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Preface

A relatively recent strand of economic literature studies information and its impact.
In this dissertation, I have employed both theoretical experimental and empirical analysis to make advances in the field of information economics.
The information that decision-makers process plays a role in determining their decisions: I focus on its impact on social preferences and channels driving the result.
Furthermore, in the social media era, each information consumer is an information producer at the same time. Nowadays, there is an almost infinite amount of information each agent can freely consume; however, information can have different quality. Studying how attitudes are formed is fundamental to understand how people process consumed information. The study about attitude formation is particularly relevant in the current age of misinformation. Low-quality information (e.g., fake news, conspiracy theories) is quickly spreading online, affecting how individuals behave, with negative spillovers on both individual outcomes (e.g., health-related decisions) and collective outcomes (e.g., climate change). We lack a deeper understanding of these phenomena.
My results inform policymakers about relevant and novel issues relative to how information is generated, processed and its implication.

Chapter 1 Rising polarization endangers social cohesion, and threatens the maintenance and the growth of a healthy society.
This study investigates the impact of exposure to polarized articles on social preferences, focusing on how such exposure influences altruism, cooperativeness, and anti-social behavior. The research explores three key channels — emotions, group identity, and expectations about the others — that may drive the deterioration of social preferences in a polarized news environment. I conduct an online experiment, wherein I have participants reading polarized articles and then interact with other participants whose characteristics are not disclosed. I find that pro-attitudinal and counter-attitudinal articles impact the level of cooperation and altruism: reading pro-attitudinal articles increases cooperation and decreases anti-social behavior. Conversely, reading counter-attitudinal articles decreases altruism and increases anti-social behavior. The impact is asymmetrical among different political supporters, providing the first experimental evidence that polarized articles affect social preferences.

Chapter 2 In joint work with Federico Innocenti and Marco Minozzo. We investigate how slanted articles influence attitudes. We implemented a field experiment where university students were randomly assigned to different treatments, reading news articles with either a positive or negative slant on several topics over four weeks. We collected

students' attitudes weekly and in a follow-up survey four weeks later. We find that: a) slanted information significantly shifts attitudes in the intended direction; b) the effect is more substantial for novel topics; c) the first impression about a novel topic shapes attitudes; d) the change in attitudes persists over time; e) different attitudes drive different economic decisions. Our findings highlight that media are more effective when shaping initial attitudes rather than altering existing ones. Thus, our results show the importance of timely information provision, especially in the early stages of public discourse.

Chapter 3 I investigate the effect of social capital on vaccination decision-making among the French population during the COVID-19 pandemic. To the best of my knowledge, this is the first paper to perform a dynamic analysis of the role of social capital in vaccinations. By utilizing geographical variation within the country's departments, I show a positive role of social capital in increasing the vaccinated population. Furthermore, the role of social capital is mitigated only by the implementation of (dis)incentives as the green pass. My results are robust to different specifications of the model and different proxies for social capital. The provided results highlight the need to strengthen social capital to have not only positive economic returns but also social and health behaviors. Additionally, policy interventions that increase the stringency of rules can result in a rapid and significant increase in vaccination rates, particularly in areas with lower social capital.

The effect of polarized information on social preferences: an experimental approach

1.1 Introduction

The ability to positively interact with others is central to successful personal and business relationships (Honhon and Hyndman, 2020) and is crucial for maintaining a healthy society (Schiefer and Van der Noll, 2017). Generally, a cohesive society is seen as a desirable feature, yet it is increasingly perceived as deteriorating (Schmeets and Te Riele, 2014). One main reason is the evolution of information consumption: the growing dominance of social media platforms as primary news sources has raised concerns about the increased exposure of individuals to pro-attitudinal content, which may exacerbate polarization (Sunstein, 2018) and make society more fragmented (Stroud, 2010). Polarization endangers the viability of society alike because of one's unwillingness to have a positive, or at least neutral, relationship with others (Leigh and Melwani, 2019).

In this project, I examine the impact of polarized articles on social preferences. Specifically, I investigate whether exposure to polarized articles concerning highly debated topics in the American media influences individuals' perceptions and interactions with others whose characteristics remain undisclosed. The focus is on how polarized articles about gun control and LGBTQ rights affect altruism, cooperativeness and anti-social behavior. I consider several potential channels through which social preferences may be impacted: emotions, measures of group identity, and expectations about others.

To shed light on the issue, I conduct a preregistered online experiment. I recruit American participants through Prolific. Initially, they are exposed to polarized articles that are previously chosen through a pre-experiment, and then they participate in the dictator game, public good game and joy of destruction game to measure social preferences. Furthermore, I collect information about the emotions evoked while reading the article, their perception of their relationship with society, and their expectations of others.

I find that reading pro-attitudinal and counter-attitudinal articles affects social preferences, resulting in higher cooperation levels and lower anti-social behavior when reading pro-attitudinal articles and lower levels of altruism and higher levels of anti-social behavior when reading counter-attitudinal articles. Furthermore, I observe an asymmetry among Democrats, Independents and Republicans on how articles affect their social preferences. In fact, Democrats and Independents increase pro-social behaviors when reading pro-attitudinal articles and have no changes when reading counter-attitudinal articles compared to when reading neutral ones. Conversely, Republicans have a deterioration of

social preferences when reading counter-attitudinal articles and no changes when reading pro-attitudinal ones compared to when reading neutral ones. Lastly, emotions and the perceived connection with society are important channels through which polarized articles impact social preferences.

The findings have strong implications. First, given the recent indication of a growing polarization in the Western societies, investigating the role of media is fundamental to develop strategies to fight polarization. Second, my experiment involves reading only two articles; however, the substantial impact on social preferences underscores the need to develop strategies to mitigate the effects of polarization. Lastly, a society with weaker ties and lower level of social preferences, might lead to negative economic consequences as inefficient allocation of resources or negative economic growth.

This study contributes to the literature on the consequences of polarization on economic decisions. To the best of my knowledge, it is the first experimental research focusing on the spillovers of polarized articles on social preferences towards another participants whose characteristics remain undisclosed, aiming to identify the effects of a polarized news environment and the possible channels leading to behavioral deterioration.

There is a large and ongoing literature on polarization. Recently, research has focused on whether social media has led to an increase in polarization. There is ongoing debate on whether echo chambers and filter bubbles contribute to heightened polarization. Two competing hypotheses emerged to predict the impact of social media on public opinion at the outset of the social network era. The first hypothesis posits that users are more likely to reduce exposure to different viewpoints as a result of the inherent features of social networks (Van Alstyne and Brynjolfsson, 2005; Sunstein, 2018); the second hypothesis predicts that social media presents opportunities for communication that could guide users to encounter more diverse view, thereby promoting moderation (Papacharissi, 2002; Bimber, 2008). Dahlgren (2021) argues against echo chambers and filter bubbles as a new phenomenon, suggesting they are simply another face of selective exposure. Bruns (2021) states "echo chambers and filter bubbles principally constitute an unfounded moral panic that presents a convenient technological scape-goat (search and social platforms and their affordances and algorithms) for a much more critical problem: growing social and political polarization." (Ross Arguedas et al., 2022) and Jungherr et al. (2020) find little support for the filter bubble hypothesis, suggesting echo chambers are less common than assumed. However, Levy (2021) provides evidence of the role of the algorithm of Facebook in providing pro-attitudinal news. Moreover, there is some evidence that increased access to partisan content has contributed to polarization (Garrett et al., 2014; Lelkes et al., 2017). Other studies demonstrate that disagreement in an online environment can backfire, increasing attitude polarization (Kim, 2015; Bail et al., 2018).

Furthermore, multiple studies have tried to measure the current level of polarization. Numerous studies observe an increase in societal and topic-related polarization. There is an increasing polarization in society as shown in (Center, 2017). Bolsen and Shapiro

(2018) document increased polarization in the debate concerning climate change. Numerous other issues also face a polarized news environment, including immigration (Iannelli et al., 2021; Schneider-Strawczynski and Valette, 2023), abortion (Carmines et al., 2010), LGBTQ rights Bishin et al. (2021), and gun control (McGinty et al., 2016). Lastly, different papers show the consequences of political polarization (Falk and Zehnder, 2013; Hernandez-Lagos and Minor, 2015; Mill and Morgan, 2022; Dimant, 2024) or intergroup interaction primarily documenting in-group favoritism and out-group hostility Chen and Li (2009); Hargreaves Heap and Zizzo (2009); Bursztyn and Yang (2022), and changes in behaviors when learning that others engage in that behavior (Rand and Yoeli, 2024).

In this paper, I measure the level of polarization concerning gun control and LGBTQ rights, and I extend the literature by investigating the impact of ideologically polarized articles on social preferences towards people whose characteristics remain undisclosed. In fact, polarization is not induced by a political figure or partisanship, but by the content of articles. As an additional methodological contribution, I aim to disentangle the impact of reading pro-attitudinal articles from the impact of reading counter-attitudinal ones that existing literature often considers as a unique phenomenon of polarization. There is an ongoing debate on the spillovers of exposure to counter-attitudinal articles. Some studies show that contact between opposing groups may decrease stereotypes (Pettigrew and Tropp, 2006) or increase the likelihood of compromise (Mutz, 2002; Huckfeldt et al., 2004; Grönlund et al., 2015). Other studies suggest that exposure to counter-attitudinal messages leads to increased perceived differences, and successively increases their commitment to their preexisting beliefs (Taber and Lodge, 2006; Nyhan and Reifler, 2010; Bail, 2015; Bail et al., 2018). I aim to extend the literature assessing the impact of exposure to counter-attitudinal articles on social preferences towards people whose characteristics remain undisclosed.

Moreover, I investigate the possible channels through which slanted articles may impact social preferences. The first channel I investigate is a different set of emotions (namely, anger, fear, sadness, joy, surprise, disgust and contempt). Many scientists believe that emotions are dominant drivers of economic decisions in life (Paul, 2007; Gilbert, 2009; Keltner et al., 2014). There is a large research on the consequences of emotions on socio-economic decisions. For example, good moods lead to optimistic judgments, and bad moods lead to pessimistic judgments (Loewenstein, 2003). Similarly, incidental moods influence risk perception (Johnson and Tversky, 1983). Iyengar et al. (2012) shows that much of this animosity between parties stems from emotional inputs. Lerner et al. (2003) demonstrate how fear and anger generate different perceptions related to the risk of a terrorist attack and the subsequent support of different policies. Emotions impact thought content and affect information processing in decision-making (Lerner et al., 2015). They play a critical role in shaping social preferences, and influencing how individuals make decisions that affect others. They can serve as immediate responses that coordinate and guide behavior in social interactions, such as cooperation, altruism, and anti-social behav-

ior (Morris and Keltner, 2000; Keltner et al., 2014). They can motivate individuals to act in ways that consider the welfare of others, even at a personal cost (Loewenstein, 2003). Furthermore, Zhu et al. (2024) examine how affective polarization influences anger, and MacKuen et al. (2010) study the impact of anger and enthusiasm in political behaviors. I contribute to the literature by analyzing the impact of pro-attitudinal and counter-attitudinal articles on seven different basic emotions as defined by (Ekman, 1992).

Lastly, I focus on how polarized articles shape perceived in-group features and the perception of the "others" whose characteristics are unknown along with their expected behaviors.

Social interactions are more frequent among in-group members than out-group members (Glaeser, 2005). In fact, according to the seminal paper by (Chen and Li, 2009), individuals are more inclined to engage in pro-social behavior when interacting with fellow group members, and the propensity for such pro-social actions intensifies with the perceived size of the in-group (Ellemers et al., 2004). There are multiple experiments showing in-group love and others showing out-group hate (Halevy et al., 2008; Yamagishi and Mifune, 2009; Halevy et al., 2012; Mill and Morgan, 2022).

Experimental evidence strongly supports that individuals possess prosocial preferences (De Dreu, 2010; Fischbacher and Gächter, 2010; Murphy et al., 2011), exhibit conditional cooperation (Kocher et al., 2008; Herrmann and Thöni, 2009), and demonstrate altruism by reducing their own payoff to increase others' payoff (**?**Fehr and Gächter, 2002; Bernhard et al., 2006). However, Kranton and Sanders (2017) show that social preferences vary depending on the type of matched partner.

Moreover, emerging literature reveals that a considerable number of participants, instead of maximizing their payoff, burn others' money (Abbink and Sadrieh, 2009; Abbink and Herrmann, 2011; Prediger et al., 2014), and are even willing to reduce their own payoff to commit antisocial actions (Zizzo and Oswald, 2001; Abbink and Doğan, 2019).

Furthermore, people have persistent misconceptions about those belonging to other groups (Bursztyn et al., 2023a), and these misconceptions play a critical role in shaping attitudes and behaviors towards others (Bursztyn and Yang, 2022). Camerer et al. (1989) shows a strong correlation between individuals' own attitudes, beliefs, and behaviors and the corresponding beliefs about other in-group members. Additionally, Lees and Cikara (2020) underscore that individuals tend to overestimate both the negativity of out-group members towards their in-group and the size of the out-group (Enders and Armaly, 2019).

Yet my study is not designed to evaluate intergroup interactions. Instead, I aim to study whether ideological polarization impacts expectations about others and self-perception in society, and if this translates into changes in social preferences.

The remainder of the paper is structured as follows: I outline the experiment in Section 2. In Section 3, I present the results of the experiment. Section 4 concludes.

1.2 The experimental design

1.2.1 The pre-experiment

Before the start of the experiment, I generated articles by using ChatGPT, focusing on four salient topics: gun control, LGBTQ rights, immigration, and abortion. I asked ChatGPT to produce articles with a perspective on the topic that is either liberal, neutral or conservative.[1]

To ensure the quality and comparability of the articles, I conducted a pre-experiment survey to select the articles to use in the experiment. The pre-experiment was conducted in late August 2024.

I recruited participants via Prolific, an online labor market widely used for conducting experiments. Workers on Prolific can choose whether to take part in a survey and are paid by the requester after performing the task.[2] The main advantage of using Prolific is the higher representativeness of the US population compared to lab experiments where almost exclusively students participate. Prolific allows for a more diverse sample in terms of age, ethnicity, education, and wealth (Palan and Schitter, 2018). Additionally, online experiments minimize reciprocity concerns and peer effects since participants do not meet in person(Mill and Morgan, 2022). Lastly, numerous online replication studies of earlier laboratory experiments have demonstrated comparable outcomes (Paolacci et al., 2010; Suri and Watts, 2011; Crump et al., 2013).

Prolific has a lower level of attentional disengagement compared to Amazon's Mechanical Turk (Mason and Suri, 2012; Albert and Smilek, 2023), and stricter rules for rejecting a submission, reducing the risk of demand effects (Chandler et al., 2014).

To ensure a high-quality sample, I restrict the eligibility criteria. I restrict recruitment to US-based individuals with an approval rate of 95% or higher and a minimum of 100 completed tasks. Lastly, individuals were required to pass two attention checks to complete the survey.[3].

Participants selected to take part in the study were directed to Qualtrics, the online tool used to record the answers for the pre-experiment. The estimated completion time was 15 minutes and the payment to complete the survey was £2.25, approximately $3.

After accepting the consent form, participants were randomly assigned to read four (out of the twelve) articles previously created. In fact I created one neutral, one pro-attitudinal and one counter-attitudinal article for four highly debated topics: LGBTQ rights, gun

[1] I gave the following instructions to ChatGPT: *"Imagine to be an American journalist. You want to write an article about gun control/LGBTQ rights/abortion/immigration from a point of view of a liberal/conservative/neutral journalist. The length of the article must be around 500 words. Be as radical as possible. Write in a style to touch the feelings of readers as much as possible."*. The last two instructions were not given to produce the neutral article.

[2] The payment is subject to the completion of the task, passing the attention checks, and providing an acceptable effort.

[3] The policy of Prolific is to reject the submissions of participants only if they fail two different attentions checks in surveys longer than 5 minutes

control, abortion, and immigration. After reading each article, participants were asked to evaluate it based on several criteria: the emotions evoked, its detectability as AI-generated, its readability, and its political orientation. The last part was devoted to the demographics of the participants and their political orientation.
Participants in the survey are not involved in the subsequent experiment.

1.2.2 The experiment

Recruitment

As for the pre-experiment, the experiment was also conducted in Prolific for the same reasons as before. To ensure a high-quality sample, I set strict eligibility criteria. I restricted recruitment to US-based individuals with an approval rate of 100% and a minimum of 100 completed tasks.[4] Furthermore, I restricted the sample to only those who identify themselves as Democrats, Independents or Republicans. Lastly, I excluded those who participated in the pre-experiment to avoid a lower impact of the articles due to lack of novelty.
Participants received a show-up fee of £2.25, approximately $3, after completing the survey,[5] and additional compensation could be earned based on their performance in the games. A subset of participants was randomly selected to receive the amount gained from the games and the expectations they provided. They were informed of this possibility. The additional compensation depended on the result of the three games: public good game, dictator game and joy of destruction game and an additional bonus could be earned by providing precise expectations about the average of other participants' choices. In the dictator game, participants were endowed with 100 points. In the public good game, each group had two participants, both endowed with 100 points and a multiplication factor of 1.5. In the joy of destruction, participants could destroy up to 100 points at a personal cost of 1 point. The bonus for accurate expectations was 100 points. The maximum amount of points a participant could gain was 475. The conversion rate was 1 point equal to $0.1. Therefore, the maximum amount a participant could win was $47.5.

Procedure

I randomly allocated participants into three groups: a control group reading neutral articles, a liberal article group, and a conservative article group. This randomization process ensures that participants are evenly distributed across the groups. All participants were directed, after reading the consent form, to read the two articles previously selected through the pre-experiment. Following the reading of each article, participants responded

[4] I increased the approval rate since in the pre-experiment I excluded many questions due to excessive quickness.

[5] The payment is subject to the completion of the task, passing the attention checks, and providing an acceptable effort.

to questions regarding the emotions elicited and their level of agreement with the content. The subsequent phase of the survey was designed to assess participants' social preferences through three games: the dictator game to measure altruism, the public good game to evaluate cooperation, and the joy of destruction game to investigate antisocial behavior. Participants were informed that they would be matched with the same person, whose characteristics were unknown, throughout the three games.
Additionally, participants were required to provide a socio-demographic profile of the individual with whom they were previously matched. They also had to indicate their expectations regarding the average behaviors of other participants.
Subsequently, participants completed the Inclusion of Other in the Self (IOS) Scale and provided an evaluation of the magnitude of the in-group to determine their perceptions of themselves within society.
Lastly, the demographic information was collected through questions about their age, gender, race, income, political orientation and education at the end of the questionnaire. I use them as controls in the econometric analysis. It also enables the examination of specific population subgroups to determine whether the effects of polarized articles vary based on individual characteristics.
Throughout the survey, there were three attention checks.
To assess the impact of polarized information on social behaviors, three different games were conducted in a one-shot format with no interactions between participants. Furthermore, participants' personal characteristics were not disclosed to prevent biases such as in-group favoritism or out-group hostility.

Cooperation

I use a public good game to study cooperation. The Public Good Game is an economic game where participants decide how much of their initial endowment to contribute to a shared pool, which benefits the group. In the public good game, players have a dominant strategy to behave non-cooperatively if they have narrow selfish preferences (Ostrom, 1990). However, studies show a substantial contribution by most of the participants in experiments contradicting the classical utilitarian economic theory.
Many studies show that a substantial proportion of people choose to cooperate in public good games, even if the situation is one-shot and completely anonymous (Ackermann and Murphy, 2019). Several studies have highlighted a positive relationship between beliefs about other people's anticipated behavior and their own choices (Croson, 2007; Neugebauer et al., 2009; Fischbacher and Gächter, 2010).
Contrary to the Prisoner's Dilemma, the other widely used game to test cooperativeness, the public good game places emphasis on different levels of contribution. Moreover, it allows for a continuous set of integers, increasing the statistical power of the analysis. Lastly, the public good game provides insights into how groups make decisions about resource allocation, public good provision, and collective action problems, which are more

similar to real world decisions.
The public game is played in groups of two to allow participants to play with the same player in the three proposed games.

Altruism

The Dictator Game is an economic experiment in which one participant, the "dictator," is given a sum of money and decides how much, if any, to share with another participant. This game is used to study altruism, fairness, and social preferences, as the receiver has no influence over the outcome. In the dictator game players have a dominant strategy of keeping the entire amount for themselves. However, experiments on the dictator game have shown that a large proportion of participants are willing to share a part of their endowment (Engel, 2011).
Contrary to the ultimatum game and the trust game, the advantage of the dictator game is that it tests pure altruism, without including other motives, such as fear of rejection or reciprocity, in participants' decisions. Furthermore, it allows for the study of altruistic preferences in a continuous set of integers, thereby providing strong statistical power.

Anti-social preferences

I use the Joy of Destruction game to study anti-social preferences. The payoff-destruction literature is divided into two different motives: inequity aversion and pure spite (Sanjaya, 2023).
(Zizzo and Oswald, 2001) introduced the Money Burning game, hypothesizing that destroying others' money is primarily caused by inequity aversion. Differently, the joy of destruction game was introduced to specifically elicit pure spite (Abbink and Sadrieh, 2009). Abbink and Herrmann (2011); Prediger et al. (2014) find that belief about others' behaviors predict money burning. There is mixed evidence on the effect of gender on burn rates: in some cases, men burned more (Grossman et al., 2013; Almås et al., 2019), while in others, women burned more (Sadrieh and Schröder, 2016; Zeballos, 2018). Furthermore, social identity has an impact on antisocial behavior. Gangadharan et al. (2019) find that low-income individuals display more antisocial behavior towards those belonging to different social classes.
In the Joy of Destruction game, participants have the option to reduce another player's resources at a personal cost, without receiving any direct material benefit themselves. Therefore, the decision to reduce another player's resources contradicts classical utilitarian economic theory.
The advantage of the Joy of Destruction game is twofold: it considers pure spite, and it is a strategic game. The first criterion excludes games with actions that are rationally motivated by material benefit. The second criterion excludes games that do not involve strategic decision-making. Furthermore, it allows for the study of anti-social preferences in a continuous set of integers, thereby providing strong statistical power.

Emotions

In the experiment I consider basic emotions. There is no consensus on which emotions are basic: (Jack et al., 2014) suggest there are four basic emotions (fear, anger, joy, and sadness), while (Ekman, 1992) proposes there are seven (fear, anger, joy, sadness, contempt, disgust, and surprise).[6]
I focus on how articles impact seven different emotions, based on the universal emotions classified by (Ekman, 1992) since this classification is the most widely used and covers a broader spectrum of basic emotions.
To analyze channels I build an index to summarize negative emotions in a single measure.

Inclusion of Other in the Self (IOS) Scale

Many studies suggest that the degree to which individuals can relate to each other matters for social preferences (Hoffman et al., 1996; Bohnet and Frey, 1999). Similarly, perceived proximity to society or an interlocutor may play a role in social preferences Dimant and Hyndman (2019). Therefore, it is essential to measure this.
To assess the perceived closeness of participants to the broader society, I employ the Inclusion of Other in the Self (IOS) Scale (Aron et al., 1992), which is a subjective, single-item, pictorial measure of relational closeness. It is simple and intuitive for subjects to understand and takes less than one minute to answer (Gächter et al., 2015).
The image represents two circles positioned at different distances, asking participants to select which pair of circles best represents their perception of themselves and society: the more distant the circles, the more distant the participant feels from society.

Group Identity

(Lees and Cikara, 2020) highlight that people tend to overestimate out-group negativity towards their in-group as well as the size of the out-group (Enders and Armaly, 2019). These misperceptions play a crucial role in shaping people's attitudes and behaviors towards others Bursztyn and Yang (2022).
Therefore, participants are asked to estimate the percentage of U.S. citizens they perceive as belonging to their in-group, compared to the percentage they believe belongs to the out-group. The in-group is defined as the group with which an individual identifies or feels psychological affinity (Tajfel, 1970). Similar to the Inclusion of Other in the Self (IOS) Scale, this approach provides another subjective measure to evaluate the relationship between the participants and society. Unlike the Other in the Self (IOS) Scale, which evaluates the perceived closeness, this measure considers the perceived size of the group a participant feels they belong to.

[6]Successively, he suggested contempt might not be among the basic emotions.

Expectations

I ask participants to provide estimates of other participants' behaviors in the three games to determine whether they have stronger negative expectations when reading a counter-attitudinal article.
Furthermore, I ask participants to provide a profile of the other participants they interacted with, whose characteristics were unknown, to check whether their expectations about demographic and political characteristics change when reading different articles.
In a rational world, participants should not assign any probability differing from random to the characteristics of the other participants with whom they have interacted since no information is given. However, choices may be influenced by expectations of others' behaviors, in-group and out-group feelings generated by the salience of the orientation of the articles (i.e., a participant who reads a conservative article may assign a higher probability to interacting with a Republican and vice-versa), an in-group effect (i.e., a participant may assign a higher probability to interacting with others similar to themselves and previous experience in Prolific (i.e., a participant may assign a higher probability to others having specific characteristics based on their previous experiences on Prolific).[7]

1.3 Results

1.3.1 The pre-experiment

472 participants started the survey, 50 of which did not finish it. Therefore, 422 answers are taken into account in the analysis (202 Democrats, 167 Independents and 53 Republicans, 223 females, 193 males and 6 non-binary).
As with most online experimental studies, the sample does not perfectly depict the American population. Especially, the percentage of Republicans is less than proportional compared to the American population.
The goal of the pre-experiment is twofold: evaluating the quality of the articles generated through the AI and selecting those that arouse stronger emotions.
I analyze the quality of the article considering its level of AI-detectability and its ability to describe properly a neutral, liberal or conservative position.

Quality of the articles

The first column of Table 1.1 shows the average values and standard deviations of AI-detection for each article. Neutral articles have the highest AI-detection, while liberal and conservative articles have similar values. The only exception is the liberal articles related to immigration that has a higher value compared to the conservative ones. However, the high standard deviations show the diversity of perception among participants. Respondents perceive neutral articles to be slightly more likely written by a liberal than a

[7] In fact, black people, old people and republicans participate less than proportionally in Prolific.

conservative, in particular the one related to immigration. While liberal and conservative articles are correctly perceived. I show the AI-detectability and perceived writers based on self-assessed political identities in Appendix A.

I run the Kruskal-Wallis test to analyze the difference in AI-detection and perceived writer within articles based on the political orientation of participants. Considering a standard level of significance of 5%, there is no statistical difference on the level of AI-detection in any article based on differences in political identities. Furthermore, the between-article analysis shows that articles on the same topics differ significantly in the AI-detection and perceived writers.

The large standard deviations on the AI-perception shows the inability of participants in identifying the articles as AI-generated, and therefore their quality.

Article	AI-detection	Liberal	Conservative
LGBTQ Neutral	7.01	5.84	4.48
	(2.23)	(1.68)	(1.77)
LGBTQ Conservative	5.13	1.76	8.83
	(2.52)	(1.75)	(2.25)
LGBTQ Liberal	5.34	8.29	2.10
	(2.34)	(1.62)	(1.68)
Immigration Neutral	5.75	5.72	3.88
	(2.70)	(2.35)	(2.51)
Immigration Conservative	4.82	2.09	8.78
	(2.51)	(1.86)	(1.67)
Immigration Liberal	5.60	7.99	2.24
	(2.63)	(2.11)	(1.92)
Abortion Neutral	6.55	5.25	4.22
	(2.56)	(1.96)	(2.09)
Abortion Conservative	4.61	1.70	9.14
	(2.56)	(1.51)	(1.38)
Abortion Liberal	4.65	8.54	1.80
	(2.57)	(2.01)	(1.55)
Gun Control Neutral	6.70	4.92	4.19
	(2.68)	(2.21)	(2.13)
Gun Control Conservative	4.66	2.28	8.21
	(2.75)	(2.28)	(2.51)
Gun Control Liberal	4.46	8.20	2.17
	(2.36)	(2.29)	(1.89)

Table 1.1: The table shows the average values and standard deviations of AI-detection for each article (Column 1). Column 2 and Column 3 show the average value attached to the perception of the articles to be written by a liberal and a conservative, respectively.

Emotions

Table 1.2 shows the values of the emotions aroused while reading each article. As expected, neutral articles are those with the lowest emotions generated. Conservative articles cause the strongest negative emotions, and liberal articles have intermediate values, except the

one about gun control. Sadness and anger are the emotions mostly evoked by the articles with an average of 3.65 and 3.4, respectively.[8] However, the low level of emotions induced by neutral articles impacts their averages. In fact, conservative articles arouse anger at a level of 5.19, and disgust and sadness at a level of 4.73 and 4.53, respectively. Liberal articles mostly evoke sadness and anger at a level of 3.76 and 3.11, respectively.
I analyze aroused emotions considering the different political orientations of readers in Appendix. Neutral articles have little impact on generating feelings for all types of respondents. Democrats have stronger negative feelings while reading conservative articles, with the exception of sadness aroused by articles related to gun control. Differently, Republicans do not always have stronger negative feelings while reading liberal articles: it depends on the topics and on the type of feelings considered. Lastly, aroused feelings of Independents have similar trends compared to Democrats, but with a lower intensity.
I run the Kruskal-Wallis test to analyze differences among groups and the Mann-Withney U test for a pairwise comparison. The level of aroused emotions significantly differs among different articles on the same topic with the exception of surprise which does not differ in any topic and the level of joy related to the articles about gun control.

Selection of the articles

The selection of the article has three different requirements: low level of AI-detection, high level of polarization of the liberal and conservative articles, and high emotions felt by the readers.
The two topics chosen are LGBTQ rights and gun control. Given the similarity of the three dimensions among the four topics, I selected the topics able to arouse the strongest emotions to have the possibility to analyze emotions as potential channels.

1.3.2 The experiment

The experiment has been pre-registered at aspredicted.org with the number #187264.
A total of 600 participants took part in the experiment. I collected participants through Prolific in three different surveys. Each survey had a special requirement concerning political affiliation: one survey was for those who consider themselves independents, one for those who consider themselves democrats and one for those who consider themselves republicans. The three surveys were exactly the same. [9] Prolific often require updating the personal information of participants to provide recent demographics to those who run

[8] The scale is 1 to 10.

[9] I removed 13 participants from the final database. I removed two of them because they inserted an incorrect Prolific ID, and therefore I could not match their information with those provided by Prolific. I removed six participants because they declared to be democrats/republicans in Prolific and they chose the other party affiliation during the survey. I kept in the final database those participants who declared themselves as independent and then they selected the democrat/republican option in the survey and vice-versa I show the results with the entire sample in the Appendix.

Article	Fear	Anger	Joy	Sadness	Disgust	Contempt	Surprise
LGBTQ Neutral	1.95	2.21	2.70	2.64	2.24	2.15	1.86
	(1.83)	(1.82)	(2.22)	(2.16)	(2.04)	(1.97)	(1.73)
LGBTQ Conservative	4.12	5.95	1.63	5.48	5.57	4.53	2.40
	(3.09)	(3.33)	(1.55)	(3.34)	(3.48)	(3.28)	(2.23)
LGBTQ Liberal	2.26	3.32	3.09	4.76	3.21	2.81	2.48
	(2.30)	(2.65)	(2.67)	(2.97)	(2.80)	(2.41)	(2.24)
Immigration Neutral	1.86	2.04	2.45	2.44	1.89	2.24	1.95
	(1.69)	(1.89)	(2.24)	(2.03)	(1.66)	(2.21)	(1.76)
Immigration Conservative	3.66	5.26	1.78	4.37	4.63	3.65	1.93
	(2.91)	(3.02)	(1.79)	(2.95)	(3.20)	(2.89)	(1.72)
Immigration Liberal	1.96	2.13	4.10	2.44	2.12	2.13	1.86
	(1.87)	(2.19)	(3.16)	(2.16)	(2.10)	(2.17)	(1.76)
Abortion Neutral	1.93	2.23	2.11	2.88	2.35	2.28	2.07
	(1.91)	(2.14)	(2.11)	(2.43)	(2.30)	(2.15)	(1.98)
Abortion Conservative	3.55	5.28	1.46	4.73	4.64	3.82	1.84
	(3.17)	(3.36)	(1.43)	(3.29)	(3.43)	(3.00)	(1.64)
Abortion Liberal	2.01	2.93	2.75	3.30	2.72	2.80	2.05
	(1.84)	(2.57)	(2.49)	(2.68)	(2.59)	(2.62)	(1.86)
Gun Control Neutral	2.09	2.24	1.73	2.69	2.16	1.95	1.86
	(1.99)	(2.18)	(1.51)	(2.53)	(2.14)	(1.84)	(1.76)
Gun Control Conservative	4.23	4.26	1.89	3.54	4.06	3.84	2.09
	(3.15)	(3.15)	(2.00)	(2.92)	(3.04)	(3.14)	(2.03)
Gun Control Liberal	3.58	4.07	1.79	4.54	3.69	3.13	2.11
	(2.53)	(2.73)	(1.92)	(2.91)	(2.92)	(2.56)	(2.05)
Average	2.77	3.40	2.33	3.65	3.18	2.94	2.10
Average Neutral	1.96	2.18	2.25	2.66	2.16	2.16	1.94
Average Conservative	3.89	5.19	1.69	4.53	4.73	3.96	2.07
Average Liberal	2.45	3.11	2.93	3.76	2.94	2.72	2.13

Table 1.2: The table shows the average values and standard deviations of emotions of the respondents while reading each article. The last column shows the average value of emotions aroused by each article and the last row shows the average value of each emotion.

surveys. Therefore, this is a signal of low attention paid during the survey. Lastly, I removed five participants because they declared to be Republicans as their political orientation and liberal on the political scale at the same time. As before, it is a signal of low attention paid.

I summarize the demographic characteristics of the respondents by their political orientation in Table 1.3.

As with most experimental studies, my sample does not perfectly represent the American population. The female represents 52.3% to the sample, compared of 50.7% of the American population. Regarding the ethnicity of the participants: 72.1% of participants are White compared to 61.6% Whites in the American population. Furthermore, 61.4% of the respondents have at least a bachelor's degree, compared to the 35% of the population. 8.23% of participants are older than 64, compared to 18.5% of the American population. Even if my sample does not perfectly reflect the American population, the

Value	Democrats	Independents	Republicans
Female	122	76	109
Male	76	107	91
Non-binary / third gender	2	4	0
American Indian or Alaska Native	1	0	0
Asian	13	10	5
Black or African American	33	35	39
Hispanic and Latino	12	3	5
Native Hawaiian or Pacific Islander	1	0	0
Other	2	3	2
White	138	136	149
High School or lower	63	83	79
Bachelor's Degree	94	76	84
Master's Degree	38	27	33
Doctorate or higher	5	1	4
0$-20,000$	13	17	17
20,001$-40,000$	30	38	33
40,001$-60,000$	33	32	39
60,001$-80,000$	33	30	27
80,001$-100,000$	30	22	33
More than 100,000$	61	48	51
18-34	58	47	57
35-54	105	107	97
55+	37	33	46
Total	200	187	200

Table 1.3: The table shows the demographic characteristics of the participants divided by their political orientation.

demographic characteristics of participants recruited in research platforms as prolific are generally more representative of the general population than lab experiments, in-person studies, and panels (Berinsky et al., 2012; Huff and Tingley, 2015). Furthermore, the comparison between Democrats and Republicans shows the latter being significantly less educated and on average older, with a higher proportion of male and white respondents, all characteristics generally associated with the typical republican voter (Stoetzer et al., 2017). Therefore, my sample shows a great similarity to the general population' characteristics and reflects the attitudes of general Democratic and Republican voters.
I show the instructions given to participants in the Appendix.

Social preferences

In this section, I present the main descriptive statistics of the three main measures of the analysis that are used to assess the level of cooperation, altruism and anti-social behavior of the participants based on their demographic characteristics. Furthermore, I show the impact of reading pro-attitudinal and counter-attitudinal articles on social preferences through running a regression. Lastly, I analyze the impact of different articles dividing the sample based on the political orientation and political scale of participants. I account

for different characteristics of the American population based on their political orientation (Graham et al., 2009). In fact, Democrats, and Republicans are different under many dimensions(Margalit, 2013; Sheldon and Nichols, 2009), while Independents may be considered in between (Sweetser, 2014). Hence, it is fundamental to account for their differences during the entire analysis.

Comparing participants based exclusively on their political orientation, there are no statistically significative differences among the three groups in the three games. To compare the level of cooperation, altruism and spite of participants reading pro-attitudinal articles with those reading counter-attitudinal articles, I run a regression considering different sets of controls. Table 1.4 shows the results. The variable pro-attitudinal includes Democrats reading liberal articles, Republicans reading conservative articles, and Independents reading neutral articles. The variable counter-attitudinal includes Democrats reading conservative articles and Republicans reading liberal articles. The Neutral variable is implicitly captured in the regression model as the baseline category and it includes all the remaining participants. The coefficients for the variables *Pro-attitudinal* and *Counter-attitudinal* represent the expected difference in the behaviors in the three games for individuals reading pro-attitudinal articles or counter-attitudinal articles compared to the baseline group (the neutral group). The regression aims to answer the question of whether or not reading pro-attitudinal or counter-attitudinal articles impacts social preferences. The resulting estimation reported in Table 1.4 shows that reading pro-attitudinal articles (7.85) leads to significantly higher values of cooperation compared to the baseline group (p-value$<$0.05). Furthermore, reading counter-attitudinal articles (6.84) leads to significantly lower values of altruism compared to the baseline group (p-value$<$0.05).[10] There is no significant impact on anti-social behavior. However, even if not significant, the directions of all variables show an improvement in pro-social behaviors when reading pro-attitudinal articles and a worsening when reading counter-attitudinal articles compared to the baseline. Thus, the key insight is that the participants change social preferences based on the slant of articles they read. Hence, the articles' slant spills over into the social preferences realm.

In the Appendix, I run two robustness checks. I first run the same analysis reducing the Neutral group. In fact, I allocate Independents into the three groups based on their average level of agreement on the articles read.[11] Then I run the same analysis only based on the average level of agreement of participants on the articles read.[12] The results of the regressions confirm the direction and significance of the results.

To investigate whether there are differences between Democrats, Republicans and Inde-

[10]The positive coefficient must be interpreted as a decrease of altruism since it captures the amount kept by participants in the dictator game

[11]After reading each articles participants were asked to assess their level of agreements on what they had just read. I assign the Independents with an average agreement >7 into the pro-attitudinal subgroup, the Independents with an average agreement <4 into the counter-attitudinal subgroup, and the remaining Independents in the neutral group.

[12]I assign the participants with an average agreement >7 into the pro-attitudinal subgroup, the participants with an average agreement <4 into the counter-attitudinal subgroup, and the remaining participants in the neutral group.

	1	2	3	4
	Cooperation (Public good game)			
Intercept	61.05***	52.28***	54.03***	52.25***
	(1.84)	(4.04)	(4.41)	(5.40)
Pro attitudinal	5.37	5.46	7.66*	7.85**
	(3.44)	(3.44)	(4.03)	(4.05)
Counter attitudinal	-7.26**	-6.74**	-4.38	-4.21
	(3.44)	(3.48)	(4.09)	(4.11)
Demographics		✓	✓	✓
Political orientation			✓	✓
Attention proxies				✓
Observations	587	587	587	587
R^2	0.02	0.04	0.04	0.04
	Altruism (Dictator game			
Intercept	56.02***	55.37***	54.21***	56.55***
	(1.39)	(3.07)	(3.36)	(4.11)
Pro attitudinal	-1.52	-1.60	-3.12	-3.27
	(2.61)	(2.62)	(3.07)	(3.08)
Counter attitudinal	8.23***	8.74***	7.05**	6.84**
	(2.61)	(2.66)	(3.12)	(3.13)
Demographics		✓	✓	✓
Political orientation			✓	✓
Attention proxies				✓
Observations	587	587	587	587
R^2	0.03	0.04	0.04	0.04
	Anti-social behavior (Joy of destruction game)			
Intercept	5.14***	8.32***	9.98***	8.54***
	(0.82)	(1.77)	(1.93)	(2.36)
Pro attitudinal	-1.38	-1.71	0.10	0.29
	(1.53)	(1.51)	(1.76)	(1.77)
Counter attitudinal	0.24	0.48	2.14	2.28
	(1.53)	(1.53)	(1.79)	(1.79)
Demographics		✓	✓	✓
Political orientation			✓	✓
Attention proxies				✓
Observations	587	587	587	587
R^2	0.00	0.05	0.07	0.07

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.4: The table shows the regression of the orientation of the article read on the measure of cooperation (public good game), altruism (dictator game), and anti-social behavior (joy of destruction game). "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls, and political orientation. "*4*" considers the demographic controls, political orientation, and the attention controls.

pendents in the impact of pro-attitudinal and counter-attitudinal articles, I run the same regression dividing the sample into three different subgroups based on the political orientations of the participants. The results of the regression are in Table 1.5.

The slant of the articles affects the cooperation of participants. Reading pro-attitudinal

articles has positive spillovers for Democrats (16.16) and Independents (12.58); whereas, reading counter-attitudinal articles has no impact. Conversely, Republicans (-10.22) co-operate less after reading counter-attitudinal articles. Furthermore, they (12.36) are less altruistic after reading counter-attitudinal articles. Lastly, Independents (-6.70) have less anti-social behavior after reading pro-attitudinal articles.

Furthermore, I consider the two most extreme groups of participants based on the value of political scale: participants who selected *1* (Far Liberals) and those who selected *7* (Far Conservatives). The results of the regression are in the Appendix.

	Cooperation (Public good game)			Altruism (Dictator game			Anti-social behavior (Joy of destruction game)		
	1	2	3	1	2	3	1	2	3
Democrats									
Intercept	54.59***	46.10***	45.60***	59.84***	59.17***	38.01***	2.49*	3.06	2.73
	(4.08)	(7.27)	(13.69)	(3.09)	(5.51)	(10.23)	(1.38)	(2.44)	(4.60)
Pro-attitudinal	15.78***	16.03***	16.16***	-6.10	-6.72	-5.67	-1.03	-0.85	-0.79
	(5.73)	(5.81)	(5.86)	(4.34)	(4.40)	(4.38)	(1.94)	(1.95)	(1.97)
Counter-attitudinal	1.19	3.69	4.27	-0.77	-1.92	-1.73	2.45	3.07	3.29
	(5.91)	(6.17)	(6.24)	(4.48)	(4.68)	(4.66)	(2.00)	(2.08)	(2.10)
Demographics		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓
Observations	200	200	200	200	200	200	200	200	200
R^2	0.05	0.07	0.07	0.01	0.03	0.07	0.02	0.05	0.05
Republicans									
Intercept	62.24***	51.84***	49.71***	55.85***	56.19***	62.93***	5.33***	10.45***	8.48**
	(3.81)	(7.61)	(9.55)	(2.93)	(5.80)	(7.23)	(1.81)	(3.47)	(4.34)
Pro-attitudinal	-0.42	-0.33	-0.08	-0.45	-0.12	-0.74	1.12	0.69	1.13
	(5.66)	(5.66)	(5.74)	(4.35)	(4.31)	(4.35)	(2.69)	(2.58)	(2.61)
Counter-attitudinal	-10.27*	-10.66*	-10.22*	13.14***	13.70***	12.36***	0.46	1.85	2.32
	(5.47)	(5.57)	(5.71)	(4.20)	(4.24)	(4.32)	(2.60)	(2.54)	(2.59)
Demographics		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓
Observations	200	200	200	200	200	200	200	200	200
R^2	0.02	0.06	0.06	0.06	0.11	0.13	0.00	0.12	0.12
Independents									
Intercept	59.19***	50.96***	28.38**	53.10***	51.91***	66.48**	8.04***	13.62***	21.04***
	(3.69)	(7.21)	(13.78)	(2.77)	(5.54)	(10.61)	(1.89)	()	(7.08)
Lib. articles	11.99**	13.31**	12.58**	2.14	2.01	2.37	-5.35*	-6.76**	-6.70**
	(5.93)	(5.92)	(5.90)	(4.46)	(4.54)	(4.55)	(3.05)	(3.03)	(3.03)
Cons. articles	1.65	0.13	1.32	3.48	4.14	3.22	-1.86	-1.18	-1.80
	(5.80)	(5.80)	(5.82)	(4.36)	(4.45)	(4.48)	(2.98)	(2.97)	(2.99)
Demographics		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓
Observations	187	187	187	187	187	187	187	187	187
R^2	0.02	0.09	0.11	0.00	0.03	0.05	0.02	0.09	0.11

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.5: The table shows the regression of the orientation of the articles read dividing participants based on their political orientation on the measure of cooperation (public good game), altruism (dictator game), and anti-social behavior (joy of destruction game). "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls, and the attention controls.

The results of far liberals and far conservatives reflect those of Democrats and Republicans in the significance and direction of the coefficients. However, the coefficients show a stronger impact of reading pro-attitudinal and counter-attitudinal articles on social preferences. In fact, far liberals contribute 21.53 more in the public good game (Democrats contribute 16.16) when reading pro-attitudinal articles. Similarly, far conservatives contribute 25.03 less (Republicans contribute -10.22) in the public good game and keep 25.52 more in the dictator game (Republicans keep 12.36) when reading counter-attitudinal articles.

Lastly, to analyze anti-social behavior I implement a zero-inflated beta model. In fact, as in previous experiments where authors used the joy of destruction game, the majority of participants do not destroy any amount. Therefore, it is necessary to account for the zero inflation. This model produces two results: it compares the probability of destruction among different groups, and then it compares the quantity destroyed among groups conditional on having decided to destroy. The zero-inflated beta model has three components: the Mu component indicates the relationship between the independent variables and the probability of the outcome falling within the beta distribution. The sigma component assesses the dispersion in the beta distribution. The nu component estimates the probability of observing a zero outcome.

	Mu Function	Sigma Function	Nu function
Intercept	-2.80***	0.48***	-0.03
	(0.07)	(0.07)	(0.00)
Pro-attitudinal	-0.41***	0.37***	0.00
	(0.10)	(0.10)	(0.00)
Counter-attitudinal	0.71***	-0.79***	0.00
	(0.11)	(0.11)	(0.00)
Observations	587	587	587

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.6: The table shows the results of the zero-inflated beta regression. The Mu component indicates the relationship between the independent variables and the probability of the outcome falling within the beta distribution. The sigma component assesses the dispersion in the beta distribution. The nu component estimates the probability of observing a zero outcome.

The table shows that the mu component is significantly negative (-2.80) indicating a low baseline probability of destruction. Reading pro-attitudinal articles has a negative coefficient (-0.41), suggesting that as participants read more pro-attitudinal articles, the likelihood of destruction decreases. Conversely, reading counter-attitudinal articles has a positive coefficient (0.71), indicating that reading counter-attitudinal articles increases the likelihood of destruction. The sigma component has a significantly positive intercept (0.48) and significant positive coefficient for reading pro-attitudinal articles (0.37) that indicate that while the average likelihood of destruction decreases, the range of responses becomes more diverse. Conversely, the negative coefficient for reading counter-attitudinal

articles (-0.79) suggests that exposure to counter-attitudinal articles is associated with reduced variability in destructive behavior. The nu (zero-inflated) component shows no significant effects for either independent variable, with both coefficients yielding extremely high p-values. This implies that reading either pro-attitudinal or counter-attitudinal articles does not significantly affect the likelihood of displaying or not displaying anti-social behavior. Therefore, reading pro-attitudinal or counter-attitudinal articles does not impact the decision on whether to destroy or not, but it affects the quantity destroyed.

Result 1 (main result): Reading pro-attitudinal or counter-attitudinal articles affect social preferences. Reading pro-attitudinal articles increases cooperation and decreases anti-social behavior, while reading counter-attitudinal articles decreases altruism and increases anti-social behaviors.

Result 1a: There is an asymmetric behaviors between Democrats, Independents, and Republicans. Democrats and Independents have positive spillovers when reading pro-attitudinal articles; Republicans have negative spillovers when reading counter-attitudinal articles.

Emotions

Emotions are a potential channel through which the slant of the article may affect social preferences.

I initially compare participants based on whether they have read pro-attitudinal or counter-attitudinal articles, then based on their political orientation, and, lastly, I divide the sample into 9 different subsamples based on the political orientation of the participant and the slant of the articles read.

I run the Kruskal-Wallis test to compare different groups and the Mann-Withney U test for a pairwise comparison throughout the entire analysis.

To see how participants are emotionally influenced by the articles they read, I compute the average values of aroused emotions between the two articles. I ask participants to self-assess their emotions on a scale of 0 to 10 (where 0 is "*Completely disagree*" and 10 is "*Completely agree*") after reading each article.

Figure 1.1 shows the averages and the confidence intervals for the emotions based on the slant of the articles read.

When comparing participants reading pro-attitudinal articles with those reading counter-attitudinal articles, the first group has a lower level of anger (-1.2, p-value$<$0.01), disgust (-1.8, p-value$<$0.01), and contempt (-1.1, p-value$<$0.01), and higher values of joy (+1.4, p-value$<$0.01). The third group has similar emotions as the pro-attitudinal one.

While comparing participants based on their political orientation, Democrats have significantly higher values of all the negative emotions: anger, fear, disgust, contempt, and sadness compared to both Republicans and Independents. Republicans have higher values of surprise compared to both Democrats and Independents and higher values of sadness

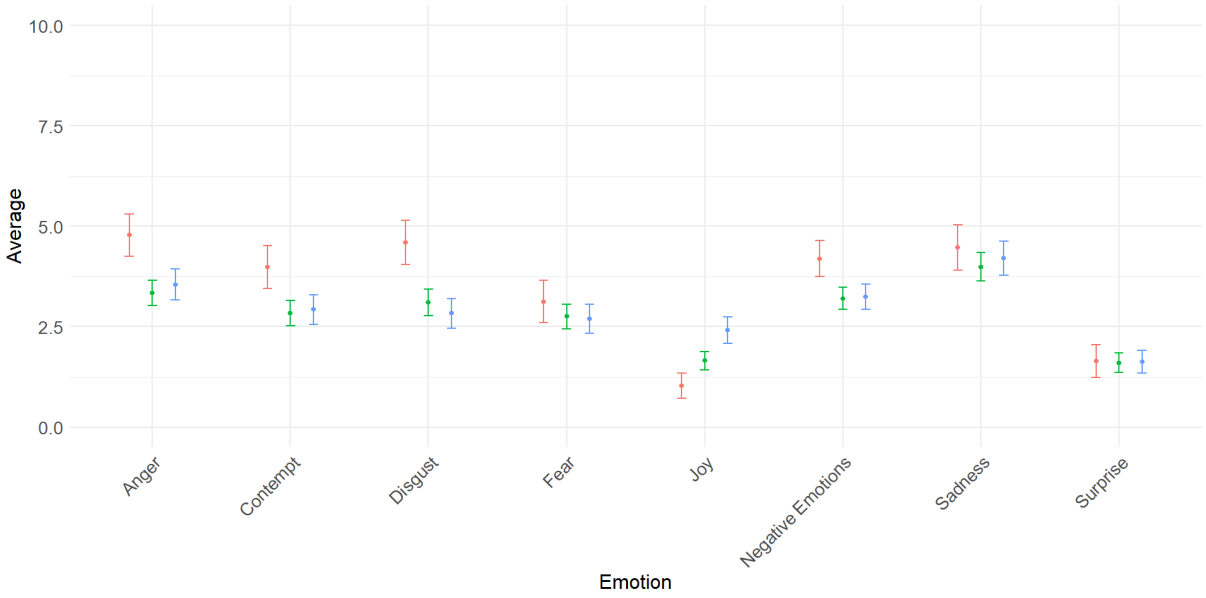


Figure 1.1: The figure shows the averages and the confidence intervals of the seven basic emotions dividing the sample based on the articles read. The blue lines represent participants reading pro-attitudinal article, the green lines represent participants reading neutral articles, and the red lines represent participants reading counter-attitudinal articles.

compared to only independents. Joy is statistically equal among the three groups.
In the appendix I show the figure where I compare participants dividing them based on the combination of the political orientation and the slant of the articles they read. I find that Democrats have on average higher values of anger (+2.44, p-value<0.01), disgust (+2.59, p-value<0.01), and contempt (+2.13, p-value<0.01) when reading conservative articles compared to when they are reading neutral ones, and lower level of joy (-1,96, p-value<0.01) while reading conservatives articles compared to when they are reading the liberal ones. Independents have no statistically significant differences on emotions based on the articles read. Republicans reading liberal articles have higher levels of anger(+1.08, p-value<0.01) and disgust (+1.29, p-value<0.05) compared to when they are reading neutral ones, and lower levels of joy (-1.45, p-value<0.01) while reading liberal articles compared to when they are reading conservative ones.
Furthermore, I consider two subsamples of the participants: those with the most extreme values on the political scale, which is a measure that takes values 1 to 7, where *"1"* represents far liberals and *"7"* far conservatives. The results show an even stronger impact of conservative articles on the far liberals, while far conservatives feel stronger disgust and contempt, but no significant differences of anger, fear and joy while reading liberal articles. Coefficients and level of significance are shown in the Appendix.
I create an index to summarize negative emotions into a single value. The new variables represents the average value of anger, fear, disgust, contempt, and sadness: its average and confidence intervals are shown in Figure 1.1. Reading counter-attitudinal articles significantly increases the average of negative emotions compared to neutral (0.98, p-value<0.01) and pro-attitudinal articles (0.96, p-value<0.01). I use the index in the

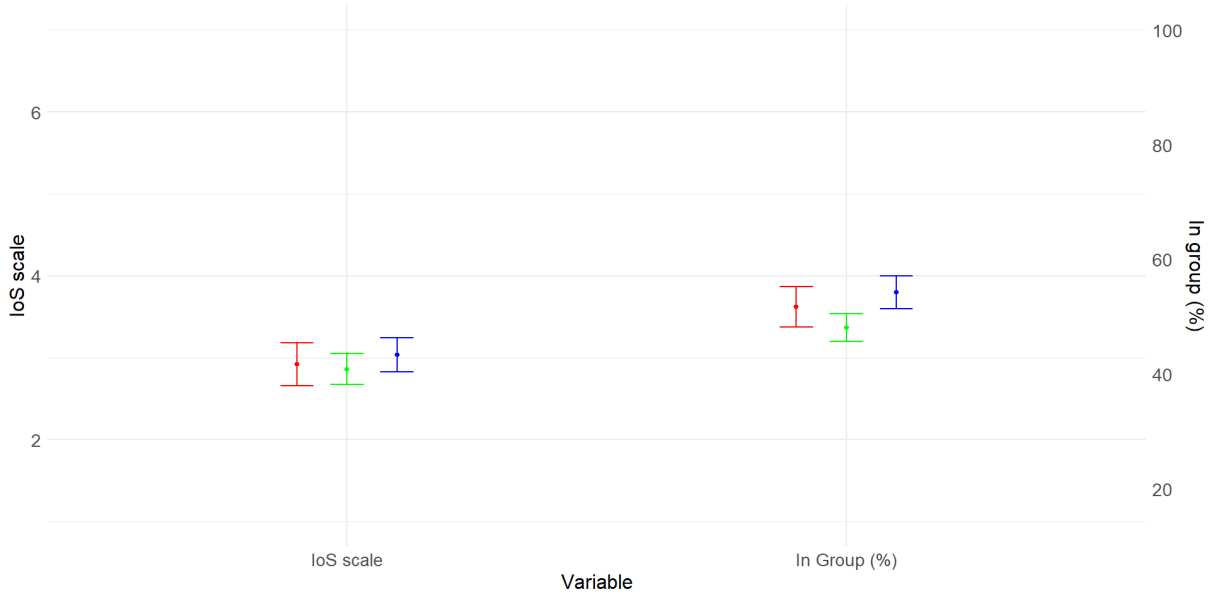


Figure 1.2: The figure shows the averages and the confidence intervals of the IoS scale and In group dimension, dividing the sample based on the articles read. The blue lines represent participants reading pro-attitudinal article, the green lines represent participants reading neutral articles, and the red lines represent participants reading counter-attitudinal articles.

analysis of channels.

Result 2: Reading counter-attitudinal articles increases the average level of the negative emotions, and decreases the one of joy.

Result 2a: The impact is stronger for the Democrats reading conservative articles than for the Republicans reading liberal articles, and the impact is stronger for the most extreme participants based on the political scale.

Group identity

To see how the articles participants read impact their group identity feelings, I consider two different measures: the IoS scale, and the perceived dimension of the in-group.

Figure 1.2 shows that the comparison among participants reading pro-attitudinal articles with those reading counter-attitudinal articles is not significant in the IoS scale and in-group dimension. In the Appendix , I run the regression considering different sets of controls.

When comparing participants based on their political orientation, Republicans feel more connected with society (+0.44 and +0.64 average points in the IoS scale compared to Democrats and Independents, p-value<0.01), and perceive a higher percentage of the population belonging to their in-group (+6.1 and +10.2 average percentage points compared to Democrats and Independent, p-value<0.01).

When comparing participants dividing them based on the combination of the three different political orientations of participants and the articles they read, I find that within

Republicans, there is no statistically significant difference on the IoS scale or in-group dimension based on what they read. However, there is a statistically significant difference in the IoS scale for both Democrats (p-value<0.10) and Independents (p-value<0.01): Democrats feel more connected with society when reading liberal articles compared to when reading neutral or conservatives ones, and Independents feel more connected with the society when reading neutral articles compared to when reading conservative ones. There is no significant difference based on the articles read in the perceived in-group dimension.

In the Appendix, I show the results of the regressions of these two measures considering three different sets of controls: no controls, demographic controls and demographic controls plus the duration required to complete the survey as a proxy for attention.

Result 3: Reading articles with different orientations impacts the perceived connection with the society for Independents and Democrats.

Demographic and Political similarities

To see whether the articles participants read impact the expected political and demographic characteristics of the participants they are interacting with, and to see whether the participants have their expectations about the others driven by some biases, I consider their predictions of the demographic characteristics and political orientation of the participant whose characteristics are not disclosed they have interacted with.

I create a variable that assumes values from 0 to 4 based on how many demographic characteristics each participant predicts the other has that are the same as his/her/their characteristics. Figure 1.3 and shows the comparison among participants reading pro-attitudinal articles with those reading counter-attitudinal articles, I find that there is no significant difference in the number of expected demographic characteristics of the other participant being the same as oneself. However, participants reading pro-attitudinal articles consider the other participant to support the same political party 18% of the times more than the group reading counter-attitudinal articles (p-value<0.01). In the Appendix, I show the results of the regression considering different sets of controls.

When comparing participants based on their political orientation, on average Republicans consider the other participants to have 2.6 (out of 4) demographic characteristics as their own, while Democrats and Independents 2.19 and 2.25, respectively (p-values<0.01). However, all participants show an in-group bias, when asked to guess the demographic characteristics of the participant they have interacted with.

In the Appendix, I show the figures where I compare participants dividing them based on the combination of the three different political orientations of participants and the articles they read. There are no differences in any of the three groups. The same result is confirmed by the regressions after controlling for demographic characteristics and the proxy for attention.

Considering a comparison of participants based exclusively on their political orientation,

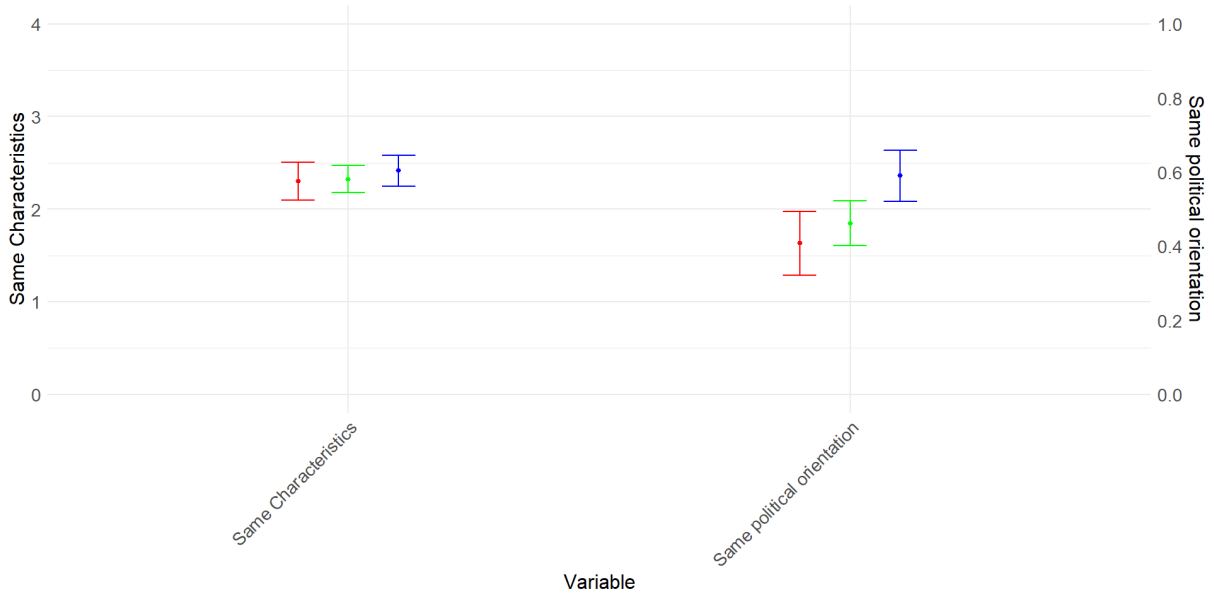


Figure 1.3: The figure shows the averages and the confidence intervals of the expected demographic and political similarities, dividing the sample based on the articles read. The blue lines represent participants reading pro-attitudinal article, the green lines represent participants reading neutral articles, and the red lines represent participants reading counter-attitudinal articles.

58% of Democrats consider the other player a fellow democrat, a percentage significantly higher compared to Republicans and Independents (46% and 44%, respectively). The p-values of the Kruskal-Wallis test is <0.05. All participants show an in-group bias. Republicans reading conservative articles assume the other participants to be more significantly likely to be fellow Republicans than when reading neutral or liberal articles (p-value<0.01). There is no effect for Independents and Democrats. The result suggests the presence of saliency for Republicans: they attach a higher probability for the other participant to be a fellow Republican when the tone of the articles is conservative.
I create a unique index to summarize the two measures. The index is the sum of the demographic and political similarity and it can have values between 0 and 5 based on how many demographic and political each participant predicts the other has compared to oneself. **Result 4**: There is an in-group effect in perceiving the other as more similar to oneself than it is and there is a saliency effect for Republicans based on the tone of the articles read. I use the index in the analysis of channels.

Expectations on others' behaviors

To see whether the articles participants read impact their expectations about how the other participants behaved in the three games, I asked them to provide their personal expectations about how the others have contributed/kept/destroyed on average. I provide monetary incentives by giving participants extra rewards if they guess correctly (or within an interval).

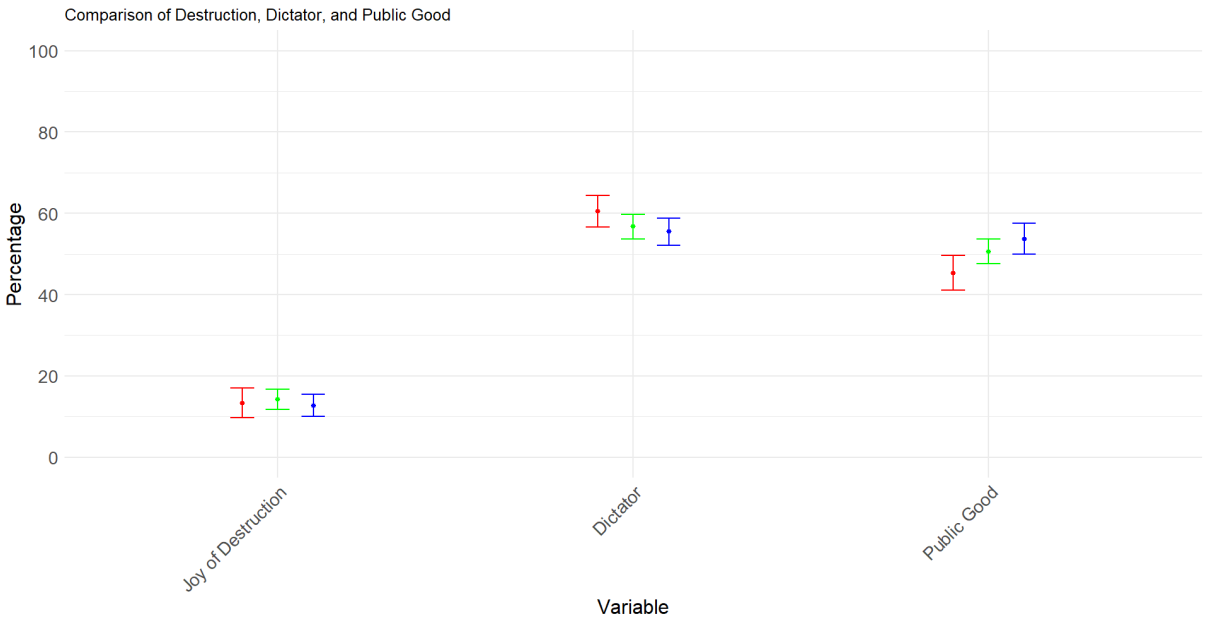


Figure 1.4: The figure shows the averages and the confidence intervals of the average expected destruction in the Joy of destruction game, the average donation in the dictator game and the average contribution in the public good game, dividing the sample based on the articles read. The blue lines represent participants reading pro-attitudinal article, the green lines represent participants reading neutral articles, and the red lines represent participants reading counter-attitudinal articles.

Figure 1.4 shows the comparison among participants reading pro-attitudinal articles with those reading counter-attitudinal articles. I find that the first group expect the others to contribute more in the public good game (53.7 vs 45.3, p-value<0.05). There is no significant difference for the dictator game and joy of destruction game. In the Appendix, I show the regressions controlling for demographic characteristics of the respondents, political orientation and the proxy for attention.

Considering a comparison of participants based on their political orientation, there are no significant differences among participants with different political orientations.

In the appendix, I compare participants dividing them based on the combination of the three different political orientations of participants and the articles they read, I find that there is only a significant difference in the expected amount contributed to the public good game of Democrats (p-value<0.05) when reading liberal articles (53.1) compared to when reading conservative articles (42.1). There are no other statistically significant differences between other groups or in other games.

I show the results of the regressions in the Appendix. The results confirm are consistent with those of the Kruskal-Wallis test. Furthermore, when considering the two most extreme participants based on the political scale, I find a significant effect (p-value<0.10) on far liberals concerning their expectations of contribution to the public good game (9.25).

Result 5: Generally, different articles do not significantly impact expectations of others' behaviors in the games.

Channels

In this section, I analyze possible channels through which the reading of polarized articles may impact social preferences. I focus on three possible different channels: emotions, in-group identities and expectations about the others.

I use two-stage least squares (2SLS). It is an effective methodology for analyzing the impact of pro-attitudinal and counter-attitudinal articles on social preferences through the previously mentioned channels. In this context, the first stage of 2SLS allows for the isolation of variation in potential mediators that can be attributed to exposure to pro-attitudinal or counter-attitudinal articles, using these article types as instrumental variables. I consider each mediator alone to analyze its impact on the three games. I regress the variables about pro-attitudinal and counter-attitudinal articles on the potential channels in the first stage. Then, I use the fitted variables on the three games in the second stage. I use the same set of controls.

Table 1.7 shows the result of the first stage. The results show that negative emotions, joy and the perceived closeness to the society (measured through the IoS scale) are the potential channels leading slanted articles affecting social preferences. The second stage determines whether they are actual channels.

Table 1.8 shows that negative emotions[13], joy and the IoS scale play an important role as channels through which slanted articles impact social preferences. In contrast, the expectations about other participants, the in-group feeling, and surprise are not significant channels. Reading counter-attitudinal articles increases the average level of negative emotions leading to a decrease in the contribution in the public good game (-7.39) and an increase in the amount kept in the dictator game (7.78). Reading counter-attitudinal articles decreases the level of joy while reading pro-attitudinal ones increases it. An increase in joy leads to a higher contribution in the public good game (7.43) and a decrease in the amount kept in the dictator game (-8.01). Lastly, pro-attitudinal articles increase the feeling of connection within the society and this leads to keeping a lower amount in the dictator game (-19.46). There is no significant impact on the amount destroyed in the Joy of Destruction game for any variable.[14]

Lastly, I repeat the analysis dividing the sample based on the political orientation of the participants to account for differences among Democrats, Republicans and Independents. I show the tables in the Appendix. Democrats and Republicans have different channels. Reading counter-attitudinal articles increases the average level of negative emotions for Democrats. However, negative emotions do not impact their social preferences.[15] Reading pro-attitudinal articles increases the level of joy while reading counter-attitudinal ones decreases it. A higher level of joy increases the contribution in the public good

[13] In the appendix, I show the analysis considering every single negative emotion alone. Anger, disgust and contempt are the three basic negative emotions that play an important role as channels through which slanted articles impact social preferences.

[14] As previously discussed, the large number of participants deciding not to destroy any amount impacts the significance of the regressions.

[15]

	Negative emotions	Joy	Surprise
Intercept	3.60***	1.56***	1.50***
	(0.37)	(0.32)	(0.33)
Pro-attitudinal	0.01	0.63***	0.00
	(0.21)	(0.18)	(0.19)
Counter-attitudinal	1.08***	-0.75***	0.16
	(0.26)	(0.23)	(0.23)
R^2	0.12	0.17	0.10
Observations	587	587	587
	IoS scale	In group feeling	Similarity
Intercept	-0.52***	34.72***	2.13***
	(0.16)	(3.54)	(0.23)
Pro-attitudinal	0.26***	1.91	0.16
	(0.09)	(2.03)	(0.13)
Counter-attitudinal	0.11	-3.06	-0.15
	(0.11)	(3.50)	(0.16)
R^2	0.10	0.06	0.09
Observations	587	587	587
	Expected contribution	Expected amount kept	Expected destruction
Intercept	46.06***	56.65***	10.87***
	(4.26)	(3.98)	(3.33)
Pro-attitudinal	3.18	-1.69	-1.40
	(2.45)	(2.29)	(1.91)
Counter-attitudinal	-4.44	2.18	-0.16
	(3.01)	(2.81)	(2.35)
R^2	0.03	0.02	0.04
Observations	587	587	587

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.7: The table shows the first stage regressions for Joy, Surprise, Negative emotions, IoS Scale, In Group feeling, Political and demographic similarity, and expectations on how others contributed in the public good game, the amount kept in the dictator game and the destruction in the joy of destruction game.

	Public good game	Dictator game	Joy of Destruction game
		Negative emotions	
Intercept	79.18***	28.41**	1.38
	(13.46)	(10.22)	(5.86)
$\hat{First\_Stage}$	-7.39**	7.78***	1.99
	(3.37)	(2.56)	(1.46)
R^2	0.04	0.04	0.07
Observations	587	587	587
		Joy	
Intercept	39.22***	70.81***	9.92***
	(7.34)	(5.57)	(3.21)
$\hat{First\_Stage}$	7.43**	-8.01***	-0.71
	(2.87)	(2.18)	(1.25)
R^2	0.04	0.04	0.06
Observations	587	587	587
		IoS scale	
Intercept	59.31***	48.77***	10.69***
	(7.42)	(5.64)	(3.22)
$\hat{First\_Stage}$	17.19	-19.46**	4.82
	(12.11)	(9.22)	(5.26)
R^2	0.03	0.03	0.07
Observations	587	587	587

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.8: The table shows the second stage regressions for Negative emotions, Joy, and the IoS scale. $\hat{First\_Stage}$ is the value estimated through the first stage for each variable.

game and decreases the amount destroyed in the joy of destruction game. Lastly, reading pro-attitudinal articles increases the feeling of connection within the society, leading to an increase in the contribution in the public good game. Moreover, reading counter-attitudinal articles increases the average negative emotions for Republicans, leading to a decrease of contribution in the public good game and an increase in the amount kept in the dictator game. Furthermore, reading pro-attitudinal articles increases the level of joy, leading to an increase in altruism for Republicans.

Result 6: Negative emotions and Joy are strong channels through which slanted articles impact social preferences. Furthermore, the perceived connection with the rest of the society has a positive impact on altruism.

Result 6a: There is asymmetry between Democrats and Republicans.

1.4 Concluding remarks

This paper investigates whether a polarized news environment impacts social preferences. In particular, I studied whether pro-attitudinal and counter-attitudinal articles decrease cooperation and altruism and increase anti-social behavior. To the best of my knowledge, I am the first to study the relationship between slanted articles and social preferences. For this purpose, I collected data on self-reported Democrats, Independents and Republicans through an online experiment.

Most importantly, I was able to show that pro-attitudinal articles have a positive and significant spillover on cooperation, while counter-attitudinal articles have a significant negative impact on altruism. Dividing the sample based on political orientation, I found that Democrats and Independents increase pro-social behaviors when reading pro-attitudinal articles and have no change when reading counter-attitudinal articles compared to when reading neutral ones. Conversely, Republicans experience a deterioration of social preferences when reading counter-attitudinal articles and no change when reading pro-attitudinal ones compared to when reading neutral ones. Lastly, I investigated possible channels through which articles may impact social preferences and I found that emotions and perceived connection within the society are strong mediators. However, there are differences among Democrats and Republicans.

While I believe the results to be robust, three possible limitations should be noted. First, I cannot be sure participants effectively read the articles. However, this should reduce differences among groups, leading to results being weaker than they would be otherwise. Secondly, I ran the experiment less than two months before the US elections and therefore participants, while reading articles, may associate them with political figures and answer the subsequent games based on sympathy (or antipathy) towards them. However, this should rather be accounted as a possible channel rather than a confounding factor. Lastly, the sample of the experiment does not perfectly depict the American population, even if it is more representative than typical student samples. To reduce its impact, I

use a large set of demographic control variables during the entire analysis. However, I cannot completely exclude the possibility that my results would differ using a perfectly representative sample.

Many interesting aspects of the results are worth further in-depth analysis.

First, it is worth pointing out that I am not the first one analyzing the impact of attitude polarization on society, but I am the first to show that it has an impact on social preferences. This is the primary result of the paper, and it is a significant and important contribution: I was able to show in a discreet situation, like an online experiment, participants modify their social preferences. Therefore, it is plausible to consider the impact of a polarized media environment being stronger in real-life activities.

Secondly, the asymmetry between Democrats, Independents and Republicans is worth further considerations. Democrats and Independents appear to have positive spillovers coming from pro-attitudinal articles, while Republicans seem to have negative spillovers from counter-attitudinal articles. The results follow findings in recent studies showing that backfire effects will be more likely to occur among Republicans than Liberals (Bail et al., 2018). A possible explanation might relate to differences among political clusters (Balliet et al., 2018). For example, political ideology may impact cooperation via concerns about equality(Fehr and Schmidt, 1999; Van Lange, 1999). However, the impact might be driven or partially impacted by the chosen topics.

Furthermore, I analyze a short-run impact. In fact, I collected participants' social preferences only a few minutes after the reading of the articles. This research cannot provide any hint on long-run effects of a polarized media environment that is left for future research.

Moreover, emotions appear to be a channel leading articles to impact social preferences. However, emotions are self-assessed by participants. Therefore further analysis is left for future research.

Lastly, my study suggests that efforts to expose individuals to opposing views may not only be ineffective but could also prove counterproductive. However, it does not imply that individuals should not be exposed to opposing views, but that in the current polarized news environment, the occasional exposure to counter-attitudinal articles does not have positive spillovers on social preferences. The results may help shed additional light on the policy debate on polarization and social media.

Given the recent indication of a growing polarization in American society and Western societies overall, it is fundamental to fully understand which further-reaching consequences the findings of my paper have. This question is particularly relevant as it might reduce interactions with others leading to a slowdown of societal progress, and it may potentially affect social interactions and economic growth.

A Articles evaluation by political identity

In this section, I show how participants evaluate each article in terms of emotions and understanding who wrote it based on their self-assessed political identities.

	Democrat	Independent	Republican
LGBTQ Neutral	6.84	7.24	7.04
LGBTQ Conservative	4.96	5.47	4.47
LGBTQ Liberal	5.30	5.39	5.40
Immigration Neutral	5.51	6.07	5.67
Immigration Conservative	4.76	4.90	4.75
Immigration Liberal	5.36	6.14	4.95
Abortion Neutral	6.49	6.56	6.76
Abortion Conservative	4.59	4.71	4.39
Abortion Liberal	4.39	4.72	5.33
Gun Control Neutral	6.93	6.42	7.00
Gun Control Conservative	4.42	4.97	4.67
Gun Control Liberal	4.38	4.91	3.85

Table 1.9: Average AI-detection by article and political identities of the respondents.

	Democrat	Independent	Republican
LGBTQ Neutral	5.66	5.71	6.74
LGBTQ Conservative	1.59	1.68	2.67
LGBTQ Liberal	8.31	8.10	8.93
Immigration Neutral	6.00	5.62	5.00
Immigration Conservative	1.94	2.21	2.25
Immigration Liberal	8.18	7.71	8.05
Abortion Neutral	5.07	5.53	5.00
Abortion Conservative	1.67	1.63	2.00
Abortion Liberal	8.69	8.60	7.83
Gun Control Neutral	4.93	4.81	5.33
Gun Control Conservative	1.93	2.22	4.67
Gun Control Liberal	8.48	8.06	7.69

Table 1.10: Average Liberal writer detection by article and political identities of the respondents.

	Democrat	Independent	Republican
LGBTQ Neutral	4.66	4.33	4.17
LGBTQ Conservative	9.07	8.71	8.33
LGBTQ Liberal	2.07	2.15	2.00
Immigration Neutral	3.58	3.87	4.94
Immigration Conservative	8.87	8.70	8.69
Immigration Liberal	2.06	1.94	3.68
Abortion Neutral	4.12	4.24	4.59
Abortion Conservative	9.36	8.94	8.83
Abortion Liberal	1.71	1.56	2.89
Gun Control Neutral	4.24	4.06	4.47
Gun Control Conservative	8.67	8.05	6.17
Gun Control Liberal	1.69	2.43	3.04

Table 1.11: Average Conservative writer detection by article and political identities of the respondents.

	Democrat	Independent	Republican
LGBTQ Neutral	1.99	1.83	2.13
LGBTQ Conservative	4.91	3.53	3.53
LGBTQ Liberal	2.34	2.05	2.67
Immigration Neutral	1.85	1.62	2.61
Immigration Conservative	3.70	3.57	3.75
Immigration Liberal	1.47	2.37	2.58
Abortion Neutral	2.08	1.71	2.06
Abortion Conservative	4.30	2.75	2.89
Abortion Liberal	1.95	1.72	3.11
Gun Control Neutral	2.69	1.65	1.60
Gun Control Conservative	4.97	3.60	2.75
Gun Control Liberal	3.97	3.04	3.46

Table 1.12: Average Fear aroused by article and political identities of the respondents.

	Democrat	Independent	Republican
LGBTQ Neutral	2.47	1.82	2.17
LGBTQ Conservative	7.06	5.49	3.73
LGBTQ Liberal	3.65	2.83	3.73
Immigration Neutral	2.09	1.89	2.28
Immigration Conservative	5.67	5.03	4.38
Immigration Liberal	1.92	2.25	2.47
Abortion Neutral	2.54	2.00	1.71
Abortion Conservative	6.21	4.54	3.83
Abortion Liberal	2.81	2.65	4.22
Gun Control Neutral	2.83	1.85	1.60
Gun Control Conservative	5.23	3.09	4.00
Gun Control Liberal	4.37	3.34	4.58

Table 1.13: Average Anger aroused by article and political identities of the respondents.

	Democrat	Independent	Republican
LGBTQ Neutral	3.06	2.57	1.74
LGBTQ Conservative	1.15	1.60	3.47
LGBTQ Liberal	3.52	2.80	2.20
Immigration Neutral	2.78	1.91	2.89
Immigration Conservative	1.62	2.02	1.56
Immigration Liberal	5.36	3.00	2.68
Abortion Neutral	2.23	1.94	2.18
Abortion Conservative	1.23	1.31	2.72
Abortion Liberal	3.71	2.02	1.78
Gun Control Neutral	1.90	1.55	1.87
Gun Control Conservative	1.68	1.98	2.75
Gun Control Liberal	1.69	2.04	1.62

Table 1.14: Average Joy aroused by article and political identities of the respondents.

	Democrat	Independent	Republican
LGBTQ Neutral	2.92	2.37	2.26
LGBTQ Conservative	6.17	5.14	4.33
LGBTQ Liberal	5.22	4.20	4.73
Immigration Neutral	2.63	2.09	2.83
Immigration Conservative	4.61	4.11	4.31
Immigration Liberal	2.15	2.82	2.42
Abortion Neutral	3.11	2.58	3.00
Abortion Conservative	4.83	4.71	4.44
Abortion Liberal	3.15	3.28	3.89
Gun Control Neutral	3.48	2.11	2.00
Gun Control Conservative	3.93	3.10	3.25
Gun Control Liberal	4.87	4.23	4.19

Table 1.15: Average Sadness aroused by article and political identities of the respondents.

	Democrat	Independent	Republican
LGBTQ Neutral	2.29	1.96	2.70
LGBTQ Conservative	6.52	5.04	4.20
LGBTQ Liberal	3.28	2.86	4.27
Immigration Neutral	2.12	1.55	2.11
Immigration Conservative	5.18	4.31	3.44
Immigration Liberal	1.67	2.47	2.74
Abortion Neutral	2.46	2.11	2.71
Abortion Conservative	5.24	3.94	4.33
Abortion Liberal	2.21	2.72	4.44
Gun Control Neutral	2.72	1.82	1.40
Gun Control Conservative	5.11	3.07	2.42
Gun Control Liberal	3.94	3.19	3.92

Table 1.16: Average Disgust aroused by article and political identities of the respondents.

	Democrat	Independent	Republican
LGBTQ Neutral	2.35	1.78	2.30
LGBTQ Conservative	5.09	4.28	3.47
LGBTQ Liberal	3.42	2.02	3.07
Immigration Neutral	2.57	1.80	2.39
Immigration Conservative	3.97	3.49	2.81
Immigration Liberal	1.67	2.37	3.11
Abortion Neutral	2.59	1.97	2.06
Abortion Conservative	4.50	3.25	2.83
Abortion Liberal	2.60	2.67	3.94
Gun Control Neutral	2.16	1.74	2.00
Gun Control Conservative	4.71	2.90	3.08
Gun Control Liberal	3.08	2.96	3.58

Table 1.17: Average Contempt aroused by article and political identities of the respondents.

	Democrat	Independent	Republican
LGBTQ Neutral	2.01	1.65	1.83
LGBTQ Conservative	2.33	2.26	3.13
LGBTQ Liberal	2.35	2.36	3.53
Immigration Neutral	2.15	1.53	2.50
Immigration Conservative	2.03	1.87	1.75
Immigration Liberal	2.06	1.59	1.89
Abortion Neutral	2.30	1.76	2.24
Abortion Conservative	1.78	1.75	2.33
Abortion Liberal	2.24	1.70	2.50
Gun Control Neutral	2.17	1.58	1.80
Gun Control Conservative	2.11	1.84	3.17
Gun Control Liberal	1.80	2.04	3.08

Table 1.18: Average Surprise aroused by article and political identities of the respondents.

B Kruskal-Wallis and Mann-Whitney U tests

In this section I provide the p-values of the Kruskal-Wallis and Mann-Whitney U tests to study the comparability of the articles.

	P-value
LGBTQ AI	0.00
LGBTQ Liberal Writer	0.00
LGBTQ Conservative Writer	0.00
Immigration AI	0.01
Immigration Liberal Writer	0.00
Immigration Conservative Writer	0.00
Abortion AI	0.00
Abortion Liberal Writer	0.00
Abortion Conservative Writer	0.00
Gun Control AI	0.00
Gun Control Liberal Writer	0.00
Gun Control Conservative Writer	0.00

Table 1.19: P-values of the Kruskal-wallis tests of the comparison of articles with different orientations of the same topic based on AI-detection, and liberal and conservative writers detection.

	P-value
LGBTQ Fear	0.00
LGBTQ Anger	0.00
LGBTQ Joy	0.00
LGBTQ Sadness	0.00
LGBTQ Disgust	0.00
LGBTQ Contempt	0.00
LGBTQ Surprise	0.01
Immigration Fear	0.00
Immigration Anger	0.00
Immigration Joy	0.00
Immigration Sadness	0.00
Immigration Disgust	0.00
Immigration Contempt	0.00
Immigration Surprise	0.70
Abortion Fear	0.00
Abortion Anger	0.00
Abortion Joy	0.00
Abortion Sadness	0.00
Abortion Disgust	0.00
Abortion Contempt	0.00
Abortion Surprise	0.83
Gun Control Fear	0.00
Gun Control Anger	0.00
Gun Control Joy	0.84
Gun Control Sadness	0.00
Gun Control Disgust	0.00
Gun Control Contempt	0.00
Gun Control Surprise	0.75

Table 1.20: P-values of the Kruskal-Wallis tests of the comparison of articles with different orientations of the same topic based on emotions aroused.

C Regressions on social preferences

In this section I provide the results of the regressions to evaluate the impact of counter-attitudinal and pro-attitudinal articles on social preferences considering demographic controls, political controls and the duration to complete the survey as a proxy for attention.

	Cooperation (Public good game)				Altruism (Dictator game				Anti-social behavior (Joy of destruction game)			
	1	2	3	4	1	2	3	4	1	2	3	4
Intercept	58.76***	49.30***	51.53***	49.88***	56.07***	56.07***	53.42***	55.71***	5.45***	8.57***	10.35***	8.89***
	(2.23)	(4.17)	(4.67)	(5.64)	(1.70)	(3.20)	(3.58)	(4.32)	(0.99)	(1.84)	(2.05)	(2.47)
Pro attitudinal	9.00***	9.29***	9.50***	9.59***	-1.36	-1.44	-1.69	-1.73	-1.99	-2.13	-1.82	-1.73
	(3.32)	(3.30)	(3.31)	(3.32)	(2.53)	(2.53)	(2.54)	(2.55)	(1.48)	(1.45)	(1.45)	(1.46)
Counter attitudinal	-2.88	-2.79	-2.53	-2.43	5.91**	6.19***	5.88**	5.75**	0.17	0.79	0.98	1.07
	(3.30)	(3.33)	(3.34)	(3.35)	(2.51)	(2.55)	(2.56)	(2.56)	(1.47)	(1.47)	(1.46)	(1.47)
Demographics		✓	✓	✓		✓	✓	✓		✓	✓	✓
Political orientation			✓	✓			✓	✓			✓	✓
Attention proxies				✓				✓				✓
Observations	587	587	587	587	587	587	587	587	587	587	587	587
R^2	0.02	0.05	0.05	0.05	0.01	0.03	0.03	0.03	0.00	0.05	0.07	0.07

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.21: The table shows the regression of the orientation of the article read based on participants' political orientation and the average level of agreement (for Independents) on the measures of cooperation (public good game), altruism (dictator game), and anti-social behavior (joy of destruction game). "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls, and political orientation. "*4*" considers the demographic controls, political orientation, and the attention controls.

	Cooperation (Public good game)				Altruism (Dictator game				Anti-social behavior (Joy of destruction game)			
	1	2	3	4	1	2	3	4	1	2	3	4
Intercept	57.59***	47.49***	50.36***	48.94***	56.49***	56.53***	53.61***	55.99***	5.66***	8.86***	10.34***	8.89***
	(2.26)	(4.23)	(4.69)	(5.61)	(1.73)	(3.26)	(3.61)	(4.32)	(1.01)	(1.87)	(2.06)	(2.46)
Pro attitudinal	10.28***	10.78***	11.18***	11.20***	-1.13	-1.16	-1.43	-1.37	-2.41*	-2.41*	-1.79	-1.77
	(3.23)	(3.22)	(3.27)	(3.28)	(2.47)	(2.49)	(2.52)	(2.52)	(1.44)	(1.42)	(1.44)	(1.44)
Counter attitudinal	-1.94	-2.32	-2.13	-2.10	4.96*	5.50**	5.38**	5.34**	0.25	1.13	1.42	1.45
	(3.40)	(3.41)	(3.42)	(3.42)	(2.61)	(2.63)	(2.63)	(2.63)	(1.52)	(1.50)	(1.50)	(1.50)
Demographics		✓	✓	✓		✓	✓	✓		✓	✓	✓
Political orientation			✓	✓			✓	✓			✓	✓
Attention proxies				✓				✓				✓
Observations	587	587	587	587	587	587	587	587	587	587	587	587
R^2	0.03	0.05	0.06	0.06	0.01	0.02	0.03	0.03	0.01	0.06	0.07	0.07

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.22: The table shows the regression of the average level of agreement of the article read on the measures of cooperation (public good game), altruism (dictator game), and anti-social behavior (joy of destruction game). "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls, and political orientation. "*4*" considers the demographic controls, political orientation, and the attention controls.

D Social preferences by political scale

In this section I show the impact of reading pro-attitudinal and counter-attitudinal articles on preferences for the participants with extreme values in the political scale.

	Cooperation (Public good game)			Altruism (Dictator game			Anti-social behavior (Joy of destruction game)		
	1	2	3	1	2	3	1	2	3
Far Liberals									
Intercept	51.63***	39.89***	41.20**	56.51***	61.04***	42.86***	6.46**	5.95	8.28
	(5.37)	(9.17)	(19.38)	(3.79)	(6.50)	(13.53)	(2.81)	(4.86)	(10.17)
Pro-attitudinal	23.94***	21.66***	21.53***	-2.74	-3.42	-1.29	-3.94	-3.71	-3.95
	(7.59)	(7.75)	(8.08)	(5.36)	(5.49)	(5.64)	(3.97)	(4.10)	(4.24)
Counter-attitudinal	7.51	8.39	8.35	5.99	4.94	6.71	1.79	3.19	3.13
	(8.05)	(8.42)	(8.65)	(5.69)	(5.96)	(6.04)	(4.21)	(4.46)	(4.54)
Demographics		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓
Observations	98	98	98	98	98	98	98	98	98
R^2	0.10	0.17	0.17	0.02	0.10	0.13	0.02	0.08	0.10
Far Conservatives									
Intercept	70.92***	52.75***	47.89***	44.67***	53.63***	53.12***	9.71**	15.35**	13.85
	(6.72)	(11.60)	(15.39)	(5.50)	(10.07)	(13.33)	(3.92)	(6.81)	(9.03)
Pro-attitudinal	-12.15	-14.62*	-14.34	8.83	8.11	6.82	-3.74	-2.61	-1.77
	(9.01)	(8.75)	(9.12)	(7.39)	(7.59)	(7.90)	(5.26)	(5.14)	(5.36)
Counter-attitudinal	-22.48***	-25.34***	-25.03***	25.77***	26.59***	25.52***	1.39	2.09	2.82
	(9.01)	(8.58)	(8.90)	(7.39)	(7.45)	(7.70)	(5.26)	(5.04)	(5.22)
Demographics		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓
Observations	84	84	84	84	84	84	84	84	84
R^2	0.07	0.25	0.25	0.14	0.22	0.22	0.01	0.19	0.20

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.23: The table shows the regression of the orientation of the article read dividing participants based on their political scale on the measure of cooperation (public good game), altruism (dictator game), and anti-social behavior (joy of destruction game). "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls, and the attention controls.

E Emotions by political orientation and articles read

In this section I show the averages and confidence intervals of the seven emotions dividing the sample into nine different subgroups based on the combination of their political orientation and the articles read.

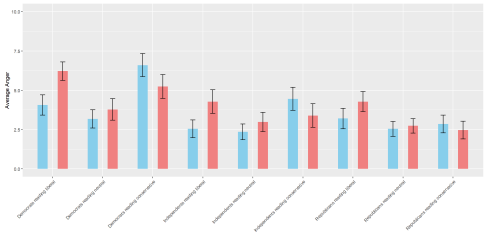


Figure 1.5: The figure shows the average and the confidence intervals of anger by political orientation and slant of the articles. Blue(Red) bars refer to the articles concerning LGBTQ right(Gun control).

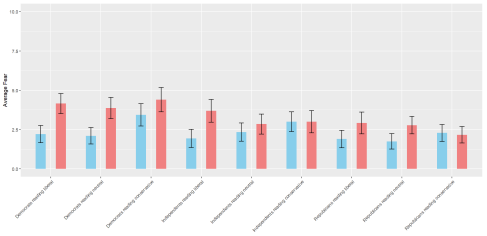


Figure 1.6: The figure shows the average and the confidence intervals of fear by political orientation and slant of the articles. Blue(Red) bars refer to the articles concerning LGBTQ right(Gun control).

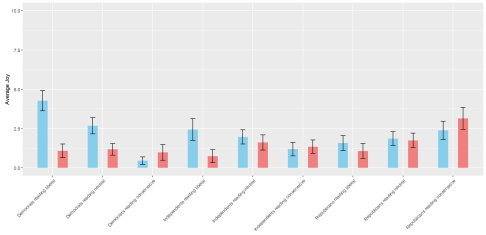


Figure 1.7: The figure shows the average and the confidence intervals of joy by political orientation and slant of the articles. Blue(Red) bars refer to the articles concerning LGBTQ right (Gun control).

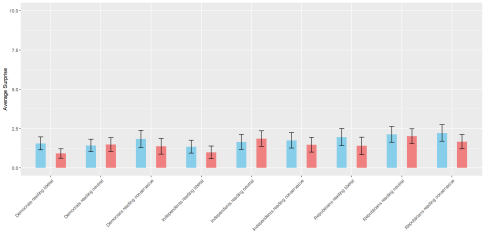


Figure 1.8: The figure shows the average and the confidence intervals of surprise by political orientation and slant of the articles. Blue(Red) bars refer to the articles concerning LGBTQ right (Gun control).

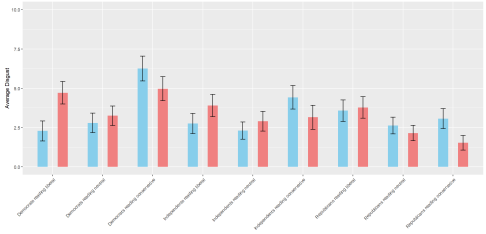


Figure 1.9: The figure shows the average and the confidence intervals of disgust by political orientation and slant of the articles. Blue(Red) bars refer to the articles concerning LGBTQ right (Gun control).

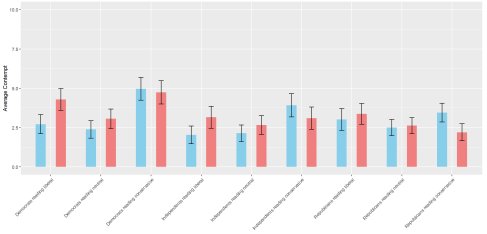


Figure 1.10: The figure shows the average and the confidence intervals of contempt by political orientation and slant of the articles. Blue(Red) bars refer to the articles concerning LGBTQ right (Gun control).

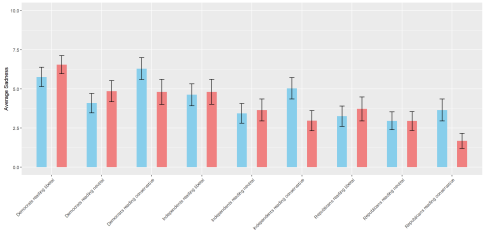


Figure 1.11: The figure shows the average and the confidence intervals of sadness by political orientation and slant of the articles. Blue(Red) bars refer to the articles concerning LGBTQ right (Gun control).

F Regressions of emotions

In this section I provide the results of the regressions to evaluate the impact of counter-attitudinal and pro-attitudinal articles on emotions considering demographic controls, political orientation and the duration to complete the survey as a proxy for attention. I initially consider the entire sample together. Then, I divide the sample into Democrats, Republicans and Independents. Subsequently, I consider the two most extreme subsemples: those who selected *1* in the political scale (Far Liberals) and those who selected *7* in the political scale (Far Conservatives).

Reading counter-attitudinal articles increases the level of anger (1.40, p-value$<$0.01), disgust (1.74, p-value$<$0.01), and contempt (1.25, p-value$<$0.01), and it decreases the level of joy (-0.75, p-value$<$0.01) compared to reading neutral articles. Reading pro-attitudinal articles increases the level of joy (0.63, p-value$<$0.01) compared to reading neutral articles.

	Anger				Fear				Joy			
	1	2	3	4	1	2	3	4	1	2	3	4
Intercept	3.34***	3.62***	3.50***	3.52***	2.75***	3.67***	3.82***	3.46***	1.66***	2.37***	2.08***	1.56***
	(0.17)	(0.34)	(0.36)	(0.44)	(0.16)	(0.32)	(0.35)	(0.42)	(0.13)	(0.25)	(0.27)	(0.32)
Pro attitudinal	0.21	0.19	0.14	0.15	-0.06	-0.10	-0.08	-0.07	0.75***	0.70***	0.64***	0.63***
	(0.26)	(0.26)	(0.25)	(0.25)	(0.25)	(0.24)	(0.24)	(0.24)	(0.19)	(0.19)	(0.19)	(0.18)
Counter attitudinal	1.44***	1.36***	1.40***	1.40***	0.38	0.30	0.48	0.49	-0.62***	-0.53**	-0.70***	-0.75***
	(0.29)	(0.30)	(0.31)	(0.31)	(0.28)	(0.28)	(0.30)	(0.30)	(0.22)	(0.21)	(0.23)	(0.23)
Demographics		✓	✓	✓		✓	✓	✓		✓	✓	✓
Political orientation			✓	✓			✓	✓			✓	✓
Attention proxies				✓				✓				✓
R^2	0.04	0.07	0.14	0.14	0.00	0.06	0.09	0.09	0.06	0.14	0.16	0.17
	Surprise				Disgust				Contempt			
Intercept	1.60***	1.95***	1.97***	1.50***	3.10***	3.24***	3.44***	3.67***	2.84***	3.11***	3.08***	3.02***
	(0.13)	(0.25)	(0.28)	(0.33)	(0.17)	(0.35)	(0.38)	(0.45)	(0.17)	(0.34)	(0.37)	(0.45)
Pro attitudinal	0.03	-0.01	0.00	0.00	-0.27	-0.30	-0.28	-0.27	0.08	0.05	0.03	0.04
	(0.20)	(0.19)	(0.19)	(0.19)	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)
Counter attitudinal	0.04	0.16	0.14	0.16	1.50***	1.51***	1.76***	1.74***	1.14***	1.21***	1.25***	1.25***
	(0.22)	(0.22)	(0.23)	(0.23)	(0.30)	(0.30)	(0.32)	(0.32)	(0.29)	(0.29)	(0.32)	(0.32)
Demographics		✓	✓	✓		✓	✓	✓		✓	✓	✓
Political orientation			✓	✓			✓	✓			✓	✓
Attention proxies				✓				✓				✓
R^2	0.00	0.08	0.09	0.10	0.06	0.07	0.11	0.11	0.03	0.05	0.06	0.06
					Sadness							
Intercept					3.99***	4.71***	4.68***	4.32***				
					(0.19)	(0.37)	(0.39)	(0.47)				
Pro attitudinal					0.22	0.20	0.17	0.18				
					(0.28)	(0.28)	(0.27)	(0.27)				
Counter attitudinal					0.48	0.35	0.50	0.51				
					(0.32)	(0.32)	(0.33)	(0.33)				
Demographics						✓	✓	✓				
Political orientation							✓	✓				
Attention proxies								✓				
Observations	587	587	587	587	587	587	587	587	587	587	587	587
R^2					0.00	0.05	0.14	0.15				

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.24: The table shows the regression of the articles read on the different emotions. "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls, and political orientation. "*4*" considers the demographic controls, political orientation, and the attention controls.

I show the results of the regressions on the average values of the seven emotions considering three different sets of controls: no controls, demographic controls and demographic controls plus the duration required to complete the survey as a proxy for attention. The results confirm the findings of the Kruskal-Wallis test for what regards the impact of articles with different orientations in generating stronger emotions.[16] In fact, after controlling for the demographic characteristics and the proxies for attention, the variable *Conservative article* has a significant coefficient for anger (2.61, p-value<0.01), fear (0.93, p-value<0.1), joy (-1.15, p-value<0.01), disgust (2.88, p-value<0.01), contempt (2.26, p-value<0.01) and sadness (1.05, p-value<0.05) for the Democrats and the variable *Liberal article* has significant coefficients for anger (1.09, p-value<0.01), fear (1.63, p-value<0.01), joy (-0.93, p-value<0.05), disgust (1.23, p-value<0.01) and contempt (0.93, p-value<0.01) for the Republicans. The coefficients must be interpreted as the average difference in the levels of each emotion for each type of article relative to the reference that is the neutral one. Additionally, demographic characteristics may play a role in increasing/decreasing emotions. However, they vary depending on the political orientation of the subjects and the emotions considered. In fact, demographic characteristics have a stronger impact on Republicans.

[16]Fear becomes significant for both the Democrats and the Republicans, and contempt becomes significant for the Republicans, after controlling for the demographic characteristics of the respondents.

	Political Orientation									Political Scale					
	Democrats			Republicans			Independents			Far Liberals			Far Conservatives		
	1	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*
Intercept	3.48***	3.63***	2.79*	2.64***	3.22***	3.18***	2.67***	2.42***	1.97	4.17***	3.00***	1.81	2.65***	2.94***	3.26***
	(0.36)	(0.62)	(1.17)	(0.33)	(0.50)	(0.63)	(0.25)	(0.60)	(1.15)	(0.50)	(0.85)	(1.79)	(0.48)	(0.88)	(1.16)
Lib. article	1.66***	1.81***	1.86***	1.10***	1.07***	1.09***	0.74	0.83	0.84	0.76	0.75	0.89	0.89	0.91	1.02
	(0.50)	(0.50)	(0.50)	(0.36)	(0.37)	(0.37)	(0.48)	(0.49)	(0.50)	(0.70)	80.72)	(0.75)	(0.65)	(0.65)	(0.67)
Cons. article	2.44***	2.57***	2.61***	0.02	-0.03	0.03	1.25***	1.29***	1.32****	3.27***	3.39***	3.52***	-0.03	0.18	0.32
	(0.51)	(0.53)	(0.54)	(0.38)	(0.37)	(0.38)	(0.47)	(0.48)	(0.49)	(0.74)	(0.78)	(0.80)	(0.65)	(0.66)	(0.69)
Demographics		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓			✓			✓
Observations	200	200	200	200	200	200	187	187	187	98	98	98	84	84	84
R^2	0.11	0.15	0.16	0.06	0.11	0.12	0.04	0.08	0.08	0.18	0.24	0.25	0.03	0.13	0.13
	Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01														

Table 1.25: Regression of the orientation of the articles on anger with different sets of controls divided by self-assessed political orientation and political scale. For what consider the political scale, I consider the two extremes: Far-liberals and Far-Conservatives. "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls and the attention controls.

	Political Orientation								Political Scale					
	Democrats			Republicans			Independents			Far Liberals			Far Conservatives	
	1	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*
Intercept	2.99***	3.74***	2.62**	2.26***	2.79***	2.55***	2.59***	3.56***	3.15***	3.50***	3.48***	1.50	2.42***	2.44**	3.28**
	(0.34)	(0.59)	(1.10)	(0.28)	(0.55)	(0.69)	(0.33)	(0.57)	(1.10)	(0.50)	(0.86)	(1.81)	(0.54)	(0.99)	(1.26)
Lib. article	0.20	0.37	0.43	0.14	0.27	0.33	0.22	0.31	0.40	-0.40	-0.14	0.09	0.08	0.25	0.45
	(0.47)	(0.47)	(0.47)	(0.40)	(0.40)	(0.41)	(0.48)	(0.47)	(0.47)	(0.71)	(0.73)	(0.75)	(0.73)	(0.73)	(0.73)
Cons. article	0.93*	0.94*	0.93*	-0.04	-0.07	0.00	0.41	0.56	0.64	1.21	1.44*	1.63**	-0.47	-0.05	0.21
	(0.49)	(0.50)	(0.50)	(0.42)	(0.41)	(0.41)	(0.46)	(0.47)	(0.47)	(0.75)	(0.79)	(0.81)	(0.73)	(0.74)	(0.75)
Demographics		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓			✓			✓
Observations	200	200	200	200	200	200	187	187	187	98	98	98	84	84	84
R^2	0.02	0.09	0.09	0.00	0.08	0.09	0.00	0.10	0.11	0.05	0.12	0.13	0.01	0.11	0.18
Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01															

Table 1.26: Regression of the orientation of the articles on fear with different sets of controls divided by self-assessed political orientation and political scale. For what consider the political scale, I consider the two extremes: Far-liberals and Far-Conservatives. "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls and the attention controls.

	Political Orientation									Political Scale					
	Democrats			Republicans			Independents			Far Liberals			Far Conservatives		
	1	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*
Intercept	1.93***	2.37***	1.52**	1.81***	2.27***	1.52**	1.79***	2.84***	3.12***	2.40***	3.01***	2.19*	3.00***	3.41***	2.20*
	(0.23)	(0.40)	(0.74)	(0.26)	(0.49)	(0.60)	(0.24)	(0.42)	(0.80)	(0.32)	(0.54)	(1.12)	(0.55)	(0.90)	(1.17)
Lib. article	0.75**	0.80**	0.82**	-0.48	-0.20	-0.06	-0.21	-0.21	-0.17	0.19	0.23	0.32	-1.20	-1.13*	-0.90
	(0.32)	(0.32)	(0.32)	(0.38)	(0.36)	(0.36)	(0.34)	(0.34)	(0.35)	(0.46)	(0.46)	(0.47)	(0.73)	(0.67)	(0.67)
Cons. article	-1.21***	-1.04***	-1.15***	0.96**	0.91**	0.93**	-0.53	-0.38	-0.36	-2.04***	-1.88***	-1.82***	-0.33	-0.39	-0.14
	(0.33)	(0.34)	(0.34)	(0.39)	(0.36)	(0.36)	(0.34)	(0.33)	(0.34)	(0.48)	(0.50)	(0.50)	(0.73)	(0.68)	(0.69)
Demographics		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓			✓			✓
Observations	200	200	200	200	200	200	187	187	187	98	98	98	84	84	84
R^2	0.15	0.20	0.24	0.07	0.23	0.25	0.01	0.09	0.09	0.21	0.30	0.32	0.04	0.29	0.32
	Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01														

Table 1.27: Regression of the orientation of the articles on joy with different sets of controls divided by self-assessed political orientation and political scale. For what consider the political scale, I consider the two extremes: Far-liberals and Far-Conservatives. "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls and the attention controls.

	Political Orientation						Political Scale					
	Democrats			Republicans			Independents			Far Liberals			Far Conservatives		
	1	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*
Intercept	1.46***	1.53***	0.59	2.07***	2.46***	2.19***	1.75***	2.25***	2.17**	1.89***	1.73***	1.50	3.13***	3.09***	3.00***
	(0.23)	(0.39)	(0.72)	(0.27)	(0.51)	(0.64)	(0.25)	(0.44)	(0.86)	(0.33)	(0.53)	(1.12)	(0.52)	(0.91)	(1.19)
Lib. article	-0.22	-0.18	-0.15	-0.39	-0.12	-0.07	-0.59	-0.63*	-0.62	-0.86*	-0.74*	-0.72	-1.14	-0.90	-0.72
	(0.32)	(0.31)	(0.31)	(0.38)	(0.37)	(0.38)	(0.36)	(0.36)	(0.37)	(0.46)	(0.45)	(0.47)	(0.69)	(0.67)	(0.69)
Cons. article	0.15	0.33	0.21	-0.13	-0.17	-0.13	-0.14	-0.01	0.00	-0.37	0.03	0.05	-1.14	-0.88	-0.67
	(0.33)	(0.33)	(0.33)	(0.40)	(0.38)	(0.38)	(0.35)	(0.36)	(0.37)	(0.49)	(0.49)	(0.50)	(0.69)	(0.68)	(0.71)
Demographics		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓			✓			✓
Observations	200	200	200	200	200	200	187	187	187	98	98	98	84	84	84
R^2	0.01	0.12	0.17	0.01	0.13	0.13	0.02	0.07	0.07	0.03	0.22	0.22	0.04	0.20	0.21
Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01															

Table 1.28: Regression of the orientation of the articles on surprise with different sets of controls divided by self-assessed political orientation and political scale. For what consider the political scale, I consider the two extremes: Far-liberals and Far-Conservatives. "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls and the attention controls.

	Political Orientation									Political Scale					
	Democrats			Republicans			Independents			Far Liberals			Far Conservatives		
	1	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*
Intercept	3.02***	3.16***	3.09***	2.39***	2.91***	3.04***	2.61***	2.23***	2.64**	3.60***	3.17***	3.53*	2.88***	2.53**	2.92**
	(0.35)	(0.62)	(1.16)	(0.28)	(0.57)	(0.71)	(0.35)	(0.63)	(1.21)	(0.49)	(0.86)	(1.80)	(0.53)	(0.98)	(1.28)
Lib. article	0.48	0.62	0.64	1.29***	1.24***	1.23***	0.72	0.83	0.81	0.20	0.43	0.39	1.34*	1.37*	1.51**
	(0.50)	(0.49)	(0.50)	(0.41)	(0.42)	(0.43)	(0.51)	(0.51)	(0.52)	(0.70)	(0.72)	(0.75)	(0.72)	(0.72)	(0.74)
Cons. article	2.59***	2.80***	2.88***	-0.09	-0.10	-0.06	1.18**	1.32**	1.29**	3.45***	3.90***	3.89***	-0.53	-0.20	-0.02
	(0.51)	(0.52)	(0.53)	(0.42)	(0.42)	(0.43)	(0.49)	(0.51)	(0.52)	(0.74)	(0.79)	(0.81)	(0.72)	(0.74)	(0.76)
Demographics		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓			✓			✓
Observations	200	200	200	200	200	200	187	187	187	98	98	98	84	84	84
R^2	0.13	0.18	0.19	0.07	0.09	0.09	0.03	0.07	0.07	0.22	0.26	0.27	0.09	0.17	0.20
	Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01														

Table 1.29: Regression of the orientation of the articles on disgust with different sets of controls divided by self-assessed political orientation and political scale. For what consider the political scale, I consider the two extremes: Far-liberals and Far-Conservatives. "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls and the attention controls.

	Political Orientation									Political Scale					
	Democrats			Republicans			Independents			Far Liberals			Far Conservatives		
	1	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*
Intercept	2.72***	3.02***	3.85***	2.56***	3.09***	2.65***	2.40***	2.28***	2.08*	3.47***	3.16***	5.70**	2.83***	2.42**	2.70**
	(0.34)	(0.60)	(1.13)	(0.29)	(0.57)	(0.71)	(0.33)	(0.61)	(1.17)	(0.52)	(0.91)	(1.90)	(0.54)	(0.97)	(1.23)
Lib. article	0.78	0.94*	0.91*	0.63	0.82*	0.93**	0.19	0.28	0.27	0.11	0.24	-0.06	1.33*	1.36*	1.67**
	(0.48)	(0.48)	(0.48)	(0.42)	(0.42)	(0.43)	(0.49)	(0.50)	(0.51)	(0.74)	(0.77)	(0.79)	(0.72)	(0.72)	(0.71)
Cons. article	2.13***	2.23***	2.26***	0.26	0.24	0.33	1.11**	1.26**	1.26**	2.64***	2.94***	2.71***	-0.38	-0.09	0.29
	(0.49)	(0.51)	(0.51)	(0.44)	(0.43)	(0.43)	(0.47)	(0.49)	(0.50)	(0.78)	(0.84)	(0.85)	(0.72)	(0.73)	(0.73)
Demographics		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓			✓			✓
Observations	200	200	200	200	200	200	187	187	187	98	98	98	84	84	84
R^2	0.09	0.13	0.14	0.01	0.09	0.10	0.03	0.06	0.06	0.13	0.16	0.19	0.08	0.19	0.26
	Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01														

Table 1.30: Regression of the orientation of the articles on contempt with different sets of controls divided by self-assessed political orientation and political scale. For what consider the political scale, I consider the two extremes: Far-liberals and Far-Conservatives. "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls and the attention controls.

	Political Orientation									Political Scale					
	Democrats			Republicans			Independents			Far Liberals			Far Conservatives		
	1	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*
Intercept	4.47***	4.88***	3.24***	2.95***	3.87***	3.65***	3.54***	3.89***	2.81**	5.06***	4.64***	2.14	2.88***	3.74***	3.64**
	(0.35)	(0.60)	(1.12)	(0.32)	(0.64)	(0.80)	(0.36)	(0.64)	(1.23)	(0.49)	(0.85)	(1.76)	(0.57)	(1.05)	(1.38)
Lib. article	1.68***	1.86***	1.92***	0.53	0.53	0.60	1.18**	1.23**	1.27**	1.17*	1.28*	1.57**	0.24	0.23	0.43
	(0.49)	(0.48)	(0.48)	(0.46)	(0.47)	(0.48)	(0.52)	(0.52)	(0.53)	(0.69)	(0.71)	(0.73)	(0.77)	(0.78)	(0.80)
Cons. article	1.08**	1.12**	1.05**	-0.28	-0.33	-0.26	0.46	0.53	0.61	1.26*	1.51*	1.75**	-0.54	-0.25	0.00
	(0.50)	(0.51)	(0.51)	(0.47)	(0.48)	(0.48)	(0.51)	(0.52)	(0.52)	(0.73)	(0.78)	(0.79)	(0.77)	(0.79)	(0.82)
Demographics		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓			✓			✓
Observations	200	200	200	200	200	200	187	187	187	98	98	98	84	84	84
R^2	0.06	0.13	0.15	0.02	0.05	0.06	0.03	0.09	0.09	0.04	0.10	0.12	0.01	0.10	0.12
	Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01														

Table 1.31: Regression of the orientation of the articles on sadness with different sets of controls divided by self-assessed political orientation and political scale. For what consider the political scale, I consider the two extremes: Far-liberals and Far-Conservatives. "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls and the attention controls.

G In-Group measures by political orientation and articles read

In this section I show the averages and confidence intervals of the two measures of in-group feeling dividing the sample into nine different subgroups based on the combination of their political orientation and the articles read.

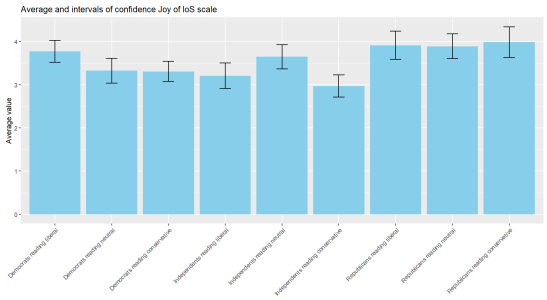


Figure 1.12: The figure show the average and the confidence intervals of the IoS scale divided by self-assessed political identity and orientation of the articles read.

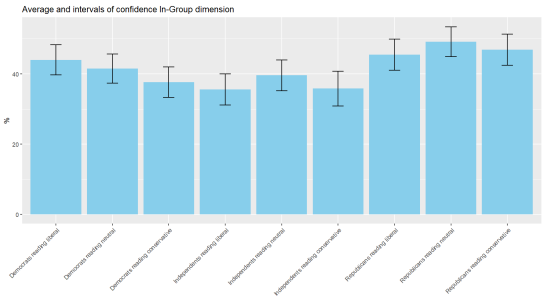


Figure 1.13: The figure show the average and the confidence intervals of the in-group perceived dimension divided by self-assessed political identity and orientation of the articles read.

H Regressions of group identity measures

In this section I provide the results of the regressions to evaluate the impact of counter-attitudinal and pro-attitudinal articles on emotions considering demographic controls and the duration to complete the survey as a proxy for attention. I initially divide the sample into Democrats, Republicans and Independents. Subsequently, I consider the two most extreme subsemples: those who selected *1* in the political scale (Far Liberals) and those who selected *7* in the political scale (Far Conservatives).

The regressions show a positive and significant impact of reading pro-attitudinal articles (0.37^{***}, p-value<0.01) in the IoS scale, while there is no significant difference in the percentage of the in-group.

	IoS scale				In-Group (%)			
	1	2	3	4	1	2	3	4
Intercept	3.37***	3.43***	3.23***	2.83***	40.86***	41.94***	37.71***	34.72***
	(0.09)	(0.17)	(0.19)	(0.23)	(1.34)	(2.71)	(2.93)	(3.54)
Pro attitudinal	0.43***	0.41***	0.38***	0.37***	2.51	2.75	1.93	1.91
	(0.13)	(0.13)	(0.13)	(0.13)	(2.05)	(2.05)	(2.03)	(2.03)
Counter attitudinal	0.26*	0.33**	0.14	0.16	0.83	0.59	-3.23	-3.06
	(0.15)	(0.15)	(0.16)	(0.16)	(2.32)	(2.35)	(2.50)	(2.50)
Demographics		✓	✓	✓		✓	✓	✓
Political orientation			✓	✓			✓	✓
Attention proxies				✓				✓
Observations	587	587	587	587	587	587	587	587
R^2	0.02	0.06	0.09	0.10	0.00	0.02	0.06	0.06

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.32: The table shows the regression of the articles read on the two measures of in-group feeling. "1 " has no controls. "2 " consider the demographic controls. "3 " considers the demographic controls, and political orientation. "4 " considers the demographic controls, political orientation, and the attention controls.

	Political Orientation									Political Scale					
	Democrats			Republicans			Independents			Far Liberals			Far Conservatives		
	1	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*
Intercept	3.32***	3.32***	2.97***	3.89***	4.14***	3.96***	3.65***	3.49***	2.53***	3.57***	3.92***	3.78***	3.79***	3.95***	3.14***
	(0.15)	(0.26)	(0.48)	(0.18)	(0.36)	(0.45)	(0.16)	(0.29)	(0.55)	(0.22)	(0.36)	(0.76)	(0.37)	(0.69)	(0.90)
Lib. article	0.45**	0.43**	0.43**	0.02	0.10	0.13	-0.44*	-0.39	-0.32	-0.14	-0.09	-0.08	0.07	0.10	0.21
	(0.22)	(0.21)	(0.21)	(0.26)	(0.26)	(0.27)	(0.24)	(0.24)	(0.24)	(0.31)	(0.31)	(0.32)	(0.50)	(0.51)	(0.52)
Cons. article	-0.02	0.13	0.05	0.09	0.10	0.10	-0.68***	-0.60**	-0.52**	-0.57	-0.32	-0.32	-0.46	-0.41	-0.29
	(0.22)	(0.22)	(0.22)	(0.27)	(0.27)	(0.27)	(0.23)	(0.24)	(0.23)	(0.33)	(0.33)	(0.34)	(0.50)	(0.52)	(0.53)
Demographics		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓			✓			✓
Observations	200	200	200	200	200	200	187	187	187	98	98	98	84	84	84
R^2	0.03	0.13	0.17	0.00	0.08	0.08	0.05	0.10	0.14	0.03	0.17	0.19	0.02	0.10	0.13
	Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01														

Table 1.33: Regression of the orientation of the articles on the Ios Scale with different sets of controls divided by self-assessed political orientation and political scale. For what consider the political scale, I consider the two extremes: Far-liberals and Far-Conservatives. "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls and the attention controls.

	Political Orientation									Political Scale					
	Democrats			Republicans			Independents			Far Liberals			Far Conservatives		
	1	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*
Intercept	41.46***	42.87***	44.17***	49.11***	53.53***	53.28***	39.55***	36.01***	28.98***	37.69***	34.27***	28.48**	52.17***	60.34***	47.43***
	(2.53)	(4.38)	(8.18)	(2.52)	(5.02)	(6.29)	(2.69)	(4.90)	(9.40)	(3.75)	(6.15)	(12.79)	(4.71)	(8.44)	(10.91)
Lib. article	2.49	2.02	1.80	-3.70	-4.32	-4.31	-4.02	-4.21	-3.55	5.40	5.25	5.87	-9.07	-10.08	-9.87
	(3.55)	(3.50)	(3.50)	(3.62)	(3.67)	(3.76)	(3.92)	(4.03)	(4.06)	(5.30)	(5.20)	(5.33)	(6.32)	(6.25)	(6.30)
Cons. article	-3.86	-3.42	-4.29	-2.28	-2.10	-2.19	-3.79	-4.38	-3.63	0.89	4.99	5.28	-11.57*	-13.47**	-13.48**
	(3.66)	(3.72)	(3.73)	(3.74)	(3.73)	(3.78)	(3.82)	(3.98)	(4.01)	(5.62)	(5.65)	(5.71)	(6.32)	(6.37)	(6.47)
Demographics		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓			✓			✓
Observations	200	200	200	200	200	200	187	187	187	98	98	98	84	84	84
R^2	0.02	0.09	0.11	0.01	0.05	0.05	0.01	0.03	0.04	0.01	0.17	0.19	0.04	0.17	0.21
	Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01														

Table 1.34: Regression of the orientation of the articles on the expected dimension of the in-group with different sets of controls divided by self-assessed political orientation and political scale. For what consider the political scale, I consider the two extremes: Far-liberals and Far-Conservatives. "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls and the attention controls.

I Similarity by political orientation and articles read

In this section I show the averages and confidence intervals of the two measures of political and demographic characteristics dividing the sample into nine different subgroups based on the combination of their political orientation and the articles read.

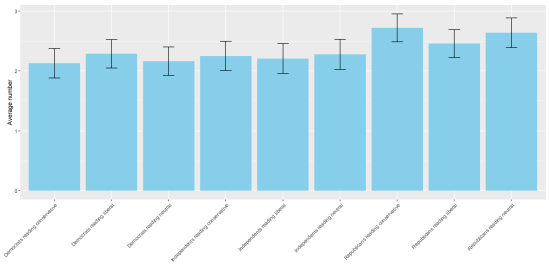


Figure 1.14: The figure show the average and the confidence intervals of the IoS scale divided by self-assessed political identity and orientation of the articles read.

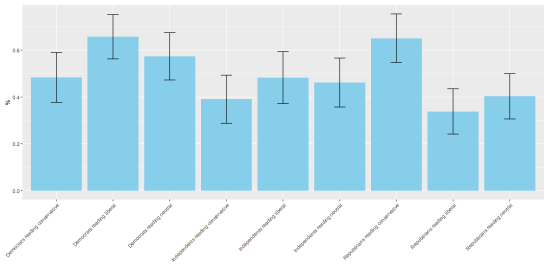


Figure 1.15: The figure show the average and the confidence intervals of the in-group perceived dimension divided by self-assessed political identity and orientation of the articles read.

J Regressions of expectations about the others

In this section I provide the results of the regressions to evaluate the impact of counter-attitudinal and pro-attitudinal articles on emotions considering demographic controls and the duration to complete the survey as a proxy for attention. I initially divide the sample into Democrats, Republicans and Independents. Subsequently, I consider the two most extreme subsemples: those who selected *1* in the political scale (Far Liberals) and those who selected *7* in the political scale (Far Conservatives).

The regression confirms the lack of significativity of the impact of articles on the number of demographic characteristics expected to be the same as oneself, while it confirms the significant impact of pro-attitudinal articles on the increased expectations of being matched with a participant with the same political orientation.

	Same characteristics				Same political orientation			
	1	2	3	4	1	2	3	4
Intercept	2.32***	2.08***	1.97***	1.72***	0.46***	0.54***	0.48***	0.40***
	(0.07)	(0.15)	(0.16)	(0.19)	(0.03)	(0.06)	(0.07)	(0.08)
Pro attitudinal	0.09	0.08	0.07	0.06	0.13**	0.11**	0.10**	0.10**
	(0.11)	(0.11)	(0.11)	(0.11)	(0.05)	(0.05)	(0.05)	(0.05)
Counter attitudinal	-0.02	0.02	-0.10	-0.08	-0.05	-0.03	-0.08	-0.07
	(0.13)	(0.13)	(0.14)	(0.13)	(0.05)	(0.05)	(0.06)	(0.06)
Demographics		✓	✓	✓		✓	✓	✓
Political orientation			✓	✓			✓	✓
Attention proxies				✓				✓
Observations	587	587	587	587	587	587	587	587
R^2	0.00	0.05	0.08	0.09	0.02	0.06	0.07	0.08

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.35: The table shows the regression of the articles read on the two political and demographic expectations about the others. "1 " has no controls. "2 " consider the demographic controls. "3 " considers the demographic controls, and political orientation. "4 " considers the demographic controls, political orientation, and the attention controls.

	Political Orientation									Political Scale					
	Democrats			Republicans			Independents			Far Liberals			Far Conservatives		
	1	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*
Intercept	2.16***	1.82***	2.10***	2.64***	2.52***	2.06***	2.28***	2.04***	2.91***	3.00***	2.43***	2.52***	2.73***	2.97***	2.83***
	(0.14)	(0.24)	(0.45)	(0.14)	(0.27)	(0.34)	(0.15)	(0.25)	(0.48)	(0.19)	(0.33)	(0.70)	(0.23)	(0.42)	(0.56)
Lib. article	0.12	0.07	0.04	-0.18	-0.12	-0.04	-0.07	-0.05	-0.04	-0.19	-0.22	-0.23	-0.17	-0.23	-0.16
	(0.20)	(0.20)	(0.19)	(0.20)	(0.20)	(0.20)	(0.21)	(0.21)	(0.21)	(0.27)	(0.28)	(0.29)	(0.31)	(0.31)	(0.32)
Cons. article	-0.03	0.01	-0.05	0.08	0.08	0.10	-0.03	0.04	0.01	-0.45	-0.47	-0.40	-0.43	-0.35	-0.27
	(0.21)	(0.21)	(0.21)	(0.20)	(0.20)	(0.20)	(0.21)	(0.21)	(0.21)	(0.29)	(0.30)	(0.31)	(0.31)	(0.32)	(0.33)
Demographics		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓			✓			✓
Observations	200	200	200	200	200	200	187	187	187	98	98	98	84	84	84
R^2	0.00	0.09	0.12	0.01	0.06	0.09	0.00	0.12	0.14	0.02	0.11	0.12	0.02	0.11	0.12
	Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01														

Table 1.36: Regression of the orientation of the articles on the expected demographic characteristics of the participant they have interacted with and their own demographic characteristics with different sets of controls divided by self-assessed political orientation and political scale. For what consider the political scale, I consider the two extremes: Far-liberals and Far-Conservatives. "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls and the attention controls.

	Political Orientation									Political Scale					
	Democrats			Republicans			Independents			Far Liberals			Far Conservatives		
	1	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*
Intercept	0.57***	0.61***	0.71***	0.40***	0.47***	0.32**	0.46***	0.48***	0.59***	0.49***	0.62***	0.88***	0.63***	0.48***	0.26
	(0.06)	(0.10)	(0.19)	(0.06)	(0.11)	(0.14)	(0.06)	(0.11)	(0.21)	(0.09)	(0.14)	(0.30)	(0.10)	(0.18)	(0.23)
Lib. article	0.08	0.07	0.06	-0.06	-0.02	0.01	0.02	0.05	0.04	0.11	0.13	0.10	-0.09	-0.08	-0.07
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.09)	(0.09)	(0.09)	(0.12)	(0.12)	(0.12)	(0.14)	(0.13)	(0.14)
Cons. article	-0.09	-0.04	-0.06	0.25***	0.24***	0.25***	-0.07	-0.05	-0.06	0.05	0.08	0.06	-0.03	0.00	0.01
	(0.09)	(0.09)	(0.09)	(0.08)	(0.08)	(0.08)	(0.09)	(0.09)	(0.09)	(0.13)	(0.13)	(0.13)	(0.14)	(0.14)	(0.14)
Demographics		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓			✓			✓
Observations	200	200	200	200	200	200	187	187	187	98	98	98	84	84	84
R^2	0.02	0.11	0.13	0.07	0.18	0.20	0.01	0.06	0.06	0.01	0.14	0.16	0.01	0.17	0.20
	Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01														

Table 1.37: Regression of the orientation of the articles on the expected political orientation of the participant they have interacted with and their own demographic characteristics with different sets of controls divided by self-assessed political orientation and political scale. For what consider the political scale, I consider the two extremes: Far-liberals and Far-Conservatives. "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls and the attention controls.

K Expectations on how others play the games

In this section I show the averages and confidence intervals of the expectations on how other participants on haverage play the game dividing the sample into nine different subgroups based on the combination of their political orientation and the articles read.

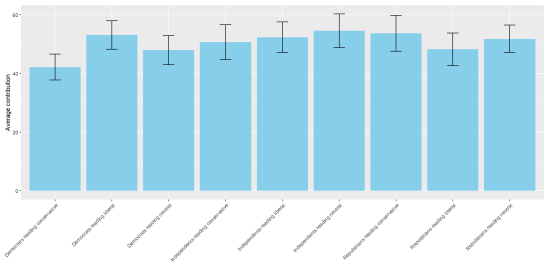


Figure 1.16: The figure shows the average values and the confidence intervals of the average expected contribution of the other players in the public good game divided by self-assessed political identity and orientation of the articles read.

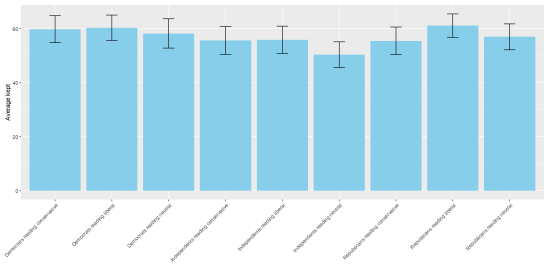


Figure 1.17: The figure shows the average values and the confidence intervals of the average expected amount kept by the other players in the dictator game divided by self-assessed political identity and orientation of the articles read.

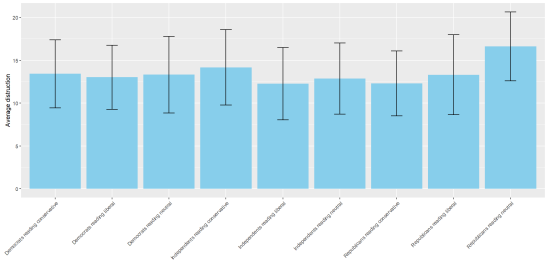


Figure 1.18: The figure shows the average values and the confidence intervals of the average expected destruction of the other players in the joy of destruction game divided by self-assessed political identity and orientation of the articles read.

L Regressions of expectations on how others play the games

In this section I provide the results of the regressions to evaluate the impact of counter-attitudinal and pro-attitudinal articles on expectations about how other participants on average play the three games. I initially divide the sample into Democrats, Republicans and Independents. Subsequently, I consider the two most extreme subsemples: those who selected *1* in the political scale (Far Liberals) and those who selected *7* in the political scale (Far Conservatives).

The regressions confirm the results for the dictator game and the joy of destruction game. However, after controlling for the demographic variables and political orientation, the expected contributions to the public good game are not significant anymore showing that the articles do not affect the expectations on how other participants play on average the three games.

	Expected contribution				Expected amount kept				Expected destruction			
	1	2	3	4	1	2	3	4	1	2	3	4
Intercept	50.62***	47.15***	47.78***	46.06***	56.72***	57.56***	55.40***	56.65***	14.20***	14.92***	15.01***	10.87***
	(1.57)	(3.19)	(3.52)	(4.26)	(1.47)	(2.99)	(3.29)	(3.98)	(1.24)	(2.51)	(2.76)	(3.33)
Pro attitudinal	3.12	3.00	3.18	3.18	-1.23	-1.25	-1.73	-1.69	-1.45	-1.51	-1.47	-1.40
	(2.41)	(2.42)	(2.44)	(2.45)	(2.25)	(2.26)	(2.28)	(2.29)	(1.91)	(1.90)	(1.92)	(1.91)
Counter attitudinal	-5.28*	-4.82*	-4.54	-4.44	3.77	3.86	2.26	2.18	-0.84	-0.33	-0.37	-0.16
	(2.73)	(2.77)	(3.00)	(3.01)	(2.55)	(2.59)	(2.80)	(2.81)	(2.16)	(2.17)	(2.36)	(2.35)
Demographics		✓	✓	✓		✓	✓	✓		✓	✓	✓
Political orientation			✓	✓			✓	✓			✓	✓
Attention proxies				✓				✓				✓
Observations	587	587	587	587	587	587	587	587	587	587	587	587
R^2	0.01	0.03	0.03	0.03	0.01	0.02	0.02	0.02	0.00	0.03	0.03	0.04

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.38: The table shows the regression of the articles read on the two political and demographic expectations about the others. "1 " has no controls. "2 " consider the demographic controls. "3 " considers the demographic controls, and political orientation. "4 " considers the demographic controls, political orientation, and the attention controls.

	Political Orientation									Political Scale					
	Democrats			Republicans			Independents			Far Liberals			Far Conservatives		
	1	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*
Intercept	47.93***	47.63***	49.85***	51.76***	47.55***	42.92***	54.52***	50.07***	27.69**	44.23***	43.31***	50.00***	55.37***	45.08***	46.22***
	(2.83)	(5.07)	(9.56)	(3.12)	(6.25)	(7.81)	(3.32)	(5.91)	(11.23)	(3.68)	(6.19)	(13.07)	(5.65)	(10.11)	(13.42)
Lib. article	5.16	5.17	5.12	-3.50	-3.42	-2.50	-2.21	-2.04	-2.16	9.43*	10.02*	9.25*	-5.88	-8.92	-8.36
	(3.98)	(4.06)	(4.09)	(4.48)	(4.57)	(4.67)	(4.83)	(4.86)	(4.85)	(5.20)	(5.23)	(5.45)	(7.58)	(7.48)	(7.75)
Cons. article	-5.78	-5.14	-4.82	1.89	2.27	2.69	-3.85	-4.07	-3.29	-2.34	-0.10	-0.68	-7.84	-11.00	-10.29
	(4.10)	(4.31)	(4.36)	(4.63)	(4.64)	(4.70)	(4.71)	(4.80)	(4.80)	(5.51)	(5.68)	(5.84)	(7.58)	(7.63)	(7.95)
Demographics		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓			✓			✓
Observations	200	200	200	200	200	200	187	187	187	98	98	98	84	84	84
R^2	0.04	0.05	0.05	0.00	0.04	0.05	0.01	0.06	0.09	0.05	0.16	0.16	0.01	0.14	0.14
	Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01														

Table 1.39: Regression of the orientation of the articles on the expected average contribution of the other participants in the public good game with different sets of controls divided by self-assessed political orientation and political scale. For what consider the political scale, I consider the two extremes: Far-liberals and Far-Conservatives. "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls and the attention controls.

	Political Orientation									Political Scale					
	Democrats			Republicans			Independents			Far Liberals			Far Conservatives		
	1	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*
Intercept	58.22***	59.50***	53.39***	56.96***	60.18***	62.32***	50.32***	47.40***	50.50***	60.54***	53.32***	40.79***	52.46***	60.95***	64.12***
	(3.00)	(5.36)	(10.10)	(2.72)	(5.49)	(6.89)	(2.92)	(5.26)	(10.14)	(3.78)	(6.50)	(13.63)	(5.15)	(9.43)	(12.48)
Lib. article	2.09	2.40	2.71	4.16	4.38	4.01	5.54	5.31	5.27	-0.80	-2.03	-0.55	4.81	6.35	5.07
	(4.21)	(4.29)	(4.32)	(3.90)	(4.02)	(4.12)	(4.25)	(4.32)	(4.38)	(5.34)	(5.49)	(5.68)	(6.92)	(6.98)	(7.21)
Cons. article	1.57	0.98	1.09	-1.51	-1.54	-1.57	5.30	6.02	5.87	-3.40	-6.24	-4.99	-0.79	-0.20	-1.68
	(4.34)	(4.56)	(4.61)	(4.03)	(4.09)	(4.14)	(4.14)	(4.27)	(4.33)	(5.67)	(5.96)	(6.09)	(6.92)	(7.12)	(7.40)
Demographics		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓			✓			✓
Observations	200	200	200	200	200	200	187	187	187	98	98	98	84	84	84
R^2	0.00	0.01	0.02	0.01	0.03	0.03	0.01	0.05	0.05	0.00	0.08	0.09	0.01	0.10	0.11
	Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01														

Table 1.40: Regression of the orientation of the articles on the expected amount kept by the other participants in the dictator game with different sets of controls divided by self-assessed political orientation and political scale. For what consider the political scale, I consider the two extremes: Far-liberals and Far-Conservatives. "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls and the attention controls.

	Political Orientation									Political Scale					
	Democrats			Republicans			Independents			Far Liberals			Far Conservatives		
	1	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*
Intercept	13.32***	16.22***	16.34**	16.61***	19.51***	12.90**	12.88***	8.04*	10.41	19.83***	22.91***	31.78**	28.96***	36.19***	33.15***
	(2.42)	(4.25)	(7.94)	(2.42)	(4.76)	(5.89)	(2.50)	(4.51)	(8.70)	(4.14)	(7.09)	(14.89)	(5.39)	(9.44)	(12.02)
Lib. article	-0.31	0.38	0.23	-3.30	-1.23	0.20	-0.60	-1.34	-1.32	-2.29	-1.52	-2.58	-10.03	-9.47	-5.95
	(3.39)	(3.40)	(3.40)	(3.48)	(3.48)	(3.52)	(3.64)	(3.71)	(3.76)	(5.85)	(5.99)	(6.21)	(7.24)	(6.98)	(6.95)
Cons. article	0.10	0.28	-0.53	-4.31	-4.82	-3.83	1.29	0.80	0.72	0.67	3.31	2.35	-14.83**	-12.71*	-8.54
	(3.50)	(3.61)	(3.62)	(3.59)	(3.54)	(3.54)	(3.55)	(3.66)	(3.72)	(6.21)	(6.51)	(6.65)	(7.24)	(7.12)	(7.13)
Demographics		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Attention proxies			✓			✓			✓			✓			✓
Observations	200	200	200	200	200	200	187	187	187	98	98	98	84	84	84
R^2	0.00	0.05	0.06	0.01	0.08	0.10	0.00	0.04	0.04	0.00	0.08	0.09	0.05	0.21	0.27
	Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01														

Table 1.41: Regression of the orientation of the articles on the expected amount destroyed by the other participants in the joy of destruction game with different sets of controls divided by self-assessed political orientation and political scale. For what consider the political scale, I consider the two extremes: Far-liberals and Far-Conservatives. "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls and the attention controls.

M Regressions on social preferences with the entire sample

In this section I provide the results of the regressions to evaluate the impact of counter-attitudinal and pro-attitudinal articles on social preferences considering demographic controls, political controls and the duration to complete the survey as a proxy for attention for the entire sample.

The results of the regression show similarity compared to the reduced sample in terms of direction and magnitude. However, reading pro-attitudinal articles has not anymore a significant effect on cooperation. This result is driven by the removed participants who behave as outliers in the distribution.

	Cooperation (Public good game)				Altruism (Dictator game				Anti-social behavior (Joy of destruction game)			
	1	2	3	4	1	2	3	4	1	2	3	4
Intercept	60.73***	51.43***	51.94***	50.49***	57.73***	57.91***	56.63***	58.44***	4.60***	8.16***	10.11***	8.83***
	(2.03)	(4.07)	(4.52)	(5.45)	(1.53)	(3.10)	(3.43)	(4.14)	(0.92)	(1.82)	(2.01)	(2.42)
Pro attitudinal	3.82	3.93	4.01	4.03	-4.38	-4.57**	-4.82**	-4.81**	0.95	0.62	1.08	1.12
	(3.08)	(3.08)	(3.11)	(3.12)	(2.33)	(2.34)	(2.36)	(2.37)	(1.40)	(1.38)	(1.38)	(1.39)
Counter attitudinal	-6.82**	-6.40*	-5.89	-5.80	6.44**	6.92***	5.80**	5.68**	0.99	1.23	2.50	2.57
	(3.53)	(3.55)	(3.85)	(3.86)	(2.67)	(2.70)	(2.92)	(2.93)	(1.61)	(1.59)	(1.71)	(1.72)
Demographics		✓	✓	✓		✓	✓	✓		✓	✓	✓
Political orientation			✓	✓			✓	✓			✓	✓
Attention proxies				✓				✓				✓
Observations	600	600	600	600	600	600	600	600	600	600	600	600
R^2	0.01	0.04	0.04	0.04	0.02	0.03	0.04	0.04	0.00	0.05	0.07	0.07

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.42: The table shows the regression of the orientation of the article read on the measure of cooperation (public good game), altruism (dictator game), and anti-social behavior (joy of destruction game) for the entire sample. "*1*" has no controls. "*2*" consider the demographic controls. "*3*" considers the demographic controls, and political orientation. "*4*" considers the demographic controls, political orientation, and the attention controls.

N 2SLS analysis by political orientation

In this section I provide the results of the 2SLS to evaluate potential channels through which slanted articles impact social preferences. I divide the sample based on political orientation.

	Negative emotions	Joy	Surprise
Intercept	3.12***	1.52**	0.59
	(0.95)	(0.74)	(0.72)
Lib. article	1.15***	0.82**	-0.15
	(0.40)	(0.32)	(0.31)
Cons. article	1.95***	-1.15***	0.21
	(0.43)	(0.34)	(0.33)
R^2	0.16	0.24	0.17
Observations	200	200	200
	IoS scale	In group feeling	Similarity
Intercept	2.97***	44.17***	2.81***
	(0.48)	(8.18)	(0.53)
Lib. article	0.43**	1.80	0.10
	(0.21)	(3.50)	(0.23)
Cons. article	0.05	-4.29	-0.11
	(0.22)	(3.73)	(0.24)
R^2	0.17	0.11	0.15
Observations	200	200	200
	Expected contribution	Expected amount kept	Expected destruction
Intercept	49.85***	53.39***	16.34**
	(9.56)	(10.10)	(7.94)
Lib. article	5.12	2.71	0.23
	(4.09)	(4.32)	(3.40)
Cons. article	-4.82	1.09	-0.53
	(4.36)	(4.61)	(3.62)
R^2	0.05	0.02	0.06
Observations	200	200	200

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.43: The table shows the first stage regressions for Joy, Sadness, Negative emotions, IoS Scale, In Group feeling, Political and demographic similarity, and expectations on how others contributed in the public good game, the amount kept in the dictator game and the destruction in the joy of destruction game. The table considers only Democrats.

	Public good game	Dictator game	Joy of Destruction game
		Negative emotions	
Intercept	40.31**	40.25***	-2.86
	(18.84)	(13.88)	(6.26)
$\hat{First\_Stage}$	3.63	-1.38	1.40
	(3.21)	(2.36)	(1.07)
R^2	0.04	0.06	0.04
Observations	200	200	200
		Joy	
Intercept	45.39***	37.83***	6.59
	(14.29)	(10.58)	(4.75)
$\hat{First\_Stage}$	5.84*	-1.93	-2.09**
	(3.18)	(2.35)	(1.06)
R^2	0.05	0.06	0.05
Observations	200	200	200
		IoS scale	
Intercept	-58.70	73.90**	18.76
	(42.46)	(31.70)	(14.38)
$\hat{First\_Stage}$	35.47***	-12.24	-4.90
	(12.56)	(9.38)	(4.25)
R^2	0.07	0.07	0.04
Observations	200	200	200

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.44: The table shows the second stage regressions for Negative emotions, Joy, and the, IoS scale $\hat{First\_Stage}$ is the value estimated through the first stage for each variable. The table considers only Democrats.

	Negative emotions	Joy	Surprise
Intercept	3.01***	1.52**	2.19***
	(0.56)	(0.60)	(0.64)
Lib. article	0.84**	-0.06	-0.07
	(0.33)	(0.36)	(0.38)
Cons. article	0.01	0.93**	-0.13
	(0.34)	(0.36)	(0.38)
R^2	0.09	0.25	0.13
Observations	200	200	200
	IoS scale	In group feeling	Similarity
Intercept	3.96***	53.28***	2.38***
	(0.45)	(6.29)	(0.42)
Lib. article	0.13	-4.31	-0.03
	(0.27)	(3.76)	(0.25)
Cons. article	0.10	-2.19	0.36
	(0.27)	(3.78)	(0.26)
R^2	0.08	0.05	0.13
Observations	200	200	200
	Expected contribution	Expected amount kept	Expected destruction
Intercept	42.92***	62.32***	12.90**
	(7.81)	(6.89)	(5.89)
Lib. article	-2.50	4.01	0.20
	(4.67)	(4.12)	(3.52)
Cons. article	2.69	-1.57	-3.83
	(4.70)	(4.14)	(3.54)
R^2	0.05	0.03	0.10
Observations	200	200	200

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.45: The table shows the first stage regressions for Joy, Sadness, Negative emotions, IoS Scale, In Group feeling, Political and demographic similarity, and expectations on how others contributed in the public good game, the amount kept in the dictator game and the destruction in the joy of destruction game. The table considers only Republicans.

	Public good game	Dictator game	Joy of Destruction game
		Negative emotions	
Intercept	86.59***	16.50	2.52
	(22.78)	(17.26)	(10.35)
$\hat{First\_Stage}$	-12.24**	15.25***	2.18
	(6.08)	(4.61)	(2.76)
R^2	0.06	0.13	0.12
Observations	200	200	200
		Joy	
Intercept	34.52***	82.58***	10.23*
	(12.80)	(9.81)	(5.78)
$\hat{First\_Stage}$	5.35	-7.34*	-0.07
	(5.32)	(4.08)	(2.40)
R^2	0.05	0.09	0.12
Observations	200	200	200

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.46: The table shows the second stage regressions for Negative emotions, Joy, and the, IoS scale $\hat{First\_Stage}$ is the value estimated through the first stage for each variable. The table considers only Republicans.

O 2SLS of negative emotions

	Negative emotions	Joy	Surprise
Intercept	2.53**	3.12***	2.17***
	(1.02)	(0.80)	(0.86)
Lib. article	0.72	-0.17	-0.62*
	(0.44)	(0.35)	(0.37)
Cons. article	1.02**	-0.36	0.00
	(0.44)	(0.34)	(0.37)
R^2	0.07	0.09	0.07
Observations	187	187	187
	IoS scale	In group feeling	Similarity
Intercept	2.53***	28.98***	3.49***
	(0.55)	(9.40)	(0.57)
Lib. article	-0.32	-3.55	0.00
	(0.24)	(4.06)	(0.25)
Cons. article	-0.52**	-3.63	-0.05
	(0.23)	(4.01)	(0.24)
R^2	0.14	0.04	0.14
Observations	187	187	187
	Expected contribution	Expected amount kept	Expected destruction
Intercept	27.69**	50.50***	10.41
	(11.23)	(10.14)	(8.70)
Lib. article	-2.16	5.27	-1.32
	(4.85)	(4.38)	(3.76)
Cons. article	-3.29	5.87	0.72
	(4.80)	(4.33)	(3.72)
R^2	0.09	0.05	0.04
Observations	187	187	187

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.47: The table shows the first stage regressions for Joy, Sadness, Negative emotions, IoS Scale, In Group feeling, Political and demographic similarity, and expectations on how others contributed in the public good game, the amount kept in the dictator game and the destruction in the joy of destruction game. The table considers only Independents.

	Public good game	Dictator game	Joy of Destruction game
		Negative emotions	
Intercept	23.59	53.15***	35.43***
	(22.66)	(17.18)	(11.54)
$\hat{First\_Stage}$	2.35	4.79	-5.14*
	(5.73)	(4.35)	(2.92)
R^2	0.09	0.05	0.10
Observations	187	187	187
		Surprise	
Intercept	34.70	115.56***	21.83*
	(22.00)	(16.12)	(11.30)
$\hat{First\_Stage}$	-1.82	-23.31***	-1.32
	(8.54)	(6.26)	(4.38)
R^2	0.09	0.11	0.08
Observations	187	187	187
		IoS scale	
Intercept	41.20	84.07***	-4.51
	(28.97)	(22.01)	(14.74)
$\hat{First\_Stage}$	-4.59	-7.11	10.66*
	(11.53)	(8.76)	(5.87)
R^2	0.09	0.05	0.10
Observations	187	187	187

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.48: The table shows the second stage regressions for Negative emotions, Joy, and the, IoS scale $\hat{First\_Stage}$ is the value estimated through the first stage for each variable. The table considers only Independents.

In this section I show the results of the 2SLS analysis considering negative emotions alone. Table 47 and Table 48 show the results for the entire sample.

	Anger	Fear	Disgust
Intercept	3.62***	3.67***	3.24***
	(0.34)	(0.32)	(0.35)
Pro-attitudinal	0.19	-0.10	-0.30
	(0.26)	(0.24)	(0.26)
Counter-attitudinal	1.36***	0.30	1.51***
	(0.30)	(0.28)	(0.30)
R^2	0.07	0.06	0.07
Observations	587	587	587
	Contempt	Sadness	
Intercept	3.11***	4.70***	
	(0.34)	(0.37)	
Pro-attitudinal	0.05	0.20	
	(0.26)	(0.28)	
Counter-attitudinal	1.21***	0.35	
	(0.29)	(0.32)	
R^2	0.05	0.05	
Observations	587	587	

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.49: The table shows the first stage regressions for Anger, Fear, Contempt, Disgust, and sadness.

Table following tables show the results for the Democrats.

The following tables show the results for the Republicans.

The following tables show the results for the Independents.

	Public good game	Dictator game	Joy of Destruction game
		Anger	
Intercept	75.14***	31.41***	4.67
	(11.11)	(8.46)	(4.88)
$\hat{First\_Stage}$	-5.76**	6.39***	0.83
	(2.59)	(1.97)	(1.13)
R^2	0.03	0.03	0.05
Observations	587	587	587
		Disgust	
Intercept	70.96***	36.05***	3.24***
	(8.05)	(6.11)	(0.35)
$\hat{First\_Stage}$	-5.41***	6.01***	-0.30
	(2.02)	(1.53)	(0.26)
R^2	0.04	0.04	0.07
Observations	587	587	587
		Contempt	
Intercept	75.14***	31.41***	5.15
	(10.38)	(7.90)	(4.56)
$\hat{First\_Stage}$	-6.75**	7.50***	0.83
	(2.80)	(2.13)	(1.23)
R^2	0.03	0.03	0.05
Observations	587	587	587

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.50: The table shows the second stage regressions for Anger, Disgust, and Contempt. $\hat{First\_Stage}$ is the value estimated through the first stage for each variable.

	Anger	Fear	Disgust
Intercept	3.63***	3.74***	3.16***
	(0.62)	(0.59)	(0.62)
Lib. article	1.81***	0.37	0.62
	(0.50)	(0.47)	(0.49)
Cons. article	2.57***	0.94*	2.80***
	(0.53)	(0.50)	(0.52)
R^2	0.15	0.09	0.18
Observations	200	200	200
	Contempt	Sadness	
Intercept	3.02***	4.88***	
	(0.60)	(0.60)	
Lib. article	0.94*	1.86***	
	(0.48)	(0.48)	
Cons. article	2.23***	1.12**	
	(0.51)	(0.51)	
R^2	0.13	0.13	
Observations	200	200	

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.51: The table shows the first stage regressions for Anger, Fear, Contempt, Disgust, and sadness for Democrats.

	Public good game	Dictator game	Joy of Destruction game
		Anger	
Intercept	35.93***	63.86***	-0.17
	(13.52)	(10.13)	(4.51)
$\hat{First\_Stage}$	3.22	-1.46	0.80
	(2.33)	(1.75)	(0.78)
R^2	0.04	0.03	0.03
Observations	200	200	200
		Fear	
Intercept	40.85	62.95***	-10.51
	(28.73)	(21.45)	(9.50)
$\hat{First\_Stage}$	2.73	-1.55	3.44
	(6.69)	(5.00)	(2.21)
R^2	0.03	0.02	0.04
Observations	200	200	200
		Contempt	
Intercept	46.64***	59.51***	-1.92
	(13.24)	(9.89)	(4.38)
$\hat{First\_Stage}$	1.38	-0.75	1.42
	(2.82)	(2.11)	(0.93)
R^2	0.03	0.02	0.04
Observations	200	200	200
		Disgust	
Intercept	53.93***	56.37***	-1.60
	(11.42)	(8.53)	(3.77)
$\hat{First\_Stage}$	-0.38	0.02	1.26*
	(2.16)	(1.61)	(0.71)
R^2	0.03	0.02	0.04
Observations	200	200	200
		Sadness	
Intercept	3.86	76.87***	5.35
	(19.11)	(14.58)	(6.53)
$\hat{First\_Stage}$	8.30***	-3.50	-0.25
	(3.20)	(2.36)	(1.06)
R^2	0.06	0.03	0.03
Observations	200	200	200

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.52: The table shows the second stage regressions for Anger, Disgust, and Contempt for Democrats. $\hat{First\_Stage}$ is the value estimated through the first stage for each variable.

	Anger	Fear	Disgust
Intercept	3.22***	2.79***	2.91***
	(0.50)	(0.55)	(0.57)
Lib. article	1.07***	0.27	1.24***
	(0.37)	(0.40)	(0.42)
Cons. articles	-0.03	-0.07	-0.10
	(0.37)	(0.41)	(0.42)
R^2	0.11	0.08	0.09
Observations	200	200	200
	Contempt	Sadness	
Intercept	3.09***	3.87***	
	(0.57)	(0.64)	
Lib. article	0.82*	0.53	
	(0.42)	(0.47)	
Cons. article	0.24	-0.33	
	(0.43)	(0.48)	
R^2	0.09	0.05	
Observations	200	200	

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.53: The table shows the first stage regressions for Anger, Fear, Contempt, Disgust, and sadness for Republicans.

	Public good game	Dictator game	Joy of Destruction game
		Anger	
Intercept	82.87***	15.28	6.26
	(17.89)	(13.63)	(8.16)
$\hat{First\_Stage}$	-9.75**	12.76***	1.42
	(4.60)	(3.50)	(2.10)
R^2	0.06	0.11	0.12
Observations	200	200	200
		Disgust	
Intercept	74.82***	25.76**	7.50
	(14.49)	(11.04)	(6.61)
$\hat{First\_Stage}$	-8.11**	10.63***	1.16
	(3.84)	(2.93)	(1.75)
R^2	0.06	0.11	0.12
Observations	200	200	200
		Contempt	
Intercept	94.93***	0.16	3.72
	(23.96)	(18.30)	(10.92)
$\hat{First\_Stage}$	-13.59***	17.59***	2.20
	(-13.59)	(5.06)	(3.02)
R^2	0.06	0.11	0.12
Observations	200	200	200

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.54: The table shows the second stage regressions for Anger, Disgust, and Contempt for Republicans. $\hat{First\_Stage}$ is the value estimated through the first stage for each variable.

	Anger	Fear	Disgust
Intercept	2.42***	3.56***	2.23***
	(0.60)	(0.57)	(0.63)
Lib. article	0.83*	0.31	0.83
	(0.49)	(0.47)	(0.51)
Cons. Article	1.29***	0.56	1.32**
	(0.48)	(0.46)	(0.51)
R^2	0.08	0.10	0.07
Observations	187	187	187
	Contempt	Sadness	
Intercept	2.28***	3.89***	
	(0.61)	(0.64)	
Lib. article	0.28	1.23**	
	(0.50)	(0.52)	
Cons. Article	1.26**	0.53	
	(0.49)	(0.52)	
R^2	0.06	0.09	
Observations	187	187	

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.55: The table shows the first stage regressions for Anger, Fear, Contempt, Disgust, and sadness for Independents.

	Public good game	Dictator game	Joy of Destruction game
		Anger	
Intercept	53.55***	43.44***	23.36***
	(15.32)	(11.57)	()
$First\hat{}\_Stage$	0.91	3.26	-4.19*
	(4.57)	(3.45)	()
R^2	0.06	0.03	0.08
Observations	187	187	187
		Disgust	
Intercept	53.82***	44.83***	22.45***
	(14.38)	(10.87)	(7.29)
$First\hat{}\_Stage$	0.87	2.98	-4.14*
	(4.50)	(3.40)	(2.28)
R^2	0.06	0.03	0.08
Observations	187	187	187
		Contempt	
Intercept	55.42***	59.44***	21.99***
	(13.97)	(10.57)	(7.08)
$First\hat{}\_Stage$	0.32	-2.31	-4.18*
	(4.56)	(3.45)	(2.31)
R^2	0.06	0.03	0.08
Observations	187	187	187
		Sadness	
Intercept	49.62**	-0.56	18.41
	(22.75)	(16.71)	(11.62)
$First\hat{}\_Stage$	1.51	12.20***	-1.73
	(4.93)	(3.62)	(2.52)
R^2	0.06	0.09	0.07
Observations	187	187	187

Notes:*p-value<0.1,**p-value< 0.05,***p-value< 0.01

Table 1.56: The table shows the second stage regressions for Anger, Disgust, and Contempt for Independents. $First\hat{}\_Stage$ is the value estimated through the first stage for each variable.

P Instructions

In this section I show the instructions given to the participants.

P.1 Consent

Welcome and thank you for taking part in this study. I am a researcher at the university of Mannheim (Germany), and I invite you to participate in a scientific study. I am trying to understand how information is perceived and its consequences.

Requirements

This study can only be taken by desktop users.

Procedures & Study Time

In this study, your main task is to read articles and answer some questions concerning them and perform some additional tasks that will be explained throughout the survey. The study should take approximately 15 minutes.

Payment and rewards

After completing the survey you will receive the participation fee. Five participants will be randomly selected to obtain an extra reward. The additional payment will be based on the points earned throughout the survey. Each point will correspond to \$0.1. The additional payment is based on your and other participants' decisions. The maximum amount you can gain additionally is 50\$ The explanation on how to gain points will be addressed throughout the survey.

Data & Consent

You will not be asked to provide any personally identifiable information during this study. This study is entirely anonymous. Please be aware that your information and responses will only be used for this study, and this data will be treated as highly confidential. No individual responses will be shared: I will only analyze the responses in aggregate. By participating in this study, you consent to the data being used for this purpose. Your participation in this research is entirely voluntary. Please note you have the right to withdraw consent at any time, and you have the right to withdraw at any point during the study. If you have any questions about this research, please feel free to contact me at gferraro@mail.uni-mannheim.de

Do you accept to participate in this experiment?

P.2 Articles

Please read the following article:[17]

Unyielding Pride: The Battle for LGBTQ Rights in an Age of Relentless Hatred

[17] I provide an example of an article.

In a world that touts progress and enlightenment, the struggle for LGBTQ rights remains a battlefield where love and hate clash with unforgiving ferocity. It is a travesty that, in the 21st century, we are still forced to defend the most basic of human dignities: the right to exist, to love, and to live authentically. The relentless onslaught of prejudice and bigotry faced by the LGBTQ community is not just a moral failing of society—it is a human rights crisis that demands radical and immediate action.

Let us be clear: the fight for LGBTQ rights is not a plea for special treatment; it is a demand for the recognition of humanity in its fullest, most vibrant form. Every day, millions of LGBTQ individuals are subjected to a brutal reality where their very existence is questioned, where their love is deemed unnatural, and where their identities are ridiculed or erased. This is not merely intolerance—it is a calculated assault on the dignity and worth of human beings.

The violence against the LGBTQ community is not always physical, though it often is. The cruelty takes many forms: the denial of healthcare, the refusal of housing, the exclusion from employment opportunities, and the relentless bullying that drives too many young people to despair. The legal system, which should serve as a bulwark against injustice, is too often weaponized to strip LGBTQ individuals of their rights and freedoms. We see this in the so-called "religious freedom" laws that serve as thinly veiled justifications for discrimination, in the bans on same-sex marriage that dehumanize love, and in the attacks on transgender rights that deny individuals the ability to live as their true selves. This hatred is not isolated; it is institutionalized, embedded in the very fabric of societies that claim to be free and fair. It is perpetuated by politicians who pander to the lowest common denominator, by religious leaders who preach exclusion rather than love, and by media that sensationalizes and stigmatizes the LGBTQ community. The consequences are dire: shattered lives, broken families, and, far too often, lives cut tragically short by suicide or hate-fueled violence.

But in the face of this relentless assault, the LGBTQ community rises, unbowed and unbroken. There is a fierce beauty in the resilience of those who refuse to be silenced, who march proudly in the streets, who love openly despite the risks, and who demand the same rights and freedoms that others take for granted. This struggle is not just about changing laws; it is about changing hearts and minds, about dismantling the systems of oppression that seek to erase the vibrancy of LGBTQ lives.

The battle for LGBTQ rights is far from over. It is a fight that demands unwavering solidarity, fierce activism, and, above all, love. Love for those who are different, love for those who are marginalized, and love for the idea that every human being has the right to live freely and authentically. It is time to embrace this struggle with the urgency and passion it deserves, to stand with the LGBTQ community not as allies but as warriors in a fight for the soul of humanity. We cannot afford to be complacent in the face of hatred; the stakes are too high, and the cost of inaction is too great. The time for half measures is over. The time for radical love and unyielding pride is now.

Please answer the following questions (where "0" is strongly disagree and "10" is strongly agree).

- The content of the article reflects my personal beliefs
- The article makes me feel anger
- The article makes me feel fear
- The article makes me feel joy
- The article makes me feel surprise
- The article makes me feel contempt
- The article makes me feel disgust
- The article makes me feel sadness

P.3 Tasks

In the second part of the study you are asked to perform three tasks that will affect your possible additional payment and the possible additional payment of another participant with whom you are randomly matched. In this section you may gain points that will be considered for the possible additional payment. Before each task, a detailed explanation of how to gain points will be provided.

Task 1

Instructions This task is about an exchange within a pair. You are randomly assigned to a pair with another participant. Neither of you knows the identity of the other participant and neither of you knows the choice of the other. Each of you is endowed with 100 points. You are asked to decide how many of your points you want to keep for yourself and how much you want to contribute to a joint account. You can choose to contribute any amount between 0 points and 100 points. Each of you has the same choice to make. All decisions are made in private and no one will learn about each other's decisions.
Your choice influences your own and the other participant's possible additional payment. Likewise, the other participant' choice influences your possible additional payment.
That is:

- The amount you keep simply remains in your possession: for every 1 point you keep, you will receive 1 point in payment
- The amount you and the other participant contribute to the joint account is summed up to a total amount. This total amount is multiplied by 1.5 and then equally split

among both of you. Thus, for every 1 point contributed to the group account by any group member, both group members (including you) receive 0.75 points.

Your payment is the sum of:

- the amount you keep
- + 0.75 * the total amount contributed to the joint account

Here, you can find three examples to help you understand how it works.
Example 1: You and the other participant do not contribute to the joint account (i.e. you both keep 100 points for yourselves).
Your payment is 100 points that is the sum of:

- 100 points: the amount you keep
- + 0 points: 0.75 * 0 (the total amount contributed to the joint account)

Example 2: You and the other participant contribute the entire amount to the joint account (i.e. you both contribute 100 points)
Your payment is 150 points that is the sum of:

- 0 points: the amount you keep
- + 150 points: 0.75 * 200 (the total amount contributed to the joint account)

Example 3: You and the other participant contribute half the amount to the joint account (i.e. you both contribute 50 points).
Your payment is 125 points that is the sum of:

- 50 points: the amount you keep
- + 75 points: 0.75 * 100 (the total amount contributed to the joint account)

The final amount after the exchange will be added to your possible additional payment.
Please decide how many of the 100 points you want to share in the joint account.

Task 2 (part 1)

Instructions
You are still paired with the same participant. This task is about dividing points between yourself and the other participant with whom you were randomly matched.
You have been assigned the role of the "allocator". The other participant is in the role of the "recipient". You are endowed with 100 points, the recipient is endowed with 0 points. You can secretly decide how many of your 100 points to transfer to the recipient. You can choose any amount between 0 points and 100 points.

The recipient receives the amount that you decide to transfer to him/her/them; you receive the amount that you decide not to transfer and thus keep. The amount you decide to keep will be accounted towards the possible additional payment.
Please decide how many of the 100 points you will keep for yourself.

Task 2 (part 2)

Instructions
You are still paired with the same participant. Now, you have been assigned the role of the "recipient". The other participant is endowed with 100 points and can secretly decide how much of his/her/their 100 points endowment to transfer to you. He/she/they can choose any amount between 0 points and 100 points. You will receive the amount of point he/she/they decides to give you.
You will be informed about the quantity if you will be selected among the winners of the additional payment.

Task 3

Instructions
You are still matched with the same participant. Both you and the other participant will receive an endowment of 100 points. You have to decide whether to destroy the other participant's points or to leave them as they are. Specifically, if you pay 1 point, you can destroy the other participant's points by any amount between 1 and 100 points (if you choose not to destroy the points of the other participant, you will not incur any cost). If you decide to destroy the other participant's points, his/her/their additional payment will be decreased by the point you chose to destroy.
The other participant will be asked to make the same choice regarding your points and will incur the same cost (1 point) if he/she/they chooses to reduce your points.
How many points of the other participant do you want to destroy?

P.4 Demographics of the other participant

Think now about the socio-demographic characteristics of the participant you have just interacted with, the one you were randomly matched with in the three previous economic decisions. What do you think are his/her/their characteristics.
What is his/her/their gender?

- Female
- Male
- Non-Binary / Third gender

What is his/her/their ethnicity?

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic and Latino
- Native Hawaiian or Pacific Islander
- White
- Other

What is his/her/their highest level of education?

- High School or lower
- Bachelor's Degree
- Master's Degree
- Doctorate or higher

Which of the following best describes the income of his/her/their household?

- 0$-20,000$
- 20,001$-40,000$
- 40,001$-60,000$
- 60,001$-80,000$
- 80,001$-100,000$
- More than 100,000$

What is his/her/their political orientation?

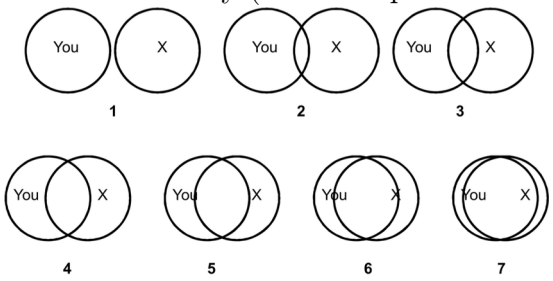
- Democrat
- Independent
- Republican

P.5 Expectations about the others

In the third part of the study you will find questions about your expectations concerning other participants' behavior in the previous three decisions . Before each question, you can read the instructions previously provided concerning each economic decision. In this section you may gain 100 points that will be added to your possible additional payment: if your expectations regarding other participants' behaviors match the average of their answers (or fall within a 10 points interval), you will be rewarded with 100 points[18]. How many points do you think the other participants have contributed to the joint account on average?
How many points do you think the other allocators have kept for themselves on average?
How many points do you think the other participants have destroyed on average?

IoS scale

The following scale measures your perceived closeness with the rest of American society. The greater is the overlap between the two circles, the closer you feel to the rest of American society (that is expressed with the X).



Choose the option that represents you:

P.6 In group perception

Consider the American society divided into two different groups. The two groups are called "in-group" and "out-group". An in-group is a social group to which a person psychologically identifies as being a member. By contrast, an out-group is a social group with which an individual does not identify.
How many people (as a percentage) do you believe belong to your in-group?

P.7 Demographics

What is your age?
What is your gender?

- Female

[18]I do not include the repetition of the instructions of the three tasks.

- Male
- Non-Binary / Third gender

What is your ethnicity?

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic and Latino
- Native Hawaiian or Pacific Islander
- White
- Other

What is your highest level of education?

- High School or lower
- Bachelor's Degree
- Master's Degree
- Doctorate or higher

Which of the following best describes the income of your household?

- 0$-20,000$
- 20,001$-40,000$
- 40,001$-60,000$
- 60,001$-80,000$
- 80,001$-100,000$
- More than 100,000$

P.8 Political view

Please, answer to the following questions related to your political orientation.
How do you consider yourself?

- Democrat
- Independent
- Republican

How do you identify your political view[19]?

P.9 Final part

We thank you for your time spent taking this survey.
Your response has been recorded.

[19]The answer is in a 7-points scale, with "1" is Liberal, "4" is Neutral, and "7" is Conservative.

First Impressions Matter: The Lasting Impact of Slanted Media on Attitudes

Joint with Federico Innocenti and Marco Minozzo

2.1 Introduction

Individuals learn from the information provided by the media, which frame events in their preferred way, engaging in partisan filtering and slanting. The content of information and its delivery shape individuals' attitudes.[1] In this paper, we use a field experiment to analyze the impact of information slant in shaping attitudes on several topics, digging into the mechanisms behind the media's effect on attitudes.

The influence of the media has potentially grown in the so-called "attention economy" (Simon, 1971). Limited attentive individuals — who process only partially the available information — tend to devote attention to like-minded media. This sorting, in turn, allows the media to personalize their content to their audience, fostering their persuasive power and facilitating the emergence of echo chambers (Innocenti, 2022). This theoretical mechanism creates an empirical challenge: to separate the effect of media reporting from news consumers' selection into different media audiences (that is, confirmation bias). See, for instance, Chopra et al. (2024). We overcame this challenge in our experiment by randomly allocating our experimental subjects to different slants. In other words, we focus on how information slant impacts attitudes, besides any bias that news consumers may have.

The primary goal of our analysis is to investigate whether slanted articles can change news consumers' attitudes. In particular, we study whether reading articles with either a positive or negative slant about a topic modifies consumers' attitudes toward the slant's intended direction. We also explore under which conditions the media can change attitudes. Notably, we test whether the novelty of a topic is a key aspect in determining the media's impact on attitudes. We also study whether the change in attitudes is anchored to the first impression about a novel topic.

Our investigation is based on a field experiment with students from the University of Verona. Our subjects enrolled in a thesis preparation course. In this course, we asked students to read news articles — selected from newspapers — covering different topics

[1]Scholars have documented this fact in many different domains, including, for instance, politics (DellaVigna and Kaplan, 2007; Gerber et al., 2009; Simonov et al., 2022), health behavior (Banerjee et al., 2019; Martinez-Bravo and Stegmann, 2022; Bursztyn et al., 2023b), fertility (Ferrara et al., 2012), violence (Yanagizawa-Drott, 2014), and migration (Djourelova, 2023; Couttenier et al., 2024; Keita et al., 2024).

for four weeks. Each article covers one topic and has either a positive or a negative perspective about the topic. We incentivized students to read these articles by linking their grades to the quality of their answers to weekly questionnaires about the articles. Each week, after reading the articles, students were also invited to answer a short survey to measure their attitudes towards the topics. We also run a follow-up survey, four weeks after the end of the experiment, to study the long-run effect of articles on attitudes.

Our field experiment consisted of two parts running concurrently. In the first part, students had to read two news articles each week, one on a known topic (*migration*) and the other on an unknown topic (*cultivated meat*). For each topic, we randomly assigned students to either a positive or a negative treatment. In other words, for each topic, students read four articles, one each week, all with the same slant, either positive or negative. In the second part, students had to read four news articles each week, each article covering a different unknown topic (*geoengineering, space colonization, baby banks,* and *the use of sand for building infrastructures*). In the first two weeks, all students received the same articles. These covered the four topics and had different slants. During the third week, for each topic, we randomly assigned half the students to read articles with a positive slant and the other half to read articles with a negative slant. The same occurred in the fourth week. Overall, considering all possible slant combinations, we have sixteen different treatments.

Our experiment yielded several results. In the first part of the experiment, we find that newspaper exposure changes students' attitudes in the desired direction: those reading positively (negatively) slanted articles increase (decrease) their attitudes. Moreover, the effect of information provision is significantly stronger for the unknown topic (cultivated meat) than the known one (migration). The treatment effect decreases over time, but is still significant in the follow-up survey for cultivated meat. We interpret our results as follows. The incremental effect of a news article on attitudes depends on the degree of previous news exposure. Migration receives constant attention from Italian media and politicians. Instead, cultivated meat is a relatively new and poorly known topic. In other words, media are more important in forming attitudes than changing them. Our results may explain why news consumers value novelty and why media are eager to provide scoops.

In the second part of the experiment, we focus only on unknown topics. We find that the first impression about a topic (that is, the update in attitudes about an unknown topic after reading the first article about it) is a good predictor of the overall effect that information provision during our experiment has on the final attitudes. Moreover, we find that information provision, by shaping attitudes about topics, also shapes topic-related investments. In particular, providing positively slanted information about a topic fosters investments in firms operating in topic-related sectors. These results highlight the importance of attitudes for economic decisions, as well as the persistence of attitudes as shaped by the first impression, which poses both opportunities and challenges for the media.

Our results offer valuable insights for scholars and policy-makers. We highlight that news novelty is not just essential to attract demand, but it also affects the ability of media

to persuade, that is, to shape news consumers' attitudes. Our results suggest that news provision on a topic serves two purposes: initially, it helps news consumers to form an impression about the topic, which becomes a reference point for later information processing; later, it helps to refine this impression and keep it alive in the news consumers' memory. Our findings help scholars to refine their understanding of the media's optimal reporting strategies and inform policy-makers about the importance of the first impression when communicating. During the recent COVID-19 pandemic, conspiracy theorists and fake news providers were considerably faster than governments and health institutions in creating a narrative. Delays in communication may have played a role in consolidating false knowledge about COVID-19 in public opinion. Therefore, just as the media compete to be the first to communicate a scoop, institutions should organize themselves to be ready to communicate with the population at any moment, as this may crucially shape attitudes for a long time.

Related literature. Our paper contributes to two strands of literature. First, we contribute to the vast experimental literature studying the effects of information provision. For instance, this literature has investigated how to correct misperceptions (that is, wrong beliefs) by providing statistical information (Hopkins et al., 2019; Grigorieff et al., 2020; Facchini et al., 2022; Alesina et al., 2023; Manzoni et al., 2024) or fact-checking (Barrera et al., 2020). We highlight that the incremental effect of information on attitudes depends on the receivers' prior knowledge and attitudes. In other words, prevention is better than cure: correcting attitudes is difficult once these have been shaped (as highlighted by the literature, featuring interventions on well-known topics). Instead, information intervention with correct information on unknown topics (for instance, supporting the dissemination of new scientific discoveries) could be more effective. To the best of our knowledge, we are the first to study the causal impact of information on the formation of attitudes towards unknown topics.

Second, we contribute by applying a new methodology to the study of the media's impact on attitudes. Many studies have used observational research designs to study attitude change (Abelson et al., 1982; Rahn et al., 1994). The primary problem is the risk of observing correlation instead of causation. Other studies have used an observational design with a repeated cross-sectional analysis measuring attitudes before and after a naturally occurring event (Krosnick et al., 2000; Huber and Arceneaux, 2007). Conclusions about causality are threatened by the possibility that a different event other than the one of interest might have led or affected the attitude change. Other studies, such as DellaVigna and Kaplan (2007), have employed a quasi-experimental approach based on geographic variations. However, geographic variation lacks full randomization and assumes media exposure based on availability rather than actual consumption. Lastly, lab-based experiments (Nelson et al., 1997; Chong and Druckman, 2007; Lecheler and De Vreese, 2010; Koivula et al., 2024) are, by construction, artificial and may suffer experimental demand biases. On the contrary, our study provides a methodological contribution by us-

ing a randomized control trial. Randomization ensures that treatments are comparable, eliminating concerns about self-selection and confounding factors.

We organize the rest of this paper as follows. Section 2.2 describes the design of the experiment. Section 2.3 presents the results from our experiment. Section 2.4 explores the economic implications of our results. Section 2.5 concludes. The appendices include additional results and details about the experiment.

2.2 Experimental design

This section presents our experimental design and describes how we implemented it.[2] The experiment lasted four weeks during the spring semester of 2025. Our subjects were 121 students from the University of Verona, out of 206 who enrolled in a thesis preparation course. As part of this course, we asked students to read newspaper articles covering different topics and supplying either a positive or a negative perspective about a topic.[3] Each week, students read an article for each topic and answered a questionnaire, containing a question for each article. After reading the articles, students were invited to answer a short survey to collect their attitudes towards these topics.[4] To ensure that students read the articles (that is, received the treatment) before answering the survey, we emailed them the invitation link of the survey only after they answered the questionnaire. Lastly, students were invited to answer a follow-up survey a month after the end of the experiment. The experiment consisted of two parts running concurrently.

First part. We pre-registered this part of the experiment with As.Predicted (registration number #213204). For four weeks, students read two articles per week, one for each of two different topics: *migration* and *cultivated meat*. These topics received different attention from the media. Migration is a topic discussed daily in the Italian media, whereas cultivated meat is rarely discussed. We randomly assigned students to either a positive or a negative treatment. In particular, half the students read positive articles about cultivated meat and migration (positive treatment). The remaining students read negative articles for both topics (negative treatment).

We use the first part of the experiment to assess whether the incremental effect of information provision on attitudes depends on the topic characteristics and the news slant (either positive or negative), and to evaluate the marginal effect of providing an additional piece of news on attitudes. In particular, we test three different hypotheses:

H1: The effect of reading newspaper articles on attitudes is stronger for unknown than known topics.

[2]This study received ethical approval from the German Association for Experimental Economic Research (Certificate No. d4fM7aRy).

[3]In Appendix O, we describe the procedure followed for selecting topics and articles.

[4]We also conducted an ex-ante survey to measure students' attitudes and knowledge of the topics before the beginning of the experiment.

H2: The direction of the effect of reading newspaper articles on attitudes depends on the articles' slant.

H3: Attitudes are an increasing (decreasing) and concave function of the number of articles read when the slant of the articles is positive (negative).

The chosen design allows us to test these hypotheses. In particular, we chose to deliver newspaper articles on migration and cultivated meat as proxies of the attitudes' response to exposure to information about known versus unknown topics. Moreover, by designing two treatments where students receive articles with either a positive or a negative slant, we are able to determine whether slant affects the effect of newspaper exposure on attitudes. Finally, we can also measure the marginal effect of providing an additional newspaper article on attitude formation, reflecting the learning process of individuals.

Second part. We pre-registered this part of the experiment with As.Predicted (registration number #213211). For four weeks, students read four articles per week, each article covering a different unknown topic: *geoengineering, space colonization, baby banks,* and *the use of sand for building infrastructures*. In the first two weeks, all students received the same articles for each topic, but we varied the slant across topics.[5] During the third week, half the students read articles with positive slants and half with negative slants, randomly allocated for each topic. The same occurred in the fourth week. This leads to 16 different sub-treatments (that is, four different combinations of articles' slants for each topic), which we summarize in Table 2.1. Each student received a treatment consisting of four sub-treatments, one for each topic.

We use the second part of the experiment to verify the existence of a priming effect of the first impression on attitudes about unknown topics, and whether providing articles with conflicting slants can alter this effect. In particular, we test the following hypothesis.

H4: The slant of the first article read affects the direction of the aggregate change in attitudes.

We chose the design described in Table 2.1 for multiple reasons. First, including four different topics increases external validity, as it ensures that the results do not derive from a specific characteristic of a single topic or from a treatment with unique features. Furthermore, since we had to focus on unfamiliar issues, identifying a larger number of truly unknown topics proved challenging. Lastly, including a higher number of articles would have reduced students' attention, potentially compromising the quality of the treatment. To this end, we implemented 16 different sub-treatments, corresponding to all possible combinations of positive and negative slants across the four weekly articles. In fact, this approach allowed us to systematically vary not only the overall balance of slants but also

[5]In particular, students received two positive articles for geoengineering, two negative articles for space colonization, a positive article followed by a negative one for baby banks, and a negative article followed by a positive one for the use of sand for building infrastructures.

GeoEng 1	PPPP	BB 1	PNPP	Sand 1	NPPP	Space 1	NNPP
GeoEng 2	PPPN	BB 2	PNPN	Sand 2	NPPN	Space 2	NNPN
GeoEng 3	PPNP	BB 3	PNNP	Sand 3	NPNP	Space 3	NNNP
GeoEng 4	PPNN	BB 4	PNNN	Sand 4	NPNN	Space 4	NNNN

Table 2.1: List of sub-treatments, that is, all combinations of articles' slants for each topic. For each sub-treatment, each letter represents the slant of one article: "P" represents a positive article, whereas "N" represents a negative article. The first letter represents the slant of the first week's article, the second letter the slant of the second week's article, and so on. "GeoEng" represents a sub-treatment for geoengineering, "BB" represents a sub-treatment for baby banks, "Sand" represents a sub-treatment for the use of sand for building infrastructures, and "Space" represents a sub-treatment for space colonization. Each student received four sub-treatments, one for each topic. For instance, a student received GeoEng 1 (only positively slanted articles about geoengineering), BB 2 (alternated positively and negatively slanted articles about baby banks), Sand 2 (one positively slanted article, then two negatively slanted articles and then again a positively slanted article about the use of sand for building infrastructures) and Space 4 (only negatively slanted articles about space colonization).

the order in which students encountered different slants. As a result, some students read four positively slanted articles, others four negatively slanted ones, while other students were exposed to mixed sequences of the positive and negative slanted articles. This structure ensures that our findings are not driven by a specific sequence or proportion of slanted articles, but instead robustly capture the influence of the first impression in shaping final attitudes.

Survey. Students answered a total of six surveys: an ex-ante survey, four surveys during the experiment, and a follow-up survey. In each survey, we measured students' attitudes towards 12 topics, including those relevant for our experiment.[6] In particular, we asked the following question for each topic, randomizing the order of the topics:

> How much are you in favour of *this topic*? Answer with a number from 1 (Extremely against) to 10 (Extremely in favour).

The question entails a positive framing (that is, the word "favour"). This framing is not a problem since it is the same for all treatments. We collected additional information, but only in some surveys. Indeed, having multiple questions in each survey helps us to avoid the concern of experimental demand effects that may arise if only the attitude questions were presented. In particular,

1. In the ex-ante survey, in the fourth week at the end of the experiment, and in the follow-up survey, we collected students' self-reported knowledge about each topic. In particular, we asked the following question for each topic:

   > How knowledgeable are you about *this topic*? Answer with a number from 1 (No knowledge) to 10 (Full knowledge)

[6]The list of topics is in Appendix O.

2. We collected some socio-demographic information about the students in the ex-ante survey: gender, field of study, and wealth.[7] During the experiment, we also collected information about students' trust in others and preferences for news providers, as additional control variables. We assumed that all these variables were stable in the experimental period and asked them only once.

3. During the experiment, we measured students' investment. We use the answers to the question to get insights into the economic impact of the media's effect on attitudes.

Finally, we disseminated the surveys with attention checks, particularly to detect whether the answers to the attitude questions were decided at random. Students' answers were anonymous. In each survey, students had to insert an alpha-numeric identifier based on their personal information. This allowed us to match answers from different surveys while ensuring each student's identity was protected. All the details about the surveys are in Appendix Q. We run all the surveys using LimeSurvey.

Thesis preparation course. We embodied our experiment in an online thesis preparation course. The course was open to all students of the University of Verona. It awarded three university credits and lasted a semester, which included the four weeks of our experiment. The course consisted of recorded lessons about collecting and analyzing data and writing a thesis. The primary activity students had to perform during the course was reading six newspaper articles per week. We shaped this activity to serve as our experimental treatment. In particular, during the weeks devoted to the experiment, students read one article for each of the six topics considered for the experiment. We incentivized students to read articles using grades. In particular, we prepared a graded questionnaire where students had to answer one question for each article they read. Questions were related to summarizing the content of the articles and commenting on their structure, strengths, and weaknesses. Questions were open text, with a minimum required length of 120–150 words. We designed the questions (and the course itself) to nudge students to read and evaluate the information carefully as part of the training for writing their thesis. Students had to meet a minimum grade on the questionnaires to pass the course. Questionnaires were sent out weekly for the duration of the experiment. The questionnaires accounted for 60% of the final evaluation of the thesis preparation course. During each week of the experiment, we followed a specific and constant procedure:

1. On Monday, we uploaded to the course web page the six newspaper articles students had to read during the week.

2. From Monday to Thursday, students had the opportunity to read the articles and fill in the weekly questionnaire.

[7] We also asked age, education, employment, and geographical questions. However, the participants in our experiment were quite homogeneous in this respect, all being students at the University of Verona.

3. From Friday to Sunday, students received an invitation to complete the weekly survey. To ensure that students read the articles before answering the survey, we emailed the invitation link for the survey to each student only after they answered the questionnaire.

Additionally, to incentivize students to participate in our experiment, we awarded a bonus to the grade (up to 15% of the final evaluation) for those answering the surveys within a few days after reading the articles.

Discussion. Arguably, our experiment could be conducted with a different design, for instance, in a standard laboratory experiment. The main advantage of our setting is twofold. On the one hand, we can collect students' attitudes in six different moments and, thus, perform a within-subject analysis that grants higher statistical power, allows us to study long-run effects, and its internal validity does not depend on random assignment (Charness et al., 2012). Significant challenges of collecting data from the same participants over time are a high dropout rate and dropouts that happen endogenously, which could jeopardize the internal validity of the experiment (Zhou and Fishbach, 2016). In our experiment, the dropout rate is significantly lower than in different settings. Moreover, our dropouts are probably related to the thesis preparation course rather than the experiment (thus, avoiding self-selection in the experiment). On the other hand, our setting is significantly less artificial than competing ones. In particular, we can be sure that students read the articles carefully since their evaluation in the thesis preparation course depended on their questionnaire answers.

2.3 Results

In this section, we describe the results of our experiment. The final sample consists of 121 students. From the initial sample of 206 students, we discarded 85 students for the following reasons:

1. 38 students left the course or did not complete at least one survey;

2. 24 students failed at least one attention check;

3. 35 students inserted different identifiers across surveys, preventing the matching of their answers over time;

4. 3 students did not consent to store and use their answers to at least one survey.

We excluded students who belong to at least one of the previous categories. We use the data collected from this final sample to test our hypotheses. We also collected answers from 108 out of 121 students in the follow-up survey.

2.3.1 First part

In the first part of the experiment, we investigate how the effect of information provision on attitudes depends on the topic novelty (known versus unknown), the news slant (positive versus negative), and the number of articles read.

We denote with a_{its} the attitude of student i toward topic t after reading s articles about such topic. We define V_{it} as the variation in the attitude of student i toward topic t from the beginning to the end of our experiment.[8] Formally,

$$V_{it} = a_{it4} - a_{it0},$$

where a_{it4} is the attitude of student i toward topic t at the end of the experiment (fourth weekly survey), whereas a_{it0} is the attitude of student i toward topic t before the experiment (ex-ante survey).

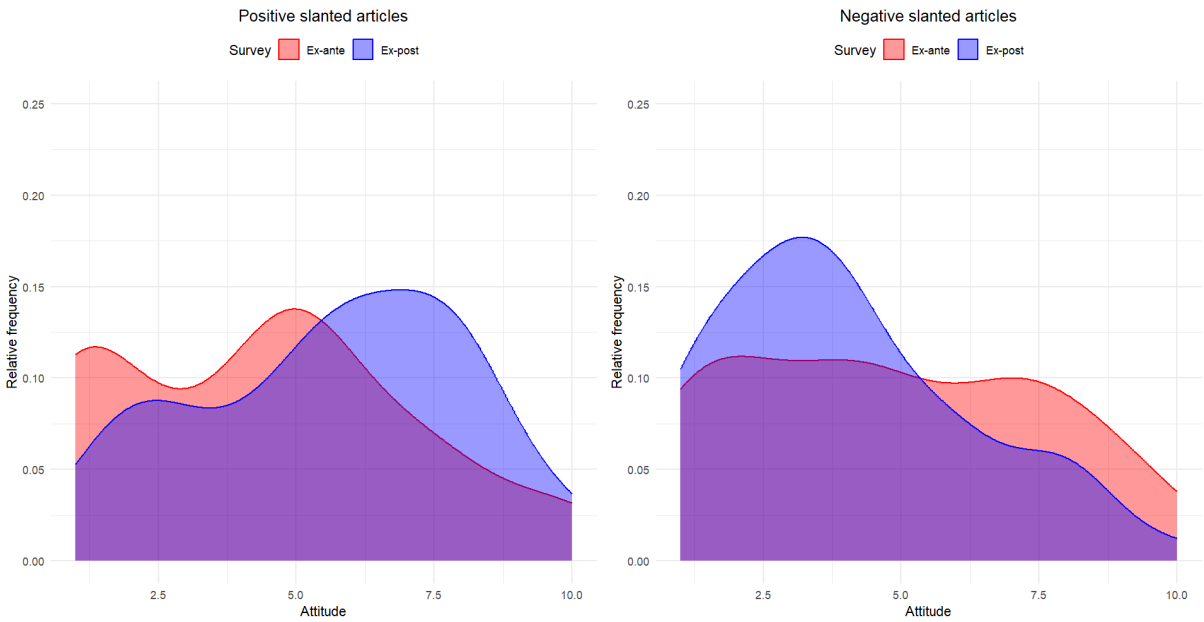


Figure 2.1: Treatment effect on attitudes for cultivated meat. Comparison of the distributions of attitudes before and after the experiment. The red area represents the distribution before the experiment, whereas the blue area represents the distribution at the end of the experiment. The left panel corresponds to the positive treatment, whereas the right panel corresponds to the negative treatment.

An initial descriptive analysis shows that the novelty of a topic is a key factor in determining the impact of information provision on attitudes. Figure 2.1 and Figure 2.2

[8] An alternative measure could be the relative variation in the attitude of student i toward topic t from the beginning to the end of our experiment, that is, v_{it}. Formally,

$$v_{it} = \frac{a_{it4} - a_{it0}}{a_{it0}}.$$

We opted to use the variation V_{it} rather than the relative variation v_{it} because the latter introduces an undesirable asymmetry; identical shifts in attitudes appear as more substantial for students with low initial attitudes compared to those with high initial attitudes, potentially biasing the interpretation of the coefficients.

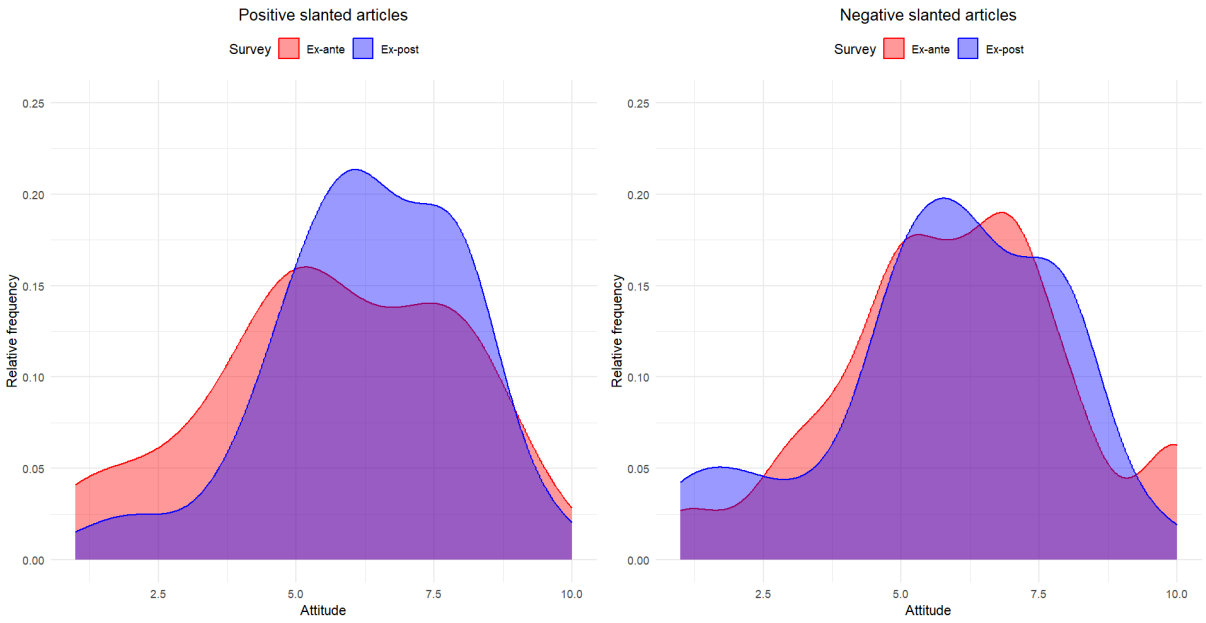


Figure 2.2: Treatment effect on attitudes for migration. Comparison of the distributions of attitudes before and after the experiment. The red area represents the distribution before the experiment, whereas the blue area represents the distribution at the end of the experiment. The left panel corresponds to the positive treatment, whereas the right panel corresponds to the negative treatment.

show that our treatment is more effective for the unknown topic (cultivated meat) than for the known topic (migration). Attitudes move in the expected direction: those receiving the positive (negative) treatment show higher (lower) attitudes ex-post. These changes are more pronounced for cultivated meat, as said before. However, the effects of the two treatments (positive or negative slant) are different. In particular, the positive treatment seems to be, to some extent, more effective than the negative treatment, for both topics. We conjecture that this may be a consequence of the fact that news coverage about these topics (as well as others) displays a majority of articles with a negative slant. Thus, articles with a positive slant, which are rarer, tend to be more effective.

Figure 2.3 confirms the different effect of the two slants, for the case of cultivated meat.[9] It shows, for each slant, the means and the 95% confidence intervals of the cumulative variation in attitudes $a_{its} - a_{it0}$, for $s = 1, 2, 3, 4$. Following our treatment, students who read positively slanted articles increased, on average, their attitude towards cultivated meat by 1.2 points, while those reading negatively slanted articles decreased, on average, their attitude towards cultivated meat by 0.8 points.

	Positive slant	Negative slant
Cultivated meat	$2.526 \cdot 10^{-5}$	0.02543
Migration	0.008206	0.4096

Table 2.2: T-test (p-values) for $H_0 : V_t = 0$ against $H_1 : V_t \neq 0$, for each combination of topic (rows) and slant (columns).

[9]The figure for migration is reported in the Appendix (Figure 2.9).

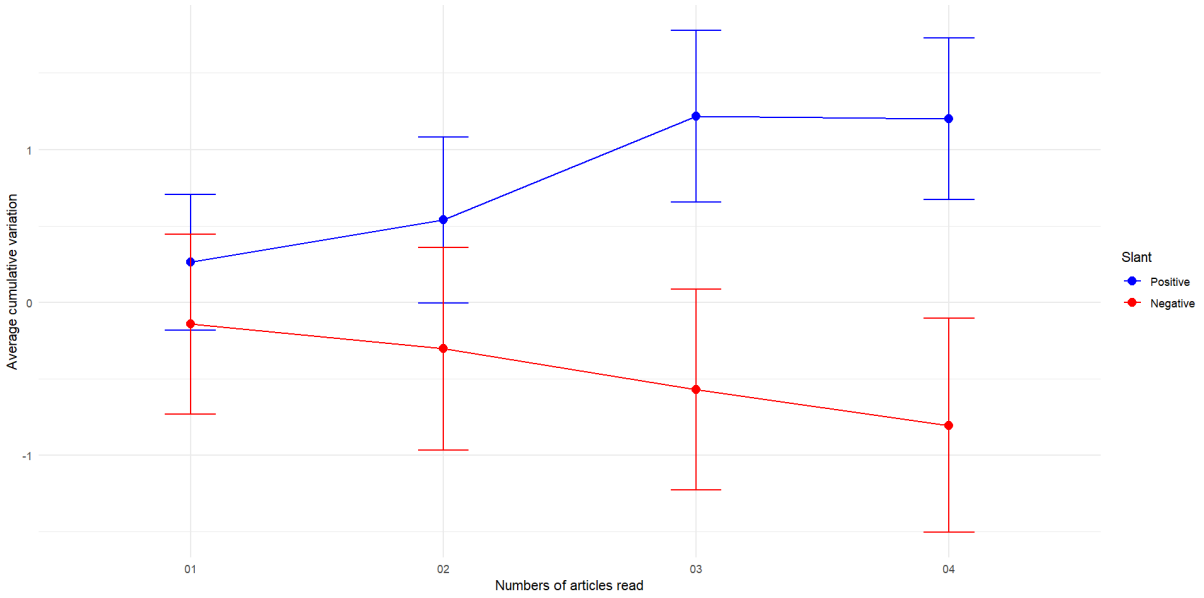


Figure 2.3: Means and confidence intervals (95%) of the cumulative variation of attitudes for the positive (blue) and negative (red) treatments, respectively, for cultivated meat over the four weeks of the experiment.

Table 2.2 shows that both treatments change attitudes toward cultivated meat, whereas only the positive treatment changes attitudes about migration, confirming our previous claims.

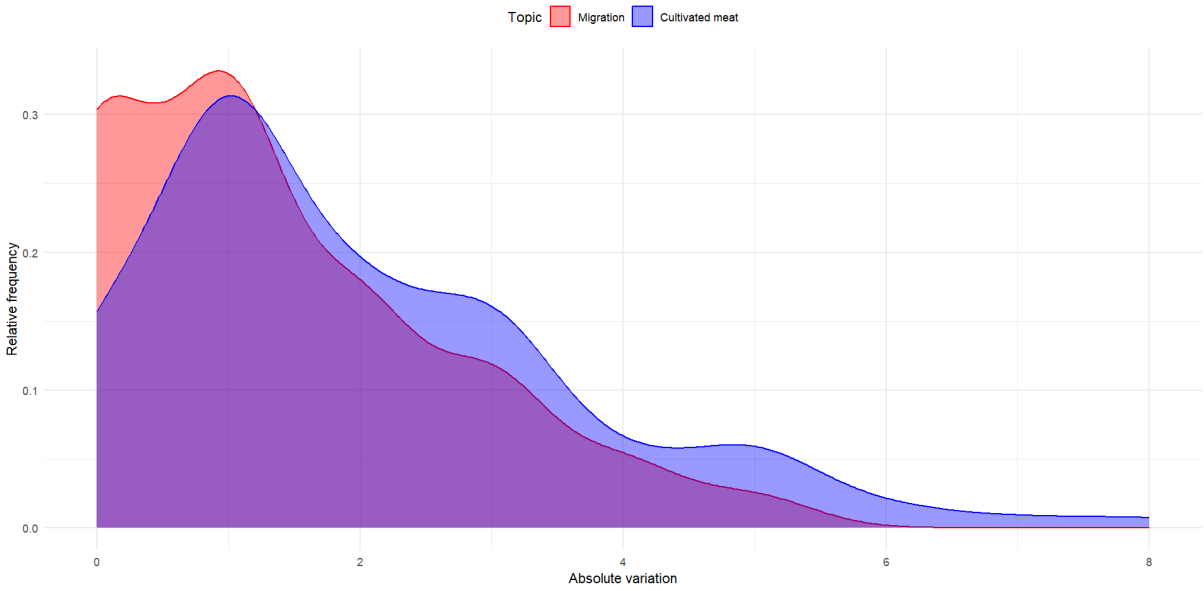


Figure 2.4: Distribution of $|V_t|$. The blue area represents the distribution for the unknown topic (cultivated meat), whereas the red area represents the distribution for the known topic (migration).

Figure 2.4 reports the distribution of the absolute value of the variation in attitudes, $|V_t|$, for each topic, merging positive and negative treatments. This figure confirms the role of novelty. The known topic, migration, has a peak around zero. In comparison, the

unknown topic, cultivated meat, has a smaller peak around zero and a thicker right tail, highlighting a more significant variation in students' attitudes.

Hypothesis 1. Following the insights from Figure 2.4, we test whether our treatment — reading four articles with the same slant, either positive or negative — has a more substantial impact on attitudes for unknown rather than known topics. To this end, we estimate the following equation:

$$|V_{it}| = \beta \cdot \text{Meat}_{it} + \mathbf{X}'_{it}\boldsymbol{\gamma} + \varepsilon_{it}. \tag{2.1}$$

Our coefficient of interest is β, representing the differential effect of our treatment when the news articles students read concern an unknown topic (cultivated meat) relative to a known one (migration). Here, Meat_{it} is a dummy variable equal to 1 if topic t is cultivated meat and 0 if it is migration, $\mathbf{X}_{it}$ is a vector of individual-level control variables, $\boldsymbol{\gamma}$ is the associated vector of coefficients, and ε_{it} is the error term. $\mathbf{X}_{it}$ includes the prior knowledge about each topic t, which was self-reported in the ex-ante survey, an index of trust, and demographic variables such as gender, self-reported wealth, field of study, and preferences for news providers.

	Model 1	Model 2	Model 3
Meat	0.645***	0.667***	0.691***
	(0.191)	(0.199)	(0.200)
Constant	1.331***	1.023***	1.479***
	(0.135)	(0.284)	(0.543)
Prior knowledge and Trust		✓	✓
Demographics			✓
Observations	242	242	242
R^2	0.045	0.059	0.072
Adjusted R^2	0.041	0.047	0.036
Note:		*p<0.1; **p<0.05; ***p<0.01	

Table 2.3: Effect of information provision about known versus unknown topics on $|V|$. We estimate three model specifications: (1) with no control variables; (2) with prior knowledge and trust; (3) with prior knowledge, trust, and demographics.

Table 2.3 shows the results of the estimation of Equation (2.1). The coefficient of the dummy variable Meat is statistically significant in all specifications, indicating that $|V|$ — the absolute value of the variation in attitudes — is significantly different between the unknown topic (cultivated meat) and the known one (migration). In particular, the exposure to information about the unknown topic leads to a greater shift (0.691***) in

attitudes compared to the known one. Notably, the inclusion of prior knowledge, trust, and demographic variables does not change the results.

Hypothesis 2. Now, we test whether the slant of the articles read (our treatment) determines the direction of the observed change in attitudes. In particular, we estimate the following equation:

$$V_{it} = \beta \cdot \text{Positive}_{it} + \mathbf{X}'_{it}\boldsymbol{\gamma} + \varepsilon_{it}. \tag{2.2}$$

Positive_{it} is a dummy variable equal to 1 if student i receives the positive treatment and 0 if the student receives the negative treatment. Thus, our coefficient of interest, β, represents the differential effect of positively slanted articles compared to negatively slanted articles on attitudes.

	Model 1	Model 2	Model 3
Positive	1.422***	1.420***	1.415***
	(0.273)	(0.274)	(0.277)
Constant	−0.491**	−0.261	0.231
	(0.200)	(0.375)	(0.761)
Prior knowledge and Trust		✓	✓
Demographics			✓
Observations	242	242	242
R^2	0.102	0.104	0.136
Adjusted R^2	0.098	0.093	0.103
Note:		*p<0.1; **p<0.05; ***p<0.01	

Table 2.4: Effect of information provision with positive versus negative slant on V. We estimate three model specifications: (1) with no control variables; (2) with prior knowledge and trust; (3) with prior knowledge, trust, and demographics.

Table 2.4 shows the results of the estimation of (2.2). The coefficient of the dummy variable Positive is statistically significant in all model specifications, indicating that there is a significantly different variation in attitudes between students who read positively slanted articles and those who read negatively slanted articles. Specifically, students who read positively slanted articles experience significantly more positive variations on their attitudes (1.415***) compared to those who read negatively slanted articles. Table 2.12 in Appendix P.1 shows that this conclusion holds even when taking into account the differences across topics.

Hypothesis 3. Finally, we test whether the relationship between newspaper exposure and variation in attitudes is increasing (decreasing) and concave when the news slant is positive (negative). Analysing Figure 2.3, we observe that attitudes move in the desired

direction and the relationship seems concave, at least for the positive treatment. We verify these conjectures by studying the impact of reading one extra article on attitudes using a quadratic function of the number of articles already read. Formally, we estimate the following equation:

$$a_{its} = \alpha + \beta_1 S_{its} + \beta_2 S_{its}^2 + \mathbf{X}'_{its}\boldsymbol{\gamma} + \varepsilon_{its}, \tag{2.3}$$

where S_{its} is the number of articles read and a_{its} is the attitude of student i toward topic t after reading s articles. Note that S_{its}^2 captures potential non-linear effects. Our coefficients of interest are β_1, representing whether the relationship is increasing or decreasing (which should depend on the treatment considered), and β_2, representing whether the relationship is concave or convex. We focus on cultivated meat and leave the analysis for migration to Appendix P.2. We estimate Equation (2.3) separately for the positive and negative treatments, to isolate the different effects that our treatments have on attitudes.

	Model 1	Model 2	Model 3	Model 4
Articles read (S)	0.335**	0.379	0.379	0.379
	(0.103)	(0.363)	(0.337)	(0.322)
S^2		−0.011	−0.011	−0.011
		(0.087)	(0.081)	(0.077)
Constant	4.372***	4.350***	2.560***	0.693
	(0.252)	(0.307)	(0.382)	(0.777)
Prior knowledge and Trust			✓	✓
Demographics				✓
Observations	325	325	325	325
R^2	0.032	0.032	0.172	0.258
Adjusted R^2	0.029	0.026	0.161	0.234
Note:			*p<0.05; **p<0.01; ***p<0.001	

Table 2.5: Effect of reading an additional newspaper article (S) with a positive slant on the attitudes about cultivated meat. We estimate four model specifications: (1) linear relationship; (2) quadratic relationship; (3) quadratic relationship with control variables for prior knowledge and trust; (4) quadratic relationship with control variables for prior knowledge, trust, and demographics.

Tables 2.5 and 2.6 report the results of the estimation of Equation (2.3) for the positive and negative treatments, respectively, for cultivated meat. Table 2.5 shows that for those students who read positively slanted articles, their attitudes are increasing, that is, $\beta_1 > 0$, in the number of articles read S. Similarly, Table 2.6 shows that for those students who read negatively slanted articles, their attitudes are decreasing, that is, $\beta_1 < 0$, in S.

	Model 1	Model 2	Model 3	Model 4
Articles read (S)	-0.204^{*}	-0.122	-0.122	-0.122
	(0.103)	(0.365)	(0.333)	(0.317)
S^2		-0.020	-0.020	-0.020
		(0.088)	(0.080)	(0.076)
Constant	4.811^{***}	4.770^{***}	2.306^{***}	1.921^{**}
	(0.253)	(0.308)	(0.430)	(0.701)
Prior knowledge and Trust			✓	✓
Demographics				✓
Observations	280	280	280	280
R^2	0.014	0.014	0.185	0.276
Adjusted R^2	0.010	0.007	0.173	0.249
Note:			*p<0.05; **p<0.01; ***p<0.001	

Table 2.6: Effect of reading an additional newspaper article (S) with a negative slant on the attitudes about cultivated meat. We estimate four model specifications: (1) linear relationship; (2) quadratic relationship; (3) quadratic relationship with control variables for prior knowledge and trust; (4) quadratic relationship with control variables for prior knowledge, trust, and demographics.

In both tables, the coefficient of the quadratic component, β_2, is negative, indicating concavity, but not statistically different from zero. We believe that our setup is not sufficiently clean to capture the effect. Indeed, different articles may have the same slant but different intensities. Furthermore, some students may already have been exposed prior to our experiments to news related to cultivated meat or may have received additional information outside of our treatment. The concavity coefficient may become significant when considering a larger number of articles and participants.

Long-run effect. Lastly, we analyze how students' attitudes evolved in the follow-up survey, conducted four weeks after the end of the experiment.

Figure 2.5 shows that our treatments have shaped students' attitudes about cultivated meat in a persistent way over time. We find that the treatment effects become slightly weaker with time, but even in the long run, there is a statistically significant difference in attitudes between the positive and negative treatments for cultivated meat.

2.3.2 Second Part

In the second part of the experiment, we focus on unknown topics and investigate whether the slant of the first article read shapes the attitudes students have at the end of the information provision embodied in our experiment.

Figure 2.5: Long run treatment effect on attitudes, for each topic and slant. The red area represents the distribution of attitude before the experiment, that is, a_0; the blue area represents the distribution of attitude at the end of the experiment, that is, a_4; and the green area represents the distribution of attitude four weeks after the end of the experiment.

To study whether students are anchored to their first impression about an unknown topic, we test whether the change in their attitudes after reading the first article, that is, $a_1 - a_0$, predicts their final change in attitudes, that is, V, across students and topics. As a preliminary analysis, Table 2.7 shows that V is highly correlated with $a_1 - a_0$, whereas it displays a weak correlation with subsequent changes in attitudes. Consistently, Figure 2.6 illustrates the joint distribution of $a_1 - a_0$ and V. The regression line suggests a positive linear association between $a_1 - a_0$ and V, indicating that students' final change in attitudes following our experiment is consistent with the variation in attitudes observed during the first week, that is, their first impression about the analyzed unknown topics.

Variation in attitudes	$a_1 - a_0$	$a_2 - a_1$	$a_3 - a_2$	$a_4 - a_3$	V
$a_1 - a_0$	1				
$a_2 - a_1$	−0.38	1			
$a_3 - a_2$	0.02	−0.33	1		
$a_4 - a_3$	−0.11	0.002	−0.48	1	
V	0.68	0.17	0.11	0.18	1

Table 2.7: Correlation between the total variation in attitudes V and the weekly variation in attitudes $a_s - a_{s-1}$ in each week s, aggregated over all topics.

Hypothesis 4. Following the suggestions from Table 2.7 and Figure 2.6, we verify whether the change in attitudes after reading the first article during the first week of

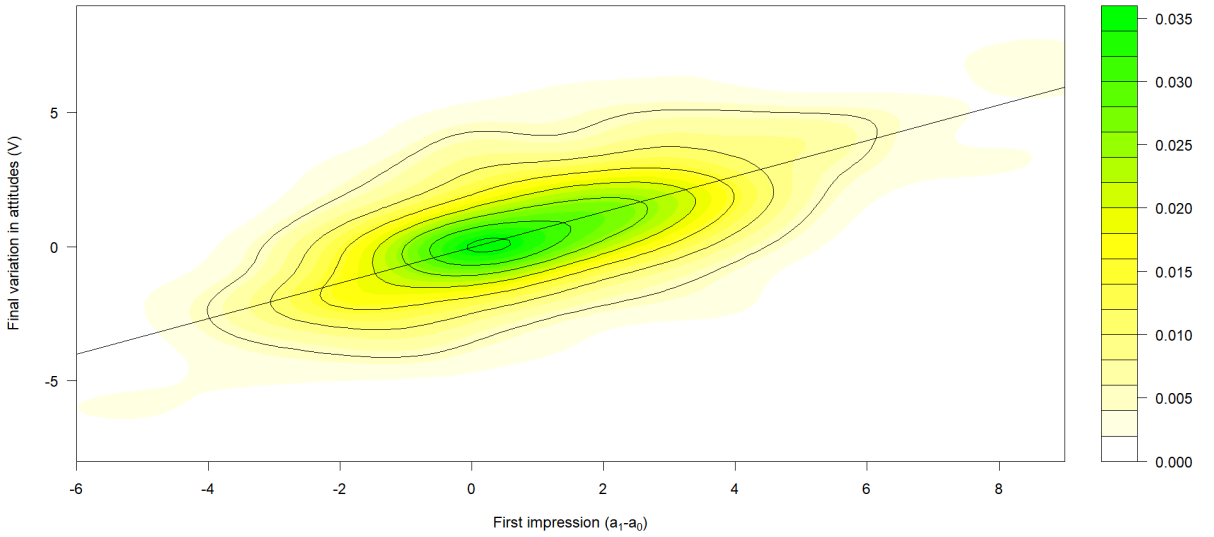


Figure 2.6: Joint distribution and linear relationship between $a_1 - a_0$ and V. The contour lines represent the joint relative frequencies of the first impression and the final variation in attitudes. The black line depicts the equation $V = -0.02 + 0.66 \cdot (a_1 - a_0)$, which is the best-fit linear regression.

the experiment (that is, the first impression) predicts the overall change in attitudes. Formally, we estimate the following equation:

$$V_{it} = \alpha + \beta(a_{it1} - a_{it0}) + \mathbf{X}'_{it}\boldsymbol{\gamma} + \varepsilon_{it}, \tag{2.4}$$

where, for each topic t and student i, $(a_{it1} - a_{it0})$ is the change in attitudes following the first impression about the topic. Our coefficient of interest is β, representing how the initial (that is, after reading the first article) change in attitudes impacts the final change in attitudes, that is, V_{it}. In other words, it represents the anchoring of students' attitudes to their first impression about a topic.
Table 2.17 in Appendix P.4 shows that the anchoring to the first impression exists independently of the first article's slant.

Table 2.8 shows the results of the estimation of Equation (2.4). A positive (negative) first impression, namely an increase (decrease) of one in the support for a given topic, is associated with a significant increase (decrease) in the attitudes toward such a topic at the end of the experiment. These effects are persistent in all model specifications where topics, as well as individual characteristics such as knowledge, trust, demographic variables, and the number of positive articles read, are considered. The key insight is that students form their attitudes with the first piece of news when confronting unknown topics. Although Bayesian agents should update their attitudes after processing each piece of news, in our experiment, students seemed anchored to their initial update. In other words, our data shows that students somehow refuse to update after reading articles subsequent to the first.

	Model 1	Model 2	Model 3	Model 4	Model 5
First impression $(a_1 - a_0)$	0.663***	0.720***	0.701***	0.697***	0.695***
	(0.033)	(0.035)	(0.035)	(0.036)	(0.036)
Constant	−0.025	−0.659***	−0.293	−0.197	−0.810
	(0.100)	(0.205)	(0.258)	(0.530)	(0.582)
Topics		✓	✓	✓	✓
Prior knowledge and Trust			✓	✓	✓
Demographics				✓	✓
Number of positive articles					✓
Observations	484	484	484	484	484
R^2	0.458	0.479	0.491	0.496	0.502
Adjusted R^2	0.457	0.475	0.485	0.483	0.488
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 2.8: The effect of the first impression on the variation in attitudes. We estimate five model specifications: (1) no control variables; (2) with topics; (3) with topics, prior knowledge and trust; (4) with topics, prior knowledge, trust, and demographics; (5) with topics, prior knowledge, trust, demographics, and number of positive articles read by students.

Long-run effect In Appendix P.3, we repeat the analysis considering the variation in attitudes from the ex-ante survey to the follow-up survey (that is, four weeks after the end of the experiment). We find that the anchoring to the first impression is persistent over time.

2.4 Economic Implications

In this section, we discuss how our results about attitude formation can impact decision-making in economics. First, we study students' answers to a non-incentivized allocation of resources task embodied in one of our surveys. We do not incentivize this task, and thus our results provide preliminary insights into the possible economic implications of the attitude polarization generated by our treatments. The results should be considered a basis for further research.[10] Second, we analyze how to account for our results when studying the strategic behavior of media, and more broadly, information designers.

2.4.1 Investment Decisions

At the end of our experiment, we ask students to allocate virtual tokens across five firms having the same risk but operating in different sectors: geoengineering, cultivated meat,

[10]We avoid monetary incentives for two reasons. First, as suggested by Zizzo (2010), monetary incentives may backfire, increasing experimenter demand effects, especially when participants are students. Second, avoiding monetary incentives allows us to maintain students' anonymity, and therefore, students do not have incentives to change their answers, fearing that their evaluations might depend on their answers. We think the benefits of avoiding monetary incentives overcome the costs in our experiment.

space colonization, AI, and smart drugs. The first three sectors resemble treated topics, whereas the other two do not. We test whether information provision and its slant impact the investment decisions. In particular, we estimate the following equations:

$$I_{it} = \beta_0 + \beta_1 \cdot \text{Information}_{it} + \mathbf{X}'_{it}\boldsymbol{\gamma} + \epsilon_{it}, \tag{2.5}$$

$$I_{it} = \beta_0 + \beta_1 \cdot P_{it} + \beta_2 \cdot N_{it} + \mathbf{X}'_{it}\boldsymbol{\gamma} + \epsilon_{it}, \tag{2.6}$$

where I_{it} represents the level of investment of student i in the firm operating in sector t, Information_{it} is a dummy variable taking value 1 if student i received information about topic (sector) t during the experiment, and value 0 otherwise, P_{it} is the number of positively slanted articles read by student i for topic (sector) t, and N_{it} is the number of negatively slanted articles read by student i for topic (sector) t.

	Equation (2.5)			Equation (2.6)		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Information	10.945***	10.922***	10.974***			
	(1.128)	(1.143)	(1.144)			
P				4.924***	4.978***	4.992***
				(0.338)	(0.344)	(0.344)
N				0.443	0.457	0.468
				(0.345)	(0.346)	(0.346)
Constant	9.372***	9.156***	10.676***	9.372***	8.313***	9.557***
	(0.874)	(1.406)	(3.110)	(0.808)	(1.302)	(2.874)
Prior knowledge and Trust		✓	✓		✓	✓
Demographics			✓			✓
Observations	605	605	605	605	605	605
R^2	0.135	0.135	0.143	0.262	0.263	0.270

Note: *p<0.1; **p<0.05; ***p<0.01

Table 2.9: Investment decisions as a function of information provision. Models 1–3 correspond to the estimation of Equation (2.5), whereas models 4–6 correspond to the estimation of Equation (2.6). For each equation, we consider three specifications: (1) with no control variables; (2) with prior knowledge and trust; (3) with prior knowledge, trust, and demographics.

Table 2.9 shows the results of the estimation of Equations (2.5) and (2.6). Models 1–3 show that investments are significantly higher for those firms operating in sectors that were covered by the articles provided during the experiment. Models 4–6 decompose the effect of information provision on investments and show that slant has an asymmetric effect on investments: receiving positively slanted articles significantly increases investments, whereas receiving negatively slanted articles does not impact investments.

2.4.2 Theoretical insights

The literature on media is vast, and it has considered several dimensions of communication and their impacts on media's optimal strategies. Traditionally, economists have studied the media markets as an industrial organization problem. See Anderson et al. (2015) for a review. In particular, the literature has explored the effects of news consumers' heterogeneous preferences on the media market outcomes. Usually, news is a differentiated product for which consumers have different tastes. Newspapers compete by choosing the slant of their news to maximize their profits, which coincide with market shares for ad-financed media. By contrast, we take a different perspective since, in our experiment, news consumers (that is, students) do not choose which newspaper to consume. They are passive agents who only read articles and form attitudes. In other words, we focus on each news consumer's information processing rather than studying the competition among media to receive attention.

How news consumers process information has important implications for the media. In fact, if the latter anticipates how news consumers process information, they can optimize their supply. For instance, while the theoretical literature predicts that ad-financed media have incentives to cover topics that match the tastes of the majority and thus are well-known (for instance, news related to migration), our results show that reporting is significantly more effective in shaping attitudes when topics are novel. Thus, a media may face a trade-off between tailoring news coverage to news consumers' tastes to capture the market — thus, selecting established topics — and its ability to shape news consumers' attitudes in the direction of the media's bias, which requires topics to be new. In other words, topic selection is a crucial decision by the media, which depends on the relative importance that the media assigns to persuading news consumers and gathering their attention. From this perspective, our results also inform the recent information design literature pioneered by Kamenica and Gentzkow (2011).

Our experimental findings highlight that multiple dimensions may make news salient. For instance, news may be salient for entertainment or learning reasons. In the first case, news consumers directly benefit from news that matches their preferences. Thus, a piece of news is salient when it matches the majority's taste, which aligns with the literature. Instead, in the second case, a piece of news is salient because news consumers are unaware of it, and media enter a race to inform them, to win the privilege of giving the first impression about a topic and shape news consumers' attitudes about it. Not all news are salient for both reasons. Some news may entail no learning but still appear in the media reporting because it is entertaining; other news may be salient until there is something to learn, but have no entertainment value for most news consumers. Since our results show that learning requires supplying a limited amount of news, this differentiation may help to explain some empirical patterns in news reporting. In particular, some pieces of news are salient for a very short time before disappearing, which is consistent with learning salience. In contrast, others are more persistent because their salience comes from entertaining.

Our results also inform about the characteristics of news consumers' learning process. In particular, we derive two implications. First, news consumers form their attitudes with the first piece of news when confronting new topics. Although a Bayesian agent should update their attitudes after processing each piece of news, in our experiment, students seemed anchored to their initial update. In other words, our data shows that students do little updating once they have formed their first impression on a topic. This result has a behavioural explanation. When unaware of a topic, the first impression may become a reference point. Then, since it is also costly to process information, subsequent information receives less attention, generating a sort of confirmation bias, where the media supplying the first impression about a topic determines the attitude that news consumers wish to confirm. Second, in the absence of further news, the effect of news on attitudes decays over time, but it remains significant. This result suggests a connection between attitude formation and memory, as a recent body of literature suggests. See, for instance, Bordalo et al. (2024).

We believe our findings and their implications might help to develop a new theoretical formalization of the media market. Depending on the media's objective — either persuasion or gathering attention for advertising — a media outlet optimally selects the topics to report about and the reporting slant. A media interested in persuasion must win the race to deliver the first impression, whereas the slant depends on its bias. Instead, a media interested in advertising revenue covers the most salient topics and supplies the slant that maximizes market shares. Moreover, the decay of the effect on attitudes over time suggests that it is crucial to consider the optimal media reporting as the result of a dynamic problem. A media interested in persuasion may cover a non-salient topic discontinuously over time to keep the first impression alive in news consumers' memory. Apart from that, our results also suggest that the possibility that news consumers have behavioural biases, such as anchoring and limited attention, should be considered.

2.5 Concluding remarks

We study, with the help of an experiment, how the media can shape attitudes towards different topics. We show that the media's ability to influence attitudes — in the direction intended by the news slant — is significantly stronger for topics that are novel. The media's effect on attitudes seems to be driven mainly by the supply of the first impression about a topic. The detected effects weaken but persist over time (that is, after four weeks). We also show that information provision, by shaping attitudes, can significantly impact economic decisions, such as the allocation of scarce resources. Finally, we discuss the implications of our experimental findings for the functioning of the media market.

While we believe our findings to be robust, our study has limitations. First, we cannot be sure that students devote sufficient effort when answering the surveys. However, a low effort would eventually reduce differences among groups, leading to our results being

weaker than they would be otherwise. Second, we believe education may play a role in the impact of news on attitudes. A high level of education, as our participants have, should increase the ability to deal with new information, potentially reducing the effect of information on attitudes. Our analysis should be repeated using a different sample to confirm our results and consequently draw clear policy conclusions. Lastly, we did not incentivize investment choices, and therefore, future research should further investigate the economic consequences of shaping attitudes through information provision.

Despite these limitations, our findings have significant implications for the literature and policymakers. On the one hand, we are the first to investigate experimentally how people process information about novel topics, thus providing relevant insights for studying behaviour in the media market. On the other hand, we show the dramatic importance of the first impression in shaping attitudes about a novel topic, thus highlighting the importance for policymakers to win the information provision race when a new topic (e.g., a crisis) emerges.

O Selection of topics and articles

We used students' knowledge and attitudes collected during the ex-ante survey to select the topics for our experiment. The goal was to select five unknown topics and a known topic with attitudes having an approximately uniform distribution to obtain the most symmetric effect for positive and negative articles. We collected attitudes about twelve topics: cultivated meat, the use of AI in the working environment, geoengineering, space colonization, smart drugs, baby banks, smart working, the use of sand for building infrastructures, migration, policies in favour of birth rate, fast fashion, policies to reduce public debt. These topics are different in terms of news coverage by Italian media. Figure 2.7 and Figure 2.8 show the distributions of prior knowledge and attitudes. Our measure of prior knowledge may be subject to individual-level inaccuracies, such as overconfidence or underconfidence. Nevertheless, it still remains an insightful measure if analyzed at the aggregate level with a sufficiently large sample. Therefore, we used the mean prior knowledge to select the topics for our experiment.

Based on the self-assessed knowledge, we can divide topics into two subgroups, unknown (cultivated meat, geoengineering, space colonization, smart drugs, baby banks, the use of sand for building infrastructures, policies in favour of birth rate, and policies to reduce public debt) and known (use of AI in the working environment, smart working, migration, and fast fashion). The mean values are shown in Table 2.10. We excluded smart drugs, the use of AI in the working environment, smart working, policies in favour of birth rate, and fast fashion since their initial attitudes are skewed. Then, we ordered the remaining topics from the least to the most known, and we chose the six topics for the experiment.

We found articles by searching on Factiva and Google News for specific keywords

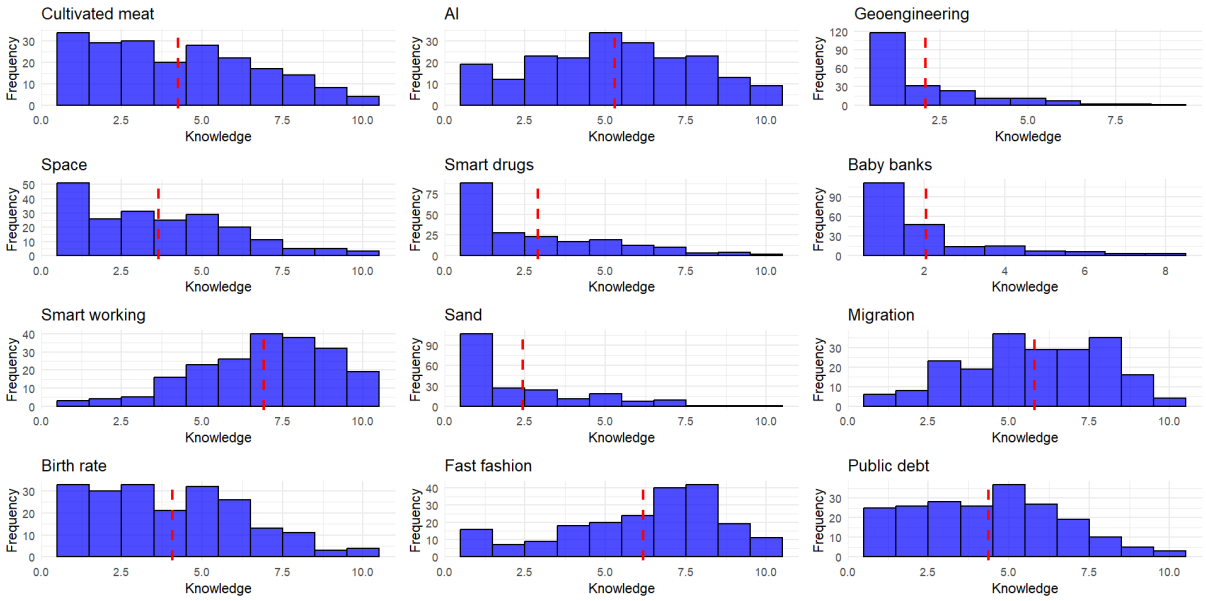


Figure 2.7: Distribution of self-reported knowledge collected in the ex-ante survey for each of the 12 topics covered. The vertical red line represents the mean.

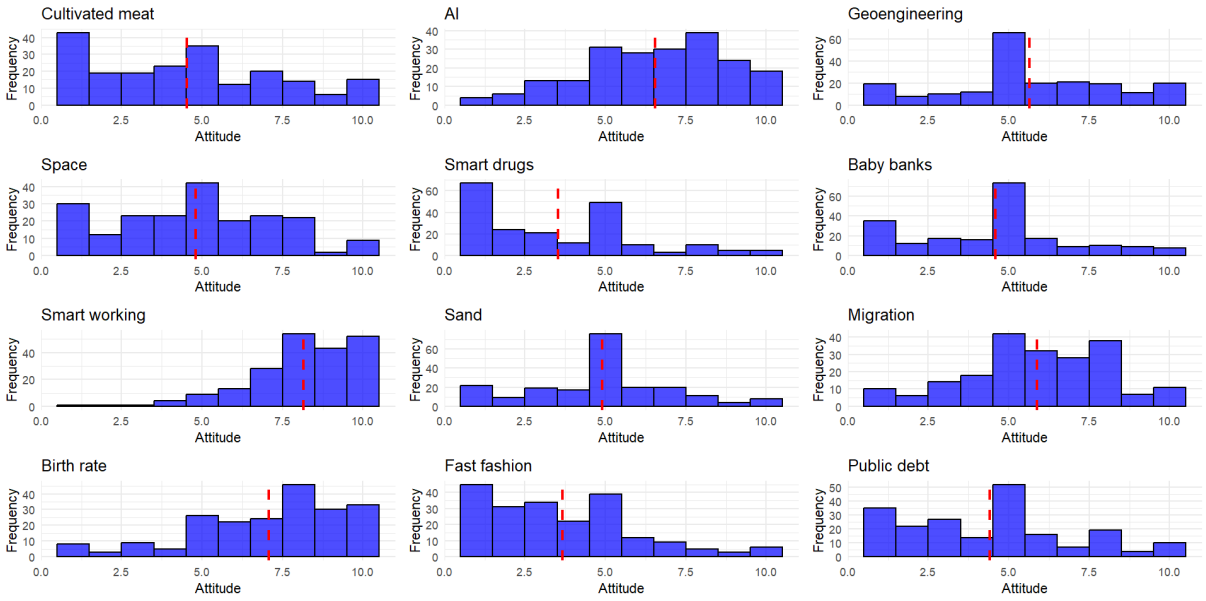


Figure 2.8: Distribution of attitudes collected in the ex-ante survey for each of the 12 topics covered. The vertical red line represents the mean.

associated with each topic. We then read and excluded all the articles that were not about the topics of interest or neutral, and measured their slants by using ChatGPT. In particular, for each article, we provided ChatGPT with the following prompt:

> "Does the article support this topic? Answer with a number in a scale from 1 (extremely against) to 10 (extremely in favour)".

Then, we included in the analysis the most slanted articles. Table 2.11 shows the slant assessment provided by ChatGPT for each selected article.

Variable	Knowledge	Attitude
Cultivated meat	4.26	4.53
	(2.49)	(2.79)
AI	5.29	6.54
	(2.49)	(2.24)
Geoengineering	2.08	5.64
	(1.66)	(2.51)
Space colonization	3.66	4.81
	(2.31)	(2.48)
Smart drugs	2.90	3.53
	(2.27)	(2.47)
Baby banks	2.05	4.59
	(1.60)	(2.42)
Smart working	6.91	8.16
	(2.08)	(1.68)
Sand	2.42	4.90
	(1.96)	(2.19)
Migration	5.79	5.88
	(2.17)	(2.21)
Birth rate	4.07	7.08
	(2.31)	(2.36)
Fast fashion	6.17	3.66
	(2.45)	(2.29)
Public debt	4.37	4.41
	(2.25)	(2.55)

Table 2.10: Mean and standard deviation (in brackets) of the self-assessed knowledge and attitude, for each topic, measured in the ex-ante survey.

Article	Slant	Article	Slant	Article	Slant	Article	Slant	Article	Slant
Baby banks 1	1	Cultivated meat 3	2	Geoengineering 3	8	Migration 5	8	Sand 5	8
Baby banks 2	1	Cultivated meat 4	2	Geoengineering 4	7	Migration 6	9	Sand 6	9
Baby banks 3	2	Cultivated meat 5	7	Geoengineering 5	7	Migration 7	7	Space colonization 1	1
Baby banks 4	7	Cultivated meat 6	8	Geoengineering 6	7	Migration 8	9	Space colonization 2	2
Baby banks 5	9	Cultivated meat 7	7	Migration 1	2	Sand 1	2	Space colonization 3	3
Baby banks 6	8	Cultivated meat 8	8	Migration 2	4	Sand 2	4	Space colonization 4	3
Cultivated meat 1	3	Geoengineering 1	2	Migration 3	3	Sand 3	1	Space colonization 5	8
Cultivated meat 2	3	Geoengineering 2	1	Migration 4	2	Sand 4	8	Space colonization 6	9

Table 2.11: For each article, the slant ranges from 1 (completely against) to 10 (completely in favour).

P Results

P.1 Hypothesis 2: Meat and Positive

We estimate the following equation:

$$V_{it} = \beta_1 \cdot \text{Meat}_{it} + \beta_2 \cdot \text{Positive}_{it} + \beta_3 \cdot (\text{Meat} \cdot \text{Positive})_{it} + \mathbf{X}'_{it}\boldsymbol{\gamma} + \varepsilon_{it}. \tag{2.7}$$

	Model 1	Model 2	Model 3
Meat	−0.625	−0.662	−0.649
	(0.398)	(0.404)	(0.405)
Positive	0.840**	0.850**	0.818**
	(0.384)	(0.386)	(0.388)
Meat × Positive	1.163**	1.140**	1.148**
	(0.543)	(0.546)	(0.547)
Constant	−0.179	0.046	0.365
	(0.281)	(0.451)	(0.667)
Prior Knowledge and Trust		✓	✓
Demographics			✓
Observations	242	242	242
R^2	0.119	0.120	0.127
Adjusted R^2	0.108	0.102	0.097
Note:		*p<0.1; **p<0.05; ***p<0.01	

Table 2.12: Effect of information provision with positive versus negative slant on V, taking into account differences across topics. We estimate three model specifications: (1) with no control variables; (2) with prior knowledge and trust; (3) with prior knowledge, trust, and demographics.

Table 2.12 reports the results of the estimation of Equation (2.7) and confirms two key findings of this paper. First, the positive treatment has been more effective than the negative treatment. Second, providing information about an unknown topic (cultivated meat) is more effective in shaping attitudes than providing information about a known topic (migration).

P.2 Hypothesis 3: Migration

We do not find any statistically significant linear or non-linear relationship between the variation in attitudes about migration and the number of articles read for each slant. Migration represents a well-known issue and is constantly widely discussed in the Italian media. In fact, individuals likely entered the experiment with strong pre-existing attitudes that are less likely to change with our treatment. We observe a temporary increase in attitudes toward migration during the first week of the experiment for all students,

independently of whether they read positively or negatively slanted articles. This change is unlikely to be caused by the treatment and is more plausibly explained by external factors: migration was the only topic among those selected that continued to receive extensive and regular coverage in the Italian media during the study period. We show how attitudes about migration evolve during our experiment for each treatment in Figure 2.9. We also estimate Equation (2.3) and show that reading articles about migration has no statistically significant effect on the corresponding attitudes, independently of the news slant (see Tables 2.13 and 2.14).

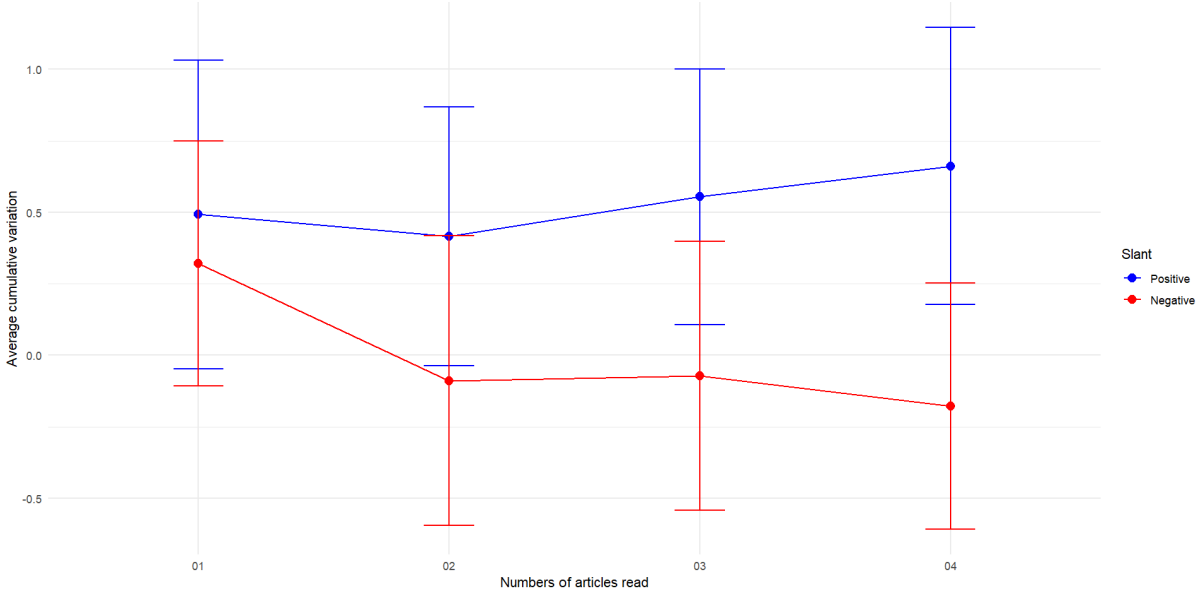


Figure 2.9: Means and confidence intervals (95%) of the cumulative variation of attitudes for the positive (blue) and negative (red) treatments, respectively, for migration over the four weeks of the experiment.

	Model 1	Model 2	Model 3	Model 4
Articles read (S)	0.138	0.297	0.297	0.297
	(0.078)	(0.276)	(0.273)	(0.257)
S^2		−0.040	−0.040	−0.040
		(0.066)	(0.066)	(0.062)
Constant	5.778***	5.699***	5.136***	2.657***
	(0.191)	(0.233)	(0.366)	(0.643)
Prior knowledge and Trust			✓	✓
Demographics				✓
Observations	325	325	325	325
R^2	0.010	0.011	0.035	0.162
Adjusted R^2	0.007	0.005	0.023	0.135
Note:		*p<0.05; **p<0.01; ***p<0.001		

Table 2.13: Effect of reading an additional newspaper article (S) with positive slant on the attitudes about migration. We estimate four model specifications: (1) linear relationship; (2) quadratic relationship; (3) quadratic relationship with control variables for prior knowledge and trust; (4) quadratic relationship with control variables for prior knowledge, trust, and demographics.

	Model 1	Model 2	Model 3	Model 4
Articles read S	−0.075	0.047	0.047	0.047
	(0.089)	(0.315)	(0.312)	(0.289)
S^2		−0.031	−0.031	−0.031
		(0.076)	(0.075)	(0.069)
Constant	6.146***	6.085***	5.071***	6.488***
	(0.219)	(0.266)	(0.467)	(0.679)
Prior knowledge and Trust			✓	✓
Demographics				✓
Observations	280	280	280	280
R^2	0.003	0.003	0.029	0.185
Adjusted R^2	−0.001	−0.004	0.014	0.155
Note:		*p<0.05; **p<0.01; ***p<0.001		

Table 2.14: Effect of reading an additional newspaper article (S) with negative slant on the attitudes about migration. We estimate four model specifications: (1) linear relationship; (2) quadratic relationship; (3) quadratic relationship with control variables for prior knowledge and trust; (4) quadratic relationship with control variables for prior knowledge, trust, and demographics.

P.3 Hypothesis 4: Long run

Table 2.15 shows that, even in the long run, V is highly correlated with $a_1 - a_0$, whereas it displays a weak correlation with subsequent changes in attitudes.

Variation in attitudes	$a_1 - a_0$	$a_2 - a_1$	$a_3 - a_2$	$a_4 - a_3$	V
$a_1 - a_0$	1				
$a_2 - a_1$	−0.39	1			
$a_3 - a_2$	0.02	−0.33	1		
$a_4 - a_3$	−0.11	0.01	−0.48	1	
V	0.70	0.14	0.11	−0.03	1

Table 2.15: Correlation between the total variation in attitudes V in the long run (that is, four weeks after the end of the experiment) and the weekly variation in attitudes $a_s - a_{s-1}$ in each week s, aggregated over all topics.

Table 2.16 repeats the estimation of Equation (2.4) considering the variation in attitudes four weeks after the end of the experiment. We find that, even in the long run, a positive (negative) first impression, namely an increase (decrease) of one in the support for a given topic, is associated with a significant increase (decrease) in the attitudes toward such a topic at the end of the experiment.

	Model 1	Model 2	Model 3	Model 4	Model 5
First impression ($a_1 - a_0$)	0.701***	0.755***	0.736***	0.729***	0.728***
	(0.035)	(0.037)	(0.037)	(0.038)	(0.038)
Constant	−0.049	−0.702***	−0.209	−0.054	−0.542
	(0.106)	(0.219)	(0.278)	(0.577)	(0.639)
Topics		✓	✓	✓	✓
Prior knowledge and Trust			✓	✓	✓
Demographics				✓	✓
Number of positive articles					✓
Observations	432	432	432	432	432
R^2	0.487	0.505	0.517	0.522	0.525
Adjusted R^2	0.486	0.501	0.510	0.508	0.510
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 2.16: The effect of the first impression on the variation in attitudes in the long run. We estimate five model specifications: (1) no control variables; (2) with topics; (3) with topics, prior knowledge and trust; (4) with topics, prior knowledge, trust, and demographics; (5) with topics, prior knowledge, trust, demographics, and number of positive articles read by students.

P.4 Hypothesis 4: Positive versus negative slant

We estimate the following equation to decompose the effect of the first impression depending on the article's slant:

$$V_{it} = \alpha + \beta_1 \cdot \max\{a_{it1} - a_{it0}, 0\} + \beta_2 \cdot \min\{a_{it1} - a_{it0}, 0\} + \mathbf{X}'_{it}\boldsymbol{\gamma} + \varepsilon_{it}. \tag{2.8}$$

Our coefficients of interest are β_1 and β_2, representing how an initial (that is, after reading the first article) positive or negative change in attitudes, respectively, impacts the final change in attitudes, that is, V_{it}.

	Model 1	Model 2	Model 3	Model 4	Model 5
Positive first impression ($\max\{a_1 - a_0, 0\}$)	0.611***	0.669***	0.643***	0.641***	0.645***
	(0.046)	(0.048)	(0.048)	(0.048)	(0.048)
Negative first impression ($\min\{a_1 - a_0, 0\}$)	0.800***	0.853***	0.849***	0.841***	0.823***
	(0.090)	(0.089)	(0.089)	(0.089)	(0.089)
Constant	0.140	−0.479**	−0.083	−0.073	−0.667
	(0.141)	(0.233)	(0.282)	(0.533)	(0.589)
Topics		✓	✓	✓	✓
Prior knowledge and Trust			✓	✓	✓
Demographics				✓	✓
Number of positive articles					✓
Observations	484	484	484	484	484
R^2	0.461	0.482	0.495	0.499	0.505
Adjusted R^2	0.459	0.477	0.487	0.485	0.490
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 2.17: The effect of positive and negative first impressions on the variation in attitudes. We estimate five model specifications: (1) with no control variables; (2) with topics; (3) with topics, prior knowledge and trust; (4) with topics, prior knowledge, trust, and demographics; (5) with topics, prior knowledge, trust, demographics, and number of positive articles read by students.

Table 2.17 shows the results of the estimation of Equation (2.8). A positive first impression, namely an increase of one in the support for a given topic, is associated with an increase (0.645***) in the attitudes toward such a topic at the end of the experiment. A negative first impression, namely a decrease of one in the support for a given topic, is associated with a decrease (0.823***) in the attitudes toward such a topic at the end of the experiment. These effects are persistent in all model specifications where topics, as well as individual characteristics such as knowledge, trust, demographic variables, and the number of positive articles read, are considered.

Table 2.18 shows the results of the estimation of Equation (2.8) in the long run, that is, when considering the variation in attitudes from the ex-ante survey to the follow-up survey. We find that positive and negative first impressions persistently shape attitudes

	Model 1	Model 2	Model 3	Model 4	Model 5
Positive first impression ($\max\{a_1 - a_0, 0\}$)	0.654^{***}	0.711^{***}	0.687^{***}	0.681^{***}	0.685^{***}
	(0.048)	(0.050)	(0.050)	(0.051)	(0.051)
Negative first impression ($\min\{a_1 - a_0, 0\}$)	0.820^{***}	0.867^{***}	0.859^{***}	0.849^{***}	0.836^{***}
	(0.094)	(0.094)	(0.093)	(0.094)	(0.094)
Constant	0.098	-0.545^{**}	-0.029	0.055	-0.414
	(0.151)	(0.250)	(0.304)	(0.581)	(0.647)
Topics		✓	✓	✓	✓
Prior knowledge and Trust			✓	✓	✓
Demographics				✓	✓
Number of positive articles					✓
Observations	432	432	432	432	432
R^2	0.490	0.507	0.519	0.524	0.527
Adjusted R^2	0.487	0.502	0.512	0.509	0.511

Note: *p<0.1; **p<0.05; ***p<0.01

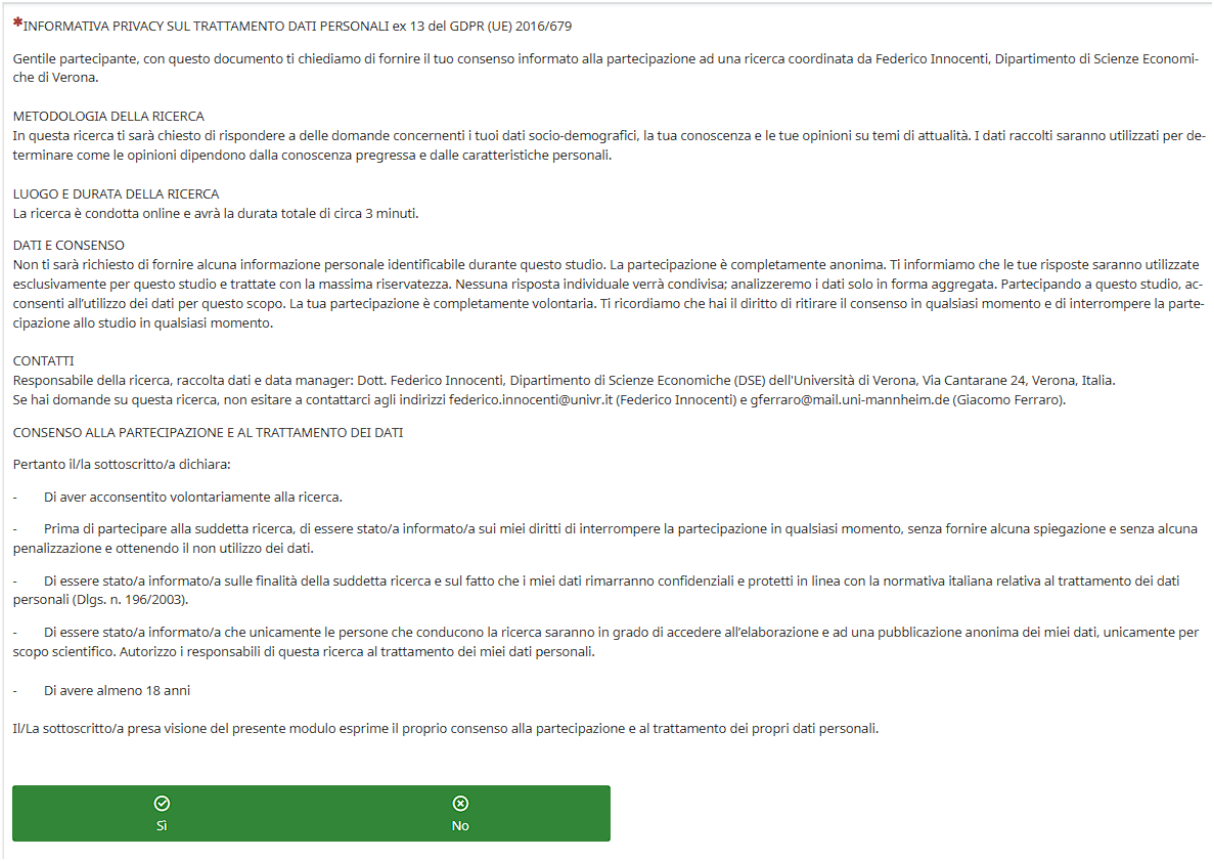
Table 2.18: The effect of positive and negative first impressions on the variation in attitudes in the long run. We estimate five model specifications: (1) with no control variables; (2) with topics; (3) with topics, prior knowledge and trust; (4) with topics, prior knowledge, trust, and demographics; (5) with topics, prior knowledge, trust, demographics, and number of positive articles read by students.

over time.

Q Experimental details

In this section, we report instructions and questions (in Italian) received by students during the experiment, and the corresponding English translations.

Q.1 Informed consent



*INFORMATIVA PRIVACY SUL TRATTAMENTO DATI PERSONALI ex 13 del GDPR (UE) 2016/679

Gentile partecipante, con questo documento ti chiediamo di fornire il tuo consenso informato alla partecipazione ad una ricerca coordinata da Federico Innocenti, Dipartimento di Scienze Economiche di Verona.

METODOLOGIA DELLA RICERCA
In questa ricerca ti sarà chiesto di rispondere a delle domande concernenti i tuoi dati socio-demografici, la tua conoscenza e le tue opinioni su temi di attualità. I dati raccolti saranno utilizzati per determinare come le opinioni dipendono dalla conoscenza pregressa e dalle caratteristiche personali.

LUOGO E DURATA DELLA RICERCA
La ricerca è condotta online e avrà la durata totale di circa 3 minuti.

DATI E CONSENSO
Non ti sarà richiesto di fornire alcuna informazione personale identificabile durante questo studio. La partecipazione è completamente anonima. Ti informiamo che le tue risposte saranno utilizzate esclusivamente per questo studio e trattate con la massima riservatezza. Nessuna risposta individuale verrà condivisa; analizzeremo i dati solo in forma aggregata. Partecipando a questo studio, acconsenti all'utilizzo dei dati per questo scopo. La tua partecipazione è completamente volontaria. Ti ricordiamo che hai il diritto di ritirare il consenso in qualsiasi momento e di interrompere la partecipazione allo studio in qualsiasi momento.

CONTATTI
Responsabile della ricerca, raccolta dati e data manager: Dott. Federico Innocenti, Dipartimento di Scienze Economiche (DSE) dell'Università di Verona, Via Cantarane 24, Verona, Italia.
Se hai domande su questa ricerca, non esitare a contattarci agli indirizzi federico.innocenti@univr.it (Federico Innocenti) e gferraro@mail.uni-mannheim.de (Giacomo Ferraro).

CONSENSO ALLA PARTECIPAZIONE E AL TRATTAMENTO DEI DATI

Pertanto il/la sottoscritto/a dichiara:

- Di aver acconsentito volontariamente alla ricerca.
- Prima di partecipare alla suddetta ricerca, di essere stato/a informato/a sui miei diritti di interrompere la partecipazione in qualsiasi momento, senza fornire alcuna spiegazione e senza alcuna penalizzazione e ottenendo il non utilizzo dei dati.
- Di essere stato/a informato/a sulle finalità della suddetta ricerca e sul fatto che i miei dati rimarranno confidenziali e protetti in linea con la normativa italiana relativa al trattamento dei dati personali (Dlgs. n. 196/2003).
- Di essere stato/a informato/a che unicamente le persone che conducono la ricerca saranno in grado di accedere all'elaborazione e ad una pubblicazione anonima dei miei dati, unicamente per scopo scientifico. Autorizzo i responsabili di questa ricerca al trattamento dei miei dati personali.
- Di avere almeno 18 anni

Il/La sottoscritto/a presa visione del presente modulo esprime il proprio consenso alla partecipazione e al trattamento dei propri dati personali.

Sì | No

Translation

Dear participant, with this document, we ask you to provide your informed consent to participate in a study coordinated by Federico Innocenti, Department of Economics, University of Verona.

RESEARCH METHODOLOGY
In this study, you will be asked to answer questions regarding your socio-demographic status, your knowledge, and your opinions on current issues. The data collected will be used to determine how opinions depend on prior knowledge and personal characteristics.

LOCATION AND DURATION OF THE RESEARCH
The survey is conducted online and has a total duration of approximately 3 minutes.

DATA AND CONSENT
You will not be asked to provide any personally identifiable information during this study.

Participation is completely anonymous. We inform you that your answers will be used exclusively for research purposes and in a strictly confidential manner. No individual response will be shared; we will analyze the data only in an aggregated form. By participating in this study, you consent to the use of the data for this purpose. Your participation is entirely voluntary. You are reminded that you have the right to withdraw your consent at any time and to interrupt your participation in the study at any moment.

CONTACTS

Research supervisor and data manager: Dr. Federico Innocenti, Department of Economics (DSE), University of Verona, Via Cantarane 24, Verona, Italy. If you have any questions about this research, please feel free to contact us at the following emails: federico.innocenti@univr.it (Federico Innocenti) and gferraro@mail.uni-mannheim.de (Giacomo Ferraro).

CONSENT TO PARTICIPATION AND DATA PROCESSING

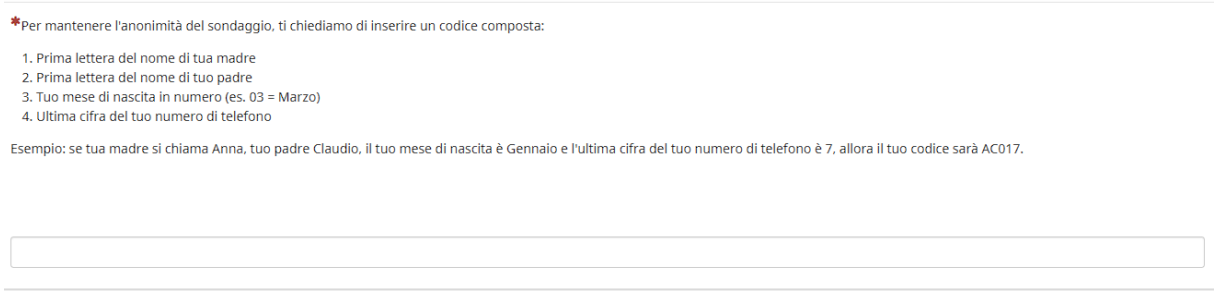
Therefore, I, the undersigned, declare that:

- I voluntarily agree to participate in the study.
- Before participating in the above-mentioned study, I have been informed of my right to withdraw at any time, without providing any justification and without any penalties or consequences regarding the use of the data.
- I have been informed about the purpose of the study and that my data will remain confidential and protected in accordance with Italian regulations on the processing of personal data (Legislative Decree no. 196/2003).
- I have been informed that only the researchers conducting the study will have access to the data and that the results may be published in anonymous form for scientific purposes only. I authorize the research managers to process my personal data.
- I am at least 18 years old.

I, the undersigned, having read this form, give my consent to participate and to the processing of my personal data.

[ ] YES [ ] NO

Q.2 Anonymuous ID



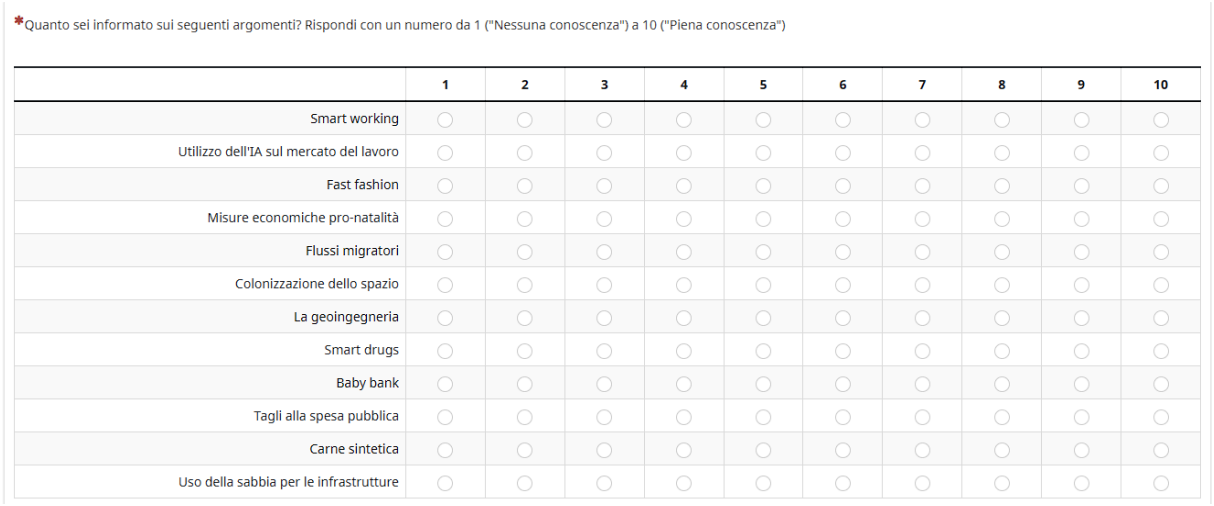
Translation

To preserve the anonymity of the survey, we ask you to enter a code composed of:

1. First letter of your mother's first name
2. First letter of your father's first name
3. Your birth month in numeric format (e.g., 03 = March)
4. Last digit of your phone number

Example: if your mother's name is Anna, your father's name is Claudio, your birth month is January, and the last digit of your phone number is 7, then your code will be `AC017`.

Q.3 Knowledge



*Quanto sei informato sui seguenti argomenti? Rispondi con un numero da 1 ("Nessuna conoscenza") a 10 ("Piena conoscenza")

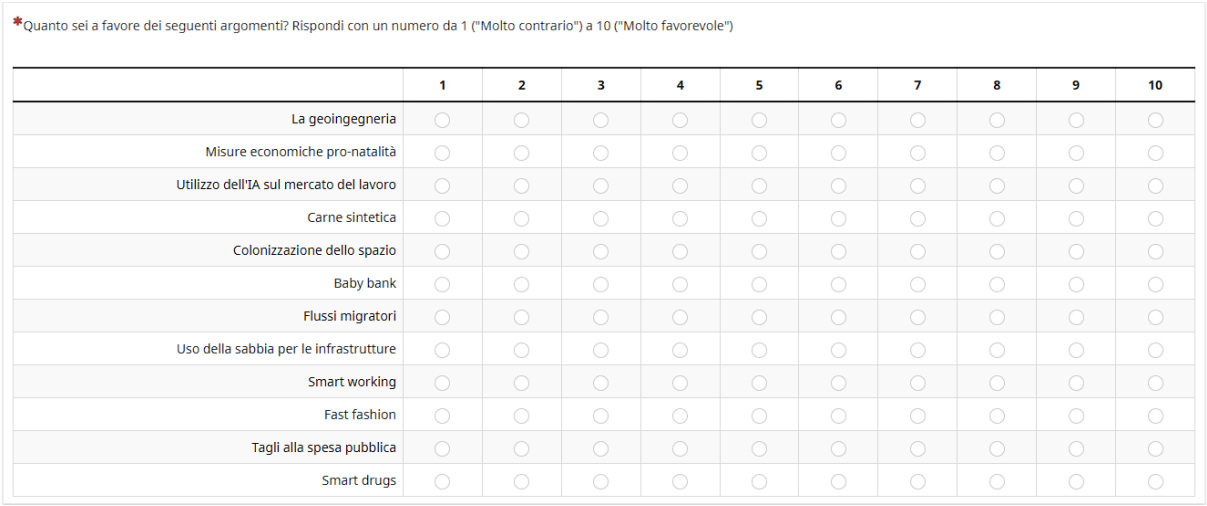
	1	2	3	4	5	6	7	8	9	10
Smart working	○	○	○	○	○	○	○	○	○	○
Utilizzo dell'IA sul mercato del lavoro	○	○	○	○	○	○	○	○	○	○
Fast fashion	○	○	○	○	○	○	○	○	○	○
Misure economiche pro-natalità	○	○	○	○	○	○	○	○	○	○
Flussi migratori	○	○	○	○	○	○	○	○	○	○
Colonizzazione dello spazio	○	○	○	○	○	○	○	○	○	○
La geoingegneria	○	○	○	○	○	○	○	○	○	○
Smart drugs	○	○	○	○	○	○	○	○	○	○
Baby bank	○	○	○	○	○	○	○	○	○	○
Tagli alla spesa pubblica	○	○	○	○	○	○	○	○	○	○
Carne sintetica	○	○	○	○	○	○	○	○	○	○
Uso della sabbia per le infrastrutture	○	○	○	○	○	○	○	○	○	○

Translation

*How knowledgeable are you about the following topics? Answer with a number from 1 ("No knowledge") to 10 ("Full knowledge").

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Smart working	○	○	○	○	○	○	○	○	○	○
The use of AI in the labor market	○	○	○	○	○	○	○	○	○	○
Fast fashion	○	○	○	○	○	○	○	○	○	○
Pro-natal economic measures	○	○	○	○	○	○	○	○	○	○
Migration	○	○	○	○	○	○	○	○	○	○
Space colonization	○	○	○	○	○	○	○	○	○	○
Geoengineering	○	○	○	○	○	○	○	○	○	○
Smart drugs	○	○	○	○	○	○	○	○	○	○
Baby banks	○	○	○	○	○	○	○	○	○	○
Public spending cuts	○	○	○	○	○	○	○	○	○	○
Cultivated meat	○	○	○	○	○	○	○	○	○	○
The use of sand for building infrastructures	○	○	○	○	○	○	○	○	○	○

Q.4 Attitudes



*Quanto sei a favore dei seguenti argomenti? Rispondi con un numero da 1 ("Molto contrario") a 10 ("Molto favorevole")

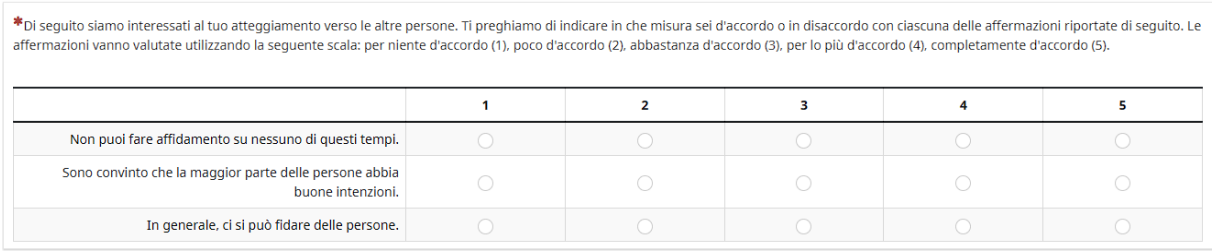
	1	2	3	4	5	6	7	8	9	10
La geoingegneria	○	○	○	○	○	○	○	○	○	○
Misure economiche pro-natalità	○	○	○	○	○	○	○	○	○	○
Utilizzo dell'IA sul mercato del lavoro	○	○	○	○	○	○	○	○	○	○
Carne sintetica	○	○	○	○	○	○	○	○	○	○
Colonizzazione dello spazio	○	○	○	○	○	○	○	○	○	○
Baby bank	○	○	○	○	○	○	○	○	○	○
Flussi migratori	○	○	○	○	○	○	○	○	○	○
Uso della sabbia per le infrastrutture	○	○	○	○	○	○	○	○	○	○
Smart working	○	○	○	○	○	○	○	○	○	○
Fast fashion	○	○	○	○	○	○	○	○	○	○
Tagli alla spesa pubblica	○	○	○	○	○	○	○	○	○	○
Smart drugs	○	○	○	○	○	○	○	○	○	○

Translation

*How much are you in favour of the following topics? Answer with a number from 1 ("Extremely against") to 10 ("Extremely in favour").

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Smart working	○	○	○	○	○	○	○	○	○	○
The use of AI in the labor market	○	○	○	○	○	○	○	○	○	○
Fast fashion	○	○	○	○	○	○	○	○	○	○
Pro-natal economic measures	○	○	○	○	○	○	○	○	○	○
Migration	○	○	○	○	○	○	○	○	○	○
Space colonization	○	○	○	○	○	○	○	○	○	○
Geoengineering	○	○	○	○	○	○	○	○	○	○
Smart drugs	○	○	○	○	○	○	○	○	○	○
Baby banks	○	○	○	○	○	○	○	○	○	○
Public spending cuts	○	○	○	○	○	○	○	○	○	○
Cultivated meat	○	○	○	○	○	○	○	○	○	○
The use of sand for building infrastructures	○	○	○	○	○	○	○	○	○	○

Q.5 Trust



*Di seguito siamo interessati al tuo atteggiamento verso le altre persone. Ti preghiamo di indicare in che misura sei d'accordo o in disaccordo con ciascuna delle affermazioni riportate di seguito. Le affermazioni vanno valutate utilizzando la seguente scala: per niente d'accordo (1), poco d'accordo (2), abbastanza d'accordo (3), per lo più d'accordo (4), completamente d'accordo (5).

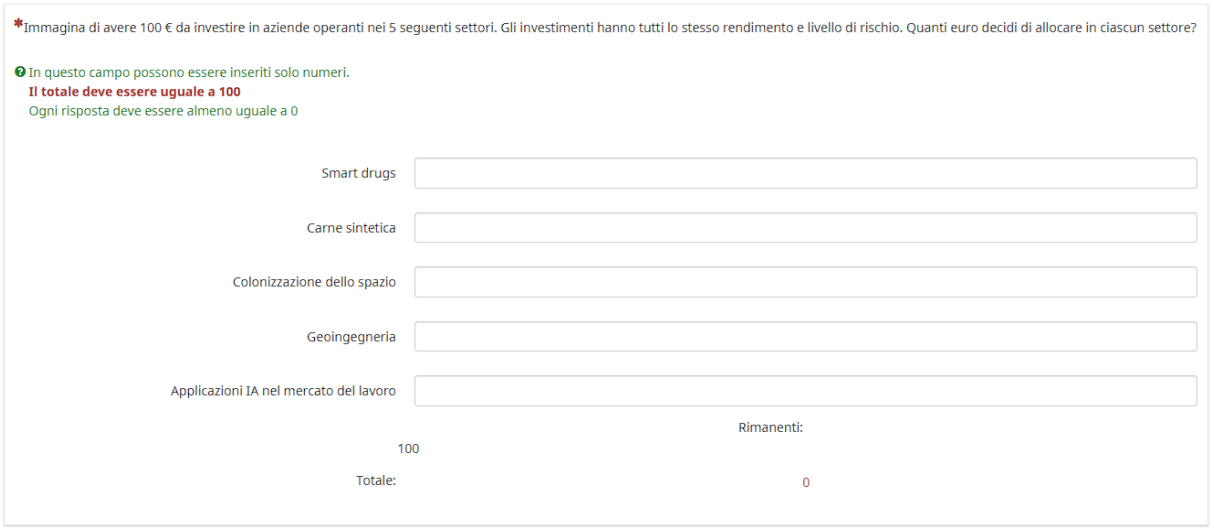
	1	2	3	4	5
Non puoi fare affidamento su nessuno di questi tempi.	○	○	○	○	○
Sono convinto che la maggior parte delle persone abbia buone intenzioni.	○	○	○	○	○
In generale, ci si può fidare delle persone.	○	○	○	○	○

Translation

In the following, we are interested in your attitude towards other people. Please indicate to what extent you agree or disagree with each of the following statements. The statements should be evaluated using the following scale: not agree at all (1), slightly agree (2), somewhat agree (3), mostly agree (4), completely agree (5).

	1	**2**	**3**	**4**	**5**
You cannot rely on anyone these days.	○	○	○	○	○
I am convinced that most people have good intentions.	○	○	○	○	○
In general, people can be trusted.	○	○	○	○	○

Q.6 Investments



Translation

Imagine you have €100 to invest in firms operating in the following 5 sectors. All investments have the same return and risk level. How many euros would you allocate to each sector?

Only numbers can be entered in this field.
The total must equal 100
Each response must be at least 0

Smart drugs	
Cultivated meat	
Space colonization	
Geoengineering	
AI applications in the labor market	

The Impact of Social capital on Vaccination Campaigns: Results from the French Case Study

3.1 Introduction

Individual decisions are pivotal in preventing and eliminating pandemics (Team, 2015).In other words, every behavior adopted has a social impact, meaning that the decision to get vaccinated leads to positive externalities (Boulier et al., 2007), whereas the lack of vaccination increases hospitalizations and the spread of the virus. Vaccination can be both an individual and a pro-social behavior (Böhm et al., 2019): it is individual since it protects the person who receives it and pro-social since it increases the level of protection of the community. This is particularly crucial for those who cannot receive the vaccine due to age limits or immunosuppression. The individual decision to get vaccinated is affected by the vaccination choices of society, which can result in free-riding (Ibuka et al., 2014). Free riders benefit from others' vaccinations while avoiding the costs of getting vaccinated (Serpell and Green, 2006).

Vaccination campaigns are not always able to reach herd immunity. For example, in Europe, only 91% of the population is vaccinated against measles, and this percentage is lower globally, reaching 71% (Vanderslott et al., 2022). However, herd immunity requires a greater percentage of the population to be vaccinated (Guerra et al., 2017). In 2018, 140,000 people died from measles, and the majority of them were children (Organization et al., 2019a). Furthermore, cases of measles not only tripled from 2017–2018 in Europe (Thornton, 2019) but also rose globally. Similar outbreaks of other viruses, such as rubella and mumps, have been reported across Europe (Béraud et al., 2018; Ferenczi et al., 2020), and they are still significant global threats. Moreover, distrust in vaccines has increased over time and is stronger in some Western countries: France has the highest value, with one in three citizens (Gallup, 2019). Vaccination hesitancy is considered a significant global health threat (Organization et al., 2019b). There are two different types of citizens who do not want to get vaccinated: those who lack sufficient incentives and those who are unwilling to get vaccinated even in the presence of incentives (Harris et al., 2010; Campos-Mercade et al., 2021; Saban et al., 2021). Social capital plays a role in citizens belonging to the first group.

Vaccination has been considered the most crucial long-term tool to mitigate the social and economic impacts of COVID-19 (DeRoo et al., 2020; Graham, 2020). However, over

a year since the beginning of the global vaccination campaign, fewer than 50% of citizens have been fully vaccinated, with approximately 60% having received at least one dose.[1] The situation is not better in the European Union, where only 65% of EU citizens are fully vaccinated (approximately 70% with at least one dose). The problem of hesitancy has become critical as the vaccination campaign has proceeded, and it has affected both developed and developing countries (Watermeyer et al., 2022): (Neumann-Böhme et al., 2020) highlighted the large presence of citizens not convinced of being inoculated, and Bughin et al. (2023) showed how some people prefer to wait some months before receiving the vaccine. To the best of my knowledge, this study is the first to analyze the relationship between social capital and the COVID-19 vaccination campaign with a specific focus of mitigating effect of public policies. The analysis is performed dynamically at the NUTS 3 level in France, and it reveals a positive and increasing impact of social capital on the share of the vaccinated population over time. The diverging path is stopped only by the introduction of the green pass.

The COVID-19 pandemic offers a unique opportunity to investigate the evolution of vaccination campaigns and how policy interventions can affect their dynamics. The results from this framework can be used internationally to boost vaccination campaigns related to different viruses and to develop protocols to be implemented in the event of new viruses. According to (Putnam et al., 1994), social capital refers to the willingness to cooperate and pursue socially valuable activities, such as vaccination. Three dimensions of social capital are identified: bonding, bridging and linking (Szreter and Woolcock, 2004). I focus on the bridging dimension, which focuses on the between-groups relationship: the stronger it is, the greater the solidarity across groups. I compact the idea of social capital to its positive side of helping a group overcome free riding behaviors. The paper considers two standard proxies of social capital: EU voter turnout and the percentage of votes obtained by populist parties. Voter turnout derives directly from (Putnam et al., 1994), and it is the main proxy used for social capital: its main advantages are comparability, recency and precision. In fact, it refers to the same election, the last five years ago, and it is detailed at desegregated geographical levels and avoids measurement errors. The well-documented literature shows a strong and positive correlation between voter turnout and pro-social preferences (Fowler, 2006; Fowler and Kam, 2007). Moreover, it is one of the phenomena least explainable on the basis of standard economic models (Guiso et al., 2004). The percentage of votes obtained by populist parties is a recently widely used proxy for social capital (Giuliano and Wacziarg, 2020; Alipour et al., 2021). There are various channels that link social capital and votes to populist parties: individuals with dense social ties may find it easier to address changes arising from globalization, technological progress, and immigration; moreover, low social capital implies a lack of trust in traditional institutions; therefore, individuals with low social ties are more likely to move against current norms and institutions and seek a populist view to replace them.

[1]Source: `https://ourworldindata.org/covid-vaccinations`.

The cumulative number of weekly vaccinations is the outcome variable chosen since it does not have measurement errors and is not affected by the natural decrease in vaccinations during the weekend or delays in delivery that occurred in the initial phase of the vaccination campaign.

The area of interest is France since it is among the few global countries that collect data at a sufficiently detailed geographical level (NUTS3), distinguish between first and second doses, and collect vaccination data considering place of residence instead of place of vaccination. Furthermore, France is among the few countries that introduced a green pass at an early stage.[2] I analyze the relationship between social capital and the number of vaccinations. I regress the number of vaccinations per 100,000 inhabitants on measures of predetermined social capital (EU voter turnout and the percentage of votes obtained by populist parties) interacted with weekly fixed effects. This approach allows us to test whether the evolution of vaccination has been modified by introducing the green pass and whether it has differed systematically depending on the level of social capital. The specification leads to a two-way fixed effects model, the standard model used to assess causality. The model controls for permanent differences between groups and time fixed effects.

In the robustness checks, I account for three possible confounders: the younger population's higher presence, population based on different levels of education, percentage of foreigners, and hospitalizations that occurred two weeks earlier.

Social capital, vaccination policies and vaccination availability interact in different ways. Initially, the availability of vaccines was low; therefore, the impact of social capital is expected to be absent since, owing to the slow distribution, vaccination capacity cannot cover the part of the population interested in getting vaccinated. After the introduction of a full-regime vaccination delivery, a higher and increasing vaccination rate over time is expected in areas with higher values of social capital. In fact, social capital is expected to reduce free-riding behaviors (Turner, 2000), especially if the actions involve a large group (Uphoff, 2000), since it is expected to increase the desire to contribute to the common good ((Coleman, 1994). Finally, after the introduction of the green pass, free-riding becomes costly. Since vaccination is the cheapest and fastest way to achieve it, a reduction in the effect of social capital on cumulative vaccination is expected.

I derive the following main findings. First, a one-standard-deviation increase in social capital increases the number of vaccinated individuals (per 100,000 inhabitants) by approximately 2,000 units at the peak. Furthermore, introducing stricter rules can mitigate the diverging path between high- and low-level social capital departments. Social capital is a substitute good for the enforcement of rules (Serageldin and Grootaert, 2017) and the provision of public goods (Adger, 2010).

[2]The green pass became necessary to go to restaurants, and shopping malls, and to have access to public transportation and other daily activities. It can be obtained by being vaccinated or by having a test done in the previous three days. The green pass was also given to people who got Covid-19 in the previous six months. The cost of its absence is not monetary but in terms of the impossibility of undertaking the majority of daily activities.

This is the first comprehensive study to investigate the dynamic relationship between social capital and vaccination rates.

(Bartscher et al., 2021; Borgonovi et al., 2021) provide evidence of the positive impact of social capital on reducing infections and fatalities in the U.S. and Europe. This might be caused by higher testing rates and the use of masks since the early stage (Lau, 2020) or by different changes in daily behaviors such as mobility or social interactions (Durante et al., 2021; Brodeur et al., 2021).

My findings show that social capital is vital in the absence of regulations related to vaccination. In fact, social capital affects the way in which citizens comply with guidelines and suggestions (Rawat and Wu, 2020). In the context of the COVID-19 pandemic, strong social capital induces voluntary adhesion to the vaccination campaign from a very early stage, even in the absence of government prescriptions or persuasion campaigns. The use of the dynamic model shows that its effect is reduced as soon as stricter regulations are implemented.

In general, my findings contribute to the literature on the positive link between social capital and noneconomic aspects (Guiso et al., 2004; Tabellini, 2010; Ye and Aldrich, 2019). More specifically, my paper provides additional findings to the literature on social capital and health (Elgar et al., 2011; Nieminen et al., 2013), with a focus on vaccination. Other studies concerning the relationship between social capital and vaccination (Rönnerstrand, 2013; Chuang et al., 2015; Terraneo et al., 2022; Cárdenas et al., 2023) are based on a survey or on a cross-sectional analysis, while my setup allows for the analysis of their dynamic interaction. Vaccination generates individual and social benefits, and higher social capital has large, positive and significant effects on boosting vaccinations. For this reason, the paper provides critical insight for policymakers on the need to implement different strategies in different areas. For example, it might be helpful to involve local general practitioners in local information campaigns in areas with lower social capital. Second, generating (dis)incentives, such as the introduction of the green pass, is a fast and effective way to reduce the gap between areas with different levels of social capital. Finally, investing in social capital leads to positive effects in the long run.

The paper has the following structure. Section 2 introduces the case study and the variables considered. In Section 3, the econometric model is set up. Section 4 presents the main empirical results. Section 5 presents the conclusions.

3.2 Case study and data

The analysed area is just over 632.500 km^2 and has 67 million people. It is divided into 96 departments.[3]

France has been heavily affected by Covid-19: more than 7 million official cases and 117 thousand fatalities occurred until the end of October 2021. The vaccination campaign

[3]Departments of Guadelupe, Martinique, Guyane, La Reunion and Mayotte are not considered since they are not in the mainland.

started at the end of 2020. The vaccination campaign began at the end of 2020 and was divided into different phases on the basis of different priority groups. Initially, residents of Établissement d'hébergement pour personnes âgées dépendantes (EHPAD) and of Établissement ou service social ou médico-social (ESMS). Then, citizens above 75 years old (from January 18th) and above 65 years old (from the beginning of March) were included. Last, it was expanded to more categories until the 12–18-year-old group was born in June. The delivery of vaccines initially experienced delays, and it sped up only from the second week of April. In the middle of July, the French president announced the introduction of the use of the green pass from August 9th. It has become necessary to enter bars, restaurants, and shopping malls and perform many other daily social activities. As of the end of October, more than three-quarters of the French population received at least one dose of vaccine, approximately 10% more than the EU average. The vaccination rate is not uniform among European countries and is not uniform within the same country.
Table 3.1 summarises the data used in the analysis , and the sources are listed in Appendix U.
The main outcome variable is the cumulative percentage of the population receiving at least one dose of vaccine. This measure is reported for NUTS 3 regions (departments) and at a high frequency. Available daily data are aggregated weekly to avoid a decrease in vaccinations during the weekend and delays in delivery, especially during the initial phases, which affects the analysis.
I assume that social capital can increase the portion of the vaccinated population: more socially responsible behaviors are adopted. My hypothesis is based on previous research showing a positive impact of social capital on the ability of community members to cooperate efficiently to obtain social benefits (Cooter, 2000; Herrmann et al., 2008).
I proxy social capital by standard variables able to capture the bridging dimension of social capital extensively used in the literature: Eu voter turnout and the percentage of votes obtained by populist parties.[4] EU voter turnout is the main variable of interest, whereas the percentage of the population obtained by populist parties is used to provide a robustness check. Additional controls allow the results to control for possible confounding factors: age, education, foreigners and hospitalizations.

3.3 Model

The model used to develop the analysis follows (Bartscher et al., 2021): it presents a rigorous dynamic analysis to study the effect of social capital on vaccination over time. The two-way fixed effects model has become the default method to estimate causal effects when data must be adjusted for unobserved time and unit-specific confounders simultaneously.

[4]The parties considered as populist follow (Ivaldi, 2018): National Front and La France Insoumise.

Data source	Year	Variables	Description
gouf.fr	Weekly (04.01.2021-31.10.2021)	Vaccination rate	Cumulative number of citizens who got the first dose of the vaccine
gouv.fr	2019	EU	Voter turnout at the European elections
gouv.fr	2017	Populist parties	Percentage of votes obtained by populist parties during the national elections
INSEE	2020	Young	Percentage of population 19 years old or younger
INSEE	2020	High Education	Percentage of population with tertiary education
INSEE	2020	Low Education	Percentage of population without secondary education
INSEE	2018	Immigrants	Percentage of immigrants
INSEE	2021	Covid-19	Number of new hospitalised Covid-19 patients of the previous week

Table 3.1: Description of the dataset used

The basic equation estimated is as follows:

$$Vaccination\_rate_{dt} = \sum_t \beta_t week_t Soc\_Cap_d + \mu_d + \lambda_t + \epsilon_{dt} \tag{3.1}$$

The model includes time, λ_t, and unit, μ_d, specific fixed effects. Unit-specific fixed effects are able to capture all those specific characteristics related to every department: it cancels out time-invariant heterogeneity. I normalize the social capital proxies by their standard deviation. The effects of social capital on vaccination over time are captured by their interaction with weekly fixed effects. The parameters of interest, β_t, compare the evolution in the vaccination rates of departments with high social capital and those with low social capital. Period one is the reference, and all the other parameters must be interpreted relative to it. The availability of vaccines was low in period one, and vaccines were given to specific categories; therefore, social capital is assumed not to play a role in the vaccination rate, and for this reason, it is chosen as the reference point.
The period analysed starts on January 4th and stops on October 31st, corresponding to the beginning of the new wave.[5]
The identifying assumption requires that no other elements be systematically correlated with social capital and the vaccination rate. To make the assumption hold, I add control variables to the regression: four pre-vaccination controls are added to capture four possible confounding factors. I use a pre-outbreak measure of the variables and interaction of each covariate with week fixed effects. It allows the impact of each variable to depend just as the effect of social capital does. Young citizens cannot vote in elections, and they belong to the category that was allowed to receive the vaccine last. Education is another central factor in choosing whether to get vaccinated or not since highly educated people can process information and understand complex situations. However, people with low levels of education might be more easily convinced. Since education has a nonlinear effect on vaccination,[6] two variables are used: the percentage of people who do not have secondary education and those with higher education. Immigrants tend to be isolated from the rest of the population (Lichter et al., 2020); therefore, they have a lower level of bridging social capital. Moreover, many foreigners do not have the right to vote. At the same time, immigrants tend to have a lower vaccination rate ((Jiménez-García et al., 2008). I interact each control variable with weekly fixed effects.
Therefore, the equation estimated is as follows:

$$Vaccination\_rate_{dt} = \sum_t \beta_t week_t Soc\_Cap_d + \sum_t \gamma_t week_t X_a + \mu_d + \lambda_t + \epsilon_{dt} \tag{3.2}$$

[5]The vaccination is not required for people being previously infected by Covid-19. The analysis for the period following the beginning of the new wave would generate biased results and therefore it was necessary to stop data collection at the end of October.

[6](Bergmann et al., 2021) find out that the vaccination rate does not increase with education: ISCED.97 score 3 is the category with the lowest rate among the over 50 years old.

Control variables are represented by X_a.

The comparison between Equation 1 and Equation 2 provides evidence on whether the identifying assumption holds. The stability of the estimation implies that the fixed effects absorb unobserved time and regional effects and that observable confounders are kept in the controls.

3.4 Results

Figure 3.1 visualises the β coefficients from equation (1). Areas with greater social capital have an increasing vaccination rate since the availability of vaccines has increased enough to satisfy demand. A one standard deviation increase in social capital increases the number of vaccinated individuals (per 100,000 inhabitants) by approximately 2,000 units at the peak. Assuming that all departments with lower-than-average social capital now have average social capital, the increase in the total number of people vaccinated is more than 210,000 citizens. Under the assumption that all departments have social capital at the department level with the highest value, the increase in the total number of people vaccinated is approximately 2,275,000 citizens, 3.5% of the French population. As expected, the diverging path starts decreasing after the address to the nation of the president about the introduction of the green pass to participate in many social activities. Before Macron's address to the nation, the increase would have been almost 250,000 and more than 2,640,000 citizens, respectively. The results obtained show a strong impact of social capital on the vaccination of the population. In addition, the introduction of stricter rules concerning green passes has been the only way to turn this trend. The main concern with the estimate is that the measure of social capital used might be correlated with other vaccination-related characteristics. For this reason, I introduce the four control variables in the analysis: figure 1.3 visualises the β coefficients from equation (2). Dynamics and statistical significance are similar among the two specifications. Therefore, the results found are robust to the presence of omitted variables.

In Appendix R, the coefficients of the control variables are plotted. As expected, there is a negative relationship between the population 19 years old or younger and the vaccination rate. The negative relationship started decreasing as soon as young citizens were allowed to receive a dose. In addition, there is a negative relationship between the number of immigrants and the vaccination rate, which becomes stronger when the number of available doses increases. The trend changes signs after several weeks and becomes nonsignificant after the 30th week. This result might be driven by the greater difficulty of migrants in gathering information about the campaign or understanding the procedure to book a vaccination (Armocida et al., 2021). Accessibility to vaccines has always been a challenge for migrants (for Disease Prevention and Control, 2020). Even if the vaccination of migrants is considered a priority for the European Union (for Disease Prevention and Control, 2020), few have been done for them ((Bartovic et al., 2021). The effects of

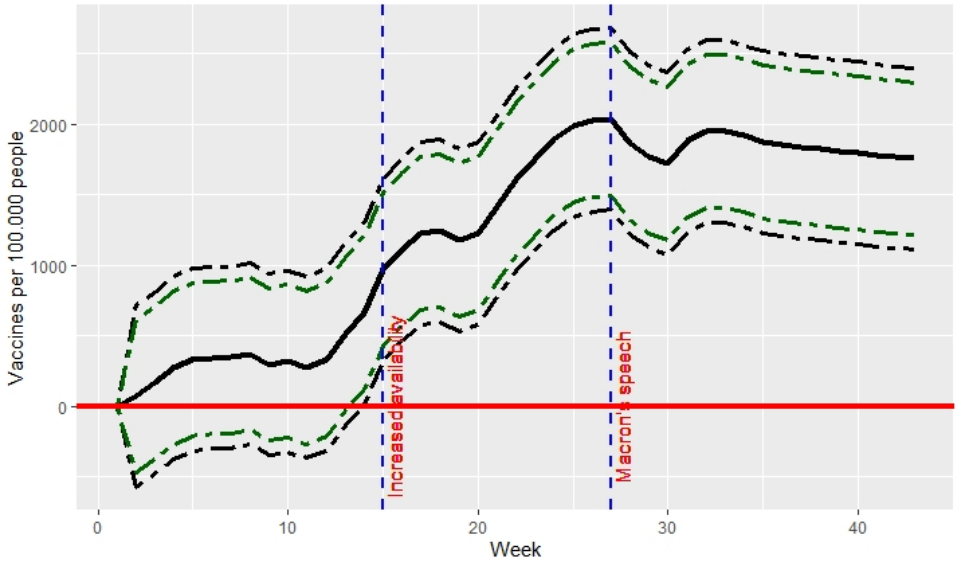


Figure 3.1: Effect of social capital, proxied by EU voter turnout, on the vaccination rate. The figure represents the dynamic evolution of the relationship between the vaccination rate per 100,000 inhabitants and social capital. The estimates are based on the model outlined in Equation (1). The first vertical line represents the week in which vaccine availability increased, and the second vertical line represents the date of the speech of the French president about the introduction of green passages for many social activities. The green (black) dotted line corresponds to the 95% (90%) confidence interval.

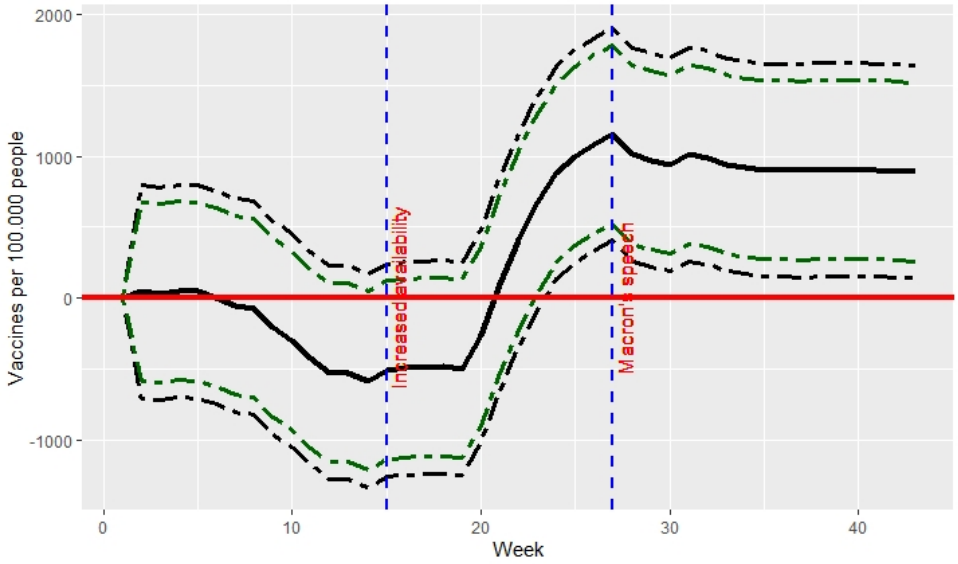


Figure 3.2: Effect of social capital, proxied by EU voter turnout, on the vaccination rate. The figure represents the dynamic evolution of the relationship between the vaccination rate per 100,000 inhabitants and social capital. The estimates are based on the model outlined in Equation (2). The first vertical line represents the week in which vaccine availability increased, and the second vertical line represents the date of the speech of the French president about the introduction of green passages for many social activities. The green (black) dotted line corresponds to the 95% (90%) confidence interval.

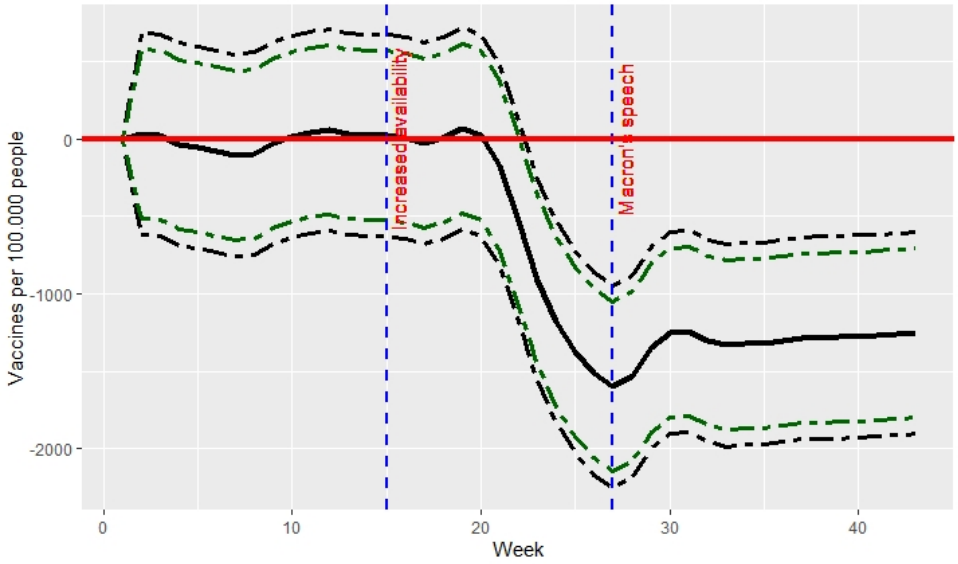


Figure 3.3: Effect of social capital, proxied by the percentage of votes for populist parties, on the vaccination rate. The figure represents the dynamic evolution of the relationship between the vaccination rate per 100,000 inhabitants and social capital. The estimates are based on the model outlined in Equation (1). The first vertical line represents the week in which vaccine availability increased, and the second vertical line represents the date of the speech of the French president about the introduction of green passages for many social activities. The green (black) dotted line corresponds to the 95% (90%) confidence interval.

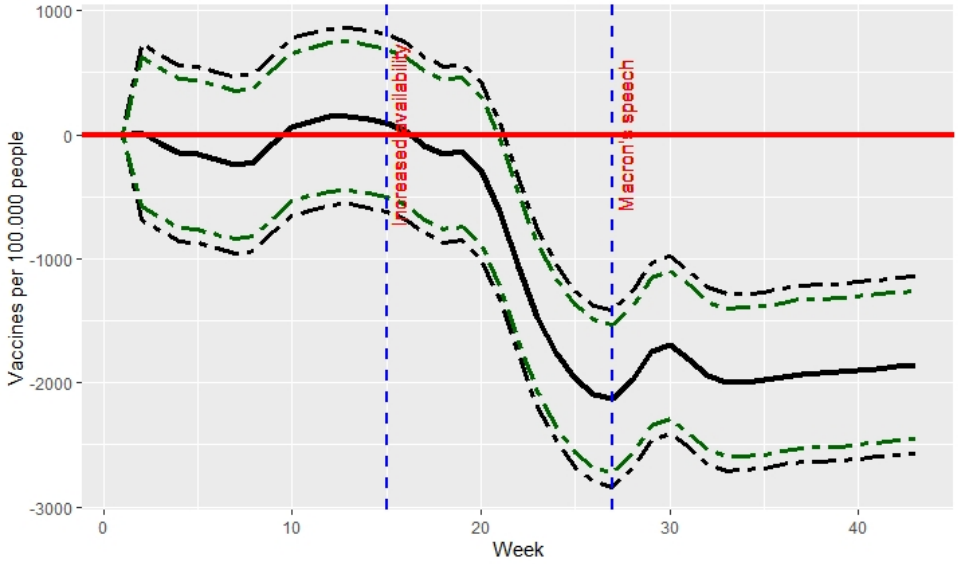


Figure 3.4: Effect of social capital, proxied by the percentage of votes for populist parties, on the vaccination rate. The figure represents the dynamic evolution of the relationship between the vaccination rate per 100,000 inhabitants and social capital. The estimates are based on the model outlined in Equation (2). The first vertical line represents the week in which vaccine availability increased, and the second vertical line represents the date of the speech of the French president about the introduction of green passages for many social activities. The green (black) dotted line corresponds to the 95% (90%) confidence interval.

education on the vaccination rate are nonlinear: the population with secondary education has the lowest rate.
In the robustness check, I account for an additional control variable: the number of new COVID-19 patients hospitalized during the previous two weeks. There is a relationship between social capital and the number of infections, and in areas where the virus is not substantially spread, the population might perceive the benefits of being vaccinated lower than those of people living in areas with a more significant outbreak.
Furthermore, I use a different measure of social capital to validate the results. Since this proxy has an opposite relationship with social capital (the greater the number of votes given to populist parties is, the lower the social capital), compared with the EU voter turnout and social capital (the greater the EU voter turnout is, the greater the social capital), the results of Figure 3.3 and Figure 3.4 must be viewed symmetrically (on the x-axis) compared to those in Figure 3.1 and Figure 3.2. This measure again leads to a very similar pattern, confirming the validity of the results: they are not driven by the choice of the proxy.
Lastly, I consider the case of another European country, Spain,[7] to confirm whether results are led only by some peculiarities related to the country chosen or they can be generalised. Magnitude, signs and levels of significance confirm once more the external validity of the results. In Appendix S the value of β coefficients are plotted.

3.5 Conclusions

This paper provides evidence on how social capital positively impacts the vaccination rate. Higher levels of social capital not only lead to positive economic outcomes but also generate positive noneconomic effects, such as an increase in the vaccination rate, driven by socially responsible behaviors.
The COVID-19 pandemic has generated a unique framework in which it is possible to analyze the dynamic behavior of the vaccination rate and the social response to the implementation of different policies. Our results have important implications for policymakers. First, it might be helpful to implement local information campaigns about vaccination's positive (individual and social) effects, especially for those categories that present lower rates, such as migrants and citizens who have secondary education. Second, in the case of lower vaccination rates, the implementation of stricter rules on the use of the green pass is a fast and effective way to increase vaccination rates. More generally, the provision of (dis)incentives plays a key role in convincing that part of the population with lower social capital. In addition, previous suggestions should be used to implement effective vaccination campaigns related to measles, rubella and mumps to achieve herd immunity. Finally, increasing social capital should become a goal for policymakers since

[7]Spain has data available only at the NUTS2 level. Due to the limited sample, confidence intervals are large. The proxy used is the EU voter turnout. I do not consider votes to populist parties since, due to Separatism, the level of populism of different regions cannot be compared

it has positive economic and noneconomic effects since social capital and the enforcement of strict rules are substitutes for goods.

R Dynamic evolution of the control variables

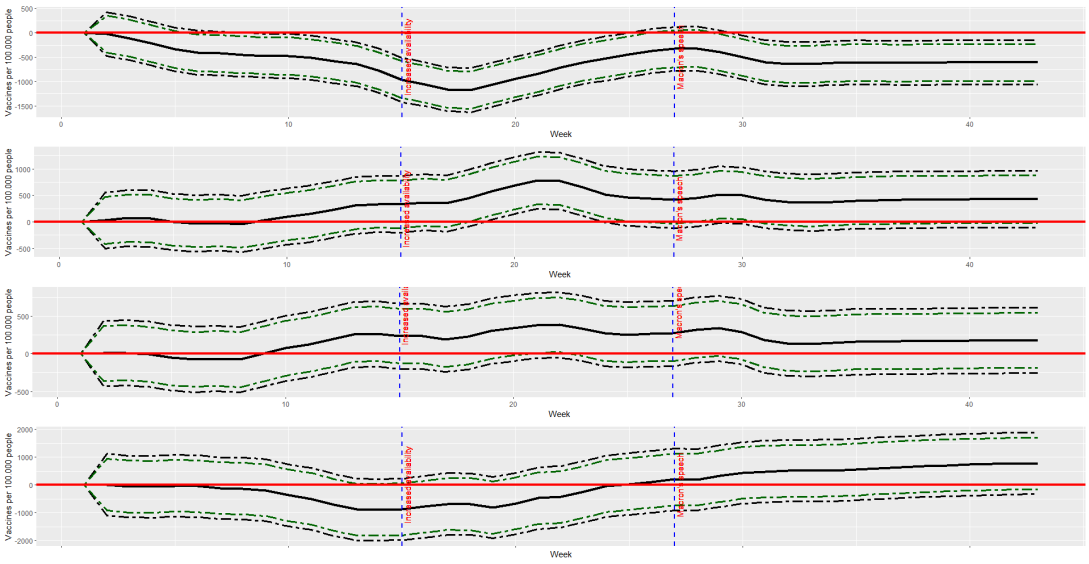


Figure 3.5: Dynamic evolution of the control variables. The first vertical line represents the week in which vaccine availability increased, and the second vertical line represents the date of the speech of the French president about the introduction of green passages for many social activities. The green (black) dotted line corresponds to the 95% (90%) confidence interval. The order of the variables considered is as follows: young figure 5, low education, high education, and immigrants.

S Effect of social capital, proxied by EU voter turnout, on the vaccination rate in Spain

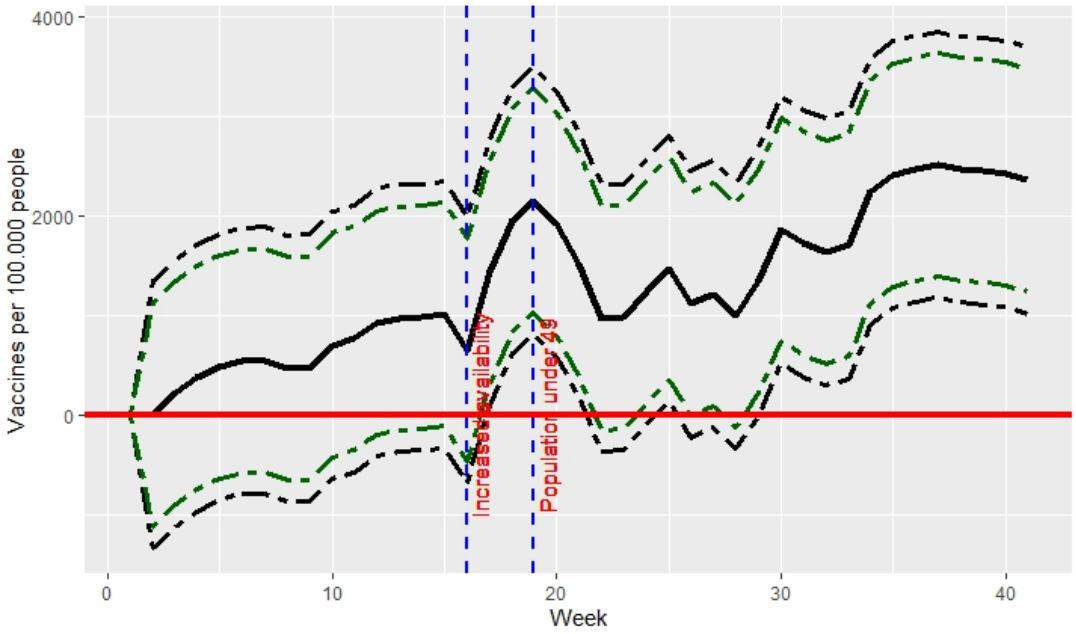


Figure 3.6: Effect of social capital, proxied by EU voter turnout, on the vaccination rate in Spain. The figure represents the dynamic evolution of the relationship between the vaccination rate per 100,000 inhabitants and social capital. The estimates are based on the model outlined in Equation (2), including the number of new patients as a unique control. The first vertical line represents the week in which vaccine availability increased, and the second vertical line represents the date of the speech of the French president about the introduction of green passages for many social activities. The green (black) dotted line corresponds to the 95% (90%) confidence interval.

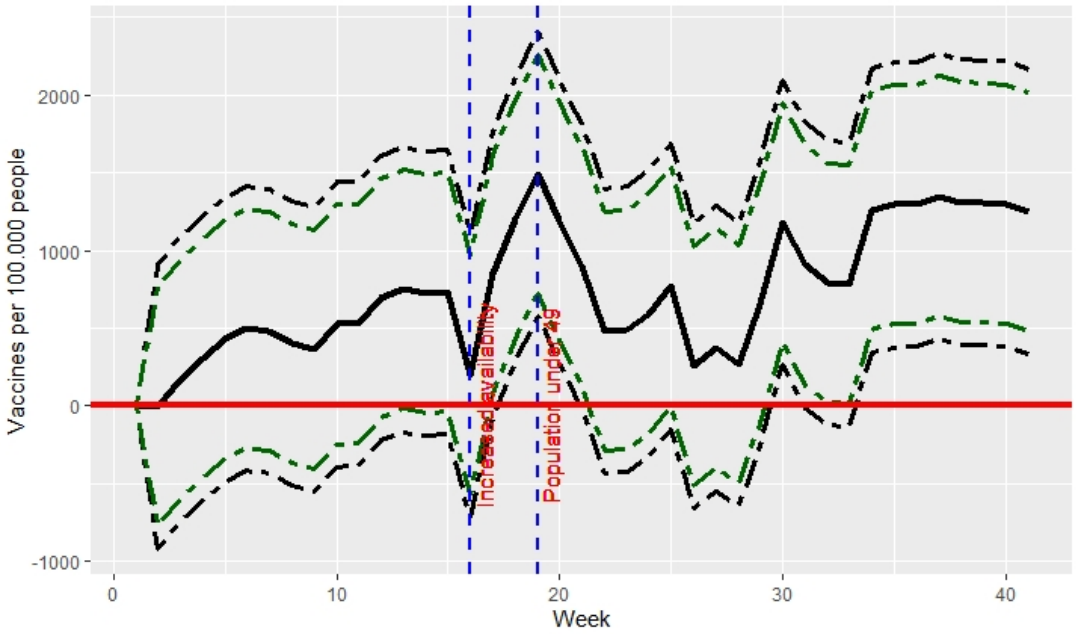


Figure 3.7: Effect of social capital, proxied by EU voter turnout, on the vaccination rate in Spain. The figure represents the dynamic evolution of the relationship between the vaccination rate per 100,000 inhabitants and social capital. The estimates are based on the model outlined in Equation (2) and include all five control variables. The first vertical line represents the week in which vaccine availability increased, and the second vertical line represents the date of the speech of the French president about the introduction of green passages for many social activities. The green (black) dotted line corresponds to the 95% (90%) confidence interval.

T Estimated coefficients

Week	Estimate	Std. Error	t value	Pr(>|t|)	Signif.
2	70.753	329.877	0.2145	0.8301810	
3	162.984	329.904	0.4940	0.6213096	
4	270.271	329.904	0.8192	0.4126971	
5	330.386	329.904	10.015	0.3166640	
6	342.450	329.904	10.380	0.2993199	
7	344.773	329.904	10.451	0.2960531	
8	371.769	329.904	11.269	0.2598523	
9	295.604	329.904	0.8960	0.3702906	
10	315.983	329.904	0.9578	0.3382203	
11	275.071	329.904	0.8338	0.4044480	
12	331.136	329.904	10.037	0.3155674	
13	510.996	329.904	15.489	0.1214796	
14	659.841	329.904	20.001	0.0455576	*
15	964.776	329.904	29.244	0.0034706	**
16	1111.388	329.904	33.688	0.0007621	***
17	1223.391	329.904	37.083	0.0002115	***
18	1245.308	329.904	37.748	0.0001625	***
19	1178.029	329.904	35.708	0.0003601	***
20	1223.192	329.904	37.077	0.0002120	***
21	1420.946	329.904	43.072	1.69e-02	***
22	1607.547	329.904	48.728	1.14e-03	***

Table C1 (continued) Estimated coefficients of Equation (1)

Week	Estimate	Std. Error	t value	Pr(>|t|)	Signif.
23	1748.317	329.904	52.995	1.23e-04	***
24	1895.931	329.904	57.469	9.77e-06	***
25	1990.058	329.904	60.322	1.77e-06	***
26	2024.986	329.904	61.381	9.17e-07	***
27	2039.449	329.904	61.820	6.97e-07	***
28	1862.792	329.904	56.465	1.75e-05	***
29	1772.376	329.904	53.724	8.22e-05	***
30	1721.713	329.904	52.188	1.89e-04	***
31	1883.912	329.904	57.105	1.21e-05	***
32	1950.532	329.904	59.124	3.66e-06	***
33	1951.140	329.904	59.143	3.62e-06	***
34	1918.989	329.904	58.168	6.47e-06	***
35	1873.255	329.904	56.782	1.46e-05	***
36	1853.373	329.904	56.179	2.07e-05	***
37	1835.400	329.904	55.634	2.82e-05	***
38	1826.032	329.904	55.350	3.31e-05	***
39	1807.472	329.904	54.788	4.55e-05	***
40	1796.394	329.904	54.452	5.49e-05	***
41	1781.134	329.904	53.990	7.10e-05	***
42	1766.483	329.904	53.545	9.07e-05	***
43	1755.867	329.904	53.224	1.08e-04	***

Table 3.2: Estimated coefficients of Equation (1)

Note: Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

U Data Sources

Variable	**Country**	**Source**
Vaccination rate	France	data.gouv.fr
EU elections turnout	France	data.gouv.fr
Populist parties	France	data.gouv.fr
Young	France	insee.fr
High Education	France	insee.fr
Low Education	France	insee.fr
Foreigners	France	insee.fr
Covid-19 hospitalization	France	data.gouv.fr

Table 3.3: Data sources

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