therefore, recall existing or recurrent views that a substantial number of people are aware of, but for which, given the novelty of the shock, it is unlikely that a significant share of the population has already established firm beliefs about.

The main aim of our study is to investigate whether exposing subjects to (one of) the two narratives influences their opinions on three relevant policy issues that are animating a vivid public debate in the US: trade openness, climate change and trust in science. Although not directly related to COVID-19, there are important connections between the pandemic and these policy issues that allow us to hypothesize that narratives on the origins of COVID-19 may have spillover effects on subjects' opinions on these specific issues.

As stated by a recent Gallup Poll, trade openness and climate change rank among the

[2]We cannot that exclude that popular narratives may be uninformative or biased because influenced by motivated reasoning, a well documented process by which people reason their way to conclusions they favor leading to biased beliefs that feel objective (Bordalo et al., 2012; Epley and Gilovich, 2016; Bénabou and Tirole, 2016).

10 issues that Americans believe to be of foremost importance (Hrynowski, 2020). Concerning trade openness, the economic crisis triggered by the COVID-19 outbreak has caused a decline in the attitude towards globalization (Garrett, 2020) and fueled public animosity around protectionism and commercial relations with China. For instance, according to an IPSOS survey conducted during the pandemic, 50% of Americans think that, in the long run, COVID-19 will cause a disruption in trade with China (IPSOS, 2020a). Thus, the Lab narrative may intensify the anti-trade sentiment among the American public. Similar considerations apply to the debate on climate change. Gallup survey data reveal that about two-thirds of Americans think that climate change is a real problem (Saad, 2019), and a recent IPSOS survey finds that 59% of respondents in the US think that climate change is as serious a crisis as COVID-19 is (IPSOS, 2020b). In addition, climate change shares a number of similarities with the COVID-19 emergency (Hepburn et al., 2020): they both involve externalities, are grounded in a complex scientific debate, and require international cooperation as well as political and public support to find viable solutions. Furthermore, it has been claimed that there exist connections between COVID-19 and the climate crisis (Mendiluce and Siri, 2020), whereby climate change can increase the probability of pandemics occurring through inter-species contact resulting from deforestation. In essence, the Nature narrative can affect the pro-environmental sentiment among Americans and enhance climate change awareness.

Finally, trust in science has proved essential in order to deal with and properly address future epidemics and health crisis (Stevence and Ron-Levey, 2020). However, although survey data suggest that most Americans trust science, the attitude towards the scientific approach to social issues is strongly heterogeneous and varies considerably with age, education, gender, race and state of residence (AAAS, 2018). In this respect, the Lab narrative induces distrust in science as it points out the risks and potential harm of scientific misconduct. Instead, the Nature narrative highlights the merits of science in improving knowledge about the genetic origin of COVID-19, which represents the first step towards developing a vaccine as well as effective medical treatments.

In terms of results, we find evidence that both the lab and Nature narratives exhibit an effect on beliefs on the causes of the pandemic, and also influence opinions on policy issues in a predictable direction for two out of three dimensions: trade and climate change. More specifically, we find that the impact on policy opinions is moderated by the political orientation of the state where subjects reside. In particular, Republican leaning states are more affected by the Lab narrative leading to polarization on both dimensions when comparing states of different political orientations. On the other hand, individuals living in Democratic states are more sensitive to the Nature narrative. Rather than simply reflecting subjects'

political views, we argue that the polarization documented in our experiment also captures differences across US states on relevant social and cultural dimensions.

The remainder of the paper is organized as follows; Section 2 presents a review of the literature and section 3 describes the experimental design. Section 4 illustrates the testable predictions on the effects of exposure to the two alternative narratives. In Section 5 we describe our empirical approach and section 6 presents the results. In Section 7 we further discuss our findings and Section 8 concludes.

2 Literature Review

There is an increasing interest in economics about how narratives form and influence opinions and behaviors (Shiller, 2017, 2019; Morson and Schapiro, 2017). Narratives are stories that are instrumentally formulated to explain, justify, predict and sometimes influence human experience (Bénabou et al., 2019), and carry important elements that make them permeate our social life. First, they "animate the sense-making process" (Brooks, 1992) and provide models of understanding to interpret new, random and unpredictable events (Chater and Loewenstein, 2016; Karlsson et al., 2004).

Second, narratives do not necessarily need to reflect the truth, nor require to be grounded on verifiable information. Rather, what really matters for a narrative to be persuasive is its internal logic and perceived reasonableness, resulting from "mixtures of fact and emotion and human interest and other extraneous details that form an impression on the human mind" (Shiller, 2017, p. 973). For instance, the tendency to formulate negative categorizations, feelings, or ideas about individuals that are considered to be part of the "outgroup" represents one of the most powerful cognitive stimuli for the affirmation of popular conspiracy narratives.

Third, narratives enhance mental representations of the reality (frames) and provide effective reference points we constantly confront with in forming opinions and making decisions (Tversky and Kahneman, 2000; Thaler and Ganser, 2015; Thaler, 2016). This persuasive effect is likely to spread over different domains that do not necessarily need to be related to the content of the narrative itself. For instance, Kahneman and Tversky (1973) suggest that, in formulating their expectations, agents place similarity of circumstance to idealized stories before ex-ante objective probabilities. Similarly, in strategic interactions never experienced before, subjects base their beliefs and choices on stylized principles of action that are drawn by analogy from different contexts (Sugden, 1989). Finally, there is evidence showing that people tend to extend strong emotions and feelings such as fear, which might eventually be evoked by narratives and other representations, to unrelated happenings (Slovic et al., 2007).

Despite the strong potential of narratives to forge the way in which we interpret life events and act accordingly, important methodological issues arise on the empirical ground. Indeed, endogeneity problems and the difficulties in tracking the origin and evolution of narratives limit the possibility of using real data to isolate their causal effect on opinions and behaviors. Experimental techniques have been used to circumvent these limitations (see Braddock and Dillard, 2016, for a recent meta-analysis on the effects of narratives) and, nowadays, there are a large number of studies reporting evidence from controlled settings on the effects of exposure to ad-hoc, experimentally built narratives on individuals' evaluations and choices.[3]

More relevant for the purpose of the present paper, experimental studies have shown that narrative representations may also influence political opinions (Wyer et al., 2002, 1991, and references therein). Hermwille (2016) presents a conceptual theory based on the multi-level perspective framework and uses it to discuss how the narratives about nuclear power that appeared in Germany, UK and Japan immediately after the Fukushima nuclear meltdown in 2011 have triggered different policy responses and changes in the energy industries of each of these countries. While sharing the same aim of assessing the causal effects of exposure to narratives, our study is novel in that it is grounded on the exogenous and unpredictable onset of the COVID-19 pandemic, providing a robust and externally valid setting to conduct our experimental investigation. The most remarkable feature of our approach is that, rather than building ad hoc, hypothetical narratives, we use the two most popular stories about the origins of COVID-19 that could be retrieved from US media since the beginning of the pandemic. Indeed, both the stories that we use fit the definition of narratives particularly well, since they provide reasonable, although not (scientifically) verifiable, explanations of an unpredictable, tragic life event, such as the COVID-19 outbreak. By evoking different mental representations of the causes of the pandemic, our claim is that exposing subjects to either story can influence subjects' beliefs on the origin of COVID-19 and their opinions on policy issues accordingly.

Finally, our study is related to the literature on priming (Cohn and Maréchal, 2016) in that we study how exposing subjects to different stories on the causes of the COVID-19 outbreak affects the way in which they interpret and form their opinions about different policy domains. Moreover, our analysis is also related to Akerlof and Kranton (2000) who show that the extent to which priming narratives affects opinions also depends on cultural

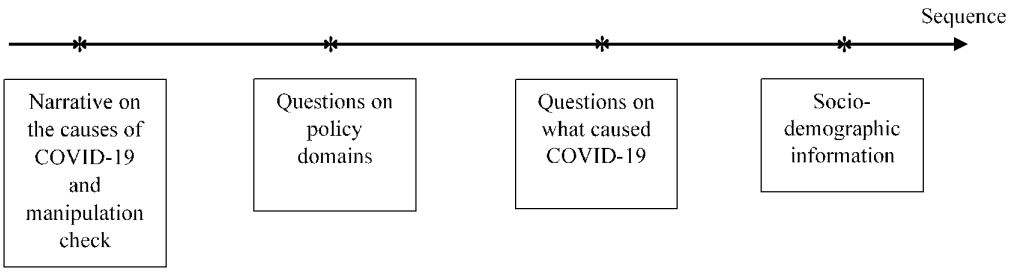
[3]These studies include consumers' evaluation of advertised products (Escalas, 2007), delay discounting and nutrition habits (Bickel et al., 2016; Mellis et al., 2018; Daniel et al., 2015, 2013a,b; Peters and Büchel, 2010), perceived efficacy of nutrition messages (Slater et al., 2003), prevention behaviors against skin cancer (Cody and Lee, 1990), participation in organ donation programs (Weber et al., 2006), student's learning processes (Mcquiggan et al., 2008), retention and comprehension of news content (Machill et al., 2007), and jury decision making (Pennington and Hastie, 1986, 1992)

and identity characteristics. The identity of individuals depends on both exogenous factors (such as gender, ethnicity) and endogenous characteristics that develop through the course of their life (and which include, for instance, occupation and political preferences).

3 Experimental Design

Our experimental protocol is aimed at assessing how exposing subjects to specific narratives about potential causes of COVID-19 affects their policy opinions during the post-pandemic recovery. Specifically, the structure of the questionnaire[4] was organized in four consecutive blocks, as shown in Figure 1.

Figure 1: The structure of the questionnaire used in the survey experiment



Experimental Manipulation and Treatments. The first block, present in two of the three treatments of our experiment, represents our experimental manipulation. It includes extracts based on coverage from two major news networks in the US. In each treatment, the extracts put forward a distinct narrative about what caused the COVID-19 outbreak.[5] More specifically, the following narratives were discussed:

(*i*) *"COVID-19 was caused by a lab accident in Wuhan"*: the extracts claim that, despite official denials from Chinese authorities, there exists (unconfirmed) evidence that the COVID-19 outbreak was caused by human error in a laboratory located near the Wuhan wet market.

(*ii*) *"COVID-19 originated in wildlife"*: the extracts refer to scientific evidence supporting the natural origin of the COVID-19 virus as a genetic mutation of pathogens transmitted across animals, presumably bats and pangolins, in wildlife.

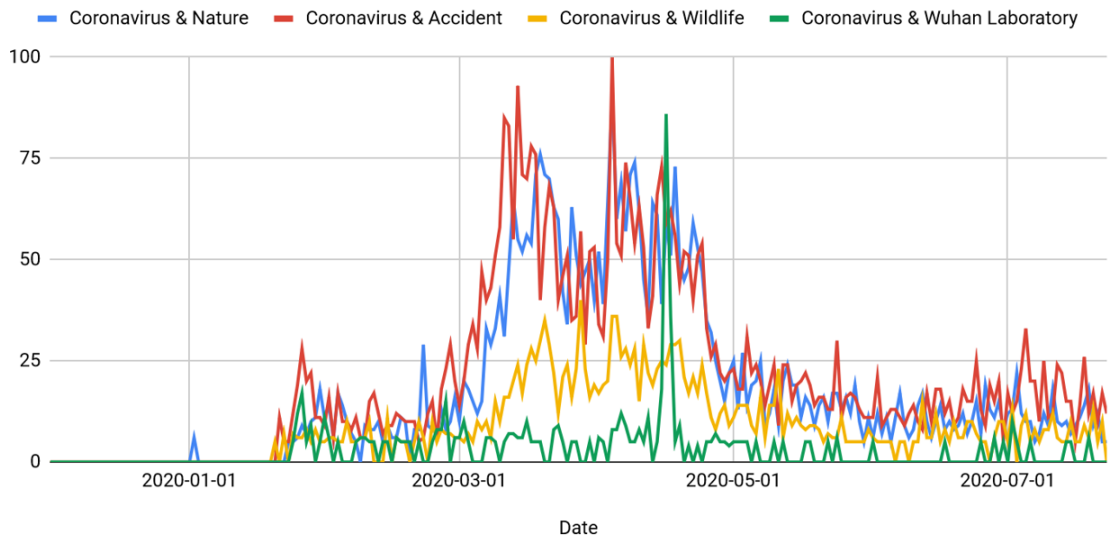
[4]All the questions included in the questionnaire are reported in Appendix A.5.

[5]The text of the extracts, as well as the link to the published articles can be found in Appendix A.4.

The first feature that the two narratives have in common is that, as can be seen from Figure 2, there is evidence from Google Trends that both appeared in the US public discourse and spread at the beginning of the breakout of the pandemic. This means that these stories pre-existed our experiment, which took place on May 7 and 8, 2020. Moreover, the two explanations appeared almost simultaneously and, since then, coexisted following a similar temporal pattern of diffusion. A second common feature is that both were covered by two major US news networks on opposite sides of the political spectrum (CNN and Fox News).

On the other hand, there are two important differences between the lab and the Nature narratives that are relevant for the scope of the present study. First, the two stories strongly differ in the role assigned to science in facilitating or contrasting the COVID-19 outbreak. Indeed, while the Lab narrative identifies scientific misconduct as the main cause of COVID-19, the Nature narrative highlights the merits of science in identifying the genetic characteristics of the virus. Second, while the Nature narrative describes the COVID-19 outbreak as a neutral and natural phenomenon, the Lab narrative clearly attributes the responsibility for the outbreak of the pandemic to Chinese formal institutions (research laboratories).

Figure 2: Narratives and Google Trends



Note: Peak in the green time-series on April 17th: On April 15th, Fox News released a report promoting the lab origin of COVID-19. Peak in the blue time-series on March 19th: on March 17th, Nature Medicine published an article that affirms that COVID-19 originated in wildlife (rather than in the lab).

Our experimental design includes three distinct treatments, depending on the presence and content of the first block. The first, baseline treatment, labeled *No story*, simply does not include the first block and subjects are immediately presented with the subsequent questions

included in the other blocks. In the other two treatments, *Lab narrative* and *Nature narrative*, subjects were initially presented with the extracts about the lab and the Nature narratives, respectively. After having read the two extracts and before answering the questions in the last three blocks, subjects completed a manipulation check. Specifically, they were required to briefly summarize in no more than two sentences what caused COVID-19 according to the extracts in the previous screen.

Four features of our experimental design were specifically conceived to filter out the following possible confounding factors: the source of the information, the interaction of partisan preferences with the information source, and the existing political biases of the news networks.

First, subjects assigned to a narrative treatment, either *Lab narrative* or *Nature narrative*, were exposed to two extracts about the same story based respectively on coverage from Fox News and CNN. These were among the most popular news networks in the US during the outbreak of the pandemic.[6] Furthermore, there is robust evidence showing that the two news networks strongly differ in the political preferences of their audiences, whereby Fox News is mainly chosen by conservative/Republican viewers and CNN by liberal/Democratic users (Weatherly et al., 2007; Schroeder and Stone, 2015; Iyengar and Hahn, 2009; Stroud, 2007; de Zúñiga et al., 2012). Thus, we made sure that each narrative was covered both by Democratic and Republican popular media outlets.

Second, despite the original news network they were taken from, the two extracts in each treatment were otherwise similar, claiming the same origin of the COVID-19 outbreak and using qualitatively equivalent framing and wording to convey the story.

Third, participants received no information about the original media source, as they were simply told that the two extracts were taken *"from articles in the US media about COVID-19"*.

Forth, the extracts were presented to subjects by using their original texts in the published articles. The only changes made in the original texts were confined to removing graphical elements and precise references to the scientific sources (journal titles and names of researchers). These minimal interventions were aimed at keeping the exposition of the two stories as equivalent as possible, without altering their perceived reliability through precise scientific references.

Policy Domains. The second block contained questions on three relevant policy do-

[6]For instance, by referring to data compiled by Nielsen, an article in Forbes dated June 2nd (Joyella, 2020) reports that, during the COVID-19 pandemic, Fox News was the most chosen news network and CNN registered the largest year-over-year variation in viewership (+117%). Moreover, as of the week 9th-15th of March 2020, Fox News and CNN were the two leading cable news networks in the US, reaching an average number of viewers in primetime of 3.54 and 2.85 million, respectively (data from www.statista.com).

mains — foreign trade, climate change, and science — that are at the core of a lively social and political debate in the US. The three specific policy domains were selected stemming from i) the literature that discusses the most important policy issues identified by Americans and ii) our predictions that public opinion on each of these policy domains could be related to the narratives about the causes of the pandemic. Indeed, we acknowledge that the list of policy domains is not conclusive, nonetheless for the feasibility of implementing the experiment we were induced to keep the number of policy domains to the minimum. For each policy domain, subjects were asked to indicate how much they agreed or disagreed with a statement affirming its social desirability on a 5-point Likert scale (with 1 indicating agreement and 5 disagreement), after trading-off potential benefits and costs for society. In detail, the three statements are reported as follows:

(*i*) Climate change: *"Preventing climate change should be given priority in the post COVID-19 recovery, even if it causes slower economic growth and some loss of jobs".*

(*ii*) Foreign trade: *"Foreign trade represents more of an opportunity than a threat for the US economy in the post COVID-19 recovery".*

(*iii*) Science: *"Science is improving our lives, and, in the post COVID-19 recovery, scientific progress should rapidly continue despite potential ethical and safety concerns".*

Questions on What Caused the COVID-19. The third block consisted of two questions. The first question specifically asked participants to allocate 100 points across four potential causes of COVID-19, indicating that the greater the number of points allocated to a given cause, the more the subject believes in a specific explanation. The potential causes considered in this block were:

(*i*) the virus originated from an accident in a lab;

(*ii*) the virus originated in nature as a result of natural processes;

(*iii*) the virus is a weapon the countries use against each other;

(*iv*) other reasons.

The hypothesis that the virus was a weapon used by some countries against others aimed to distinguish those who believe in a pure conspiracy theory and participants that associate the COVID-19 with a lab accident deriving from a human error. The second question asked those who believe that COVID-19 originated from "other reasons" to indicate these reasons.

In this way, the questionnaire did not exclude *a priori* the existence of a common belief incidentally excluded by researchers.

Social Context and Socio-Demographic Information. In the fourth (and last) block, subjects were asked their willingness to get vaccinated against viruses other than COVID-19, their state of residence as well as other socio-demographic questions, including gender, age, occupational and educational status, income situation, whether lockdown restrictions were active in the state where they were actually living, their political view (on a 5-point scale moving from very conservative to very liberal), and, finally, how much time (in minutes) they spent watching, reading or listening to news about politics and current affairs on a typical day.

The state of residence is used as a proxy of the political and social context in which participants in our experiment live. In the main analysis, we will study how the effects of being exposed to a specific narrative on policy opinions is moderated by the political orientation, Republican leaning or Democratic leaning, of the state of residence. Then, in the discussion, we will combine the political classification of the states with socio-cultural, state-specific measures of tightness and openness.

3.1 Procedures

The survey experiment was conducted on the 7th and 8th of May, 2020, and administered via Qualtrics (www.qualtrics.com). Participants were recruited via the on-line platform Prolific (Palan and Schitter, 2018). Two restrictions were imposed in selecting participants: they were required to possess the US nationality and reside in the US. Several reasons justify our selection criteria. First, they are aimed at attenuating the potential influence of the (unobservable) social and cultural heterogeneity across participants on the results of the survey experiment. Second, by these conditions, it can be reasonably expected that, at the time of the participation in the experiment, participants were physically located in the US and, therefore, equally exposed to the social, political, and media attention for the COVID-19 emergency.

To limit potential response biases that are due to wording used in the questions, their ordering, the presence of (apparently irrelevant) formatting elements, and other context effects (Tourangeau and Rasinski, 1988; Schwarz and Strack, 1999), we designed the questions on the policy domains in the second block by following two important experimental features. First, all of the three statements explicitly referred to the post COVID-19 recovery, thus making responses in the baseline *No story* treatment (in which subjects were not exposed to any story about the cause of the COVID-19) comparable with those in the other two

treatments, *Lab narrative* and *Nature narrative* (in which, before the questions on the policy domains, subjects were induced to think about the COVID-19 causes). Second, within treatment, the order in which the questions on the socio-economic domains were presented was randomized across subjects.

All questions in the questionnaire appeared on separate and consecutive screens.[7] After proceeding to the next questions in the questionnaire, the respondents had no chance to move back to previous questions and revise the corresponding answers.

Overall, 3,086 participants (out of an eligible population of 29,273 - at the time of our study) were hired for the survey experiment: 1,053 in the baseline *No Story* treatment, 1,016 in *Lab narrative*, and 1,017 in *Nature narrative*. Each subject was randomly allocated to one of the three treatments and could participate in the survey experiment only once. The survey experiment lasted for 5.45 minutes on average and the participants were paid £0.84 (around $1.1) for their participation.

4 Predictions

We formulate our empirical predictions for the impact of stories on beliefs and policy opinions, by grounding them both on rational (or Bayesian) and on behavioral assumptions.

In terms of the rational framework, standard models of cheap talk suggest that messages from experts (the media) can at least partially reveal some information to receivers (citizens), that have less information on a decision relevant state of the world as long as preferences are not too distant (Crawford and Sobel, 1982), or when there are instrumental concerns such as reputation or career concerns (Sobel, 1985; Ottaviani and Sørensen, 2006; Pavesi and Scotti, 2017). As long as the information on the true cause of the pandemic also provides policy relevant information, an informative message on the cause may also rationally affect beliefs on these policy issues. Moreover, Bayesian persuasion (Kamenica and Gentzkow, 2011), shows that senders that have conflicting interests with receivers can design the information structure in order to rationally persuade individuals in the desired direction. Thus, for instance, a politician can selectively reveal public information and successfully persuade rational voters, despite voters being aware of the politician's inherent bias.

The availability and representative heuristics introduced by (Tversky and Kahneman, 1973) provide the behavioral foundations for our predictions. According to the availability

[7]The manipulation check following the media extracts in block 1 was presented in a single screen; the questions on the policy domains in block 2 were administered in three consecutive screens; the question in block 3 on what caused COVID-19 was presented in one screen and, in case subjects indicated "other reasons", subjects entered a second screen for detailing their answer; the socio-demographic questions in block 4 were included in ten consecutive screens.

heuristic, when presented with a question on an issue for which subjects do not have a definite opinion, they will refer to the closest available memory they can recall. In line with this idea, exposing subjects to alternative stories could alter their opinions about the origin of COVID-19 accordingly. On other hand, the representative heuristic supports the change in policy opinions induced by the story, since it provides evidence that individuals form their expectations based on some idealized story or model rather than on estimated probabilities.

Another stream of literature, known as persuasion bias, confirms that individuals tend to be influenced by the repetition of messages even if these do not contain new information (DeMarzo et al., 2004). This is particularly relevant because persuasion bias also implies that repeated interaction within a social context asymptotically leads multidimensional policy beliefs to converge to a unique platform where all individuals converge to homogeneous beliefs on each dimension. This suggests that narratives that are persuasive on one dimension have the potential to influence also other issues not directly related to the story. For instance, by attributing the cause of the virus to Chinese institutions, the Lab narrative could indirectly have a negative impact on people's beliefs on the benefit of trading with foreign countries.

Both these streams of literature therefore allow us to formulate the following hypotheses:

$H1 - H2$ Exposing individuals to an existing explanation on the causes of the COVID-19 pandemic will affect:

$H1:$ subjects' beliefs on the causes of the pandemic in line with the story they are exposed to.

$H2:$ subjects' opinions on policy issues which are correlated with the explanation provided, or, perceived as such by the individuals.

In terms of the effect on policy opinions, again both the rational framework and the behavioral literature allow us to formulate more precise hypotheses. Indeed, from the rational perspective recent theoretical and experimental contributions show how individuals receiving the same informative signal on a state of the world, may rationally develop polarized beliefs on the same state if they start from heterogeneous priors (Andreoni and Mylovanov, 2012; Baliga et al., 2013; Loh and Phelan, 2019; Fryer et al., 2019). This suggests that in different social contexts characterized by distinct initial beliefs on certain policy issues, people may rationally update these beliefs in opposite directions.

The political science literature suggests that the direction of this shift can depend on local political orientation. Indeed Nyhan and Reifler (2010) and Flynn et al. (2017) show that, when presented with relevant facts on a policy issue, individuals will modify their beliefs in the direction of their preferred party's policy platform, even if the facts contradict the

correctness of their preferred party's position. Moreover, there is evidence that citizens are more likely to follow a frame if it is promoted by their party, also illustrating that biases are more pronounced on issues that are at the heart of party conflicts (Slothuus and De Vreese, 2010).

Another stream of literature that draws on behavioral psychology suggests that preferences can be endogenously shaped by the economic and social environment (Bowles, 1998; Palacios-Huerta and Santos, 2004; Fehr and Hoff, 2011). To measure the causal effects of the environment on preferences and behavior, social scientists have recently begun to rely on priming techniques developed in experimental psychology. In this respect, exposing subjects to different stories can be seen as presenting primes to activate certain mental processes. As suggested by Akerlof and Kranton (2000), the same prime can have a different impact on individuals according to their heterogenous identity, or sense of belonging to a social group. The social context can thus represent a relevant source of identity. In line with these considerations, there is evidence that individuals process information, select news networks and respond to politicians' speeches differently, according to their social context, de facto feeding political polarization (Gentzkow, 2016; Gentzkow et al., 2019; Martin and Yurukoglu, 2017). All these considerations allow us to formulate the third prediction on the heterogeneous effects of narratives on policy positions

$H3$: Exposing individuals to the Lab narrative or the Nature narrative on the causes of the COVID-19 pandemic will positively affect the difference between the opinions on each issue (Trade Openness, Relevance of Climate Change and Trust in Science) of subjects residing in Democratic versus Republican states, with residents in Democratic states expressing relatively more favorable opinions on each issue relative to those in Republican states.

The above hypothesis suggests that exposure to the different narratives should increase divergence in opinions across states, thus increasing polarization. However, while both stories have the potential to produce polarizing effects on policy opinions, we conjecture that these are more powerful in *Lab narrative*, since it includes distinct elements that allow us to hypothesize that it should produce spillover effects on other policy domains not directly related to the unknown phenomenon for which the story provides an explanation. Indeed, explicitly mentioning China provides an immediate association to a wider Republican policy agenda that, in the words of Shiller (2019) can be considered part of a constellation of stories that evoke a larger narrative. This platform supports protectionism in the US and is reinforced by messages of identity and patriotism that inflate the potential for the Lab

narrative to have a negative impact on subjects' view of opening to international trade.[8] Moreover, this larger conservative narrative also includes recurring statements downplaying the importance of climate change and often openly discrediting scientific research.[9]

On the other hand, the Nature narrative is possibly related to a more distant constellation (therefore potentially more diluted), that can be broadly recognizable as "progressive" and is more commonly associated with the liberal values represented by Democrats. The Nature narrative should induce the reader to think of the value of scientific research in helping humanity comprehend and deal with natural phenomena. Indeed there is evidence that Democrats have a generally more positive view of the scientific method with respect to Republicans, and even believe scientists should take a more active role in shaping the policy debate (Kennedy and Funk, 2019). Therefore, when evaluating the importance of climate change and science, the representative heuristic should once again lead those exposed to the Nature narrative in a liberal context to be more supportive of the importance of these two issues.

5 Empirical Approach

5.1 Econometric Specification

We are interested in investigating whether the proposed narratives influence respondents' opinions on the causes of COVID-19 as well as on vital policy domains in the post-pandemic world. The dependent variables referring to the potential origins of COVID-19 are continuous, whereas elicited policy preferences are ordered categories. Therefore, we estimate an OLS model for both outcomes and also an ordered probit model for the latter.[10]

Denoting with $j = B,\ L,\ N$ the baseline treatment, *Lab narrative* and *Nature narrative*, respectively, we test hypotheses $H1$ and $H2$ by estimating the following linear model:

$$Y_{i,j} = \beta_B + \sum_{j=L,\,N} \beta_j \cdot d_{i,j} + \gamma_0 \cdot Rep_i + \phi' X_i + \psi' Z_s + \varepsilon_i, \tag{1}$$

where, $Y_{i,j}$ is the outcome variable for individual i subject to narrative j, $d_{i,j}$ is a dummy variable indicating whether a subject has been randomly assigned to narrative j (the baseline group that received no narrative is the omitted group), Rep_i is a dummy taking value 1 if the

[8] As part of the "America First" economic policy, the Trump presidency introduced a series of tariffs on imported goods from the Canada, China, Mexico and the European Union (Gonzales, 2018; Horsley, 2018; Long, 2018; BBC, 2018).

[9] Parker and Davenport (2016); UCS (2017).

[10] Ordered logit estimates and a Brant test for the parallel odds assumption can be found in the supplementary material.

respondent lives in a Republican-oriented state and zero otherwise, X_i and Z_s are vectors of individual and state-level controls, respectively, and ε_i is the error term.

The only difference between testing hypothesis $H1$ and hypothesis $H2$ is that for $H1$ we use as dependent variable respondents' beliefs on the potential cause of COVID-19, whereas for $H2$ we consider respondents' opinions on three randomly ordered policy issues. We can write hypotheses $H1$ and $H2$ as follows:

$$H1 \; and \; H2: \; \left(\overline{Y}_{j=L,\,N} - \overline{Y}_{B}\right) = \beta_{j=L,\,B} \neq 0. \tag{2}$$

To establish the validity of $H1$ and $H2$ we test the null hypothesis that $\beta_{j=L,\,B} = 0$ for beliefs and opinions.

Subsequently, we analyze hypothesis $H3$ by including in Equation (1) an interaction term between the treatment and the state political orientation. This specification allows us to verify the existence of heterogeneous treatment effects between state groups. Formally, we estimate the following augmented model:

$$Y_{i,j} = \beta_B + \sum_{j=L,\,N} \beta_j \cdot d_{i,j} + \gamma_0 \cdot Rep_i + \sum_{j=L,\,N} \gamma_j \cdot d_{i,j} \cdot Rep_i + \phi' X_i + \psi' Z_s + \varepsilon_i. \tag{3}$$

Equation (3) permits us to disentangle the effects of our narratives on the opinions of respondents living in states characterized by different political and social environments. Hypothesis $H3$ takes the following form:

$$H3: \left(\overline{Y}_{j=L,\,N} - \overline{Y}_{B}\right)|_{Rep_i=1} - \left(\overline{Y}_{j=L,\,N} - \overline{Y}_{B}\right)|_{Rep_i=0} = \gamma_{j=L,\,B} > 0. \tag{4}$$

Notice that this condition can also be written as

$$\left(\overline{Y}_{j=L,\,N}\,|_{Rep_i=1} - \overline{Y}_{j=L,\,N}\,|_{Rep_i=0}\right) - \left(\overline{Y}_{B}\,|_{Rep_i=1} - \overline{Y}_{B}\,|_{Rep_i=0}\right) > 0. \tag{5}$$

Therefore, we will verify whether the distance between the opinions of respondents living in Republican states and those of respondents living in Democratic states is larger in the two treatment groups than in the baseline. In other words, we are wondering if narratives might cause polarization in subjects' opinions.[11]

Denoting with $\mathbf{W_{i,s}}\delta$ the right-hand side of Equation (1), with the exclusion of the error term, we can write the ordered probit model as follows:

[11] See Bail et al. (2018) and Suhay et al. (2018) for recent works using the same notion of polarization.

$$P[Y_i = c] = F(\mu_c - \mathbf{W_{i,s}}\delta) - F(\mu_{c-1} - \mathbf{W_{i,s}}\delta), \tag{6}$$

where F is the standard normal cumulative distribution function. Even in this case, we first estimate a model without interaction terms, and then we include them to test $H3$ as for Equation (3). To make heteroscedasticity-consistent inference, all estimates are based on White standard errors.

5.2 Data

The study involved 3,091 participants. Before the main experiment, a pilot study with 241 participants was conducted on May 7, 2020. The main experiment took place on May 8 with 2,850 participants. Since both the pilot and the main experiment follow identical experimental protocols, we pooled the samples together. We dropped 5 observations, as two subjects did not provide their age, whereas three individuals did not specify their state of residence. Altogether this results in 3,086 observations for the empirical analysis.

Table 1 summarizes the socio-demographic characteristics of subjects entering our sample. About 35 percent of respondents reside in states classified as Republican. To classify the states into Republican or Democratic, we used the average party affiliation of each state's residents throughout 2018.[12] We decided not to rely on respondents self-reported partisan affiliation, as asking this question before the narrative and policy questions could prime the respondents to think about the study from a partisan point of view, while asking the question after the narrative and policy questions could result in conditioning the party affiliation on the responses to the policy questions for the sake of consistency (Falk and Zimmermann, 2013). For instance, respondents could adjust their political orientation after having read the narratives and having expressed an opinion on relevant socioeconomic issues. Male participants constitute 48 percent of the sample. We used a discrete variable to measure the highest level of education the respondent achieved. According to this variable, most of the individuals earned a high-school diploma (34.42 percent, education=2) or a bachelor's degree (46.26 percent, education=3). Approximately 78 percent of respondents were living in

[12]Data extracted from Jones (2019) (on May 9th, 2020). We classified as Republican leaning those states with a fraction of affiliations greater or equal to the fraction of Democrats. In the supplementary material (which is available upon request), we perform a robustness check by re-classifying states with the same fractions of Republicans and Democrats according to the relative number of Republican seats in the U.S. Congress. With respect to other potential classifications, there are two important advantages in using data from the Gallup survey: it compares states over the same period of time and includes nonvoters' political opinions.

a location subject to lockdown restrictions at the time of the survey. Self-reported income classification indicates that, on average, individuals perceive themselves in a class of income equal to 6, given a ten-point scale where 10 is the highest income class. The age of the subjects ranges from 18 to 80, with a mean age of 34.61 years. The majority of respondents were working, either part-time or full-time. Finally, we also control for the cumulated number of COVID-19 confirmed cases registered in each state till the day before the survey experiment.[13] According to Appendix A.1, that reports the balancing tests, the randomization across narratives was successful.

[13]COVID-19 data comes from USAFacts (2020) (data extracted on May 15th, 2020).

Table 1: Sociodemographic Characteristics and Descriptive Statistics

Variable	Description	Mean	SD
Rep	Dummy variable taking value 1 if the state is a lean Republican state and 0 otherwise.	0.35	0.48
Male	Dummy variable taking value 1 if subject is a male and 0 otherwise.	0.49	0.50
Education	Five-class variable indicating the highest level of education the respondent achieved: lower that high school=1, high school=2, bachelor=3, master=4, doctorate=5.	2.87	0.83
Lockdown	Dummy variable indicating whether respondents is living in a county under lockdown restrictions.	0.78	0.42
Income	Self-reported income level on a ten-point scale where 10 is the highest income class.	6.07	1.81
Age	Respondent's age.	34.61	12.88
Working	Dummy variable taking value 1 if respondent is working either full-time or part-time and 0 otherwise.	0.52	0.50
Self-employed	Dummy variable taking value 1 if respondent is self-employed and 0 otherwise.	0.11	0.32
Student	Dummy variable taking value 1 if respondent is a student and 0 otherwise.	0.16	0.37
Unemployed	Dummy variable taking value 1 if respondent is unemployed and 0 otherwise.	0.16	0.37
Other	Dummy variable taking value 1 if respondent does not belong to any previous working category.	0.04	0.21
COVID-19	Total number of COVID-19 cases registered in the state from the beginning of the pandemic to the day before the experiment.	57,380.07	80,995.99

Notes: This table describes the sociodemographic variables used as controls in the study and provides the mean and the standard deviation of each variable.

5.3 Manipulation Check

This section reports the results of our manipulation checks. To assure that the subjects read and understood the text, after having exposed the subjects to the narratives, we asked them to summarize in no more than two sentences what caused COVID-19 according to the text they read.

To test whether respondents correctly understood our narratives, we apply content analysis. In particular, we use a co-occurrence network technique, a common methodology in quantitative content analysis (Danowski, 1993). Figures 3 and 4 display the co-occurrence networks in *Lab narrative* and *Nature narrative*, respectively.

Our analysis employs three structural measures of networks. To compute the strength of words in the co-occurrence network, we use the Jaccard coefficient. This coefficient is particularly suitable when a text contains a few words, and each word appears a limited number of times. More specifically, the Jaccard coefficient emphasizes whether or not specific words co-occur, regardless of their frequency.[14] To account for the frequency of each relevant word, we adjust the size of relevant nodes according to the number of times a word appears. Finally, we report network centrality, that is, a measure identifying the most relevant nodes in the network.

Figure 3 shows that subjects exposed to the Lab narrative frequently jointly used words such as "*lab, Wuhan, COVID-19, virus, and cause*". In addition, those that mentioned the "*wet market*" used negative verb forms. By looking at the frequency of co-occurrences related to lab, we may conclude that participants correctly understood manipulation.

[14]Please, see Romesburg (1984) for a detailed explanation on Jaccard coefficient.

Figure 3: Co-Occurrence Network of Words (in *Lab narrative*)

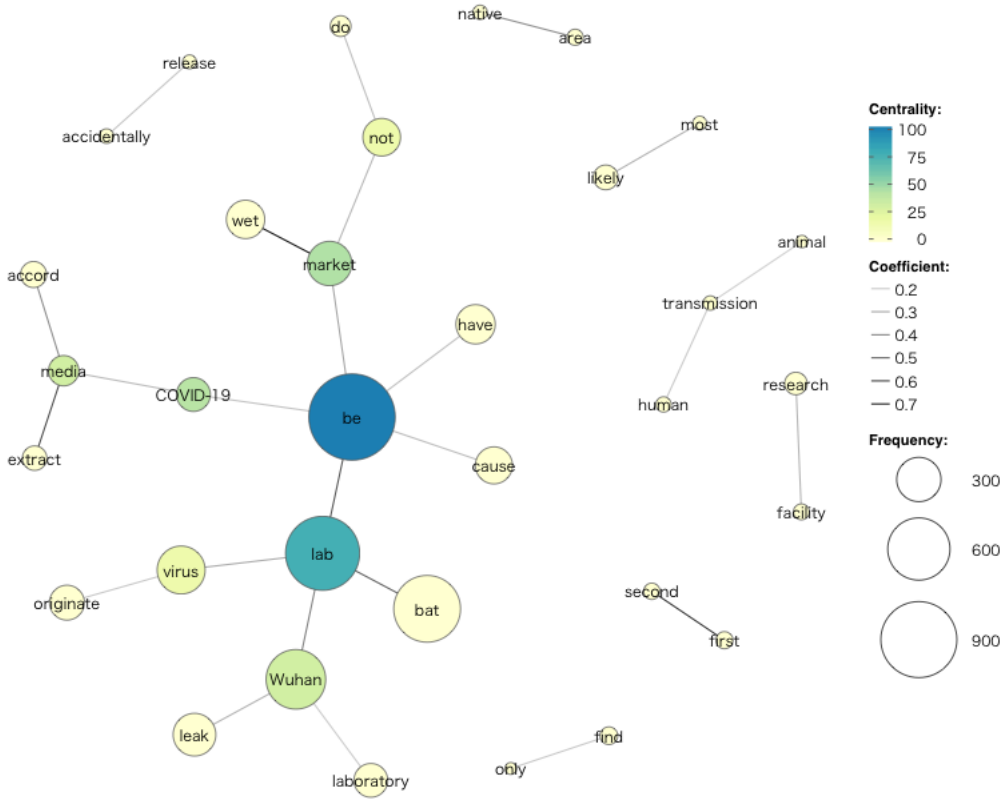
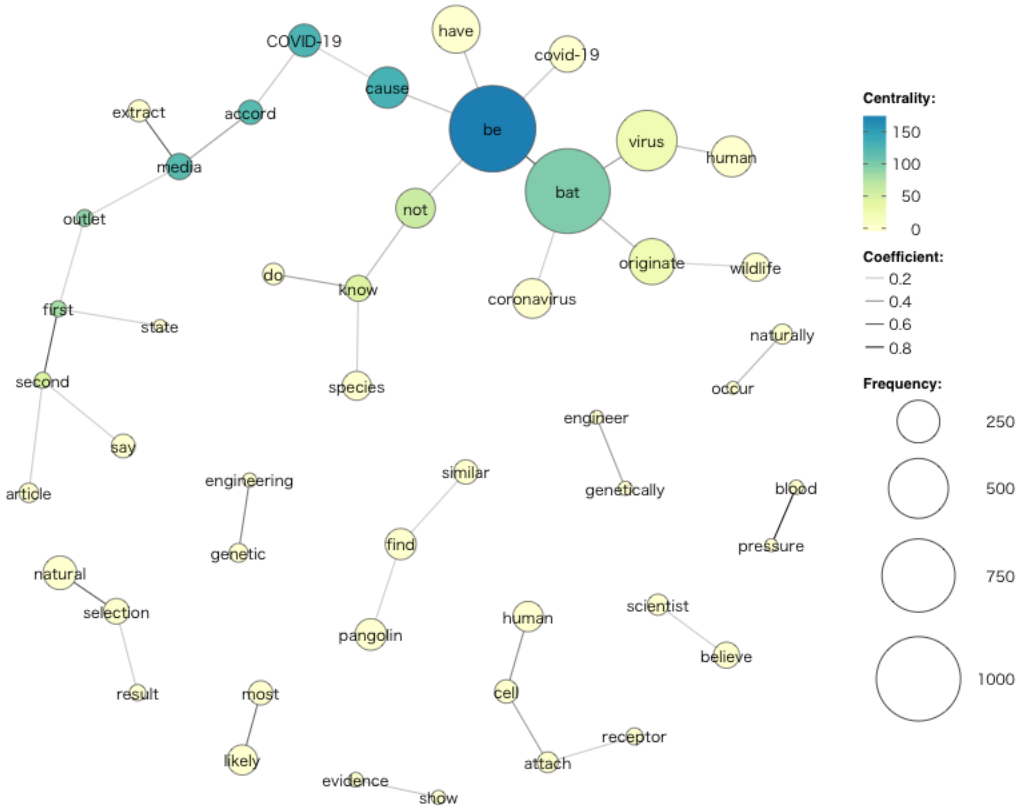


Figure 4 displays the co-occurrence network for words used by subjects exposed to the Nature narrative. The most frequent combinations of words involve "*bat, virus, originate, human, wildlife, coronavirus, and COVID-19*". In addition, other words such as natural, selection, and pangolin also exhibited a relatively high frequency. Therefore, even for this narrative, we may conclude that participants positively responded to the manipulation.

Figure 4: Co-Occurrence Network of Words (in *Nature narrative*)



6 Main Results

6.1 Narratives and Causes of COVID-19

In this section, we assess the impact of our narratives on individual opinions about the causes of the COVID-19 pandemic. Figure 5 illustrates the means of the points assigned to each listed cause of COVID-19 and their confidence intervals. The figure seems to suggest that our narratives are effective in convincing subjects about the causes of COVID-19. More specifically, those facing the Lab narrative allocate more points to the option that COVID-19 is a consequence of a laboratory accident than those facing the Nature narrative or no story. In a similar vein, those facing the Nature narrative allocate more points to the option that COVID-19 is a natural phenomenon than those facing the Lab narrative or no story. Finally, those facing no story or the Lab narrative are more likely to think that COVID-19 is a secret weapon than those exposed to the Nature narrative. According to a Kruskal-Wallis test, the differences across treatments are statistically significant ($\chi^2(2)$ is 182.647 ($p = 0.000$) for the

accident hypothesis, 138.661 ($p = 0.000$) for the nature hypothesis and 13.815 ($p = 0.001$) for the weapon hypothesis).[15]

Figure 5: Points assigned to COVID-19 causes

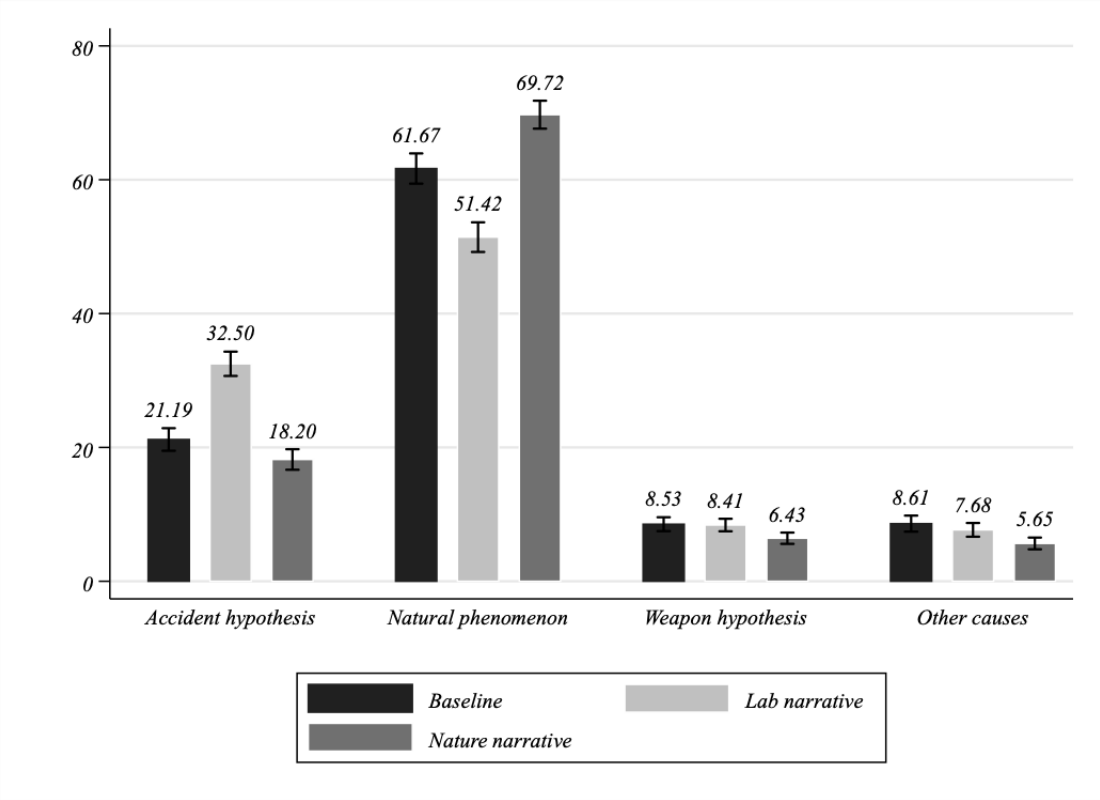


Table 2 reports the OLS estimates of Equations (1) and (3). Columns 1 and 2 show the effect of our treatment variables on the average number of points that individuals allocated to the hypothesis that COVID-19 originated from an accident in a lab. In this respect, the Lab narrative is particularly effective. On average, respondents exposed to the Lab narrative allocate 11.52 points more to the lab hypothesis than subjects in the baseline group. This difference is perfectly coherent with our summary statistics. By looking at all the coefficients reported in the first row of Table 2, we may notice that the extra-points assigned to the lab-accident hypothesis are points subtracted from the natural-phenomenon hypothesis. In contrast, the Lab narrative does not affect the points allocated to the weapon hypothesis or other causes. Column 1 also shows that the exposure to the Nature narrative negatively influences the number of points assigned to the hypothesis that COVID-19 has been the consequence of a lab accident.

[15]The results of the Kruskal-Wallis test can be found in the supplementary material available upon request.

In Columns 3 and 4, the dependent variable is the number of points that individuals assigned to the hypothesis that COVID-19 is simply the result of natural phenomena like any other virus. According to Column 3, participants exposed to the Nature narrative positively responded to the stimulus, allocating a higher amount of points (7.78 extra-points) to the hypothesis that the coronavirus had a natural origin. Comparing the coefficients of *Nature narrative* reported in all columns, we may notice that individuals exposed to this narrative assigned less weight to all the alternative hypotheses. In other words, the exposure to the Nature narrative is also associated with a decrease in the points assigned to the conspiratorial hypothesis that COVID-19 is a weapon that countries use against each other (Columns 5 and 6) and other alternative causes (Columns 7 and 8), whereas participants exposed to the Lab narrative tend to substitute the natural-phenomenon hypothesis with the lab-accident one, without affecting the relevance of the other causes. Finally, respondents living in Republican leaning states are less likely to indicate unlisted COVID-19 origins.

Table 2: Narratives and Causes of COVID-19 pandemic (OLS regressions)

	Accident		Nature		Weapon		Other causes	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lab narrative	11.52***	10.39***	-10.58***	-9.20***	-0.08	-0.01	-0.85	-1.18
	(1.26)	(1.54)	(1.60)	(1.99)	(0.71)	(0.84)	(0.80)	(1.05)
Nature narrative	-2.65**	-2.52*	7.78***	8.02***	-2.11***	-1.69**	-3.02***	-3.81***
	(1.15)	(1.44)	(1.56)	(1.95)	(0.68)	(0.81)	(0.76)	(1.00)
Lab narrative*Rep		3.31		-4.01		-0.17		0.87
		(2.68)		(3.37)		(1.54)		(1.60)
Nature narrative*Rep		-0.49		-0.56		-1.20		2.25
		(2.42)		(3.25)		(1.46)		(1.50)
Rep	1.44	0.52	-0.51	0.97	0.86	1.30	-1.79***	-2.80**
	(1.12)	(1.80)	(1.46)	(2.43)	(0.66)	(1.17)	(0.69)	(1.26)
Constant	24.92***	25.34***	46.93***	46.23***	10.99***	10.77***	17.16***	17.65***
	(4.52)	(4.58)	(5.67)	(5.76)	(2.45)	(2.50)	(3.05)	(3.08)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,086	3,086	3,086	3,086	3,086	3,086	3,086	3,086
R^2	0.06	0.06	0.06	0.06	0.02	0.02	0.02	0.02

Notes: Coefficients from OLS regressions. Additional controls include a dummy variable equal to 1 if respondent is a male and zero otherwise, respondent's education level, an indicator variable for individuals living under lockdown restrictions, a self-reported assessment of personal income, respondent's age and employment status. Finally, we also included the number of official COVID-19 cases recorded in the respondent's state till the day before the interview. Robust standard errors in parentheses. Significance levels: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

In summary, we find that participants in the study positively respond to our narratives. Specifically, those exposed to the lab narrative tend to allocate a higher number of points to

the hypothesis that the virus originated from a lab accident. Vice versa, those exposed to the Nature narrative tend to increase the number of points attributed to the hypothesis of a natural origin of the COVID-19.

Result 1: In line with hypothesis $H1$, narratives on COVID-19 origins influence subjects' beliefs on the causes of the pandemic.

6.2 Narratives and Policy Domains

6.2.1 Climate Change

In this sub-section, we study the impact of the narratives on respondents' attitudes toward climate change in the post-COVID world. Table 3 reports linear regression and ordered probit estimates for climate change opinions. Both models provide perfectly consistent results.

Columns 1 and 3 provide the OLS and ordered probit coefficients when we do not consider any heterogeneous treatment effect. This allows us to verify hypothesis $H2$, that is, we can determine if the two narratives affect respondents' opinions regarding the importance of preventing climate change, independently of the state in which they live. Indeed, the Lab narrative does not exert a significant treatment effect on average opinions. In contrast, the Nature narrative seems to generate more consensus towards climate defense, although the coefficient of *Nature narrative* is statistically significant only at 10 percent.

In Columns 2 and 4, we interacted the two treatments with the dummy capturing state political orientation. In this way, we can assess the effects of narratives on climate change opinions, conditional on the state's political orientation in which respondents reside. The interaction term's coefficient between *Lab narrative* and the Rep dummy indicates that exposing individuals to the Lab narrative positively affects the difference between the opinions of residents in Republican states and those of residents in Democratic ones. This means that with respect to the control group and compared to subjects living in Democratic states, individuals living in Republican states react more to the Lab narrative, increasing their disagreement with the idea of acting to prevent climate change. Therefore, for the Lab narrative, the evidence favors hypothesis $H3$.

Table 3: Narratives and Climate Change

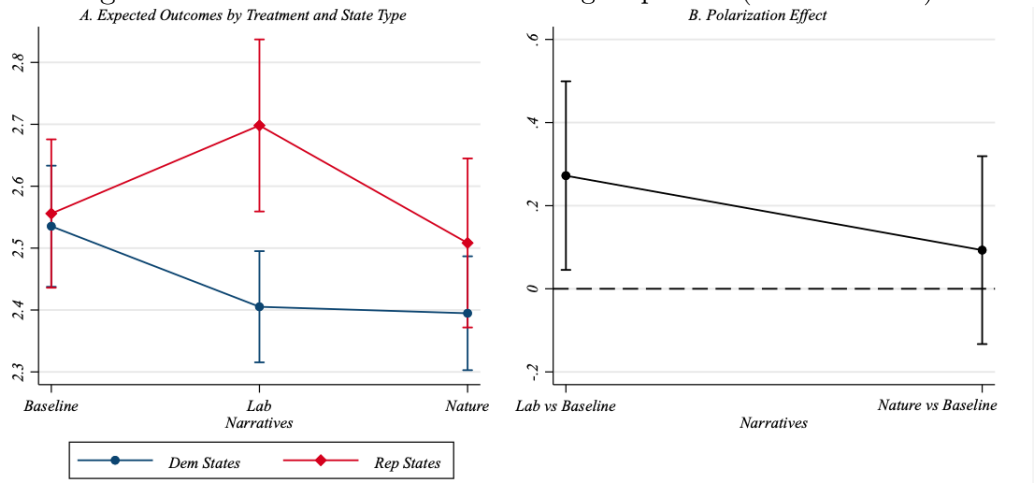
	OLS		Ordered Probit	
	(1)	(2)	(3)	(4)
Lab narrative	-0.04	-0.13*	-0.02	-0.10*
	(0.05)	(0.07)	(0.05)	(0.06)
Nature narrative	-0.11*	-0.14**	-0.09*	-0.12**
	(0.06)	(0.07)	(0.05)	(0.06)
Lab narrative*Rep		0.27**		0.22**
		(0.12)		(0.10)
Nature narrative*Rep		0.09		0.08
		(0.12)		(0.10)
Rep	0.10**	-0.01	0.10**	0.00
	(0.05)	(0.08)	(0.04)	(0.07)
Constant	2.21***	2.27***		
	(0.19)	(0.20)		
Controls	Yes	Yes	Yes	Yes
Observations	3,086	3,086	3,086	3,086
Pseudo-R^2 or R^2	0.03	0.03	0.01	0.01
Log-likelihood			-4,652.61	-4,650.01

Notes: Coefficients from OLS and ordered probit regressions. The other remarks about the additional controls of Table 2 apply. Heteroskedasticity-robust standard errors in parentheses. Significance levels: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

In order to better visualize how each treatment affects respondents' opinions, it can be useful to plot the predicted outcomes for both types of respondents. Panel A of Figure 6 shows the expected opinion of people living in Democratic states (blue line) and people living in Republican states (red line). As we can see, in the baseline group, respondents' opinions do not differ across state types. However, when we look at the Lab narrative, we can notice that individuals living in Democratic states tend to agree more with the climate change statement. In contrast, participants residing in Republican states tend to agree less with the climate change statement. Panel B of Figure 6 contrasts the difference between treated subjects living in Republican-leaning states and respondents living in Democratic-leaning states with the same difference in the baseline group. In line with hypothesis $H3$, we can conclude that, under the Lab narrative, opinions on climate change prevention become more polarized.[16]

[16]Figure A1 in Appendix A.2 shows that the Lab narrative produces significant distributional effects when considering each item separately.

Figure 6: Narratives and Climate Change Opinions (with 95% CIs)



Result 2: The Nature narrative tends to increase the consensus toward climate change prevention during post-COVID recovery (especially for individuals located in Democratic states), whereas exposure to the Lab narrative increases the opinion gap between subjects living in Republican states and those living in Democratic states.

6.2.2 International Trade

We now examine the impact of narratives on respondents' opinions regarding international trade. Table 4 shows the coefficients of the linear regression and ordered probit models.

According to Columns 1 and 3 of Table 4, on average, people's opinions on international trade do not change when they are exposed to the lab or Nature narratives. Therefore for international trade the data do not confirm hypothesis H2.

However, if we consider possible interaction effects between our treatments and people's state of residence, we may observe the existence of heterogeneous effects. Columns 2 and 4 of Table 4 reveal the existence of a significant treatment effect for subjects residing in Republican states and exposed to the Lab narrative. Compared to residents of Democratic states, those residing in Republican states are more likely to disagree with the statement that foreign trade represents an opportunity rather than a threat for the US economy, once they are exposed to the Lab narrative. In this respect, the total effect of the Lab narrative on trade opinions of subjects living in Republican states is positive and statistically significant at 5 percent level. The sum of the direct effect (*Lab narrative*) and the interaction term (*Lab narrative**Rep) is 0.16 and the standard error is 0.08. In contrast, participants living in Democratic states are relatively insensitive to both narratives. That is, as for climate change, even for trade, the Lab narrative causes a significant increase in the opinion gap between

individuals residing in Republican and Democratic states. Again, for the Lab narrative, hypothesis H3 is confirmed.

Table 4: Narratives and Foreign Trade

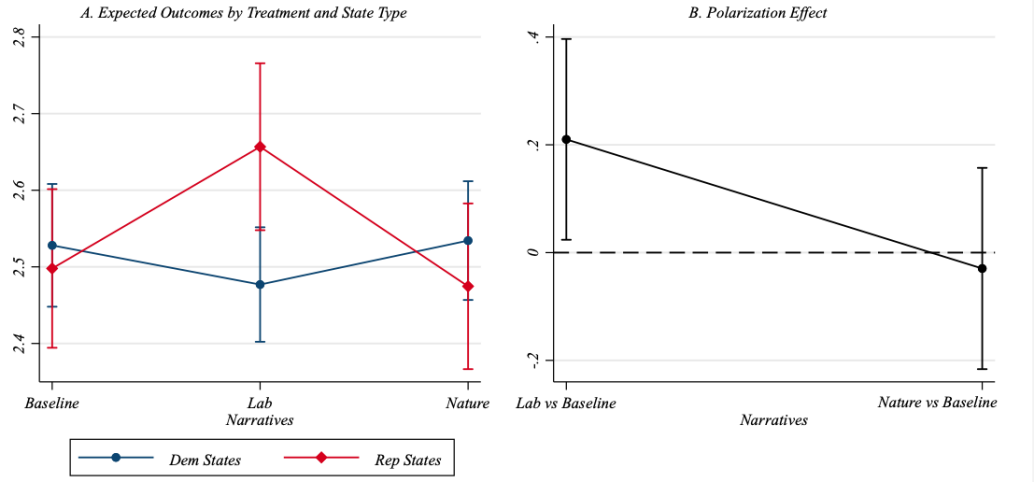
	OLS		Ordered Probit	
	(1)	(2)	(3)	(4)
Lab narrative	0.02	-0.05	0.02	-0.05
	(0.05)	(0.06)	(0.05)	(0.06)
Nature narrative	-0.00	0.01	0.00	0.01
	(0.05)	(0.06)	(0.05)	(0.06)
Lab narrative*Rep		0.21**		0.21**
		(0.10)		(0.10)
Nature narrative*Rep		-0.03		-0.03
		(0.10)		(0.10)
Rep	-0.00	-0.06	-0.01	-0.07
	(0.04)	(0.07)	(0.04)	(0.07)
Constant	3.06***	3.09***		
	(0.16)	(0.16)		
Controls	Yes	Yes	Yes	Yes
Observations	3,086	3,086	3,086	3,086
Pseudo-R^2 or R^2	0.03	0.03	0.01	0.01
Log-likelihood			-4,313.86	-4,310.29

Notes: Coefficients from OLS and ordered probit regressions. The other remarks about the additional controls of Table 2 apply. Heteroskedasticity-robust standard errors in parentheses. Heteroskedasticity-robust standard errors in parentheses. Significance levels: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

By displaying the predicted outcomes for interviewees in different political contexts, panel A of Figure 7 helps us visualize how our treatments affect respondents' opinions. Panel B of Figure 7 reports the two narratives' treatment effect on the differential opinion between subjects living in Republican and Democratic states. As for climate change, the Lab narrative continues to polarize subjects' positions according to the state's political orientation in which they live.[17]

[17]A graphical representation of the distributional effects in *Lab narrative* can be found in Appendix A.2, where we report the ordered probit predictions for each response separately.

Figure 7: Narratives and Foreign Trade Opinions (with 95% CIs)



Result 3: The Lab narrative affects only individuals residing in Republican states. In particular, this narrative reduces the fraction of those that agree with the idea that foreign trade represents more of an opportunity than a threat to the US economy in the post COVID-19 recovery. In line with hypothesis H3, this generates significant divergence between the opinions of individuals living in Democratic states and individuals living in Republican ones.

6.2.3 Trust in Science

The last socio-economic issue we analyze refers to respondents' trust in scientific progress. Table 5 shows the regression coefficients for the causal relationship between narratives exposure and trust in science.

As we can notice, there are no significant effects, neither in terms of treatment effects nor in terms of polarization. So, for the statement on scientific progress, data does not confirm our hypotheses H2 and H3. The only findings worthy of observation are the coefficients of the Nature narrative and the Republican state dummy in Columns 1 and 3. Although they are significant only at 10 percent, they suggest that the Nature narrative mildly sways public opinion in favor of scientific progress, and that this effect is less relevant in Republican states.

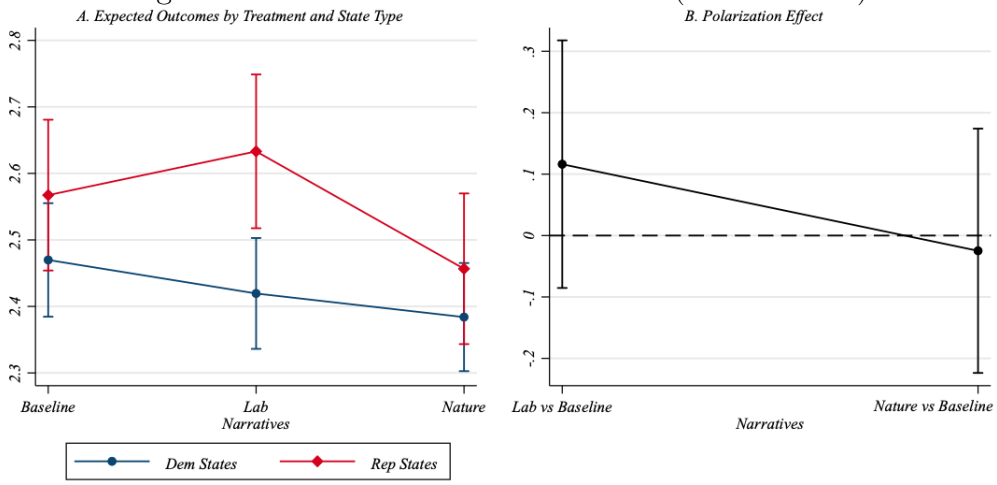
Table 5: Narratives and Science Statement

	OLS		Ordered Probit	
	(1)	(2)	(3)	(4)
Lab	-0.01	-0.05	-0.01	-0.05
	(0.05)	(0.06)	(0.05)	(0.06)
Nature	-0.09*	-0.09	-0.09*	-0.08
	(0.05)	(0.06)	(0.05)	(0.06)
Lab*Rep		0.12		0.12
		(0.10)		(0.10)
Nature*Rep		-0.02		-0.02
		(0.10)		(0.10)
Rep	0.07*	0.04	0.07*	0.04
	(0.05)	(0.07)	(0.04)	(0.07)
Constant	3.00***	3.01***		
	(0.17)	(0.18)		
Additional controls	Yes	Yes	Yes	Yes
Observations	3086	3086	3086	3086
Pseudo-R^2	0.04	0.04	0.02	0.02
Log-likelihood			-4428.11	-4426.97

Notes: Coefficients from OLS and ordered probit regressions. The other remarks about the additional controls of Table 2 apply. Heteroskedasticity-robust standard errors in parentheses. Heteroskedasticity-robust standard errors in parentheses. Significance levels: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Panel A of Figure 8 illustrates the predicted degree of trust in science for people living in Democratic and Republican states. As we can see, the Lab narrative is associated with polarization; however, since a certain degree of polarization is already present in the baseline group, the differential effect of the Lab narrative is statistically insignificant (panel B of Figure 8).

Figure 8: Narratives and Trust in Science (with 95% CIs)



Result 4: The two narratives do not produce any significant change in public opinion about the utility of scientific progress.

Thus, summarizing our findings, we observe that people exposed to narratives on the origins of COVID-19 tend to assign greater weight to the underlying cause suggested by the narrative. In this respect, no significant differences emerge between Republican and Democratic states. Furthermore, we find evidence that narratives have the potential to alter public opinion about important policy domains, nonetheless the effect of the narrative largely depends on the context within which the individuals exposed to the narratives reside. More specifically, the experimental subjects residing in Republican states disagree more than those residing in Democratic states on the importance of climate change and on the positive effects of international trade. These results are particularly relevant from a normative point of view because they show that spreading the same narrative over a heterogeneous population may lead to significant polarization effects. In the next section, we explore the possible causes of these divergent patterns.

7 Discussion: Narratives and the Social Context

The social context changes the meaning of words. In particular, "human mind strives to reach enduring understanding of events by forming them into a narrative that is embedded in social interactions" (Shiller, 2017, 972). Thus, a possible explanation for the different effects we observed in Republican and Democratic states may rely on the social context in which individuals interact. As argued by Gelfand et al. (2011), the social context cultivates

and reinforces the expression of specific individual traits, which adapt and reinforce the social norms of that context.

In this respect, Harrington and Gelfand (2014) argue that many differences across US states are explained by a common principle. According to them, differences among states reflect a core cultural contrast, widely studied in sociology, anthropology, and psychology: the degree of"tightness" of communities. Tight societies are characterized by many, strongly enforced rules, and little tolerance for deviant behaviors. In contrast, loose cultures have few, strongly enforced norms and a high degree of tolerance for deviance. From a sociological perspective, tight societies tend to have less civil liberties, more media restrictions, more authoritarian administrations, and heavy use of the death penalty. Compared to those who live in looser contexts, people inhabiting tighter societies exhibit more cautious behaviors, impulse control, self-monitoring capacity, and need for structure. The origins of these differences are rooted in the past. Tight societies have experienced a higher number of ecological and human-made threats—such as natural disasters, territorial disputes, famines, pandemics, and other threats. Stricter rules helped them coordinate social behaviors and survive in difficult periods. This is also the reason why the tightness–looseness dimension can capture the sensitivity of US states to new threats such as COVID-19 and the responsiveness in terms of policies.

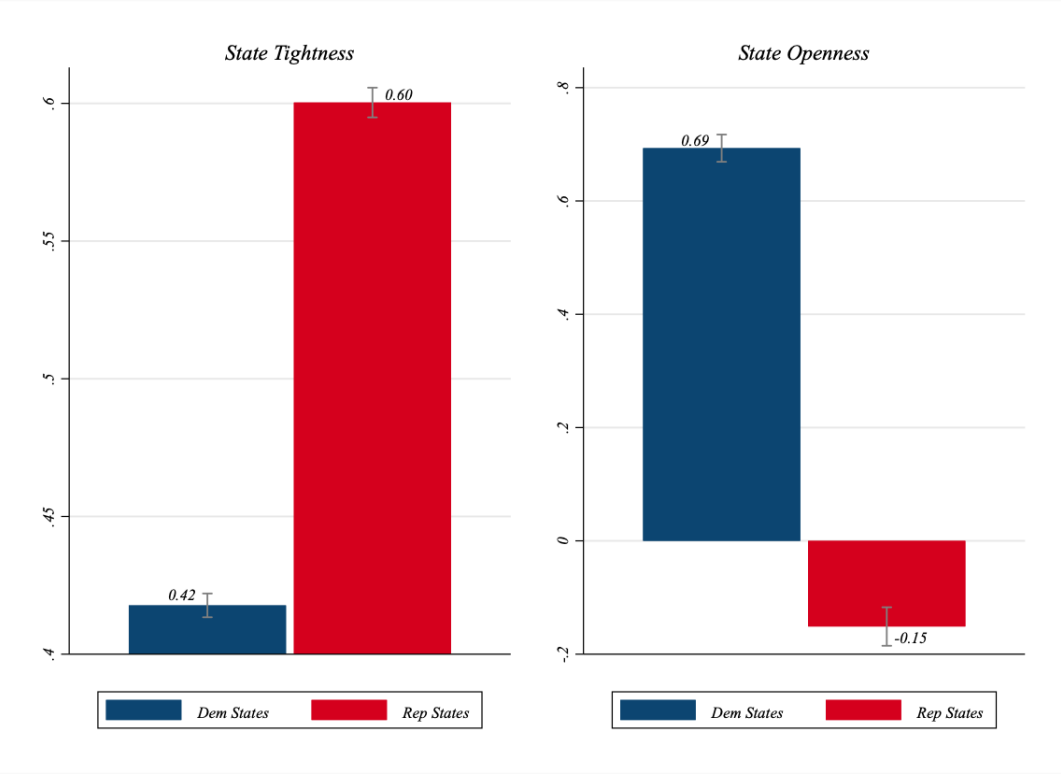
To create an indicator of states' tightness, Harrington and Gelfand (2014) first collected a broad set of theoretically supported variables. They then reduced the pool of indicators to nine items that were mutually agreed to be relevant, non-redundant, and central to the concept of tightness–looseness. In line with their predictions, Harrington and Gelfand found that their tightness measure is associated with a variety of ecological and historical factors.

However, COVID-19 is not only a threat, but a foreign threat, so individual responses may also change according to their degree of openness, and this degree of openness may be influenced by the context in which they live. Therefore, open individuals may have more tolerant and progressive views about external shocks. On this subject, Rentfrow et al. (2008) emphasize the existence of geographic differences in personality traits and values, and that these differences persist over time. In other words, personality traits can be extended to broad regional areas and vary across U.S. states. Although Gelfand et al. (2011) and Harrington and Gelfand (2014) argue that tight states are less open to outside influences since they represent potential threats, there are some noticeable exceptions such as Wisconsin, Alaska, or Hawaii. Indeed, these are examples of relatively loose states that are rather closed. This distinction could explain why treated respondents in Democratic states seem to react less to international trade than other issues.

Using the Harrington and Gelfand (2014) measure of state tightness and the Rentfrow et

al. (2008) index of openness, Figure 9 shows the average values of these two indicators for Democratic and Republican states. Republican states are significantly tighter than Democratic ones, whereas the latter are more open than the former. On average, there are about 0.18 points of difference in the tightness of Republican and Democratic states.[18] In contrast, the average openness index is 0.69 in Democratic states and -0.15 in Republican territories.

Figure 9: Tightness and Openness of U.S. states



Starting from this literature on states' cultural differences, we re-estimated our OLS and ordered probit specifications by replacing the Republican state dummy with the continuous measures of state tightness and openness traits mentioned above.[19] We found that these two dimensions explain the conditional impacts of narratives on respondents' opinions. In other words, our state dummy is a proxy of deeper cultural differences among US states that affect the way individuals perceive our narratives.

Result 5: Narratives on COVID-19 origins affect people's opinions about other socioeconomic issues by increasing the distance among individuals living in loose (open) societies

[18] We divided the tightness index proposed in Harrington and Gelfand (2014) by 100 in order to obtain readable coefficients for our regression analysis.

[19] Numerical results can be found in Appendix A.3.

and those living in tight (close) societies.

8 Conclusion

The unpredictable outbreak of COVID-19 has deeply permeated all aspects of our life, and the level of uncertainty about the disease has fueled the appearance of alternative, sometimes competing, narratives about its real origin. These narratives do not merely respond to the human necessity of making sense of the pandemic but also reflect more general representations of the society as a whole as well as other cultural dimensions and commonly shared convictions of its members. The hidden social and cultural foundation of narratives makes these constructs powerful determinants of beliefs, opinions, and other economic outcomes that are not directly related to the content of the story. Our experimental results show that exposing US subjects to stories about the origin of COVID-19 that are well-established in US media but not scientifically confirmed strongly influences both their beliefs about the real cause of the pandemic and, more importantly, their opinions on relevant policy issues that are not directly related to the health emergency. First, relative to a baseline situation in which subjects are not presented with any story, narratives exert their convincing impact by swaying subjects' beliefs in the direction of their underlying argument. Second, narratives shape subjects' opinions on policy issues, with the sign of the effect depending on the social and political environment in which they live. Indeed, we find that the Lab narrative - putting forward the idea that the virus originated from a human error and scientific misconduct in a lab in China - leads subjects living in Republican leaning, tighter and less open states, to express less favorable opinions about trade openness and the relevance of climate change, relative to those living in Democratic leaning, looser and more open states.

We believe that our findings provide insight to interpret real-world phenomena. First, the uncertainty about the real causes of the COVID-19 outbreak has made it an ideal topic for the emergence of conspiracy theories. According to a recent study based on a representative survey of US adults (Uscinski et al., 2020), the main determinants of beliefs in COVID-19 conspiracy theories are the psychological predispositions to reject authoritative information and to interpret major and unpredictable events as the product of conspiracies, as well as partisan and ideological motivations. In addition to influencing how people make sense of the real causes of the COVID-19 outbreak, our results warn about the risk that these stories permeate opinions on different and relevant policy issues that are apparently not related to the pandemic.

Second, and more importantly, the persuasiveness of narratives and their ability to spread over different domains make them an effective instrument in the hands of politicians to

gain electorate support and draw attention to their platforms (Jones et al., 2014). "Stories commonly used in describing and analyzing policy issues are a force in themselves" (Roe, 1994) and, through their ad hoc formulated narratives, politicians instill powerful mental frames and principles of judgment in public opinion that determine the appraisal or refusal of specific policy issues.[20]

In this respect, our findings provide a more specific understanding of the manner in which politicians can exploit narratives for electoral purposes. Indeed, by considering that the proposed narratives exhibited the same power in convincing respondents on the origins of COVID-19, independently of their state of residence (Result 1), we claim that the polarization in policy opinions observed in our experiment (Results 2 and 3) is the consequence of a cheerleading effect instead of directional-motivated reasoning (Bullock and Lenz, 2019).[21] In other words, our narratives implicitly contain specific political cues that activate partisan respondents. These individuals affirm their political identity by adopting policy positions that are aligned with their social context, independently of their beliefs on the causes of the disease.

The cheerleading effect suggests that politicians may not be using narratives with the ultimate scope of convincing citizens about the definitive version of the facts directly represented by the narration, but with the indirect goal of making their policy platform more salient for their supporters. This increase in polarization on specific issues may be used instrumentally to increase partisan voter turnout by activating a greater share of passive supporters who may have otherwise refrained from casting their vote.

Acknowledgements. We thank Viola Angelini, Marco Bertoni, Dmitri Vinogradov, Huan Xie, and participants at the 2020 Conference of the CPEG for useful discussions and comments. Financial support from VERA, University of Venice "Ca' Foscari" and LIUC University is gratefully acknowledged. The Ethical Committee of the University of Venice "Ca' Foscari" approved the experimental protocol. All errors are ours.

[20]For instance, as eloquently claimed by (Shiller, 2017, p. 997), President Donald J. Trump is "a master of narratives," and part of his political success can be attributed to the ability to push forward his political agenda through well-formulated, simple, and persuasive stories. In this respect, the stories on the origin of the COVID-19 outbreak used in our experiment resemble two of the most commonly adduced concepts in the rhetoric of President Trump in recent years: the (economic and diplomatic) attrition with China and his critical arguments against science, in particular when referring to climate change and the origins of COVID-19.

[21]Directional-motivated reasoning refers to the effect that emerges when partisans disagree about politically relevant facts because they genuinely believe in the partisan narrative.

References

AAAS, "Perceptions of science in America. A report from the public face of science initiatives," 2018.

Akerlof, George A and Dennis J Snower, "Bread and bullets," *Journal of Economic Behavior & Organization*, 2016, *126*, 58–71.

_ **and Rachel E Kranton**, "Economics and identity," *The quarterly journal of economics*, 2000, *115* (3), 715–753.

Andreoni, James and Tymofiy Mylovanov, "Diverging opinions," *American Economic Journal: Microeconomics*, 2012, *4* (1), 209–32.

Bail, C.A., L.P. Argyle, T.W. Brown, J.P. Bumpus, H. Chen, J. Hunzaker M.F.and Lee, M. Mann, F. Merhout, and A. Volfovsky, "Exposure to opposing views on social media can increase political polarization," *Proceedings of the National Academy of Sciences*, 2018, *115* (37), 9216–9221.

Baliga, Sandeep, Eran Hanany, and Peter Klibanoff, "Polarization and ambiguity," *American Economic Review*, 2013, *103* (7), 3071–83.

BBC, "US tariffs a dangerous game, says EU," 2018.

Bénabou, Roland, Amin Falk, and Jean Tirole, "Narratives, imperatives, and moral reasoning," *NBER*, 2019, *w24798.*

_ **and Jean Tirole**, "Mindful economics: The production, consumption, and value of beliefs," *Journal of Economic Perspectives*, 2016, *30* (3), 141–64.

Bickel, Warren K, A George Wilson, Chen Chen, Mikhail N Koffarnus, and Christopher T Franck, "Stuck in time: Negative income shock constricts the temporal window of valuation spanning the future and the past," *PloS one*, 2016, *11* (9), e0163051.

Bolsen, Toby and Matthew A Shapiro, "The US news media, polarization on climate change, and pathways to effective communication," *Environmental Communication*, 2018, *12* (2), 149–163.

Bordalo, Pedro, Nicola Gennaioli, and Andrei Shleifer, "Salience theory of choice under risk," *The Quarterly journal of economics*, 2012, *127* (3), 1243–1285.

Bowles, Samuel, "Endogenous preferences: The cultural consequences of markets and other economic institutions," *Journal of economic literature*, 1998, *36* (1), 75–111.

Braddock, Kurt and James Price Dillard, "Meta-analytic evidence for the persuasive effect of narratives on beliefs, attitudes, intentions, and behaviors," *Communication Monographs*, 2016, *83* (4), 446–467.

Brooks, Peter, *Reading for the Plot: Design and Intention in Narrative*, Cambridge, MA: Harvard University Press, 1992.

Brunnermeier, Markus K, Harold James, and Jean-Pierre Landau, *The Euro and the battle of ideas*, Princeton, NJ: Princeton University Press, 2018.

Bullock, J.G. and G. Lenz, "Partisan bias in surveys," *Annual Review of Political Science*, 2019, *22*, 325–342.

Chater, Nick and George Loewenstein, "The under-appreciated drive for sense-making," *Journal of Economic Behavior & Organization*, 2016, *126* (B), 137–154.

Cody, Robyn and Christina Lee, "Behaviors, beliefs, and intentions in skin cancer prevention," *Journal of Behavioral Medicine*, 1990, *13* (4), 373–389.

Cohn, Alain and Michel André Maréchal, "Priming in economics," *Current Opinion in Psychology*, 2016, *12*, 17–21.

Crawford, Vincent P and Joel Sobel, "Strategic information transmission," *Econometrica*, 1982, *50* (6), 1431–1451.

Daniel, Tinuke Oluyomi, Christina M Stanton, and Leonard H Epstein, "The future is now: Comparing the effect of episodic future thinking on impulsivity in lean and obese individuals," *Appetite*, 2013, *71*, 120–125.

_ , _ , and _ , "The future is now: reducing impulsivity and energy intake using episodic future thinking," *Psychological science*, 2013, *24* (11), 2339–2342.

_ , Michele Said, Christina M Stanton, and Leonard H Epstein, "Episodic future thinking reduces delay discounting and energy intake in children," *Eating behaviors*, 2015, *18*, 20–24.

Danowski, James A., "Network analysis of message content," in W. D. Richards Jr. and G. A. Barnett, eds., *Progress in communication sciences IV*, Norwood, NJ: Ablex, 1993, pp. 197–221.

de Bruin, Wändi Bruine, Andrew M Parker, Mirta Galesic, and Raffaele Vardavas, "Reports of social circles' and own vaccination behavior: A national longitudinal survey.," *Health Psychology*, 2019, *38* (11), 975.

de Zúñiga, G., H. T. Correa, and S. Valenzuela, "Selective exposure to cable news and immigration in the US: The relationship between FOX News, CNN, and attitudes toward Mexican immigrants," *Journal of Broadcasting & Electronic Media*, 2012, *56* (4), 597–615.

DeMarzo, P. M., D. Vayanos, and J. Zwiebel, "Persuasion bias, social influence, and unidimensional opinions," *The Quarterly Journal of Economics*, 2004, *118* (3), 906–968.

Epley, Nicholas and Thomas Gilovich, "The Mechanics of Motivated Reasoning," *Journal of Economic Perspectives*, 2016, *30* (3), 133–140.

Escalas, Jennifer Edson, "Self-referencing and persuasion: Narrative transportation versus analytical elaboration," *Journal of Consumer Research*, 2007, *33* (4), 421–429.

Falk, Armin and Florian Zimmermann, "A taste for consistency and survey response behavior," *CESifo Economic Studies*, 2013, *59* (1), 181–193.

Fehr, Ernst and Karla Hoff, *Tastes, castes, and culture: the influence of society on preferences*, The World Bank, 2011.

Flynn, DJ, Brendan Nyhan, and Jason Reifler, "The nature and origins of misperceptions: Understanding false and unsupported beliefs about politics," *Political Psychology*, 2017, *38*, 127–150.

Fryer, Jr Roland G, Philipp Harms, and Matthew O Jackson, "Updating beliefs when evidence is open to interpretation: Implications for bias and polarization," *Journal of the European Economic Association*, 2019, *17* (5), 1470–1501.

Garrett, Geoffrey, "The post-COVID-19 world will be less global and less urban," 2020.

Gelfand, M. J., J. L. Raver, Nishii L., L. M. Leslie, J. Lun, B. C. Lim, L. Duan, A. Almaliach, S. Ang, J. Arnadottir, and Z. Aycan, "Differences between tight and loose cultures: A 33-nation study," *Science*, 2011, *332* (6033), 1100–1104.

Gentzkow, Matthew, "Polarization in 2016," Technical Report, Toulouse Network for Information Technology 2016.

_ , **Jesse M Shapiro, and Matt Taddy**, "Measuring group differences in high-dimensional choices: method and application to congressional speech," *Econometrica*, 2019, *87* (4), 1307–1340.

Gonzales, Richard, "Trump slaps tariffs on imported solar panels and washing machines," *National Public Radio Inc.(US)*, 2018.

Harrington, Jesse R. and J. Gelfand Michele, "Tightness–looseness across the 50 united states," *Proceedings of the National Academy of Sciences*, 2014, *111* (22), 7990–7995.

Hepburn, Cameron, Brian O'Callaghan, Nicholas Stern, Joseph Stiglitz, and Dimitri Zenghelis, "Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?," *Oxford Review of Economic Policy*, 2020, *36* (1), S359–S381.

Hermwille, Lukas, "The role of narratives in socio-technical transitions—Fukushima and the energy regimes of Japan, Germany, and the United Kingdom," *Energy Research & Social Science*, 2016, *11*, 237–246.

Horsley, Scott, "Trump formally orders tariffs on steel, aluminum imports," *National Public Radio*, 2018.

Hrynowski, Zach, "Several Issues Tie as Most Important in 2020 Election," 2020.

IPSOS, "Coronavirus: opinion and reactions. Results from a multi-country poll," 2020a.

_ , "Two thirds of citizens around the world agree climate change is as serious a crisis as Coronavirus," 2020b.

Iyengar, S. and K. S. Hahn, "Red media, blue media: Evidence of ideological selectivity in media use," *Journal of communication*, 2009, *59* (1), 19–39.

Jones, J.M., "Democratic States Exceed Republican States by Four in 2018," 2019.

Jones, Michael, Elizabeth Shanahan, and Mark McBeth, *The science of stories: Applications of the narrative policy framework in public policy analysis*, Springer, 2014.

Joyella, Mark, "Fox News Dominates May Ratings, But CNN Prime Time Jumps 117%," 2020.

Kahneman, Daniel and Amos Tversky, "On the psychology of prediction.," *Psychological review*, 1973, *80* (4), 237.

Kamenica, Emir and Matthew Gentzkow, "Bayesian persuasion," *American Economic Review*, 2011, *101* (6), 2590–2615.

Karlsson, Niklas, George Loewenstein, Jane McCafferty et al., "The economics of meaning," *Nordic Journal of Political Economy*, 2004, *30* (1), 61–75.

Kaufmann, Eric, "Can narratives of white identity reduce opposition to immigration and support for hard Brexit? A survey experiment," *Political Studies*, 2019, *67* (1), 31–46.

Kennedy, B. and C. Funk, "Democrats and Republicans differ over role and value of scientists in policy debates," *Pew Research Center*, 2019.

Loh, Isaac and Gregory Phelan, "Dimensionality and disagreement: Asymptotic belief divergence in response to common information," *International Economic Review*, 2019, *60* (4), 1861–1876.

Long, Heather, "Trump has officially put more tariffs on US allies than on China," *Washington Post*, 2018, *31*.

Machill, Marcel, Sebastian Köhler, and Markus Waldhauser, "The use of narrative structures in television news: An experiment in innovative forms of journalistic presentation," *European Journal of Communication*, 2007, *22* (2), 185–205.

Martin, Gregory J and Ali Yurukoglu, "Bias in cable news: Persuasion and polarization," *American Economic Review*, 2017, *107* (9), 2565–99.

Mcquiggan, Scott W, Jonathan P Rowe, Sunyoung Lee, and James C Lester, "Story-based learning: The impact of narrative on learning experiences and outcomes," in "International Conference on Intelligent Tutoring Systems" Springer 2008, pp. 530–539.

Mellis, Alexandra M, Sarah E Snider, and Warren K Bickel, "Narrative theory: II. Self-generated and experimenter-provided negative income shock narratives increase delay discounting.," *Experimental and clinical psychopharmacology*, 2018, *26* (2), 113.

Mendiluce, María and Jose Siri, "The COVID-19 recovery can be the vaccine for climate change," 2020.

Morson, Gary Saul and Morton Schapiro, *Cents and Sensibility: What Economics Can Learn from the Humanities*, Princeton, NJ: Princeton University Press, 2017.

Niederdeppe, Jeff, Sungjong Roh, and Michael A Shapiro, "Acknowledging individual responsibility while emphasizing social determinants in narratives to promote obesity-reducing public policy: a randomized experiment," *PloS one*, 2015, *10* (2), e0117565.

Normand, S. L. T., M. B. Landrum, E. Guadagnoli, J. Z. Ayanian, T. J. Ryan, P. D. Cleary, and B. J. McNeil, "Validating recommendations for coronary angiography following an acute myocardial infarction in the elderly: a matched analysis using propensity scores," *Journal of Clinical Epidemiology*, 2001, *54* (4), 387–398.

Nyhan, Brendan and Jason Reifler, "When corrections fail: The persistence of political misperceptions," *Political Behavior*, 2010, *32* (2), 303–330.

Ottaviani, Marco and Peter Norman Sørensen, "Reputational cheap talk," *The Rand journal of economics*, 2006, *37* (1), 155–175.

Palacios-Huerta, Ignacio and Tano J Santos, "A theory of markets, institutions, and endogenous preferences," *Journal of Public Economics*, 2004, *88* (3-4), 601–627.

Palan, Stefan and Christian Schitter, "Prolific. ac—A subject pool for online experiments," *Journal of Behavioral and Experimental Finance*, 2018, *17*, 22–27.

Parker, Ashley and Coral Davenport, "Donald Trump's energy plan: more fossil fuels and fewer rules," *New York Times*, 2016, *26.*

Pavesi, Filippo and Massimo Scotti, "Good lies," *Working Paper Series 39, Economics Discipline Group, UTS Business School*, 2017.

Pennington, Nancy and Reid Hastie, "Evidence evaluation in complex decision making.," *Journal of personality and social psychology*, 1986, *51* (2), 242.

_ and _ , "Explaining the evidence: Tests of the Story Model for juror decision making.," *Journal of personality and social psychology*, 1992, *62* (2), 189.

Peters, Jan and Christian Büchel, "Episodic future thinking reduces reward delay discounting through an enhancement of prefrontal-mediotemporal interactions," *Neuron*, 2010, *66* (1), 138–148.

Rentfrow, Peter J., Samuel D. Gosling, and Jeff Potter, "A theory of the emergence, persistence, and expression of geographic variation in psychological characteristics," *Perspectives on Psychological Science*, 2008, *3* (5), 339–369.

Roe, Emery, *Narrative policy analysis: Theory and practice*, Duke University Press, 1994.

Romesburg, H. C., *Cluster Analysis for Researchers*, Belmont, CA: Lifetime Learning Publications, 1984.

Rubin, D. B., "Using propensity scores to help design observational studies: Application to the tobacco litigation," *Health Services & Outcomes Research Methodology*, 2001, *2* (3-4), 169–188.

Saad, L., "Americans as concerned as ever about global warming," 2019.

Schroeder, E. and D. F. Stone, "Fox news and political knowledge," *Journal of Public Economics*, 2015, *126*, 52–63.

Schwarz, N. and F. Strack, "Reports of subjective well-being: judgmental processes and their methodological implications.," in D Kahneman, E Diener, and N Schwarz, eds., *Well-being: the Foundations of Hedonic Psychology*, New York: Russell Sage Foundation, 1999, pp. 61–84.

Shiller, Robert J., "Narrative Economics," *American Economic Review*, 2017, *107* (4), 967–1004.

_ , *Narrative economics: How stories go viral and drive major economic events*, Princeton, CA: Princeton University Press, 2019.

Slater, Michael D, David B Buller, Emily Waters, Margarita Archibeque, and Michelle LeBlanc, "A test of conversational and testimonial messages versus didactic presentations of nutrition information," *Journal of nutrition education and behavior*, 2003, *35* (5), 255–259.

Slothuus, Rune and Claes H De Vreese, "Political parties, motivated reasoning, and issue framing effects," *The Journal of Politics*, 2010, *72* (3), 630–645.

Slovic, Paul, Melissa L Finucane, Ellen Peters, and Donald G MacGregor, "The affect heuristic," *European journal of operational research*, 2007, *177* (3), 1333–1352.

Sobel, Joel, "A theory of credibility," *The Review of Economic Studies*, 1985, *52* (4), 557–573.

Stevence, Lance and Ilana Ron-Levey, "Trust in Science Essential in Battle Against COVID-19," 2020.

Stroud, J. N., "Media effects, selective exposure, and Fahrenheit 9/11," *Political Communication*, 2007, *24* (4), 415–432.

Sugden, Robert, "Spontaneous order," *Journal of Economic perspectives*, 1989, *3* (4), 85–97.

Suhay, E., E. Bello-Pardo, and B. Maurer, "The polarizing effects of online partisan criticism: Evidence from two experiments," *The International Journal of Press/Politics*, 2018, *23* (1), 95–115.

Thaler, Richard H, "Behavioral economics: Past, present, and future," *American Economic Review*, 2016, *106* (7), 1577–1600.

_ **and LJ Ganser**, *Misbehaving: The making of behavioral economics*, WW Norton New York, 2015.

Tourangeau, Roger and Kenneth A Rasinski, "Cognitive processes underlying context effects in attitude measurement.," *Psychological bulletin*, 1988, *103* (3), 299.

Tversky, Amos and Daniel Kahneman, "Availability: A heuristic for judging frequency and probability," *Cognitive psychology*, 1973, *5* (2), 207–232.

_ **and** _ , *Choices, values, and frames*, Cambridge University Press, 2000.

UCS, "Attacks on Science," 2017.

USAFacts, "US Coronavirus Cases and Deaths. Track COVID-19 data daily by state and county," 2020.

Uscinski, Joseph E, Adam M Enders, Casey Klofstad, Michelle Seelig, John Funchion, Caleb Everett, Stephan Wuchty, Kamal Premaratne, and Manohar Murthi, "Why do people believe COVID-19 conspiracy theories?," *Harvard Kennedy School Misinformation Review*, 2020, *1* (3).

Weatherly, J. N., T. V. Petros, K. M. Christopherson, and E. N. Haugen, "Perceptions of political bias in the headlines of two major news organizations," *Harvard International Journal of Press/Politics*, 2007, *12* (2), 91–104.

Weber, Keith, Matthew M Martin, Members of COMM 401, and Michael Corrigan, "Creating persuasive messages advocating organ donation," *Communication Quarterly*, 2006, *54* (1), 67–87.

Wyer, Robert S, Rashmi Adaval, and Stanley J Colcombe, "Narrative-based representations of social knowledge: Their construction and use in comprehension, memory,

and judgment.," in M. P. Zanna, ed., *Advances in experimental social psychology*, Vol. 34, Academic Press, 2002, pp. 131–197.

_ , **Thomas Lee Budesheim, Sharon Shavitt, Ellen D Riggle, R Jeffrey Melton, and James H Kuklinski**, "Image, issues, and ideology: The processing of information about political candidates.," *Journal of Personality and Social Psychology*, 1991, *61* (4), 533.

A Appendix

A.1 Balance Tests

In this appendix, we perform a battery of covariate balance test devoted to checking the validity of our randomization process. Because balance is a property involving not only the sample mean of a covariate but also its overall distribution, we use standardized differences and the variance ratio to assess the balance among all randomized groups. According to Normand et al. (2001), a standardized difference greater than 0.10 is indicative of imbalance, while Rubin (2001) indicates a cut-off of 0.25. We take a conservative approach, relying on a threshold level of 0.10. Regarding the variance ratio, balance is identified by values close to 1, whereas it should be rejected for values greater than 2.0 or less than 0.5 (Rubin, 2001). Table A1 reports the balance statistics. The first four columns contrast the sociodemographic characteristics of individuals in the baseline group with those entering the lab and the Nature narratives, respectively. The last two columns compare individuals in the two treatments. All statistics show an effective balance among groups, with standardized differences always lower than 0.1 and the variance ratios close to 1.

Table A1: Covariate Balance Tests

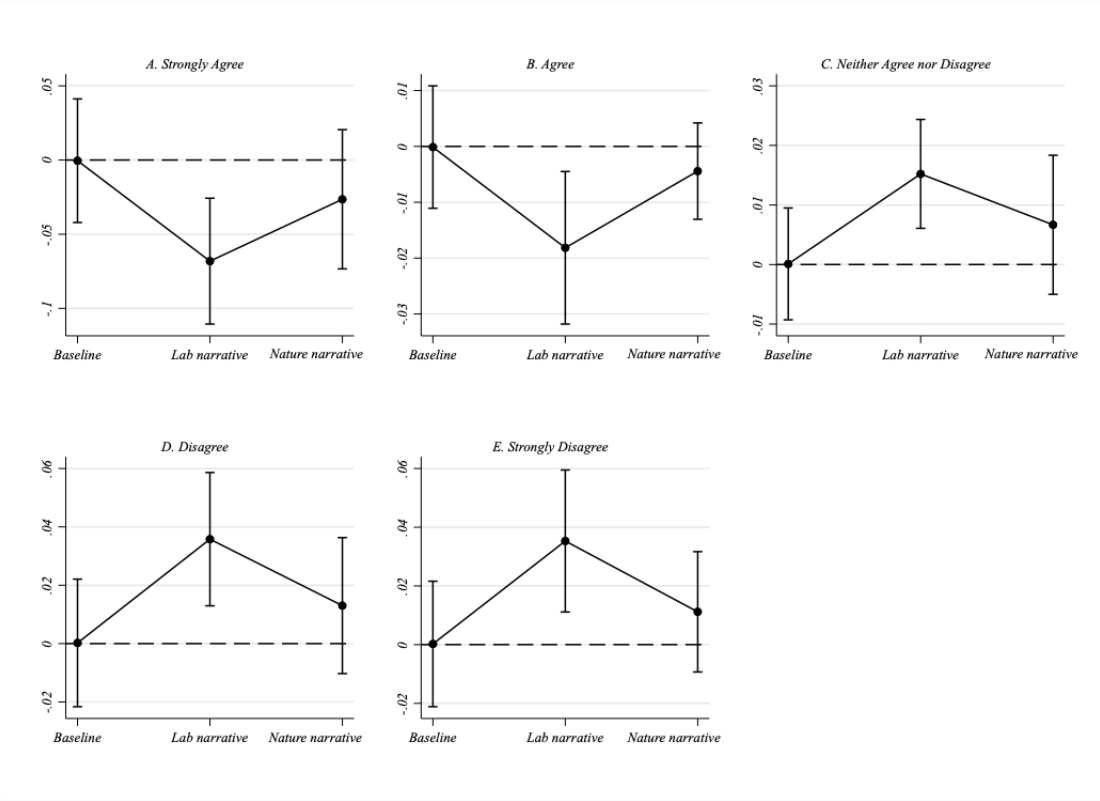
	Lab narrative vs No Story		Nature narrative vs No Story		Lab narrative vs Nature narrative	
	Std. Diff	Var. Ratio	Std. Diff	Var. Ratio	Std. Diff	Var. Ratio
Rep	-0.02	0.99	0.02	1.01	0.02	1.01
Male	0.05	1.00	-0.05	1.00	-0.05	1.00
Education	0.01	0.98	-0.01	1.02	-0.01	1.02
Lockdown	0.02	0.97	-0.02	1.03	-0.02	1.03
Income	0.01	0.99	-0.01	1.01	-0.01	1.01
Age	0.06	1.02	-0.06	0.98	-0.06	0.98
Self-employed	-0.02	0.96	0.02	1.04	0.02	1.04
Student	-0.07	0.88	0.07	1.13	0.07	1.13
Unemployed	0.00	0.99	0.00	1.01	0.00	1.01
Working	0.07	1.00	-0.07	1.00	-0.07	1.00
COVID-19	-0.04	0.92	0.04	1.09	0.04	1.09

Notes: Covariate balance tests based on standardized differences in mean and variance ratio.

A.2 Ordered Probit Figures for Policy Domains

Using the results reported in Column 4 of Table 3, Figure A1 displays the gap in climate change opinions between respondents living in Republican and Democratic states across narratives. If we consider the baseline group, we can see that individuals living in Republican states do not significantly differ in terms of opinions from individuals living in Democratic states. However, compared to treated inhabitants of Democratic states, residents in Republican states and exposed to the Lab narrative tend to have a lower probability of strongly agreeing or agreeing with our proposed statement in favor of higher probabilities of having no opinion, disagreeing and strongly disagreeing. This evidence confirms the results summarized in Figure 6, showing a more polarized distribution of opinions once subjects are exposed to the Lab narrative.

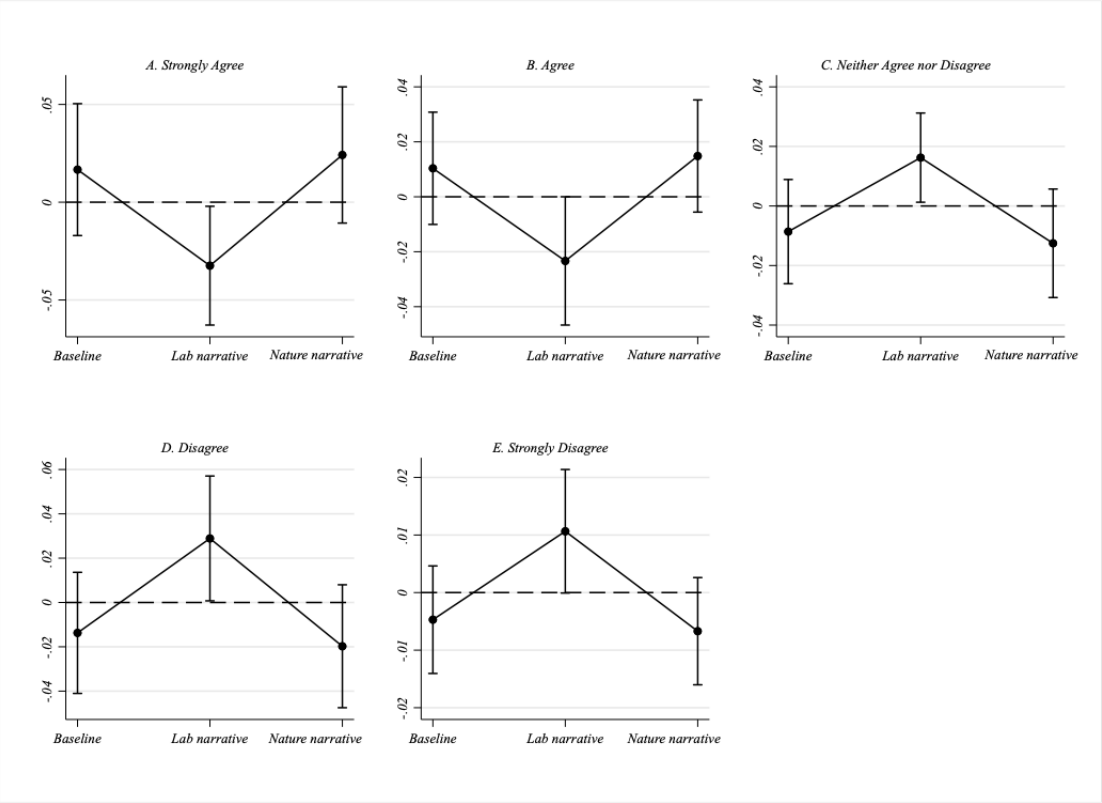
Figure A1: Expected Probabilities for Climate Change



Based on the coefficients reported in Column 4 of Table 4, Figure A2 illustrates the narratives' impact on international trade opinions. Even for international trade, the two types of residents exhibit different opinions when exposed to the Lab narrative. As for the climate change question, the emergence of this polarization is due to a lower probability of observing residents in Republican states agreeing or strongly agreeing with the statement

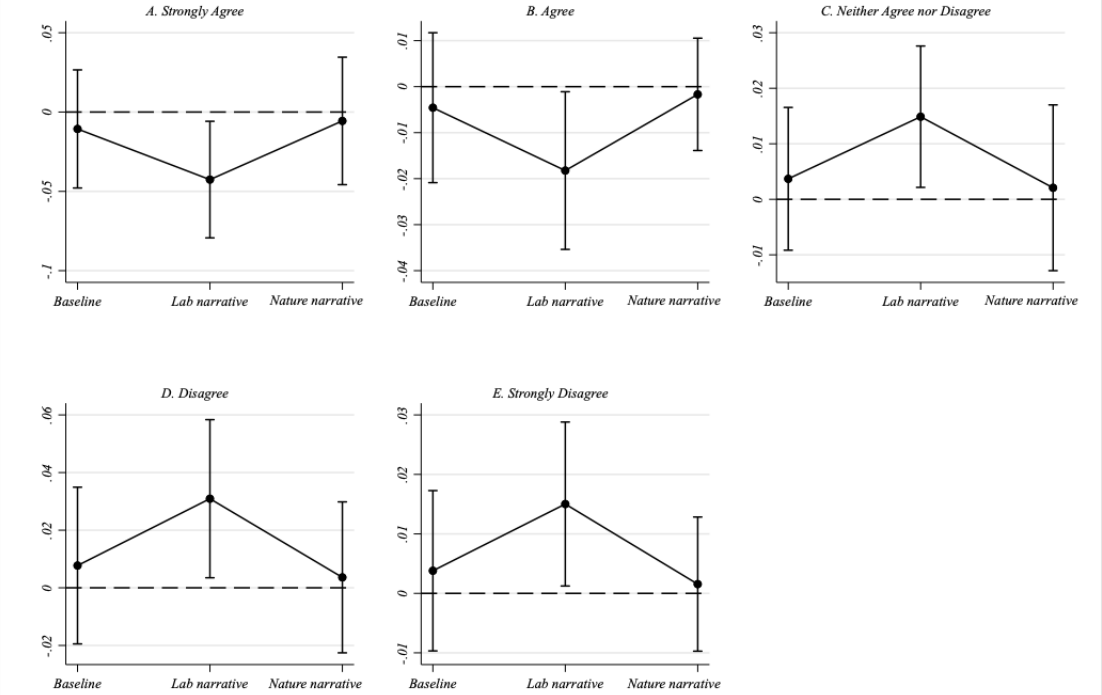
than those living in Democratic states. This result confirms the evidence reported in Figure 7.

Figure A2: Expected Probabilities for Foreign Trade



Finally, using the estimates provided in Column 4 of Table 5, Figure A3 illustrates the narratives' impact on science opinions. As seen in Figure 8, although the within group treatment effects are not statistically significant, the two types of residents exhibit different opinions when exposed to the Lab narrative. Residents in Republican states exposed to the Lab narrative are less likely to agree with our statement and more likely to assume a neutral or unfavorable opinion.

Figure A3: Expected Probabilities for Trust in Science



A.3 Results for Tightness and Openness

Table C1 presents the OLS estimates for our socioeconomic issues when we replace the state dummy with continuous measures of state tightness and openness traits.

Table C1: Socioeconomic issues and states tightness (openness)

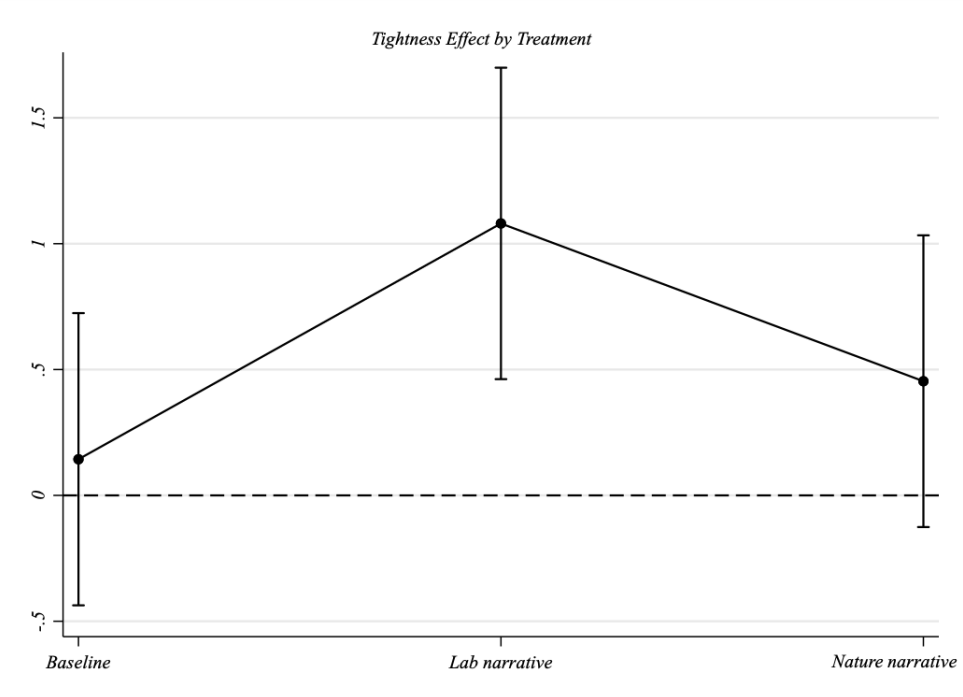
	Climate change		*Trade*		*Science*	
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Lab	-0.48**	-0.01	-0.20	0.08	-0.09	0.01
	(0.21)	(0.06)	(0.18)	(0.05)	(0.19)	(0.06)
Nature	-0.25	-0.11*	0.09	-0.01	0.03	-0.11*
	(0.21)	(0.06)	(0.18)	(0.05)	(0.18)	(0.06)
Lab*Tightness	0.94**		0.47		0.16	
	(0.42)		(0.35)		(0.39)	
Nature*Tightness	0.31		-0.19		-0.25	
	(0.41)		(0.35)		(0.37)	
Lab*Openness		-0.08		-0.15**		-0.06
		(0.08)		(0.06)		(0.07)
Nature*Openness		-0.01		0.01		0.03
		(0.08)		(0.07)		(0.07)
Tightness	0.14		0.11		0.20	
	(0.30)		(0.26)		(0.28)	
Openness		-0.03		0.06		-0.01
		(0.06)		(0.04)		(0.05)
Constant	2.16***	2.28***	2.99***	3.05***	2.93***	3.04***
	(0.25)	(0.19)	(0.20)	(0.15)	(0.23)	(0.17)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,075	3,086	3,075	3,086	3,075	3,086
R^2	0.04	0.03	0.03	0.03	0.04	0.04

Notes: OLS regressions in which the Rep state dummy has been replaced with state tightness. Additional controls include a dummy variable equal to 1 if respondent is a male and zero otherwise, respondent's education level, an indicator variable for individuals living under lockdown restrictions, a self-reported assessment of personal income, respondent's age and employment status. Finally, we also included the number of official COVID-19 cases recorded in the respondent's state till the day before the interview. Heteroskedasticity-robust standard errors in parentheses. Significance levels: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Using the OLS coefficients reported in Column 1 of Table C1, Figure A1 shows the marginal impact of state tightness on climate change opinions. Notice that this impact is 1.08 and strongly significant for participants exposed to the Lab narrative. According to Column 1 of Table C1, the marginal impact is the result of a direct impact of tightness

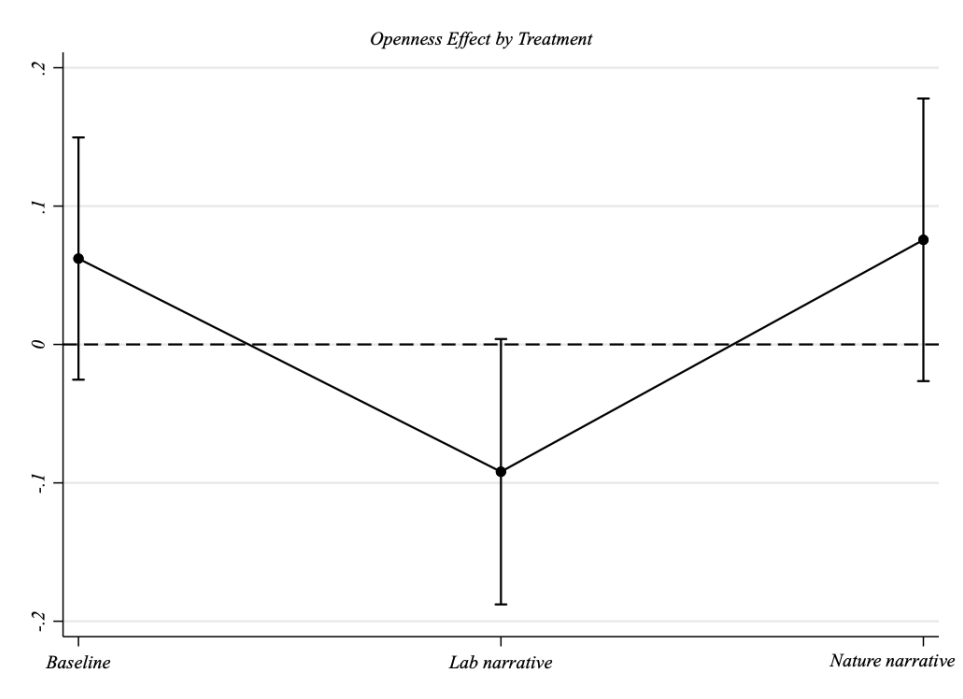
equal to 0.14, and an interaction effect with *Lab narrative* equal to 0.94. The latter also determines the statistical significance of the overall effect observed in the figure. Therefore, if we multiply the tightness gap between Republican and Democratic states (i.e., 0.18 points) by 0.94 and add the direct effect, we fully explain the distance between Democratic and Republican states observed in panel D of Figure 6. Finally, Figure A1 is also consistent with the lack of significant effects due to the Nature narrative.

Figure A1: State Tightness and Climate Change



Based on the parameters reported in Column 4 of Table C1, Figure A2 displays the marginal effect of states' openness traits on foreign trade opinions. Here, we can see that openness tends to impact on international trade negatively. This means that more open societies disagree less with the idea that foreign trade may represent an opportunity for the US economy after the COVID-19 emergency. Multiplying the coefficient of the interaction term between openness and the*Lab narrative* (-0.15) by the openness gap between Democratic and Republican states (0.84), we get an expected moderation effect of -0.18 points. Considering a positive direct effect of openness traits equal to 0.06, the expected opinion gap between Democratic and Republican states becomes -0.12 points, which is consistent with the gap observed in panel D of Figure 7.

Figure A2: State Openness and Foreign Trade



Since respondents' trust in science does not change with our narratives (see Table C1), for the sake of space, we omit any graphical representation.

A.4 Narratives

Below we provide the full text of each narrative, each of which is based on coverage from two media sources on the opposite side of the US political spectrum (CNN and Fox News). Each extract has the feature of being backed by research, implying that the only salient difference between the extracts is the narrative itself and not its formal validation. Moreover, we chose to hide the name of the specific research cited in the articles from which the extracts were taken to control for potential reputation effects. Three of the extracts were taken directly from the websites of the two media outlets, while one was taken from the Daily Caller, a source that is however directly connected to Fox News. The reasons for this choice were the following: 1) the Daily Caller was directly owned by the Fox News anchorman Tucker Carlson that the article is quoting at the time the experiment was run; 2) the Daily Caller article directly quotes Fox News and actually embeds the Fox News video that includes Carlson's speech that is cited in the article; 3) Tucker Carlson's speech, like the other extracts, contains a narrative that is research based and therefore in no way less formally validated than the other extracts. The reason we chose this particular extract is that at the time the experiment

was run, the other Fox News stories making the same argument were more based on political statements rather than on research, and therefore less homogeneous on this dimension in comparison to the other extracts.

A.4.1 The lab Narrative

[Media 1][22] A potentially explosive theory — first posed by two Chinese researchers in early February holds that the origin of COVID-19 traces back to an accident in one of two labs near the Wuhan market that work with bats. Most of the experts interviewed for this story discounted the theory — whose progenitors reportedly withdrew their paper — saying it wasn't supported by evidence. The theory has also been strenuously denied by the Chinese government and one of the labs. But one expert, a chemical biology professor and bio-weapons expert at an important US University, has suggested to several media outlets that the lab-accident theory has credence. "The possibility that the virus entered humans through a laboratory accident cannot and should not be dismissed," said the doctor in an email.

[Media 2][23] Despite previous reports that coronavirus had been traced to bats, most likely the kind that could be found in wet markets like the one in Wuhan, a new report from an important Chinese University suggests that there's a more likely scenario — a leak from a lab. The report detailed the tracing of COVID-19 to the intermediate horseshoe bat — a bat that they confirmed was not available at the Wuhan wet market and did not live locally. In fact, the report noted that native populations were no closer than 600 miles away from the first known cases, making a natural transmission from bat to human appear more unlikely. The only place those particular bats existed locally was inside a research facility — which was just several hundred yards from the Wuhan wet market — and the paper's ultimate conclusion was that the coronavirus pandemic had likely been the result of a leak from the lab: "The killer coronavirus probably originated from a laboratory in Wuhan."

A.4.2 The Nature narrative

[Media 3][24] In early February, Chinese researchers published an article in a top science journal that concluded the "COVID-19 is 96% identical at the whole-genome level to a bat coronavirus." Later that month, 27 public health scientists from across the United States

[22]: CNN, April 6, 2020: https://edition.cnn.com/2020/04/06/us/coronavirus-scientists-debate-origin-theories-invs/index.html

[23]Dailycaller, March 31, 2020, paraphrasing a speech from Tucker Carlson (Fox News): https://dailycaller.com/2020/03/31/coronavirus-lab-wuhan-tucker-carlson-report/

[24]CNN, April 6, 2020: https://edition.cnn.com/2020/04/06/us/coronavirus-scientists-debate-origin-theories-invs/index.html

and the world wrote a letter in another leading scientific journal. In the piece, the experts cited scientific evidence that support the theory that "overwhelmingly conclude that this coronavirus originated in wildlife, as have so many other emerging pathogens. "We're very confident that the origin of Covid-19 is in bats," the president of a health nonprofit that tracks zoonotic spillover. "We just don't know where exactly it originated – which bat species exactly. And we don't know how many others there are out there that could emerge in the future."

[Media 4][25] A group of researchers compared the genome of this novel coronavirus with the seven other coronaviruses known to infect humans: SARS, MERS and COVID-19, which can cause severe disease. That analysis showed that the "hook" part of the spike had evolved to target a receptor on the outside of human cells called ACE2, which is involved in blood pressure regulation. It is so effective at attaching to human cells that the researchers said the spike proteins were the result of natural selection and not genetic engineering. The overall molecular structure of this virus is distinct from the known coronaviruses and instead most closely resembles viruses found in bats and pangolins that had been little studied and never known to cause humans any harm.

A.5 Questionnaire

[The questionnaire was written in American English. The first block of Lab narrative included the two extracts reported in A.4.1. The first block of Nature narrative included the two extracts reported in A.4.2. The first block was not included in the No story. The order of the questions on policy domains in block 2 was randomized across subjects.]

[Screen 1: Welcome screen]

Welcome to this survey. We are conducting a short academic study about COVID-19 and other issues. The questionnaire is anonymous, and the answers will be analyzed in aggregate form for research purposes only. Please answer all questions accurately. There are no correct answers! Therefore, we ask you to answer sincerely on the basis of your own opinions. The survey will take around 10 minutes. Thank you for your help. Please do not hesitate to contact us for further information on our study:

Armenak Antinyan (antinyan.armenak@gmail.com);
Thomas Bassetti (thomas.bassetti@unipd.it);

[25]Fox News, March 24, 2020: https://www.foxnews.com/science/the-coronavirus-did-not-escape-from-a-lab-heres-how-we-know

Luca Corazzini (luca.corazzini@unive.it);
Filippo Pavesi (fpavesi@liuc.it)

Please choose, whether you would like to continue with the study or quit. Please note that if you decide to quit you will not be paid. If you do not give your consent, please do not forget to return your submission on Prolific by selecting the 'Stop without completing' button.

[] I GIVE MY CONSENT, and I want to continue with the study.
[] I DO NOT GIVE MY CONSENT, and I want to quit the study.

[Screen 2: Prolific identification]

Provide your Prolific identification number.

[Screen 3 (Block 1): Introduction to the media extracts]

In the next page, you will find extracts from articles in the US media about COVID-19. Please read them carefully before answering the questions that follow.

Disclaimer: Views, thoughts, and opinions expressed in the following paragraphs do not necessarily reflect the view of the researchers involved in the research project.

[Screen 4 (Block 1): Media extracts]

[Screen 5 (Block 1): Manipulation check]

Please summarize in no more than two sentences what has caused COVID-19 according to the media extracts in the previous screen.

[Screen 6 (Block 2): Questions on policy domains]

Foreign trade represents more of an opportunity than a threat for the US economy in the post COVID-19 recovery. On a scale from 1 (Completely agree) to 5 (Completely disagree) indicate how much you agree with the previous statement.

[] 1 Completely agree
[] 2 Agree
[] 3 Neither agree, nor disagree
[] 4 Disagree
[] 5 Completely disagree

[Screen 7 (Block 2)]

Science is improving our lives, and, in the post COVID-19 recovery, scientific progress should rapidly continue despite potential ethical and safety concerns. On a scale from 1 (Completely agree) to 5 (Completely disagree) indicate how much you agree with the previous statement.

[] 1 Completely agree
[] 2 Agree
[] 3 Neither agree, nor disagree
[] 4 Disagree
[] 5 Completely disagree

[Screen 8 (Block 2)]

Preventing climate change should be given priority in the post COVID-19 recovery, even if it causes slower economic growth and some loss of jobs. On a scale from 1 (Completely agree) to 5 (Completely disagree) indicate how much you agree with the previous statement.

[] 1 Completely agree
[] 2 Agree
[] 3 Neither agree, nor disagree
[] 4 Disagree
[] 5 Completely disagree

[Screen 9 (Block 3): Questions on what caused COVID-19]

We now want to investigate your opinions about the causes of COVID-19. Please allocate 100 points across potential causes of COVID-19. The higher the points allocated to a given cause, the more you believe that specific cause provoked COVID-19.

[] The virus originated from an accident in a Lab:
[] The virus originated in nature as a result of natural processes:
[] The virus is a weapon the countries use against each other:
[] Other reasons:

Total:

[Screen 10 (Block 3)]

According to your response to the previous question, you believe that COVID-19 was caused by "other reasons". Please detail your answer below.

[Screen 11 (Block 4): Socio-economic and demographic questions]

In the next future, how willing would you be to get vaccinated against viruses other than COVID-19 (e.g., influenza and other infectious viruses) on a scale from 1 (Extremely willing) to 5 (Extremely unwilling)?

[] 1 Extremely willing
[] 2 Willing
[] 3 Neither willing, nor unwilling
[] 4 Unwilling
[] 5 Extremely unwilling

[Screen 12 (Block 4)]

What is your gender?

[] Male
[] Female
[] Other

[Screen 13 (Block 4)]

What is your age?

[Screen 14 (Block 4)]

Which of the following describes your situation the best? Please think about the activity or situation which is primary for you.

[] Unemployed
[] Student
[] Working either part-time or full-time
[] Self-employed
[] Other

[Screen 15 (Block 4)]

What is the highest level of education you achieved to date?

[] No formal education
[] Lower than a high school diploma
[] High school diploma
[] Bachelor degree
[] Master's degree
[] Doctoral degree

[Screen 16 (Block 4)]

Imagine an income scale on which 1 indicates the lowest income group and 10 the highest income group in the United States. We would like to know in what group your household is. Please, specify the appropriate number, counting all wages, salaries, pensions and other incomes earned.

[] 1 Lowest income group
[] 2
[] 3
[] 4
[] 5
[] 6
[] 7
[] 8
[] 9
[] 10 Highest income group

[Screen 17 (Block 4)]

Are lockdown restrictions currently in place where you are living?

[] Yes
[] No

[Screen 18 (Block 4)]

How would you describe your political views?

[] Very conservative
[] Conservative
[] Moderate

[] Liberal
[] Very liberal

[Screen 19 (Block 4)]

In which US state are you residing in?

[Screen 20 (Block 4)]

On a typical day, about how much time do you spend watching, reading or listening to news about politics and current affairs? Please give your answer in minutes.